CITY OF MILWAUKIE

AGENDA

October 12, 2021
PLANNING COMMISSION
milwaukieoregon.gov

Zoom Video Meeting: due to high rates of community COVID-19 transmission, the Planning Commission will hold this meeting through Zoom video. The public is invited to watch the meeting online through the City of Milwaukie YouTube page (https://www.youtube.com/channel/UCRFbfqe3OnDWLQKSB_m9cAw) or on Comcast Channel 30 within city limits.

If you wish to provide comments, the city encourages written comments via email at planning@milwaukieoregon.gov. Written comments should be submitted before the Planning Commission meeting begins to ensure that they can be provided to the Planning Commissioners ahead of time. To speak during the meeting, visit the meeting webpage (https://www.milwaukieoregon.gov/bc-pc/planning-commission-81) and follow the Zoom webinar login instructions.

1.0 Call to Order – Procedural Matters — 6:30 PM

2.0 Planning Commission Minutes – Motion Needed

- 2.1 August 10, 2021

3.0 Information Items

4.0 Audience Participation — This is an opportunity for the public to comment on any item not on the agenda

5.0 Hearing Items

- 5.1 Hillside Planned Development
  - Summary: Final Planned Development: Redevelopment of Hillside Park with higher density apartment and mixed-use buildings.
  - Applicant: Jill Smith, Housing Authority of Clackamas County
  - Address: 2889 Hillside Court
  - File: PD-2021-001 (master file)
  - Staff: Senior Planner Vera Kolias
- 5.2 Middle Housing Code
  - Summary: Proposed code and map amendments for the first phase of implementation of the city's comprehensive plan – middle housing, tree preservation, and residential parking.
  - File: ZA-2021-002
  - Staff: Senior Planner Vera Kolias

6.0 Planning Department Other Business/Updates

7.0 Planning Commission Committee Updates and Discussion Items — This is an opportunity for comment or discussion for items not on the agenda.

8.0 Forecast for Future Meetings

October 21, 2021	Work Session: Joint meeting with NDA's
October 26, 2021	Continued Hearing: ZA-2021-002 Middle Housing and Tree Code Hearing: VR-2021-014, 23rd Ave Property Line Adjustment
November 9, 2021	Hearing: VR-2021-015, Filbert St ADU conversion variance

Milwaukie Planning Commission Statement

The Planning Commission serves as an advisory body to, and a resource for, the City Council in land use matters. In this capacity, the **mission of the Planning Commission is to articulate the Community's values and commitment to socially and** environmentally responsible uses of its resources as reflected in the Comprehensive Plan

1. PROCEDURAL MATTERS. If you wish to register to provide spoken comment at this meeting or for background information on agenda items please send an email to planning@milwaukieoregon.gov.
2. PLANNING COMMISSION and CITY COUNCIL MINUTES. City Council and Planning Commission minutes can be found on the City website at www.milwaukieoregon.gov/meetings.
3. FORECAST FOR FUTURE MEETINGS. These items are tentatively scheduled but may be rescheduled prior to the meeting date. Please contact staff with any questions you may have.
4. TIME LIMIT POLICY. The Commission intends to end each meeting by 10:00pm. The Planning Commission will pause discussion of agenda items at 9:45pm to discuss whether to continue the agenda item to a future date or finish the agenda item.

Public Hearing Procedure

Those who wish to testify should attend the Zoom meeting posted on the city website, state their name and city of residence for the record, and remain available until the Chairperson has asked if there are any questions from the Commissioners. Speakers are asked to submit their contact information to staff via email so they may establish standing.

1. STAFF REPORT. Each hearing starts with a brief review of the staff report by staff. The report lists the criteria for the land use action being considered, as well as a recommended decision with reasons for that recommendation.
2. CORRESPONDENCE. Staff will report any verbal or written correspondence that has been received since the Commission was presented with its meeting packet.
3. **APPLICANT'S PRESENTATION.**
4. PUBLIC TESTIMONY IN SUPPORT. Testimony from those in favor of the application.
5. NEUTRAL PUBLIC TESTIMONY. Comments or questions from interested persons who are neither in favor of nor opposed to the application.
6. PUBLIC TESTIMONY IN OPPOSITION. Testimony from those in opposition to the application.
7. QUESTIONS FROM COMMISSIONERS. The commission will have the opportunity to ask for clarification from staff, the applicant, or those who have already testified.
8. REBUTTAL TESTIMONY FROM APPLICANT. After all public testimony, the commission will take rebuttal testimony from the applicant.
9. CLOSING OF PUBLIC HEARING. The Chairperson will close the public portion of the hearing. The Commission will then enter into deliberation. From this point in the hearing the Commission will not receive any additional testimony from the audience but may ask questions of anyone who has testified.
10. COMMISSION DISCUSSION AND ACTION. It is the Commission's intention to make a decision this evening on each issue on the agenda. Planning Commission decisions may be appealed to the City Council. If you wish to appeal a decision, please contact the Planning Department for information on the procedures and fees involved.
11. MEETING CONTINUANCE. Prior to the close of the first public hearing, *any person* may request an opportunity to present additional information at another time. If there is such a request, the Planning Commission will either continue the public hearing to a date certain or leave the record open for at least seven days for additional written evidence, argument, or testimony. The Planning Commission may ask the applicant to consider granting an extension of the 120-day time period for making a decision if a delay in making a decision could impact the ability of the City to take final action on the application, including resolution of all local appeals.

Meeting Accessibility Services and Americans with Disabilities Act (ADA) Notice

The city is committed to providing equal access to public meetings. To request listening and mobility assistance services contact the Office of the City Recorder at least 48 hours before the meeting by email at ocr@milwaukieoregon.gov or phone at 503-786-7502. To request Spanish language translation services email espanol@milwaukieoregon.gov at least 48 hours before the meeting. Staff will do their best to respond in a timely manner and to accommodate requests. Most Council meetings are broadcast live on the city's YouTube channel and Comcast Channel 30 in city limits.

Servicios de Accesibilidad para Reuniones y Aviso de la Ley de Estadounidenses con Discapacidades (ADA)

La ciudad se compromete a proporcionar igualdad de acceso para reuniones públicas. Para solicitar servicios de asistencia auditiva y de movilidad, favor de comunicarse a la Oficina del Registro de la Ciudad con un mínimo de 48 horas antes de la reunión por correo electrónico a ocr@milwaukieoregon.gov o llame al 503-786-7502. Para solicitar servicios de traducción al español, envíe un correo electrónico a espanol@milwaukieoregon.gov al menos 48 horas antes de la reunión. El personal hará todo lo posible para responder de manera oportuna y atender las solicitudes. La mayoría de las reuniones del Consejo de la Ciudad se transmiten en vivo en el canal de YouTube de la ciudad y el Canal 30 de Comcast dentro de los límites de la ciudad.

Milwaukie Planning Commission:
Lauren Loosveldt, Chair
Joseph Edge, Vice Chair
Greg Hemer
Robert Massey
Amy Erdt
Adam Khosroabadi
Jacob Sherman

Planning Department Staff:
Laura Weigel, Planning Manager
Vera Kolias, Senior Planner
Brett Kelver, Senior Planner
Will First, Administrative Specialist II

CITY OF MILWAUKIE

PLANNING COMMISSION MINUTES

City Hall Council Chambers
10722 SE Main Street
www.milwaukieoregon.gov

August 10, 2021

Present:	Joseph Edge, Vice Chair Greg Hemer Adam Khosroabadi Robert Massey Jacob Sherman	Staff:	Laura Weigel, Planning Manger Vera Kolias, Senior Planner Justin Gericke, City Attorney
Absent:	Lauren Loosveldt, Chair Amy Erdt		

(00:00:05)
1.0 Call to Order – Procedural Matters*

Vice-Chair Edge called the meeting to order at 6:30 pm and read the conduct of meeting format into the record.

Note: The information presented constitutes summarized minutes only. The meeting video is available by clicking the Video link at *http://www.milwaukieoregon.gov/meetings.*

(00:00:29)
2.0 Informational Items

No information was presented for this portion of the meeting.

(00:00:37)
3.0 Audience Participation

No information was presented for this portion of the meeting.

(00:01:26)
4.0 Work Session

(00:01:37)
4.1 Summary: Comprehensive Plan Implementation - Draft Code/Map Amendments –Batch #1

Vera Kolias, Senior Planner shared an update about the Comprehensive Plan Implementation project. The policy mandates were to increase the supply of middle

housing, increase city-wide tree canopy and preserve existing trees, and manage parking to enable middle housing. Draft code and maps were under development. The Comprehensive Plan included a policy to create an equitable distribution of housing choices throughout the city. Some of the key amendments were to:

- Consolidate the eight residential zones to six
- Allow lot size to determine permitted housing types
- Allow middle housing to be permitted as attached or detached units
- Require one parking space per unit and allow the space to be located in the driveway or setback
- Require tree preservation, protection, and replacement of removed trees in new development and private property

The code will still have development standards, such as maximum lot coverage, building height, minimum landscaping, and setbacks. The outcome will be code amendments that balance the city's goal for a 40% tree canopy and implementation of the housing policies outlined in House Bill 2001.

The purpose of this meeting was to present the comprehensive plan and land use map, zoning map, permitted uses, definitions, parking, ADU review and design, and development standards. On August 10, there will be a discussion about flag lots and back lots, natural resource code, and Title 17 – Land Division. On August 24, which will be the final meeting prior to the public hearing there will be a focus on tree code, and design and development standards for middle housing.

There was a proposal for new definitions related to middle housing. Those included middle housing, multi-unit development, quadplex, triplex, and uses allowed by right. Some of the key code amendments regarding ADUs were to allow them by right and subject them to design and development standards, and revisions to the footprint requirement for accessory structures more than 3 years old when converted to an ADU. There was a proposal to create a new Type II variance for Type B ADUs for a 25% increase in size over the maximum square feet currently allowed instead of a Type III variance. Yurts will no longer be an allowed detached ADU because Yurts do not meet the building code.

Commissioner Sherman asked about the rationale of the different sizes of an ADU and the 25% variance option. Kolias responded, this would give the applicant some flexibility as they designed their ADU. A Type II ADU would require a Neighborhood District Association and public notice. This aligned with other variances within the code for setbacks, lot coverage, and fences. Commissioner Sherman understood that the code only allowed one ADU per lot. They were interested in discussing the possibility of an attached and detached ADU per lot. Kolias responded, currently, the plan was one ADU per lot. Kolias wanted to discuss this further. Commissioner Hemer shared, one or two ADUs should be maximum to ensure if cottage clusters needed to be built that should be the focus instead of building multiple ADUs. Vice Chair Edge shared, each duplex, triplex, or quadplex should be allowed to have an ADU. Also, single dwelling units should be permitted two ADUs per lots as long as they followed the code requirements, such as maximum lot coverage, minimum vegetation, and other requirements. Commission Khosroabadi asked, were there any cons to allowing more

than one ADU on a lot? Kolias responded, they did not think there were any cons and wanted the group to keep in mind that as the code was written there were not any parking requirements for ADUs, therefore ADU parking is likely to occur on the street. Commissioner Sherman shared, two ADUs should be outright permitted and it did not matter if the ADU would be attached or detached. Commissioner Hemer shared, where density was happening additional ADUs should not be permitted. Vice Chair Edge asked, if staff would be willing to draft language regarding ADUs with middle housing for a later discussion?

Kolias presented the draft parking code updates. The proposed code was one space per unit, not including ADU's, with an option to have the required space in the driveway or within the setback. There were conversations about parking alternatives, which included the parking modification process or considering incentives for income-restricted housing. There were conversations to incentivize income-restricted housing through the parking requirements. The Planning Department proposed a by right reduction in minimum off-street parking for development meeting a specific level of affordability. Possible code language discussed was to allow any multi-unit dwelling unit or middle housing dwelling unit that was affordable to households earning equal to or less than 80 percent of the area median income (AMI) as defined by the U.S. Department of Housing and Urban Development to receive a 25% parking reduction. The reduction would only apply to the income-restricted units. Commission Khosroabadi shared, the incentive for affordable housing was beneficial to the city and had the ability to drive more development for affordable housing. Commissioner Sherman shared, the percentage could be higher. Maybe 50%. Commissioner Massey shared, 25% was not a needle mover. Commissioner Hemer shared, the parking reductions should be based on income tiers because some of individuals in the restricted-income housing may have a car. Vice Chair Edge shared, they wanted to review the amount of the reduction indexed to the percentage of the AMI the restricted-income housing provided. They agreed with Commissioner Hemer that the developer needed some parking for restricted-income residents. Kolias shared, the Planning Department could review the Hillside project and their parking spaces projection. The applicant was developing restricted-income housing and applied for a parking reduction. Commissioner Sherman shared, the Planning Department should consider the location of the restricted-income housing and proximity to public transportation. If the two were close maybe the parking modification would permit zero parking spaces. Kolias shared, the code already allowed parking modifications for development near public transportation. This was something that needed an additional look to understand how this portion of the code could benefit restricted-income housing. Commissioner Sherman shared, it would be beneficial to the City to not require a minimum parking for single family housing. Kolias responded, the code needed to be the same for middle housing and single family by state law. Vice Chair Edge asked, what Comprehensive Plan policies supported having a minimum parking space per one dwelling unit vs zero parking spaces?

Kolias presented the Comprehensive Plan residential maps updates. The plan was to consolidate four residential land use designations to two, which were moderate density and high density. The Moderate Density Residential (R-MD) Zone included what was R-5, R-7, and R-10. The permitted housing types were single-unit detached on moderate to

small lots and middle housing. Any site with natural resource or natural hazard overlays may require a reduction in density. The High Density Residential Zone included R-1, R-1-B, R-2, R-2-.5, R-3. The permitted housing types were a wide variety of housing types with the predominant housing type being multi-unit development. Office uses were outright permitted and commercial uses were conditional uses in limited areas. The zoning permitted uses in the high density zones were not in alignment. Some of the zones outright permitted multi-unit and in other zones, it was a conditional use. Due to the inconsistent criteria between the different zones, it was difficult to consolidate these zones. The Planning Department proposed to maintain the HD zones as they were. The Planning Department would insert middle housing and amend associated minimum lot sizes and terminology as needed. In conclusion, the city will have 6 zones: R-1, R-1-B. R-2, R-2-.5, R-3 and R-MD. Commissioner Massey shared, as the Planning Department considered the congregate housing definition it needed to be more diverse and include halfway housing, like a Northwest Housing Alternatives, and temporary housing shelters. Kolias and Vice Chair Edge agreed. Commissioner Hemer would like the Planning Department to conduct more outreach due to lack of public responses. They wanted the Planning Department to ensure what was being proposed aligned with the Comprehensive Plan and what the residents wanted. Kolias responded, they went to Milwaukie's Farmer's Market, among multiple outreach efforts, to answer questions about the code updates. Laura Weigel, Planning Manager recommended Kolias share an update about the various engagement that they completed thus far. Commissioner Sherman agreed that was a great idea. It would be valuable to start each meeting sharing an updated outreach plan with the Planning Commission. Kolias shared, there was an article about the project in every pilot newsletter since September 2020.

Commissioner Sherman asked about the criteria for townhomes and cottages and wondered how the criteria impacted the tree canopy goals. Kolias responded, the criteria was based on House Bill 2001. A cottage cluster had to be part of a cluster and the lot must be at least 1,500 square feet (sf) for each cottage. Commissioner Sherman encouraged the Planning Department to take the first sentence from the townhomes' statement and add it to the cottage clusters' statement. They also would like more information about the cottage clusters setbacks. Kolias shared, the consultant looked at the cottage cluster codes from other cities and the model code from House Bill 2001. They asked to hold off on discussing this until August 24th, when the Planning Department was returning to present the cottage cluster code. From now until then, there was a possibility for some tweaks to the code. Commissioner Sherman asked, about the design standards and wanted to make sure those standards were not lost as the City will allow other types of development.

Kolias presented the project's timeline. During July and August, they were hosting Planning Commission work sessions, tracking written public comments, and engaging with the public. From September until the code adoption, there will be Planning Commission and City Council public hearings, the final draft code would be posted, and conduct community engagement activities.

(01:48:08)

5.0 Planning Department Other Business/Updates

Weigel shared, Janine Gates, Assistant Planner was leaving the Planning Department to join the Community Development Department as their Housing and Economic Development Program Manager.

(01:49:00)
6.0 Planning Commission Committee Updates and Discussion Items

Commissioner Sherman asked about federal funding for park development. Weigel responded, they were unsure and needed to check with Kelly Brooks, Interim Community Development Director. Commissioner Sherman wanted an update about the Milwaukie Bikeway plan. Weigel responded, the plan went to Council and they did not decide on the preferred plan. That was still in the works.

(01:54:1828)
7.0 Forecast for Future Meetings

August 10, 2021	Work Session Item: Comprehensive Plan Implementation – Draft Code/Map Amendments – Batch #2
August 24, 2021	Work Session Item: Comprehensive Plan Implementation – Tree Code; Draft Code/Map Amendments – Batch #3
September 14, 2021 (tentative)	Hearing Item: VR-2021-013, Bonaventure Senior Living Walkways

Meeting adjourned at approximately 8:30 PM.

Respectfully submitted,

N. Janine Gates
Assistant Planner

CITY OF MILWAUKIE

To: Planning Commission

Through: Laura Weigel, Planning Manager and Steve Adams, City Engineer

From: Vera Kolias, Senior Planner and Jennifer Backhaus, Engineering Tech III

Date: October 5, 2021, for October 12, 2021, Public Hearing

Subject: File: PD-2021-001; ZC-2021-002; CPA-2021-002; S-2021-001
Applicant/Owner: Housing Authority of Clackamas County
Address: 2889 SE Hillside Ct
Legal Description (Map & Tax Lot): 11E25CD 00100, 00102
NDA: Ardenwald

ACTION REQUESTED

Review the final development plan proposed with land use application master file #PD-2021-001 and its associated applications and forward a recommendation to City Council based on the recommended Findings and Conditions of Approval found in Attachments 1 and 2. This action would allow for development of a 600-unit multiunit housing and mixed use development, pending approval of the final development plan by City Council.

BACKGROUND INFORMATION

This Planned Development proposal is for the redevelopment of Hillside Park, which is owned and operated by the Housing Authority of Clackamas County (HACC). The 16-acre property consists of 100 single-family dwelling units and the 100-unit Hillside Manor tower. The tower, which was partitioned onto a separate lot in early 2020, will remain on site and be refurbished. The remainder of the site is proposed to be redeveloped with apartments and mixed-use buildings for a total of 600 units on the property (400 new units, 100 replacement units, and 100 units in the Hillside Manor tower) at the end of all phases of development (see Figures 1 and 2).

In addition to the residential development, the proposal includes open space, recreational areas, playgrounds, and the development of small-scale commercial uses in the mixed-use buildings facing onto SE 32nd Ave and SE Meek St. To achieve the new density proposed, the site will be rezoned to R1 (High Density Residential) on the north and GMU (General Mixed Use) on the south. The Comprehensive Plan designations will also be changed from Medium Density Residential to High Density Residential on the north and Town Center on the south.

Figure 1. Master Plan

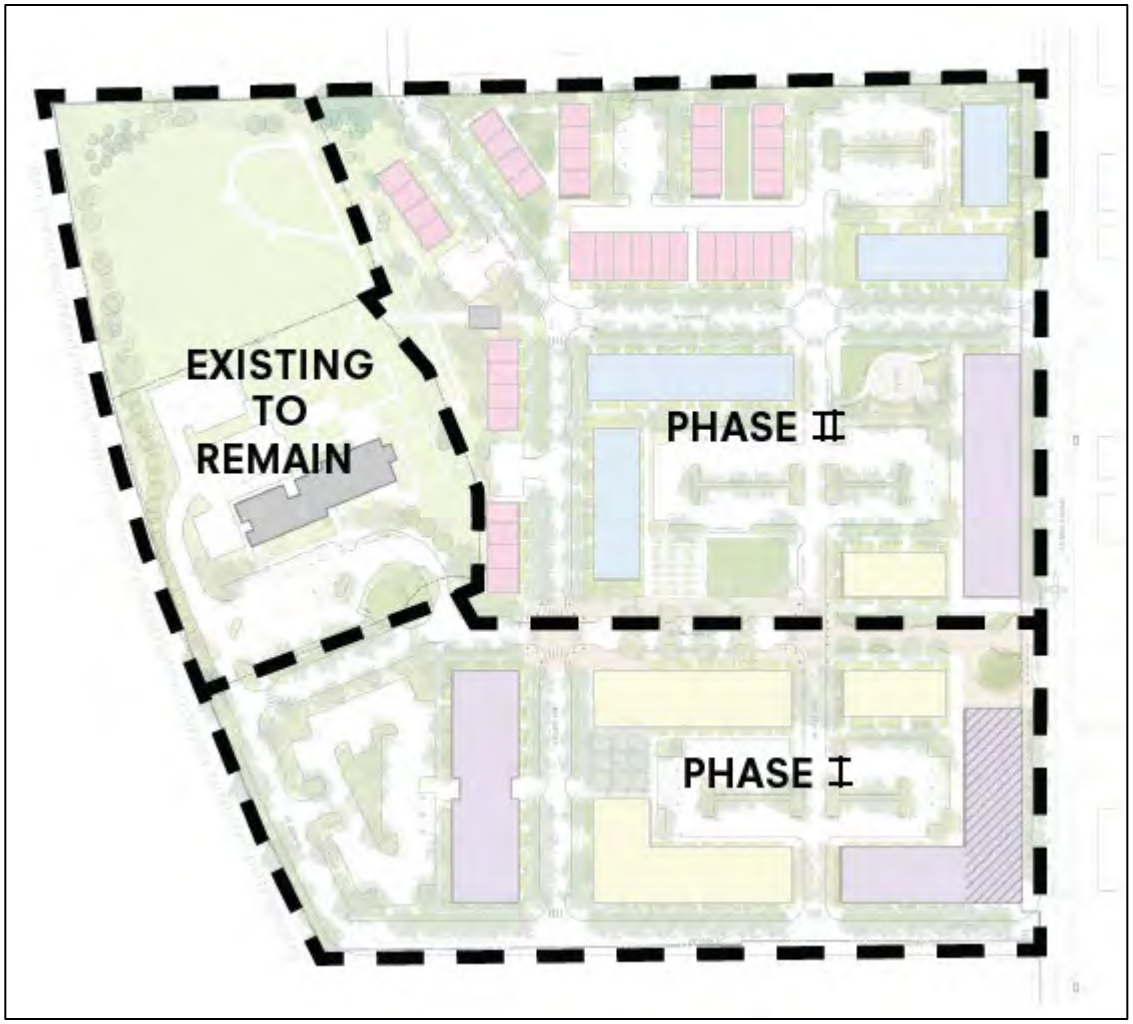


Figure 2. Phasing Plan

The proposed redevelopment on the site will involve the phased demolition of the existing improvements, including removal of the structures, demolition of the existing roads, and removal or abandonment of the underground infrastructure. A new street grid and infrastructure plan is proposed, with the streets to be realigned. The phasing plan will include assisting the current Hillside Park residents with relocation into the new units upon completion. Please refer to Sheet MP 1.9 in Attachment 4.c for a detail of Phase 1. The first phase includes HACC developing at least 100 replacement units on Lot B that will be deeply affordable and that will be leased to low-income residents.

The Master Plan also includes subdividing the property into smaller lots to phase development and provide the opportunity for development of lots by outside partners (See Figure 3). The overall development is anticipated to be a combination of both market rate and affordable housing and will leverage federal, state, and local funding opportunities.

Figure 3. Land Division Plan

A. Site and Vicinity

The subject property is located at 2889 SE Hillside Ct. A neighborhood of predominantly single dwelling units is located to the north, the campus of Providence Hospital is to the east, the vacant "Murphy Site" is to the south, and the North Milwaukie Industrial Area, the Southern Pacific rail line, and Hwy 224 are immediately to the west (see Figures 4 and 5).

Figure 4. Site and Vicinity

The site is located in the Ardenwald neighborhood and is adjacent to the Central Milwaukie part of the city.

Figure 5. Site and Vicinity - Aerial photo

B. Zoning Designation

Residential R-3

(see Figure 6)

C. Comprehensive Plan Designation

High Density Residential (HD)

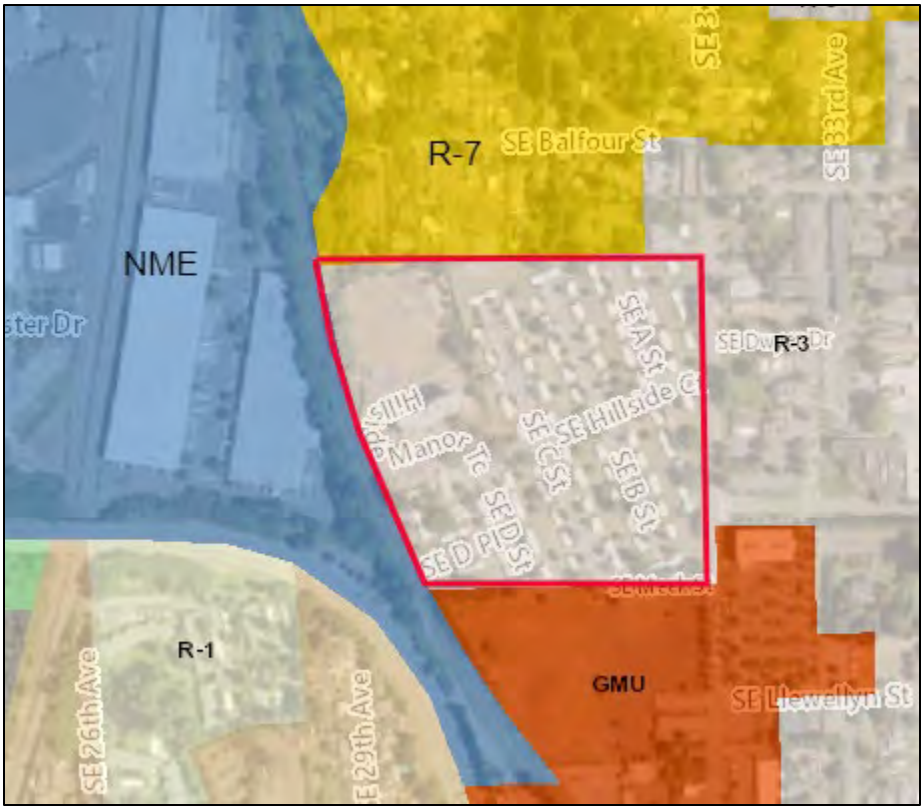


Figure 6. Zoning

D. Land Use History

Hillside Manor and Hillside Park is a multifamily development in the R-3 zone.

The 99 detached dwellings with one duplex were built in the 1940s prior to any zoning requirements on the site. Under the current code, this development pattern would also be considered "multifamily development," requiring a conditional use in the R-3 zone. As such, the existing development has "de facto" conditional use status per MCC 19.905.8.

- **1969 (file #VR-69-7)**: The existing Hillside Manor tower was originally approved on the site through a 1969 Variance that allowed the building to vary from the normal height and parking requirements of the zoning at the time. In the current R-3 zone multifamily housing is permitted though a conditional use. Therefore, the tower development also has "de facto" conditional use status on the site.
- **CSU review**: There is an existing wireless communication facility on the tower building. That facility has been permitted, and subsequently adjusted, via a number of Type II Community Service Use applications per MMC 19.905.11 – Wireless Communication Facilities (file #CSU-10-08; CSU-11-03; CSU-12-01; CSU-12-05).
- **2019 (file #MLP-2019-003; VR-2019-011; CU-2019-003):** This partition created two parcels to separate the Manor tower from the remainder of the site for financing purposes. No new or additional development on either of the two parcels was proposed as part of this partition request. A variance was approved to allow a side

yard setback of 4.1 ft rather than 5 ft resulting from the partition. Because the multifamily development is a conditional use, the partition was considered a minor modification to the conditional use. An easement was placed over the open space area to assure that the residents of the Tower would still be able to access this area even though it was on a separate lot from the Tower. The conditions of approval limited the overall number of units between the two parcels to 234 without further zoning or Planned Development approvals.

- **2021 (File #PD-2021-002; TFR-2020-003):** The Planning Commission approved the preliminary Planned Development on March 23, 2021. As required, the applicant has submitted the Final Planned Development application within 18 months of that approval.

E. Proposal

The applicant is seeking land use approval to develop a mixed-income community of 600 units (400 new units, 100 replacement units, and 100 units in the Hillside Manor tower) at the end of all phases of development. The applicant is using the Planned Development (PD) process, which allows greater flexibility in design than would otherwise be possible through the standards of the underlying R-3 zone.

As described in the application materials, the existing houses in Hillside Park will be replaced with 100 new affordable units for the population currently being served on the site. Removing the existing houses creates the opportunity to develop 400 new residential units that will include a mix of both affordable and market-rate housing. The new units will provide a variety of housing choices, from walkup townhomes in the northern part of the site (adjacent to the existing single-family neighborhood to the north) to 3- and 4-story mixed-income apartment buildings to the south.

In addition to the residential development, the proposal includes opportunities for small-scale commercial and office uses on the ground floor of the buildings along 32nd Ave. The GMU zone allows a wide variety of uses, many of which are not appropriate for, or compatible with, the proposed development or the surrounding neighborhood context. The proposed PD modifies the allowable uses to be specific to the site by allowing a total of 20,000 sq ft of commercial space on Lots A and E and community space available to the residents only in Building C.1, located on Lot C (not a Community Service Use). The redevelopment plan will also provide new amenities for the residents including enhanced open space areas, garden plots, and a playground.

Redevelopment of the site is a significant undertaking and will involve creating a new street grid and infrastructure network allowing the streets to be realigned for increased safety and better connectivity to the surrounding neighborhood. The new street grid will also help support the increased density. The new streetscapes will be characterized by wide sidewalks, planter strips, a full tree canopy, and green infrastructure (that could include water quality swales, ponds, and/or planters). A total of 489 vehicle parking spaces will be provided with a mixture of on-street parking spaces and surface lots.

The Master Plan includes subdividing the property into smaller lots to facilitate phased development and provide the opportunity for development of lots by outside partners. In order to reach the density goals and allow for mixed-use development, the final development plan and program includes a request to change the Zoning and Comprehensive Plan Designation of the property. The northern portion of the site is proposed with a zoning of R1 and a Comprehensive Plan designation of High Density Residential. The southern portion of the site is proposed as GMU (General Mixed Use) with a Comp Plan designation of TC (Town Center), consistent with the property directly to the south across Meek St (see Figures 7 and 8).

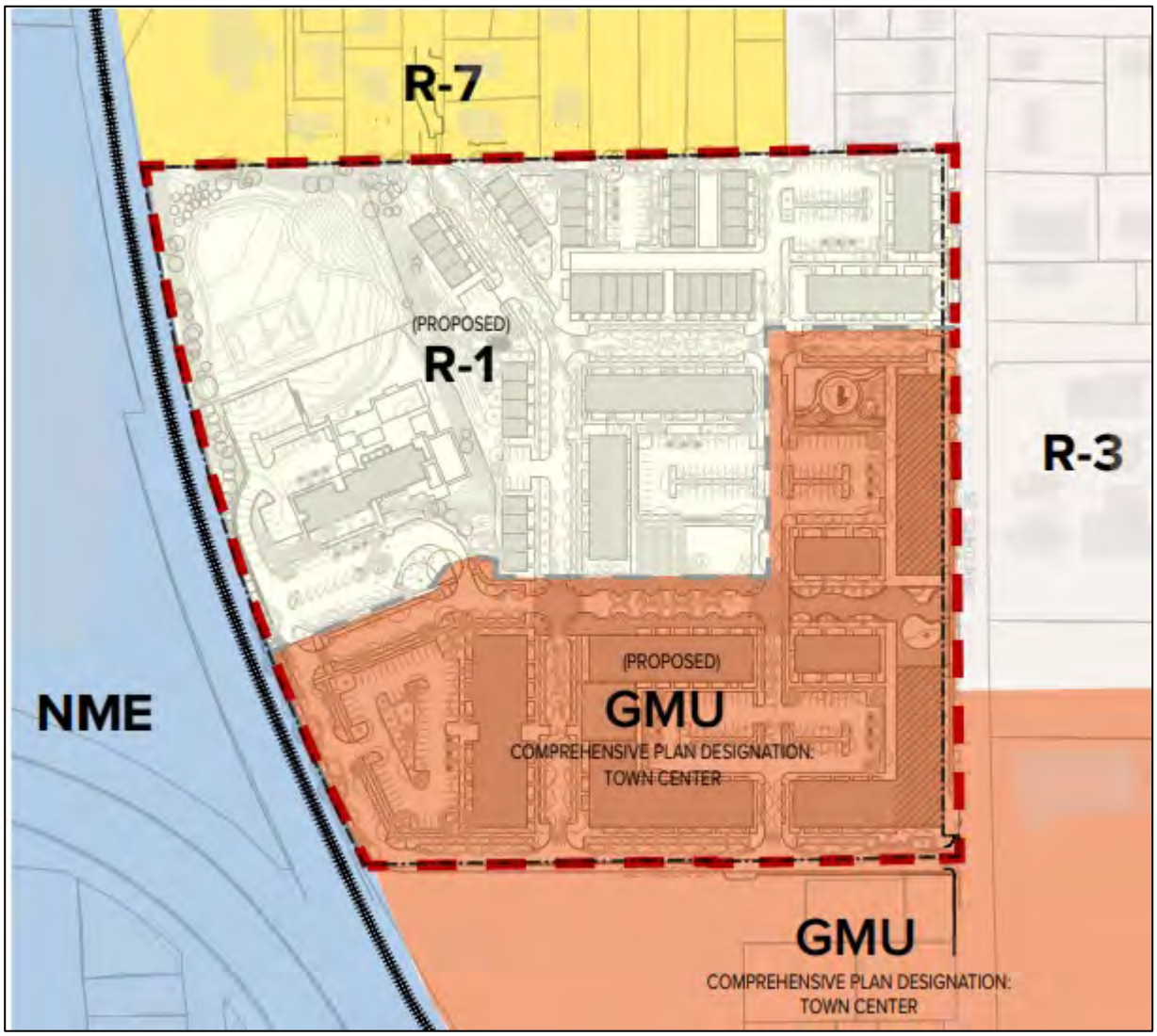


Figure 7. Proposed Zoning

Figure 8. Proposed Density Allocation

As described in the application materials, blending the density across the site through the Planned Development regulations allows more density to be concentrated on the southern end of the site adjacent to commercially orientated streets and the existing GMU zoning on the Murphy site to the south. It also allows the preservation and development of large open space areas on the interior of the Hillside site, which will be accessible to all residents. The goal of the project is to create an overall feel of the site that is park-like, with playgrounds, open areas, and community gardens, all bisected by wide streets featuring trees and plantings with concentrations of density around the perimeter.

This application is for review of a Final Development Plan and Program (MMC 19.311.7).

The project requires approval of the following applications:

1. Final Planned Development (master file #PD-2021-001)

   The Planned Development process allows for adjustments in lot sizes, lot dimensions, and some development standards, including building height, and a potential increase in density (up to 20% above the maximum normally allowed). The final development plan and program includes a review of the requested zone changes.

2. Zone Change (ZC-2021-001)

   To achieve the new density proposed, the site will be rezoned to R1 (High Density Residential) on the north and GMU (General Mixed Use) on the south.

3. Comprehensive Plan Map Amendment (CPA-2021-002)

   The Comprehensive Plan designations will also be changed from Medium Density Residential to High Density Residential on the north and Town Center on the south.

4. Subdivision (S-2021-001)

   The Master Plan includes subdividing the property into 10 lots to facilitate phased development and provide the opportunity for development of lots by outside partners.

F. Changes from the Preliminary PD approval

A summary of changes from the Preliminary PD approval are included in Attachment 3.a. All changes have been made to the narrative (not the plans, Transportation Impact Statement, or Preliminary Stormwater Report). The majority of the changes are updates to the preliminary PD narrative, including new sections related to the zone and comprehensive plan map amendments, as well as the proposed subdivision.

Updates have also been made to reflect the preliminary PD review comments, including:

- The 32nd Ave frontage has been redesigned based on input from Tri-Met on the location of the bus stops and other transit facilities along this frontage.
- The phasing has been changed to include Lot C in Phase 1.
- Information has been provided describing the architectural character of the future buildings.
- Additional information related to the Central Milwaukie Bikeways Concept plan is included.
- Removed the reference to a new bike lane on 32nd Ave, as it was erroneously included in the preliminary PD report.

G. Land Use Review Process

Milwaukie Municipal Code (MMC) Section 19.311 generally outlines the review process for approval of a Planned Development. The applicant received "approval in principle" of a preliminary development plan and program. The applicant is now initiating the Type IV review process by submitting a final development plan along with a proposed subdivision, zone change, and comprehensive plan map amendment applications. The Planning Commission's role is to consider the application package at a public hearing and make a recommendation to the City Council. City Council will then hold a public hearing on the application and issue a final decision.

APPROVAL CRITERIA

MMC 19.311.10 – Planning Commission Action of Final Development Plan and Program

MMC 19.311.10 provides direction for the Planning Commission's review of a Final Development Plan and Program as follows:

A. Upon receipt of the final development plan and program, phasing plan, and preliminary plat, where applicable, notice shall be given and the Planning Commission shall hold a public hearing per Section 19.1007. If the final development plan and program is found to be consistent with previous approval and with the intent and requirements of this title, it shall recommend the same, together with appropriate documents and conditions, to the City Council for adoption.

B. It shall at the same time recommend the change to PD Zone in accordance with the provisions of Section 19.902. The approved final development plan and program shall be the basis upon which the change in zone is made. It shall at the same time approve the preliminary plat in accordance with the Milwaukie land division regulations unless the proposal is a phased development in accordance with the provisions of Subsection 19.311.17.

As noted above, the applicant has included a summary of all changes to the final development plan and program, none of which are substantive or inconsistent with the preliminary plan approval. Please refer to the staff report from the March 23, 2021 public hearing for a comprehensive review of the application materials. However, a number of changes directly respond to questions or comments made during the preliminary plan public hearing and are summarized below.

Parking Modification

- Vehicle parking for the site will include 352 spaces in the lots on the site and 137 spaces on the streets that are interior to the site, resulting in an overall parking rate of 0.82 spaces per unit. These spaces are for the residential uses and the commercial uses in the mixed-use buildings. Another 19 new parallel parking spaces will be developed along the west side of 32nd Ave that will also be available to serve the site but are not included in the overall parking ratio since they will also be available to the larger neighborhood.
- Information related to a parking modification request was included with the preliminary plan application. The materials state that a reduced parking rate will be adequate to serve the site based on a number of factors, including a reduced parking demand for affordable multi-family buildings, the opportunity to share parking spaces between the small commercial uses in Buildings A2 and E1 and the residential uses, and the close proximity of the site to transit, which allows a 20% reduction of the on-site parking spaces by right. The entire development has been designed with a strong emphasis on walking, biking, and transit, which will further encourage the use of the alternative means of transportation. Also, over 500 bicycle parking spaces, both on-site and within the buildings, will be provided to

meet the bike parking requirements. Finally, a robust Transportation Demand Measures (TDM) program is proposed for the site with the following amenities to further reduce residents' reliance on automobiles:

- On-site bicycle repair station and mobile bicycle maintenance service several times per year
- Wayfinding station/kiosk with transit and other multi-modal information
- Onsite TDM Coordinator providing information, rideshare matching, and walking/biking group coordination
- Distribution of transit, wayfinding, and other transportation information to new residents as they move in and annually to all residents
    - There is currently a transit shelter at the intersection of 32nd Ave and Hillside Ct which will be moved toward the west to accommodate the new bus pull-out lane on 32nd Ave. A new transit shelter will be installed at the intersection of 32nd Ave and Meek St.
- Bicycle share program memberships and a bike-share station
- E-scooter share program with designated spaces
- Dedicated ride share spaces for programs such as Uber and Lyft

- Concerns and issues about on-site parking were raised during the preliminary review process. The final planned development application materials address these concerns:
    - There have been concerns raised that the proposed redevelopment plan does not account for multiple vehicle ownership with the ratio of 0.82 spaces per unit. However, the redevelopment of Hillside is a future-focused plan designed for the next 75-100 years and as such follows the trend of jurisdictions throughout the Portland metro region who are focused on reducing and dis-incentivizing automobile parking and usage in favor of public transit and alternative modes of transportation.
    - Much of the current multiple-car ownership in Hillside comes from the convenience of having ample on-street parking available to store these vehicles, and less on actual need.
    - A survey of the Hillside residents was conducted prior to the pandemic as part of the Health Impact Assessment of Hillside Master Plan which was undertaken specifically to guide the redevelopment of the Hillside site. The survey received responses from 94 of the 200 total households in Hillside, including residents in both the Manor tower and the detached homes. A key takeaway from this survey concerning transportation usage found that in 2019 only 36 percent of respondents reported driving an automobile in the past week. These findings are consistent with those of the Traffic Impact Analysis which included a reduction in vehicle trip generation for affordable housing. This reduction is supported by university research

documented in an article identifying the transportation impacts of affordable housing.

- The on-street parking spaces provided around the housing should function the way they do in downtown Milwaukie, where cars regularly come and go, freeing up spaces throughout the day. Prevailing laws allow any car left on a public street for more than 24 hours to be towed away, but this is rarely a problem since most people move their cars on a regular basis. The natural turn-over of the on-street parking spaces should make spaces available throughout the day and evening for visitors.
- It is anticipated that a parking permit program will be created on the individual lots to help prioritize the use of the on-site parking spaces. Each lot includes designated ADA compliant parking spaces located as close as feasible to each building entrance. The intent of these ADA spaces is that they would not be used for 24-hour or overnight parking, since they need to remain available for medical transport, Tri-Met LIFT buses and short-term visitors. Therefore, a lot-by-lot parking permit program could be used to assign on-site parking spaces to residents who have special needs or circumstances. These parking permit programs will be managed and enforced by the managers of the individual buildings/lots, so the specifics of the programs would be determined as part of the future development programs.

TriMet consultation

A condition of approval in the preliminary plan approval required that the applicant consult with TriMet and implement best practices on the location and design of proposed bus stops, bus pullouts, and other TriMet services for the development.

As included in the application narrative, in May of 2021 the project architect consulted with Michelle Wyffels with Tri-Met on the 32nd Ave transit improvements both over Zoom and via emails. A record of the emails exchanged with TriMet were provided as Exhibit K and an annotated plan showing the requested changes was provided as Exhibit L. These changes to the transit facilities on 32nd Ave have been incorporated into the project plans.

CONCLUSION

Staff recommendation to the Planning Commission is as follows:

Recommend that the City Council approve the final development plan subject to the attached Findings, Conditions of Approval, and Other Requirements. The final development plan and program is consistent with the previous approval and with the intent and requirements of MMC 19.311.

CODE AUTHORITY AND DECISION-MAKING PROCESS

The proposal is subject to the following provisions of the Milwaukie Municipal Code (MMC):

- MMC 19.302 - Medium and High Density Residential Zones
- MMC 19.303 – Commercial Mixed-Use Zones
- MMC 19.311 - Planned Development Zone
- MMC 19.505.3 - Multifamily Housing
- MMC 19.600 - Off Street Parking and Loading
- MMC 19.700 - Public Facility Improvements
- MMC 19.902 – Amendments to Maps and Ordinances
- MMC 19.1007 - Type IV Review
- MMC 17 - Land Division (Subdivision)
- MMC 12.16 - Access Management

This application is subject to Type IV review, which requires the Planning Commission to consider whether the applicant has demonstrated compliance with the code sections shown above and make a recommendation to City Council for a final decision. In Type IV reviews, the Commission assesses the application against review criteria and development standards and evaluates testimony and evidence received at the public hearing, in order to determine what recommendation to forward to the Council.

MMC 19.311.10 provides the necessary direction for the Commission and its review of a Final Development Plan and Program:

"If the final development plan and program is found to be consistent with previous approval and with the intent and requirements of this title, it shall recommend the same, together with appropriate documents and conditions, to the City Council for adoption."

Based on this, the Commission has three decision-making options:

A. Continue the hearing, to allow for additional public testimony and/or the provision of additional information from the applicant. The Commission may be able to identify specific information needs, deficiencies, or suggested revisions to the proposed development plan that are related to the final development plan and program's consistency with the previous approval and requirements.

B. Recommend approval of the application subject to the recommended Findings and Conditions of Approval.

C. Recommend approval of the application with minor modifications to the recommended Findings and Conditions of Approval. Such modifications need to be read into the record.

The final decision on this application must be made by December 25, 2021, in accordance with the Oregon Revised Statutes and the Milwaukie Zoning Ordinance. If needed, the applicant has waived the time period in which the application must be decided.

COMMENTS

Notice of the proposed modifications was given to the following agencies and persons: City of Milwaukie Building, Engineering, and Public Works Departments; Ardenwald and Historic Milwaukie Neighborhood District Associations Chairperson & Land Use Committee; Clackamas Fire District #1 (CFD#1); Metro; Oregon Department of Land and Conservation Development; Clackamas County; Oregon Department of Transportation; North Clackamas School District; and properties within 400 ft of the site.

ATTACHMENTS

Attachments are provided as indicated by the checked boxes. All material is available for viewing upon request.

	Early Web Posting	Packet
1. Recommended Findings in Support of Approval	☐	☒
2. Recommended Conditions of Approval	☐	☒
3. Recommended Other Requirements	☐	☒
4. Applicant's Narrative and Supporting Documentation (received August 17, 2021)		
a. Application forms	☒	☒
b. Narrative	☒	☒
c. Preliminary development plans (including land division plan, density allocation, circulation plan, phasing plan, open space and planting plans, street sections and plans, grading plan, storm, utility, and sanitary plans)	☒	☒
d. Transportation Impact Study	☒	☒
e. Stormwater Report	☒	☒
f. Pre-application conference notes	☒	☒
5. Exhibits		
a. Sign in Sheets from Community meetings	☒	☒
b. Master Plan Tabulations	☒	☒
c. Parking Tables	☒	☒
d. Expected Water System Demands	☒	☒
e. Expected Sanitary Flows	☒	☒
f. Ardenwald NDA Meeting Minutes	☒	☒

	Early Web Posting	Packet
g. PD-2020-002 Notice of Decision	☒	☒
h. TriMet review of transit stops - emails	☒	☒
i. Master Plan with TriMet comments	☒	☒
6. Public Comments Received	☐	☒

Key:
Early Web Posting = Materials posted to the land-use application webpage at the time of public notice 20 days prior to the hearing.
Packet = packet materials available online at https://www.milwaukieoregon.gov/bc-pc/planning-commission-81.

Recommended Findings for Approval
File #PD-2021-001, Hillside Master Plan – Final Planned Development

Sections of the Milwaukie Municipal Code not addressed in these findings are found to be inapplicable to the decision on this application.

1. The applicant, Jill Smith, representing the Housing Authority of Clackamas County (HACC), has applied for approval of a final planned development plan and program at the site known as Hillside Park and Hillside Manor at 2889 SE Hillside Ct. This site is in the R-3 Zone. The land use application file number is PD-2020-002.

2. The proposal is for a multi-unit dwelling development. Hillside Manor, the tower, which was partitioned onto a separate lot in early 2020, will remain on site and be refurbished. The remainder of the 16-acre site is proposed to be redeveloped with apartments and mixed-use buildings for a total of 600 units on the property (400 new units, 100 replacement units, and 100 units in the Hillside Manor tower) at the end of all phases of development. The proposed development is being submitted as a Planned Development application to provide more flexibility related to development standards and maximum density. The subject application has been submitted for final development plan review.

3. The proposal is subject to the following provisions of the Milwaukie Municipal Code (MMC):
    - MMC Title 12 Streets, Sidewalks, and Public Places
    - MMC Section 19.1006 Type III Review
    - MMC Section 19.311 Planned Development Zone (PD)
    - MMC Section 19.302 Medium and High Density Residential Zones (including R-1)
    - MMC Section 19.303 Commercial Mixed Use Zones (including GMU)
    - MMC Title 17 Land Division
    - MMC Chapter 19.500 Supplementary Development Regulations
    - MMC Chapter 19.600 Off-Street Parking and Loading
    - MMC Chapter 19.700 Public Facility Improvements
    - MMC Section 19.902 Amendments to Maps and Ordinances

    Only the sections relevant to the decision for denial of the application are addressed below.

4. The application submittal includes a proposed final Planned Development, zone change, comprehensive plan map amendment, and a subdivision application. Of the application components, the final Planned Development, zone change, and comprehensive plan map amendment require the highest level of review (Type IV); as per MMC Subsection 19.1001.6.B, all are being processed with Type IV review.

    The application has been processed and public notice provided in accordance with MMC Section 19.1007 Type IV Review. As required by MMC Subsection 19.1002.2, a preapplication conference was held on December 12, 2019. Public notice was sent to property owners and current residents within 400 ft of the subject property. As required

by law, a public hearing with the Planning Commission was held on October 12, 2021 and with the City Council on November 16, 2021.

5. MMC Title 12 Streets, Sidewalks, and Public Places

   a. MMC Chapter 12.16 Access Management

      MMC Section 12.16.040 establishes standards for access (driveway) requirements, including access spacing, number and location of accessways, and limitations for access onto streets. Spacing criteria are based upon several factors, including stopping sight distance, ability of turning traffic to leave a through lane with minimal disruption to operation, minimizing right turn conflict overlaps, maximizing egress capacity, and reducing compound turning conflicts where queues for turning/decelerating traffic encounter conflicting movements from entering/exiting streets and driveways.

      Through review of the applicant's TIS, the City's traffic consultant found the proposed site access at Meek Street would meet the City's spacing standard of 300 feet for collector streets. The access on Dwyer Street was measured to be 240 feet away from the nearest driveway to the north. However, Dwyer Street is located some 410 feet from the next intersection at Harvey Street, which meets access spacing requirements. Having the second site access street be an extension of Dwyer Street is also an improvement from existing conditions. Also, the development will remove six existing driveways along this section of 32nd Avenue resulting in improved safety. Additionally, a left turn lane will be required for north bound SE 32nd Ave at Meek St as mitigation for expected trip increases. This left-turn pocket must be constructed either prior to, or concurrently with, that phase of development, which creates greater than 325 residential units.

      As conditioned, the development is consistent with the applicable standards of MMC 12.16.

   b. MMC Chapter 12.24 Clear Vision at Intersections

      MMC 12.24 establishes standards for maintenance of clear vision at intersections to protect the safety and welfare of the public in their use of City streets.

      Through review of the applicant's TIS, the City's traffic consultant found both proposed new driveways, at Meek Street and Dwyer Street, were found to meet stopping sight distances but intersection sight distance for turning vehicles was not met for the Meek Street driveway to the south, due to some foliage obstructions, however this has since been remedied through code enforcement. With construction of new roadways and driveways, the applicant must verify required site distance is obtained.

      As conditioned, all driveways, accessways, and intersections associated with the proposed development conform to the applicable standards of MMC 12.24.

   The City Council finds that, as conditioned, the development meets all applicable requirements of MMC Title 12. This standard is met.

6. MMC Title 17 establishes the regulations governing land division.

a. MMC Chapter 17.12 Application Procedure and Approval Criteria

MMC Section 17.12.040 establishes the approval criteria for a preliminary plat. The proposed plans meets these criteria as described below.

(1) MMC Subsection 17.12.040.A.1 requires that the proposed preliminary plat complies with Title 19 Zoning and other applicable ordinances, regulations, and design standards.

As demonstrated by the applicant's submittal materials and evidenced by these findings, the proposed subdivision complies with the applicable ordinances, regulations, and design standards. As proposed, this criterion is met.

(2) MMC Subsection 17.12.040.A.2 requires that the proposed boundary will allow reasonable development and will not create the need for a variance of any land division or zoning standard.

The proposed boundary will provide sufficient area on each parcel to accommodate future development in accordance with the standards of the underlying R-1 and GMU zones. The parcels do not have physical constraints or dimensional limitations that would necessitate the need for variances in the future. As proposed, this criterion is met.

(3) MMC Subsection 17.12.040.A.3 requires that the proposed subdivision plat name is not duplicative and the plat otherwise satisfies the provisions of ORS 92.090(1).

The proposed boundary results in ten parcels in a three-phase development program.

(4) MMC Subsection 17.12.040.A.4 requires that the streets and roads in the proposed subdivision are laid out so as to conform to the plats of subdivisions already approved for adjoining property as to width, general direction, and in all other respects unless the City determines it is in the public interest to modify the street or road pattern.

(5) MMC Subsection 17.12.040.A.4 requires that the application include a detailed narrative description demonstrating how the proposal conforms to all applicable code sections and design standards.

As proposed, this criterion is met.

As proposed, the City Council finds that the proposed boundary meets the applicable criteria.

b. MMC Chapter 17.28 Design Standards

MMC 17.28, particularly MMC Section 17.28.040, establishes standards for lot design for land divisions and boundary changes.

(1) MMC Subsection 17.28.040.A requires that the lot size, width, shape, and orientation shall be appropriate for the location and the type of use contemplated, as well as that minimum lot standards shall conform to Title 19.

The proposed lots are generally rectangular in shape and meet the minimum area requirements for the proposed re-zoning to R1 and GMU zones. All lots conform to the relevant standards of the proposed zones as described in Finding 7 and to other applicable standards of Title 19 as described elsewhere in these findings. The size and shape of the lots were primarily dictated by a desire to create a street grid that is more rectilinear to improve overall site circulation and safety. Additionally, the need to connect the new streets into the existing street network that surrounds the site skewed the grid pattern. Each lot is an appropriate size to develop with multi-family buildings while also providing open space amenities and adequately meeting the development standards such as parking, pedestrian circulation, and landscaping.

(2) MMC Subsection 17.28.040.B requires that lot shape shall be rectilinear, except where not practicable due to location along a street radius, or existing lot shape. The sidelines of lots, as far as practicable, shall run at right angles to the street upon which the lots face. As far as practicable, the rear lot line shall run parallel to the street.

The proposed lots are generally rectangular in shape and meet the minimum lot standards in Title 19. As described above, the desire to redevelop the streets in a 90-degree grid pattern will result in the majority of the proposed lots being rectilinear. The location of the Manor tower and surrounding parking, which will remain on the site, results in Lots H, C and K being skewed and not having right angles on all corners. Additionally, new 29th Ave will need to connect to the existing right of way in the neighborhood to the north, creating irregular angles in Lots G and K. Except for these variations, the side and rear lot lines will run parallel to the new streets as much as practical.

(3) MMC Subsection 17.28.040.C limits compound lot lines for side or rear lot lines.

The only lot line in the development that includes changes in direction is the rear lot line of Lot K. This lot line backs up the Manor and the open space tract (Lot J) both of which are existing features of the site with boundaries that follow the slope of the existing site topography. Though lot K will feature a compound lot line on the rear, the change in direction will not exceed the 10% requirement and this standard is met. MMC Subsection 17.28.040.D allows lot shape standards to be varied pursuant to MMC 19.911.

No variances to the lot shape standards are requested in this application.

(4) MMC Subsection 17.28.040.E limits double frontage and reversed frontage lots, stating that they should be avoided except in certain situations.

Several of the lots included in the subdivision will comprise full city blocks with frontages on all four sides. Therefore, Lots A, B, C, D, E, and G will all be considered double frontage lots. Through Section 19.311.3, a modification is requested to allow double frontage lots because the proposed subdivision represents a unique situation where full-sized, urban-scale blocks are being created.

(5) MMC Subsection 17.28.040.F requires that, pursuant to the definition and development standards contained in Title 19 for frontage, required frontage shall be measured along the street upon which the lot takes access. This standard applies when a lot has frontage on more than one street.

As proposed, all of the proposed lots will exceed the minimum frontage requirement of R1 and GMU zones.

As proposed, the City Council finds that the new lots presented in the applicant's preliminary plat meet the applicable design standards established in MMC 17.28.

c. MMC Chapter 17.32 Improvements

MMC 17.32 establishes procedures for public improvements, including a requirement that work shall not begin until plans have been approved by the City.

As discussed in Finding 11, physical improvements are required as a result of the proposed Planned Development.

As conditioned, the City Council finds that the applicable standards of MMC 17.32 are met.

7. MMC Chapter 19.300 Base Zones

As a Planned Development, the proposed subdivision is subject to the requirements for Planned Developments as established in MMC Section 19.311. The Planned Development (PD) zone is a superimposed zone applied in combination with regular existing zones. The subject property is zoned R-3, but the application proposes to re-zone the property to a combination of Residential R-1 and General Mixed Use (GMU). The underlying zone requirements of MMC Section 19.302 and Section 19.303 are relevant and must be addressed as well. These findings will analyze compliance with the proposed new base zones.

a. MMC Section 19.311 Planned Development Zone (PD)

The purpose of a Planned Development (PD) zone is to provide a more desirable environment than is possible through the strict application of Zoning Ordinance requirements, encouraging greater flexibility of design and providing a more desirable use of public and private common open space. PD zones can promote variety in the physical development pattern of the city and encourage a mix of housing types.

(1) MMC Subsection 19.311.2 Use

The City Council approves the final development plan of a PD zone, in consideration of the proposal's conformance to the following standards:

(a) Conformance to the City's Comprehensive Plan

As addressed in more detail in Findings 8 and 12, the proposed Planned Development conforms to the City's Comprehensive Plan and is consistent with the relevant policies and goals.

(b) Formation of a compatible and harmonious group

As proposed, the development is a re-imagined mixed-use and mixed-income community on the site of an existing affordable housing community. The site, which already features multi-family housing, serves as a transition between the higher density commercial uses to the south and the single-family houses to the north. The entire development will create a harmonious micro-neighborhood that will be characterized by green streets, abundant open space amenities, and landscaping that will be consistent throughout the site.

(c) Suitability to the capacity of existing and proposed community utilities and facilities

The existing public utilities and facilities in the vicinity of the subject property are all of sufficient size and capacity to support the proposed development. As required, the new utilities provided within the proposed development itself will be suitable to serve it. As demonstrated in the Transportation Impact Study, the surrounding street network has adequate capacity available to support the increase in density on the site. The existing utilities that currently serve Hillside Park will be updated in the process of relocating them to assure that there is adequate capacity to serve all of the future buildings. Services such as school capacity and fire/police protection is available to serve the proposed uses and densities. Therefore, the site is suited to the proposal and this criterion is met.

(d) Cohesive design and consistency with the protection of public health, safety, and welfare in general

The grid network proposed for the new streets will increase safety in the area by allowing for better visibility at corners and aligning the intersection at 32nd Ave and Dwyer St to the existing street to the east. Public health will be improved by creating an emphasis on walking and outdoor recreation through the improved pedestrian circulation network and open spaces. Finally, public welfare will be addressed by providing more affordable housing units in the City of Milwaukie, where they are critically needed (as indicated by the City of Milwaukie's Housing Needs Analysis). This criterion is met.

(e) Affordance of reasonable protection to the permissible uses of properties surrounding the site

The northern edge of the proposed development will protect the privacy of the single unit dwellings to the north by providing a landscape buffer that will be fully planted to screen the surrounding properties. Additionally, all of the buildings along the north edge will be limited to two stories to be compatible with the houses to the north. The connection of 29th Ave is proposed as a pedestrian route and bikeway with restricted, gated access for emergency vehicles, prohibiting cut-through vehicle traffic in the neighborhood to the north. The addition of commercial uses on the ground floor of the buildings facing 32nd Ave will be an

amenity to the residents and surrounding neighborhood, and the limitations proposed to the permitted GMU uses will assure that these small commercial businesses will be compatible with the development on the site and the surrounding area. This criterion is met.

(2) MMC Subsection 19.311.3 Development Standards

MMC 19.311.3 establishes that the various applicable standards and requirements of MMC Title 19, including those of the underlying zone(s), are applicable in a PD zone, unless the Planning Commission grants a variance from those standards in its approval of the PD or the accompanying subdivision plat. The City Attorney has concurred with the conclusion of City staff that a formal variance request is not required for adjustments related to the flexibility inherent in the stated purpose of the PD zone to encourage greater flexibility of design and provide a more efficient and desirable use of common open space, with an allowance for some increase in density as a reward for outstanding design (e.g., housing type, lot size, lot dimension, setbacks, and similar standards).

(a) Minimum Size of a PD Zone

MMC Subsection 19.311.3.A requires that a PD Zone may be established only on land that is suitable for the proposed development and of sufficient size to be planned and developed in a manner consistent with the purposes of this zone.

The subject property is approximately 16 acres in size and provides an adequate area for development. This includes the provision of a mix of housing types and uses, greater flexibility in the development standards to create a cohesive design concept for the entire site, and to provide for larger swaths of open space that will offer better amenities to the residents of Hillside. The site is located in an area that is well-served by the existing transportation network, utility infrastructure, and services.

(b) Special Improvements

MMC Subsection 19.311.3.B establishes the City's authority to require the developer to provide special or oversize sewer lines, water lines, roads and streets, or other service facilities.

It is not anticipated that special or oversized utility lines or roads will be necessary to develop the Planned Development that is being proposed. All the existing infrastructure currently serving the site will be removed and replaced in phases and will be appropriately sized to serve the development proposed.

(c) Density Increase and Control

MMC Subsection 19.311.3.C allows an increase in density of up to 20% above the maximum allowed in the underlying zone(s), if the City Council

determines that the proposed Planned Development is outstanding in planned land use and design and provides exceptional advantages in living conditions and amenities not found in similar developments constructed under regular zoning.

As discussed elsewhere in these Findings, the portions of the site that will have the Comprehensive Plan designation of High Density Residential will exceed the maximum density of 24 dwelling units permitted in this designation. Lots D, F, G, H, J and K combined will have a density of 24.27 dwelling units per acre, which is well below the 20% increase above the density range permitted by this standard. This modest increase in density will be offset by the abundant open space and other outdoor amenities that will be provided throughout the site for the benefit of the residents.

The development will provide 600 units of housing with a range of affordability from 30% and below of the area median income to 80% and below of area median income.

The City Council finds that the proposed development provides sufficiently outstanding design features to justify minimal density increase.

(d) Peripheral Yards

MMC Subsection 19.311.3.D requires that yards along the periphery of any Planned Development zone be at least as deep as the front yard required in the underlying zone(s). Open space may serve as peripheral yard.

The west side of the site is bounded by the railroad and across the railroad corridor the zoning is NME - North Milwaukie Employment Zone. The development proposal includes a thick landscape buffer along the west property line to assure that the residential buildings in the development will be adequately buffered from the noise of the railroad.

The properties to the south across Meek St and southeast across 32nd Ave are zoned GMU and currently undeveloped. The GMU zone encourages buildings to be close to street lot lines and provide an active frontage with public entrances, façade features and windows, therefore screening and buffering along the south property line of the site would not be appropriate with the GMU zoning.

The properties northeast across 32nd Ave are zoned R3 and are mostly developed as Providence Milwaukie Hospital. Proposed Lot E on the Hillside site will be zoned GMU and will need to meet maximum setback and frontage occupancy standards that would not make buffering and screening from the hospital across 32nd Ave practical. Lot F will be zoned R-1 and will be across 32nd Ave from an existing townhouse development. The buildings proposed on Lot F will be set back with the required front yard minimum of the R-1 zone of 15 ft, which will allow for a large area that will be planted with trees and landscaping to soften and screen the buildings from the townhouses across the street.

The neighborhood to the north is zoned R-7 and developed with single-family houses. The proposed buildings along the northern boundary will be set back from the property line a minimum of 15 ft (the front yard setback of the R-1 zone). This setback will provide a wide landscape buffer that will be planted with trees and tall shrubs that will help obscure views and absorb sounds to protect the privacy of the neighboring houses. Additionally, all of the buildings that abut the northern property line will be limited to 2 stories in height.

With the proposed setbacks and landscape buffering from the properties to the north and northeast, the peripheral yard standards will be met for the proposed Planned Development.

(e) Open Space

MMC Subsection 19.311.3.E requires that a Planned Development set aside land as open space for scenic, landscaping, or other recreational purposes within the development. A minimum of one-third of the gross area of the site must be provided as open space and/or outdoor recreational areas, with at least half of this area being of the same general character as the area containing dwelling units.

The gross area of the subject property is approximately 19.5 acres, so a minimum of 5.85 acres must be provided as open space. The proposal provides open space and recreational areas dispersed throughout the site that will provide outdoor spaces in an equitable way for all the residents of Hillside. By creating larger swaths of open space (versus small open areas dedicated to each residential unit) more resources can be placed in these open areas in the form of playground equipment, sports equipment, outdoor furnishing, and landscaping, which will collectively provide better overall amenities.

The proposed open space plan includes a total of 7.8 acres of usable open space, which is 40% of the site. This is a combination of 6.8 acres of planted area (including the 1.8-acre large open area in the northwest corner) and approximately 0.9 acres of "paved" open space areas, such as playgrounds and plazas.

(3) MMC Subsection 19.311.6 Planning Commission Review of Final Development Plan and Program

MMC 19.311.6 establishes that the Planning Commission shall review an applicant's final development plan and program for a PD and shall notify the applicant whether the proposal appears to satisfy the provisions of this section or has any deficiencies. Upon the Commission's approval in principle of the preliminary plan and program, the applicant shall file a final development plan and program and an application for zone change.

The applicant submitted a preliminary development plan and program, which was processed as a Type III application for the purposes of noticing and establishing review by the Planning Commission. The Planning Commission approved the plan "in

principle" on March 23, 2021. As required, the applicant initiated a Type IV review process by submitting a final development plan along with a proposed subdivision and any other applicable reviews on August 17, 2021 (within 18 months). The Planning Commission considered the application package and made a recommendation to the City Council for a final decision.

(4) MMC Subsection 19.311.8 Land Division

MMC 19.311.8 requires that the submittal of a final development plan and program be accompanied by an application for subdivision preliminary plat, where the PD involves the subdivision of land.

The proposal includes a proposed 10-lot subdivision. The final planned development includes a preliminary plat and associated information about the proposed subdivision.

This standard is met.

(5) MMC Subsection 19.311.9 Approval Criteria

MMC 19.311.9 requires that the approval authority may approve, approve with conditions, or deny the proposed PD zone based on the following criteria:

(a) Substantial consistency with the proposal approved with Subsection 19.311.6

The applicant has submitted a final development plan and program, including a phasing plan.

(b) Compliance with Subsections 19.311.1, 19.311.2, and 19.311.3

As demonstrated by these findings, the proposed development complies with these sections.

(c) The proposed amendment is compatible with the surrounding area based on the following factors:

(i) Site location and character of the area.

(ii) Predominant land use pattern and density of the area.

(iii) Expected changes in the development pattern for the area.

The proposed Planned Development will allow the site to redevelop in a way that is more efficient, practical, and sustainable than the current Hillside Park development. The site will feature a mix of housing types as well as providing both affordable and market rate options. The mixed-use buildings will provide the opportunity to add some small, neighborhood focused commercial uses to the site that will enhance the area. The increase in residential density on the site will be balanced by the abundant recreational amenities and open space opportunities that will include plazas, playgrounds, and open fields. Additionally, the existing streets and infrastructure will be replaced with a safer and better-connected street network that will feature wide, protected sidewalks, bike lanes, and landscape

planters with street trees. The flexibility provided by the Planned Development zone allows the proposal to meet the purpose of the zone by providing a variety of housing choices in a development pattern that will be aesthetically pleasing to both the residents and the neighborhood.

The Final Planned Development includes the proposal to change the Comprehensive Plan designation of the site from Medium Density Residential to a combination of High Density Residential and Town Center. The applicable policies of each of these proposed designations are demonstrated in these Findings. The type of housing proposed on the site, the adjacency of similar uses and development intensities in the area, and the availability and adequacy of the surrounding street system and utility infrastructure make the Hillside site able to conform to the policies of each of these new designations.

The entire development will create a harmonious micro-neighborhood that will be characterized by green streets, abundant open space amenities, and landscaping that will be consistent throughout the site.

As demonstrated in the Traffic Impact Study submitted with the proposal, the surrounding street network has adequate capacity available to support the increase in density on the site. Additionally, the existing utilities that currently serve Hillside Park will be updated in the process of relocating them to assure that there is adequate capacity to serve all of the future buildings. Services such as school capacity and fire/police protection has been found to be available to serve the proposed uses and densities.

The grid network proposed for the new streets will increase safety in the area by allowing for better visibility at corners and aligning the intersection at 32nd Ave and Dwyer St to the existing street to the east. Public health will be improved by creating an emphasis on walking and outdoor recreation through the improved pedestrian circulation network and open spaces. Finally, public welfare will be addressed by providing more affordable housing units in the City of Milwaukie, where they are critically needed (as indicated by the City of Milwaukie's Housing Needs Analysis).

The northern edge of the proposed development will protect the privacy of the single-family houses to the north by providing a lush landscape buffer that will be fully planted to screen the surrounding properties. Additionally, all of the buildings along the northern edge will be limited to two stories to be compatible with the houses to the north. The connection of 29th Ave is proposed as a pedestrian path and bikeway with a locked access gate for use by emergency vehicles, prohibiting cut-through vehicle traffic in the neighborhood to the north. The addition of commercial uses on the ground floor of the buildings facing onto 32nd Ave will be an amenity to the residents and surrounding neighborhood, and the limitations proposed to the permitted GMU uses will assure that these small

commercial businesses will be compatible with the development on the site and the surrounding area.

As demonstrated in these Findings, the site meets the minimum lot size requirement for the PD Zone and there are no special improvements that will be required. The proposed residential densities will be blended across the site but in no case will they be greater than 20% of what is allowed in the High Density Residential Comprehensive Plan designation (24 dwelling units per acre). Peripheral yards screening adjacent existing developments will be provided where appropriate, primarily along the northern property line to screen the residential development to the north and on the western property line to abate noise from the railroad. Overall, the site will include an abundance of Open Space exceeding the one-third requirement for planned developments at the end of the third phase.

The major change anticipated for this area would be the future development of the Murphy site located to the south of the subject site and zoned GMU. This 7-acre site is identified in the Central Milwaukie Land Use and Transportation Plan as an "Opportunity Site," since it is a large, vacant site with high visibility and good access to transportation and services. It is envisioned to be developed with a mix of uses that might including 3- to 4-story multi-family residential buildings, commercial uses, and flex space for light industrial. Given the wide range of uses and densities that are permitted for this site, it is hard to predict what the final development plan will be. However, by zoning the lower half of the Hillside site GMU and proposing higher-density mixed use buildings for this part of the site, it will increase the likelihood that the future use on the Murphy site will be compatible with the Hillside site.

(d) The need is demonstrated for uses allowed by the proposed amendment

The most recent study of housing inventory in the City of Milwaukie was done in 2016 and presented as the Milwaukie Housing Needs Analysis (HNA). Key findings of this study include:

- *A comparison of estimated current housing demand with the existing supply identifies a general need for rental units at the lowest price level:*
    - *30% of all needed units are projected to be multi-family in structures of 5+ attached units*
    - *The greatest need for both ownership and rental units is found at lower price points. This reflects the findings that an estimated 37% of Milwaukie households are rent-burdened and currently pay more than 30% of their income towards housing costs.*
- *There is also a current need for more affordable units. In order for all households, both existing and new, to pay 30% or less of their income towards housing in 2036, a total of 1,189 rental units affordable at $900 per month or less are required.*

- *As demand increases, prices rise, and the remaining land within the UGB is developed, denser forms of development and creative reuse of parcels through infill and redevelopment will become necessary. As stated in the application materials, the proponents understand the needs of the rental market as they own a large portfolio of apartment communities ranging in affordability. They have found a gap in the availability of the proposed apartment types. Within their community, they have a waiting list for the type of accommodations this project is providing. The City of Milwaukie's Comprehensive Plan recognizes increased housing is a need and the City Council has identified increased housing opportunity and supply as a top goal for the city.*

The proposed Planned Development will add 400 new units to the existing Hillside Park site, with a large portion of those units being built as affordable housing. This will directly address the public needs identified in the Housing Needs Analysis. Additionally, because the 100 existing residential houses on the site will be replaced with the proposal, no viable housing stock will be taken out of the current housing inventory.

(e) The subject property and adjacent properties presently have adequate public transportation facilities, public utilities, and services to support the use(s) allowed by the proposed amendment, or such facilities, utilities, and services are proposed or required as a condition of approval for the proposed amendment

As demonstrated elsewhere in these Findings, adequate infrastructure will be available to serve the site. All of the existing streets and utilities serving the site will be removed and rebuilt to support the proposed new development. These changes will result in streets that are safer for all modes of travel and that align better to the existing street network in the area. The new utilities will be built to meet current development standards and adequate capacity in the existing sewer, storm, and water systems to support the proposed uses has been demonstrated with capacity studies submitted with the application. The site is well served by public transit by the #75 bus that operates along 32nd Ave with two bus stops along the site frontage. Fire services are provided to the site from the Clackamas County Fire District #1 and police services from the City of Milwaukie Police Department and both these public services are adequate to serve the site. The local school district has capacity available to serve an increase in student population.

(f) The proposal is consistent with the functional classification, capacity, and level of service of the transportation system. A transportation impact study may be required subject to the provisions of Chapter 19.700.

A transportation impact study has been included as part of application submittal. See Finding 11 for details.

(g) Compliance with all applicable standards in Title 17 Land Division

As detailed in Finding 5, the proposed final development complies with the applicable standards in Title 17. A preliminary plat has been submitted.

(h) Compliance with all applicable development standards and requirements

As conditioned, and as detailed in these Findings, the proposed development complies with the applicable development standards and requirements.

(i) The proposal demonstrates that it addresses a public purpose and provides public benefits and/or amenities beyond those permitted in the base zone

As demonstrated elsewhere in these Findings, the HNA has identified an immediate need for more multi-family housing and more affordable housing to meet the current and future needs of the population of Milwaukie. By allowing the Hillside site to redevelop, the Planned Development can help address this need by adding 400 new units housing that will be available to a variety of household sizes and incomes. Within the proposed development, these new residential units will be located in a park-like setting that will feature large outdoor recreation areas that will appeal to different populations and age groups. Additionally, all of the new streets and infrastructure will create a safe and well-functioning neighborhood with a strong emphasis on alternate modes of transportation and community gathering. All of these amenities for the future residents will be made possible by allowing the entire site to be designed under a single Planned Development review, allowing for efficient use of the land, a cohesive design across the site, and the modification of standards to better fit the concept for the development and the unique aspects of the site.

As conditioned, the City Council finds that the proposed development meets the approval criteria.

(6) MMC Subsection 19.311.10 Planning Commission Action on Final Development Plan and Program

MMC 19.311.10 requires that the Planning Commission hold a public hearing using Type IV review to consider a final development plan and program, zone change application, and subdivision preliminary plat. If the Planning Commission finds that the final development plan and program is in compliance with the preliminary approval and with the intent and requirements of the applicable provisions of the zoning ordinance, it shall forward a recommendation for approval to the City Council for adoption.

As required, the Planning Commission held a public hearing on October 12, 2021, in accordance with the Type IV process outlined in MMC Section 19.1007 and considered the proposed development plan and program, zone change application, comprehensive plan map amendment, and subdivision review. The Planning Commission found that the development plan and program is in compliance with the intent and requirements of

the applicable provisions of MMC Title 19 Zoning and forwarded a recommendation of approval to the City Council for adoption.

(7) MMC Subsection 19.311.11 Council Action on Final Development Plan and Program

MMC 19.311.11 requires that the City Council consider the final development plan and program and zone change application through the Type IV review process, upon receipt of a recommendation from the Planning Commission. Upon consideration of the proposal, the Council may adopt an ordinance applying the PD zone to the subject property and adopt the final development plan and program as the standards and requirements for that PD zone. The Council may also continue consideration and refer the matter back to the Planning Commission with recommendations for amendment, or may reject the proposal and abandon further hearings and proceedings.

The Council considered the final plan and program, zone change application and comprehensive plan map amendment, as well as the accompanying applications for subdivision preliminary plat and associated reviews, in accordance with the Type IV review process outlined in MMC Section 19.1007. The Council held a public hearing on November 16, 2021, and adopted an ordinance applying the PD zone to the subject property, which adopted the final development plan and program as the standards and requirements for the new PD zone (Ordinance ####).

The City Council finds that the applicable standards and requirements of MMC 19.311 are met. As per Ordinance ####, the final development plan and program is adopted as the standards and requirements and the PD zone designation is applied to the subject property.

b. MMC Section 19.302 Medium and High Density Residential Zones (including R-1)

The subject property is zoned Residential R-3. The application includes a proposed rezoning of the site to both R-1 and GMU. As noted in Finding 7-a(2), although the underlying zone standards are primarily applicable, the PD zone allows adjustment to some of those standards. This applies to such underlying zone limitations as housing type, lot size, lot dimension, setbacks, and similar standards that relate to flexibility of design, greater efficiency in the use of common open space, and minor increases in density allowed as a reward for outstanding design.

(1) Permitted Uses

As per MMC Table 19.302.2, multifamily development is an outright permitted use in the R-1 zone.

The proposal includes 600-units of multifamily housing.

(2) Lot and Development Standards

As discussed in Finding 7-a(2), above, adjustments to underlying zone standards that are related to the flexibility of design afforded by the PD process are allowed and do not require a formal variance request. Table 7-b(2) compares the applicable standards for development of the lots in the R-1 zone with the standards proposed as the final development plan and program for this PD zone.

Table 7-b(2)		
Standard	R-1 Requirement	Proposed R-1 PD Requirement Lots D, F, G, H (Manor), and K
1. Minimum Lot Size	5,000 sq ft	0.99 ac – 2.45 ac
2. Minimum Lot Width	50 ft	100 ft – 298 ft
3. Minimum Lot Depth	80 ft	100 ft – 328 ft
4. Minimum street frontage	35 ft	97 ft – 298 ft
5. Front Yard	15 ft	10 ft (modification requested)
6. Side Yard	5 ft	5 ft
7. Rear Yard	15 ft	36 ft
8. Street Side yard	15 ft	5 ft – 10 ft (modification requested)
9. Maximum Building Height	3.5 stories or 45 ft (whichever is less; with additional 10% vegetation)	2- 3 stories (10 stories in Manor tower – existing)
10. Maximum lot coverage	45%	20% - 35% (7% for Lot H) (modification requested)
11. Minimum vegetation	15%	15% (38% for Lot H)
12. Minimum density	25 units per acre (232 units)	233 units
13. Maximum density	32 units per acre (297 units)	233 units (modification requested to allow lots D, F, and H to exceed max. density – see table below)

The lots and development standards that will govern development on the subject property are shown in Table 7-b(2) and effectively establish a component of the final development plan and program for this PD zone.

c. MMC Section 19.303 Commercial Mixed Use Zones (including GMU)

The subject property is zoned Residential R-3. The application includes a proposed rezoning of the site to both R-1 and GMU. As noted in Finding 7-a(2), although the underlying zone standards are primarily applicable, the PD zone allows adjustment to some of those standards. This applies to such underlying zone limitations as housing type, lot size, lot dimension, setbacks, and similar standards that relate to flexibility of design, greater efficiency in the use of common open space, and minor increases in density allowed as a reward for outstanding design.

(1) Permitted Uses

As per MMC Table 19.303.2, multifamily and mixed-use development is an outright permitted use in the GMU zone.

The proposal includes 600 units of multifamily housing and mixed use development.

(2) Lot and Development Standards

As discussed in Finding 7-a(2), adjustments to underlying zone standards that are related to the flexibility of design afforded by the PD process are allowed and do not require a formal variance request. Table 7-b(2) compares the applicable standards for development in the R-2 zone with the standards proposed as the final development plan and program for this PD zone.

Table 7-b(2)

Standard	GMU Requirement	Proposed GMU PD Requirement Lots A, B, C, and E
1. Minimum Lot Size	1,500 sq ft	1.3 ac – 1.4 ac
2. Minimum street frontage	25 ft	175 ft – 305 ft
3. Minimum density	25 units per acre (standalone residential; no min. for mixed-use buildings)	Lot A (mixed-use): 75 du/ac Lot B (residential): 78 du/ac Lot C (residential): 50 du/ac Lot E (mixed-use): 67 du/acre
13. Maximum density	50 units per acre (standalone residential; no max. for mixed-use buildings)	Lot A (mixed-use): 75 du/ac Lot B (residential): 78 du/ac Lot C (residential): 50 du/ac Lot E (mixed-use): 67 du/acre

Building Height	Buildings in the GMU Zone shall provide a step back of at least 15 ft for any street-facing portion of the building above the base maximum height.	The buildings in the GMU zone (except Building B1) are proposed to be four stories tall, taking advantage of the additional height allowed by providing residential use for at least 25% of the FAR. This standard will be modified to eliminate the requirement for a step back for buildings over three stories in the GMU Zone. This modification will allow buildings fronting on 32nd Avenue and Meek Street to have a more uniform façade and allow the buildings to be constructed in more affordable manner consistent with the goal of providing affordable housing on the site.

The lots and development standards that will govern development on the subject property are shown in Table 7-b(2) and effectively establish a component of the final development plan and program for this PD zone.

Overall Density				
Lot	Approx. Area	Number of Units	Zoning	Density
Lot A	1.3 acres	101	GMU	75 du/acre
Lot B	1.4 acres	108	GMU	78 du/acre
Lot C	1.3 acres	65	GMU	50 du/acre
Lot D	1.4 acres	54	R-1	39 du/acre
Lot E	1.4 acres	93	GMU	67 du/acre
Lot F	1 acre	40	R-1	40 du/acre
Lot G	1.5 acres	27	R-1	18 du/acre
Lot H (Manor)	2.5 acres	100	R-1	37 du/acre
Lot J (Open Space)	1.8 acres	0	R-1	0
Lot K	1.1 acres	12	R-1	11 du/acre
Total	14.6 acres	600		41 du/acre

The maximum density permitted in the R1 zone is 32 units per acre. In the GMU zone there is no maximum density for mixed-use buildings but a limit of 50 units per acre for stand-alone residential buildings. MMC 19.311.3.C allows the density to be blended across the site. As shown in the table above, several of the proposed R-1 zoned lots will exceed the maximum density of the R-1 zone because some of the density of the GMU zone will be transferred to these lots. The overall

density of the entire development will be 41 dwelling units per acre, which falls between the maximums allowed in R-1 and GMU zones.

The City Council finds that, as conditioned, the proposal meets the applicable development standards.

8. MMC Chapter 19.500 Supplementary Development Regulations

   a. MMC Subsection 19.505.3 Multifamily Housing

      MMC 19.505.3 establishes design standards for multifamily housing to facilitate the development of attractive housing that encourages multimodal transportation and good site and building design. The requirements of this subsection are intended to achieve the principles of livability, compatibility, safety and functionality, and sustainability. The design elements established in MMC Subsection 19.505.3.D are applicable to all new multifamily housing developments with 3 or more units.

      (1) MMC Subsection 19.505.3.B states that all new multifamily and congregate housing developments with 3 or more dwelling units on a single lot are subject to the design elements in Table 19.505.3.D.

      The proposed development will have 600 dwelling units on 10 lots and is considered multifamily. The proposed development meets the applicability standards of MMC 19.505.3.B.

      (2) MMC Subsection 19.505.3.D contain standards for Multifamily Design Guidelines.

      The proposed multi-unit residential development is following the Design Guidelines for the Discretionary Process. Each building will be required to meet the standards at the time of development.

      The application as proposed meets the standards of this section as described in Table 2 below.

Table 19.505.3.D Design Guidelines—Multifamily Housing		
Design Element	Guideline	Findings
1. Private Open Space	The development should provide private open space for each dwelling unit, with direct access from the dwelling unit and visually and/or physically separate from common areas. The development may provide common open space in lieu of private open space if the common open space is well designed, adequately sized, and functionally similar to private open space.	*The proposed Planned Development will not preclude any of the future buildings from meeting the private open space requirements. The townhouse and walk-up apartments will likely provide the private open space in the form of small private yards adjacent to the units. The larger apartment buildings will either provide small balconies or common open space areas that may include some of the open space amenities already being planned into the larger planned development.* *The application proposes that the open space areas developed on individual lots (for example the playground on Lot E) will be credited towards meeting this open space standard for the development on Lot E. This will assure that there is a variety of different types of open space throughout the site meeting the recreational needs of a diverse population of residents.*
2. Public Open Space	The development should provide sufficient open space for the purpose of outdoor recreation, scenic amenity, or shared outdoor space for people to gather.	*The Planned Development will include a variety of public open space opportunities that will include playgrounds, sport courts, plazas with outdoor furnishings, pocket parks, and the larger open space area in the northwest corner of the site. It is proposed that these open space areas will be used in-part to meet the public open space standard for the individual buildings at the time of development.*
3. Pedestrian Circulation	Site design should promote safe, direct, and usable pedestrian facilities and connections throughout the development. Ground-floor units should provide a clear transition from the public realm to the private dwellings.	*As designed, the proposed development will have continuous connections with adequate lighting and street crossings to site elements as required.*
4. Vehicle and Bicycle Parking	Vehicle parking should be integrated into the site in a manner that does not detract from the design of the building, the street frontage, or the site. Bicycle parking should be secure, sheltered, and conveniently located.	*352 off-street parking spaces and 137 on-street parking spaces are proposed for a total of 489 spaces for the development.* *Bicycle parking spaces will be provided in bike rooms inside of the buildings as well as in clusters around the site.* *A total of 375 bicycle parking spaces are proposed, at least 50% of which will be covered.*

Table 19.505.3.D Design Guidelines—Multifamily Housing		
Design Element	Guideline	Findings
5. Building Orientation and Entrances	Buildings should be located with the principal façade oriented to the street or a street-facing open space such as a courtyard. Building entrances should be well-defined and protect people from the elements.	*The majority of the lots in the development will be surrounded by streets on at least three sides. Therefore, orientating the building entrances to an adjacent street should not be an issue for any of the future buildings. Though none of the buildings have been designed at this time, there is nothing in the design of the Planned Development that would preclude the buildings from including well-defined and protective entrances.*
6. Building Façade Design	Changes in wall planes, layering, horizontal & vertical datums, building materials, color, and/or fenestration should be incorporated to create simple and visually interesting buildings Windows and doors should be designed to create depth and shadows and to emphasize wall thickness and give expression to residential buildings. Windows should be used to provide articulation to the façade and visibility into the street. Building facades should be compatible with adjacent building facades. Garage doors shall be integrated into the design of the larger façade in terms of color, scale, materials, and building style.	*The design of the Planned Development would not prevent any of the future buildings from being able to meet the façade design standards. During the development of each lot careful consideration of building façade design will be done to assure that all of the buildings will meet these standards.*
7. Building Materials	Buildings should be constructed with architectural materials that provide a sense of permanence and high quality, incorporating a hierarchy of building materials that are durable. Street-facing facades should consist predominantly of a simple palette of long-lasting materials such as brick, stone, stucco, wood siding, and wood shingles. Split-faced block and gypsum reinforced fiber concrete (for trim elements) should only be used in limited quantities. Fencing should be durable, maintainable, and attractive.	*The vision for the redevelopment of Hillside is to construct buildings that feature durable, high-quality materials while still providing affordable housing options. As such, each of the future buildings will be designed in accordance with these standards.*

Table 19.505.3.D Design Guidelines—Multifamily Housing		
Design Element	Guideline	Findings
8. Landscaping	Landscaping should be used to provide a canopy for open spaces and courtyards, and to buffer the development from adjacent properties. Existing, healthy trees should be preserved whenever possible. Landscape strategies that conserve water should be included. Hardscapes should be shaded where possible, as a means of reducing energy costs (heat island effect) and improving stormwater management.	*Nearly 7 acres of the site is proposed to be landscaped. The Planned Development plan includes landscaping, open space recreation areas, and substantial buffers throughout the site. Throughout these areas existing healthy trees will be preserved where practical and new trees will be planted. Hardscaped areas such as parking lots and vehicle circulation areas will be shared when possible to minimize the overall impervious area on the site. Native and drought-tolerant plantings will be selected when appropriate and the irrigation systems installed throughout the site will be low-volume to conserve water.*
9. Screening	Mechanical equipment, garbage collection areas, and other site equipment and utilities should be screened so they are not visible from the street and public or private open spaces. Screening should be visually compatible with other architectural elements in the development.	*The design of the Planned Development would not prevent any of the future mechanical equipment, garbage areas or other site utilities from being screened in to meet these standards.*
10. Recycling Areas	Recycling areas should be appropriately sized to accommodate the amount of recyclable materials generated by residents. Areas should be located such that they provide convenient access for residents and for waste/recycling haulers. Recycling areas located outdoors should be appropriately screened or located so they are not prominent features viewed from the street.	*The design of the Planned Development would not prevent any of the future recycling areas from meeting these requirements.*

Table 19.505.3.D Design Guidelines—Multifamily Housing		
Design Element	Guideline	Findings
11. Sustainability	Development should optimize energy efficiency by designing for building orientation for passive heat gain, shading, day-lighting, and natural ventilation. Sustainable materials, particularly those with recycled content, should be used whenever possible. Sustainable architectural elements should be incorporated to increase occupant health and maximize a building's positive impact on the environment. When appropriate to the context, buildings should be placed on the site giving consideration to optimum solar orientation. Methods for providing summer shading for south-facing walls, and the implementation of photovoltaic systems on the south-facing area of the roof, are to be considered.	*Most of the buildings on the site will be multi-family affordable housing development that are publicly financed and must adhere to a green building program. It is anticipated that these buildings will be certified through Earth Advantage or a similar program, assuring that they will be energy efficient, constructed of sustainable and durable materials, and healthy for the occupants.* *Additionally, throughout the development there will be a major emphasis on alternative modes of transportation by providing green streets with wide sidewalk corridors and planter strips, and integration of the transit stops on 32nd Ave with ample bike parking. Planting zones will be maximized to provide landscaping and tree species with large canopies that support the City of Milwaukie's Urban Forestry 40% canopy coverage goal. Green roofs on buildings are encouraged and will contribute to reducing the stormwater released into the treatment system. Stormwater from new impervious surfaces will be directed to new water quality facilities before being released from the site.*
12. Privacy Considerations	Development should consider the privacy of, and sight lines to, adjacent residential properties, and should be oriented and/or screened to maximize the privacy of surrounding residences.	*Adjacent residential properties zoned low-density residential are located to the north of the site. The buildings on the north side of the site have been setback at least 15 feet from the north property line in order to provide a wide landscape buffer from the houses to the north. This area has mature existing trees and will be further planted with trees and tall shrubs that will help obscure views and absorb sounds to protect the privacy of these neighboring homes. Additionally, all of the buildings that abut the north property line will be limited to two stories in height. Building F2 will be located on a sloped lot, so it is proposed as two stories on the north side and three stories on the south to account for the topography of the lot.*

Table 19.505.3.D Design Guidelines—Multifamily Housing		
Design Element	Guideline	Findings
13. Safety	Development should be designed to maximize visual surveillance, create defensible spaces, and define access to and from the site. Lighting should be provided that is adequate for safety and surveillance, while not imposing lighting impacts to nearby properties. The site should be generally consistent with the principles of Crime Prevention Through Environmental Design (CPTED): • Natural Surveillance • Natural Access Control • Territorial Reinforcement	*As proposed, all safety design considerations will be met in the final permit plans.* *The future landscaping and site lighting will be designed with safety in mind. Additionally, the layout of the Planned Development, which will replace the angled streets and dead-end cul-de-sacs with a more open and easily surveilled circulation plan will help to bolster these safety measures.*

The City Council finds that, as conditioned, the discretionary multifamily design guidelines have been met.

b. MMC Section 19.505.7 Nonresidential Development

MMC 19.505.7 establishes design standards for nonresidential and mixed-use development. The design standards apply to the street-facing façades.

The proposed development includes two mixed use buildings (A2 and E1) in the proposed GMU zone, which are subject to these standards.

(1) Weather Protection

All ground-floor building entries must be protected by canopies or a recess at least 3 ft behind the façade.

All first-floor entries in buildings A2 and E1 are proposed to meet this standard.

(2) Exterior Building Materials

This section details specific materials to be used as primary, secondary, and accent materials, as well as a list of prohibited materials.

Buildings A2 and E1 will be constructed of durable, high-quality materials selected from Table 19.505.7.C.3. To maintain the overall affordability of these buildings, however, it is proposed that this standard be modified to allow both "finished metal panels" and "fiber-reinforced cement siding and panels" (i.e., Hardie plank) to be used as primary building materials required to cover at least 60% of the applicable building façades instead of secondary materials limited to only 40% of the building façade. The quality and durability of these materials has increased in recent years as demonstrated on a number of projects throughout the region.

(3) Windows and Doors

(a) For nonresidential and mixed-use buildings, 30% of the ground-floor street wall area must consist of openings, i.e., windows or glazed doors. The ground-floor street wall area is defined as the area up to the finished ceiling height of the space fronting the street or 15 ft above finished grade, whichever is less.

Buildings A2 and E1 will be able to meet all of the applicable window standards by providing both ground-floor windows and doors that meet the standards of this section. The proposed Planned Development will not preclude the buildings from meeting these standards.

(b) For all buildings, the following applies:

(i) Nonresidential ground-floor windows must have a visible transmittance (VT) of 0.6 or higher.

The application materials state that this standard will be met.

(ii) Doors and/or primary entrances must be located on the street-facing block faces and must be unlocked when the business located on the premises is open. Doors/entrances to second-floor residential units may be locked.

The application materials state that all commercial entries will remain unlocked during business hours and that residential entries will be kept secure.

(iii) Clear glazing is required for ground-floor windows. Nontransparent, reflective, or opaque glazings are not permitted.

The application materials state that ground-floor glazing will comply with this standard.

(iv) The bottom edges of windows along pedestrian ways shall be constructed no more than 36 in above grade.

The application materials state that the ground floor windows will meet this standard.

(v) Ground-floor windows for nonresidential uses shall allow views into storefronts, working areas, or lobbies. Signs are limited to a maximum coverage of 50% of the required window area.

The application materials state that ground-floor window signs will comply with this standard.

(vi) Windows shall be designed to provide shadowing. This can be accomplished by recessing windows 4 in into the façade and/or incorporating trim of a contrasting material or color.

The application materials state that the windows will meet this standard.

(c) For all building windows facing streets, courtyards, and/or public squares, the following window elements are prohibited:

(i) Reflective, tinted, or opaque glazing.

(ii) Simulated divisions (internal or applied synthetic materials).

(iii) Exposed, unpainted metal frame windows.

The application materials state that none of the prohibited elements are proposed.

(4) Roofs

Enliven the pedestrian experience and create visual interest through roof form.

The proposed Planned Development will not prevent Buildings A2 and E1 from complying with the roofing standards.

(5) Rooftop Equipment and Screening

Integrate mechanical equipment into the overall building design.

All mechanical equipment placed on the roofs of Buildings A2 and E1 will be screened from public view.

(6) Ground-Level Screening

Mechanical and communication equipment, outdoor storage, and outdoor garbage and recycling areas shall be screened so they are not visible from streets, other ground-level private open space, or common open spaces.

The design of the Planned Development would not prevent any of the future mechanical equipment, garbage areas, or other site utilities from being screened to meet these standards.

(7) Rooftop Structures

Rooftop structures related to shared outdoor space—such as arbors, trellises, or porticos related to roof decks or gardens—shall not be included in the building's maximum height calculation, as long as they do not exceed 10 ft in height.

No rooftop structures are anticipated on Buildings A2 or E1 at this time.

(8) Building Orientation to Transit

New mixed-use buildings shall have their primary orientation toward a transit street or, if not adjacent to a transit street, a public right-of-way which leads to a transit street. The primary building entrance shall be visible from the street and shall be directly accessible from a sidewalk connected to the public right-of-way. A building may have more than 1 entrance.

Both Buildings A2 and E1 are located directly adjacent to 32nd Ave (a transit street) and will be able to orient the main building entrances to this street.

As proposed, the City Council finds that the standards of MMC 19.500 are met.

9. MMC Chapter 19.600 Off-Street Parking and Loading

MMC 19.600 regulates off-street parking and loading areas on private property outside the public right-of-way. The purpose of these requirements includes providing adequate space for off-street parking, minimizing parking impacts to adjacent properties, and minimizing environmental impacts of parking areas.

a. MMC Section 19.602 Applicability

MMC 19.602 establishes the applicability of the provisions of MMC 19.600, and MMC Subsection 19.602.3 establishes thresholds for full compliance with the standards of MMC 19.600. Development of a vacant site is required to provide off-street parking and loading areas that conform fully to the requirements of MMC 19.600.

The proposed development consists of 600 dwelling units, including 2 mixed use buildings, and is required to conform fully to the requirements of MMC 19.600.

The City Council finds that the provisions of MMC 19.600 are applicable to the proposed development.

b. MMC Section 19.605 Vehicle Parking Quantity Requirements

MMC 19.605 establishes standards to ensure that development provides adequate vehicle parking (off-street) based on estimated parking demand.

The proposed multi-unit residential development includes 600 apartments and up to 20,000 sq ft of commercial space. As described in the application materials, 461 units will be less than 800 sq ft and 39 units will be more than 800 sq ft. The existing Hillside Manor tower, with 100 units, has 59 parking spaces that were approved in 1969 via land use file #VR-69-7.

As per MMC Table 19.605.1, the minimum number of required off-street parking spaces for multifamily housing is 1 space per unit for units less than 800 sq ft and 1.25 spaces per unit for units more than 800 sq ft. The minimum number of spaces for general commercial space is 3 spaces per 1,000 sq ft. The maximum number of spaces is 2 spaces per dwelling unit, regardless of size. According to MMC Table 19.605.1, the proposed development should provide a minimum of 629 spaces and would have a maximum of 1200 spaces allowed. As proposed, the development would provide 489 parking spaces (352 on-site and 137 on-street) in a mixture of off- and on-street spaces, a parking ratio of 0.82 per unit when including the off-street spaces, which is below that range. This includes the existing 59 parking spaces at Hillside Manor. Another 19 new parallel parking spaces will be developed along the west side of 32nd Ave that will also be available to serve the site but are not included in the overall parking ratio since they will also be available to the larger neighborhood. A parking modification has been requested to permit the proposed parking plan.

Subject to approval of the requested parking modification, the City Council finds that this standard is met.

c. MMC Subsection 19.605.2 Quantity Modifications and Required Parking Determinations

(1) MMC Subsection 19.605.2 A. allows for the modification of minimum and maximum parking ratio standards as calculated per Table 19.605.1.

The applicant has requested a modification to the minimum required parking for the development and proposes to provide a total of 352 off-street spaces and 137 on-street spaces for the development rather than the minimum required 629.

(2) MMC Subsection 19.605.2 C.1. contains the approval criteria for granting a parking modification, including a demonstration that the proposed parking quantities are reasonable based on (1) existing parking demand for similar uses in other locations, (2) quantity requirements from other jurisdictions, and (3) professional literature. In addition to this criterion, a request for modifications to decrease the amount of minimum required parking must meet the following criteria:

(a) The use of transit, parking demand management (TDM) programs, and/or special characteristics of the site users will reduce expected vehicle use and parking space demand for the proposed use or development, as compared with the standards in Table 19.605.1.

(b) The reduction of off-street parking will not adversely affect available on-street parking.

(c) The requested reduction is the smallest reduction needed based on the specific circumstances of the use and/or site.

The applicant has proposed providing 352 off-street parking spaces and 137 on-street parking spaces for the site. The existing Hillside Manor tower is already below the minimum required with 59 spaces for 100 units. The requested reduction is due to the nature of the development as an affordable housing community.

The ITE Parking Manual, 5th Edition shows an average parking rate for Affordable Housing (ITE category 223) of 1.3 spaces/unit compared to a parking rate of 1.7 spaces per unit for typical market rate Multifamily Mid-Rise Housing (ITE category 221). This equates to affordable housing requiring approximately 25%fewer parking spaces than market rate housing.

This reduced need for parking is consistent with what HACC has found with the properties it owns and manages. The low-income populations that HACC serves have very limited access to personal vehicles due to the high cost of ownership and maintenance of a vehicle. Additionally, many lower income residents are seniors or people living with physical ailments who have difficulty driving their own car. A recent survey of the Hillside Manor residents, conducted pre-pandemic, found that only 36% of the residents reported driving in the past week. This same surveyed population was found to be very dependent on other modes of transportation such as Tri-Met (37%), carpooling (40%), and taxi or ride-share (11%). Therefore, it is reasonable that a 25%

parking reduction should be applied to all of the proposed affordable housing, which include all the buildings on Lots B, C, D, F, G and K. This would result in a reduction of 67 spaces from the base minimum requirement of 503 for a total of 436 spaces.

The small commercial businesses proposed for Buildings A2 and E1 will have peak parking demands that will not coincide with the peak parking demands of the multi-family units. The majority of commercial businesses experience their peak demand during the daytime, typically between the hours of 9 am and 5 pm. Multi-family residential housing experiences its peak parking demand in the evening and nighttime hours, typically from 10 pm to 7 am according to the ITE. Therefore, the case can be made that the two uses can share parking spaces since the peak parking demands are near opposites. A credit for shared parking, as proposed by the applicant, results in 61 fewer spaces, bringing the new total required on the site to 375 parking spaces.

Additionally, the type of commercial uses proposed for the development are specifically selected to be uses that would attract residents of Hillside and the surrounding neighborhood as customers. Therefore, it is likely that a large percentage of the customers that patronize these businesses will walk or bike to them, further reducing the need for the additional 60 parking spaces dedicated to the commercial businesses.

A total of 137 on-street parking spaces will be developed within the new street network that includes Dwyer St, Hillside Ct, Meek St, 28th Ave, 29th Ave, and 31st Ave. The MMC does not allow on-street parking to count toward minimum or maximum parking requirements, but in this case these parking spaces are interior to the site and will not be convenient for anyone other than the residents and guests of Hillside. The modification request cites other jurisdictions in the region including Hillsboro, Gladstone, Clackamas County, the Villebois development in Wilsonville, and Lake Oswego who allow on-street parking to count toward on-site parking requirements establishing a precedent for recognizing the functional use of the spaces. The 19 on-street parking spaces on 32nd Ave adjacent to the mixed-use buildings have not been included in the 137 total on-street spaces available to serve the residential units. These spaces will be allocated toward the commercial uses during the day but will still be available for resident parking during the night.

The narrative includes details of TDM measures for the project, designed to encourage walking, biking, and transit use, including the following:

- *Bicycle Facilities: Provide an on-site bicycle repair station. 29th Ave is anticipated to be a sharrow street and part of the Central Milwaukie Bikeway Concept.*
- *Bicycle Maintenance Services: Bring in mobile maintenance service several times annually.*
- *Wayfinding Station: Provide on-site kiosk or information center with multi-modal wayfinding information and transit information.*

- *TDM Coordination: Designate an on-site TDM Coordinator (can be property manager) offering multi-modal and wayfinding information, rideshare matching, walking/biking group coordination.*
- *TDM Communication: Distribute transit, wayfinding, and other TDM informational materials to new residents as they move in and annually to all residents.*
- *Bicycle Share Program: Provide private or public bicycle share memberships to on-site residents and establish a bike-share station on-site.*
- *E-Scooter Share Program: Create a designated space on site for shared scooters.*
- *Dedicated Ride-Share Spaces: Designate some on-site parking spaces for the use by programs like Uber and Lyft.*
- *Transit: There is currently a transit shelter at the intersection of 32nd Ave and Hillside Ct which will be moved toward the west to accommodate the new bus pull-out lane on 32nd Ave. A new transit shelter will be installed at the intersection of 32nd Ave and Meek St.*

Accounting for a proposed modification of the minimum required parking for affordable housing and shared parking, the new minimum required would be 375 off-street spaces. The proposed plans include 352 off-street spaces and 137 on-street spaces for a total of 489 parking spaces for the development, which includes a comprehensive TDM program to further decrease the number of vehicles on the site. The combination of the on-site parking and the additional 137 on-street parking spaces results in an overall functional parking rate of 0.82 spaces per unit. The strong emphasis on walking, biking, transit, and a robust TDM program will further reduce residents reliance on vehicles allowing the parking spaces proposed to adequately serve the needs of the development.

The City Council finds that the applicant has adequately addressed the criteria for a parking modification to allow a reduced number of parking spaces on the site.

d. MMC 19.605.3 Exemptions and By-Right Reductions to Quantity Requirements

MMC 19.605.3.B establishes standards for reductions to minimum parking requirements. Multifamily development within 500 ft of a transit stop with peak hour service frequency is afforded a 20% reduction to required parking.

The proposed development is a multifamily development with two mixed-use buildings within 500 ft of the Trimet #75 bus route resulting in a base requirement of 503 parking spaces. The proposal is entitled to a 20% reduction in the minimum required parking for a total reduction of 125 spaces. The minimum required number of spaces, with reductions, is 503 spaces. 489 parking spaces in a combination of off-street and on-street spaces are proposed, subject to a request for a parking modification as discussed in Finding 9.c.

e. MMC Section 19.606 Parking Area Design and Landscaping

MMC 19.606 establishes standards for parking area design and landscaping, to ensure that off-street parking areas are safe, environmentally sound, and aesthetically pleasing, and that they have efficient circulation.

(1) MMC Subsection 19.606.1 Parking Space and Aisle Dimension

MMC 19.606.1 establishes dimensional standards for required off-street parking spaces and drive aisles. For 90°-angle spaces, the minimum width is 9 ft and minimum depth is 18 ft, with a 9-ft minimum curb length and 22-ft drive aisles. Parallel spaces require with 22-ft lengths and a width of 8.5 ft.

The parking areas shown on the Planned Development plan have been laid out conceptually based on the standards of Table 19.606.1 using a 9-ft wide and 18-ft long parking space. Full compliance with these standards will be shown at the time of development.

(2) MMC Subsection 19.606.2 Landscaping

MMC 19.606.2 establishes standards for parking lot landscaping, including for perimeter and interior areas. The purpose of these landscaping standards is to provide buffering between parking areas and adjacent properties, break up large expanses of paved area, help delineate between parking spaces and drive aisles, and provide environmental benefits such as stormwater management, carbon dioxide absorption, and a reduction of the urban heat island effect.

(a) MMC Subsection 19.606.2.C Perimeter Landscaping

In all but the downtown zones, perimeter landscaping areas must be at least 6 ft wide where abutting other properties and at least 8 ft wide where abutting the public right-of-way. At least 1 tree must be planted for every 30 lineal ft of landscaped buffer area, with the remainder of the buffer planted with grass, shrubs, ground cover, mulch, or other landscaped treatment. Parking areas adjacent to residential uses must provide a continuous visual screen from 1 to 4 ft above the ground to adequately screen vehicle lights.

The perimeter parking lot landscaping adjacent to the right-of-way in the GMU zone have been designed at 4-ft wide, consistent with Table 19.606.2.C.1 for Downtown Zones. In the R-1 zone the perimeter parking lot landscaping buffers adjacent to the right-of-way have been designed at 8 ft. The parking lots on Lots K and F, which are the only parking areas abutting another property have been designed with a 6-ft buffer.

The buffer along the northern edge of the site, adjacent to the R-7 zone is proposed at 15-ft wide and will be planted with trees and tall shrubs that will help obscure views and absorb sounds to protect the privacy of the neighboring houses. This landscape buffer will also serve to meet this parking lot planting standard.

This standard is met.

(b) MMC Subsection 19.606.2.D Interior Landscaping

At least 25 sq ft of interior landscaped area are required for each parking space. Planting areas must be at least 120 sq ft in area, at least 6 ft in width, and dispersed throughout the parking area. For landscape islands, at least 1 tree shall be planted per island, with the remainder of the buffer planted with grass, shrubs, ground cover, mulch, or other landscaped treatment.

Interior parking lot islands in compliance with these standards have been shown in all of the parking lots proposed in the Planned Development, as illustrated on the submitted concept plans. Full compliance with these standards will be show at the time of development.

This standard is met through the approval of the Planned Development.

As conditioned, the City Council finds that the applicable standards of MMC 19.606.2 are met.

(3) MMC Subsection 19.606.3 Additional Design Standards

MMC 19.606.3 establishes various design standards, including requirements related to paving and striping, wheel stops, pedestrian access, internal circulation, and lighting.

(a) MMC Subsection 19.606.3.A Paving and Striping

Paving and striping are required for all required maneuvering and standing areas, with a durable and dust-free hard surface and striping to delineate spaces and directional markings for driveways and accessways.

The plans submitted indicate that all parking areas will be paved and striped.

This standard is met.

(b) MMC Subsection 19.606.3.B Wheel Stops

Parking bumpers or wheel stops are required to prevent vehicles from encroaching onto public rights-of-way, adjacent landscaped areas, or pedestrian walkways. Curbing may substitute for wheel stops if vehicles will not encroach into the minimum required width for landscape or pedestrian areas.

The plans submitted indicate that all parking areas will meet this standard.

This standard is met.

(c) MMC Subsection 19.606.3.C Site Access and Drive Aisles

Accessways to parking areas shall be the minimum number necessary to provide access without inhibiting safe circulation on the street. Drive aisles shall meet the dimensional requirements of MMC 19.606.1, including a 22-ft minimum width for drive aisles serving 90°-angle stalls and a 16-ft minimum width for drive aisles not abutting a parking space. Along

collector and arterial streets, no parking space shall be located such that its maneuvering area is in an ingress or egress aisle within 20 ft of the back of the sidewalk. Driveways and on-site circulation shall be designed so that vehicles enter the right-of-way in a forward motion.

The plans submitted indicate that all parking areas will meet this standard.

This standard is met.

(d) MMC Subsection 19.606.3.D Pedestrian Access and Circulation

Pedestrian access shall be provided so that no off-street parking space is farther than 100 ft away, measured along vehicle drive aisles, from a building entrance or a walkway that is continuous, leads to a building entrance, and meets the design standards of MMC Subsection 19.504.9.E.

A pedestrian access and circulation plan was submitted with the final plan application materials. The plans submitted indicate that all parking areas will be meet this standard.

This standard is met.

(e) MMC Subsection 19.606.3.E Internal Circulation

The City Council has the authority to review the pedestrian, bicycle, and vehicular circulation of the site and impose conditions to ensure safe and efficient on-site circulation. Such conditions may include, but are not limited to, on-site signage, pavement markings, addition or modification of curbs, and modification of drive aisle dimensions.

The City Council has reviewed the proposed circulation plan and concluded that it provides safe and efficient on-site circulation.

This standard is met.

(f) MMC Subsection 19.606.3.F Lighting

Lighting is required for parking areas with more than 10 spaces and must have a cutoff angle of 90° or greater to ensure that lighting is directed toward the parking surface. Lighting shall not cause a light trespass of more than 0.5 footcandles measured vertically at the boundaries of the site and shall provide a minimum illumination of 0.5 footcandles for pedestrian walkways in off-street parking areas.

The plans submitted indicate that the site will meet these standards.

A condition requiring a photometric plan showing compliance to be submitted during permit review has been included.

As conditioned, this standard is met.

As conditioned, the City Council finds that the applicable standards of MMC 19.606.3 are met.

As conditioned, the City Council finds that the applicable design and landscaping standards of MMC 19.606 are met.

f. MMC Section 19.608 Loading

MMC 19.608 establishes standards for off-street loading areas and empowers the Planning Director to determine whether loading spaces are required. The purpose of off-street loading areas is to contain loading activity of goods on-site and avoid conflicts with travel in the public right-of-way; provide for safe and efficient traffic circulation on the site; and minimize the impacts of loading areas to surrounding properties. For residential development with fewer than 50 dwelling units on a site that abuts a local street, no loading space is required; otherwise, 1 space is required.

The standards required to calculate required loading spaces is based on the individual lots and building. Proposed Buildings B2 and C1 will be entirely residential use and will contain more than 50 dwelling units, so each of these buildings will require one loading space. Proposed Buildings A2 and E1 will be mixed-use buildings with a floor area of more than 50,000 sq. ft. for each building, so each of these buildings will also require two loading spaces. The combined total is six loading spaces between these four buildings. However, because all of these lots and buildings will be developed in compliance with the Planned Development, a modification using Section 19.311.3 is requested to allow the loading space requirement to be applied site-wide allowing some of these buildings to share loading spaces. Additionally, as described by the applicant, some of the required loading spaces are proposed to be provided in the street instead of on individual lots so that they can better serve more than one building.

The submitted vehicle circulation plan shows where the proposed loading spaces will be located. A dedicated loading area will be provided in front of buildings C and H (the Manor). An on-street loading space will be provided on 31st Ave adjacent to the northwest corner of Lot E, which can serve the buildings on Lot D, E, and F. A second on-street loading space is provided on 31st Ave adjacent to the southeast corner of Lot D which can serve the buildings on Lots A, B, D, and E. No impacts to the public right of way or surrounding properties are anticipated by loading activity on the site.

All of the proposed loading spaces will meet the loading space standards. A modification is included as part of the Planned Development to allow these spaces to be located in the street instead of on individual lots to allow them to serve more buildings.

Subject to approval of the final development plan and program, and the requested modification to these standards, the City Council finds that this standard is met.

g. MMC Section 19.609 Bicycle Parking

MMC 19.609 establishes standards for bicycle parking for new development of various uses. Multifamily residential development with 4 or more units shall provide 1 space per unit. When at least 10 bicycle spaces are required, a minimum of 50% of the spaces shall be covered and/or enclosed. MMC Subsection 19.609.3.A provides that each bicycle parking space shall have minimum dimensions of 2 ft by 6 ft, with 5-

ft-wide aisles for maneuvering. MMC Subsection 19.609.4 requires bike racks to be located within 50 ft of a main building entrance.

For each of the residential buildings proposed on the site the minimum number of bicycle parking spaces required will be the same as the number of units. For the commercial uses proposed on the ground floor of buildings A2 and E1 the number of bike parking spaces will be determined by the uses in each building, but in no case will there be less than two spaces for each use. Based on these minimum requirements, over 510 bicycle parking spaces would be required on the site, which, according to the application materials, exceeds the amount that is likely to be used.

Based on the resident populations in HACC's other properties (including the Hillside Manor) many residents of affordable housing are elderly or disabled and not likely to use bicycles for transportation. Additionally, the existing bicycle network surrounding the site is currently not well developed, making travel by bicycle a less attractive option. However, the future Central Milwaukie Bikeway Concept (CMBC) will connect the Hillside development and the vacant site to the south to both the Springwater Corridor and the Monroe Street Greenway. The CMBC will also cater to pedestrians and ADA accessibility, not just bicyclists, but will be several years before it is constructed. As part of the TDM measures, the proposal includes exploration of a bikeshare program, so individual bike spaces could be reduced. Therefore, a modification through the Planned Development review is requested to reduce the minimum number of required bicycle parking spaces on the site to 0.75 spaces per unit which would bring the total number of spaces down to 375 spaces required to serve the residential units plus the additional spaces to serve the commercial uses.

Bicycle parking spaces will be provided in bike rooms inside of the buildings as well as in clusters around the site. The submitted circulation plan shows where concentrations of bike racks will be provided, with several racks located around the exterior of buildings A2 and E1 to serve the future commercial uses in these buildings. Bicycle parking for the new multi-family buildings will be partially provided in combined bike storage rooms inside the buildings assuring that at least 50% of the bike parking spaces will be covered. The concentrations of bicycle parking locations will be dispersed throughout the site to be convenient to all of on-site amenities and gathering spots. Additionally, bike parking will be provided within 50 ft of the entrances all of proposed buildings.

Subject to approval of the final development plan and program, and the requested modification to these standards, the City Council finds that this standard is met.

h. MMC Section 19.610 Carpool and Vanpool Parking

MMC 19.610 establishes carpool parking standards for new industrial, institutional, and commercial development. The number of carpool/vanpool parking spaces shall be at least 10% of the minimum amount of required parking spaces. Carpool/vanpool spaces shall be located closer to the main entrances of the building than other

employee or student parking, except ADA spaces and shall be clearly designated with signs or pavement markings for use only by carpools/vanpools.

The proposed development is a predominantly multi-unit residential development.

This standard does not apply.

As conditioned, the City Council finds that the proposed development meets all applicable standards of MMC 19.600.

10. MMC Chapter 19.700 Public Facility Improvements

MMC 19.700 is intended to ensure that development, including redevelopment, provides public facilities that are safe, convenient, and adequate in rough proportion to their public facility impacts.

a. MMC Section 19.702 Applicability

MMC 19.702 establishes the applicability of the provisions of MMC 19.700, including new construction.

The applicant proposes to develop new construction of 400 multifamily residential units as an expansion to an existing multifamily development, for a total of 600 residential units. The proposed new construction and additional dwelling units fulfill the applicability criteria of MMC 19.700.

b. MMC Section 19.703 Review Process

MMC 19.703 establishes the review process for development that is subject to MMC 19.700, including requiring a preapplication conference, establishing the type of application required, and providing approval criteria.

The applicant had a preapplication conference with City staff on May 14, 2020, prior to application submittal. The applicant's proposal includes a Transportation Facilities Review and a transportation impact study, meeting requirements of this section.

c. MMC Section 19.704 Transportation Impact Evaluation

MMC 19.704 establishes the process and requirements for evaluating development impacts on the surrounding transportation system, including determining when a formal Transportation Impact Study (TIS) is necessary and what mitigation measures will be required.

The proposed development completed a formal TIS according to scoping developed by the City Engineer and the City's on-call traffic consultant (DKS), who provided the applicant with a scope of work for the TIS. Warrants for a left turn pocket for northbound 32nd Ave were found to be met and are proposed to be included with this development. This left-turn pocket must be constructed either prior to, or concurrently with, that phase of development which creates greater than 325 residential units.

As submitted with additional submittal received regarding a left turn lane for northbound 32nd Ave, the applicant's TIS is sufficient to meet the requirements of MMC 19.704.

d. MMC Section 19.705 Rough Proportionality

MMC 19.705 requires that transportation impacts of the proposed development be mitigated in proportion to its potential impacts.

Improvements submitted by the applicant were in rough proportion to potential impacts. Final design will be approved by City Engineering prior to construction, including final design mitigations for any deficiency in intersection-sight distance. The minimum AASHTO sight distance requirements shall be met at the proposed street intersection and driveways and final acceptance shall be made by the City Engineer prior to final site plan approval

e. MMC Section 19.707 Agency Notification and Coordinated Review

MMC 19.707 establishes provisions for coordinating land use application review with other agencies that may have some interest in a project that is in proximity to facilities they manage.

The application was referred to the Oregon Department of Transportation (ODOT), Clackamas County Department of Transportation and Development (DTD), TriMet, and Metro for comment. Agency comments have been incorporated into these findings and the associated conditions of approval.

f. MMC Section 19.708 Transportation Facility Requirements

MMC 19.708 establishes the City's requirements and standards for improvements to public streets, including pedestrian, bicycle, and transit facilities.

(1) MMC Subsection 19.708.1 General Street Requirements and Standards

MMC 19.708.1 provides general standards for streets, including for access management, clear vision, street layout and connectivity, and intersection design and spacing.

As proposed, the development is consistent with the applicable standards of MMC 19.708.1.

(2) MMC Subsection 19.708.2 Street Design Standards

MMC 19.708.2 provides design standards for streets, including dimensional requirements for the various street elements (e.g., travel lanes, bike lanes, on-street parking, landscape strips, and sidewalks).

The proposed 32nd Ave cross section conforms to applicable requirements and are consistent with MMC 19.708.2.

(3) MMC Subsection 19.708.3 Sidewalk Requirements and Standards

MMC 19.708.3 provides standards for public sidewalks, including the requirement for compliance with applicable standards of the Americans with Disabilities Act (ADA).

The proposed development includes ADA compliant ramps, sidewalks, and crossings.

As conditioned under the Final Development Plan to construct all improvements consistent with ADA requirements, the development is consistent with all applicable standards of MMC 19.708.3.

(4) MMC Subsection 19.708.4 Bicycle Facility Requirements and Standards

MMC 19.708.4 provides standards for bicycle facilities, including a reference to the Public Works Standards.

The City's bicycle facilities goals, objectives, and policies are found in Chapter 6 of the Transportation System Plan (TSP). No additional context is identified for the adjacent frontage of development. Because of the low volume of traffic and the slow travel speeds on the proposed new streets bicycles will share travel lanes with the vehicle traffic.

As proposed, the development is consistent with all applicable standards of MMC 19.708.4.

(5) MMC Subsection 19.708.5 Pedestrian/Bicycle Path Requirements and Standards

MMC 19.708.5 provides standards for pedestrian and bicycle paths.

The proposed site plan includes pedestrian connections within the development through internal streets with sidewalks and sharrows.

As proposed, the development does not require dedication of a path and is consistent with standards of MMC 19.708.5.

(6) MMC Subsection 19.708.6 Transit Requirements and Standards

MMC 19.708.6 provides standards for transit facilities.

The City's transit facilities goals, objectives, and policies are found in Chapter 7 of the TSP. There are already transit facilities in place that serve the Planned Development site. Two existing TriMet bus stops are located on 32nd Ave; one just north of the intersection with the existing Hillside Ct (stop #7342), and the second just north of the intersection with future Meek Street (stop #7349). Based on consultations with TriMet designers these two stops will be combined into a single bus stop located between SE Dwyer and SE Meek Sts and enhanced as part of the development.

The new combined stop will include a raised curb/bus platform to facilitate bus loading and a new 4 ft by 8 ft transit shelter. Pedestrian access to the stop will also be improved with a new crosswalk and with ADA ramps on both sides of 32nd Ave, and new refuge islands in the center of the street to calm traffic and prevent cars from pulling around the stopped bus. The new bus stop will be sized for future growth by allowing room for a larger shelter (4 ft by 12 ft) and a trash can in the future. The consolidation of the bus stops is anticipated to occur as part of Phase 2 of the development when the bulk of the 32nd Ave frontage improvements will be constructed. No additional right-of-way dedications should be required to facilitate the new combined stop.

As proposed, the development is consistent with all applicable standards of MMC 19.708.6.

As conditioned, the City Council finds that the proposed development meets the applicable public facility improvement standards of MMC 19.700.

11. MMC Section 19.902 Amendments to Maps and Ordinances

MMC 19.902 establishes the process for amending the City's Comprehensive Plan and land use regulations, including the zoning map. Specifically, MMC Subsection 19.902.4 establishes the review process and approval criteria for comprehensive plan map amendments and Subsection 19.902.6 establishes the review process and approval criteria for zoning map amendments.

a. MMC Subsection 19.902.4.A Review Process

MMC 19.902.4.A provides that, generally, changes to the maps of the comprehensive plan shall be evaluated through either a Type IV or Type V review. The City Attorney has the authority to determine the appropriate review process for each proposed zoning map amendment.

The proposed comprehensive plan map amendments encompass a single property of approximately 19.5 acres and are related to a proposed planned development, which requires Type IV review. The City Council finds that the Type IV review process is appropriate for the proposed zoning map change.

b. MMC Subsection 19.902.4.B Approval Criteria

MMC 19.902.4.B establishes the following approval criteria for comprehensive plan map amendments:

(1) Changes to the Milwaukie Comprehensive Plan may be approved if the following criteria are met:

(a) The proposed amendment is consistent with the goals and policies of the Comprehensive Plan, as proposed to be amended.

(i) The proposed amendment to the Comprehensive Plan designation of the site will help to facilitate the proposed density, housing type and development pattern for the Hillside site. The proposed development plan aligns with many of the goals and policies of the Comprehensive Plan which are addressed below:

FOSTERING COMMUNITY, CULTURE & BELONGING

GOAL 1.2 - PROMOTE INCLUSION AND DIVERSITY

Policy 1.2.5: Consider diversity, equity, and inclusion when making land use decisions related to map or text amendments to the Comprehensive Plan and any codes or maps implementing the Comprehensive Plan.

The proposed redevelopment of Hillside addresses equity and inclusion by providing hundreds of new affordable housing units for low-income residents.

ENVIRONMENTAL STEWARDSHIP & COMMUNITY RESILIENCE

GOAL 3.2 - WATER QUALITY AND RESOURCES

Policy 3.2.8: Improve stormwater detention and treatment standards through the use of best available science, technology, and management practices to meet water quality standards and achieve wildlife habitat protection and connectivity goals and standards.

The proposed redevelopment will update all of the existing outdated utilities on the site including the stormwater disposal system. The new system will include the use of swales and other above-ground facilities to provide water quality treatment prior to disposal.

GOAL 3.4 - HEALTHY URBAN FOREST

Policy 3.4.2: Pursue the City's goal of creating a 40% tree canopy through a combination of development code and other strategies that lead to preservation of existing trees and planting of new trees and prioritize native and climate-adapted species, while also considering future solar access.

The proposed redevelopment plan includes the preservation of existing trees and the significant planting of new trees along the rights-of-way and on individual lots. These efforts will assist the City toward reaching their 40% tree canopy goal and improves the existing conditions at the Hillside site, which currently lacks trees.

GOAL 3.6 - AIR, NOISE, AND LIGHT QUALITY

Policy 3.6.4: Encourage or require building and landscape design, land use patterns, and transportation design that limit or mitigate negative noise impacts to building users and residents, particularly in areas near freeways, regional freight ways, rail lines, major city traffic streets, and other sources of noise.

The redevelopment plan includes robust landscaping along the western edge of the property that will help mitigate the noise impacts of the adjacent railroad right-of-way and the industrial uses to the west.

GOAL 5.1 - IDENTIFYING, AVOIDING, AND REDUCING HAZARD POTENTIAL

Policy 5.1.3: Encourage and prioritize development in areas with low risk of natural hazards and restrict development in areas with high risk that cannot be adequately mitigated.

The site contains no natural hazards such as floodplain, landslide hazard or steep slopes so it represents an ideal area to increase density and add more housing units within the City.

GOAL 5.3 - INFRASTRUCTURE AND BUILDING RESILIENCY

Policy 5.3.2: Increase the quality, resiliency, diversity, and redundancy of utility and transportation infrastructure to increase chances of continued service following a natural disaster.

The proposed redevelopment plan will turn the existing dead-end streets into a connected grid network, allowing multiple points of entry into the neighborhood in the case of a disaster. Additionally, the new water system will be looped into the existing water line to the north creating system that is more resilient if part of the system should fail.

Policy 5.3.5: Prohibit essential public facilities and uses that serve vulnerable populations from being located within areas at high risk of flooding, landslides, liquefaction, and fire, and aim to relocate existing uses in these areas.

The property contains no know hazards such a risk of flooding or potential landslides so it is an ideal site for affordable housing which would serve potentially vulnerable populations.

GOAL 5.4 - ADAPTATION AND MITIGATION

Policy 5.4.4: Encourage, green infrastructure and development practices.

The site will be redeveloped with green infrastructure, including streets that include wide sidewalks, bike lanes, planting strips and stormwater swales. Additionally, the development on the site will be built to meet established sustainability goals such as Earth Advantage.

GOAL 6.1 - BUILT ENVIRONMENT

Policy 6.1.5: Create a more energy efficient land use pattern that includes but is not limited to infill and cluster development, neighborhood hubs and increased density.

The redevelopment is a prime infill opportunity that will result in a more efficient use of the site by converting the single-family and duplex development to multi-family apartments served by streets laid out in an efficient grid pattern.

Policy 6.1.6: Encourage the creation of compact, walkable neighborhoods and neighborhood hubs throughout the city that provide a mix of uses and help reduce transportation emissions and energy usage.

When completed, the re-envisioned Hillside Park will serve as a new neighborhood hub, providing compact development, walkable streets, ample open space amenities and a mix of uses.

GOAL 6.2 - TRANSPORTATION AND UTILITY INFRASTRUCTURE

Policy 6.2.1: Increase the quantity, quality and variety of Milwaukie's transit and active transportation options, including trails, bike lanes, and sidewalks.

The proposed redevelopment will include new streets and open space areas that will encourage the use of transit and alternate transportation options through the use of bike lanes, the continuation of the city bike path through 29th Ave to the north, wide sidewalks, a new enhanced bus stop and transit plazas.

CREATING COMPLETE NEIGHBORHOODS

GOAL 7.1 – EQUITY

Policy 7.1.1: Provide the opportunity for a wider range of rental and ownership housing choices in Milwaukie, including additional middle housing types in low and medium density zones.

Policy 7.1.3: Promote zoning and code requirements that remove or prevent potential barriers to home ownership and rental opportunities for people of all ages and abilities, including historically marginalized or vulnerable populations such as people of color, aging populations, and people with low incomes.

Policy 7.1.8: Collaborate with community partners to provide a continuum of programs that address the needs of unhoused persons and families, including temporary shelters, alternative shelter models, long-term housing, and supportive services.

Hillside Park will provide a wide mix of housing choices, unit sizes and rental rates that will be both affordable and market rate. This mix will offer housing for people of all ages, abilities and incomes and will help to address the needs of unhoused persons and families in Clackamas County.

GOAL 7.2 – AFFORDABILITY

Policy 7.2.2: Allow and encourage the development of housing types that are affordable to low or moderate-income households, including middle housing types in low and medium density zones as well as larger apartment and condominium developments in high-density and mixed-use zones.

The up-zoning of the property to a high-density (R1) zone and a mixed-use (GMU) zone is being done to facilitate the development of apartment buildings that will be affordable to low and moderate-income households.

Policy 7.2.3: Pursue programs and incentives that reduce the impacts that development/design standards and fees have on housing affordability, including modifications to parking requirements, system development charges, and frontage improvements.

The proposal includes a modification to the parking requirements to reduce the minimum parking required to serve the development. This modification will help the project to provide adequate, but not excessive, on-site parking to help control the costs of the development.

Policy 7.2.5: Expand and leverage partnerships with non-profit housing developers and other affordable housing providers and agencies that preserve or provide new low to moderate income-housing units, create opportunities for first-time homeownership, and help vulnerable homeowners maintain and stay in their homes.

The Housing Authority of Clackamas County (HACC) represent an affordable housing partner whose mission is to provide more low and moderate income housing opportunities for county residents.

GOAL 7.3 – SUSTAINABILITY

Policy 7.3.8: Allow for a reduction in required off-street parking for new development within close proximity to light rail stations and frequent bus service corridors.

The project site is adjacent to a frequent bus service corridor (32nd Avenue) so the reduction of off-street parking spaces proposed with the redevelopment is consistent with this policy.

GOAL 7.4 – LIVABILITY

Policy 7.4.1: Implement land use and public investment decisions and standards that:

a) encourage creation of denser development in centers, neighborhood hubs and along corridors; and

b) foster development of accessible community gathering places, commercial uses, and other amenities provide opportunities for people to socialize, shop, and recreate together.

The request to change the zoning and Comprehensive Plan designation of the site is appropriate since it will facilitate denser development along a corridor, allowing the site to become a neighborhood hub. The redevelopment plan also includes several large open space areas that will be accessible to the community, offering a variety of amenities that will cater to different ages and interests. These open spaces as well as the small commercial uses proposed along 32nd Ave will create spaces within the neighborhood to gather, shop, and recreate.

<u>URBAN DESIGN & LAND USE GOALS & POLICIES</u>

GOAL 8.1 – DESIGN

Policy 8.1.2 (Central Milwaukie):

A. Ensure that new development and redevelopment supports better transportation connectivity through the Central Milwaukie district, especially for pedestrians and cyclists. Increased connectivity should include pedestrian and bicycle improvements through large sites.

C. Ensure buildings and sites are designed to support a pedestrian-friendly streetscape and establish a storefront environment along key streets as set out in the Central Milwaukie Land Use and Transportation Plan.

D. Ensure that new development is designed to create a transition to adjoining residentially zoned properties in terms of height, massing, setbacks, and building form.

The application of the GMU zoning creates the opportunity to add small-scale commercial uses on the site that will offer services to the Hillside residents. The redevelopment plan promotes a stepped-down density and height on the north side of the site, allowing the new buildings to be more compatible to the lower density residential uses to the north. The plan includes pedestrian-friendly and bicycle-friendly amenities and outdoor seating areas throughout.

GOAL 8.2 – LIVIBILITY

Policy 8.2.2: Parking design policies:

a) Establish parking standards that contribute to higher levels of active transportation and increased use of transportation demand management programs to achieve community design patterns that are more sustainable.

The requested Modification to the minimum parking standards on the site is consistent with the increase in active transportation infrastructure proposed on the site and will be mitigated through the use of TDM policies by HACC.

Policy 8.2.4: Public space design policies:

a) Provide clear standards for the design and improvement of public spaces and streets as set forth in design objectives of adopted project plans or special area plans.

b) Design streets to provide for the equitable allocation of space for different modes including pedestrians, bicycles, and transit.

c) Provide adequate seating in public spaces where people are intended to gather, with consideration of weather protection as appropriate.

Though the new open space areas on the Hillside Park site will be privately owned, they have been designed in a way that is consistent with these policies by emphasizing alternate modes of transportation and providing outdoor seating and weather protection where appropriate.

SUPPORTING ECONOMIC DEVELOPMENT & GROWTH

GOAL 11.1 - CURRENT AND FUTURE ECONOMIC LAND USE

Policy 11.1.8: Facilitate the development of housing that meets the needs of local employees across a wide range of price ranges and housing types in zones that allow residential development.

The new housing will provide a wide range of housing options that will benefit local employees in need of affordable housing.

As shown above, the proposed amendment to the Comprehensive Plan designations of the site is aligned with many of goals and policies of the Milwaukie Comprehensive Plan. The new designations will help to facilitate the redevelopment of the site into a neighborhood hub that will provide a more equitable, livable, sustainable, healthy and efficient use of the Hillside site.

The City Council finds that this criterion is met.

(b) The proposed amendment is in the public interest with regard to neighborhood or community conditions.

The City's HNA identified an immediate need for more multifamily housing and more affordable housing to meet the current and future needs of the population of Milwaukie. Changing the Comprehensive Plan designation of the site will allow for the development of 400 additional multi-family units on the Hillside site, so it is in the public interest to allow the site to help address this need. Additionally, the project will include updating all of the public infrastructure on the site – both streets and utilities – to be more functional, safe and built to modern standards. This will be an improvement to the current community conditions where the streets in Hillside either dead end or have unsafe connections to the larger transportation network.

This criterion is met.

(c) The public need is best satisfied by this particular proposed amendment.

Though the Comprehensive Plan includes other sites in the City that could eventually be developed to help meet the need for more multi-family and more affordable housing in Milwaukie, the Hillside site is a key opportunity to immediately start addressing the City's housing need. The site is owned by HACC who is a willing and experienced developer of low-income housing. The site is an infill site, so its redevelopment will not require the purchase and development of a greenfield site. It is also located in the central part of Milwaukie, so it is close to shopping and services, well-served by transit and has all necessary utilities and infrastructure readily available to it. Changing the designation of the property to

allow more density creates an opportunity to satisfy the City's housing shortage now.

This criterion is met.

(d) The proposed amendment is consistent with the Metro Urban Growth Management Functional Plan and relevant regional policies.

The Urban Growth Management Functional Plan is Section 3.07 of the Metro Code. The plan provides tools to meet goals of the 2040 Growth Concept, Metro's long-range growth management plan for the Portland metropolitan area. Title 7 of this plan calls for the establishment of voluntary affordable housing production goals to be adopted by local governments in order to increase the supply of affordable housing in the region. The following regional policy is relevant to this proposal:

3.07.730 Requirements for Comprehensive Plan and Implementing Ordinance Changes

Cities and counties within the Metro region shall ensure that their comprehensive plans and implementing ordinances:

a. Include strategies to ensure a diverse range of housing types within their jurisdictional boundaries.

b. Include in their plans actions and implementation measures designed to maintain the existing supply of affordable housing as well as increase the opportunities for new dispersed affordable housing within their boundaries.

c. Include plan policies, actions, and implementation measures aimed at increasing opportunities for households of all income levels to live within their individual jurisdictions in affordable housing.

The proposed Comprehensive Plan amendment is consistent with this policy since it represents an action that would increase the opportunity for more affordable housing within Milwaukie. Additionally, no existing affordable housing will be lost with this proposal, so the existing supply of affordable housing will be maintained and increased with the approval of this amendment.

As demonstrated, the proposal is consistent with the Metro Urban Growth Management Functional Plan.

This criterion is met.

(e) The proposed amendment is consistent with relevant State statutes and administrative rules, including the Statewide Planning Goals and Transportation Planning Rule.

The applicable Statewide Planning Goals are addressed below:

Goal 1: Citizen Involvement. To develop a citizen involvement program that ensures the opportunity for citizens to be involved in all phases of the planning process.

This application is being reviewed through a quasi-judicial process that requires public hearings with both the Milwaukie Planning Commission and City Council. A public notice was mailed by the City to all properties within 400 ft of the site and the application materials were made available to the public and posted on the City's website. Additionally, before the application was submitted to the City for review the applicant team engaged in a multi-year long neighborhood outreach process to solicit public opinion about how the site should redevelop. Because the public had several opportunities to review and comment on the application, the proposal meets the intent of Goal 1.

Goal 2: Land Use Planning. To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.

The City of Milwaukie's Comprehensive Plan guides all land uses actions within the City boundaries and the City's Zoning Code enforces the policies of Comprehensive Plan. These two adopted documents provide the policy framework that is the basis for all land use decisions in City. The application has demonstrated conformance with the applicable polices of the Comprehensive Plan and Zoning Code in this report and is therefore consistent with Goal 2.

Goal 10: Housing. To provide for the housing needs of citizens of the state.

Goal 10 calls for cities to provide an adequate land inventory and planning regulations to address the identified public need for housing. The City's Housing Needs Analysis identifies a public need for more multi-family housing and more affordable housing in the City of Milwaukie. This proposal directly addresses these needs by creating the opportunity to add 400 more affordable multi-family housing to an underutilized site that is well-served by all of the necessary utilities and infrastructure.

As addressed elsewhere in these findings, the proposed development would provide 600 units of much-needed rental housing, much of it affordable, to the city.

Per the City's 2016 Housing Needs Analysis (HNA), Milwaukie currently has a range of housing types, including single-family detached and attached homes, duplexes, multi-family, and mixed-use developments, and has sufficient capacity to provide for needed housing during the next 20 years. The HNA includes the city's buildable lands inventory (BLI) for housing within the UGB, showing that the city has sufficient zoned capacity to meet the projected housing needs over the next 20 years. Relevant findings from the HNA include:

(i) The projected growth in the number of non-group households over 20 years (2016-2036) is roughly 1,070 households, with accompanying population growth of 2,150 new residents. The supply of buildable land includes properties zoned to accommodate a variety of housing types.

(ii) Over the next 20 years, 30% of all needed units are projected to be multi-family in structures of 5+ attached units.

(iii) The analysis identifies a general need for rental units at the lowest price level. The findings demonstrate that there are fewer housing opportunities at lower price points than might be considered "affordable" to many local households, particularly for renter households.

The proposed development would add 400 units of housing, much of it affordable, to the site. Therefore, this application meets the intent of Goal 10.

Goal 11: Public Facilities and Services. To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

The proposed amendment to the Comprehensive Plan will not negatively impact public facilities or create service capacity shortfalls. The site is already connected to all of the necessary facilities and services, most of which will be significantly upgraded with this proposal. The construction of additional multi-family housing on the site will not have an impact on public facilities so Goal 11 is met.

Goal 12: Transportation. To provide and encourage a safe, convenient and economic transportation system.

The proposed amendment would not require any major changes to the existing transportation system in the area. The site is served by a network of public streets and highways that have adequate capacity to serve additional multi-family housing units on the site, meeting the intent of Goal 12.

Transportation Planning Rule

The Transportation Planning Rule (TPR) ensures that the transportation system is capable of supporting possible increases in traffic intensity that could result from changes to adopted plans and land-use regulations. The TPR requires local governments to place measures assuring that allowed land uses are consistent with the identified function, capacity, and performance standards of a facility if a change to the comprehensive plan "significantly affects" a transportation facility. As it relates to this application, the TPR defines "significantly affects" as measured at the end of the planning period identified in the adopted transportation system plan:

- Allow land uses or levels of development that would result in types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;
- Reduce the performance of an existing or planned transportation facility below the minimum acceptable performance standard identified in the TSP or comprehensive plan; or
- Worsen the performance of an existing or planned transportation facility that is otherwise projected to perform below the minimum acceptable performance standard identified in the TSP or comprehensive plan.

The proposal includes changes to the Comprehensive Plan designation of the site to allow a zone change from medium-density residential zoning (R3) to a split of high-density residential (R1) and general mixed-use zoning (GMU). To determine the potential impacts the zone change could have on the surrounding transportation system, the trip generation of the site in the reasonable worst-case development scenario under existing and proposed zoning was estimated as part of the Transportation Impact Study.

The reasonable worst-case development scenario of the site under existing and proposed zoning was selected based on the permitted land uses found in Table 19.302.2 of the code. The land uses selected to represent the worst-case development scenario were single-family housing for the existing R-3 zone and multifamily housing for the proposed R-1 and GMU zones. These land uses are expected to have the highest trip generation potential and are considered the most trip-intensive land uses of the site.

The maximum allowable density of under the existing R-3 zoning is 14.5 dwelling units per acre. Since the subject site is approximately 16 acres, this gives a reasonable worst-case development potential of 232 units under existing R-3 zoning. For the R-1 and GMU zones, the required density is 17.4 units per acre and 50 stand-alone units per acre, respectively. The Hillside plan proposes an average 24.2 units per acre in the proposed R-1 zone of the site and 70 units per acre in the GMU zone of the site. Thus, the Hillside development is assumed to be a reasonable worst-case scenario under the proposed zoning.

The TIS found that under this reasonable worst-case development scenario of the site all surrounding intersections are expected to continue operating within the City of Milwaukie and ODOT standards under all analysis scenarios except for the intersection of Harrison Street at]42nd Avenue. This intersection will exceed City standards under background conditions and worsen by one second of delay at full build-out of the reasonable worst-case development scenario. However, no mitigation is recommended because the increase in traffic volumes do not meet the threshold to warrant a new traffic signal. The TIS also found that the surrounding transportation system was generally operating safely. No significant crash

patterns were identified at any of the surrounding intersections that would indicate safety concerns.

As demonstrated in the TIS, the comparison of the reasonable worst-case development scenario shows that the transportation system is capable of supporting the proposed Comprehensive Plan Amendment and zone change and no modifications to the City's TSP are needed. Therefore, the conditions of the Transportation Planning Rule are satisfied.

As shown above, the proposed amendment to the Comprehensive Plan designation of the site is consistent with the relevant and applicable Statewide Planning Goals and the Transportation Planning Rule.

This criterion is met.

c. MMC Subsection 19.902.6.A Review Process

MMC 19.902.6.A provides that, generally, changes to the zoning map that involve 5 or more properties or encompass more than 2 acres of land are legislative and are therefore subject to Type V review; otherwise, they are quasi-judicial in nature and subject to Type III review. The City Attorney has the authority to determine the appropriate review process for each proposed zoning map amendment.

The proposed zoning map amendments encompass a single property of approximately 19.5 acres and are related to a proposed planned development, which requires Type IV review. The City Council finds that the Type IV review process is appropriate for the proposed zoning map change.

d. MMC Subsection 19.902.6.B Approval Criteria

MMC 19.902.6.B establishes the following approval criteria for zoning map amendments:

(1) The proposed amendment is compatible with the surrounding area based on the following factors:

(a) Site location and character of the area

(b) Predominant land use pattern and density of the area

(c) Expected changes in the development pattern for the area

The location of the site is suitable for the proposed Planned Development and additional residential density because it is located in an area that is well-served by the existing transportation network, utility infrastructure, and services. The site has easy access to Highway 99E (McLoughlin Blvd) and Highway 224 (Milwaukie Expressway) via 32nd Ave that fronts the site. Additionally, the site is approximately one-half mile from downtown Milwaukie to the south, so itis in close proximity to commercial retail, parks, and services that will be needed to serve the new residents. Directly across 32nd Ave is a hospital and clinic that can serve the medical needs of the residents. Local schools are close by and convenient. Finally, the site is located directly located on a frequent service

bus line. With the proximity of so many necessary services to serve the new housing units the site location is an ideal for the proposed use.

The site sits at the intersection between the Ardenwald, Historic Milwaukie, McLoughlin Industrial, and Central Milwaukie Planning Area identified in the City's Central Milwaukie Land Use and Transportation Plan. Each of these planning areas represents a different set of planning goals and objectives. As such, the overall character of the area represents a mix of uses with no single use dominating the area. The site, which already features multi-family housing, serves as a transition between the higher density uses to the south and the single-family houses to the north. Likewise, the site abuts the railroad line and manufacturing uses to the west. Across 32nd Ave from the site, there is a variety of commercial and medical uses as well as existing multi-family residential housing. Since the general use of the site will not be changing significantly as it will still be used predominately for affordable multi-family housing after redevelopment, the proposed Planned Development will continue to be compatible with the character of the area and this criterion is met.

There is no predominant land use pattern in the surrounding area since the neighborhood is a mix of residential, commercial, medical, and industrial uses. Additionally, there is not a specific zoning pattern, since every abutting side of the site has a different zoning designation: Low-Density Residential (R-7) to the north, Medium to High Residential (R-3) to the east, General Mixed Use (GMU) to the south, and North Milwaukie Employment Zone (NME) to the west. Therefore, , changing the zoning of the site from R-3 to R-1 and GMU is appropriate to recognize that the site sits at a crossroads of many different uses and can continue to serve as a transitional area between them.

The density in the residential areas north and east of the site is currently lower than what is proposed through the Planned Development. However, the property to the south (which is currently vacant) is zoned GMU and has the potential to be developed with much higher densities than what is proposed for the subject site. Proposing a transition of the zoning on the site, with GMU on the south and R-1 on the north will help provide a stepped-down density pattern across the site, with the lowest density lots located on the north of the site. Finally, the 9-story, 100-unit Hillside Manor has been located on the site since the 1960s and though this existing building is far taller and denser that what is proposed with the other lots in the Planned Development, it does represent an existing land use pattern that is part of the historical character of the area and should be taken into consideration when considering the compatibility of the proposal. As proposed, the Planned Development will be compatible with the land use pattern and density of the area.

The major change anticipated for this area would be the future development of the Murphy site located to the south of the subject site and zoned GMU. This 7-acre site is identified in the Central Milwaukie Land Use and Transportation Plan as an "Opportunity Site," since it is a large, vacant/under-utilized site with high visibility and good access to transportation and services. It is envisioned to be developed with a

mix of uses that might include 3- to 4-story multi-family residential buildings, commercial uses, and flex space for light industrial. Given the wide range of uses and densities that are permitted for this site, it is difficult to predict what the final development plan will be. However, by zoning the lower half of the Hillside site GMU and proposing higher-density mixed use buildings for this part of the site, it will increase the likelihood that the future use on the Murphy site will be compatible with the Hillside site.

The proposed zoning amendment is compatible with the surrounding area based on the factors listed above.

This criteria is met.

(2) The need is demonstrated for uses allowed by the proposed amendment.

The 2020 Milwaukie Comprehensive Plan notes a particular need for affordable housing and rental housing opportunities. The Housing Needs Analysis specifically identifies a need for affordable housing.

The most recent study of housing inventory in the City of Milwaukie was done in 2016 and presented as the Milwaukie Housing Needs Analysis (HNA). Key findings of this study include:

- *A comparison of estimated current housing demand with the existing supply identifies a general need for rental units at the lowest price level:*
    - *30% of all needed units are projected to be multi-family in structures of 5+ attached units.*
    - *The greatest need for both ownership and rental units is found at lower price points. This reflects the findings that an estimated 37% of Milwaukie households are rent-burdened and currently pay more than 30% of their income towards housing costs.*
- *There is also a current need for more affordable units. In order for all households, both existing and new, to pay 30% or less of their income towards housing in 2036, a total of 1,189 rental units affordable at $900 or less are required.*
- *As demand increases, prices rise, and the remaining land within the UGB is developed, denser forms of development and creative reuse of parcels through infill and redevelopment will become necessary.*

The HNA findings match similar and more current work done around the region including, Clackamas County Regional Housing Needs Analysis (issued in September of 2019), ECONorthwest's report "Potential Sources and Uses of Revenue to Address the Region's Homeless Crisis" (issued in February 2020 to support Metro's successful Housing Bond measure) and the State of Oregon's 2016-2020 Consolidated Plan Amendment (issued in 2016, representing the State's five-year housing and community development planning process required by the United States Department of Housing

and Urban Development). All of these studies have found a growing gap between the number of Oregonians who need affordable housing and the availability of affordable homes. This trend has led to destabilizing rent increases, an alarming number of evictions of low- and fixed-income people, increasing homelessness, and serious housing instability throughout Oregon.

The proposed Planned Development will add 400 new units to the existing Hillside Park site, with a large portion of those units being built as affordable housing. This will directly address the public needs identified in the Housing Needs Analysis. Additionally, because the 100 existing residential houses on the site will be replaced with the proposal, no viable housing stock will be taken out of the current housing inventory. Furthermore, portions of the site were identified as "unlikely to redevelop" in the Housing Needs Analysis, meaning that adding more density to the site represents an unidentified opportunity to help Milwaukie meet its housing needs without removing any available land that was already earmarked for future housing in the study.

The proposal helps meet an immediate need for more multi-family housing and more affordable housing to meet the current and future needs of the population of Milwaukie.

This criterion is met.

(3) The availability is shown of suitable alternative areas with the same or similar zoning designation.

Changing the property from the R-3 zone to R-1/GMU will not eliminate the possibility of building multi-family housing on the site and will in fact facilitate this. Therefore, it is not necessary for there to be other areas in the City available to support this type of development since the rezoning will not remove any property from the multi-family "land bank" for the City. However, there are other properties in the City that are zoned R-3 that are currently under-developed and could support more lower-density multi-family housing if necessary. These areas include:

- *Properties located between King Rd and Monroe St near the intersection of 44th Ave.*
- *Properties south and east of the project site centered on 34th Ave.*
- *The property east of the Milwaukie Center on Kellogg Creek Dr.*

The existence of these properties shows that there are suitable alternative areas in the City with R-3 zoning that could support more development at the allowable R-3 intensity.

This criterion is met.

(4) The subject property and adjacent properties presently have adequate public transportation facilities, public utilities, and services to support the use(s) allowed by the proposed amendment, or such facilities, utilities, and services are proposed or required as a condition of approval for the proposed amendment.

The applicant's submittal materials include a traffic impact study, utility plans, and preliminary stormwater drainage report to demonstrate that public facilities are or will be made adequate to serve the proposed development.

Existing water and sanitary sewer services to the Hillside development are provided by the City and Clackamas County's Water and Environment Services (WES) respectively and are adequate to serve the proposed new units.

The new utilities will be built to meet current development standards and adequate capacity in the existing sewer, storm, and water systems to support the proposed uses has been demonstrated with capacity studies submitted with the application. Existing, on-site underground utilities must be removed or abandoned at the appropriate phases of development.

All internal streets must be constructed in conformance with the city's Public Works Standards.

As streets are constructed, the development design engineer must confirm that all street intersections and driveways meet the minimum AASHTO sight distance requirements; final acceptance shall be made by the City Engineer prior to acceptance.

All work done within existing or proposed public ROW must be in conformance with the city's Public Works Standards.

The subject property and adjacent properties presently have adequate public transportation facilities, public utilities, and services to support the proposed development.

This criterion is met.

(5) The proposed amendment is consistent with the functional classification, capacity, and level of service of the transportation system. A transportation impact study may be required subject to the provisions of Chapter 19.700.

The applicant prepared a transportation impact study (TIS) to evaluate the proposed development's anticipated impacts on the transportation system. The TIS estimated a net increase in daily motor vehicle trips of 1,426 trips. All study intersections were found to operate at an acceptable level of service through the 2026 AM and PM peak hours with full buildout of the proposed development, expect for the intersection of Harrison St and 42nd Ave, which with background conditions would exceed mobility standards even without the development. Therefore, mitigation is not triggered by the development at any of the study street intersections. At the southern accessway of the site, a left turn pocket is required to mitigate impacts for vehicles access the site from northbound 32nd Ave. The additional ridership generated by the site will require improving adjacent bust stops as addressed above.

As conditioned, the proposed is consistent with the functional classification, capacity, and level of service of the transportation system.

This criterion is met.

(6) The proposed amendment is consistent with the goals and policies of the Comprehensive Plan, including the Land Use Map.

As proposed, the entire site will be rezoned from R-3 (Medium Density Residential) to R-1 (High Density Residential) on the northern half and GMU (General Mixed Use) on the south. The Comprehensive Plan Designation of the site will be changed to match these new zones, with High Density Residential on the north and Town Center on the south. The current Comprehensive Plan designation of the site is Medium Density Residential.

The purpose of the High Density Residential zone in Chapter 19.302 of the MMC states that it is "intended to create and maintain higher density residential neighborhoods that blend a range of housing types with a limited mix of neighborhood-scale commercial, office, and institutional uses." The northern side of Hillside Park will be consistent with the purpose by providing a variety of housing types including 2-story townhomes, 2- and 3-story walk-up style apartments, and the Manor Tower, which will all be supported by the small commercial and office uses on the southern side of the site.

Chapter 19.303 of the MMC states that the purpose of the General Mixed Use zone is to "promote a mix of uses that will support a lively and economically robust district. It is also intended to ensure high-quality urban development that is pedestrian-friendly and complementary to the surrounding area." The Hillside Park redevelopment will represent high-quality urban design and the new street network and open space amenities are designed to make the site bicycle- and pedestrian-friendly while minimizing the prominence of vehicles on the site. Adding small commercial uses on the site will help to create a lively and robust center that will benefit residents and draw in neighbors from the larger community. As shown, the proposed development will be consistent with the purpose of the GMU zoning.

The southern half of Hillside Park will be developed with a mix of high density housing and small commercial and office uses. The site is well served by transit and will feature an enhanced bicycle and pedestrian network. Off-street parking will be not be a prominent feature and parking ratios will be purposefully low to encourage other modes of transportation. Finally, the development will represent a mix of both affordable housing serving HACC's community and market-rate housing that will provide a range of housing options. The final development plan meets the policies of the Town Center designation and is appropriate for the site.

As described above, the GMU zoning that will be applied to the site will be modified to encourage neighborhood-scale commercial uses and not larger employment uses drawing visitors or workers from the region. Additionally, uses that are not compatible with residential development will not be permitted outright. These specific modifications to the GMU zoning that will limit the commercial uses to those that are neighborhood-scale will be included in the PD overlay that will accompany the zoning designation on the site.

The applicable goals of the Comprehensive Plan are addressed in full above. To summarize, the project is aligned with many of goals and policies of the Milwaukie Comprehensive Plan, because the redevelopment will create a new neighborhood hub that will provide a more equitable, livable, sustainable, healthy and efficient use of the Hillside site.

This criterion is met.

(7) The proposed amendment is consistent with the Metro Urban Growth Management Functional Plan and relevant regional policies.

The policies of the Metro Urban Growth Management Functional Plan were addressed above. As demonstrated, the proposal is consistent with Title 7 of this plan which calls for the establishment of voluntary affordable housing production goals to be adopted by local governments in order to increase the supply of affordable housing in the region. In summary, the Metro Urban Growth Management Functional Plan includes a number of titles that address various aspects of the region's goals and policies for urban development.

(a) Title 1 Housing Capacity

The proposed development will provide 600 needed housing units in a compact urban form.

(b) Title 7 Housing Choice

The proposed development will provide needed affordable multi-unit rental housing and will support Metro's policies for expanding housing choice with a needed housing type in Milwaukie.

The proposed amendment is consistent with the Metro Urban Growth Management Functional Plan and relevant regional policies.

This criterion is met.

(8) The proposed amendment is consistent with relevant State statutes and administrative rules, including the Statewide Planning Goals and Transportation Planning Rule.

The applicable Statewide Planning Goals and the Transportation Planning Rule were addressed above. As shown above, the proposal is consistent with goals around Citizen Involvement, Land Use Planning, Housing, Facilities and Transportation. Analysis for the Transportation Impact Study submitted with the application found that the comparison of the reasonable worst-case development scenarios shows that the transportation system is capable of supporting the proposal no modifications to the City's TSP are needed.

Several of the Statewide Planning Goals are relevant to the proposed amendment:

(a) Goal 2 Citizen Involvement

Prior to submitting the application, the applicant conducted a series of open houses and public events to discuss and present the project (October 24, 2018, February 21, 2019, May 30, 2019, and December 4, 2019), including a presentation at Planning Commission and City Council meetings on August 13, 2019, and August 20, 2019, respectively.

The applicant initially submitted an application for a preliminary Planned Development. The Type III review process utilized for consideration of a preliminary Planned Development plan and program provides for public hearings by the Planning Commission where citizens have the opportunity to present testimony and participate in the decision-making process. A public hearing on the preliminary plan and program was held by the Planning Commission on March 23, 2021.

The applicant submitted an application for a final Planned Development. The Type IV review process utilized for consideration of a final Planned Development plan and program provides for public hearings by the Planning Commission and City Council where citizens have the opportunity to present testimony and participate in the decision-making process. A public hearing on the final plan and program was held by the Planning Commission on October 12, 2021 and the City Council on November 16, 2021.

The Commission and Council considered testimony from citizens en route to reaching the decision reflected in these findings.

(b) Goal 10 Housing

As addressed elsewhere in these findings, the proposed development would provide 600 units of much-needed rental housing, much of it affordable, to the city.

Per the City's 2016 Housing Needs Analysis (HNA), Milwaukie currently has a range of housing types, including single-family detached and attached homes, duplexes, multi-family, and mixed-use developments, and has sufficient capacity to provide for needed housing during the next 20 years. The HNA includes the city's buildable lands inventory (BLI) for housing within the UGB, showing that the city has sufficient zoned capacity to meet the projected housing needs over the next 20 years. Relevant findings from the HNA include:

(i) The projected growth in the number of non-group households over 20 years (2016-2036) is roughly 1,070 households, with accompanying population growth of 2,150 new residents. The supply of buildable land includes properties zoned to accommodate a variety of housing types.

(ii) Over the next 20 years, 30% of all needed units are projected to be multi-family in structures of 5+ attached units.

(iii) The analysis identifies a general need for rental units at the lowest price level. The findings demonstrate that there are fewer housing opportunities at lower price points than might be considered "affordable" to many local

households, particularly for renter households.

(c) *Goal 12 Transportation and Transportation Planning*

As addressed elsewhere in these findings, the applicant's TIS analyzed the potential impact of the proposed Planned Development on the surrounding transportation system. This study found that the proposed development is projected to generate a net additional 110 trips during the morning peak hour, a net additional 105 trips during the evening peak hour. With this additional traffic, all study intersections were found to operate at an acceptable level of service through the 2026 AM and PM peak hours with full buildout of the proposed development, except for Harrison St/42nd Ave. This intersection also exceeds mobility standards under the 2026 background conditions scenario. Therefore, mitigation is not triggered by the development. The proposed project is estimated to add 5 AM peak hour trips and 5 PM peak hour trips through this intersection. Installation of a traffic signal at Harrison St/42nd Ave is identified in the Milwaukie TSP, and has also been identified as a need with the Monroe Street Greenway project, and will be planned and funded. The intersection did not meet signal warrants for the 2026 AM and PM peak hours full buildout scenario.

A warrant analysis was conducted for traffic signals and left turn pockets at the site accesses. The analysis found that traffic signal warrants would not be met. Left turn lane warrants are projected to be met for the northbound approach of Meek Street/32nd Avenue during PM peak hour 2026 buildout conditions. A left turn lane is proposed as mitigation by this development. This left-turn pocket must be constructed either prior to, or concurrently with, the phase of development that creates greater than 325 residential units.

A Transportation Planning Rule (TPR) analysis was conducted to address the proposed rezone. A reasonable worst-case trip generation was performed for the existing R-3 designation and the proposed R-l and GMU designation. The proposed rezone estimated a net increase in motor vehicle trip generation: 54 weekday AM peak hour trips, 27 weekday PM peak hour trips, and 796 daily trips. The 2040 analysis assumed three improvement projects as identified in the Milwaukie TSP. Operations analysis with the proposed zone change showed no deficiencies. The proposed zone change will not further degrade the performance of the planned transportation facility beyond what is allowed in the current zone.

The proposed amendment is consistent with relevant State statutes and administrative rules, including the Statewide Planning Goals and Transportation Planning Rule.

The proposed amendment is consistent with the applicable criteria for zoning map and comprehensive plan land use map amendments.

As conditioned, the City Council finds that the proposed amendment to the City's Zoning Map and Comprehensive Plan land use map are approvable.

12. The application was referred to the following departments and agencies on August 27, 2021:

    - Milwaukie Building Division
    - Milwaukie Engineering Department
    - Milwaukie Public Works Department
    - Clackamas County Fire District #1
    - Ardenwald and Historic Milwaukie Neighborhood District Association Chairperson and Land Use Committee
    - Metro
    - Oregon Department of Transportation
    - Clackamas County

    In addition, notice of the public hearing was mailed to owners and residents of properties within 400 ft of the subject property on September 22, 2021.

    Agency and NDA comments received are summarized as follows:

Conditions of Approval
Master File # PD-2021-001
Hillside Master Plan, 2889 SE Hillside Ct

1. Applicant must construct the project in compliance with all Public Works Standards and the requirements identified in Other Requirements.
2. Prior to building permit for each phase, the following must be addressed related to the platting of the site:
    a. For phase 1 of the development, the final plat for the initial phase must be submitted within 1 year subsequent to approval of the preliminary plat.
    b. For subsequent phases, final plat approval is required for each separate phase, in accordance with Subsection 19.311.17.
    c. Final plat approval for the last phase must be obtained within 7 years of the date of approval of the final development plan.
3. Building Permit Submittal

    The applicant must submit a Type I Development Review application with final plans for construction of each phase of the project. The purpose of the Type I Development Review is to confirm that the final construction plans are substantially consistent with the land use approval. The final construction plans must address the following:

    a. Final plans submitted for construction permit review must be in substantial conformance with plans approved by this action, which are the plans stamped received by the City on August 17, 2021, except as otherwise modified by these conditions.
    b. Provide a narrative describing all actions taken to comply with these conditions of approval.
    c. Provide a narrative describing any changes made after the issuance of this land use decision that are not related to these conditions of approval.
    d. Final plans submitted for construction permit review must include details of the bike stall dimensions to confirm that the applicable standards are met.
    e. Final plans submitted for construction permit review must include a photometric plan showing compliance with lighting standards.
    f. Final plans submitted for construction permit review must include all amenities associated with that phase.
4. Prior to issuance of development permits, the following must be resolved:
    a. Prior to commencement of any earth-disturbing activities, the applicant must obtain an erosion control permit and a grading permit from the City.

b. Prior to commencement of any earth-disturbing activities, erosion control and tree protection measures must be in place and maintained throughout construction. Tree protection fencing is required to be installed a minimum of 10 ft from the trunk of the existing trees on the site. Fencing must be maintained throughout the duration of construction and will be inspected. No disturbance is permitted within the fenced area. Verification from a certified arborist that all tree protection measures have been properly installed is required.

5. Prior to final occupancy of Phase 1, the following must be resolved, unless otherwise noted:

   a. Verification from a certified arborist that the proposed tree removal, preservation, and new plantings as approved have been completed as required, to be submitted and updated prior to final occupancy of each building.

   b. Public Improvements as shown on the plans received by the City on August 17, 2021 except as otherwise modified by these conditions:

      (1) Where intersection site distance cannot be met, mitigation measures subject to City Engineer approval must be proposed.

      (2) Per the Traffic Impact Study review, a left-turn lane is required for north bound SE 32nd Avenue at Meek Street as mitigation for expected trip increases. This left-turn pocket must be constructed prior to (or concurrently with) that phase of development which creates greater than 325 residential units.

      (3) Stormwater improvements must be reviewed and deemed compliant with MMC 12.02 and MMC 13.14, including locating assets where inspection and maintenance activities can feasibly occur (current plans locate public manholes, in locations not yet approved by the City).

      (4) The design and construction of each phase of the development must include maintaining the existing street, water, wastewater, and stormwater infrastructure that is servicing the phases of the site which still have existing housing and tenants.

   c. Dedication/Easement Requirements as shown on the plans received by the City on August 17, 2021, except as otherwise modified by these conditions.

6. Final construction of the project must comply with all Oregon Department of Transportation requirements, including the installation of continuous fencing (no gates) along the property line fronting the rail tracks to ensure the safe operation of trains by preventing illegal trespassing of pedestrians across the tracks.

7. Expiration of Approval

   a. As per MMC Subsection 19.311.16, if substantial construction or development on Phase 1, in compliance with the approved final development plan and program, has not occurred within 12 months of its effective date, the Planning Commission may initiate a review of the PD Zone and hold a public hearing to determine whether its

continuation (in whole or in part) is in the public interest. Notification and hearing shall be in accordance with MMC Section 19.1007 Type IV Review. If found not to be, the Planning Commission shall recommend to the City Council that the PD Zone be removed by appropriate amendment to the Zoning Ordinance and the property changed back to original zoning.

b. The required public infrastructure must be constructed in conjunction with or prior to each phase.

Other Requirements
Master File # PD-2021-001
Hillside Master Plan – 2889 SE Hillside Ct

The following items are not conditions of approval necessary to meet applicable land use review criteria. They relate to other development standards and permitting requirements contained in the Milwaukie Municipal Code (MMC) and Public Works Standards that are required at various points in the development and permitting process.

1. The level of use approved by this action shall be permitted only after issuance of a certificate of occupancy.

2. Limitations on Development Activity.

   Development activity on the site shall be limited to 7:00 a.m. to 10:00 p.m. Monday through Friday and 8:00 a.m. to 5:00 p.m. Saturday and Sunday, as provided in MMC Subsection 8.08.070(I).

3. Landscaping Maintenance.

   As provided in MMC Subsection 19.606.2.E.3, required parking area landscaping shall be maintained in good and healthy condition.

4. Applicant must submit an access and water supply plan as required by the Clackamas Fire District #1 for full review and approval.

5. Final Development Plan and Program

   As per the requirements of MMC Subsection 19.311.12 through 19.311.15, no excavation, grading, construction, improvement, or building shall begin, and no permits therefor shall be issued, until the following items must be addressed regarding the final development plan and program:

   a. Prior to the effective date of the ordinance adopting the final development plan and program and accompanying change to the zoning map, file with the City Recorder's office a final development plan and program that includes any modifications that were part of the final plan approved by City Council.

   b. The City shall prepare a notice to acknowledge that the final development plan and program approved by City Council constitutes zoning for the subject property. The notice shall contain a legal description of the property and reference to the certified copy of the final development plan and program filed in the office of the City Recorder. The applicant shall record a copy of this acknowledgment notice in the County Recorder's office.

   c. An application for approval of variations to the recorded final plan and program may be submitted in writing. Such variations may be approved by the City staff provided they do not alter dwelling unit densities, alter dwelling unit type ratios, change the

boundaries of the planned development, or change the location and area of public open spaces and recreational areas.

6. Prior to, or concurrent with, building permit submittal, the following must be resolved:

   a. Submit full-engineered plans for construction of all required public improvements, which must be reviewed and approved by the City of Milwaukie Engineering Department.

   b. Obtain a right-of-way permit for construction of all required public improvements listed in these recommended conditions of approval.

   c. Pay an inspection fee equal to 5.5% of the cost of the public improvements; at time of plan submittal, a plan review fee of 1.5% is required, the balance of the 5.5% is required at time of issuance of the right-of-way permit.

   d. Provide a payment and performance bond in the amount of 130 percent of the approved engineer's estimate or contractor's bid cost of the required public improvements.

7. Prior to final inspection, the following must be resolved:

   a. Provide a final approved set of electronic PDF red-lined "As Constructed" drawings to the City of Milwaukie.

   b. Install all underground utilities, including stubs for utility service, prior to surfacing any streets.

   c. Clear vision areas shall be maintained at all driveways and accessways and on the corners of all property adjacent to an intersection.

8. Prior to final acceptance, the following must be resolved:

   a. Provide a final approved set of digitally signed, electronic PDF "As Constructed" drawings to the City of Milwaukie.

   b. Provide a 2-year maintenance bond in the amount of 10 percent of the approved engineer's estimate or contractor's bid cost of the required public improvements.

9. Other Engineering Requirements.

   Submit a final stormwater management plan to the City of Milwaukie Engineering Department for review and approval. The plan shall be prepared in accordance with Section 2 - Stormwater Design Standards of the City of Milwaukie Public Works Standards. In the event the stormwater management system contains underground injection control devices, submit proof of acceptance of the storm system design from the Department of Environmental Quality.

   The stormwater management plan shall demonstrate that the post-development runoff does not exceed pre-development runoff, inclusive of any existing stormwater management facilities serving the development site.

The stormwater management plan shall demonstrate compliance with water quality standards in accordance with the City of Portland Stormwater Management Manual.

Development/building permits will not be issued for construction until the stormwater management plan has been approved and deemed compliant with MMC 12.02 and MMC 13.14 by the City of Milwaukie.

RECEIVED
AUG 17 2021
CITY OF MILWAUKIE
PLANNING DEPARTMENT

MILWAUKIE PLANNING
6101 SE Johnson Creek Blvd.
Milwaukie OR 97206
503-786-7630
planning@milwaukieoregon.gov

Application for Land Use Action

Master File #: PD-2021-001; ZC-2021-001 ~~CPA-2021-002; S-2021-001~~

Review type*: ☐ I ☐ II ☒ III ☒ IV ☐ V

CHECK ALL APPLICATION TYPES THAT APPLY:

- ☐ Amendment to Maps and/or Ordinances:
  - ☐ Comprehensive Plan Text Amendment
  - ☒ Comprehensive Plan Map Amendment
  - ☐ Zoning Text Amendment
  - ☒ Zoning Map Amendment
- ☐ Code Interpretation
- ☐ Community Service Use
- ☐ Conditional Use
- ☐ Development Review
- ☐ Director Determination
- ☐ Downtown Design Review
- ☐ Extension to Expiring Approval
- ☐ Historic Resource:
  - ☐ Alteration
  - ☐ Demolition
  - ☐ Status Designation
  - ☐ Status Deletion
- ☒ Land Division:
  - ☐ Final Plat
  - ☐ Lot Consolidation
  - ☐ Partition
  - ☐ Property Line Adjustment
  - ☐ Replat
  - ☒ Subdivision
- ☐ Miscellaneous:
  - ☐ Barbed Wire Fencing
- ☐ Mixed Use Overlay Review
- ☐ Modification to Existing Approval
- ☐ Natural Resource Review**
- ☐ Nonconforming Use Alteration
- ☐ Parking:
- ☐ Quantity Determination
  - ☐ Quantity Modification
  - ☐ Shared Parking
  - ☐ Structured Parking
- ☒ Planned Development
- ☐ Residential Dwelling:
- ☐ Accessory Dwelling Unit
  - ☐ Duplex
  - ☐ Manufactured Dwelling Park
  - ☐ Temporary Dwelling Unit
  - ☐ Sign Review
- ☐ Transportation Facilities Review
- ☐ Variance:
- ☐ Use Exception
  - ☐ Variance
  - ☐ Willamette Greenway Review
- ☐ Other: _____
- ☐ **Use separate application forms for:**

Annexation and/or Boundary Change
- Compensation for Reduction in Property Value (Measure 37)

Daily Display Sign
- Appeal
- Appeal

RESPONSIBLE PARTIES:

APPLICANT (owner or other eligible applicant—see reverse): Jill Smith/ Housing Authority of Clackamas County

Mailing address: P.O. Box 1510, Oregon City State/Zip: OR, 97045

Phone(s): 503-502-9278 Email: JSmith6@clackamas.us

Please note: The information submitted in this application may be subject to public records law.

APPLICANT'S REPRESENTATIVE (if different than above): Devin Ellin/ Housing Authority of Clackamas County

Mailing address: P.O. Box 1510, Oregon City State/Zip: OR, 97045

Phone(s): 971-227-0472 Email: dellin@clackamas.us

SITE INFORMATION:

Address: 2889 SE Hillside Court Map & Tax Lot(s): 11E25CD 00100, 11E25CD 00102

Comprehensive Plan Designation: Med. Res. Zoning: R3 Size of property: 16 acres

PROPOSAL (describe briefly):

Final Planned Development, 9-lot Subdivision, Zone Change and Comprehensive Plan Amendment review to allow the redevelopment of Hillside Park with higher density apartment and mixed-use buildings.

SIGNATURE:

ATTEST: I am the property owner or I am eligible to initiate this application per Milwaukie Municipal Code (MMC) Subsection 19.1001.6.A. If required, I have attached written authorization to submit this application. To the best of my knowledge, the information provided within this application package is complete and accurate.

Submitted by: Jill Smith (Aug 9, 2021 11:26 PDT) Date: 08/09/2021

IMPORTANT INFORMATION ON REVERSE SIDE

*For multiple applications, this is based on the highest required review type. See MMC Subsection 19.1001.6.B.1.

WHO IS ELIGIBLE TO SUBMIT A LAND USE APPLICATION (excerpted from MMC Subsection 19.1001.6.A):

Type I, II, III, and IV applications may be initiated by the property owner or contract purchaser of the subject property, any person authorized in writing to represent the property owner or contract purchaser, and any agency that has statutory rights of eminent domain for projects they have the authority to construct.

Type V applications may be initiated by any individual.

PREAPPLICATION CONFERENCE:

A preapplication conference may be required or desirable prior to submitting this application. Please discuss with Planning staff.

REVIEW TYPES:

This application will be processed per the assigned review type, as described in the following sections of the Milwaukie Municipal Code:

- Type I: Section 19.1004
- Type II: Section 19.1005
- Type III: Section 19.1006
- Type IV: Section 19.1007
- Type V: Section 19.1008

****Note**: Natural Resource Review applications **may require a refundable deposit.** Deposits require completion of a Deposit Authorization Form, found at www.milwaukieoregon.gov/building/deposit-authorization-form.

THIS SECTION FOR OFFICE USE ONLY:

FILE TYPE	FILE NUMBER	AMOUNT (after discount, if any)	PERCENT DISCOUNT	DISCOUNT TYPE	DATE STAMP
Master file	PD-2021-001	$ 5,000			RECEIVED AUG 17 2021 CITY OF MILWAUKIE PLANNING DEPARTMENT
Concurrent application files	S-2021-001	$ 3,675	25%	CONCURRENT APP.	
	ZC-2021-001	$ 3,750	25%		
	CPA-2021-002	$ 3,750	25%		
		$			
Deposit (NR only)				☐ **Deposit Authorization Form received**	
TOTAL AMOUNT RECEIVED: $			**RECEIPT #:**		**RCD BY:**

Associated application file #s (appeals, modifications, previous approvals, etc.): PD-2020-002

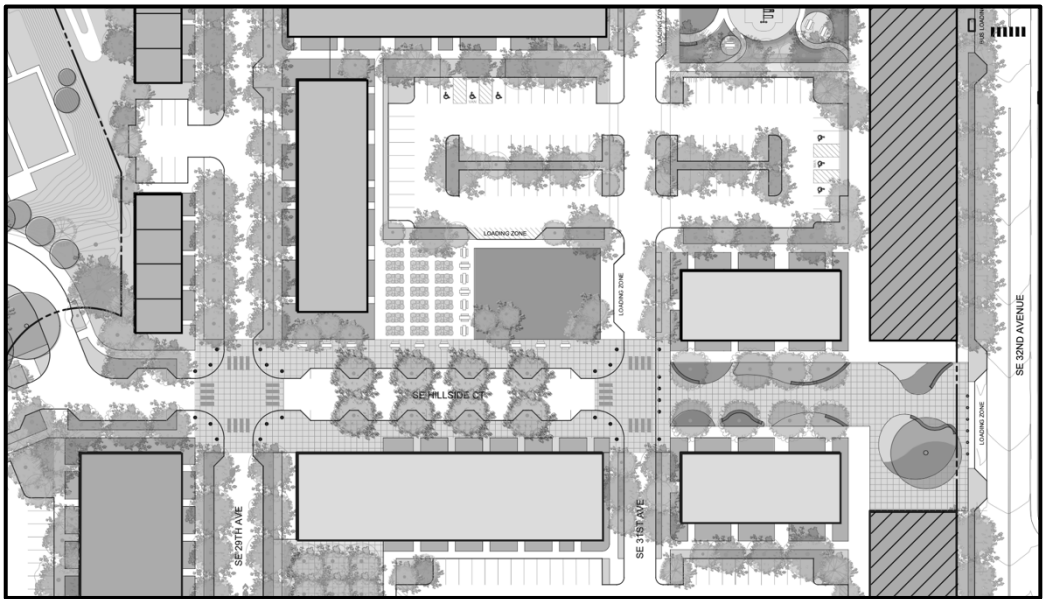
Neighborhood District Association(s): ARDENWALD; HISTORIC MILWAUKIE

Notes:

HILLSIDE MASTER PLAN

APPLICATION FOR:

FINAL PLANNED DEVELOPMENT
SUBDIVISION
ZONE CHANGE/COMPREHENSIVE PLAN AMENDMENT



Presented by:
Housing Authority of Clackamas County

Presented to:
City of Milwaukie Planning Department

Prepared with the Assistance of:
Scott|Edwards Architects
Humber Design Group, Civil Engineers
Walker Macy, Landscape Architects
Lancaster Mobley, Transportation Engineers
The Bookin Group LLC, Land Use Planners

August 2021

TABLE OF CONTENTS

MP 3.20 Overall Grading Plan
MP 3.21 Street Profiles
MP 3.30 Storm Sewer Plan
MP 3.31 Storm Sewer Profiles
MP 3.32 Storm Sewer Profiles
MP 3.33 Storm Sewer Profiles
MP 3.40 Sanitary Sewer Plan
MP 3.41 Sanitary Sewer Profile
MP 3.42 Sanitary Sewer Profile
MP 3.50 Water System Plan

Overview of changes to written narrative since Preliminary PD approval.

I. Summary:

- Changed "Preliminary" PD to "Final" PD throughout section, added Subdivision and Zone Change to Request.
- Updated address information for Humber Design and The Bookin Group
- Added information about the Neighborhood meeting and PC Hearing to the Neighborhood Outreach section
- Added section on Resident Outreach, including info on current parking issues related to the redevelopment of the Manor Tower
- Added a section outlining the changes to the project since the Preliminary PD approval in March 2021.
- Added a section outlining compliance with the conditions of approval of the Preliminary PD decision.

II. Existing Conditions:

- Added Preliminary PD approval to Land Use History Section

III. Proposed Plan:

- Changed "Preliminary" PD to "Final" PD throughout section.
- Changed references to subdivision and zone change from future tense to present tense throughout section.
- Updated the descriptions of the Town Center and High-Density Residential Comp Plan designations to match the 2020 update to the Milwaukie Comp Plan.
- Changed the lots from letters (A-K) to numbers (1-9) in the Land Division section of the report to match the Preliminary Plat.
- Changed number of lots in subdivision from 10 to 9 to match Preliminary Plan (Manor lot is not included in subdivision since it is already platted).
- Adjusted the proposed lot sizes and dimensions slightly to match the Preliminary Plat survey. (page 10)
- Confirmed that shared open space areas would be located in access easements, as shown on the Preliminary Plat. (page 6-7)
- Added info about timing of Open Space construction on individual lots (page 7)
- Provided a description of the purpose of the "no build" easements on Lots A and E (page 7)
- Updated section on Phasing to reflect that Phase 1 will now include Lot C along with Lots A & B. (page 10)
- Added info in the Parking section regarding how on-site and on-street parking will operate to help address concerns from Hillside resident (page 12)
- Added a section describing the Architectural Character of the future buildings (page 14)
- Added info in the bike parking section to acknowledge the proposed Central Milwaukie Bikeways Concept plan (page 32)
- Removed reference to new bike lane on 32nd Ave, since this is not included in the proposal and was mistakenly included in the Preliminary report. (page 36)
- Revised the response to Section 19.708.6 *Transit Requirements and Standards* to describe the changes to the bus stops on SE 32nd Avenue that came from consultation with TriMet designer. (page 40)

- Clarified that the proposed water system *will* connect to the existing water main in SE 29th Ave north of the site, which was in error in the Preliminary report (page 41)

IV. Legal Justification

- Changed "Preliminary" PD to "Final" PD throughout the section
- Added and addressed Approval Criteria for Comprehensive Plan Amendment, Zone Change and Subdivision

I. SUMMARY OF PROPOSAL

Description: Hillside Park Preliminary Planned Development

Location: 2889 SE Hillside Court

State ID: 11E25CD 00100 and 11E25CD 00102

Site Size: 16.16 acres

Request: A Final Planned Development, Subdivision, Zone Change and Comprehensive Plan Amendment review for the redevelopment of Hillside Park to allow higher density apartment and mixed-use buildings

Owner: Jill Smith, Executive Director
Housing Authority of Clackamas County
P.O. Box 1510
Oregon City, OR 97045
JSmith@clackamas.us

Architect: Lisa McClellan, Principal
Scott|Edwards Architecture, LLP
2525 E Burnside St.
Portland, OR 97214
Lisa@seallp.com

Engineer: David Humber, PE, Principal
Humber Design Group, Inc.
110 SE Main St, Suite 200
Portland, OR 97214
dave.humber@hdgpdx.com

Land Use Planner: Debbie Cleek, Principal
The Bookin Group
1120 SW Taylor Street, Suite 555
Portland, OR 97205
cleek@bookingroup.com

Zoning: R3 – Medium Density Residential

Overlays: None

Project Vision: A vibrant mixed-use, mixed-income community that preserves and rebuilds the existing affordable housing on the 16-acre site, while creating new opportunities for expanding housing options.

Project Summary: The Planned Development proposal is for the redevelopment of Hillside Park, which is owned and operated by the Housing Authority of Clackamas County (HACC). The 16-acre property consists of 100 single-family dwelling units and the 100-unit Hillside Manor tower. The site

represents a unique redevelopment opportunity as it is underutilized and many of the aging homes are in need of replacement. The tower, which was partitioned onto a separate lot in early 2020, will remain on site and be refurbished. The remainder of the site will be redeveloped with apartments and mixed-use buildings for a total of 600 units on the property (400 new units, 100 replacement units and 100 units in the Hillside Manor tower) at the end of all phases of development. In addition to the residential development, HACC plans include open space, recreational areas, playgrounds, and the development of small-scale commercial uses in the mixed-use buildings facing onto SE 32nd Avenue and SE Meek Street. To achieve the new density proposed, the site will be rezoned to R1 (High Density Residential) on the north and GMU (General Mixed Use) on the south. The Comprehensive Plan designations will also be changed from Medium Density Residential to High Density Residential on the north and Town Center on the south.

Redevelopment on the site will involve the phased demolition of the existing improvements, including removal of the structures, demolition of the existing roads, and abandonment of the infrastructure. A new street grid and infrastructure plan will be developed, allowing the streets to be realigned to the surrounding neighborhood to provide better connectivity and increased safety. The phasing plan will include assisting the current Hillside Park residents with relocation into one of the new units upon completion. The first phase anticipates HACC developing at least 100 replacement units that will be leased to low-income residents.

The Master Plan also includes subdividing the property into smaller lots to facilitate phased development and provide the opportunity for development of lots by outside partners. The new residential development is anticipated to be both market rate and affordable housing that will leverage federal, state, and local funding opportunities.

Pre-Application Conference: A Pre-Application Conference to discuss the project with the City of Milwaukie was held on December 12, 2019 (Project ID: 19-018PA).

Neighborhood: Ardenwald-Johnson Creek

Neighborhood Outreach: The residents of Hillside Park, neighbors from the surrounding Ardenwald-Johnson Creek Neighborhood Association and stakeholders from the larger community were invited to participate in a number of outreach efforts and workshops conducted in 2018 and 2019. These outreach events focused on gathering input from the community and refining the proposed master plan based on the input received. Below is a summary of the community events that were held prior to submitting the Preliminary Planned Development application to the City.

2018

Sept. 5: Hillside Resident Listening Session
Oct. 24: Community Visioning Workshops
Nov. 7: Sustainability Workshop

2019

Feb. 7: Hillside Park Door to Door Outreach
Feb. 21: Community Design Workshop
May 30: Community Open House – Presenting 3 Design Concepts
Oct. 3: Housing Authority Board hearing to approve proposed Master Plan
Dec. 4: Celebration of community and resident input process and the unveiling of the Hillside Master Plan

represents a unique redevelopment opportunity as it is underutilized and many of the aging homes are in need of replacement. The tower, which was partitioned onto a separate lot in early 2020, will remain on site and be refurbished. The remainder of the site will be redeveloped with apartments and mixed-use buildings for a total of 600 units on the property (400 new units, 100 replacement units and 100 units in the Hillside Manor tower) at the end of all phases of development. In addition to the residential development, HACC plans include open space, recreational areas, playgrounds, and the development of small-scale commercial uses in the mixed-use buildings facing onto SE 32nd Avenue and SE Meek Street. To achieve the new density proposed, the site will be rezoned to R1 (High Density Residential) on the north and GMU (General Mixed Use) on the south. The Comprehensive Plan designations will also be changed from Medium Density Residential to High Density Residential on the north and Town Center on the south.

Redevelopment on the site will involve the phased demolition of the existing improvements, including removal of the structures, demolition of the existing roads, and abandonment of the infrastructure. A new street grid and infrastructure plan will be developed, allowing the streets to be realigned to the surrounding neighborhood to provide better connectivity and increased safety. The phasing plan will include assisting the current Hillside Park residents with relocation into one of the new units upon completion. The first phase anticipates HACC developing at least 100 replacement units that will be leased to low-income residents.

The Master Plan also includes subdividing the property into smaller lots to facilitate phased development and provide the opportunity for development of lots by outside partners. The new residential development is anticipated to be both market rate and affordable housing that will leverage federal, state, and local funding opportunities.

Pre-Application Conference: A Pre-Application Conference to discuss the project with the City of Milwaukie was held on December 12, 2019 (Project ID: 19-018PA).

Neighborhood: Ardenwald-Johnson Creek

Neighborhood Outreach: The residents of Hillside Park, neighbors from the surrounding Ardenwald-Johnson Creek Neighborhood Association and stakeholders from the larger community were invited to participate in a number of outreach efforts and workshops conducted in 2018 and 2019. These outreach events focused on gathering input from the community and refining the proposed master plan based on the input received. Below is a summary of the community events that were held prior to submitting the Preliminary Planned Development application to the City.

2018

Sept. 5: Hillside Resident Listening Session
Oct. 24: Community Visioning Workshops
Nov. 7: Sustainability Workshop

2019

Feb. 7: Hillside Park Door to Door Outreach
Feb. 21: Community Design Workshop
May 30: Community Open House – Presenting 3 Design Concepts
Oct. 3: Housing Authority Board hearing to approve proposed Master Plan
Dec. 4: Celebration of community and resident input process and the unveiling of the Hillside Master Plan

2020

Aug 20: Request for comments for the Environmental Review (required for HUD assisted projects) sent to neighbors via email.

Oct 29: The Notice of Finding of No Significant Impact (FONSI) and Intent to Request for Release of Funds (RROF) for the Environmental Review approved by HUD.

2021

Feb 24: Virtual meeting with the Ardenwald/Johnson Creek Neighborhood Association to present the Preliminary Planned Development Master Plan and go over any changes to the plan that had occurred during the design development phase.

Mar 23: City of Milwaukie Planning Commission Hearing on the Preliminary Planned Development application. The Commission voted in support of the proposal.

Exhibits documenting this outreach process have been provided including the sign-in sheets from the February 21st Community Design Workshop (Exhibit A) and the May 30th Community Open House (Exhibit B), the Minutes from the 2021 Neighborhood Meeting (Exhibit I) and a copy of the decision from the Planning Commission (Exhibit J).

Resident Outreach: Following the approval of the Preliminary Planned Development application by the Planning Commission, HACC was made aware of concerns a few of the current residents of Hillside Park had with the redevelopment plan. This spring and summer HACC has made additional efforts to make sure that existing residents are informed of the process. HACC staff has been holding regular resident meetings to discuss the redevelopment and relocation process and answer resident questions. HACC also held two Zoom meetings on June 24th (day & evening) and is hoping to schedule in-person meetings later this summer or early fall depending on CDC recommendations around in-person gatherings. Additionally, HACC has started delivering a monthly newsletter to residents that provides updates on the repositioning and redevelopment process. Beginning this fall, HACC's relocation consultant, Darcy Vincent, will start scheduling one-on-one meetings with residents who will be relocated in Phase 1 to better understand their individual relocation needs.

One issue that a resident raised with City Staff was concerns over on-site parking. Additional information about how on-site and on-street parking will operate following the redevelopment of the property has been added to the Parking Section in Part III of this report. Currently some parking issues have arisen from the ongoing renovation of the Hillside Manor tower, which rendered some on-site parking spaces temporarily unavailable. At this point the renovated Hillside Manor laundry room has re-opened for resident use, reliving some of the stress related to accessing the laundry room. In addition, HACC has installed signage designating two parking spots adjacent to the laundry room as short-term parking (limited to 2 hours). In August and September HACC will need to close the Manor parking lot for about month to relocate parking islands, replace lighting, add irrigation, and resurface and restripe the parking lot. During this time, Manor residents and construction workers will need to park on the surrounding city streets. HACC staff has been in regular communication with residents about the lot closure, but still anticipate this being stressful for some residents. Their resident services team will be available to work directly with residents to address issues and provide solutions.

Overview of Changes to Proposal: Since receiving approval of the Preliminary Planned Development from the Planning Commission on March 23, 2021, the following changes have been made to the proposal:

- The SE 32nd Avenue Frontage has been redesigned based on input from Tri-Met on the location of the bus stops and other transit facilities along this frontage. See Section III, page 40 of this report for a full description of these changes.
- The Phasing has been changed to include Lot C in Phase 1.
- Information has been provided in this report describing the architectural character of the future buildings. See Section III, page 14 for this information.

Compliance with Preliminary Conditions of Approval: The approval of the Preliminary PD (PD-2020-002) by the Planning Commission included two conditions of approval. Compliance with these conditions of approval is demonstrated below:

1. *Per MMC 129.311.6.B, this approval of a preliminary planned development plan and program requires that the applicant submit within 18 months of the preliminary plan notice of decision, a final development plan and program, which will serve as an application for the PD zone change and comprehensive plan map amendment. The submittal deadline for the final development plan and program is September 24, 2022.*

Response: This application for the Final Planned Development has been submitted within the 18-month timeframe so this condition is met.

2. *Applicant must consult with TriMet and implement best practices on the location and design of the proposed bus stops, bus pullouts, and other TriMet services for the development.*

Response: In May of 2021 the project architect consulted with Michelle Wyffels with Tri-Met on the SE 32nd Avenue transit improvements both over Zoom and via emails. A record of the emails exchanged with Tri-Met are provided as Exhibit K and an annotated plan showing the requested changes is provided as Exhibit L. These changes to the transit facilities on 32nd Avenue have been incorporated into the project plans and this condition of approval is met.

II. EXISTING CONDITIONS

SITE CHARACTERISTICS

Vicinity. The Hillside Park site is located directly west of SE 32nd Avenue and north of SE Meek Street (Figure MP 1.1). The site lies within the boundaries of the Ardenwald-Johnson Neighborhood Association and is approximately 1/4 mile east of Highway 99E (McLoughlin Blvd) and 1/8 of a mile north of Highway 224 (Milwaukie Expressway) and 1/2 mile northeast of downtown Milwaukie. The Union Pacific railroad line lies on the western edge of the site.

Surrounding Uses. North of the site, properties are developed with primarily single-family residential uses. East of the site along SE 32nd Avenue there are a variety of uses including some single-family and multi-family homes, as well as the Providence Milwaukie Hospital and a medical clinic. South of the site across SE Meek Street there is a large vacant property owned by Murphy Plywood that is currently zoned GMU (General Mixed Use) with no specific development proposed on the site at this time. West of the site, beyond the railroad corridor there are several industrial uses, including Precision Castparts, which occupies the large industrial building directly east of the site.

Site Description. The existing site conditions are illustrated on Figure MP 1.8 and show that Hillside Park site is fully developed with a network of public streets (SE Hillside Court, SE A Street, SE B Street, SE C Street, SE D Street and SE D Place) surrounding and providing access to the 87 existing houses as well as the Hillside Manor tower. The houses on site were all built in the 1940s as 1-story single family residences and duplexes that each include an attached garage. The Manor is a 9-story tower located on the west side of the site, surrounded by two paved parking lots that provide a total of 59 parking spaces. South of the Manor there is a community center building that provides meeting space and connection to social services for the residents of Hillside Park.

The site slopes gradually downhill from the northeast corner toward the southwest corner. Just west of C Avenue the slope increases to create a large berm surrounding the open space area located in the northwest corner of the site. The open space area contains a concrete walking path with benches and workout stations distributed along the route. A small berm and chain link fence separates the site from the adjacent railroad corridor to the west. The remainder of the open space is landscaping. The entire Hillside site contains large, mature trees dispersed throughout the property that will be preserved and protected as much as possible.

Zoning and Comprehensive Plan Designation. The site is zoned R3, a medium density residential zone. The R3 zone allows a maximum density of 14.5 units per acre. The comprehensive plan designation of the site is Medium Density Residential which prescribes densities of between 8.8 to 21.1 units per net acre

Previous Land Use History.

- **PD-2020-002; TFR-2020-003:** Approval of the Preliminary Planned Development and Transportation Impact Analysis review to redevelop the site with 600 mixed-income multi-family housing units. This approval included a condition of approval that required a Final Planned Development application to be submitted within 18 month of the March 23, 2021 approval date.

- **MLP-2019-003; VR-2019-001; CU-2019-003:** Approval to divide the 16-acre Hillside site into two parcels. The request includes approval of a Variance to a side yard setback and a Minor Modification to the existing Conditional Use for the Hillside Manor tower (see Variance VR-69-7 discussion below) to alter

the site size of the previous CU. The purpose of this partition was to separate out the Hillside Tower onto its own 2.45-acre parcel for funding purposes. An easement was placed over the open space area to assure that the residents of the Tower would still be able to access this area even though it was on a separate lot from the Tower. The conditions of approval limited the overall number of units between the two parcels to 234 without further zoning or Planned Development approvals.

- **VR-69-7:** The Hillside Manor tower was originally approved on the site through a 1969 Variance which allowed the building to vary from the normal height and parking requirements of the zoning at the time. In the current R3 zone multifamily housing is permitted though a conditional use, therefore, the tower development has "de facto" conditional use status on the site per MCC 19.905.8. The open space area directly north of the Manor was also referenced in the 1969 Variance decision as part of the justification for approving the tower, though its preservation was not specifically addressed in the conditions of approval.

- **Zoning Confirmations:** A 1991 memorandum from the Milwaukie Community Development Department indicated that at that time the Manor consisted of 101 units (at that time the office had been converted to an additional unit, but has since been converted back into an office) and 59 parking spaces and that "no zoning deficiencies have been accounted for." A second Zoning Confirmation was done in 2018 and found the use of the site was consistent with the applicable zoning and land use regulations.

SITE OPERATIONS

Ownership. The site is owned by the Housing Authority of Clackamas County (HACC) who have owned and managed the site since 1941. HACC owns and manages five other affordable housing developments, three located in Oregon City and two in Milwaukie.

HACC Mission. "To provide and develop affordable housing with supportive services for individuals and families on their path to improved health, wellness, prosperity and inclusion. In order to sustain these services, we prioritize equitable service delivery, financial sustainability, and thriving partnerships to ensure long term viability".

HACC was awarded Metro 2040 Planning and Development Grant to help fund the redevelopment of Hillside Park. HACC also intends to leverage federal, state, and local funding opportunities such as the HUD Rental Assistance Demonstration (RAD) and Section 18 programs, Metro's Affordable Housing Bond, Low Income Housing Tax Credits (LIHTC), and New Markets Tax Credits (NMTC) to fund the effort.

Current Program on the Site. The 200 housing units on the Hillside Park site are leased to low income residents on a permanent basis. The housing is not transitional or emergency housing, since residents are welcome to stay in their units for as long as they wish assuming they continue to qualify for subsidized housing. A recent study of the tenant population found that 94% of the households in Hillside Park where making below $30,000 of annual income. Additionally, 34% of the head of households were over 65 years of age and 76% live with a disability.

The Hillside Manor tower is currently is being renovated with a combination of HUD RAD/Section 18 funds. The project includes a full renovation of the building's major systems and interiors as well as repairs to the building's structure and includes:

- asbestos abatement
- earthquake-safety upgrades
- interior apartment remodels
- updates to mechanical, electrical and plumbing
- refurbished elevators
- enhanced energy efficiency

EXISTING DEVELOPMENT

Buildings. As illustrated in Figure MP 1.8 the site is developed with a 9-story tower which provides 100 housing units – 99 single-family houses and one duplex – for a total of 200 units on site. The houses were constructed in the 1940s and the tower was added to the site in 1970.

Density. The existing density of the entire Hillside Park development is 12.4 units per acre which meets both the minimum (11.6 units per acre) and maximum density (14.5 units per acre) of the R3 zone. The Table II-1 below shows how the current density on the site is divided between the two lots:

Table II-1: Existing Density

Standard	R3 Zoning Requirement	Parcel 1 (Hillside Tower)	Parcel 2 (Remaining Hillside Park)
Minimum Density (units/acre)	11.6	40.4	7.3
Maximum Density (units/acre)	14.5	40.4	7.3

The discrepancy in the density, with Parcel 2 being under the minimum density and Parcel 1 being over the maximum density was addressed as part of the recent Partition approval, which conditioned the density of the entire site to 234 units (without further approval of a zone change or Planned Development) which equates to a maximum density of 14.5 units for the combined site.

Lot Coverage and Vegetation. The R3 zone allows a maximum lot coverage of 40% and requires at least 35% of the site to be developed as vegetation. Because the site is under-developed and features large swaths of landscaping between the houses, as well as the large open space area in the northwest corner, both of these standards are met with the current development pattern.

Open Space. The open space area located directly north of the Manor contains a concrete walking path, benches, workout stations, and a landscaped field. The open space area was referenced in the 1969 Variance decision as part of the justification for approving Manor tower, though its preservation was not specifically addressed in the conditions of approval. The existing open space is an amenity that benefits all of the Hillside Park residents and is covered by an easement that assures access to this area by all Hillside residents.

Vehicular Parking. The Manor currently has 59 dedicated parking spaces in the two parking lots that surround it, for a parking ratio of 0.58 spaces per unit. This is below the current required parking ratio for multifamily dwellings of 1 space per unit for dwelling units that are under 800 sq. ft. in size. However, the original approval for the Manor in 1968 approved the development with 40 parking spaces so the deficiency in parking is an existing non-conforming situation. For the rest of Hillside Park, each individual house has a dedicated attached garage, which complies with the requirement of one space per dwelling unit for single-family dwellings.

Existing Utilities. Existing infrastructure is presented in Figure MP 1.8.

Water Service. Water service to Hillside Park is provided by a network of public water lines located within the rights-of-way for the public streets or in public easement across the property. Water service to the Manor is provided from a 6-inch public water main located in SE C Street in a public water easement.

Sanitary/Stormwater Sewer Service. The public sewer lines that serve the development consist of a network of lines located primarily in public easements across the property. Stormwater drainage typically follows the contours of the site, draining from the west side toward the northeast corner.

Fire/Police Protection. Fire services are provided to the site from the Clackamas County Fire District #1. There are several public fire hydrants located on the site. The site is provided with police services from the City of Milwaukie Police Department.

School Facilities: Hillside Park is served by the North Clackamas School District. The site is located approximately one mile south of Ardenwald Elementary School, two miles north of Wilber Rowe Middle School, and 1/2 mile north of Milwaukie High School. The North Clackamas School District's website did not indicate that there are any capacity issues in the local schools and a bond measure to improve many of their facilities was passed in 2016.

Existing Transportation System. According to the City of Milwaukie Transportation System Plan (TSP) all of the streets serving Hillside Park are classified as Local Streets with the exception of SE 32nd Avenue, which is classified as a Collector Street.

The majority of streets that serve the site (SE A Street, SE B Street, SE C Street, SE D Street, SE D Street and SE Meek Street) are developed with a two-lane cross-section consisting of a 25-foot wide paved surface and curb-tight sidewalks averaging between 4 and 6 feet wide. SE Hillside Court provides a wider cross-section, with a 35-foot paved surface with curb-tight sidewalks. On-street parking is permitted along both sides of all of the streets.

SE 32nd Avenue has a two-lane cross-section consisting of a 30-foot wide paved surface and a 4-foot wide curb-tight sidewalk along the Hillside site frontage. On-street parking is prohibited on both sides of 32nd Avenue and the posted speed limit is 25 mph. A painted crosswalk on the north side of the intersection of SE 32nd and Hillside Court provides a safer pedestrian crossing of 32nd Avenue.

No bike lanes or planter strips to help buffer pedestrians are provided along any of the streets in the network.

Existing Traffic Operations. The project's Transportation Engineer analyzed historic traffic data and conducted traffic counts at intersections surrounding the site as documented in the Transportation Impact Study (Appendix B). All of the studied intersections were found to be operating at a Level of Service (LOC) for peak hours in both the morning and afternoon at a D or better with the exception of the intersection of SE Harrison Street at SE 42nd Avenue.

Transit Availability. Hillside Park is served by the #75 (Cesar Chavez/Lombard) bus that operates on SE 32nd Avenue, with bus stops located at the intersection of SE Hillside Court (stops #7342 southbound and #7339 northbound) and SE Meek Street (stops #7349 southbound and #8894 northbound). This route provides

service with 15-minute or better headways most of the day. The closest light rail stop is the Milwaukie/Main Street MAX Station served by the Orange line, located approximately a mile southwest of the site.

III. PROPOSED PLAN

SUMMARY OF FINAL DEVELOPMENT PLAN

Project Summary.

The redevelopment of Hillside Park will result in a vibrant mixed-use, mixed-income community. The design will preserve the 9-story Hillside Manor which is undergoing refurbishment. The existing houses in Hillside Park will be replaced with 100 new affordable units for the population currently being served on the site. Removing the existing houses creates the opportunity to develop 400 new residential units representing a mix of both affordable and market-rate housing. The new units will provide a variety of housing choices, from walkup townhomes in the north of the site (adjacent to the existing single-family neighborhood) to 3- and 4-story mixed-income apartment buildings in the south.

In addition to the residential development, there will be opportunities for small-scale commercial and office uses on the ground floor of the buildings along 32nd Avenue. The redevelopment plan will also provide new amenities for the residents including enhanced open space areas, garden plots, and a playground.

Redevelopment of the park will involve creating a new street grid and infrastructure network allowing the streets to be realigned for increased safety and better connectivity to the surrounding neighborhood to help support the increased density. The new streetscapes will be characterized by wide sidewalks, planter strips, a full tree canopy, and green infrastructure. A total of 489 vehicle parking spaces will be provided with a mixture of on-street parking spaces and surface lots.

The Master Plan includes subdividing the property into smaller lots to facilitate phased development and provide the opportunity for development of lots by outside partners. Additionally, the proposal includes a request to change the Zoning and Comprehensive Plan Designation of the property in order to reach density goals and allow for mixed use development. The north portion of the site is proposed with a zoning of R1 and a Comprehensive Plan designation of High Density Residential. The southern portion of the site is proposed as GMU (General Mixed Use) with a Comp Plan designation of TC (Town Center), consistent with the property directly to the south across SE Meek Street.

Density and Housing Types.

The density and housing types are represented by three major zones on the site, illustrated on Figure MP 1.5 – Density Allocation:

- **North:** The north zone, that abuts the existing single-family houses north of the site will have the lowest overall density and will be developed with a mix of townhomes and walk-up style apartments. The buildings that are directly adjacent to the north property line will be limited to two stories. This zone will also include the existing open space area in the northwest corner of the site. The north zone will be entirely zoned R1 and developed with approximately 70 units.
- **Central:** The central zone will have increased density, with a mix of townhomes, walk-up style apartments, and 3- and 4-story apartment buildings, as well as the existing Hillside Manor. It is anticipated that the apartment building in this zone that fronts onto SE 32nd Avenue will include small commercial uses to take advantage of the proximity to the commercial street. This zone will also include the playground and other large open space

amenities. The central zone will be zoned both R1 and GMU and will be developed with approximately 160 units, plus the 100 refurbished units in the Manor.

- **South:** The south zone will represent the area of the highest density, with all of the housing proposed as 3- and 4-story apartment buildings, including the building that will provide 100 units of affordable housing for the HACC residents that will be displaced from the existing houses. The building directly at the corner of 32nd and Meek is anticipated to have small scale commercial uses in the ground floor. The higher density of south zone will be consistent with the future GMU development across Meek Street on the "Murphy" site as well as other more intensive commercial uses further south on 32nd towards the Milwaukie town center. The south zone will be entirely GMU zoning and will be developed with approximately 270 units.

The housing in all zones is anticipated to include a mixture of both market rate and affordable housing that will leverage federal, state, and local funding, creating opportunities for expanded housing choice and different types of housing throughout the development. The housing will feature a mix of units that will range between 1- and 4-bedrooms as demonstrated on Exhibit C Master Plan Tabulations. In the buildings that will provide affordable housing, the unit sizes will meet or exceed the minimum unit size prescribed by OHCS Table N13.01, which requires the following minimum unit sizes:

- 1-bedroom unit = 600 sq. ft. minimum
- 2-bedrooms = 800 sq. ft. minimum
- 3-bedrooms = 1,000 sq. ft. minimum

Table III-1 below shows the density proposed for each of the lots in the subdivision.

Table III-1 - Proposed Density by Lot

Lot	Appx. Lot Size	Number of Units	Zoning	Density
Lot A	1.3 acres	101 units	GMU	75 du/acre
Lot B	1.4 acres	108 units	GMU	78 du/acre
Lot C	1.3 acres	65 units	GMU	50 du/acre
Lot D	1.4 acres	54 units	R1	39 du/acre
Lot E	1.4 acres	93 units	GMU	67 du/acre
Lot F	1 acre	40 units	R1	40 du/acre
Lot G	1.5 acres	27 units	R1	18 du/acre
Lot H (Manor)	2.5 acres	100 units	R1	37 du/acre
Lot J (Open Space)	1.8 acres	0 units	R1	0 du/acre
Lot K	1.1 acres	12 units	R1	11 du/acre
Total	**14.6 acres**	**600 units**		**41 du/acre**

The maximum density permitted in the R1 zone is 17.4 units per acres. In the GMU zone there is no maximum density for mixed-use buildings but a limit of 50 units per acre for stand-alone residential buildings. The Planned Development standards (19.311.3.C) allow the density to be blended across the site. As shown in the table above, several of the proposed R1 zoned lots will exceed the maximum density of the R1 zone because some of the density of the GMU zone will be transferred to these lots. The overall density of the entire development will be 41 dwelling units per acre which falls between the maximums allowed in R1 and GMU.

By blending the density across the site through the Planned Development regulations it allows more density to be concentrated on the south end of the site adjacent to commercially orientated streets and the existing GMU zoning on the Murphy site to the south. It also allows the preservation and development of large open space areas on the interior of the Hillside site, which will be accessible to all of the residents. The overall feel of the site will be park-like, with playgrounds, open areas and community gardens, all bisected by wide streets featuring trees and plantings with concentrations of density around the perimeter.

The provisions of 19.311.3.C (the Planned Development standards) state that proposed density increases may not be 20% greater than the density range prescribed for the primary land use designation indicated in the Comprehensive Plan. As part of this Master Plan proposal the areas of the site that will be changed to R1 zoning will also receive a new Comprehensive Plan designation of High Density Residential. The Milwaukie Comprehensive Plan indicates a density range of 21.2 to 24 units per acre in High Density Residential. Table III-2 below shows how the overall density in the R1 zoned portion of the site will not exceed a 20% increase above the maximum density prescribed by the Comprehensive Plan.

Table III-2 – Maximum Density in the R1 Zone

Lot	Appx. Lot Size	Zoning	Number of Units	Density
Lot D	1.4 acres	R1	54 units	39 du/acre
Lot F	1 acre	R1	40 units	40 du/acre
Lot G	1.5 acres	R1	27 units	18 du/acre
Lot H (Manor)	2.5 acres	R1	100 units	37 du/acre
Lot J (Open Space)	1.8 acres	R1	0 units	0 du/acre
Lot K	1.1 acres	R1	12 units	11 du/acre
Total	**9.3 acres**		**233 units**	**25.1 du/acre**
Maximum Density allowed in High Density Residential				24 du/acre
20% increase in Maximum Density per PD allowance				28.8 du/acre

The increase in maximum density in R1 from 24 dwelling units per acre to 25.1 dwelling units per acre is a modest increase representing only a 5% increase over the permitted maximum for High Density Residential. This re-zoning scenario – applying R1 to some of the medium-to-high density lots like D and F and then asking for an increase to the maximum using the PD process – is preferable to applying GMU to these lots and not requesting the increase. The GMU designation includes many other uses beyond residential housing, specifically commercial and light industrial uses that would not be desired on these exclusively residential lots. Additionally, the GMU zone allows a much higher maximum density (50 du/acre for residential buildings) than what is envisioned for the northern portions of the development. Finally, Lots D and F do not meet the overall purpose of the GMU zone, which is to "recognize the importance of central Milwaukie as a primary commercial center and promote a mix of uses that will support a lively and economically robust district".

The portions of the site that will be zoned GMU will receive the Comprehensive Plan designation of Town Center (TC). There is no maximum density associated with this designation since it is a commercial designation. However, the Comprehensive Plan does indicate that in the areas designated as Town Center "a variety of higher density housing is desired…and the City shall work cooperatively with the private sector to provide a diverse range of affordable housing." As such the increases in density in the GMU will comply with the 20% cap of 19.311.3.C and meet the goals of the Comprehensive Plan.

The minimum density requirement of the R1 zone is 11.6 dwelling units per acres. In GMU the minimum density is 25 units per acre. All of the individual lots (minus Lot J – the Open Space lot) and the overall development comply with the minimum density requirements of both of the zones.

The overall building coverage of the development is approximately 33%, which is well below the 45% maximum of the R1 zone, and the 85% maximum of the GMU zone.

Commercial Frontage and Proposed Uses.

SE 32nd Avenue is classified on the City's Transportation System Plan as a Collector and along its east side (across from the Hillside site) there are several small-scale commercial uses as well as a hospital. Additionally, the site directly to the south of the site across Meek Street (the Murphy site) is zoned GMU and identified as an "opportunity site" for redevelopment in the Central Milwaukie Plan, giving it the potential to be developed with future employment, commercial, or mixed-use development. Based on this surrounding context, creating the potential for commercial uses in the southwest corner of the Hillside site is appropriate.

Adding commercial zoning to Hillside creates an opportunity for a livelier and more active site. Having on-site amenities service-orientated businesses and small offices will directly benefit the Hillside residents, but also draw in residents from the immediately surrounding neighborhood creating more interaction between these two groups. Generally, these uses are envisioned to be smaller in scale and represent uses that are primarily focused on serving the neighborhood, versus large-scale commercial or employment centers that would draw from the larger region. As described later, the development plan includes improvements to the on-site pedestrian network and connections to the neighborhood, so it is anticipated that many of the visitors to these local businesses would either walk or ride bicycles.

To facilitate the commercial development on site, the proposal includes adding GMU (General Mixed Use) zoning to the southwest corner of the site, allowing commercial uses on the ground floor of buildings E1 and A2. However, the GMU zoning is a designation that allows a wide variety of uses, several of which would not be appropriate for the site based on the neighborhood context and the potential to overload the surrounding transportation network. Additionally, some of the uses allowed in GMU are not compatible with residential development and would not be a good fit for the site. Therefore, the Final Planned Development proposal would modify the proposed uses and intensities of the GMU zoning to be specific to the site. Table III-3 below summarizes the modifications to the GMU zoning that are proposed.

Table III-3 – Modified GMU Uses proposed

Commercial Uses	GMU Code	Hillside Proposal	Notes
General office, including medical and dental clinics	Permitted	Yes	Total available commercial space on Lots A + E will be 20,000 sq. ft. Anticipated uses will be a blend of these permitted uses.
Drinking establishments	Permitted	Yes	
Eating establishments	Permitted	Yes	
Indoor recreation (gyms, yoga studios, dance studios)	Permitted	Yes, but maximum size limit of 5,000 sq. ft.	
Retail-oriented sales	Permitted	Yes.	
Personal/business services	Permitted	Yes.	
Day care	Permitted	Yes	
Repair-oriented (includes repair of electronics, bicycles, clocks, jewelry, guns, small appliances, and office equipment; tailors; shoe repair; locksmiths; and upholsterers.)	Permitted	Yes, but maximum size limit of 5,000 sq. ft.	
Community service uses (includes schools, government offices, religious institutions, community meeting buildings, private club/lodge and recreational facilities – mainly outdoor.)	Community Service Use approval	Yes, but limited to 15,000 sq. ft.	The ground floor of building C1 is anticipated to be a community room for Hillside residents only. At this time no Community Service use serving the broader neighborhood is proposed.
Marijuana retailer	Permitted	No	
Commercial lodging	Permitted	No	
Vehicle sales and rentals	Permitted	No	
Vehicle repair and service	Permitted	No	
Manufacturing and production	Permitted	No	
Residential Uses:			
Rowhouse, Multi-family, Cottage Cluster housing, Live-work units, Senior and Retirement housing	Permitted	Yes	
Mixed-Use	Permitted	Yes	
Boarding house	Conditional Use	No	

The Traffic Impact Study submitted with the application (Appendix B) demonstrates that there is adequate capacity throughout the surrounding transportation system to support these proposed uses.

Open Space and Community Amenities.

Once fully developed, one of the prominent features of the Hillside site will be the large amounts of area dedicated to open space and landscaping, as shown in Figure MP 2.1 – Open Space Plan. The design concept includes pocket parks and open areas distributed throughout the site to both be convenient to residents for a range of uses and mitigate the more intensely developed portions of the site. All of the developed open areas will be considered neighborhood amenities since they will not be fenced or restricted to just Hillside residents' use and will be designed to be inviting and integrated into the neighborhood.

The largest landscaped area will be the existing open space area in the northwest corner of the site, which is an existing open lawn area bordered by wooded buffers to the north and west. This tract will remain as a passive gathering space. A new walkway will be added to provide access to SE 29th Avenue via switchbacks and stairs down the 15-foot vertical slope from 29th Avenue. New pockets of trees and shrubs will also be added along this slope. The well-established community garden plots north of the Manor building and adjacent to the open space area will be maintained.

Two common play areas represent the next largest allocation of open space. The play area in Lot E is intended as a formal playground with fixed equipment and seating for parents nearby. The landscape design will include an open lawn area with a forested garden to create a backdrop and to screen the parking lot from SE Dwyer Street. To the south, a flexible open play area in Lot D is intended as a gathering space and could include some nature play components and community gardens and will be a gathering space and extension of SE Hillside Court during peak events.

Smaller pockets of greenspace will be dispersed throughout the neighborhood, including greens between townhomes, landscaping around the bases of new buildings, and stoops/front yards where ground-floor unit entries are provided off the street. On the north and west edges of the Hillside site a landscaped buffer, which will include some mature existing trees, will provide privacy and some noise mitigation for the single-family homes to the north and from the active rail line on the west edge.

Hillside Court which will bisect the development is envisioned in part as a "living street" or "shared street" that will cater more to pedestrians and bikes, with an emphasis on social outdoor space rather than space for vehicle traffic by providing wide promenade type sidewalks, lush plantings, seating and a narrowed, de-emphasized vehicle roadway. The eastern connection of the street to SE 32nd Ave is proposed as a public plaza with an existing mature maple tree protected as a centerpiece, surrounded by seating. This plaza will be primarily hardscape, with potential for seating, landscape beds and connections to the new buildings on Lots A and E which will flank the plaza on the north and south. Moving west from the plaza, a series of sinuous planting beds under a grove of trees will offer seating and respite from the sun, as well as space for community gatherings. West of SE 31st Avenue, the northern edge of Hillside Court is envisioned as a large boardwalk-style sidewalk with seating adjacent to the open play area and gathering space on Lot D.

In addition to the formal outdoor spaces, all of the new streets will be furnished with wide planter strips and street trees to help shade the street network, reducing the heat island effect and intercepting some rainwater. These walkable streets will provide a well-landscaped, human-scaled public realm that encourages people to gather outside, interact with their neighbors and move safely through the community for daily exercise.

These landscaped and paved open space areas, the decorative landscaping surrounding the buildings, and the new planter strips in the streets, when combined, will result in over 41% of the site developed as landscape or open space, which exceeds the City requirement of 30% in the PD Zone.

The open space areas will be covered by access easements to allow all residents to access and use the open space. An easement to this effect already exists over the open space area in Lot J that was created with the 2019 Partition Plat, allowing the residents of the Manor access to this area for recreation and exercise. Lot J is also popular with neighbors to the north and their access to this area - via the new extension of SE 29th Avenue as a bike and walkway - will not be restricted with the

redevelopment. Additionally, on the lots that HACC does not retain ownership, cost sharing and maintenance agreements will be put in place to dictate the upkeep of the amenities.

In addition to the Open Space easements, "no build" easements have been proposed on Lots A and E to assure that the buildings on these lots are setback an adequate distance from the open space area to allow enough light and air into the open space. It is envisioned that these no build areas will be able to be used for outdoor seating for the commercial tenants or other outdoor recreational purposes for the buildings occupants.

HACC's intent is for each of the open areas and recreational amenities located on individual lots to be developed with the construction of the buildings and parking on the lot. This will assure that no outdoor areas will be inadvertently destroyed or unnecessarily ripped out and then re-built when the construction on the lot commences. The only exception to this lot-by-lot development of the open areas is the improvements on Lot J in the northwest corner of the site. The improvements planned for this area will be completed by the end of final phase of development which will occur within 7 years per the Planned Development requirements.

Proposed Zoning/Comprehensive Plan Designations.

As shown on Figure MP 1.2 – Proposed Zoning Plan the entire site will be rezoned from R3 (Medium Density Residential) to R1 (High Density Residential) on the north half and GMU (General Mixed Use) on the south. The Comprehensive Plan Designation of the site will be changed to match these new zones, with High Density Residential on the north and Town Center on the south. The current Comprehensive Plan designation of the site is Medium Density Residential. It is anticipated that both these requests will be submitted with the Final Planned Development application.

R1 Zoning. The purpose of the High Density Residential zone in Chapter 19.302 of the MMC states that it is "intended to create and maintain higher density residential neighborhoods that blend a range of housing types with a limited mix of neighborhood-scale commercial, office, and institutional uses." As described above, the north side Hillside Park will be consistent with the purpose, by providing a variety of housing types including 2-story townhomes, 2- and 3-story walk-up style apartments, and the Manor Tower, which will all be supported by the small commercial and office uses on the south side of the site.

High Density Residential Comprehensive Plan Designation. According to the Milwaukie Comprehensive Plan, sites may be designated High Density Residential based on the following policies:

a. *A wide variety of housing types are permitted, with the predominant housing type being multi-unit development.*
b. *These areas should be adjacent to or within close proximity to downtown or district shopping centers, employment areas and/or major transit centers or transfer areas.*
c. *Access to High Density areas should be primarily by major or minor arterials.*
d. *Office uses are outright permitted in limited areas within close proximity of downtown.*

The north side of the site will be able to meet these policies since the housing types being proposed are all multi-family, the site is within ½ mile from downtown and adjacent to the Murphy site which has been identified as a future employment opportunity site. Although SE 32nd Avenue is classified as a Collector, it connects to an arterial street (SE Harrison Street) just south of the Murphy site and as shown by the Traffic Impact Study (Appendix B) it is adequate to handle the increased traffic anticipated from the development. The Final Development Plan can largely comply with these

Comprehensive Plan policies and so the High Density Residential designation is appropriate for the site.

GMU Zoning. Chapter 19.303 of the MMC states that the purpose of the General Mixed Use zone is to "promote a mix of uses that will support a lively and economically robust district. It is also intended to ensure high-quality urban development that is pedestrian-friendly and complementary to the surrounding area." The Hillside Park redevelopment will represent high-quality urban design and the new street network and open space amenities are designed to make the site pedestrian-friendly while minimizing the prominence of vehicles on the site. Adding small commercial uses on the site will help to create a lively and robust center that will benefit residents and draw in neighbors from the larger community. As shown the proposed development will be consistent with the purpose of the GMU zoning.

Town Center Comprehensive Plan Designation. The policies behind the Town Center Comprehensive Plan designation include:

a. *Mixed-use development combining residential high-density housing with retail, personal service, commercial, and/or offices, is encouraged.*
b. *The Downtown and Riverfront Land Use Framework Plan and the Downtown Mixed -Use Zone shall implement Subarea 1 of the Town Center Master Plan.*
c. *Downtown Milwaukie is part of the Milwaukie Town Center, which is a regional destination in the Metro 2040 Growth Concept*
d. *The Town Center Area shall be served by multimodal transportation options; therefore, on-street parking, shared parking, and enclosed parking are the most appropriate parking options in the Town Center Area.*
e. *A variety of higher density housing is desired in the Town Center Area. The city shall work cooperatively with the private sector to provide a diverse range of affordable housing.*
f. *Downtown public improvements should be coordinated with private improvement efforts by local property owners and should aim to stimulate and support private investments in the area.*
g. *Central Milwaukie is part of the Milwaukie Town Center that serves the larger Milwaukie community with goods and services and seeks to provide opportunities for a dense combination of commercial retail, office, services, and housing uses.*
h. *The city will continue to work closely with Metro and TriMet in planning for transit improvements.*
i. *More detailed design concepts and principles for these areas are included in the Urban Design section.*

The southern half of Hillside Park will be developed with a mix of high density housing and small commercial and office uses. The site is just outside of the Central Milwaukie Area Plan however, the site embodies many of the core principles of this plan. The site will include a mix of housing and small commercial uses providing goods and services to the community. The site is well served by transit and the owner has been working closely with TriMet on the proposed improvements to the transit stops on 32nd Avenue. The site will encourage multimodal transportation options with an enhanced bicycle and pedestrian network and a deemphasis on off-street vehicle parking and parking ratios will be purposefully low to encourage other modes of transportation. Finally, the development will represent a mix of both affordable housing serving HACC's community and market-rate housing that will provide a range of housing options. The Final Development Plan will meet the policies of the Town Center designation and is appropriate for the site.

As described above, the GMU zoning that will be applied to the site will be modified to encourage neighborhood-scale commercial uses and not larger employment uses drawing visitors or workers from the region. Additionally, uses that are not compatible with residential development will not be permitted outright. These specific modifications to the GMU zoning that will limit the commercial uses to those that are neighborhood-scale will be denoted by the PD (Planned Development) overlay that will accompany the zoning designation on the site.

Lot Pattern.

The Master Plan for Hillside Park includes subdividing the property into a total of 9 lots, as illustrated on Figure MP 4.01 – Preliminary Plat. Subdividing the property creates the opportunity for some of the lots to be sold separately by HACC to help fund the project. If sold, these lots would be developed by outside partners. The subdivision would also allow the construction to happen in phases to help facilitate the relocation of the existing residents in the houses on site. Finally, the new lots lines would coincide with the proposed new street grid and infrastructure network that will align the streets for better connectivity to the surrounding neighborhood and increased safety. Additionally, the more regular and rectangular lots will help support the increased density and housing types envisioned for the site.

The site is currently divided into two parcels, both owned by HACC. The lot surrounding the Hillside Manor tower was created in 2020 to help facilitate the refurbishment of the tower through a HUD funding package. This lot will remain as part of the new subdivision proposal but will ultimately be realigned slightly along Hillside Court to match the new street alignment.

The main driver of the lot pattern was the desire to align the streets within Hillside to the surrounding street network and create a better on-site circulation pattern. The primary entrance to the site from SE 32nd will be moved north to align with SE Dwyer Street to the west, creating a much safer intersection. Three additional access points to the site will be created along Meek Street which will be extended and improved as a half street for the full length of the site. These new egress/exit points on Meek will eliminate many of the existing dead end streets headed south (SE A Street, SE B Street, SE D Street and SE D Place) improving circulation. These changes will also eliminate the need for the large cul-de-sac turnaround at the end of Hillside Court, freeing up more land for units and landscaping. The east end of SE Hillside Court will be developed with a landscaped plaza connecting to SE 32nd Avenue and creating a safe and welcoming pedestrian and bike connection to the neighborhood and direct access to the existing bus stops on SE 32nd Avenue. Finally, SE 29th Avenue, which bisects the site will be connected to the single-family neighborhood to the north as a bike boulevard without vehicle traffic, creating improved pedestrian and bicycle access to the site and surrounding neighborhood.

One of the major site constraints effecting the lot pattern is the desire to maintain and enhance the existing open space area in the northwest corner of the site. This area is defined by a big drop in topography from the elevation of the rest of the site, with large berms surrounding the open space area. The lot pattern will respect this topography, leaving the berms intact and minimizing on site grading and fill. Additionally, the Hillside Manor and its adjacent parking lots and landscaping will remain on site, dictating the shape of the lot that surrounds this existing development. So, although the new lot pattern will be as close as possible to a standard orthogonal grid, these site constraints and the need to connect to the surrounding transportation network requires adjustments to the standard grid pattern.

The minimum lot size in the R1 zone for multi-family development is 5,000 square feet, with a minimum lot width of 50 feet and a minimum lot depth of 80 feet. Additionally, all lots must have at least 35 feet of street frontage. The front lot line has been determined as the lot line that the new building(s) will most likely face. Table III-4 shows how the lots proposed in the R1 zone will comply with these requirements.

Table III-4 – Dimensional Standards of R1 lots

Lot	Appx. Lot Size	Appx. Lot Width	Appx. Lot Depth	Appx. Lot Frontage
Lot 4 (D)	60,645 sq. ft.	226 ft.	267 ft.	267 ft.
Lot 6 (F)	43,162 sq. ft.	198 ft.	215 ft.	212 ft.
Lot 7 (G)	66,107 sq. ft.	240 ft.	214 ft.	214 ft.
Lot 8 (K)	46,296 sq. ft.	297 ft.	100+ ft.	297 ft.
Lot 9 (J) (Open Space)	77,975 sq. ft.	217 ft.	288 ft.	n/a
Lot H (Manor)	106,725 sq. ft.	288 ft.	328 ft.	97 ft.

In the GMU Zone all lots must have a minimum lot size of 1,500 square feet and at least 25 feet of street frontage. Table III-5 demonstrates how the lots in the GMU zone will comply with these standards.

Table III-5 – Dimensional Standards of GMU lots

Lot	Appx. Lot Size	Appx. Lot Frontage
Lot 1 (A)	58,426 sq. ft.	295 ft.
Lot 2 (B)	60,041 sq. ft.	226 ft.
Lot 3 (C)	55,746 sq. ft.	174 ft.
Lot 5 (E)	60,539 sq. ft.	305 ft.

Phasing.

Redevelopment of the park will be done in phases to allow for the relocation of the existing residents, the disconnection and reconfiguration of the existing utilities and street network, and to assist with the financing of the project. The first phase of development will involve Lots A, B and C (shown on Figure MP 1.9), followed by two subsequent phases.

The location of the first phase (Lots A, B and C) was carefully considered to assure the feasibility of demolishing the existing roads and abandoning the existing utility lines without cutting off service or access to the tower or the houses that will remain on the site. The first phase will involve the demolition of 46 residential buildings, and the removal of the southern half of A, B, C and D Streets. The existing public and private utility lines south of Hillside Court will be abandoned, but the utility connections to the remaining buildings will be untouched since Hillside Court and the utility lines therein will remain in place.

The phasing plan will include assisting the current Hillside Park residents with relocation. The residents in the houses that will be demolished in the first phase will be relocated to off-site housing following HUD's requirements. The Phase 1 includes HACC developing 100 replacement units on Lot B that will be deeply affordable and available to low income residents. The residents of the northern

houses remaining on-site after Phase 1 will have the option to relocate into the new buildings before these houses are demolished with Phase 2. Current residents of Hillside Park who are relocated to off-site locations will also have the option of relocating back into one of Lot B buildings upon completion.

Within Phase 1, B Street will be replaced with SE 31st Avenue with will act as a utility corridor and main access point to SE Hillside Court, serving Lots A and B and connecting the new utilities to the existing services in Hillside Court. Vehicle circulation around the new lots will be provided by Meek Street on the south, SE 29th Avenue on the west, SE Hillside Street on the north, which are all proposed as ¾ streets and SE 28th Avenue that will be developed as a full street. This circulation plan will prevent building any temporary streets or infrastructure that will need to be demolished at a later phase of development.

One of the goals of developing the southeast half of the site first is to set the expectations and character for the rest of the project. The high-visibility southeast corner will include some of the major site features such as the treed plaza on Lot B and the landscaped plaza on the east end of Hillside Court. In addition, by starting in this corner of the site, the landscape in these public spaces will have time to mature early in the project's lifetime, enhancing the aesthetics of the overall project. Finally, it is possible that Lot A might be sold and developed to an outside partner to fund the remainder of the project and this large corner lot would be considered the most desirable real estate.

Future phases will include Lots D, E, F, G, and K and the surrounding streets and infrastructure, including the landscape improvements to Lot J (the open space tract). Lot H (the Manor) is already developed and therefore, are not included.

Parking.

Vehicle parking for the site will include 352 spaces in the lots on the site and 137 spaces on the streets that are interior to the site (SE Dwyer Street, SE Hillside Court, SE Meek Street, SE 28th Avenue, SE 29th Avenue and SE 31st Avenue) resulting in an overall parking at a rate of 0.82 spaces per unit. Another 19 new parallel parking spaces will be developed along the west side of SE 32nd Avenue that will also be available to serve the site but are not included in the overall parking ratio since they will also be available to the larger neighborhood.

As described in detail in the Development Standards section of this report, this reduced parking rate will be adequate to serve the site based on a number of factors, including a reduced parking demand for affordable multi-family buildings, the opportunity to share parking spaces between the small commercial uses in Buildings A2 and E1 and the residential uses, and the close proximity of the site to transit which allows a 20% reduction of the on-site parking spaces by right. Additionally, a robust Transportation Demand Measures (TDM) program is proposed for the site to further reduce resident's reliance on automobiles. Finally, the entire development has been designed with a strong emphasis on walking, biking, and transit, which will further encourage the use of the alternative means of transportation.

Over 500 bicycle parking spaces, both on-site and within the buildings, will be provided to meet the bike parking requirements. Four full-sized loading spaces will also be provided – some of which will be located on the new streets to more efficiently use the site area and to allow multiple buildings to share these spaces

The current development pattern at Hillside Park – single-family detached houses and duplexes – allows some residents the opportunity the own several vehicles that are parked along the street in front of their residences. There have been concerns raised that the proposed redevelopment plan does not account for multiple vehicle ownership with the ratio of 0.82 spaces per unit. However, the redevelopment of Hillside is a future-focused plan designed for the next 75-100 years and as such follows the trend of jurisdictions throughout the Portland metro region who are focused on reducing and dis-incentivizing automobile parking and usage in favor of public transit and alternative modes of transportation. Much of the current multiple-car ownership in Hillside comes from the convenience of having ample on-street parking available to store these vehicles, and less on actual need.

It is anticipated that after the development of the multi-family housing on the site, the parking will function much more like it has for decades surrounding Hillside Manor, where 59 parking spaces serve 100 units with very few problems or conflicts. A survey of the Hillside residents was conducted prior to the pandemic as part of the Health Impact Assessment of Hillside Master Plan which was undertaken specifically to guide the redevelopment of the Hillside site. The survey received responses from 94 of the 200 total households in Hillside, included residents in both the Manor tower and the detached homes. A key takeaway from this survey concerning transportation usage found that in 2019 only 36 percent of respondents reported driving an automobile in the past week which is significantly less than the 83 percent that reported driving every or most days in a recent Gallup poll (see pages 20-21 of the report).

These findings are consistent with those of the Traffic Impact Analysis (Appendix B) which included a reduction in vehicle trip generation for affordable housing. This reduction is supported by university research documented in an article identifying the transportation impacts of affordable housing.[1]

Additionally, the ITE Parking Generation Manual[2] also shows lower parking rates based on measured demand from surveys of "real-world" multi-family affordable housing developments with income limits similar to what is proposed for Hillside. These surveys included all parking activity at the residential site, including both residents and visitors, and determined that the average parking rate required to serve affordable housing was 0.99 spaces per unit for weekdays (based on 29 surveys) and 0.79 spaces for Saturdays (based on 10 surveys). The proposed 0.82 spaces per unit falls between these averages, and is more appropriate for the Hillside site, which is being re-developed with a strong emphasis on transit and other means of transportation such as biking and walking. In addition, the neighborhood-focused commercial uses proposed on site, and the larger neighborhood context that includes close-by commercial, office and medical services, and is well-served by transit, will help residents to be less reliant on automobile use.

The on-street parking spaces provided around the housing should function the way they do in downtown Milwaukie, where cars regularly come and go, freeing up spaces throughout the day. Prevailing laws allow any car left on a public street for more than 24 hours to be towed away, but this is rarely a problem since most people move their cars on a regular basis. Typically, it is owners of multiple cars (some of which may not be fully operable) that tend to abuse these laws, in which

[1] Howell, A., Currans, K., Gehrke, S., Norton, G., & Clifton, K. (2018). Transportation impacts of affordable housing: Informing development review with travel behavior analysis. *Journal of Transport and Land Use*, *11*(1). https://doi.org/10.5198/jtlu.2018.1129

[2] Institute of Transportation Engineers, Parking Generation Manual, 5th Edition, January 2019.

case towing in-operable cars away to make room for others is not an unreasonable solution. The natural turn-over of the on-street parking spaces should make spaces available throughout the day and evening for visitors.

It is anticipated that a parking permit program will be created on the individual lots to help prioritize the use of the on-site parking spaces. Each lot includes designated ADA compliant parking spaces located as close as feasible to each building entrance. The intent of these ADA spaces is that they would not be used for 24-hour or overnight parking, since they need to remain available for medical transport, Tri-Met LIFT buses and short-term visitors. Therefore, a lot-by-lot parking permit program could be used to assign on-site parking spaces to residents who have special needs or circumstances. These parking permit programs will be managed and enforced by the managers of the individual buildings/lots, so the specifics of the programs would be determined as part of the future development programs.

Landscape Concept.

The new Hillside development will include community gathering spaces, enhanced outdoor recreation areas, and amenities that will serve both Hillside residents and neighbors. To achieve a consistent landscape concept for the entire site the proposed Planting Zone (Figure MP 2.2) describes several categories of plant materials based on the potential use of the various open spaces:

- Larger, high-use common greens, with play areas and sports fields, will consist primarily of low-water-use lawn interspersed with new shade trees.
- Landscaped areas dispersed through the site and between the new buildings will consist of native and adaptive shrubs.
- Around the base of the buildings, irrigated but drought-tolerant shrubs and groundcover plantings will provide visual harmony with the buildings and a sense of privacy for ground-floor units.
- Streets and parking lots will include shade trees and non-irrigated planter strips with simple lawn or groundcover. In some areas these planter strips may include stormwater treatment bioswales with specific plant palettes serving this purpose.
- The open space area in Lot J will remain undisturbed although some shade trees will be added around the open lawn area. The slope east of Lot J will be replanted, with invasive species removed and new seeded areas of native and adaptive plants added adjacent to the proposed switch-back walkway and stairs.
- A goal of providing 'edible landscapes' where possible within the community will be met with gardens, fruit-bearing trees, and pollinator-friendly landscapes.
- Green roofs will be encouraged on new buildings to provide stormwater management benefits as well as potential gathering spaces with views for residents.

Several existing trees on the site will be protected and incorporated into the proposed plaza, common greens and buffers, with appropriate measures for tree protection taken during construction. Additional new trees will be planted throughout the site in parking lots, buffer areas, in key open spaces and along the new streets to meet Milwaukie's Urban Forest Management Plan Strategy goal to "*foster urban forest growth to achieve 40% canopy coverage by 2040 and sustain that level through time."* Because the tree canopy goal of this plan includes both public and privately-owned land in Milwaukie, the Hillside tree canopy calculation is based on a 19.5-acre area that includes both the private lots and the new public streets. Assuming an average canopy size of 35 feet per tree, the plan proposes a total canopy coverage of 29% which is a substantial improvement over the existing site and will help the City achieve the citywide goal.

Street trees will be planted in planter strips that are at least 4-feet wide or in tree wells along more heavily used sidewalks. Trees have been selected from the City of Milwaukie's Street Tree List and will be spaced between 15 and 30 feet on center depending on the width of the planter strip and anticipated size of the tree at maturity.

Low-volume irrigation is proposed for the site, to reduce demands on municipal water use in the summer. These systems typically use 75% less water than standard sprinkler systems. The irrigation system will be zoned to provide separate watering patterns for shrubs and lawn and will include smart irrigation controls for even greater efficiency.

Architectural Character of the Buildings.

Architectural character is generally defined by those special physical characteristics of a building or place such as a neighborhood that sets it apart from other buildings and its surroundings and contributes to its unique individuality.

Hillside Neighborhood's desirability will be measured in part by the diverse architectural character that is expressed throughout the community. Each building comprising the neighborhood shall be designed in context realizing that building massing and scale, roof lines, building modulation, and architectural character all contribute to the way this area will look, feel, and function for generations. Architects, builders, and developers are encouraged to carefully combine a variety of appropriate architectural styles to create neighborhood that feels natural to the region in character yet allows for variety and interest.

Specific elements of the individual buildings such as materials, colors and design style will be decided on a lot-by-lot basis as the buildings are being designed, since the developer, program and funding package for each lot will be unique. It is not HACC's intention to have the buildings look homogeneous, but rather their preference is to have the area look like a real neighborhood with a variety of design styles represented. However, there are some overarching characteristics desired for each of the main development zones that are described in detail below.

North Section- Bridging Neighborhoods

The North Section of the site is adjacent to the Ardenwald neighborhood to the north, which is comprised of single-family homes and multi-family housing. Ardenwald community members voiced a preference for low-density housing adjacent to the neighborhood. To accommodate this request, two and three-story townhomes and low-density, three-story walk-ups comprise the North Section.

Buildings in this section of the master plan are encouraged to aesthetically reflect a transition and connection between the existing scale, massing, and material qualities of the homes to the north, and the larger multifamily apartment buildings in the Center Section of the site.

Building Attributes:

Building on Lot K

- 2-story townhouses
- Ground floor residential units with garden front yards
- Pitched roofs
- Low Density building

Buildings on Lot G

- 2 and 3-story townhouses
- Ground floor residential units with garden front yards
- Pitched roofs

Buildings on Lot F

- 3-story Walk-up Apartment buildings: Ground floor residential units with garden front yards, open common stairwell
- Pitched roofs
- Medium Density building

Center Section - The Heart

In the Center Section, a plaza adjacent to the A and E buildings, draws the pedestrian into the heart of the site. A public plaza and grove of trees offer seating and respite from the sun and connects to transportation, while also remaining flexible enough to host community events like farmer's markets or craft fairs. A dedicated play area adjacent to building E1 would serve the lower density buildings to the north and be next to parking lots tucked behind the buildings. An open lawn area with nearby community garden beds anchors the Center Section as a dedicated public amenity.

Raised intersections at Hillside and 29th, Hillside and 31st, promote maximum accessibility and encourage walking through the site from east-west. Hillside Avenue is on axis with the existing Hillside Manor building, offering those residents easy access to these new community amenities as well.

Buildings in this section of the master plan are encouraged to aesthetically reflect the vibrant and energetic feeling that the gathering, play, and community-focused elements bring to the geographic center of the community. A denser urban environment will be reflected in the landscaping as well as the definition between public space and private space. Expansive views inside buildings looking out to gathering and play spaces are encouraged. Maximum pedestrian ground floor connection to gathering space and sidewalks is desired. Commercial space adjacent to the plaza that are food/retail focused are encouraged as well, with entrances on both east and west sides of building.

Building Attributes:

Buildings on Lot D

- 3-story Walk-up Apartment building: Ground floor residential units with garden front yards, open common stairwell
- Pitched roofs
- Medium density building

Buildings on Lot E

- E1: Mixed use – commercial use on ground floor, residential units on 3 upper floors
- E2: 3-story apartment building with ground floor residential units with garden front yards
- Flat Roofs / Parapets
- High Density building

South Section- The Hub

The south section of the site is thought of as the "hub", reflecting the already existing General Mixed Use (GMU) zoning to the south of the master plan property line. The GMU zone allows 4-6 story buildings with a variety of commercial uses and housing, and this section of the site continues the zoning qualities of the larger, denser GMU building scale and urban feel.

Building Attributes:
Buildings on Lot C

- 4-story apartment building with ground floor residential units including garden front yards
- Flat Roofs / Parapets
- High Density building

Buildings on Lot B

- B1, B2: 4-story apartment buildings with ground floor residential units including garden front yards
- Flat Roofs / Parapets
- High Density buildings

Buildings on Lot A

- A1: 3-story apartment building with ground floor residential units including garden front yards
- A2: 4-story mixed use building – commercial use on ground floor, residential units on 3 upper floors
- Flat Roofs / Parapets
- High Density buildings

Sustainability.

The Oregon Housing and Community Service (OHCS), the state organization that manages the tax credits that provide most of the funding for affordable housing, requires third-party green building certification for all new construction projects. Therefore, it is anticipated that all of the affordable housing buildings that will be constructed on the site will be certified green buildings. The most common certification program used by affordable housing developments is Earth Advantage, but the state will also accept certification from other well-established certification programs such as LEED.

Additionally, the layout of the Planned Development has been designed to encourage alternate means of transportation such as walking and biking. The network of green streets with wide sidewalks, protective landscaping and trees will enhance the pedestrian environment. Pedestrian travel distances will also be reduced with the new orthogonal street grid and the elimination of the dead-end cul-de-sacs. Additionally, access to transit will be enhanced by creating better pedestrian connections to 32nd through the plaza at the eastern end of Hillside Court.

Planting zones throughout the development will be maximized with large canopies trees that support the City of Milwaukie's Urban Forestry 40% canopy coverage goal. Additionally, the landscape plan incorporates lush landscaping and preserves many of the existing trees already on the property. Green roofs on buildings are encouraged and will contribute to reducing the stormwater released into the treatment system.

Modified Development Standards.

As part of the Planned Development review process modifications to development standards may be requested based on unique aspects of the development proposal. A number of standards are requested to be modified within this proposal including setbacks, building step back, building materials, minimum vehicle parking, loading spaces, land division requirements, and the provision

of a vehicle turnaround on SE 29th Avenue. All of these modifications are described in detail in the Development Standards section of this report.

Generally, these modifications are aimed at creating a consistent development pattern across the site and efficiently using the available site area. These modifications take into account the uniqueness of developing multiple full block lots at an urban scale served by an internal network of new streets. Furthermore, these modifications will help realize the vision of providing a vibrant mix of new affordable housing units with abundant open space to serve the residents.

DEVELOPMENT STANDARDS

The following section describes the development standards that would apply to the site under the proposed R1 and GMU zoning designations, and how the proposed development will comply with these standards.

Density.

As demonstrated in Table III-1 and Table III-2 above, the overall density of the proposed redevelopment plan will be 40 dwelling units per acre. This blended density across the site falls between the maximum density of 17.4 units per acre allowed in the R1 zone and 50 units per acre allowed in the GMU zone (for stand-alone residential buildings). Mixed use buildings in the GMU zone have no maximum density requirement.

The minimum density requirement of the R1 zone is 11.6 dwelling units per acres. In GMU the minimum density is 25 units per acre. The overall density of the development is above the minimum density of both zones. As shown in Table III-1, all of the individual lots (minus Lot J – the Open Space lot) also comply with the minimum density requirements of the zoning that will be applied to each of the lots.

As shown above the proposed development is in compliance with both the minimum and maximum density standards.

R1 Development Standards.

Table III-6 below shows how the lots in the R1 zone comply with the applicable development standards of the R1 zone once they are developed. Note that Lot J – the open space lot – will be zoned R1 but is not included in the table since it will not contain any development beyond landscaping and hardscaping.

Table III-6 – Development Standards in the R1 Zone

Development Standard	Lot D	Lot F	Lot G	Lot H (Manor)	Lot K
Maximum Height: 3 stories or 45 feet (whichever is less)	3 stories	3 stories	2-3 stories	10 stories (existing)	3 stories
Minimum Front Setback: 15 ft.	10 ft. *	10 ft. *	10 ft.*	114 ft.	10 ft.*
Minimum Side Setback: 15 ft.	5 ft. *	15 ft.	5 ft.*	70 ft.	5 ft.*
Minimum Street Side Setback: 15 ft.	5 ft. *	10 ft. *	5 ft.*	15 ft.	5 ft.*
Minimum Rear Setback: 15 ft.	15 ft. min	15 ft.	15 ft.	15 ft.	5 ft.*
Minimum 32nd Avenue Setback: 30' from center of ROW	n/a	32 ft.	n/a	n/a	n/a
Maximum Lot Coverage: 45%	30%	31%	35%	7%	20% max
Minimum Vegetation: 15%	15% min	15% min	15% min	38%	15% min
Minimum Front Yard Vegetation: 40%	40% min	40% min	40% min	>40%	40% min

*Indicates a setback to be modified

As shown in this table the front setback of all of the lots and the side setbacks on some of the lots do not meet the standards of the R1 zone. These standards will be modified through the Planned Development process (Section 19.311.3) in order to create a more consistent development pattern throughout the site. These modifications will allow the buildings on the northern lots to look more similar to the buildings on the south, in the GMU zone, which allows a more urban development pattern. All modified setbacks are shown on Figure MP 1.4.

GMU Development Standards.

Table III-7 below shows how the lots in the GMU zone will be able comply with the applicable development standards of the zone once they are developed.

Table III-7 – Development Standards in the GMU Zone

Development Standard	Lot A	Lot B	Lot C	Lot E
Minimum FAR: 0.5 to 1	5.5 to 1	4.0 to 1	3.7 to 1	4.3 to 1
Base Maximum Height: 3 stories/45 ft. Bonus for residential use: 4 stories/57 ft.	4 stories	4 stories	4 stories	4 stories
Minimum Street Setback: 0' (site is not shown on Residential Edge Treatment Map)	0 ft. min	0 ft. min	0 ft. min	0 ft. min
Maximum Street Setback: 20' (site is not shown on Commercial Edge Treatment Map)	20 ft. max	20 ft. max	20 ft. max	20 ft. max
Minimum 32nd Avenue Setback: 30' from center of ROW	40 ft. min	n/a	n/a	40 ft. min.
Side and Rear Setbacks: none	3 ft. min	3 ft. min	3 ft. min	3 ft. min
Frontage Occupancy: 50% (site is not shown on Frontage Occupancy Map)	n/a	n/a	n/a	n/a
Maximum Lot Coverage: 85%	30%	47%	44%	32%
Minimum Vegetation: 15%	15% min.	15% min.	15% min.	15% min.

Additional development standards in the GMU zone that apply to the lots are addressed below:

19.303.4.A.2.c - Floor Area Ratio. *If a project is to be developed in phases, the required FAR must be met for the land area in the completed phase(s), without consideration of the land area devoted to future phases.*
Response: The entire development is anticipated to be developed in three phases. Phase 1 will be entirely located within the GMU zone and will meet the minimum FAR of 0.5 to 1 at the time of built out, since the total FAR for Phase 1 (Lots A and B) will be 2.7. The specific FAR calculations for Phases 2 and 3 will be determined at the time of development but will be able to comply with the minimum FAR requirement since all of the stand-alone lots in GMU meet the minimum FAR.

19.303.4.B.2.b - Height Bonus. *Buildings in the GMU Zone shall provide a step back of at least 15 ft for any street-facing portion of the building above the base maximum height.*
Response: The buildings in the GMU zone (except Building B1) are proposed to be four stories tall, taking advantage of the additional height allowed by providing residential use for at least 25% of the FAR. This standard will be modified as part of the Planned Development proposal per Section 19.311.3. The modification is requested in order to provide a uniform edge along SE 32nd Avenue, to create a cohesive look across the site, and to help keep the cost of the buildings down to assure that they can be built as affordable housing.

19.303.4.C.2.f - Street Setbacks. *No vehicle parking is permitted between the building and the street. Vehicle parking must be located behind and/or to the side of buildings, except in cases of a through-lot or lots which front on 3 or more streets, in which case this standard applies to 2 streets.*
Response: All of the lots proposed in the GMU zone will front three or more streets. Primarily the lots have been designed to have the buildings adjacent to the street frontages and the parking located in the interior of the lots to be able to meet this standard as much as is practical on lots with multiple frontages.

19.303.4.E.2.a and c - Primary Entrances. *All new buildings shall have at least 1 primary entrance facing an abutting public street.*
Response: All of the lots in the GMU will have entrances oriented to the public streets. Each of the lots have multiple frontages on public streets and the buildings have been designed to be flush with the streets, so this development standards shall easily be met for each lot.

Planned Development Overlay Development Standards.

Chapter 19.311 includes the development standards and requirements that apply in a PD zone, which will be the overlay zone that will be added to the property with approval of the Planned Development proposal. The PD zone allows the base zone development standards to be modified to be specific to the development, but also includes development standards that apply specifically in the PD zone. These standards are addressed below:

19.311.3.A - Minimum Size of a PD Zone. *A PD Zone may be established only on land which is suitable for the proposed development and of sufficient size to be planned and developed in a manner consistent with the purposes of this zone.*
Response: The entire Hillside site totals 16 acres, making it of a sufficient size to be planned and developed in a way that is consistent with the purpose of the PD Zone. This includes the provision of a mix of housing types and uses, greater flexibility in the development standards to create a cohesive design concept for the entire site, and to provide for larger swaths of open space that will offer better amenities to the residents of Hillside.

19.311.3.B - Special Improvements. *In its approval of the final plan or land division plat within a PD Zone, the City may require the developer to provide special or oversize sewer lines, water lines, roads and streets, or other service facilities. Such approval shall not obligate the City to expend funds for additional construction equipment or for special road, sewer, lighting, water, fire, or police service.*
Response: It is not anticipated that special or oversized utility lines or roads will be necessary to develop the Planned Development that is being proposed. As described above, all of the existing infrastructure currently serving the site will be removed and replaced in phases and will be appropriately sized to serve the development proposed.

19.311.3.C - Density Increase and Control. *The City Council may permit residential densities which exceed those of the underlying zone, if it determines that the planned development is outstanding in planned land use and design and provides exceptional advantages in living conditions and amenities not found in similar developments constructed under regular zoning. In no case shall such density increase be more than 20% greater than the density range prescribed for the primary land use designation indicated in the Comprehensive Plan.*
Response: As shown in Table III-2 above, the portions of the site that will have the Comprehensive Plan designation of High Density Residential will exceed the maximum density of 24 dwelling units permitted in this designation. Lots D, F, G, H, J and K combined will have a density of 24.27 dwelling units per acre, which is well below the 20% increase above the density range permitted by this standard. This modest increase in density will be offset by the abundant open space and other outdoor amenities that will be provided throughout the site for the benefit of the residents.

19.311.3.D - Peripheral Yards. *Along the periphery of any PD Zone, additional yard depth, buffering, or screening may be required. Peripheral yards shall be at least as deep as that required by the front yard regulations of underlying zones. Open space may serve as peripheral yard and/or buffer strips to separate one planned area from another, if such dual use of the land is deemed to comply with this section.*
Response: The west side of Hillside is bounded by the railroad and across the railroad corridor the zoning is NME - North Milwaukie Employment Zone. The development proposal includes a thick landscape buffer along the west property line to assure that the residential buildings in Hillside will be adequately buffered from the noise of the railroad.

The properties to the south across Meek Street and southeast across SE 32nd Avenue are zoned GMU and currently undeveloped. The GMU zone encourages buildings to be close to street lot lines and provide an active frontage with public entrances, façade features and windows, therefore screening and buffering along the south property line of the site would not be appropriate with the GMU zoning.

The properties northeast across SE 32nd Avenue are zoned R3 and are mostly developed as Providence Milwaukie Hospital. Proposed Lot E on the Hillside site will be zoned GMU and as such will need to meet maximum setback and frontage occupancy standards that would not make buffering and screening from the hospital across 32nd Avenue practical. Lot F will be zoned R1 and will be across 32nd Avenue from an existing townhouse development. The buildings proposed on Lot F will be setback the required front yard minimum of the R1 zone – 15 feet – which will allow for a large area that will be planted with trees and lush landscaping to soften and screen the buildings from the townhouses across the street.

Along the north boundary of the site the neighborhood to the north is zoned R7 and developed with single-family houses. The proposed buildings on along the north boundary will be setback from the

property line a minimum of 15 feet (the front yard setback of the R1 zone). This setback will provide a wide landscape buffer that will be planted with trees and tall shrubs that will help obscure views and absorb sounds to protect the privacy of the neighboring houses. Additionally, all of the buildings that abut the north property line will be limited to 2 stories in height. Building F2 will be located on a sloped lot, so it might be 2 stories on the north side and three stories on the south to account for the topography of the lot.

With the proposed setbacks and landscape buffering from the properties to the north and northeast the peripheral yards standards will be met for the proposed Planned Development.

19.311.3.E - Open Space. *Open space means the land area to be set aside and used for scenic, landscaping, or open recreational purposes within the development. Open space may also include areas which, because of topographic or other conditions, are deemed by the City Council to be suitable for leaving in a natural condition. Open space shall be adequate for the recreational and leisure needs of the occupants of the development and shall include the preservation of areas designated by the City for open space or scenic preservation in the Comprehensive Plan or other plans adopted by the City.*

Response: The Planned Development features open space and recreational areas dispersed throughout the site that will provide outdoor spaces in an equitable way for all the residents of Hillside. By creating larger swaths of open space (versus small open areas dedicated to each residential unit) more resources can be placed in these open areas in the form of playground equipment, sports equipment, outdoor furnishing and landscaping, which will provide better overall amenities. Additionally, the large open area in the northwest corner of the site, which is currently popular with both residents and neighbors, will be preserved and enhanced to provide a large area for exercise, recreation and leisure. There are no areas on the site designated in the Comprehensive Plan for open space or scenic preservation, so this is not a factor in meeting this standard.

The development plan and program shall provide for the landscaping and/or preservation of the natural features of the land. To ensure that open space will be permanent, deeds or dedication of easements of development rights to the City may be required. Instruments and documents guaranteeing the maintenance of open space shall be approved as to form by the City Attorney. Failure to maintain open space or any other property in a manner specified in the development plan and program shall empower the City to enter said property in order to bring it up to specified standards. In order to recover such maintenance costs, the City may, at its option, assess the real property and improvements within the planned development.

Response: It is not anticipated that any of the open space features in Hillside will be deeded to the City. Easements and maintenance agreements for each of the communal open spaces will be created with the subdivision to assure that the open spaces will be accessible to all residents and well-maintained into the future.

All planned unit developments will have at least one-third of the gross site area devoted to open space and/or outdoor recreational areas. At least half of the required open space and/or recreational areas will be of the same general character as the area containing dwelling units. Open space and/or recreational areas do not include public or private streets.

Response: When all of the phases are completed Hillside will include 41% open space. This open space will be provided in the form of recreational areas, plazas, streetscape, and playgrounds. Additionally, there will be open space areas surrounding each of the residential buildings that will be landscaped to soften the site and reduce the heat island effect. This landscaping surrounding the buildings will be compatible with the general character of the buildings themselves.

Site Design Standards of Chapter 19.504.

The Supplementary Development Regulations of Chapter 19.500 apply when new development is proposed on a site and are generally regulated through Design Review. Conceptual compliance with these standards is address below to demonstrate that the proposed Planned Development will not create a situation in which these standards cannot be met at the time of development of the individual lots. The standards that apply are addressed as follows:

19.504.1 - Clear Vision Areas. *A clear vision area shall be maintained on the corners of all property at the intersection of two streets or a street and a railroad according to the provisions of the clear vision ordinance in Chapter 12.24.*

Response: All of the proposed lots and development will be able to comply with the clear vision requirements of Chapter 12.24. The proposed buildings will be setback from the corners and the proposed landscaping in the clear vision area will be selected to remain small to assure clear vision around the corners will not be blocked.

19.504.5 - Distance from Property Line. *Where a side or rear yard is not required and a structure is not to be erected at the property line, it shall be set back at least 3 ft from the property line.*

Response: No side or rear setbacks are required in the GMU zone so this standard will apply to Lots A, B, C and E. On each of these lots the proposed buildings will be setback at least 3 feet from the side and rear property lines to assure that this standard is met.

19.504.6 - Transition Area Measures. *Where commercial, mixed-use, or industrial development is proposed abutting or adjacent to properties zoned for lower-density residential uses transition measures shall be required.*

Response: Mixed use development is proposed for Lots A and E. These two lots will abut either R1 or GMU zoning within the site. The property to the south across Meek Street is zoned GMU and the property to the east across SE 32nd Avenue is zoned GMU and R3. Therefore, the lots proposed for mixed use will not abut and low-density residential zones (R5-R10) and this standard does not apply.

19.504.7 - Minimum Vegetation. *No more than 20% of the required vegetation area shall be covered in mulch or bark dust. Mulch or bark dust under the canopy of trees or shrubs is excluded from this limit.*

Response: Robust landscaping and open space areas are proposed throughout the site and will be a major feature of the development. The overall landscaped area of the development equates to 41% of the total area, well above the required minimum. Some bark dust will be installed around new plantings, but overall the landscaping will feature lush plantings, grassy lawns, and trees.

19.504.9 - On-Site Walkways and Circulation. *All development shall provide a system of walkways that encourages safe and convenient pedestrian movement within and through the development site. On-site walkways shall link the site with the public street sidewalk system. Walkways shall connect building entrances to one another and building entrances to adjacent public streets and existing or planned transit stops.*

Response: Each of the lots in the development will be surrounded by public streets with wide sidewalks. Within the lots the buildings, parking areas, and other amenities will have a direct walkway connection to the public sidewalks. New walkways on the lots will be hard-surfaced and at least 5-feet wide and will provide direct connections to the public sidewalk with limited obstructions or vehicle crossings.

19.504.10 - Setbacks Adjacent to Transit. *When adjacent to a street served by transit, new commercial, office, or institutional development, shall be set back no more than 30 ft from the right-of-way that is providing transit service.*

Response: SE 32nd Avenue is served by the #75 (Cesar Chavez/Lombard) bus, with bus stops located at the intersection with SE Hillside Court, so this setback applies to Lots A and E, which will have commercial or office uses on the ground floor. Both of the buildings proposed to be adjacent to SE 32nd Avenue (Building A2 and E1) will be setback at least 40 feet from the centerline of the 32nd Avenue right of way, so this maximum setback standard will be met.

Building Design Standards of Chapter 19.505.

Similar to the Site Design Standards found in Chapter 19.504, the Building Design Standards of Chapter 19.505 will be applied when new development is proposed on the lots and are generally regulated through Design Review. Conceptual compliance with these standards is address below to demonstrate that the proposed Planned Development will not prevent these standards from being met at the time of development of the individual lots. Based on the uses proposed for the Hillside site the standards that would apply are 19.505.3 for multi-family buildings and 19.505.7 for non-residential development. Additionally, 19.505.8 that regulates building orientation to transit would apply since 32nd Avenue is served by a transit line. These standards are addressed below:

Standards for Multi-Family Buildings (19.505.3):

19.505.3.D.1 - Private Open Space. *The development should provide private open space for each dwelling unit. Private open space should have direct access from the dwelling unit and should be visually and/or physically separate from common areas. The development may provide common open space in lieu of private opens space if the common open space is well designed, adequately sized, and functionally similar to private open space.*

Response: The proposed Planned Development will not preclude any of the future buildings from meeting the private open space requirements. The townhouse and walk-up apartments will likely provide the private open space in the form of small private yards adjacent to the units. The larger apartment buildings will either provide small balconies or common open space areas that may include some of the open space amenities already being planned into the larger planned development. It is assumed through the Planned Development process that the open space areas developed on individual lots (for example the playground on Lot E) will be credited towards meeting this open space standard for the development on Lot E. This will assure that there is a variety of different types of open space throughout the site meeting the recreational needs of a diverse population of residents.

19.505.3.D.2 - Public Open Space. *The development should provide sufficient open space for the purpose of outdoor recreation, scenic amenity, or shared outdoor space for people to gather.*

Response: As described earlier, the Planned Development will include a variety of public open space opportunities that will include playgrounds, sport courts, plazas with outdoor furnishings, pocket parks, and the lager open space area in the northwest corner of the site. It is assumed that these open space areas will be used in-part to meet the public open space standard for the individual buildings at the time of development.

19.505.3.D.5 - Building Orientation and Entrances. *Buildings should be located with the principal façade oriented to the street or a street-facing open space such as a courtyard. Building entrances should be well-defined and protect people from the elements.*

Response: The majority of the lots in the development will be surrounded by streets on at least three sides, therefore, orientating the building entrances to an adjacent street should not be an

issue for any of the future buildings. Though none of the buildings have been designed at this time, there is nothing in the design of the Planned Development that would preclude the buildings from including well-defined and protective entrances.

19.505.3.D.6 - Building Façade Design. *Changes in wall planes, layering, horizontal datums, vertical datums, building materials, color, and/or fenestration shall be incorporated to create simple and visually interesting buildings. Windows and doors should be designed to create depth and shadows and to emphasize wall thickness and give expression to residential buildings. Windows should be used to provide articulation to the façade and visibility into the street. Building façades shall be compatible with adjacent building façades.*
Response: The design of the Planned Development would not prevent any of the future buildings from being able to meet the façade design standards. During the development of each lot careful consideration of building façade design will be done to assure that all of the buildings will meet these standards.

19.505.3.D.7 - Building Materials. *Buildings should be constructed with architectural materials that provide a sense of permanence and high quality. Street-facing façades shall consist predominantly of a simple palette of long-lasting materials such as brick, stone, stucco, wood siding, and wood shingles. A hierarchy of building materials shall be incorporated. The materials shall be durable and reflect a sense of permanence and quality of development.*
Response: The vision for the redevelopment of Hillside is to construct buildings that feature durable, high-quality materials while still providing affordable housing options. As such, each of the future buildings will be designed in accordance with these standards.

19.505.3.D.8 - Landscaping. *Landscaping of multifamily developments should be used to provide a canopy for open spaces and courtyards, and to buffer the development from adjacent properties. Existing, healthy trees should be preserved whenever possible. Landscape strategies that conserve water shall be included. Hardscapes shall be shaded where possible, as a means of reducing energy costs (heat island effect) and improving stormwater management.*
Response: The Planned Development plan includes landscaping, open space recreation areas, and substantial buffers throughout the site. Throughout these areas existing healthy trees will be preserved where practical and new trees will be planted. Hardscaped areas such as parking lots and vehicle circulation areas will be shared when possible to minimize the overall impervious area on the site. Native and drought-tolerant plantings will be selected when appropriate and the irrigation systems installed throughout the site will be low-volume to conserve water.

19.505.3.D.9 – Screening. *Mechanical equipment, garbage collection areas, and other site equipment and utilities should be screened so they are not visible from the street and public or private open spaces. Screening should be visually compatible with other architectural elements in the development.*
Response: The design of the Planned Development would not prevent any of the future mechanical equipment, garbage areas or other site utilities from being screened in to meet these standards.

19.505.3.D.11 - Sustainability. *Multifamily development should optimize energy efficiency by designing for building orientation for passive heat gain, shading, day-lighting, and natural ventilation. Sustainable materials, particularly those with recycled content, should be used whenever possible. Sustainable architectural elements shall be incorporated to increase occupant health and maximize a building's positive impact on the environment. When appropriate to the context, buildings should be placed on the site giving consideration to optimum solar orientation. Methods*

for providing summer shading for south-facing walls, and the implementation of photovoltaic systems on the south-facing area of the roof, are to be considered.
Response: The proposed Planned Development reimagines Hillside from the ground up with sustainability as one of the cornerstones of the new community. The development pattern will be changed by emposing an orthogonal grid to the existing streets which will allow an orientation of buildings that will allow for more energy efficient design. Most of the buildings on the site will be multi-family affordable housing projects that are publicly financed and must adhere to a green building program. It is anticipated that these buildings will be certified through Earth Advantage or a similar program, assuring that they will be energy efficient, constructed of sustainable and durable materials, and healthy for the occupants.

Additionally, throughout the development there will be a major emphasis on alternative modes of transportation by providing green streets with wide sidewalk corridors and planter strips, and integration of the transit stops on 32nd Avenue with ample bike parking. Planting zones will be maximized to provide lush landscaping and tree species with large canopies that support the City of Milwaukie's Urban Forestry 40% canopy coverage goal. Green roofs on buildings are encouraged and will contribute to reducing the stormwater released into the treatment system.

19.505.3.D.12 - Privacy Considerations. *Multifamily development should consider the privacy of, and sight lines to, adjacent residential properties, and be oriented and/or screened to maximize the privacy of surrounding residences.*
Response: Adjacent residential properties zoned low-density residential (R-7) exist to the north of the site. The buildings on the north side of the site have been setback at least 15 feet from the north property line in order to provide a wide landscape buffer from the houses to the north. This area has mature existing trees will be further planted with trees and tall shrubs that will help obscure views and absorb sounds to protect the privacy of these neighboring homes. Additionally, all of the buildings that abut the north property line will be limited to two stories in height. Building F2 will be located on a sloped lot, so it is proposed as two stories on the north side and three stories on the south to account for the topography of the lot.

19.505.3.D.13 - Safety. *Multifamily development should be designed to maximize visual surveillance, create defensible spaces, and define access to and from the site. Lighting should be provided that is adequate for safety and surveillance, while not imposing lighting impacts to nearby properties. The site should be generally consistent with the principles of Crime Prevention Through Environmental Design.*
Response: The future landscaping and site lighting will be designed with safety in mind. Additionally, the layout of the Planned Development, which will replace the angled streets and dead-end cul-de-sacs with a more open and easily surveilled circulation plan will help to bolster these safety measures.

Standards for Non-Residential Development (19.505.7):
19.505.7.C.1 – Corners. *Buildings located at a key corner in the GMU Zone, as shown on Figure 19.505.7.C.1, shall incorporate corner features.*
Response: The site is not included on the above referenced Figure, so these standards do not apply.

19.505.7.C.2 - Weather Protection. *Through the use of awnings and canopies along the ground floor of buildings protect pedestrians from rain, provide shade, encourage window shopping and lingering, and create visual interest on the ground floor of a building.*

Response: Buildings A2 and E1 (the only proposed mixed-use buildings on the site) will be able to provide awnings or canopies along the ground floor. The proposed Planned Development will not preclude the buildings from meeting these standards.

19.505.7.C.3 - Exterior Building Materials. *Provide a sense of permanence, through the use of certain permitted building materials; to provide articulation and visual interest to larger buildings; and to allow for a variety of materials and designs. Table 19.505.7.C.3 specifies the primary, secondary, and prohibited material types referenced in this standard.*
Response: Buildings A2 and E1 will be constructed of durable, high-quality materials selected from Table 19.505.7.C.3, however, to maintain the overall affordability of these buildings it is proposed that this standard be modified to allow both "finished metal panels" and "fiber-reinforced cement siding and panels" (i.e. Hardie plank) to be used as primary building materials required to cover at least 60% of the applicable building façades instead of secondary materials limited to only 40% of the building façade. The quality and durability of these materials has increased in recent years as demonstrated on a number of projects throughout the region.

19.505.7.C.4 - Windows and Doors. *Enhance street safety and provide a comfortable pedestrian environment by providing ground-level transparency between the interior of buildings and the sidewalk.*
Response: Buildings A2 and E1 will be able to meet all of the applicable window standards by providing both ground-floor windows and doors that meet the standards of this section. The proposed Planned Development will not preclude the buildings from meeting these standards.

19.505.7.C.5 – Roofs. *Enliven the pedestrian experience and create visual interest through roof form.*
Response: The proposed Planned Development will not prevent Buildings A2 and E1 from complying with the roofing standards.

19.505.7.C.6 - Rooftop Equipment and Screening. *Integrate mechanical equipment into the overall building design.*
Response: All mechanical equipment placed on the roofs of Buildings A2 and E1 will be screened from public view.

19.505.7.C.7 - Ground-Level Screening. *Mechanical and communication equipment, outdoor storage, and outdoor garbage and recycling areas shall be screened so they are not visible from streets, other ground-level private open space, or common open spaces.*
Response: The design of the Planned Development would not prevent any of the future mechanical equipment, garbage areas, or other site utilities from being screened to meet these standards.

19.505.7.C.8 - Rooftop Structures. *Rooftop structures related to shared outdoor space—such as arbors, trellises, or porticos related to roof decks or gardens—shall not be included in the building's maximum height calculation, as long as they do not exceed 10 ft in height.*
Response: No rooftop structures are anticipated on Buildings A2 or E1 at this time.

19.505.8 - Building Orientation to Transit. *New mixed-use buildings shall have their primary orientation toward a transit street or, if not adjacent to a transit street, a public right-of-way which leads to a transit street. The primary building entrance shall be visible from the street and shall be directly accessible from a sidewalk connected to the public right-of-way. A building may have more than 1 entrance.*

Response: Both Buildings A2 and E1 are located directly adjacent to SE 32nd Avenue (a transit street) and will be able to orient the main building entrances to this street.

Parking and Loading.

The standards for off-street parking and loading are found in Chapter 19.600 of the Zoning Code. These standards are addressed below:

19.605.1 - Minimum and Maximum Requirements. *Development shall provide at least the minimum and not more than the maximum number of parking spaces as listed in Table 19.605.1. Modifications to the standards in Table 19.605.1 may be made as per Section 19.605.*

Response: The minimum and maximum standards of Table 19.605.1 that apply to the residential uses on the site are as follows:

Table III-8 – Minimum and Maximum Parking Standards

Multifamily dwellings containing 3 or more dwelling units	Minimum Requirement	Maximum Requirement
Dwelling units with 800 sq. ft. of floor area or less	1 space per dwelling unit	2 spaces per dwelling unit
Dwelling units with more than 800 sq. ft. of floor area	1.25 spaces per dwelling unit	2 spaces per dwelling unit

For the purpose of comparing the number of provided parking spaces to the minimum parking requirements for multifamily dwellings above, Exhibit D has been provided. This table shows the breakdown of unit type for each of the proposed buildings, assuming that all 1- and 2-bedroom units will 800 sq. ft. or below and all larger units will be above 800 sq. ft.

Building H, the existing Manor building, includes a total of 59 existing parking spaces surrounding the building. This parking ratio for the Manor is vested with the 1969 Variance, which approved the Manor with a total of 40 parking spaces. Since this decision, additional parking spaces have been added near the tower to bring the total to 59 spaces, for a parking ratio of 0.59 spaces per unit. There are no changes to the Manor site included with this Planned Development request, so the existing non-conforming parking rights would be preserved.

In addition, up to 20,000 square feet of the ground floor building area in buildings A2 and E1 will be used for commercial uses. As described earlier in this report, the list of uses in the GMU zone that will be permitted in these buildings will be modified to only include uses that are compatible with residential use and would serve the immediate neighborhood. The minimum and maximum parking requirements for the uses being considered in the GMU zone are as follows:

Table III-9 – GMU Minimum and Maximum Parking Requirements

Use	Minimum Requirement	Maximum Requirement
General office	2 spaces per 1,000 sq. ft.	3.4 spaces per 1,000 sq. ft.
Eating and drinking establishments	4 spaces per 1,000 sq. ft.	15 spaces per 1,000 sq. ft.
Indoor recreation	3 spaces per 1,000 sq. ft.	5.5 spaces per 1,000 sq. ft.
Retail-oriented sales	2 spaces per 1,000 sq. ft.	5 spaces per 1,000 sq. ft.
Personal/business services	4 spaces per 1,000 sq. ft.	5.4 spaces per 1,000 sq. ft.
Day care	2 spaces per 1,000 sq. ft.	3.5 spaces per 1,000 sq. ft.
Commercial Services (includes repair shops)	2.8 spaces per 1,000 sq. ft.	5.1 spaces per 1,000 sq. ft.

Since the actual uses in these buildings is currently unknown, in the interim the minimum parking requirement for all of the GMU uses proposed can roughly be averaged to 3 spaces per 1,000 sq. ft for determining the likely parking requirement. This average takes into account the low parking intensive uses (Office, Retail and Day Care) with the high parking intensive uses (Eating and Drinking Establishments and Personal/business services).

Additionally, the entire site qualifies the 20% parking reduction of 19.605.3.B.2.b since the site is in close proximity to public transit. SE 32nd Avenue is served by the #75 (Cesar Chavez/Lombard) bus that operates with 15-minute or better service most of the day. Bus stops are located at both the intersection of SE Hillside Court and the intersection with SE Meek Street.

A total of 352 on-site parking spaces are proposed. These parking spaces will be adequate to serve the development based on the following site-specific factors:

- **Reduced Parking Requirement for Affordable Housing.** The ITE Parking Manual, 5th Edition shows an average parking rate for Affordable Housing (ITE category 223) of 1.3 spaces/unit compared to a parking rate of 1.7 spaces per unit for typical market rate Multifamily Mid-Rise Housing (ITE category 221). This equates to affordable housing requiring approximately 25% fewer parking spaces than market rate housing.

  This reduced need for parking is consistent with what HACC has found with the properties it owns and manages. The low-income populations that HACC serves have very limited access to personal vehicles due to the high cost of ownership and maintenance of a vehicle. Additionally, many lower income residents are seniors or people living with physical ailments who have difficulty driving their own car. A recent survey of the Manor residents found that only 36% of the residents reported driving in the past week. This same surveyed population was found to be very dependent on other modes of transportation such as Tri-Met (37%), carpooling (40%), and taxi or ride-share (11%). As such there is strong case to be made that a 25% parking reduction should be applied to all of the proposed affordable housing which include all the buildings on Lots B, C, D, F, G and K.

- **Shared Parking between Commercial and Residential Uses.** The small commercial businesses proposed for Buildings A2 and E1 will have peak parking demands that will not coincide with the peak parking demands of the multi-family units. Exhibit F demonstrates the potential peak parking demands from the ITE Manual of several small commercial business, such as an office,

a coffee shop, a casual dining restaurant, and a shopping center. As shown in this table, the majority of commercial business experience their peak demand during the daytime, typically between the hours of 9 am and 5 pm. Exhibit F also compares the peak demand hours of the commercial uses to multi-family residential housing, which experiences its peak parking demand in the evening and nighttime hours, typically from 10 pm to 7 am according to the ITE. Therefore, the case can be made that the two uses can share parking spaces since the peak parking demands are near opposites.

Additionally, the type of commercial uses proposed for the development are specifically selected to be uses that would attract residents of Hillside and the surrounding neighborhood as customers. Therefore, it is likely that a large percentage of the customers that patronize these businesses will walk or bike to them, further reducing the need for additional parking spaces dedicated to the commercial businesses.

Finally, both of the commercial ground floors will front onto SE 32nd Avenue, a public street that will include 19 on-street parallel parking spaces that would be available to serve the commercial uses. It is suggested that parking restrictions, such as a 2-hour limit during the daytime be added to these spaces to help foster their use as short-term parking serving the commercial businesses.

- **Additional On-Street Parking within the Development Site.** A total of 137 on-street parking spaces will be developed within the new street network that includes Dwyer Street, Hillside Court, Meek Street, SE 28th Avenue, SE 29th Avenue, and SE 31st Avenue. The Milwaukie Zoning Code does not allow on-street parking to count toward minimum or maximum parking requirements, but in this case these parking spaces are interior to the site and will not be convenient for anyone other than the residents and guests of Hillside. There are other jurisdictions in the region including Hillsboro[3], Gladstone[4], Clackamas County[5] and Lake Oswego[6] who allow on-street parking to count toward on-site parking requirements establishing a precedent for recognizing the functional use of the spaces.

  It should be noted that the 19 on-street parking spaces on SE 32nd Avenue have not been included in the 137 total on-street spaces available to serve the residential units. As described above these spaces on SE 32nd Avenue will be allocated toward the commercial uses during the day but will still be available for resident parking during the night.

[3] Section 12.50.340 of the Hillsboro Code states: "If a development includes construction or reconstruction of public streets to provide additional on-street parking, off-street parking may be reduced by 1 off-street space for each constructed on-street space if the new on-street parking is configured consistent with existing on-street parking."

[4] Section 17.48.030.f of the Gladstone Code states: "On-street parking may count towards fulfilling up to one-quarter of the off-street parking requirements where on-street parking is allowed and the applicant can demonstrate that on-street parking is available. On-street parking must be available on the subject site's frontage in order to be credited towards the off-street parking requirement."

[5] Section 1015.02.D.2.b of the Clackamas County Code states: "In commercial and industrial zoning districts, available permitted on-street parking spaces on a development's street frontage may be counted toward required parking."

[6] Section 50.05.004.9.a.iii of the Lake Oswego Code/Downtown Design District states: "Existing on-street parking along the property frontage shall be used to calculate parking requirements."

- **Transportation Demand Measures to Reduce Vehicle Use.** The physical form of the development is designed to encourage the use of walking, biking, and transit. Additional measures will be implemented on the site to further encourage the use of alternate means of transportation. It is assumed that these measures will help to reduce the residents' reliance on individual vehicles, which will further reduce the need for parking spaces. TDM measures that are currently under consideration by HACC are listed below. The final TDM program will be provided with the Final Planned Development application.
  - Bicycle Facilities: Provide an on-site bicycle repair station.
  - Bicycle Maintenance Services: Bring in mobile maintenance service several times annually.
  - Wayfinding Station: Provide on-site kiosk or information center with multi-modal wayfinding information and transit information.
  - TDM Coordination: Designate an on-site TDM Coordinator (can be property manager) offering multi-modal and wayfinding information, rideshare matching, walking/biking group coordination.
  - TDM Communication: Distribute transit, wayfinding, and other TDM informational materials to new residents as they move in and annually to all residents.
  - Bicycle Share Program: Provide private or public bicycle share memberships to on-site residents and establish a bike-share station on-site.
  - E-Scooter Share Program: Create a designated space on site for shared scooters.
  - Dedicated Ride-Share Spaces: Designate some on-site parking spaces for the use by programs like Uber and Lyft.

As shown on Exhibit E, the combination of the affordable housing reduction, the shared parking for the commercial uses and the on-street parking spaces in the interior of the site will result in all of the minimum parking requirements of the multifamily housing and commercial uses being met, with an additional surplus of 52 parking spaces above the required minimums. The combination of the on-site parking and the additional 137 on-street parking spaces results in an overall functional parking rate of 0.82 spaces per unit. The strong emphasis on walking, biking, transit, and a robust TDM program will further reduce resident's reliance on vehicles allowing the parking spaces proposed to adequately serve the needs of the development.

19.606.1 Parking Space and Aisle Dimensions. *The dimensions for required off-street parking spaces and abutting drive aisles shall be no less than in Table 19.606.1.*

Response: The parking areas shown on the Planned Development plan have been laid out conceptually based on the standards of Table 19.606.1 using a 9-ft wide and 18-ft long parking space. Full compliance with these standards will be show at the time of development.

19.606.2.C Perimeter Parking Lot Landscaping. *The perimeter landscaping of parking areas shall meet the following standards.*

1. *Dimensions. The minimum width of perimeter landscape areas are shown in Table 19.606.2.C.1.*
2. *Planting Requirements. Landscaping requirements for perimeter buffer areas shall include one tree planted per 30 lineal ft of landscaped buffer area. The remainder of the buffer area shall be grass, ground cover, mulch, shrubs, trees, or other landscape treatment other than concrete and pavement.*

Response: The perimeter parking lot landscaping adjacent to the right-of-way in the GMU zone have been designed at 4-ft wide, consistent with Table 19.606.2.C.1 for Downtown Zones. In the R1 zone the perimeter parking lot landscaping buffers adjacent to the right-of-way have been designed at 8

feet. The parking lots on Lots K and F, which are the only parking areas abutting another property have been designed with a 6-ft buffer.

3. *Additional Planting Requirements Adjacent to Residential Uses. In addition to the planting requirements of Subsection 19.606.2.D.2, all parking areas adjacent to a residential use shall have a continuous visual screen in the landscape perimeter area that abuts the residential use. The screen must be opaque throughout the year from 1 to 4 ft above ground to adequately screen vehicle lights.*

Response: The buffer along the northern edge of the site, adjacent to the R7 zoning is proposed at 15-ft wide and will be planted with trees and tall shrubs that will help obscure views and absorb sounds to protect the privacy of the neighboring houses. This lush landscape buffer will also serve to meet this parking lot planting standard.

D. Interior Parking Lot Landscaping

1. *General Requirements. Interior landscaping of parking areas shall be provided for sites where there are more than 10 parking spaces on the entire site.*
2. *Required Amount of Interior Landscaped Area. At least 25 sq ft of interior landscaped area must be provided for each parking space. Planting areas must be at least 120 sq ft in area and dispersed throughout the parking area.*
3. *Location and Dimensions of Interior Landscaped Areas.*
   a. *Interior landscaped area shall be either a divider median between opposing rows of parking, or a landscape island in the middle or at the end of a parking row.*
   b. *Interior landscaped areas must be a minimum of 6 ft in width.*
4. *Planting Requirements for Interior Landscaped Areas*
   a. *For divider medians, at least 1 shade or canopy tree must be planted for every 40 linear ft. Trees shall be planted at evenly spaced intervals to the greatest extent practicable.*
   b. *For landscape islands, at least 1 tree shall be planted per island. If 2 interior islands are located contiguously, they may be combined and counted as 2 islands with 2 trees planted.*
   c. *The remainder of any divider median or landscape island shall be grass, ground cover, mulch, shrubs, trees, or other landscape treatment other than concrete and pavement.*

Response: Interior parking lot islands in compliance with these standards have been shown in all of the parking lots proposed in the Planned Development, as illustrated on Figure MP 2.2. Full compliance with these standards will be show at the time of development.

19.608.2 - Number of Loading Spaces. *The ratios listed below should be the minimum required unless the Planning Director finds that a different number of loading spaces are needed upon reviewing the loading needs of a proposed use.*

A. *Residential Buildings. Buildings where all of the floor area is in residential use should meet the following standards:*
   1. *Fewer than 50 dwelling units on a site that abuts a local street: no loading spaces required.*
   2. *All other buildings: 1 loading space.*
B. *Nonresidential and Mixed-Use Buildings. Buildings where any floor area is in nonresidential uses should meet the following standards:*
   1. *Less than 20,000 sq. ft. of total floor area: no loading spaces required.*
   2. *20,000 to 50,000 sq. ft. of total floor area: 1 loading space.*
   3. *More than 50,000 sq. ft. of total floor area: 2 loading spaces.*

Response: These standards required to calculation of required loading spaces to be is based on the individual lots and building, Proposed Buildings B2 and C1 will be entirely residential use and will contain more than 50 dwelling units, so each of these buildings will require one loading space.

Proposed Buildings A2 and E1 will be mixed-use buildings with a floor area of more than 50,000 sq. ft. for each building, so each of these buildings will also require two loading spaces. The combined total is six loading spaces between these four buildings. However, because all of these lots and buildings will be developed in compliance with the Planned Development, a modification using Section 19.311.3 is requested to allow the loading space requirement to be applied site-wide allowing some of these buildings to share loading spaces. Additionally, some of the required loading spaces are proposed to be provided in the street instead of on individual lots so that they can better serve more than one building.

Figure MP 1.6, the Vehicle Circulation Plan shows where the proposed loading spaces will be located. A dedicated loading area will be provided in front of buildings C and H (the Manor). An on-street loading space will be provided on SE 31st adjacent to the northwest corner of Lot E, which can serve the buildings on Lot D, E, and F. A second on-street loading space is provided on SE 31st adjacent to the southeast corner of Lot D which can serve the buildings on Lots A, B, D, and E.

19.608.3 - Loading Space Standards. *Loading spaces shall be at least 35-ft long and 10-ft wide and shall have a height clearance of at least 13 ft. Loading areas shall be provided on the site and be separate from parking spaces.*
Response: All of the loading spaces described above will meet the loading space standards. A modification is included as part of the Planned Development to allow these spaces to be located in the street instead of on individual lots to allow them to serve more buildings.

19.609.2.A - Quantity of Bicycle Parking Spaces. *The quantity of required bicycle parking spaces shall be as described in this subsection. In no case shall less than 2 spaces be provided.*

1. *The number of bicycle parking spaces shall be at least 10% of the minimum required vehicle parking for the use.*
3. *Multifamily residential development with 4 or more units shall provide 1 space per unit.*

Response: For each of the residential buildings proposed on the site the minimum number of bicycle parking spaces required will be the same as the number of units. For the commercial uses proposed on the ground floor of buildings A2 and E1 the number of bike parking spaces will be determined by the uses in each building, but in no case will there be less than two spaces for each use. Based on these minimum requirements over 510 bicycle parking spaces would be required on the site, which exceeds the amount that is likely to be used.

Based on the resident populations in HACC's other properties (including the Hillside Manor) many residents of affordable housing are elderly or disabled and not likely to use bicycles for transportation. Additionally, the existing bicycle network surrounding the site at this time is not well developed, making travel by bicycle a less attractive option. A Central Milwaukie Bikeway Concepts plan is currently in development and if adopted, will greatly improve the bicycle connections surrounding the site, but is still years away from full development. HACC fully supports the development of this enhanced bike network through the Hillside site, however, even with this future bike connection a reduction to on-site bike parking is still supportable based on anticipated bicycle usage of the residents. Therefore, a Modification through the Planned Development review is requested to reduce the minimum number of required bicycle parking spaces on the site to 0.75 spaces per unit which would bring the total number of spaces down to 375 spaces required to serve the residential units plus the additional spaces to serve the commercial uses.

These bicycle parking spaces will be provided in bike rooms inside of the buildings as well as in clusters around the site. Figure MP 1.7 the Pedestrian Circulation Plan shows where concentrations

of bike racks will be provided, with several rack located around the exterior of buildings A2 and E1 to serve the future commercial uses in these buildings.

19.609.2.B - Covered or enclosed bicycle parking. *A minimum of 50% of the bicycle spaces shall be covered and/or enclosed (in lockers or a secure room)***.**
Response: Bicycle parking for the new multi-family buildings will be partially provided in combined bike storage rooms inside the buildings assuring that at least 50% of the bike parking spaces will be covered.

19.609.4 – Bicycle parking location. *Bicycle parking facilities shall be located within 50 ft of the main building entrance or closer to the entrance than the nearest non-ADA designated vehicle parking space and dispersed for multiple entrances.*
Response: As shown on Figure MP 1.7, the Pedestrian Circulation Plan, the concentrations of bicycle parking locations will be dispersed throughout the site to be convenient to all of on-site amenities and gathering spots. Additionally, bike parking will be provided within 50 feet of the all of proposed buildings.

LAND DIVISION STANDARDS

The following section describes the standards that apply to the 9-lot subdivision included in the Final Planned Development application and demonstrates how the proposed lot pattern complies with the standard of Title 17.

17.28.040.A - Size and Shape. *Lot size, width, shape, and orientation shall be appropriate for the location and the type of use contemplated. Minimum lot standards shall conform to Title 19.*
Response: The proposed lot pattern is shown on the Preliminary Plat Figure MP 4.01. Additionally, Tables III-4 and III-5 above show how each of the lots can comply the applicable size and dimensional standards of the R1 and GMU zones of Title 19, which will be applied to the lots. The size and shape of the lots was primarily dictated by desire to create a street gird that is more rectilinear to improve overall site circulation and safety. The deviations in this grid-pattern are generally in response to the existing development on the site that will remain including the Manor building and surrounding parking and the open space area in the northwest corner. Additionally, the need to connect the new streets into the existing street network that surrounds the site skewed the gird pattern. Each of the lots are an appropriate size to develop with multi-family buildings while also providing open space amenities and adequately meeting the development standards such as parking, pedestrian circulation, and landscaping.

17.28.040.B – Rectilinear Lots Required. *Lot shape shall be rectilinear, except where not practicable due to location along a street radius, or existing lot shape. The sidelines of lots, as far as practicable, shall run at right angles to the street upon which the lots face. As far as practicable, the rear lot line shall run parallel to the street.*
Response: As described above, the desire to redevelop the streets in a 90-degree grid pattern will result in the majority of the proposed lots being rectilinear. The location of the Manor tower and surrounding parking, which will remain on the site, results in Lots H, C and K (Parcel 1 of PP 2020-026 and Lots 3 and 8) being skewed and not having right angles on all corners. Additionally, new SE 29th Avenue will need to connect to the existing right of way in the neighborhood to the north, creating irregular angles in Lots G and K (Lots 7 & 8). Except for these variations, the side and rear lot lines will run parallel to the new streets as much as practical.

17.28.040.C - Limits on Compound Lot Line Segments. *Changes in direction along side and rear lot lines shall be avoided. Cumulative lateral changes in direction of a side or rear lot line exceeding 10% of the distance between opposing lot corners along a given lot line may only be permitted through the variance provisions of MMC Subsection 19.911. Changes in direction shall be measured from a straight line drawn between opposing lot corners.*
Response: The only lot line in the development that includes changes in direction is the rear lot line of Lot K (Lot 8). This lot line backs up the Manor and the open space tract (Lot J/9) both of which are existing features of the site with boundaries that follow the slope of the existing site topography. Though Lot K/8 will feature a compound lot line on the rear, the change in direction will not exceed the 10% requirement and this standard is met.

17.28.040.D - Adjustments to Lot Shape Standard. *Lot shape standards may be adjusted subject to Section 19.911 Variances.*
Response: No adjustments to the lot shape standards are anticipated with this plat, so this standard does not apply.

17.28.040.E - Limits on Double and Reversed Frontage Lots. *Double frontage and reversed frontage lots should be avoided, except where essential to provide separations of residential development from railroads, traffic arteries, or adjacent nonresidential uses, or to overcome specific disadvantages of topography and orientation.*
Response: Several of the lots included in the subdivision will comprise of full city blocks with frontages on all four sides. Therefore, Lots A, B, C, D, E, and G (Lots 1, 2, 3, 4, 5, 6 and 7) will all be technically considered double frontage lots. Through Section 19.311.3 a modification is requested to allow double frontage lots because the proposed subdivision represents a unique situation where full-sized, urban-scale blocks are being created.

17.28.040.F - Measurement of Required Frontage. *Pursuant to the definition and development standards contained in Title 19 for frontage, required frontage shall be measured along the street upon which the lot takes access.*
Response: As shown in Tables III-4 and III-5 all of the proposed lots will exceed the minimum frontage requirement of R1 and GUM zones.

Additional Land Division Development Standards of Chapter 17.28. The other development standards of Title 17 apply to the proposal and include:

- ***17.28.010 Conformity of Subdivision*** - which requires subdivisions to comply with the development plans of the City, take into consideration any preliminary plans and conform with state laws. Compliance with this standard will be addressed with the submittal of the subdivision application.
- ***17.28.020 Public Facility Improvements*** – which requires subdivisions to comply with Chapter 19.700, which is addressed below to show how the Final Planned Development conforms with these standards.
- ***17.28.030 Easements*** – which addresses easements over utility lines and watercourses, neither of which are necessary with this proposal since all utilities will be located in the right of ways and there are no watercourses on the site.
- ***17.28.080 Public Open Spaces*** – which addresses the dedication of areas for schools, parks and playground for public use. Although all of the open space areas will be open to the residents of the neighborhood, none of these require dedication to the public, since they will be owned and maintained by HACC.

INFRASTRUCTURE

The following section describes the standards that will apply to the streets and utilities proposed in the Planned Development. This section shows general compliance with Chapter 19.700 - Public Facility Standards and Requirements and the applicable requirements of Chapter 13.

19.708 Transportation Facility Requirements

19.708.1.D General Street Requirements and Standards in Non-Downtown Zones. *Development in a non-downtown zone that has frontage on a street section is subject to the requirements of the Milwaukie Public Works Standards, which implements the street design standards and right-of-way dedication requirements. The following general provisions apply to development that is not in any of the downtown zones:*

1. *Streets shall be designed and improved in accordance with the standards of this chapter and the Public Works Standards. ODOT facilities shall be designed consistent with State and federal standards. County facilities shall be designed consistent with County standards.*
2. *Streets shall be designed according to their functional classification per Figure 8-3b of the TSP.*

Response: The streets in the Planned Development have been designed to take into account the Public Works Standards and the anticipated functional classifications of each street. The majority of the streets proposed are new streets so they are not currently shown in the TSP, but they have been designed based on their connections to the existing roadway network, the anticipated traffic, and how many units they will typically serve. The street designs that are proposed are as follows and street sections illustrating these streets can be found on Figure MP 2.6:

- **SE Meek Street:** A Neighborhood Street with an approximately 54-ft right-of-way. Two options for developing this street have been shown based on the level of participation by the owners of the Murphy site to the south. If the Murphy site grants permission to develop a portion of the new street on their site, then Meek Street will be developed as a 3/4 street with at least a 20-ft driving surface allowing two travel lanes, parking, a bike lane, and a sidewalk on the north side.

  If the Murphy site is not willing to allow a portion of the new street on their site (until they are ready to redevelop) then Figure MP 1.9 shows an alternate configuration for Meek Street. In this version, the on-street parking, curb-returns and bike lane have been removed to allow the full 20-ft wide driving surface entirely on the Hillside site. Later, when either an agreement with the Murphy site is reached, or they develop their half of the street, the 14 on-street parking spaces and bike lane can be added back in to the north side of the street.

- **SE Hillside Court:** A Local Street with a right-of-way that varies between 68 feet (adjacent to Lots B and D) and 60 feet (adjacent to Lots C and H). The east end of this street will be developed as a Living Street with a number of traffic calming devices including wider sidewalks, decorative paving near the intersections and planters to de-emphasize the vehicle roadway. These measures will help transition the street into the public plaza located between buildings A and E and allow the street to function as a community gathering space during special events. The northern sidewalk of this portion of street is 20-ft wide and envisioned to function like a boardwalk.

- **SE Dwyer Street:** A Local Street with a 60-ft right-of-way. This street will include a 34-ft wide roadway with parking on both sides, a 6-ft sidewalk and a 7-ft wide planter strip.

- **SE 32nd Avenue:** This existing street is classified as a Collector Street in the TSP. New on-street parallel parking will be constructed along the west side of this street for the entire site frontage providing 19 new parking spaces and a bus turnout. These improvements will require the existing curb and sidewalk to be moved to the west and reconstructed with a 6-ft wide sidewalk and an 8-ft wide planter strip. A dedication along this frontage is anticipated to accommodate the new sidewalk corridor and planter strip within the right-of-way.

- **SE 31st Avenue:** A Local Service Street with a 42-ft right-of-way consisting of a 22-ft wide roadway, 6-ft wide sidewalk and 4-ft wide planter strip.

- **SE 29th Avenue:** This street is classified in the TSP as a Multi-Use Connector. It is proposed as a Local Street with a 60-ft right-of-way consisting of a 34-ft wide roadway with parking on both sides, a 6-ft sidewalk and a 7-ft wide planter strip. This street will terminate at the north end with a 24-ft radius cul-de-sac turnaround for vehicle use. North of the cul-de-sac the street will be blocked by removable bollards that will prohibit vehicle access into the neighborhood to the north but will still allow access for emergency vehicles pedestrians and bicycles.

- **SE 28th Avenue:** A Local Street with a 52-ft wide right-of-way. This street will include a 34-ft wide roadway. The east side of the street will include a 6-ft wide sidewalk and a 7-ft wide planter strip. The west side of the street, adjacent to the boundary of the property and the railroad line will have a 5-ft wide planter strip but no sidewalk.

3. *Street right-of-way shall be dedicated to the public for street purposes in accordance with Subsection 19.708.2.*
   Response: It is anticipated that all of the streets within the development will be public and therefore dedicated to the City in accordance with 19.708.2 as part of the platting process.

4. *The City shall not approve any development permits for a proposed development unless it has frontage or approved access to a public street.*
   Response: It is anticipated that the streets will be dedicated to the public as part of the platting process, which will occur before development permits for the lots are applied for. Therefore, all lots will have frontage at the time of development.

5. *Off-site street improvements shall only be required to ensure adequate access to the proposed development and to mitigate for off-site impacts of the proposed development.*
   Response: The only off-site street improvements anticipated are the improvements to SE 32nd Avenue described above.

6. *The following provisions apply to all new public streets and extensions to existing public streets.*
   a. *All new streets shall be dedicated and improved in accordance with this chapter.*
   b. *Dedication and construction of a half-street is generally not acceptable. However, a half-street may be approved where it is essential to allow reasonable development of a*

property and when the review authority finds that it will be possible for the property adjoining the half-street to dedicate and improve the remainder of the street when it develops. The minimum paved roadway width for a half-street shall be the minimum width necessary to accommodate 2 travel lanes pursuant to Subsection 19.708.2.

Response: The majority of the streets proposed will be new public streets and therefore will be dedicated through the platting process. No half-streets are proposed, however, a few 3/4 streets are proposed. Meek Street will be a 3/4 street, which will be completed when the Murphy property to the south is developed. Additionally, during Phase 1 Hillside Court and SE 29th Avenue will be constructed as 3/4 streets and then completed with the future phases of development. Because these streets are interior to the development site it will be possible to improve the remainder of these streets with the future phases of development. These 3/4 streets are proposed to be constructed with a rolled asphalt curb on the unfinished side to allow for easy future construction of the finished curb and sidewalk. All of the 3/4 streets will include at least a 20-ft wide roadway to allow for emergency vehicle access.

7. *Traffic calming may be required for existing or new streets. Traffic calming devices shall be designed in accordance with the Public Works Standards or with the approval of the Engineering Director.*

   Response: Traffic calming devices are voluntarily being added to the Living Street section of Hillside Court, including a narrowed driving surface and landscaping planters that will help define this street as an extension of the pedestrian plaza to the east. These devices will be designed in accordance with the Public Works standards.

8. *Railroad Crossings. Where anticipated development impacts trigger a need to install or improve a railroad crossing, the cost for such improvements may be a condition of development approval.*

   Response: No railroad crossings will be required on the site.

9. *Street Signs. The City shall install all street signs, relative to traffic control and street names, as specified by the Engineering Director. The applicant shall reimburse the City for the cost of all such signs installed by the City.*
10. *Streetlights. The location of streetlights shall be noted on approved development plans. Streetlights shall be installed in accordance with the Public Works Standards or with the approval of the Engineering Director.*

Response: The design of street signs and lighting will be done as part of the Final Planned Development submittal and will comply with all applicable Public Works Standards.

19.708.1.E. Street Layout and Connectivity

1. *The length, width, and shape of blocks shall take lot size standards, access and circulation needs, traffic safety, and topographic limitations into consideration.*
2. *The street network shall be generally rectilinear but may vary due to topography or other natural conditions.*

   Response: The new street network proposed with the Planned Development will create a rectilinear grid that will improve traffic safety while assuring that all of the lots will have their access and circulation needs met. All interior street intersections have been designed with a 20-ft curb radius to assure that a large trash truck or fire truck can maneuver through the site, while still slowing traffic to provide safer conditions for bikes and pedestrians. The curb radius for the two intersections at SE 32nd Street have been designed with a 30-ft curb radius.

3. *Streets shall be extended to the boundary lines of the developing property where necessary to give access to or allow for future development of adjoining properties.*
4. *Permanent turnarounds shall only be provided when no opportunity exists for creating a through street connection. For proposed land division sites that are 3 acres or larger, a street ending in a turnaround shall have a maximum length of 200 ft, as measured from the cross street right-of-way to the farthest point of right-of-way containing the turnaround. Turnarounds shall be designed in accordance with the requirements of the Public Works Standards.*
5. *A street with a permanent turnaround may serve no more than 20 lots.*

   Response: SE 29th Avenue is proposed with a permanent cul-de-sac turnaround at the end of a an approximately 250-ft street length (measured from the intersection with SE Dwyer Street). North of the turnaround the street will continue through the northern property line of the site to provide a connection for emergency vehicles, bicycles, and pedestrians. This access will be controlled with removable bollards.

   This 24-ft radius turnaround will only serve Lots G and K, though no vehicle access to Lot G is proposed off this length of street. The turnaround will be striped with no parking so that it will function property as a turnaround.

   This turnaround is proposed, because access into the single-family residential neighborhood to the north would create cut-through traffic that would exit onto SE 32nd Avenue at an unsafe intersection with SE Balfour Street. The Traffic Impact Study (Appendix B) provided a comparative analysis of the development with 29th Avenue as both a roadway and a bikeway. The study found that a vehicular connection between the site and SE 29th Avenue would not significantly improve or degrade the performance of the surrounding transportation system compared with providing only a bicycle/pedestrian connection. It is estimated that only a small percentage of vehicles from the northern neighborhood would consider using the site as a cut-through to SE 32nd, since it would offer no real benefit to travel times and 29th Avenue is currently a narrow, under-improved street that is difficult to navigate. Finally, the majority of the lots to the north are already developed and do not need this additional access to provide connectivity for future development.

   Because there is no need or desire to continue SE 29th Avenue through to the north a modification through the Planned Development will be requested to develop a permanent turnaround at the terminus of this street and to have the length of the dead end be longer than 200 feet.

   It should be noted that the right of way for SE 31st Avenue has also been extended to the north property line of the site to allow for any future development that may occur on the lots to the north. The constructed street improvements will not be extended to this property line, but this dedication of right of way will leave this as an option in the future. If necessary, a one-foot control strip can be placed at the end of this right of way as part of the platting process.

19.708.1.F. Intersection Design and Spacing.

1. *Connecting street intersections shall be located to provide for traffic flow, safety, and turning movements, as conditions warrant.*
2. *Street and intersection alignments for local streets shall facilitate local circulation but avoid alignments that encourage nonlocal through traffic.*

3. *Streets should generally be aligned to intersect at right angles (90 degrees). Angles of less than 75 degrees will not be permitted unless the Engineering Director has approved a special intersection design.*
4. *New streets shall intersect at existing street intersections so that centerlines are not offset. Where existing streets adjacent to a proposed development do not align properly, conditions shall be imposed on the development to provide for proper alignment.*

Response: The new intersections throughout the development have been designed to meet these standards by aligning all of the streets to a 90-degree grid. SE Dwyer Street is being moved north so that the intersection with SE 32nd Avenue, which serves as one of the main entrance/exits for the development, will better align with the street across SE 32nd Avenue. The main exception to the grid is where SE 29th Avenue must align to the centerline of the existing right of way to the north.

5. *Minimum and maximum block perimeter standards are provided in Table 19.708.1.*
6. *Minimum and maximum intersection spacing standards are provided in Table 19.708.1.*

Response: The streets in the development will be classified as follows:

- Local Streets: SE 28th Avenue, SE 29th Avenue, SE 31st Avenue, Dwyer Street, Hillside Court
- Neighborhood Street: Meek Street
- Collector: SE 32nd Avenue

The majority of the intersections within the neighborhood are spaced between 200 and 275 feet apart, which meets the minimum and maximum distance between intersections for both Local and Neighborhood Streets. The two intersections proposed on 32nd Avenue (at Dwyer and at Meek) will be spaced approximately 600 feet apart that meeting the requirements for Collector Streets. The average block perimeter within the development is 1,100 feet with will not exceed the maximum block perimeter for any street classification.

As described above, SE 29th Avenue is proposed as a bike and walkway and not a through street for vehicles. The current block perimeter of SE Dwyer/29th/Balfour/32nd is larger than the current maximum block perimeter but will be getting smaller with SE Dwyer Street being moved to the north. Additionally, the through connection of 29th Avenue for bicycles, pedestrians and emergency vehicles will bring this block closer to meeting conformance with this standard than the current situation.

19.708.2 Street Design Standards. *Table 19.708.2 contains the street design elements and dimensional standards for street cross sections by functional classification.*

Response: Figure MP 2.6 shows the street sections proposed for all the new streets in the Planned Development which will comply with the standards of Table 19.708.2. It should be noted that the streets proposed as Local Streets (SE 28th Avenue, SE 29th Avenue, SE 31st Avenue, Dwyer Street, Hillside Court) will have a 20-ft wide shared travel lane/bike lane that will be adequate to serve the proposal since the volume of traffic on these streets and the travel speeds will be relatively low.

19.708.3 Sidewalk Requirements and Standards. *Goals, objectives, and policies relating to walking are included in Chapter 5 of the TSP and provide the context for needed pedestrian improvements. Figure 5-1 of the TSP illustrates the Pedestrian Master Plan and Table 5-3 contains the Pedestrian Action Plan. Americans with Disabilities Act (ADA) requirements for public sidewalks shall apply where there is a conflict with City standards.*

Response: Figure MP 1.7 shows the Pedestrian Circulation Plan for the Planned Development. All of the proposed new streets will include sidewalks meeting the width requirements of Table 19.708.2. All proposed sidewalks will be located within the public right-of-way and will be constructed to Public Works Standards.

19.708.4 Bicycle Facility Requirements and Standards. *Bicycle facilities include bicycle parking and on-street and off-street bike lanes, shared lanes, bike boulevards, and bike paths. Goals, objectives, and policies relating to bicycling are included in Chapter 6 of the TSP and provide the context for needed bicycle improvements. Figure 6-2 of the TSP illustrates the Bicycle Master Plan, and Table 6-3 contains the Bicycle Action Plan.*

Response: Figure MP 2.6 shows the proposed street sections and how bicycle traffic will be accommodated on each of the new streets. Because of the low volume of traffic and the slow travel speeds on the proposed streets bicycles will share travel lanes with the vehicle traffic. The exception to the is SE 32nd Avenue, a Neighborhood Street where there will be a dedicated bike lane.

19.708.6 Transit Requirements and Standards. *Transit facilities include bus stops, shelters, and related facilities. Required transit facility improvements may include the dedication of land or the provision of a public easement. Goals, objectives, and policies relating to transit are included in Chapter 7 of the TSP. Figure 7-3 of the TSP illustrates the Transit Master Plan, and Table 7-2 contains the Transit Action Plan.*

Response: There are already transit facilities in place that serve the Planned Development site. Two existing TriMet bus stops are located on SE 32nd Avenue; one just north of the intersection with the existing Hillside Court (stop #7342), and the second just north of the intersection with future Meek Street (stop #7349). Based on consultations with Tri-Met designers these two stops will be combined into a single bus stop located between SE Dwyer and SE Meek Streets and enhanced as part of the development.

The new combined stop will include a raised curb/bus platform to facilitate bus loading and a new 4' by 8' transit shelter. Pedestrian access to the stop will also be improved with a new crosswalk and with ADA ramps on both sides of 32nd Avenue, and new refuge islands in the center of the street to calm traffic and prevent cars from pulling around the stopped bus. The new bus stop will be sized for future growth by allowing room for a larger shelter (4' by 12') and a trashcan in the future. The consolidation of the bus stops is anticipated to occur as part of Phase 2 of the development when the bulk of the 32nd Avenue frontage improvements will be constructed. No additional right-of-way dedications should be required to facilitate the new combined stop.

19.709 Public Utility Requirements

19.709.3 Design Standards. *Public utility improvements shall be designed and improved in accordance with the requirements of this chapter, the Public Works Standards, and improvement standards and specifications identified by the City during the development review process. The applicant shall provide engineered utility plans to the Engineering Director for review and approval prior to construction to demonstrate compliance with all City standards and requirements.*

Response: Utility Plans have been provided with the Planned Development application. Generally, all of the existing stormwater, sewer and water lines that server the existing housing on the Hillside site will be removed in phases and replaced with new lines that meet the current design standards. The existing stormwater and sewer disposal lines are located in public utility easements that will be vacated as part of the platting process and all of the new lines will be located within the public right-of-way.

As shown on the plans provided, the new lines will be constructed in accordance with the Public Works Standards of Chapter 13.04 for the water system, Chapter 13.12 for the sewer system and Chapter 13.14 for the stormwater management system as follows:

- **Water/Fire Suppression:** Water service for the lots will come from new system of 8-inch lines located the public streets that will connect to both the existing 12-inch water line in SE 32nd Avenue and the existing 12-inch water line in Meek Street. This system will connect to the existing water main in SE 29th Avenue north of the site to create a looped system. The existing Manor building will tie into the system in SE Hillside Court with a new connection to the existing water line that currently serves the building. Expected water system demands from the proposed Master Plan are included as Exhibit G. This loading analysis will be shared with the public works department for their review in relation to capacities of the existing system model. New and existing fire hydrant locations are shown on Figure MP 3.50.

- **Sanitary Sewer:** The new sanitary sewer system will tie into the existing 8-inch sanitary sewer line in SE Meek Street. The system will be extended west on Meek Street (to serve Lot C) and north on SE 29th Street (to serve Lot K). Branches off the line in 29th will extending east at SE Hillside Court (serving Lots A, B, D and E) and at SE Dwyer Street (serving Lot D, E, F and G). Additionally, the existing 12-inch sanitary sewer line in SE 32nd Avenue is available to serve Lots A, E, and F. The existing Manor building will tie into this system via a new 10-inch lateral which will connect to a new sanitary main in SE Hillside Court. Expected sanitary flows from the proposed Master Plan are included as Exhibit H. This loading analysis will be shared with the public works department for their review in relation to capacities of the existing system model. Existing and proposed sanitary sewer systems are shown on Figure MP 3.40.

- **Stormwater Disposal:** Stormwater quality and detention for the new public streets will be handled with stormwater green street planters that will be located within the planter strips in the new streets. These planters will convey stormwater to a new public stormwater system that will be constructed in all of the new streets and will tie into either the existing 36-inch stormwater disposal line in SE Meek Street, or to the new city stormwater disposal line that is being installed along the railroad right of way. Stormwater disposal from the existing Manor development and the north half of SE 29th Avenue will dispose to the existing 12-inch stormwater disposal line that drains to the north of the property. A Stormwater Report verifying pre- and post-runoff rates has been provided as Appendix C.

  It is anticipated that stormwater quality and detention for the parking lots and buildings on the individual lots can be handled on the lots though a variety of options, including:
  - Raingardens or stormwater planters;
  - Ecoroofs (as a means of impervious area reduction);
  - Mechanical systems including cartridge filter vaults and oversized detention pipes with flow control manholes;
  - Potentially drywells (feasibility is being investigated by the owner).

  Regardless of the stormwater management methods selected, each lot will be required to meet current city code requirements at their time of development. Existing and proposed stormwater facilities are shown on Figure MP 3.30.

These new systems will be constructed in phases that match the three major development phases. The utility connections to the existing houses will be maintained until the buildings are removed from the site. All existing public utility lines that will be abandoned will be left in place and filled with CDF (concrete) if they are more than 7.5 feet below the finished grade. All other utility lines will be

removed. Any public utility easements will be removed from the property as part of the platting process.

Traffic Analysis.

The Transportation Impact Study (TIS) submitted as Appendix B analyzed the potential impact of the proposed Planned Development on the surrounding transportation system. This study found that the proposed development is projected to generate a net additional 110 trips during the morning peak hour, a net additional 105 trips during the evening peak hour. With this additional traffic, all surrounding intersections are expected to continue operating within the City of Milwaukie and ODOT standards under all analysis scenarios except for the intersection of SE Harrison Street at SE 42nd Avenue. This intersection will exceed City standards under background conditions and worsen by one second of delay at full build-out of the Planned Development. However, no mitigation is recommended because the increase in traffic volumes do not meet the threshold to warrant a new signal.

The TIS also found that the surrounding transportation system was generally operating safely. No significant crash patterns were identified at any of the surrounding intersections that would indicate safety concerns. Adequate sight distance is available at the site access at SE 32nd Avenue, ensuring safe and efficient operation at this intersection. Additionally, the realignment of SE Dwyer Street at SE 32nd Avenue will improve the spacing of this intersection, reducing the number of potential conflicts and improving the safety and flow of SE 32nd Avenue.

With regard to the proposed zone change from R3 to R1 and GMU, the TIS providing and analysis of the State Transportation Planning Rule (TPR) and found that under the worse-case development scenario for these zones the system is still capable of supporting the proposed changes to the zoning without any modifications to the City's Transportation System Plan.

SUMMARY OF MODIFIED DEVELOPMENT STANDARDS

Section 19.311.3 allows a modified set of development standards to be created for the Planned Development site. These standards get adjusted through the PD process. The following are the Development Standards that are requested to be modified with this Planned Development proposal. Generally, these modifications address the uniqueness of the site and the development proposed and will help create a consistent development pattern across the site.

- ***19.302.4.B.1 – Setbacks in R1.*** *Minimum yard requirements for primary structures are 15 feet for the front yard, side yard and street side yard.*
  Modification: The front setback for all of the lots in R1 will be reduced from 15 feet to 10 feet. The side and rear setbacks for some of the lots in R1 will be reduce from 15 feet to 5 feet. In no instance will the modifications be along the perimeter of the site. These modifications will allow for the more efficient use of the land, allow the buildings in the R1 to match the look of the buildings on the southern lots zoned GMU, which permits a more urban development pattern allowed outright and create a consistent overall development pattern across the entire site.

- ***19.303.4.B.2.b - Height Bonus.*** *Buildings in the GMU Zone shall provide a step back of at least 15 ft for any street-facing portion of the building above the base maximum height.*
  Modification: This standard will be modified to eliminate the requirement for a step back for buildings over three stories in the GMU Zone. This modification will allow buildings fronting on

32nd Avenue and Meek Street to have a more uniform façade and allow the buildings to be constructed in more affordable manner consistent with the goal of providing affordable housing on the site.

- ***19.505.3.D.1 - Private Open Space.*** *The development should provide private open space for each dwelling unit. Private open space should have direct access from the dwelling unit and should be visually and/or physically separate from common areas. The development may provide common open space in lieu of private open space if the common open space is well designed, adequately sized, and functionally similar to private open space.*
  Modification: The open space areas provided on the individual lots offer a variety of recreational opportunities for diversity of residents, for example a playground for young families on Lot E and an exercise path of Lot J that is popular with seniors. The goal of this modification is to not have these open areas be homogenous in order to meet this requirement. This modification requests that the open space planned for the development as a whole be used to meet the standard of Private Open Space for the lots individually when then are reviewed for development approval.

- ***19.505.7.C.3 - Exterior Building Materials.*** *Provide a sense of permanence, through the use of certain permitted building materials. Table 19.505.7.C.3 specifies the primary, secondary, and prohibited material types referenced in this standard.*
  Modification: This standard will only apply to Buildings A2 and E1, the two mixed-use buildings on the site. To maintain the overall affordability of these buildings this standard will be modified to allow both "finished metal panels" and "fiber-reinforced cement siding and panels" (i.e. Hardie plank) to be used as primary building materials, allowed to cover at least 60% of the applicable building façades.

- ***19.605.1 - Minimum Parking Requirements.*** *Development shall provide at least the minimum number of parking spaces listed in Table 19.605.1.*
  Modification: The total number of parking spaces provided will 489, which will include both on-site parking spaces and parking spaces on the streets that are interior to the site (i.e. all streets except SE 32nd Avenue). This will result in an overall parking ratio of 0.82 spaces per unit which is less that what is required by the parking standards of Table 19.605.1. However, the combination of reductions through the proximity to transit, shared parking between the residential and commercial uses, and the reduced parking needs of affordable housing will assure that this ratio is adequate to serve the site. Additionally, the overall development pattern and the TDM measures proposed will encourage alternative means of transportation and reduce the overall demand for vehicle parking spaces.

- ***19.608.3 - Loading Space Standards.*** *Loading areas shall be provided on the site and be separate from parking spaces.*
  Modification: Some of the loading spaces will be provided on the streets within the development to be more centrally located between the buildings. The total number of required loading spaces provided will be reduced to four since they will be able to be shared between buildings and lots, creating more efficient use of the site.

- ***19.609.2.A - Quantity of Bicycle Parking Spaces.*** *Multifamily residential development with 4 or more units shall provide 1 space per unit.*

Modification: This requirement would provide more bike parking spaces than are likely to be used in an affordable housing development. A Modification is requested to reduce the minimum number of required bicycle parking spaces to 0.75 spaces per unit for the residential units.

- ***17.28.040.E - Limits on Double and Reversed Frontage Lots.*** *Double frontage and reversed frontage lots should be avoided.*
  Modification: Several lots included in the subdivision will comprise of full city blocks with frontages on all four sides, creating double frontage lots. The proposed subdivision represents a unique situation where full-sized, urban-scale blocks are being created, and therefore double-frontage lots cannot be avoided.

- ***19.708.1.E.4 - Street Layout and Connectivity.*** *Permanent turnarounds shall only be provided when no opportunity exists for creating a through street connection. For proposed land division sites that are 3 acres or larger, a street ending in a turnaround shall have a maximum length of 200 ft.*
  Modification: SE 29th Avenue is proposed to end in a permanent turnaround for vehicles, though it will still provide a through connection for emergency vehicles, bikes and pedestrians. The length of this street will be approximately 250 feet from the intersection with Dwyer Street. This turnaround will help prevent cut-through traffic into the single-family residential neighborhood to the north without compromising the performance of the surrounding street system.

IV. LEGAL JUSTIFICATION

APPROVAL CRITERIA FOR FINAL DEVELOPMENT PLAN

The approval criteria for a Final Development Plan are found in Section 19.311.9 of the Milwaukie Municipal Code. The approval authorities may approve, approve with conditions, or deny the Final Development Plan based on the following approval criteria:

A. Substantial consistency with the proposal approved with Subsection 19.311.6;

19.311.6 Planning Commission Review of Preliminary Development Plan and Program.

A. Conditional approval by Planning Commission. Following the meeting, or any continuance thereof, the Planning Commission shall notify the applicant whether, in its opinion, the provisions of this chapter have been satisfied, or advise of any deficiencies.

Findings: The Preliminary Development Plan was considered by the Planning Commission at a public hearing on March 23, 2021 and was approved with conditions, therefore, this approval criterion is met.

B. Upon approval in principle of the preliminary development plan and program by the Planning Commission, with or without modifications, the owner-applicant must, within 18 months, file with the City a final development plan and program, including a phasing plan if applicable, which serves as an application for a PD Zone change.

Findings: The approval of the Preliminary Development Plan from the Planning Commission required the Final Development Plan to be submitted by September 24, 2022 in order to meet the 18 month window of approval. This application has been filed within that timeline, so this approval criterion is met.

B. Compliance with Subsections 19.311.1, 19.311.2, and 19.311.3;

19.311.1 Purpose. The purpose of a PD Planned Development Zone is:

A. To provide a more desirable environment than is possible through the strict application of Zoning Ordinance requirements;
B. To encourage greater flexibility of design and the application of new techniques in land development;
C. To provide a more efficient, aesthetic, and desirable use of public and private common open space;
D. To promote variety in the physical development pattern of the City;
E. To encourage a mix of housing types and to allow a mix of residential and other land uses;
F. To provide an alternative discretionary review process for projects requiring more flexibility than what would be provided through the standard clear and objective development review or land division process.

Findings: The proposed Planned Development will allow the site to redevelop in a way that is more efficient, practical, and sustainable than the current Hillside Park development. The site will feature a mix of housing types as well as providing both affordable and market rate options. The mixed-use buildings will provide the opportunity to add some small, neighborhood focused commercial uses to the site which will enhance the area. The increase in residential density on the site will be balanced by the abundant recreational amenities and open space opportunities that will include

plazas, playgrounds, and open fields. Additionally, the existing streets and infrastructure will be replaced with a safer and better-connected street network that will feature wide, protected sidewalks, bike lanes, and landscape planters with street trees. The flexibility provided by the Planned Development zone allows the proposal to meet the purpose of the zone by providing a variety of housing choices in a development pattern that will be aesthetically pleasing to both the residents and the neighborhood. This criterion is met.

19.311.2 Use. ***A planned development approved by the City Council and based on a final development plan and program shall constitute the Planned Development Zone. The PD Zone is a superimposed zone applied in combination with regular existing zones. A PD Zone shall be comprised of such combinations of types of dwellings and other structures and uses as shall be authorized by the City Council, but the City Council shall authorize only those types of dwellings and other structures and uses as will:***

A. Conform to the City's Comprehensive Plan;

Findings: The Final Planned Development includes the proposal to change the Comprehensive Plan designation of the site from Medium Density Residential to a combination of High Density Residential and Town Center. The applicable policies of each of these proposed designations are addressed in Section III of this report and the approval criteria for the Zone Change and Comprehensive Plan Amendment are addressed below. The approval criteria show that the type of housing proposed on the site, the adjacency of similar uses and development intensities in the area, and the availability and adequacy of the surrounding street system and utility infrastructure makes the Hillside site able to conform to the policies of each of these new designations and this criterion is met.

B. Form a compatible and harmonious group;

Findings: The entire development will create a harmonious micro-neighborhood that will be characterized by green streets, abundant open space amenities and landscaping that will be consistent throughout the site. This criterion is met.

C. Be suited to the capacity of existing and proposed community utilities and facilities;

Findings: As demonstrated in the Traffic Impact Study submitted with the proposal (Appendix B) the surrounding street network has adequate capacity available to support the increase in density on the site. Additionally, the existing utilities that currently serve Hillside Park will be updated in the process of relocating them to assure that there is adequate capacity to serve all of the future buildings. Services such as school capacity and fire/police protection has found to be available to serve the proposed uses and densities as shown in Section II of this report. Therefore, the site is suited to the proposal and this criterion is met.

D. Be cohesively designed and consistent with the protection of public health, safety, and welfare in general;

Findings: The grid network proposed for the new streets will increase safety in the area by allowing for better visibility at corners and aligning the intersection at SE 32nd and Dwyer Street to the existing street to the east. Public health will be improved by creating an emphasis on walking and outdoor

recreation through the improved pedestrian circulation network and open spaces. Finally, public welfare will be addressed by providing more affordable housing units in the City of Milwaukie, where they are critically needed (as indicated by the City of Milwaukie's Housing Needs Analysis described in detail below). This criterion is met.

E. Afford reasonable protection to the permissible uses of properties surrounding the site. In addition to residences and their accessory uses, the City Council may authorize commercial and nonresidential uses which it finds to be:

1. Designed to serve primarily the residents of the planned development or surrounding areas, and

2. Fully compatible with, and incorporated into, the design of the planned development.

Findings: The northern edge of the proposed development will protect the privacy of the single-family houses to the north by providing a lush landscape buffer that will be fully planted to screen the surrounding properties. Additionally, all of the buildings along the north edge will be limited to two stories to be compatible with the houses to the north. The connection of SE 29th Street is proposed as a bikeway with temporary access for emergency vehicles, prohibiting cut-through vehicle traffic in the neighborhood to the north. The addition of commercial uses on the ground floor of the buildings facing onto SE 32nd Street will be an amenity to the residents and surrounding neighborhood, and the limitations proposed to the permitted GMU uses will assure that these small commercial businesses will be compatible with the development on the site and the surrounding area. This criterion is met.

19.311.3 Development Standards. All standards and requirements of this chapter and other City ordinances shall apply in a PD Zone unless adjusted through the PD process. Approval of a PD Zone establishes a modified set of development standards specific to the development.

Findings: The Development Standards of 19.311.3 are addressed in full in Section III of this report. In this section it was found that the site meets the minimum lot size requirement for the PD Zone and there are no special improvements that will be required. The proposed residential densities will be blended across the site but in no case will they be greater that 20% of what is allowed in the High Density Residential Comprehensive Plan designation (24 dwelling units per acre). Peripheral yards screening adjacent existing developments will be provided where appropriate, primarily along the north property line to screen the residential development to the north and on the west property line to abate noise from the railroad. A number of modifications have been requested to the development standards to address the unique characteristics of the site and to create a more cohesive plan. Overall, the site will include an abundance of Open Space exceeding the one-third requirement for planned developments at the end of the third phase. In summary, all of the Development Standards can be met, and this criterion is met.

C. The proposed amendment is compatible with the surrounding area based on the following factors:

1. Site location and character of the area.

Findings: The location of the site is suitable for the proposed Planned Development and additional residential density because it is located in an area that is well-served by the existing transportation network, utility infrastructure and services. The site has easy access to Highway 99E (McLoughlin Blvd) 1/4 mile east and Highway 224 (Milwaukie Expressway) via SE 32nd Avenue that fronts the site.

Additionally, the site is approximately 1/2 a mile from downtown Milwaukie to the south, so it's in close proximity to commercial retail, parks, and services that will be needed to serve the new residents. Directly across SE 32nd Avenue is a hospital and clinic that can serve the medical needs of the residents. Local schools are in close by and convenient. Finally, the site is located directly located on a frequent service bus line. With the proximity of so many necessary services to serve the new housing units the site location is an ideal for the proposed use.

The site sits at the intersection between the Ardenwald, McLoughlin Industrial and Central Milwaukie Planning Area identified in the City's Central Milwaukie Land Use and Transportation Plan. Each of these Planning Areas represents a different set of planning goals and objectives. As such, the overall character of the area represents a mix of uses with no single use dominating the area. The site, which already features multi-family housing, serves as a transition between the higher density uses to the south and the single-family houses to the north. Likewise, the site abuts the railroad line and manufacturing uses to the west. Across SE 32nd Avenue from the site, there is a variety of commercial and medical uses as well as existing multi-family residential housing. Since the general use of the site will not be changing significantly and will still be used predominately for affordable multi-family housing after redevelopment it can be concluded that the proposed Planned Development will continue to be compatible with the character of the area and this criterion is met.

2. Predominant land use pattern and density of the area.

Findings: As described above, there is no predominant land use pattern in the surrounding area since the neighborhood is a mix of residential, commercial, medical, and industrial uses. Additionally, there is not a specific zoning pattern, since every abutting side of the site has a different zoning designation: Low-Density Residential (R7) to the north, Medium to High Residential (R3) to the east, General Mixed Use (GMU) to the south, and North Milwaukie Employment Zone (NME) to the west. As such, changing the zoning of the site from R3 to R1 and GMU is appropriate to recognize that the site sits at a crossroads of many different uses and can continue to serve as a transitional area between them.

The density in the residential areas north and east of the site is currently lower than what is proposed through the Planned Development, however, the property to the south (which is currently vacant) is zoned GMU and has the potential to be developed with much higher densities than what is proposed for the subject site. Proposing a transition of the zoning on the site, with GMU on the south and R1 on the north will help provide a stepped-down density pattern across the site, with the lowest density lots located on the north of the site. Finally, the 9-story, 100-unit Hillside Manor has been located on the site since the 1960s and though this existing building is far taller and denser that what is proposed with the other lots in the Planned Development it does represent an existing land use pattern that is part of the historical character of the area and should be taken into consideration when analyzing the compatibility of the proposal. As shown, the Planned Development will be compatible with the land use pattern and density of the area and this criterion is met.

3. Expected changes in the development pattern for the area.

Findings: The major change anticipated for this area would be the future development of the "Murphy Site" located to the south of the subject site and zoned GMU. This 7-acre site is identified in the Central Milwaukie Land Use and Transportation Plan as an "Opportunity Site", since it's a large, vacant/under-utilized site with high visibility and good access to transportation and services. It is envisioned to be developed with a mix of uses that might including 3- to 4-story multi-family residential buildings, commercial uses, and flex space for light industrial. Giving the wide range of uses and densities that are

permitted for this site it is hard to predict what the final development plan will be. However, by zoning the lower half of the Hillside site GMU and proposing higher-density mixed use buildings for this part of the site it will increase the likelihood that the future use on the Murphy Site will be compatible with the Hillside site. This criterion is met.

D. The need is demonstrated for uses allowed by the proposed amendment;

Findings: The most recent study of housing inventory in the City of Milwaukie was done in 2016 and is presented in the Milwaukie Housing Needs Analysis. Key findings of this study include:

- A comparison of estimated current housing demand to the existing supply identifies a general need for rental units at the lowest price level (p. 35):
  - 30% of all needed units are projected to be multi-family in structures of 5+ attached units;
  - The greatest need for both ownership and rental units is found at lower price points. This reflects the findings that an estimated 37% of Milwaukie households are rent-burdened and currently pay more than 30% of their income towards housing costs.
- There is also a current need for more affordable units. In order for all households, current and new, to pay 30% or less of their income towards housing in 2036, a total of 1,189 rental units affordable at $900[1] or less are required (p. 35).
- As demand increases, prices rise, and the remaining land within the UGB is developed, denser forms of development and creative reuse of parcels through infill and redevelopment will become necessary (p. 25).

Milwaukie's findings match similar and more current work done around the region including, Clackamas County Regional Housing Needs Analysis (issued in September of 2019), ECO Northwest's report "Potential Sources and Uses of Revenue to Address the Region's Homeless Crisis" (issued in February 2020 to support Metro's successful Housing Bond measure) and the State of Oregon's 2016-2020 Consolidated Plan Amendment (issued in 2016, representing the State's five-year housing and community development planning process required by the United States Department of Housing and Urban Development). All of these studies have found a growing gap between the number of Oregonians who need affordable housing and the availability of affordable homes. This trend has led to destabilizing rent increases, an alarming number of evictions of low- and fixed-income people, increasing homelessness, and serious housing instability throughout Oregon.

The proposed Planned Development will add 400 new units to the existing Hillside Park site, with a large portion of those units being built as affordable housing. This will directly address the public needs identified in the Housing Needs Analysis. Additionally, because the 100 existing residential houses on the site will be replaced with the proposal, no viable housing stock will be taken out of the current housing inventory. Furthermore, the Hillside Park site was identified as "unlikely to redevelop" in the Housing Needs Analysis, meaning that adding density to the site represents an unidentified opportunity to help Milwaukie's meet its housing needs without removing any available land that was already earmarked for future housing in the study. This criterion is met.

E. The subject property and adjacent properties presently have adequate public transportation facilities, public utilities, and services to support the use(s) allowed by the proposed amendment, or such

[1] $900 rent cited in the Milwaukie Housing Needs Analysis is based on pre-2016 data. Based on inflation factors the 2020 Low Income Housing Tax Credit available for a one bedroom unit is closer to $1,100 and is closer to what units in the proposed development will rent for.

facilities, utilities, and services are proposed or required as a condition of approval for the proposed amendment;

Findings: As described in Section III of this report, all of the existing streets and utilities serving the site will be removed and rebuilt to support the proposed new development. These changes will result in streets that are safer for all modes of travel and that align better to the existing street network in the area. The new utilities will be built to meet current development standards and adequate capacity in the existing sewer, storm, and water systems to support the proposed uses has been demonstrated with capacity studies submitted with the application. The site is well served by public transit by the #75 bus that operates along SE 32nd Avenue with two stops along the site frontage. Fire services are provided to the site from the Clackamas County Fire District #1 and police services from the City of Milwaukie Police Department and both these public services are adequate to serve the site. The local school district has capacity available to serve an increase in student population. This criterion is met.

F. The proposal is consistent with the functional classification, capacity, and level of service of the transportation system. A transportation impact study may be required subject to the provisions of Chapter 19.700;

Findings: A Transportation Impact Study was included as Appendix B of the application. The TIS found that all surrounding intersections are expected to continue operating within the City of Milwaukie and ODOT standards under all analysis scenarios except for the intersection of SE Harrison Street at SE 42nd Avenue. This intersection will exceed City standards under background conditions and worsen by one second of delay at full build-out of the Planned Development. However, no mitigation is recommended because the increase in traffic volumes do not meet the threshold to warrant a new traffic signal. The TIS also found that the surrounding transportation system was generally operating safely. No significant crash patterns were identified at any of the surrounding intersections that would indicate safety concerns. This criterion is met.

G. Compliance with all applicable standards in Title 17 Land Division;

Findings: The applicable standards of Title 17 that apply to the proposed 10-lot subdivision were addressed in Section III of this report. These findings show that the Preliminary Plat (Figure MP 4.01) complies with the minimum lot standards of the R1 and GMU zones and the proposed lots are as regular and rectilinear as possible taking into account the existing development on the site that will remain. This criterion is met.

H. Compliance with all applicable development standards and requirements; and

Findings: The applicable development standards and requirements were addressed in Section III of this report, where compliance with the R1 and GMU development standards was demonstrated. In addition, the Site Design Standards of Chapter 19.504, the Building Design Standards of Chapter 19.505, and the Parking and Loading Standards of Chapter 19.600 were addressed for the proposed design. A number of modifications to these standards are requested as part of the Planned Development process and it has been shown that these modifications will result in a more cohesive, efficient, and appropriate design based on the uniqueness of the site and development proposed. This criterion is met.

I. The proposal demonstrates that it addresses a public purpose and provides public benefits and/or amenities beyond those permitted in the base zone.

Findings: As shown in the Findings to the criteria for 19.311.9.D above, the City of Milwaukie's Housing Needs Analysis has identified an immediate need for more multi-family housing and more affordable housing to meet the current and future needs of the population of Milwaukie. By allowing the Hillside site to redevelop the Planned Development can help address this need by adding 400 new units of housing that will be available to a variety of household sizes and incomes. Within the proposed development these new residential units will be sited in a park-like setting that will feature large outdoor recreation areas that will appeal to different populations and age groups. Additionally, all of the new streets and infrastructure will create a safe and well-functioning neighborhood with a strong emphasis on alternate modes of transportation and community gathering. All of these amenities for the future residents will be made possible by allowing the entire site to be designed under a single Planned Development review, allowing for efficient use of the land, a cohesive design across the site, and the modification of standards to better fit the concept for the development and the unique aspects of the site. This criterion is met.

APPROVAL CRITERIA FOR COMPREHENSIVE PLAN AMENDMENT

Changes to the maps of the Milwaukie Comprehensive Plan shall be evaluated against the approval criteria in Subsection 19.902.3.B. A quasi-judicial map amendment shall be approved if the following criteria are met:

1. The proposed amendment is consistent with the goals and policies of the Comprehensive Plan, as proposed to be amended.

Findings: The proposed amendment to the Comprehensive Plan designation of the site will help to facilitate the proposed density, housing type and development pattern for the Hillside site. The proposed development plan aligns with many of the goals and policies of the Comprehensive Plan which are addressed below:

FOSTERING COMMUNITY, CULTURE & BELONGING

GOAL 1.2 - PROMOTE INCLUSION AND DIVERSITY

Policy 1.2.5: *Consider diversity, equity, and inclusion when making land use decisions related to map or text amendments to the Comprehensive Plan and any codes or maps implementing the Comprehensive Plan.*

Findings: The proposed redevelopment of Hillside addresses equity and inclusion by provide hundreds of new affordable housing units for low-income residents.

ENVIRONMENTAL STEWARDSHIP & COMMUNITY RESILIENCE

GOAL 3.2 - WATER QUALITY AND RESOURCES

Policy 3.2.8: *Improve stormwater detention and treatment standards through the use of best available science, technology, and management practices to meet water quality standards and achieve wildlife habitat protection and connectivity goals and standards*.

Findings: The proposed redevelopment will update all of the existing outdated utilities on the site including the stormwater disposal system. The new system will include the use of swales and other above-ground facilities to provide water quality treatment prior to disposal.

GOAL 3.4 - HEALTHY URBAN FOREST

Policy 3.4.2: *Pursue the City's goal of creating a 40% tree canopy through a combination of development code and other strategies that lead to preservation of existing trees and planting of new trees and prioritize native and climate-adapted species, while also considering future solar access.*

Findings: The proposed redevelopment plan includes the preservation of existing trees and the significant planting of new trees along the rights-of-way and on individual lots. These efforts will assist the City toward reaching their 40% tree canopy goal and improves the existing conditions at the Hillside site, which currently lacks trees.

GOAL 3.6 - AIR, NOISE, AND LIGHT QUALITY

Policy 3.6.4: *Encourage or require building and landscape design, land use patterns, and transportation design that limit or mitigate negative noise impacts to building users and residents, particularly in areas near freeways, regional freight ways, rail lines, major city traffic streets, and other sources of noise.*

Findings: The redevelopment plan includes robust landscaping along the western edge of the property that will help mitigate the noise impacts of the adjacent railroad right-of-way and the industrial uses to the west.

GOAL 5.1 - IDENTIFYING, AVOIDING, AND REDUCING HAZARD POTENTIAL

Policy 5.1.3: *Encourage and prioritize development in areas with low risk of natural hazards and restrict development in areas with high risk that cannot be adequately mitigated.*

Findings: The site contains no natural hazards such as floodplain, landslide hazard or steep slopes so it represents an ideal area to increase density and add more housing units within the City.

GOAL 5.3 - INFRASTRUCTURE AND BUILDING RESILIENCY

Policy 5.3.2: *Increase the quality, resiliency, diversity, and redundancy of utility and transportation infrastructure to increase chances of continued service following a natural disaster.*

Findings: The proposed redevelopment plan will turn the existing dead-end streets into a connected grid network, allowing multiple points of entry into the neighborhood in the case of a disaster. Additionally, the new water system will be looped into the existing water line to the north creating system that is more resilient if part of the system should fail.

Policy 5.3.5: *Prohibit essential public facilities and uses that serve vulnerable populations from being located within areas at high risk of flooding, landslides, liquefaction, and fire, and aim to relocate existing uses in these areas.*

Findings: The property contains no know hazards such a risk of flooding or potential landslides so it is an ideal site for affordable housing which would serve potentially vulnerable populations.

GOAL 5.4 - ADAPTATION AND MITIGATION

Policy 5.4.4: *Encourage, green infrastructure and development practices.*

Findings: The site will be redeveloped with green infrastructure, including streets that include wide sidewalks, bike lanes, planting strips and stormwater swales. Additionally, the development on the site will be built to meet established sustainability goals such as Earth Advantage.

GOAL 6.1 - BUILT ENVIRONMENT

Policy 6.1.5: *Create a more energy efficient land use pattern that includes but is not limited to infill and cluster development, neighborhood hubs and increased density.*

Findings: The redevelopment is a prime infill opportunity that will result in a more efficient use of the site by converting the single-family and duplex development to multi-family apartments served by streets laid out in an efficient grid pattern.

Policy 6.1.6: *Encourage the creation of compact, walkable neighborhoods and neighborhood hubs throughout the city that provide a mix of uses and help reduce transportation emissions and energy usage*.

Findings: When completed, the re-envisioned Hillside will serve as a new neighborhood hub, providing compact development, walkable streets, ample open space amenities and a mix of uses.

GOAL 6.2 - TRANSPORTATION AND UTILITY INFRASTRUCTURE

Policy 6.2.1: *Increase the quantity, quality and variety of Milwaukie's transit and active transportation options, including trails, bike lanes, and sidewalks.*

Findings: The proposed redevelopment will include new streets and open space areas that will encourage the use of transit and alternate transportation options through the use of bike lanes, the continuation of the city bike path through 29th Avenue to the north, wide sidewalks, a new enhanced bus stop and transit plazas.

GOAL 7.1 – EQUITY

Policy 7.1.1: *Provide the opportunity for a wider range of rental and ownership housing choices in Milwaukie, including additional middle housing types in low and medium density zones.*

Policy 7.1.3: *Promote zoning and code requirements that remove or prevent potential barriers to home ownership and rental opportunities for people of all ages and abilities, including historically marginalized or vulnerable populations such as people of color, aging populations, and people with low incomes.*

Policy 7.1.8: *Collaborate with community partners to provide a continuum of programs that address the needs of unhoused persons and families, including temporary shelters, alternative shelter models, long-term housing, and supportive services.*

Findings: Hillside will provide a wide mix of housing choices, unit sizes and rental rates that will be both affordable and market rate. This mix will offer housing for people of all ages, abilities and incomes and will help to address the needs of unhoused persons and families in Clackamas County.

CREATING COMPLETE NEIGHBORHOODS

GOAL 7.2 – AFFORDABILITY

Policy 7.2.2: *Allow and encourage the development of housing types that are affordable to low or moderate-income households, including middle housing types in low and medium density zones as well as larger apartment and condominium developments in high-density and mixed-use zones.*

Findings: The up-zoning of the property to a high-density (R1) zone and a mixed-use (GMU) zone is being done to facilitate the development of apartment buildings that will be affordable to low and moderate-income households.

Policy 7.2.3: *Pursue programs and incentives that reduce the impacts that development/design standards and fees have on housing affordability, including modifications to parking requirements, system development charges, and frontage improvements.*

Findings: The proposal includes a modification to the parking requirements to reduce the minimum parking required to serve the development. This modification will help the project to provide adequate, but not excessive, on-site parking to help control the costs of the development.

Policy 7.2.5*: Expand and leverage partnerships with non-profit housing developers and other affordable housing providers and agencies that preserve or provide new low to moderate income-housing units, create opportunities for first-time homeownership, and help vulnerable homeowners maintain and stay in their homes.*

Findings: The Housing Authority of Clackamas County (HACC) represent an affordable housing partner whose mission is to provide more low and moderate income housing opportunities for county residents.

GOAL 7.3 - SUSTAINABILITY

Policy 7.3.8: *Allow for a reduction in required off-street parking for new development within close proximity to light rail stations and frequent bus service corridors.*

Findings: The project site is adjacent to a frequent bus service corridor (32nd Avenue) so the reduction of off-street parking spaces proposed with the redevelopment is consistent with this policy.

GOAL 7.4 - LIVABILITY

Policy 7.4.1: *Implement land use and public investment decisions and standards that:*

a) encourage creation of denser development in centers, neighborhood hubs and along corridors; and

b) foster development of accessible community gathering places, commercial uses, and other amenities provide opportunities for people to socialize, shop, and recreate together.

Findings: The request to change the zoning and Comprehensive Plan designation of the site is appropriate since it will facilitate denser development along a corridor, allowing the site to become a neighborhood hub. The redevelopment plan also includes several large open space areas that will be accessible to the community, offering a variety of amenities that will cater to different ages and interests. These open spaces as well as the small commercial uses proposed along 32nd Avenue will create spaces within the neighborhood to gather, shop and recreate.

GOAL 8.1 - DESIGN

Policy 8.1.4: *Neighborhood Hubs (outside of NMU areas)*

a) Provide opportunities for the development of neighborhood commercial services and the provision of amenities and gathering places for residents of the surrounding area.

b) Ensure that new development is compatible with the height, massing and building form allowed by zoning on adjacent residential properties. A hub development need not be identical to the height, massing or form of buildings allowed by nearby zoning for a finding of compatibility.

c) Ensure new development contributes to a pedestrian friendly environment along the property frontage.

d) Encourage development of multi-season outdoor seating areas and pedestrian plazas.

e) Provide for a high level of flexibility in design and incentives to accommodate a variety of start-ups, temporary uses and incremental expansions and explore innovative techniques for waiving or deferring full site development and parking requirements.

f) Provide a process to allow start-up and temporary uses that take advantage of incentives and deferral programs to make a smooth transition to status as a permanent use.

Findings: The application of the GMU zoning creates the opportunity to add small-scale commercial uses on the site that will offer services to the Hillside residents. The redevelopment plan promotes a stepped-down density and height on the north side of the site, allowing the new buildings to be more compatible to the lower density residential uses to the north. The plan includes pedestrian-friendly amenities and outdoor seating areas throughout.

GOAL 8.2 - LIVIBILITY

Policy 8.2.2: *Parking design policies:*

a) Establish parking standards that contribute to higher levels of active transportation and increased use of transportation demand management programs to achieve community design patterns that are more sustainable.

Findings: The requested Modification to the minimum parking standards on the site is consistent with the increase in active transportation infrastructure proposed on the site and will be mitigated through the use of TDM policies by HACC.

Policy 8.2.4: *Public space design policies:*

a) Provide clear standards for the design and improvement of public spaces and streets as set forth in design objectives of adopted project plans or special area plans.

b) Design streets to provide for the equitable allocation of space for different modes including pedestrians, bicycles, and transit.

c) Provide adequate seating in public spaces where people are intended to gather, with consideration of weather protection as appropriate.

Findings: Though the new open space areas on the Hillside site will be privately owned, they have been designed in a way that is consistent with these policies by emphasizing alternate modes of transportation and providing outdoor seating and weather protection where appropriate.

SUPPORTING ECONOMIC DEVELOPMENT & GROWTH

GOAL 11.1 - CURRENT AND FUTURE ECONOMIC LAND USE

Policy 11.1.8*: Facilitate the development of housing that meets the needs of local employees across a wide range of price ranges and housing types in zones that allow residential development.*

Findings: The new housing will provide a wide range of housing options that will benefit local employees in need of affordable housing.

Summary Findings: As shown above, the proposed amendment to the Comprehensive Plan designation of the site is aligned with many of goals and policies of the new Milwaukie Comprehensive Plan, which was updated in 2020. The new designations will help to facilitate the redevelopment of the site into a neighborhood hub that will provide a more equitable, livable, sustainable, healthy and efficient use of the Hillside site. This criterion is met.

2. The proposed amendment is in the public interest with regard to neighborhood or community conditions.

Findings: The City of Milwaukie's Housing Needs Analysis has identified an immediate need for more multi-family housing and more affordable housing to meet the current and future needs of the population of Milwaukie. Changing the Comprehensive Plan designation of the site will allow for the development of 400 additional multi-family units on the Hillside site, so it is in the public interest to allow the site to help address this need. Additionally, the project will include updating all of the public infrastructure on the site – both streets and utilities – to be more functional, safe and built to modern standards. This will be an improvement to the current community conditions where the streets in Hillside either dead end or have unsafe connections to the larger transportation network. This criterion is met.

3. The public need is best satisfied by this particular proposed amendment.

Findings: Though the Comprehensive Plan includes other sites in the City that could eventually be developed to help meet the need for more multi-family and more affordable housing in Milwaukie, the Hillside site is a great opportunity to immediately start addressing the City's housing need. The site is owned by HACC who is a willing, eager and experienced developer of low-income housing. The site is an infill site, so its redevelopment will not require the purchase and development of a greenfield site. It is also located in the central part of Milwaukie, so it is close to shopping and services, well-served by transit and has all necessary utilities and infrastructure readily available to it. Changing the designation of the property to allow more density creates an opportunity to satisfy the City's housing shortage now, so this criterion is met.

4. The proposed amendment is consistent with the Metro Urban Growth Management Functional Plan and relevant regional policies.

Findings: The Urban Growth Management Functional Plan is Section 3.07 of the Metro Code. The plan provides tools to meet goals of the 2040 Growth Concept, Metro's long-range growth management plan for the Portland metropolitan area. Title 7 of this plan calls for the establishment of voluntary affordable housing production goals to be adopted by local governments in order to increase the supply of affordable housing in the region. The following regional policy is relevant to this proposal:

3.07.730 Requirements for Comprehensive Plan and Implementing Ordinance Changes
Cities and counties within the Metro region shall ensure that their comprehensive plans and implementing ordinances:

a. Include strategies to ensure a diverse range of housing types within their jurisdictional boundaries.
b. Include in their plans actions and implementation measures designed to maintain the existing supply of affordable housing as well as increase the opportunities for new dispersed affordable housing within their boundaries.
c. Include plan policies, actions, and implementation measures aimed at increasing opportunities for households of all income levels to live within their individual jurisdictions in affordable housing.

The proposed Comprehensive Plan amendment is consistent with this policy since it represents an action that would increase the opportunity for more affordable housing within Milwaukie. Additionally, no existing affordable housing will be lost with this proposal, so the existing supply of affordable housing will be maintained and increased with the approval of this amendment.

As demonstrated, the proposal is consistent with the Metro Urban Growth Management Functional Plan and this criterion is met.

5. The proposed amendment is consistent with relevant State statutes and administrative rules, including the Statewide Planning Goals and Transportation Planning Rule.

Findings: The applicable Statewide Planning Goals are addressed below:

Goal 1: Citizen Involvement. *To develop a citizen involvement program that ensures the opportunity for citizens to be involved in all phases of the planning process.*

Findings: This application is being reviewed through a quasi-judicial process that requires public hearings with both the Milwaukie Planning Commission and City Council. A public notice will be mailed by the City to all adjoining property owners and the application materials will be made available to the public and posted on the City's website. Additionally, before the application was submitted to the City for review the project team engaged in a multi-year long neighborhood outreach process to solicit public opinion about how the site should redevelop. Because the public will have several opportunities to review and comment on the application, the proposal meets the intent of Goal 1.

Goal 2: Land Use Planning. *To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.*

Findings: The City of Milwaukie's Comprehensive Plan guides all land uses actions within the City boundaries and the City's Zoning Code enforces the policies of Comprehensive Plan. These two adopted documents provide the policy framework that is the basis for all land use decisions in City. The application has demonstrated conformance with the applicable polices of the Comprehensive Plan and Zoning Code in this report and is therefore consistent with Goal 2.

Goal 10: Housing. *To provide for the housing needs of citizens of the state.*

Findings: Goal 10 calls for cities to provide an adequate land inventory and planning regulations to address the identified public need for housing. The City's Housing Needs Analysis identifies a public need for more multi-family housing and more affordable housing in the City of Milwaukie. This proposal directly addresses these needs by creating the opportunity to add more affordable multi-family housing to an underutilized site that is well-served by all of the necessary utilities and infrastructure. Therefore, this application meets the intent of Goal 10.

Goal 11: Public Facilities and Services. *To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.*

Findings: The proposed amendment to the Comprehensive Plan will not negatively impact public facilities or create service capacity shortfalls. The site is already connected to all of the necessary facilities and services, most of which will be significantly upgraded with this proposal. The construction of additional multi-family housing on the site will not have an impact on public facilities so Goal 11 is met.

Goal 12: Transportation. *To provide and encourage a safe, convenient and economic transportation system.*

Findings: The proposed amendment would not require any major changes to the existing transportation system in the area. The site is served by a network of public streets and highways that have adequate capacity to serve additional multi-family housing units on the site, meeting the intent of Goal 12.

Transportation Planning Rule

The Transportation Planning Rule (TPR) ensures that the transportation system is capable of supporting possible increases in traffic intensity that could result from changes to adopted plans and land-use regulations. The TPR requires local governments to place measures assuring that allowed land uses are consistent with the identified function, capacity, and performance standards of a facility if a change to the comprehensive plan "significantly affects" a transportation facility. As it relates to this application, the TPR defines "significantly affects" as measured at the end of the planning period identified in the adopted transportation system plan:

- *Allow land uses or levels of development that would result in types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;*
- *Reduce the performance of an existing or planned transportation facility below the minimum acceptable performance standard identified in the TSP or comprehensive plan; or*
- *Worsen the performance of an existing or planned transportation facility that is otherwise projected to perform below the minimum acceptable performance standard identified in the TSP or comprehensive plan.*

Findings: The proposal includes changes to the Comprehensive Plan designation of the site to allow a zone change from medium-density residential zoning (R3) to a split of high-density residential (R1) and general mixed-use zoning (GMU). To determine the potential impacts the zone change could have on the surrounding transportation system, the trip generation of the site in the reasonable worst-case development scenario under existing and proposed zoning was estimated as part of the Transportation Impact Study.

The reasonable worst-case development scenario of the site under existing and proposed zoning was selected based on the permitted land uses found in Table 19.302.2 of the code. The land uses selected to represent the worst-case development scenario were single-family housing for the existing R3 zone and multifamily housing for the proposed R1 and GMU zones. These land uses are expected to have the highest trip generation potential and are considered the most trip-intensive land uses of the site.

The maximum allowable density of under the existing R3 zoning is 14.5 dwelling units per acre. Since the subject site is approximately 16 acres, this gives a reasonable worst-case development potential of 232 units under existing R3 zoning. For R1 and GMU zones, the required density is 17.4 units per acre and 50 stand-alone units per acre, respectively. The Hillside plan proposes an average 24.2 units per acre in the proposed R1 zone of the site and 70 units per acre in the GMU zone of the site. Thus, the Hillside development is assumed to be a reasonable worst-case scenario under the proposed zoning.

The TIS found that under this reasonable worst-case development scenario of the site all surrounding intersections are expected to continue operating within the City of Milwaukie and ODOT standards under all analysis scenarios except for the intersection of SE Harrison Street at SE 42nd Avenue. This intersection will exceed City standards under background conditions and worsen by one second of delay at full build-out of the reasonable worst-case development scenario. However, no mitigation is recommended because the increase in traffic volumes do not meet the threshold to warrant a new traffic signal. The TIS also found that the surrounding transportation system was generally operating safely. No significant crash patterns were identified at any of the surrounding intersections that would indicate safety concerns.

As demonstrated in the TIS, the comparison of the reasonable worst-case development scenario shows that the transportation system is capable of supporting the proposed Comprehensive Plan Amendment and zone change and no modifications to the City's TSP are needed. Therefore, the conditions of the Transportation Planning Rule are satisfied.

Summary Findings: As shown above, the proposed amendment to the Comprehensive Plan designation of the site is consistent with the relevant and applicable Statewide Planning Goals and the Transportation Planning Rule and this criterion is met.

APPROVAL CRITERIA FOR ZONING MAP AMENDMENT

Changes to the Zoning Map shall be evaluated against the approval criteria of Section 19.906.2.B. A quasi-judicial map amendment shall be approved if the following criteria are met:

1. ***The proposed amendment is compatible with the surrounding area based on the following factors:***
   a. ***Site location and character of the area.***
   b. ***Predominant land use pattern and density of the area.***
   c. ***Expected changes in the development pattern for the area.***

   Findings: The proposed zone change to R1 and GMU is compatible with the surrounding area. The site is located at the intersection of several different land uses and development patterns (industrial, commercial, multi-family housing and single-dwelling housing) so there is not a consistent character or predominant density to the area. As such, the redeveloped property will provide a transition between the commercial uses and higher density housing that could be built on the "Murphy" site to the south under the GMU zoning and the single-dwelling residential neighborhood to the north. The development of the Murphy site is the largest expected change to the development pattern of the area, and the proposed GMU zoning and density for the south half of subject site will match this future development. On the north half of the site, the R1 zoning will offer a stepped-down density and development pattern that is closer in scale to the R7 zoning north of the site, while still allowing sufficient density to warrant the redevelopment. The location of the site is well-suited to more density because it is within a developed street network, is served by a frequent-service bus line and has all the necessary utilities available to serve the site. This criterion is met.

2. ***The need is demonstrated for uses allowed by the proposed amendment.***

   Findings: The public need for the Zone Change has been addressed in approval criteria numbers 2 and 3 for the Comprehensive Plan amendment above. In summary, the proposal helps meet an immediate need for more multi-family housing and more affordable housing to meet the current and future needs of the population of Milwaukie. This criterion is met.

3. ***The availability is shown of suitable alternative areas with the same or similar zoning designation.***

   Findings: Changing the property from R3 (a multi-dwelling zone) to R1/GMU will not eliminate the possibility of building multi-family housing on the site and will in fact facilitate this. Therefore, it is not necessary for there to be other areas in the City available to support this type of development since the rezoning will not remove any property from the multi-family "land bank" for the City. However, there are other properties in the City that are zoned R3 that are currently under-developed and could support more lower-density multi-family housing if necessary. These areas include:
   - Properties located between SE King Road and SE Monroe Street near the intersection of SE 44th Avenue.
   - Properties south and east of the project site centered on SE 34th Avenue.
   - The property east of the Milwaukie Center on Kellogg Creek Drive.

   The existence of these properties shows that there are suitable alternative areas in the City with R3 zoning that could support more development at the allowable R3 intensity and this criterion is met.

4. ***The subject property and adjacent properties presently have adequate public transportation facilities, public utilities, and services to support the use(s) allowed by the proposed amendment, or such facilities, utilities, and services are proposed or required as a condition of approval for the proposed amendment.***

   Findings: The Hillside property already has adequate transportation facilities, public utilities and services necessary to serve the site. However, as part of the redevelopment plan the street network and public utilities will be rebuilt to current standards to provide a safer transportation network and modernized

utilities within the Hillside site. These improvements will assure that the adequate infrastructure serving the site will continue to be serviceable long into the future. This criterion is met.

5. ***The proposed amendment is consistent with the functional classification, capacity, and level of service of the transportation system. A transportation impact study may be required subject to the provisions of Chapter 19.700.***

   Findings: A Transportation Impact Study was included as Appendix B of the application. The TIS found that all surrounding intersections are expected to continue operating within the City of Milwaukie and ODOT level of service standards except for the intersection of SE Harrison Street at SE 42nd Avenue. This intersection will exceed City standards under background conditions and worsen by one second of delay at full build-out of the Planned Development. However, no mitigation is recommended because the increase in traffic volumes do not meet the threshold to warrant a new traffic signal. The TIS also found that the surrounding transportation system was generally operating safely. No significant crash patterns were identified at any of the surrounding intersections that would indicate safety concerns. As such, the proposed zone change is consistent with the functional classification, capacity and level of service standards of the City's Transportation System Plan and this criterion is met.

6. ***The proposed amendment is consistent with the goals and policies of the Comprehensive Plan, including the Land Use Map.***

   Findings: The applicable goals of the Comprehensive Plan were addressed in full in approval criteria for number 1 the proposed Comprehensive Plan Amendment. To summarize, the project is aligned with many of goals and policies of the Milwaukie Comprehensive Plan, because the redevelopment will create a new neighborhood hub that will provide a more equitable, livable, sustainable, healthy and efficient use of the Hillside site. This criterion is met.

7. ***The proposed amendment is consistent with the Metro Urban Growth Management Functional Plan and relevant regional policies.***

   Findings: The policies of the Metro Urban Growth Management Functional Plan were addressed in approval criteria number 4 for the proposed Comprehensive Plan Amendment. As demonstrated, the proposal is consistent with Title 7 of this plan which calls for the establishment of voluntary affordable housing production goals to be adopted by local governments in order to increase the supply of affordable housing in the region and this criterion is met.

8. ***The proposed amendment is consistent with relevant State statutes and administrative rules, including the Statewide Planning Goals and Transportation Planning Rule.***

   Findings: The applicable Statewide Planning Goals and the Transportation Planning Rule were addressed in approval criteria number 5 for the proposed Comprehensive Plan Amendment. As shown above, the proposal is consistent with goals around Citizen Involvement, Land Use Planning, Housing, Facilities and Transportation. Analysis for the Transportation Impact Study submitted with this application found that the comparison of the reasonable worst-case development scenarios shows that the transportation system is capable of supporting the proposal no modifications to the City's TSP are needed. Therefore, this criterion is met.

APPROVAL CRITERIA FOR PRELIMINARY PLAT

The approval criteria for a Preliminary Plat are found in Section 17.12.040.A of the Milwaukie Municipal Code. The approval authority may approve, approve with conditions, or deny a preliminary plat based on the following approval criteria:

1. ***The proposed preliminary plat complies with Title 19 of this code and other applicable ordinances, regulations, and design standards.***

   Findings: Section III of this report demonstrates in detail how the proposed plat complies with the land division standards of Title 17 and the zoning regulations and design standards of Title 19. This criterion is met.

2. ***The proposed division will allow reasonable development and will not create the need for a variance of any land division or zoning standard.***

   Findings: The proposed land division will allow for reasonable development on all of the new lots as shown by the Planned Development Master Plan. Because of the uniqueness of this proposal, where the entire street network is being reconfigured to create full-block lots, a Modification to the land division standards is being requested as part of the Planned Development request. Specifically, Section 17.28.040.E limits the creation the double-frontage lots which would prevent the platting of full-block lots with frontage on four sides. This variance is supportable because the reconfiguration of the streets will lead to better connectivity and safety for the surrounding transportation network and full-block lots are appropriate for the large size of the proposed lots and the scale of the development proposed on them. With approval of this modification this approval criteria will be met.

3. ***The proposed subdivision plat name is not duplicative and the plat otherwise satisfies the provisions of ORS 92.090(1).***

   Findings: The name of the plat - "Hillside" – has been reviewed and accepted by Clackamas County and reserved for use by the application. As such the plat name has been found to not be duplicative and this criterion is met.

4. ***The streets and roads are laid out so as to conform to the plats of subdivisions already approved for adjoining property as to width, general direction, and in all other respects unless the City determines it is in the public interest to modify the street or road pattern.***

   Findings: The newly proposed network of streets in the Hillside plat will convert the existing unconnected street network into an efficient grid that will incorporate and connect to all of the streets surrounding the site. Specifically, the plat will complete the north half of SE Meek Street, change SE 28th, SE 29th and SE 31st to connected through-streets and re-locate the intersection of SE Dwyer Street to be aligned with the street to the east. Each of the right-of-way widths proposed on the plat are based on the anticipated street classification for each new street as described in detail in Section III of this report.

   The only exception to this connected grid network is SE 29th Avenue, that will continue into the neighborhood to the north only as a bikeway, pedestrian walkway and emergency route, but will not allow vehicle traffic through. A Modification to Section 19.708.1.E.4 - Street Layout and Connectivity

has been requested as part of the Planned Development to allow this street to be designed in this manner. This modified street has gained conceptual approval by the Planning Commission as part of the Preliminary Planned Development review and had general support from City staff and the adjacent neighborhood. With this approved Modification to the road pattern for the plat this criterion will be met.

5. A detailed narrative description demonstrating how the proposal conforms to all applicable code sections and design standards.

Findings: Section III of this report demonstrates how the proposed plat and the anticipated future development on the lots conforms to the applicable code sections and design standards. This criterion is met.

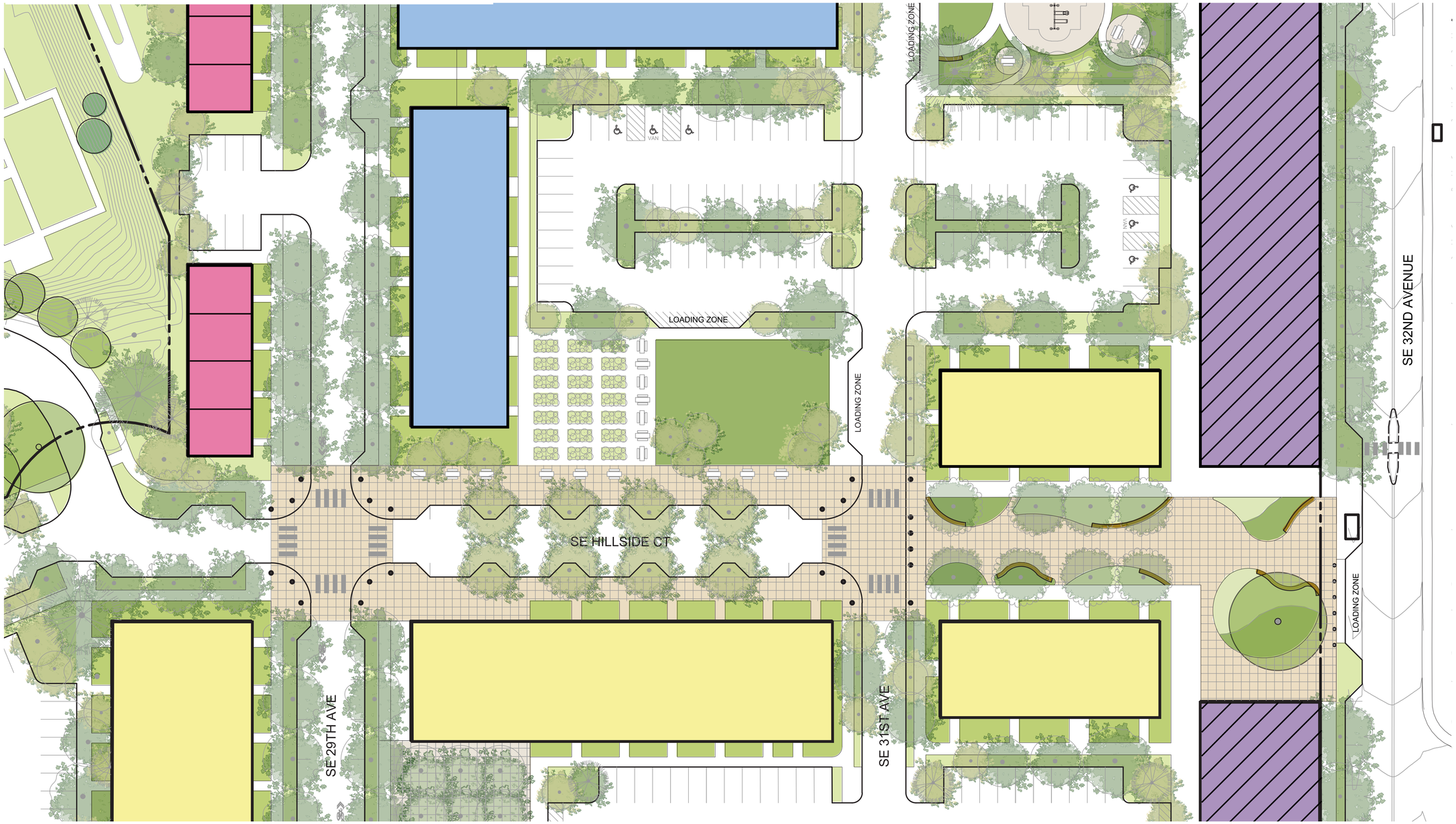
CONCLUSION

As shown in this report, the proposed Final Planned Development, Comprehensive Plan Amendment, Zone Change and Subdivision, allowing the redevelopment of Hillside Park with higher density apartments and mixed-use buildings, can met all of the relevant approval criteria. The Modifications included with this proposal will create a consistent development pattern across the site and assure the efficient use of the available land. Approval of this Planned Development will help realize the new vision of Hillside as a vibrant mixed-use, mixed-income community that preserves and rebuilds the existing affordable housing, while creating new opportunities for expanding housing options.

HILLSIDE MASTER PLAN

MILWAUKIE, OREGON

08.06.2021



Health, Housing & Human Services CLACKAMAS COUNTY

SEA SCOTT|EDWARDS ARCHITECTURE

The Bookin Group, LLC

Humber Design Group, Inc.

WALKER|MACY

lancaster mobley

TABLE OF CONTENTS

ARDENWALD NEIGHBORHOOD
1 & 2 STORY, LOW-DENSITY RESIDENTIAL

SE 29TH AVE

EXISTING SINGLE-FAMILY
RESIDENCES & DUPLEXES

STEEP GRADE

OPEN SPACE

STEEP GRADE

SE A ST

SE B ST

SE C ST

EXISTING HILLSIDE
MANOR BLDG

SE HILLSIDE CT

SE D ST

SE MEEK ST

SE 32ND AVE

MULTI-FAMILY
APARTMENT
BUILDINGS
(2 STORIES)

SE DWYER DR

MEDICAL
OFFICE
BUILDINGS
(2-STORIES)

MEDICAL
OFFICE
BUILDING
(3 STORIES)

PROVIDENCE
MILWAUKIE
HOSPITAL
(3 STORIES)

INDUSTRIAL BUILDING
(PRECISION CAST PARTS)

TRAIN NOISE

INDUSTRIAL AREA

MILWAUKIE EXPRESSWAY

MURPHY SITE
UNDEVELOPED

Milwaukie, OR

VICINITY MAP

MP 1.1

Health, Housing & Human Services
CLACKAMAS COUNTY

SEA
SCOTT|EDWARDS ARCHITECTURE

R-7

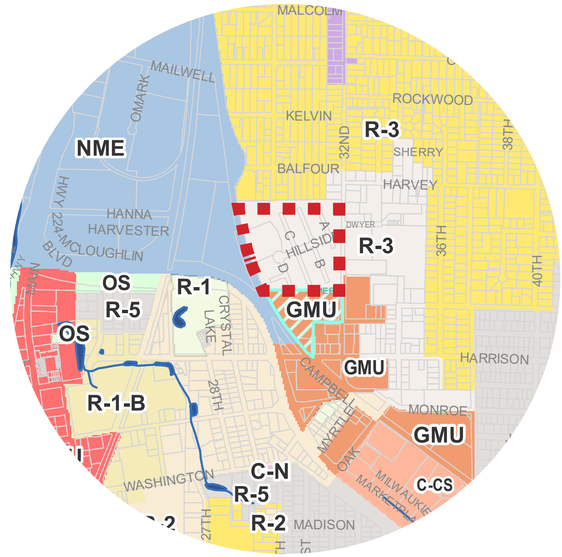
(PROPOSED)
R-1

R-3

NME

(PROPOSED)
GMU
COMPREHENSIVE PLAN DESIGNATION:
TOWN CENTER

GMU
COMPREHENSIVE PLAN DESIGNATION:
TOWN CENTER

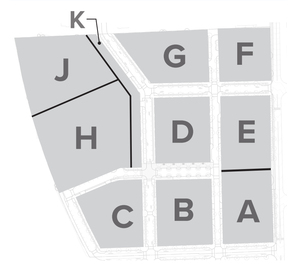


CURRENT ZONING

PROPOSED
ZONING

MP 1.2

KEY PLAN



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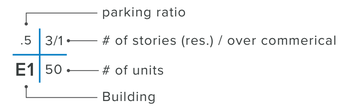


TABULATIONS

Lot A	= 1.34 ac	**75 du/ac**
Lot B	= 1.38 ac	**78 du/ac**
Lot C	= 1.29 ac	**50 du/ac**
Lot D	= 1.39 ac	**39 du/ac**
Lot E	= 1.39 ac	**67 du/ac**
Lot F	= 0.99 ac	**40 du/ac**
Lot G	= 1.52 ac	**18 du/ac**
Lot H	= 2.45 ac	**37 du/ac**
Lot J	= 1.79 ac	**0 du/ac**
Lot K	= 1.06 ac	**11 du/ac**
Total	= **14.61 ac**	

Hillside Manor (existing)	= 100 units
Hillside Park (replacement units)	= 100 units
Net New Units (to be developed)	= 400 units
Grand Total	= **600 units**

Off-street parking*	= 352 stalls
On-street parking	= 138 stalls
Total	= **490 stalls**

MASTER PLAN

MP 1.3

XX' = BUILDING SETBACKS REQUESTING MODIFICATION FROM ZONING STANDARDS

LAND DIVISION PLAN

MP 1.4

Health, Housing & Human Services CLACKAMAS COUNTY

SCOTT|EDWARDS ARCHITECTURE

DENSITY ALLOCATION

MP 1.5

REMOVABLE BOLLARDS

(EMERGENCY ACECESS ONLY)

OPEN SPACE

29TH AVE.

DWYER ST.

HILLSIDE CT.

MEEK ST.

31ST AVE.

SE 32ND AVENUE

SE 28TH AVE

PLAY

OPEN PLAY

K1

K2

K3

STOP

PARKING

LOADING ZONE/DROP OFF

MAIN COLLECTOR ROAD

LOOP ROAD

LOCAL STREETS

SERVICE STREET

MAIN ACCESS POINT

SECONDARY ACCESS POINT

BUS STOP

PROPOSED TRAFFIC CONTROL

CURBLESS INTERSECTION W/ BOLLARDS

PROPOSED LEFT TURN LANE

COLLECTOR

NEIGHBORHOOD ROUTE

LOCAL ROUTE

0 50' 100' 200

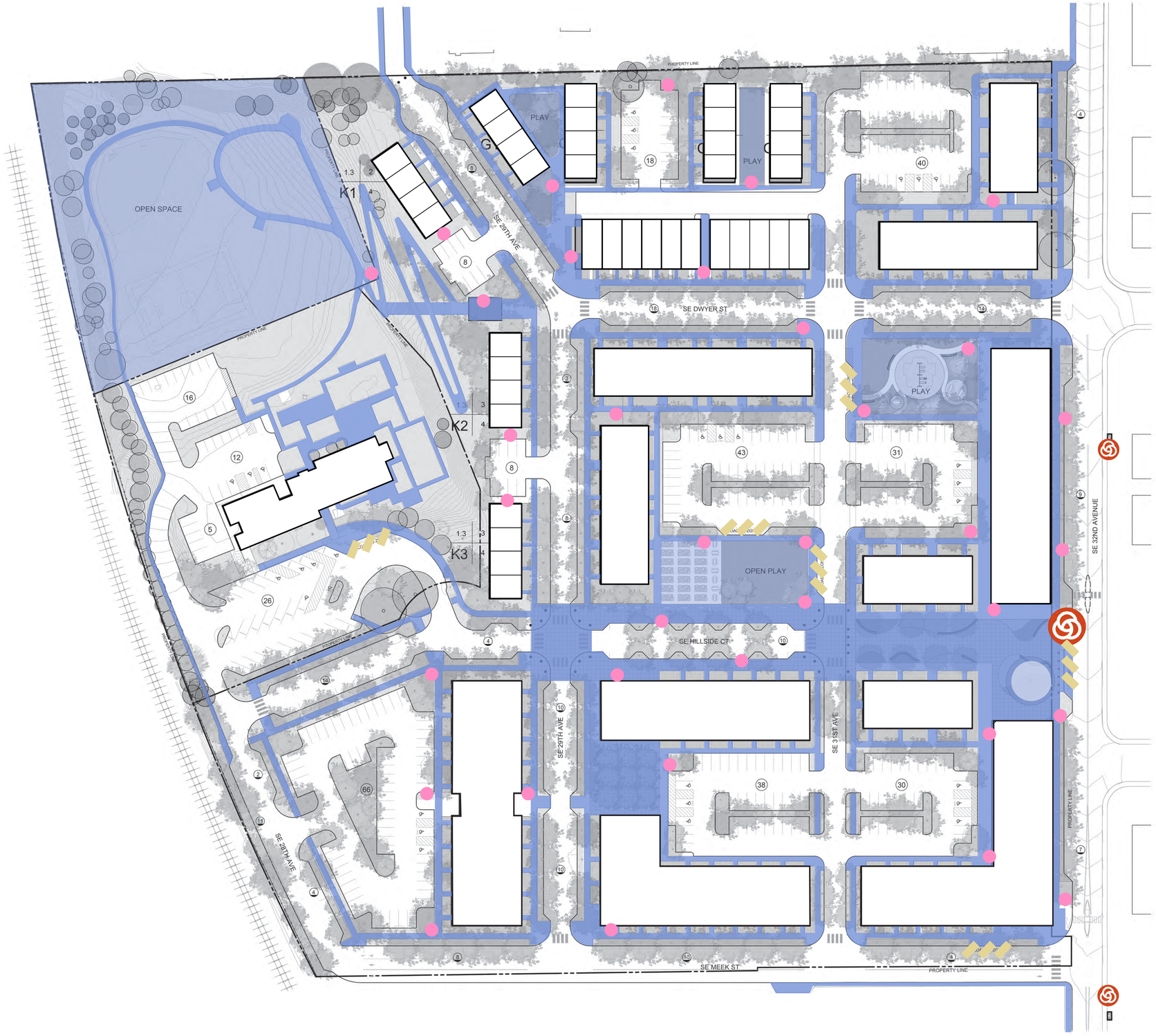
NORTH

VEHICULAR CIRCULATION & ON-SITE PARKING

MP 1.6

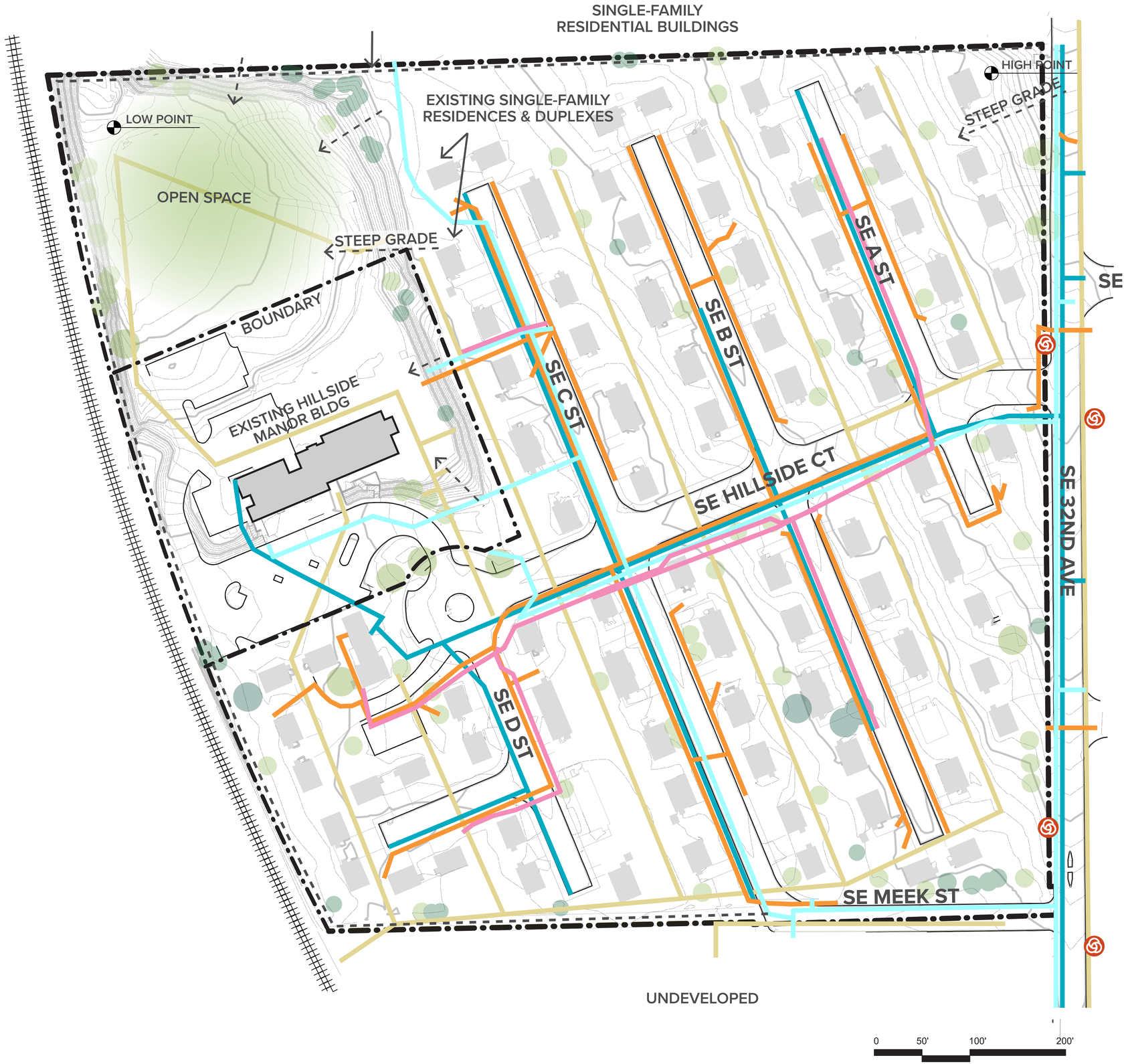
Health, Housing & Human Services CLACKAMAS COUNTY

SCOTT|EDWARDS ARCHITECTURE



PEDESTRIAN CIRCULATION

MP 1.7



STORM DRAIN
SANITARY SEWER
GAS
ELECTRIC
DOMESTIC WATER
TELECOM

EXISTING DEVELOPMENT SUMMARY

Hillside Manor Bldg	= 100 units
Hillside Park	= 100 units
Total	= **200 units**

EXISTING CONDITIONS

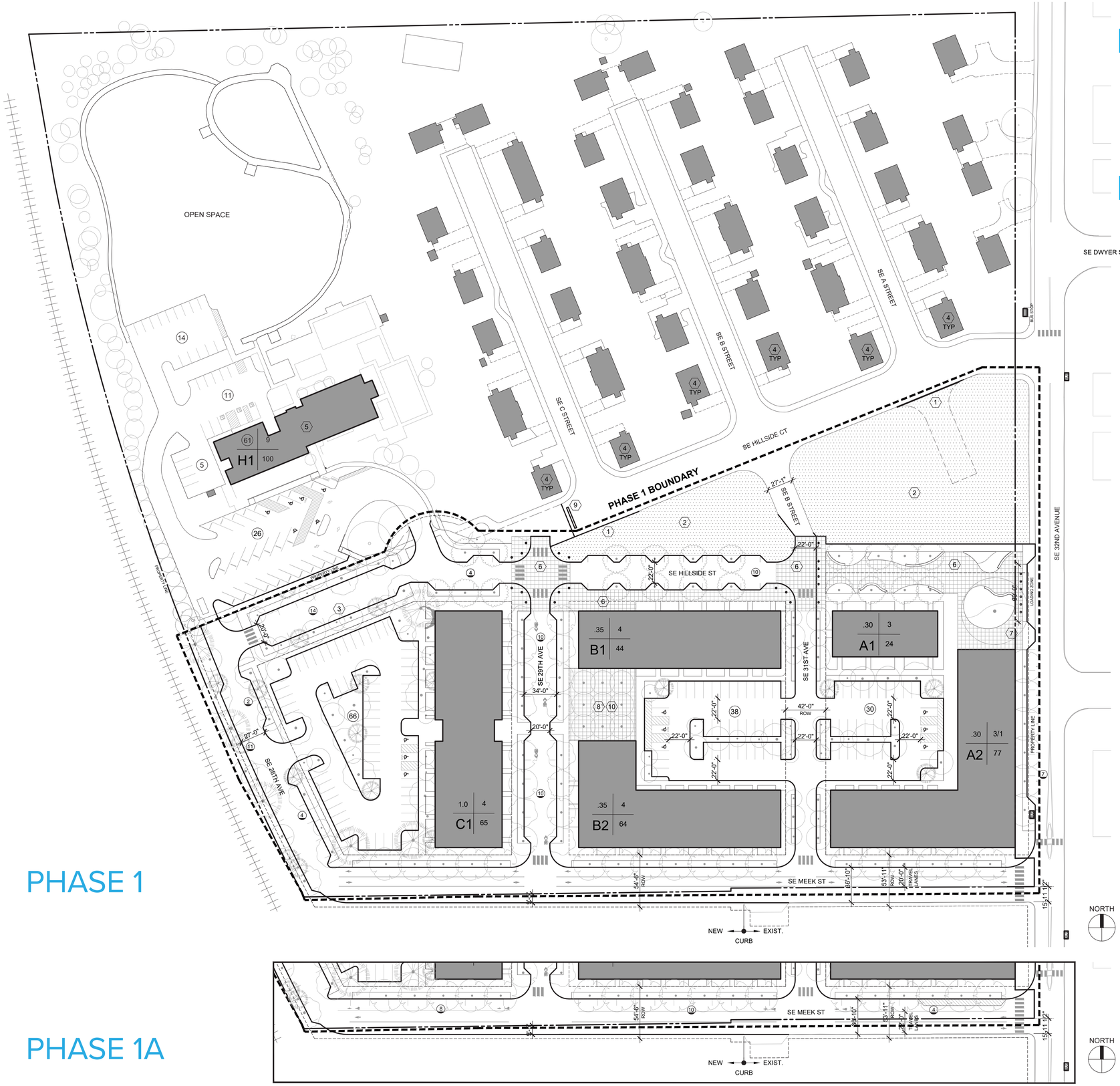
MP 1.8

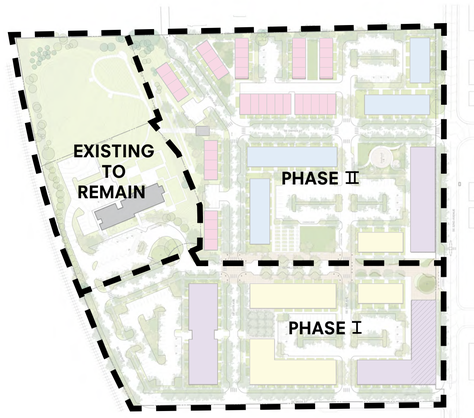
Health, Housing & Human Services CLACKAMAS COUNTY

SCOTT|EDWARDS ARCHITECTURE

PH1 PHASE I - BEFORE MEEK ST. ACCESS AGREEMENT (DELAY STRIPING OF 22 PARKING SPACES

PH1A PHASE I - AFTER MEEK ST. ACCESS AGREEMENT (STRIPE 22 PARKING SPACES, BIKE LANE, SHIFT TRAVEL LANES





PHASE 1

PHASE 1A

PHASED DEVELOPMENT PLAN

MP 1.9

Health, Housing & Human Services CENTRAL CITY CONCEPTS

SE A SCOTT|EDWARDS ARCHITECTURE

HILLSIDE
PRELIMINARY PLAT

IN THE S.E. 1/4 S.W. 1/4 SECTION 25 TOWNSHIP 1 SOUTH, RANGE 1 EAST, W.M.
CITY OF MILWAUKIE, COUNTY OF CLACKAMAS, STATE OF OREGON
DATE: APRIL 23, 2021

PROPERTY DESCRIPTION

ALL THAT PART OF THE WILLIAM MEEK DONATION LAND CLAIM SITUATE IN SECTION 25, TOWNSHIP 1 SOUTH, RANGE 1 EAST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF CLACKAMAS AND STATE OF OREGON, DESCRIBED AS PARCEL 1 AND PARCEL 2 OF PARTITION PLAT 2020-026.

EASEMENT LEGEND

- OPEN SPACE EASEMENT
- OPEN SPACE AREA
- NO BUILD

NOTES

1. BASIS OF BEARINGS SOUTH 01°11'03" EAST HELD BETWEEN FOUND MONUMENTS 'A' AND 'B' ALONG THE CENTERLINE OF SE 32ND AVENUE.

WESTLAKE CONSULTANTS INC.
ENGINEERING ◆ SURVEYING ◆ PLANNING
PACIFIC CORPORATE CENTER
15115 S.W. SEQUOIA PARKWAY, SUITE 150
TIGARD, OREGON 97224
(503) 684-0652
FAX (503) 624-0157

PRELIMINARY PLAT
FOR
SCOTT | EDWARDS ARCHITECTURE, LLP
SE. 1/4 S.W. 1/4 SECTION 25 T.1S. R.1E. W.M.
WILWAUKIE, CLACKAMAS COUNTY, OREGON

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON JULY 13, 1979 LEONARD SCHELSKY 2641
RENEWS: 06-30-2022

PRELIMINARY PLAT

MP 1.10

Health, Housing & Human Services CLACKAMAS COUNTY

SCOTT|EDWARDS ARCHITECTURE

J:\2715-003\14. SURVEY\CAD\W\9275-003-P_PRELIMINARY.DWG 2021-10-14 10:39 AM - SDS

SCALE: 1 INCH = 50 FEET

HILLSIDE
PRELIMINARY PLAT

IN THE S.E. 1/4 S.W. 1/4 SECTION 25 TOWNSHIP 1 SOUTH, RANGE 1 EAST, W.M.
CITY OF MILWAUKIE, COUNTY OF CLACKAMAS, STATE OF OREGON
DATE: APRIL 23, 2021

PROPERTY DESCRIPTION
ALL THAT PART OF THE WILLIAM MEEK DONATION LAND CLAIM SITUATE IN SECTION 25, TOWNSHIP 1 SOUTH, RANGE 1 EAST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF CLACKAMAS AND STATE OF OREGON, DESCRIBED AS PARCEL 1 AND PARCEL 2 OF PARTITION PLAT 2020-026.

TOPOGRAPHIC LEGEND:

- FOUND MONUMENT AS NOTED
- WATER VALVE
- WATER METER
- FIRE HYDRANT
- FIRE DEPT. CONNECTION
- HOSE BIB
- POST INDICATOR VALVE
- WATER VAULT
- SIGN
- BOLLARD
- FLAG POLE
- GATE POST
- GAS METER
- ELECTRIC METER
- ELECTRIC TRANSFORMER
- LIGHT POLE
- ELECTRIC GENERATOR
- TELEPHONE RISER
- TELEPHONE VAULT
- CABLE TV BOX
- SANITARY SEWER MANHOLE
- CLEANOUT
- STORM SEWER MANHOLE
- CATCH BASIN CENTER
- AREA DRAIN
- ROOF DRAIN
- UTILITY RISER
- UTILITY VAULT
- UTILITY STUB UP
- OH — OVERHEAD LINES
- SS — UNDERGROUND SANITARY SEWER LINE
- SD — UNDERGROUND STORM DRAIN LINE
- W — UNDERGROUND WATER LINE
- E — UNDERGROUND POWER
- G — UNDERGROUND GAS LINE
- T — UNDERGROUND TELE-COM
- X — X — FENCE AS NOTED
- HAND RAIL
- EDGE OF PAVEMENT
- BUILDING FOOTPRINT LINE
- 12" DECIDUOUS TREE
- 24" EVERGREEN TREE
- CONCRETE

WESTLAKE CONSULTANTS INC.
ENGINEERING ◆ SURVEYING ◆ PLANNING
PACIFIC CORPORATE CENTER
15115 S.W. SEQUOIA PKWY. SUITE 150
TIGARD, OREGON 97224
(503) 684-0652
FAX (503) 684-0157

EXISTING SITE CONDITIONS
FOR
SCOTT | EDWARDS ARCHITECTURE, LLP
SE. 1/4 S.W. 1/4 SECTION 25 T.1S. R.1E. W.M.
MILWAUKIE, CLACKAMAS COUNTY, OREGON

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON JULY 10, 1979 LEONARD SCHELSKY 1641
RENEWS: 06-30-2022

PRELIMINARY PLAT

MP 1.11

Health, Housing & Human Services CLACKAMAS COUNTY

SCOTT|EDWARDS ARCHITECTURE

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HILLSIDE
PRELIMINARY PLAT

IN THE S.E. 1/4 S.W. 1/4 SECTION 25 TOWNSHIP 1 SOUTH, RANGE 1 EAST, W.M.
CITY OF MILWAUKIE, COUNTY OF CLACKAMAS, STATE OF OREGON
DATE: APRIL 23, 2021

PROPERTY DESCRIPTION

ALL THAT PART OF THE WILLIAM MEEK DONATION LAND CLAIM SITUATE IN SECTION 25, TOWNSHIP 1 SOUTH, RANGE 1 EAST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF CLACKAMAS AND STATE OF OREGON, DESCRIBED AS PARCEL 1 AND PARCEL 2 OF PARTITION PLAT 2020-026.

WESTLAKE CONSULTANTS, INC.
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PACIFIC CORPORATE CENTER
15115 S.W. SEQUOIA PARKWAY, SUITE 150
TIGARD, OREGON 97224
(503) 684-0652
FAX (503) 684-0157

EXISTING ROAD & UTILITY EASEMENTS
FOR
SCOTT | EDWARDS ARCHITECTURE, LLP
SE. 1/4 S.W. 1/4 SECTION 25 T.1S. R.1E. W.M.
WILWAUKIE, CLACKAMAS COUNTY, OREGON

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON JULY 10, 1979 LEONARD SCHELSKY 2644
RENEWS: 06-30-2022

PRELIMINARY PLAT

MP 1.12

Health, Housing & Human Services
CLACKAMAS COUNTY

SCOTT|EDWARDS ARCHITECTURE

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HILLSIDE
PRELIMINARY PLAT

IN THE S.E. 1/4 S.W. 1/4 SECTION 25 TOWNSHIP 1 SOUTH, RANGE 1 EAST, W.M.
CITY OF MILWAUKIE, COUNTY OF CLACKAMAS, STATE OF OREGON
DATE: APRIL 23, 2021

PROPERTY DESCRIPTION
ALL THAT PART OF THE WILLIAM MEEK DONATION LAND CLAIM SITUATE IN SECTION 25, TOWNSHIP 1 SOUTH, RANGE 1 EAST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF CLACKAMAS AND STATE OF OREGON, DESCRIBED AS PARCEL 1 AND PARCEL 2 OF PARTITION PLAT 2020-026.

WESTLAKE CONSULTANTS INC.
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PACIFIC CORPORATE CENTER
15115 S.W. SEQUOIA PARKWAY, SUITE 150
TIGARD, OREGON 97224
(503) 684-0652
FAX (503) 684-1537

TOPOGRAPHIC CONTOURS
FOR
SCOTT | EDWARDS ARCHITECTURE, LLP
SE. 1/4 S.W. 1/4 SECTION 25 T.1S. R.1E. W.M.
MILWAUKIE, CLACKAMAS COUNTY, OREGON

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JULY 13, 1979
LEONARD SCHELSKY
2841
RENEWS: 06-30-2022

PRELIMINARY PLAT

MP 1.13

Health, Housing & Human Services
CLACKAMAS COUNTY

SEA SCOTT|EDWARDS ARCHITECTURE

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LEGEND

PROPERTY LINE
TOTAL SITE AREA: 847,044 SF (19.5 ACRES)

USABLE OPEN SPACE – PLANTED
TOTAL AREA: 297,228 SF

USABLE OPEN SPACE – PAVED
TOTAL AREA: 40,407 SF

SITE AREA	847,044 SQ.FT (19.5 ACRES)
TOTAL USABLE OPEN SPACE	337,635 SQ.FT (7.8 ACRES)
% USABLE OPEN SPACE / SITE AREA	40%

GENERAL SHEET NOTES

PER CITY OF MILWAUKIE CODE TITLE 19, CHAPTER 19.200:
"OPEN SPACE" MEANS ANY PARCEL OF LAND OR PORTION OF A PARCEL WITHOUT A STRUCTURE, EXCEPT AS USED AND DEFINED IN THE PLANNED DEVELOPMENT ZONE.

S|E A
SCOTT|EDWARDS ARCHITECTURE LLP
2525 E. Burnside St., Portland, OR 97214
phone:(503) 226-3617 www.seallp.com

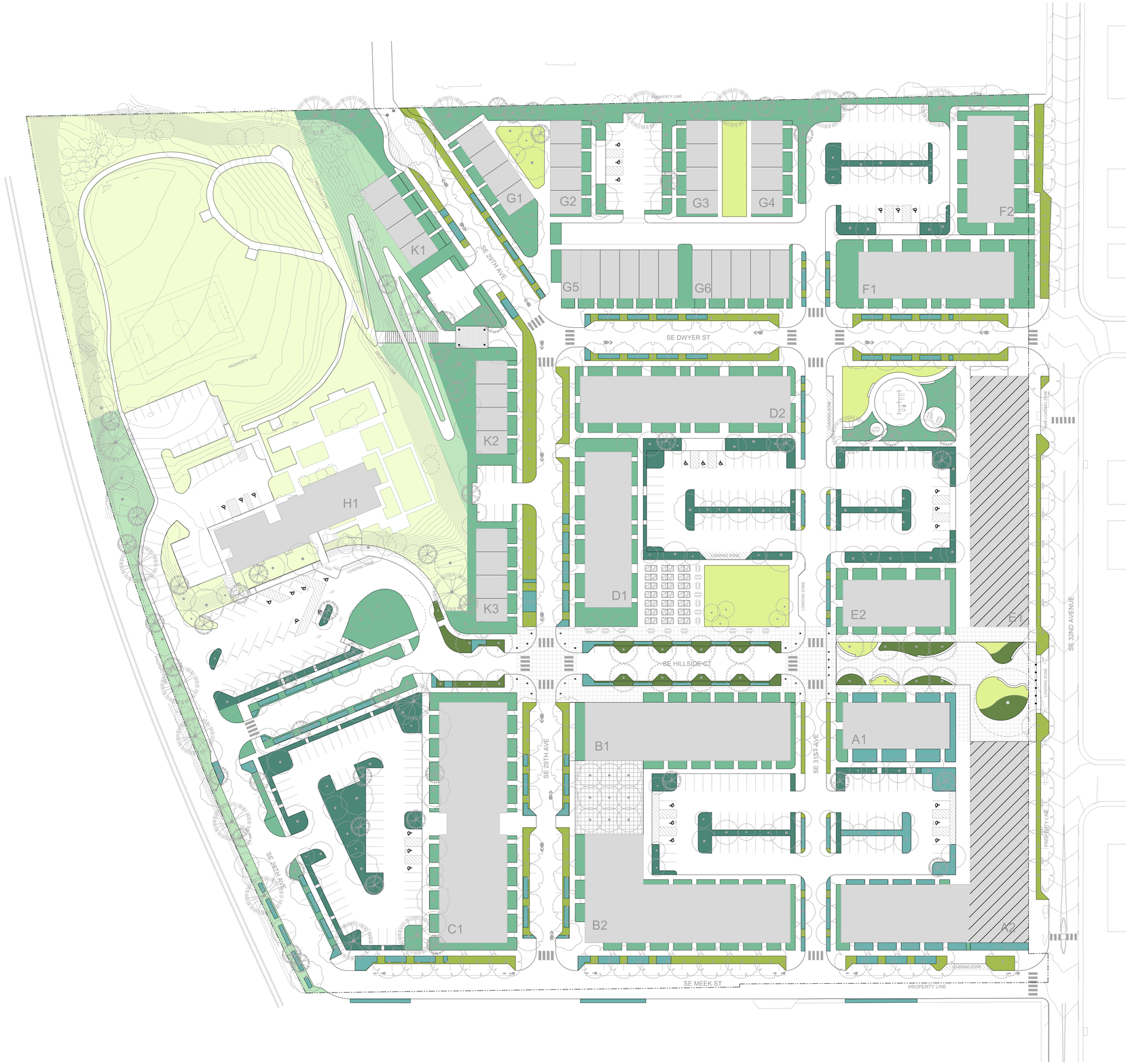
HILLSIDE MASTER PLAN

32ND AND MEEK ST.
MILWAUKIE, OR 97222

Drawing:
OPEN SPACE PLAN

Job No:	20064
Date:	10/23/2020
Drawn By:	TS/YH/SC-
Checked By:	NK/KP-
Sheet No:	

MP 2.1



LEGEND – PLANT ZONES

- PROPERTY LINE
- RIGHT OF WAY PLANT MIX: A
- RIGHT OF WAY PLANT MIX: B
- PARKING LOT LANDSCAPE
- STORM WATER TREATMENT
- UNDISTURBED AREAS, EXISTING CONDITIONS
- LAWN/MEADOW/SEEDED AREAS
- SHRUBS, GRASSES, GROUNDCOVERS AND/OR FORBES
- LANDSCAPE BUFFER – NATIVE/NATIVE ADAPTIVE SHRUBS, GRASSES AND GROUNDCOVERS

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HILLSIDE MASTER PLAN

32ND AND MEEK ST.
MILWAUKIE, OR 97222

Drawing:
PLANTING ZONE PLAN

Job No:	20064
Date:	10/23/2020
Drawn By:	TS/YH/SC-
Checked By:	NK/KP-
Sheet No:	

MP 2.2

LEGEND

PROPERTY LINE
TOTAL SITE AREA: 847,044 SF (19.5 ACRES)

TREE TYPES	TREE QUANTITIES	
	38	TYPE I – DECIDUOUS, MONO-CULTURE, LARGE STREET TREE
	21	TYPE II – DECIDUOUS, MONO-CULTURE, FLOWERING OR STRONG FALL COLOR OR UNIQUE CHARACTERISTICS
	26	TYPE III – DECIDUOUS, POLY-CULTURE, LARGE STREET TREE DOES NOT CONTAIN SPECIES FROM TYPE I OR TYPE II
	28	
	20	

TREE TYPES	TREE QUANTITIES	
	173	TYPE IV – DECIDUOUS/EVERGREEN MIX, POLY-CULTURE, SMALLER CANOPIES THAN I, II, III
	41	
	55	
	20	
	44	EXISTING TREE – CONIFER
	35	EXISTING TREE – DECIDUOUS

TOTAL TREE QUANTITY = 501

CALCULATIONS

CALCULATIONS ASSUME ALL PROPOSED & EXISTING TREE CANOPIES AT MATURITY AVERAGE A TOTAL AREA OF 706 SQ.FT AND A CANOPY DIAMETER OF 30'.
THE FORMULA USED IS: $\pi \times (\text{diameter}/2)^2$ OR $3.14159 \times (30/2)^2$

SITE AREA	847,044 SQ.FT (19.5 ACRES)
TREE CANOPY AREA	353,706 SQ.FT (8.0 ACRES)
TREE CANOPY / SITE AREA	42%

PRELIMINARY TREE SPECIES LIST

APPROVED STREET TREES PER CITY OF MILWAUKIE
REFERENCE PUBLIC WORKS STANDARDS SECTION 5 STREET DESIGN

3–3.9 FEET WIDE PLANTER SPACE – 15' STANDARD ON CENTER SPACING

ACER CIRCINATUM	VINE MAPLE
CARPINUS JAPONICUS	JAPANESE HORNBEAM
CERCIS CANADENSIS CULTIVARS	EASTERN REDBUD
CERCIS OCCIDENTALIS	WESTERN REDBUD
MAAKIA AMURENSIS	AMUR MAAKIA
MAGNOLIA GRANDIFLORA 'LITTLE GEM'	MAGNOLIA
NYSSA SINENSIS	CHINESE TUPELO
PISTACIA CHINENSIS	CHINESE PISTACHE
QUERCUS DUMOSA	SCRUB OAK
QUERCUS FRAINETTO	HUNGARIAN OAK
STYRAX JAPONICUS	JAPANESE SNOWBELL
STYRAX OBASSIA	BIG LEAF SNOWBELL
SYRINGA RETICULATA	JAPANESE TREE LILAC
ZELKOVA SERRATA 'CITY SPRITE' OR 'WIRELESS'	ZELKOVA
CARPINUS BETULUS 'FASTIGATA'	COLUMNAR HORNBEAM
CORNUS KOUSA AND CULTIVARS	KOUSA DOGWOOD

6–8+ FEET WIDE PLANTER SPACE – 30' STANDARD ON CENTER SPACING

ARBUTUS MENZIESII	MADRONE
ARBUTUS UNEDO	STRAWBERRY TREE
CELTIS OCCIDENTALIS	HACKBERRY
FAGUS SYLVATICA	EUROPEAN BEECH
JUNIPERUS OCCIDENTALIS	WESTERN JUNIPER
NYSSA SYLVATICA	BLACK TUPELO
PSEUDOTSUGA MENZIESII	DOUGLAS-FIR
QUERCUS CHRYSOLEPIS	CANYON LIVE OAK
QUERCUS GARRYANA	OREGON OAK
QUERCUS ILEX	HOLLY OAK
QUERCUS PHELLOS	WILLOW OAK
QUERCUS SHUMARDII	SHUMARD OAK
QUERCUS SUBER	CORK OAK
THUJA PLICATA X STANDISHII	GREEN GIANT THUJA
ZELKOVA SERRATA 'GREEN VASE' OR 'VILLAGE GREEN'	ZELKOVA

4–5.9 FEET WIDE PLANTER SPACE – 20' STANDARD ON CENTER SPACING

GINKGO BILOBA 'PRINCETON SENTRY' OR 'FASTIGIATA'	COLUMNAR GINKGO
QUERCUS ROBUR X ALBA	COLUMNAR OAK
ZELKOVA SERRATA 'MUSASHINO'	COLUMNAR ZELKOVA
ARBUTUS MENZIESII	MADRONE
ARBUTUS UNEDO	STRAWBERRY TREE
CORNUS KOUSA AND CULTIVARS	KOUSA DOGWOOD
PARROTIA PERSICA	PERSIAN PARROTIA
QUERCUS HYPOLEUCOIDES	SILVER LEAF OAK

SEA
SCOTT | EDWARDS ARCHITECTURE LLP
2525 E. Burnside St., Portland, OR 97214
phone:(503) 226-3617 www.seallp.com

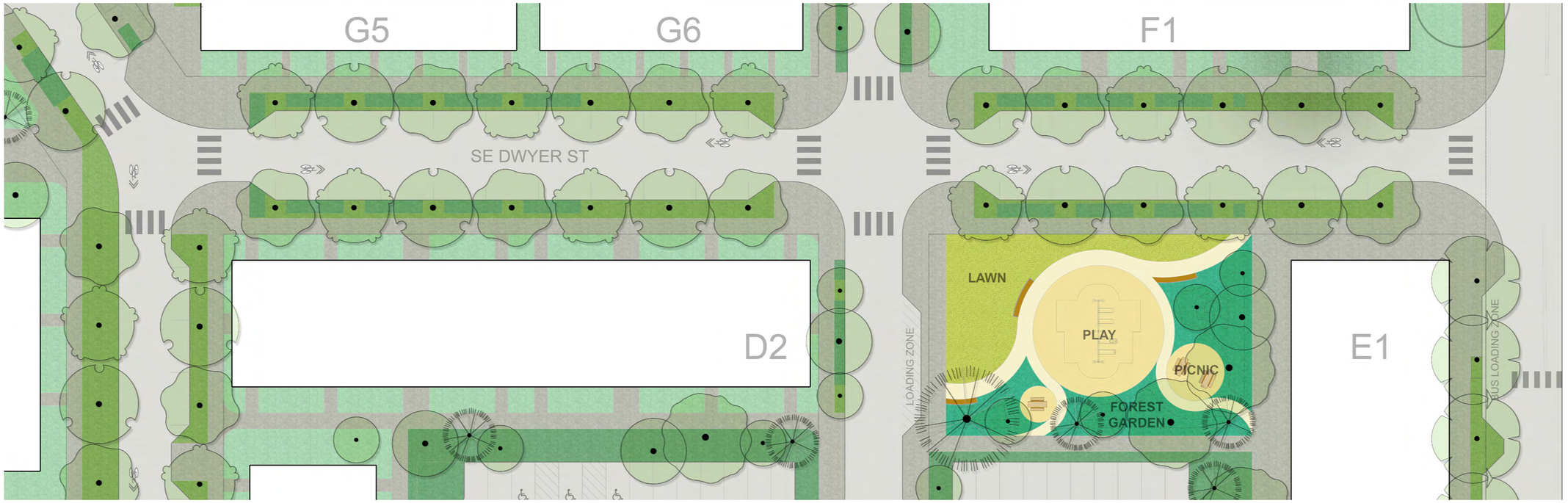
HILLSIDE MASTER PLAN

32ND AND MEEK ST.
MILWAUKIE, OR 97222

Drawing:
TREE PLAN

Job No:	20064
Date:	10/23/2020
Drawn By:	TS/YH/SC-
Checked By:	NK/KP-
Sheet No:	

MP 2.3

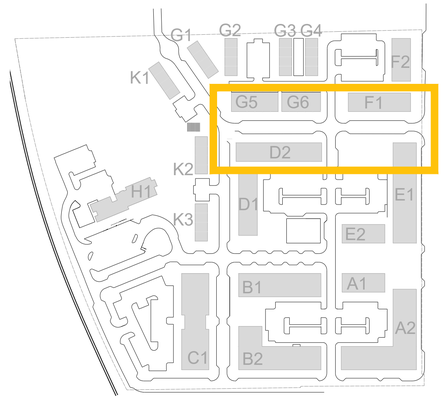


1 SE DWYER STREET – ENLARGEMENT PLAN
SCALE: 1" = 20'-0"

PLAN

LEGEND

- STORMWATER
- MIX A: SHRUBS, GROUNDCOVERS, GRASSES
- MIX B: SHRUBS, GROUNDCOVERS, GRASSES
- MIX C: SHRUBS, GROUNDCOVERS, GRASSES
- LAWNS, MEADOWS, SEED MIXES
- VEHICULAR PAVING
- PEDESTRIAN PAVING- FINISH TYPE I
- PEDESTRIAN PAVING- FINISH TYPE II



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HILLSIDE MASTER PLAN

32ND AND MEEK ST.
MILWAUKIE, OR 97222

Drawing:

ENLARGEMENT PLANS

Job No:	20064
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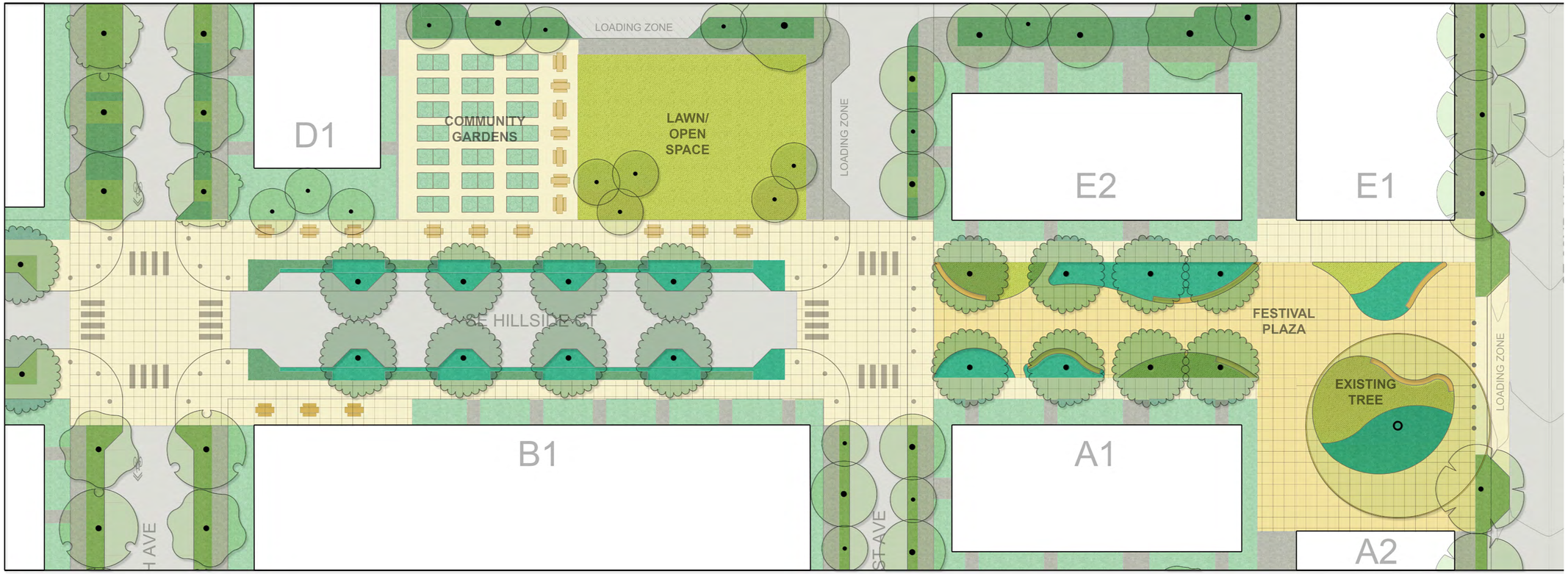
Drawn By:	TS/YH/SC-
Checked By:	NK/KP-
Sheet No:	

MP 2.4

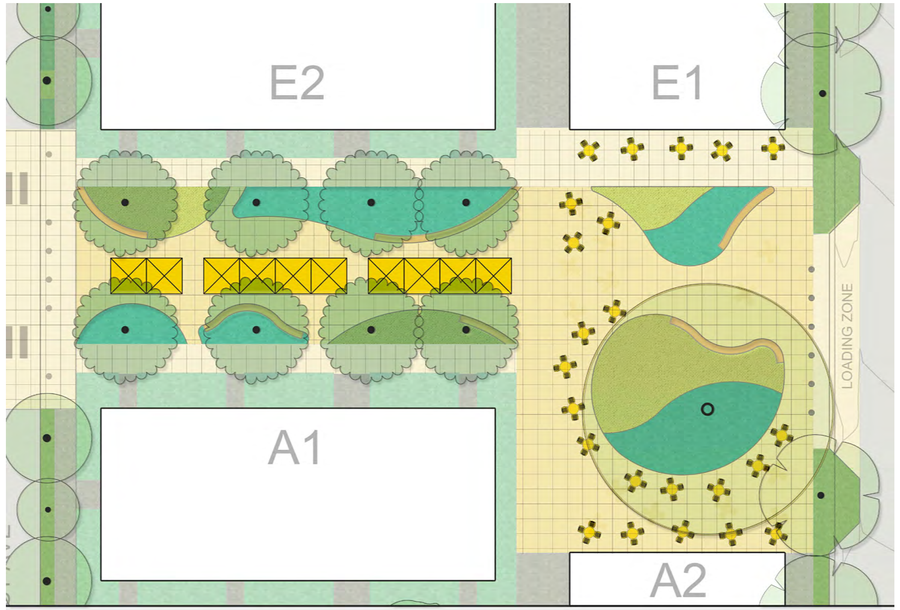


1 SE HILLSIDE COUT – ENLARGEMENT PLAN
SCALE: 1" = 20'-0"

PLAN

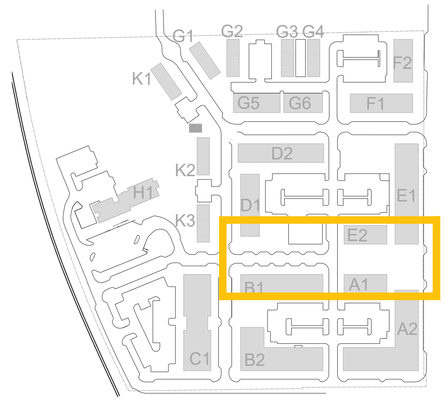
LEGEND

- STORMWATER
- MIX A: SHRUBS, GROUNDCOVERS, GRASSES
- MIX B: SHRUBS, GROUNDCOVERS, GRASSES
- MIX C: SHRUBS, GROUNDCOVERS, GRASSES
- LAWNS, MEADOWS, SEED MIXES
- VEHICULAR PAVING
- PEDESTRIAN PAVING- FINISH TYPE I
- PEDESTRIAN PAVING- FINISH TYPE II



2 MARKET LAYOUT CONCEPT
SCALE: 1" = 20'-0"

PLAN



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HILLSIDE MASTER PLAN

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MILWAUKIE, OR 97222

Drawing:

ENLARGEMENT PLANS

Job No:	20064
Date:	10/23/2020
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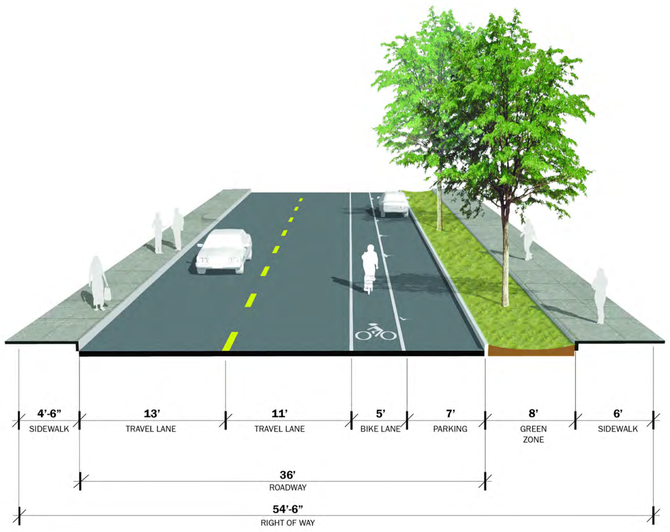
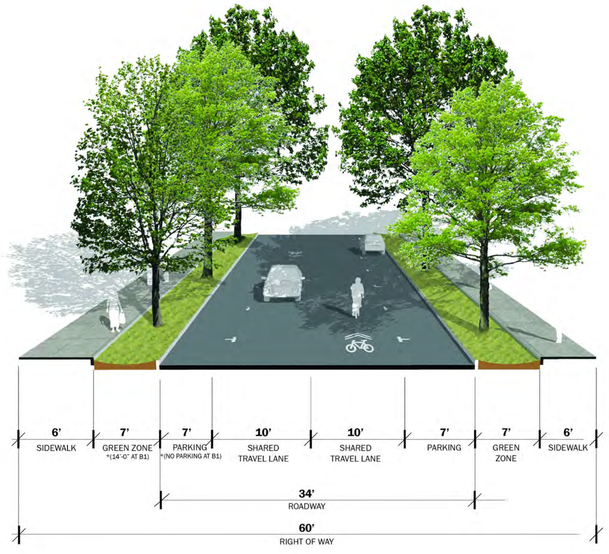
Checked By:	NK/KP-
Sheet No:	

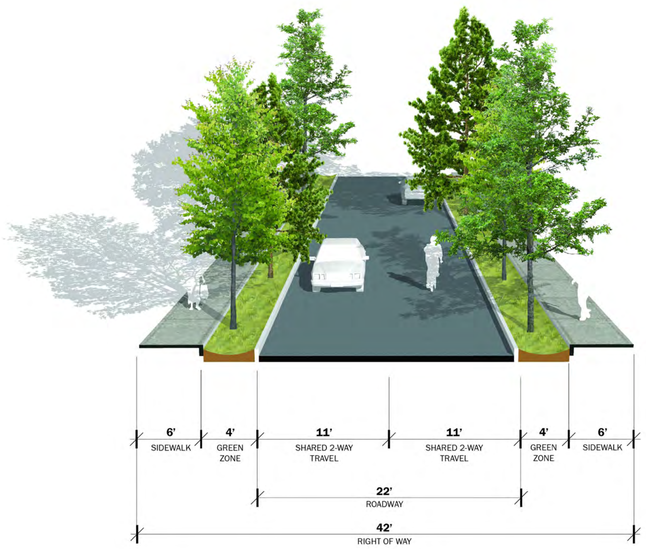
MP 2.5



SECTION A, TYP.
NEIGHBORHOOD STREET
NOT TO SCALE

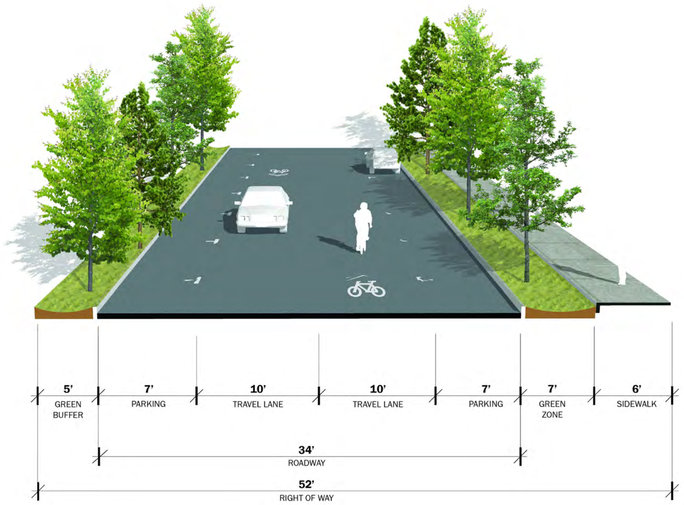


SECTION B, TYP.
LOCAL STREET
NOT TO SCALE

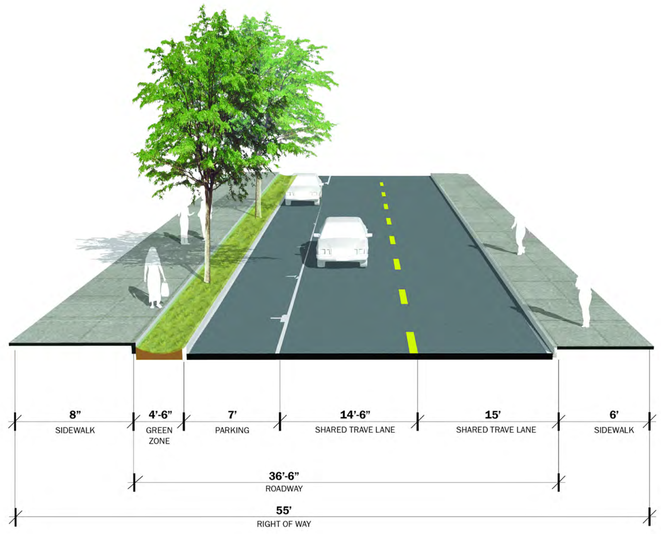


SECTION C, TYP.
(SERVICE STREET)
NOT TO SCALE

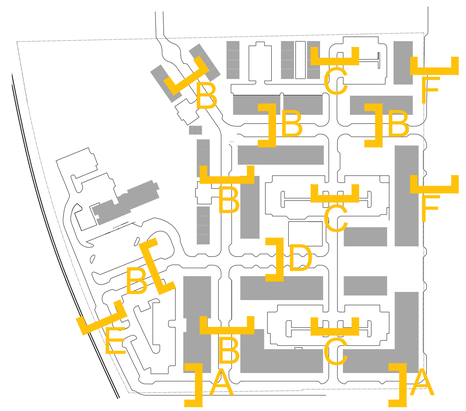
SECTION D, TYP.
(LIVING STREET)
NOT TO SCALE



SECTION E, TYP.
LOCAL STREET
NOT TO SCALE



SECTION F, TYP.
COLLECTOR STREET
NOT TO SCALE



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HILLSIDE MASTER PLAN

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Drawing:

SECTIONS

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Date:	10/23/2020
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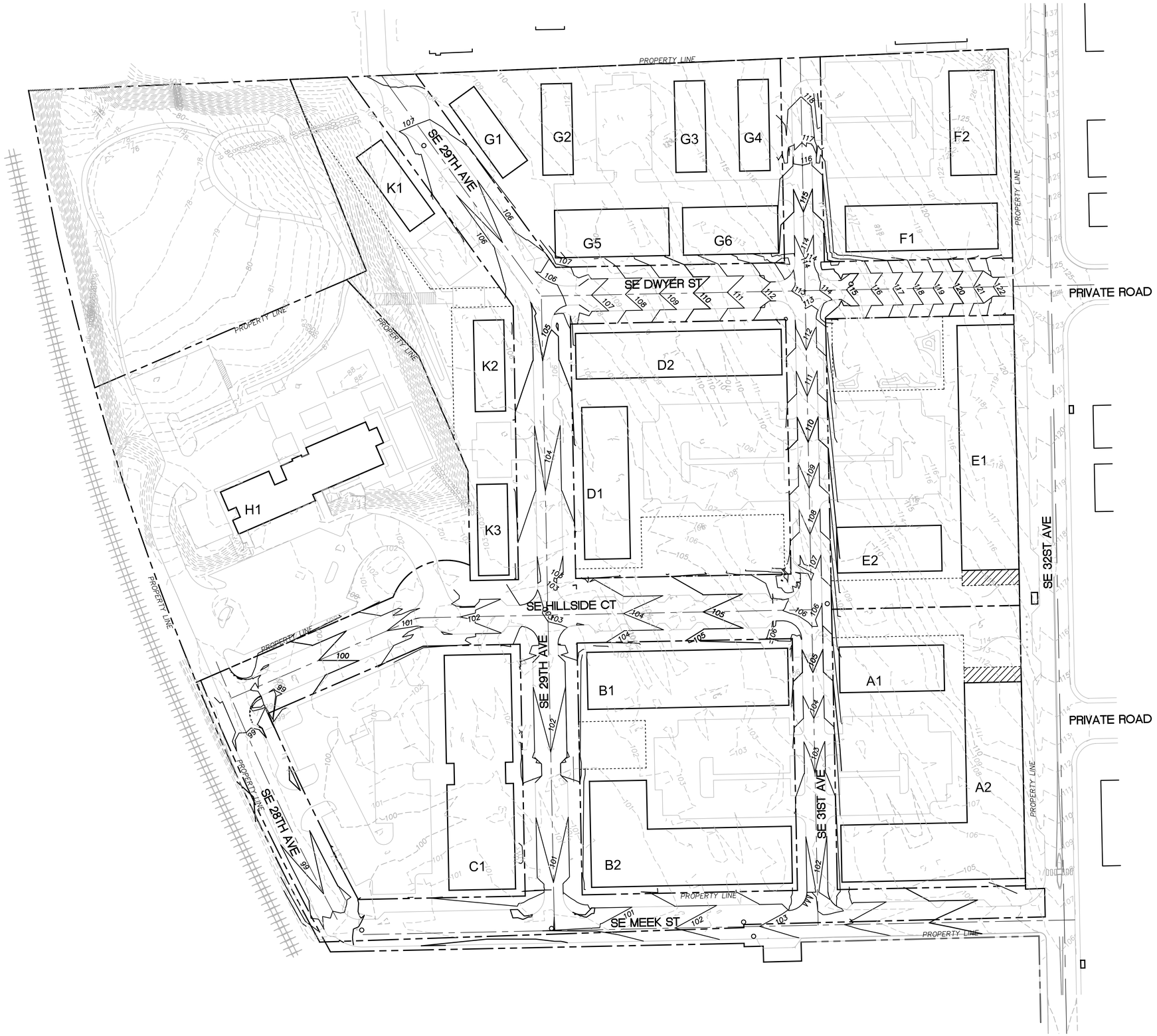
MP 2.6



STREET PLAN
SCALE: 1"=50'

GRAPHIC SCALE
0 50 100
1 inch = 50 ft.

GENERAL SHEET NOTES

1. ALL CONSTRUCTION PER LATEST CITY OF MILWAUKIE PUBLIC WORKS STANDARDS.
2. PROJECTS THAT DISTURB MORE THAN 1.0 ACRES SHALL APPLY FOR NPDES 1200C EROSION CONTROL PERMIT WITH OREGON DEQ.

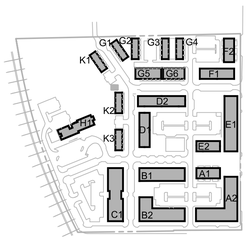
LEGEND

SYMBOL	DESCRIPTION
XXX	EXISTING CONTOUR
XXX	PROPOSED CONTOUR
2.2%	SLOPE ARROW

KEYNOTES

1. NONE THIS SHEET.

KEY PLAN



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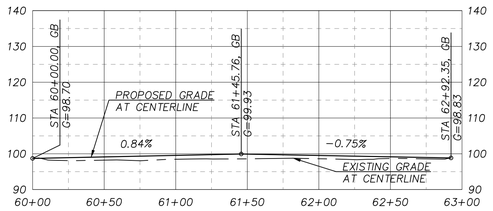
Drawing:

OVERALL GRADING PLAN

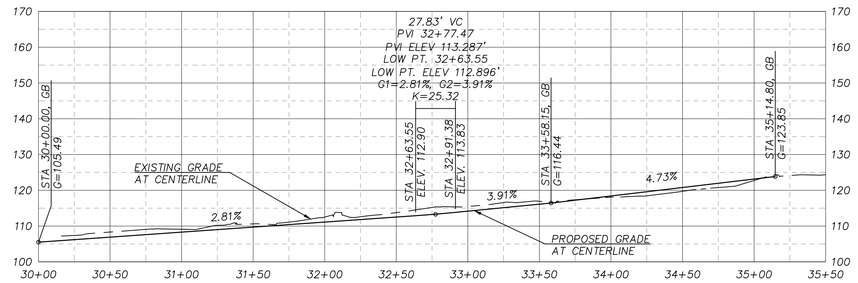
Job No:	20064
Date:	10/23/2020
Drawn By:	-
Checked By:	-
Sheet No:	

MP3.20



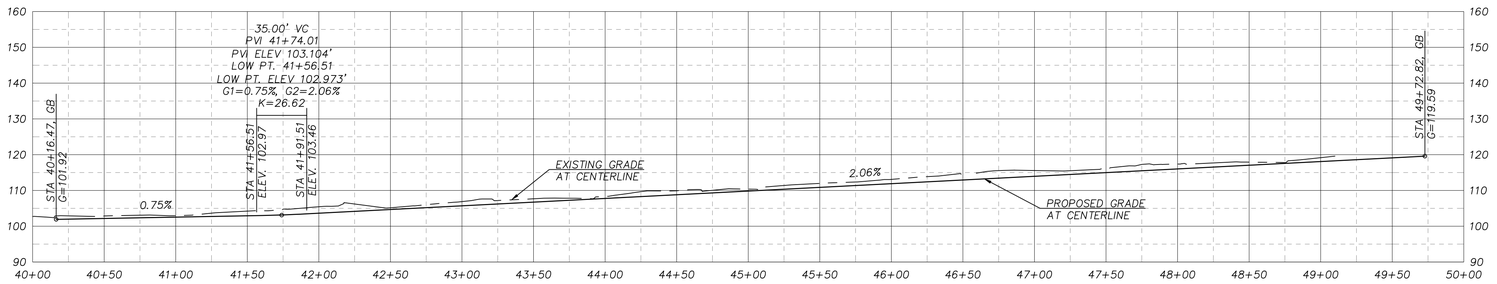
SE 28TH AVENUE PROFILE

SCALE: H: 1"=50'
V: 1"=20'



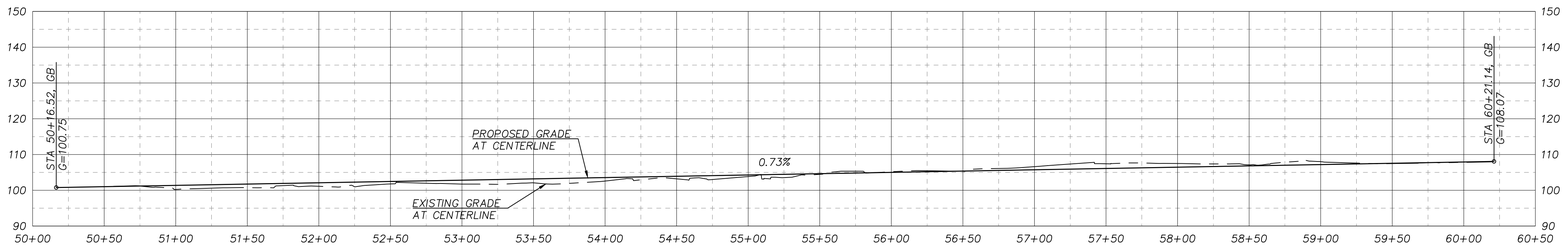
SE DWYER STREET PROFILE

SCALE: H: 1"=50'
V: 1"=20'



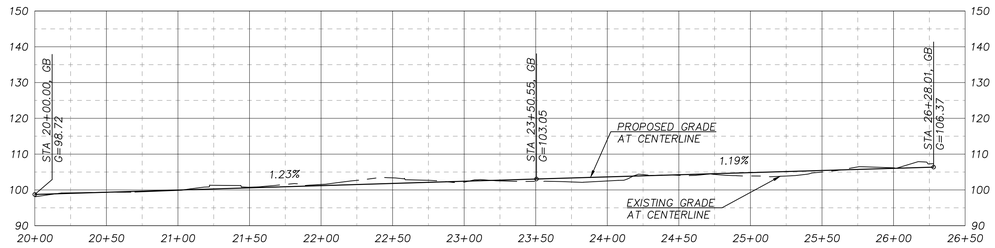
SE 31ST AVENUE PROFILE

SCALE: H: 1"=50'
V: 1"=20'



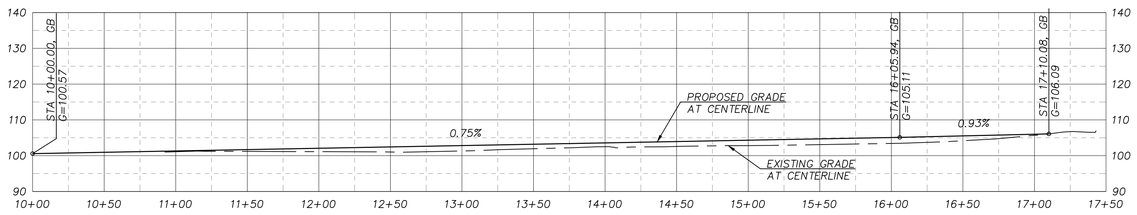
SE 29TH AVENUE PROFILE

SCALE: H: 1"=50'
V: 1"=20'



SE HILLSIDE COURT PROFILE

SCALE: H: 1"=50'
V: 1"=20'



SE MEEK STREET PROFILE

SCALE: H: 1"=50'
V: 1"=20'

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STREET PROFILES

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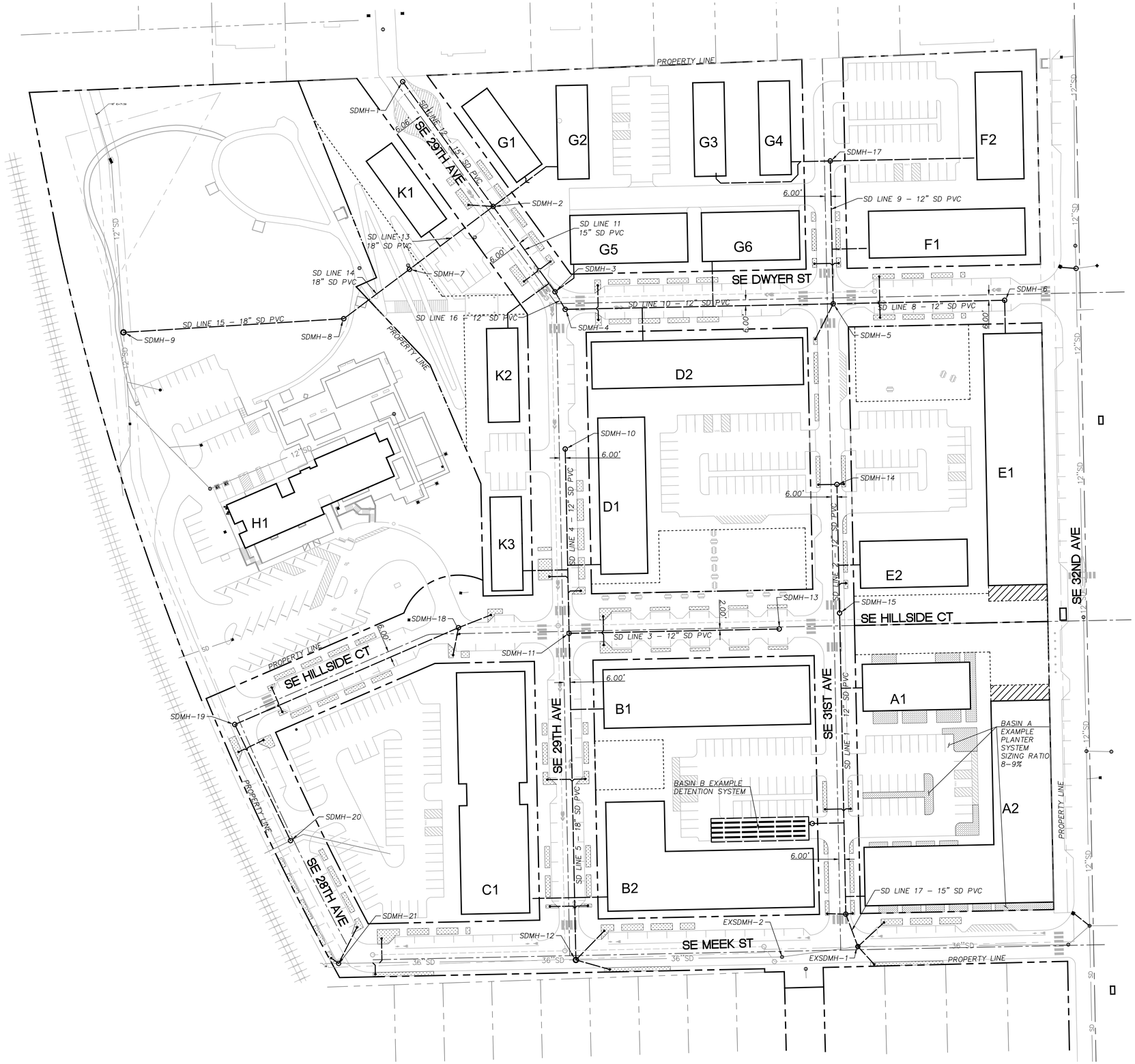
Sheet No:	

MP3.21



STORM SYSTEM PLAN
SCALE: 1"=50'

GRAPHIC SCALE
0 50 100
1 inch = 50 ft.

GENERAL SHEET NOTES

1. ALL CONSTRUCTION PER LATEST CITY OF MILWAUKIE PUBLIC WORKS STANDARDS.
2. STORM PIPE LESS THAN 24–INCH IN DIAMETER TO BE RIBBED PVC.
3. STORM PIPE LOCATED 5 FEET EAST OF STREET CENTERLINE WHERE POSSIBLE.
4. MINIMUM STORM PIPE COVER IS 36 INCHES.
5. EACH INDIVIDUAL LOT DEVELOPMENT SHALL MEET CURRENT CITY STORMWATER MANAGEMENT REQUIREMENTS FOR WATER QUALITY AND FLOW CONTROL.
6. ALL PUBLIC RIGHT OF WAY DEVELOPMENT IS PROPOSED TO HAVE STORMWATER MANAGEMENT MET BY SERIES OF GREEN STREET PLANTERS.

LEGEND

SYMBOL	DESCRIPTION
X" SD	EX. STORM DRAIN
X"SD – PVC	PROPOSED STORM DRAIN
●	EX. STORM MANHOLE
○	PROPOSED STORM MANHOLE
•	OVERFLOW DRAIN
▨	PUBLIC STORM FACILITY SIZING FACTOR 8%

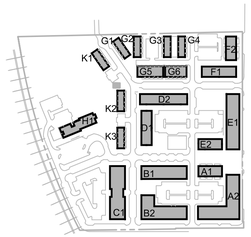
ABBREVIATIONS

EX.	EXISTING
FG	FINISHED GRADE
IE	INVERT ELEVATION
LF	LINEAL FEET
MH	MANHOLE
OD	OVERFLOW DRAIN
SD	STORM DRAIN

KEYNOTES

1. NONE THIS SHEET

KEY PLAN



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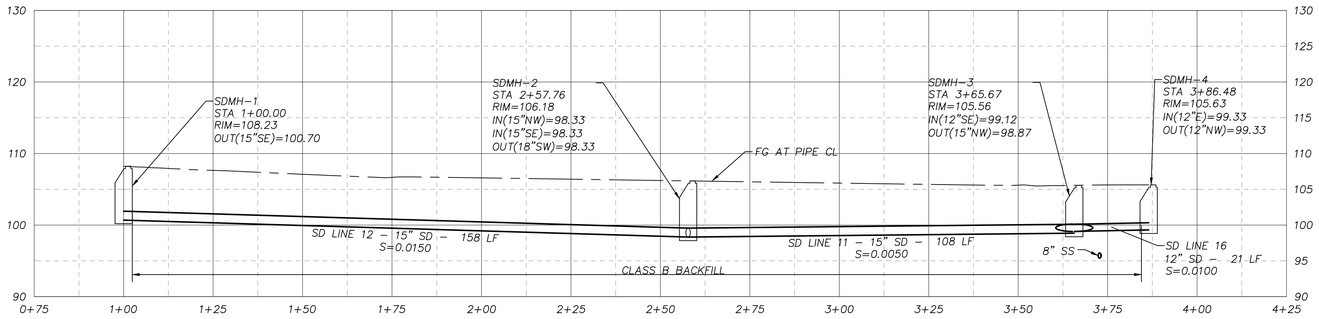
Drawing:

STORM SEWER PLAN

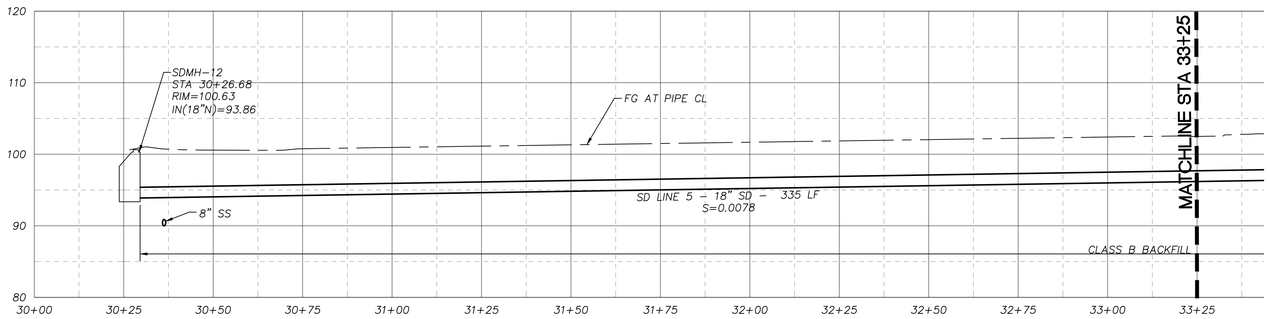
Job No:	20064
Date:	10/23/2020
Drawn By:	-
Checked By:	-
Sheet No:	

MP3.30



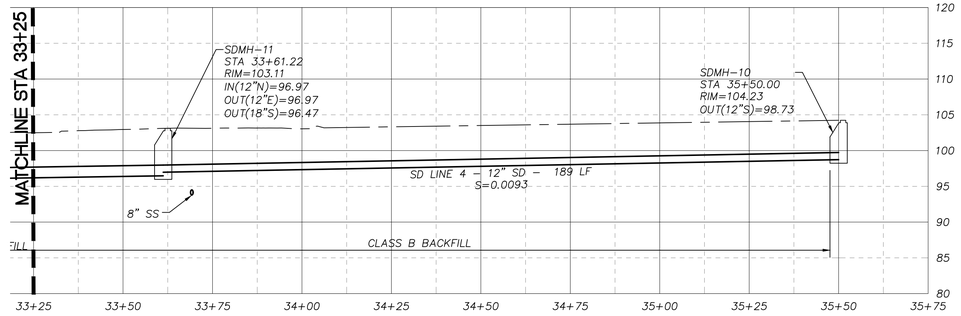
SE 29TH ST STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



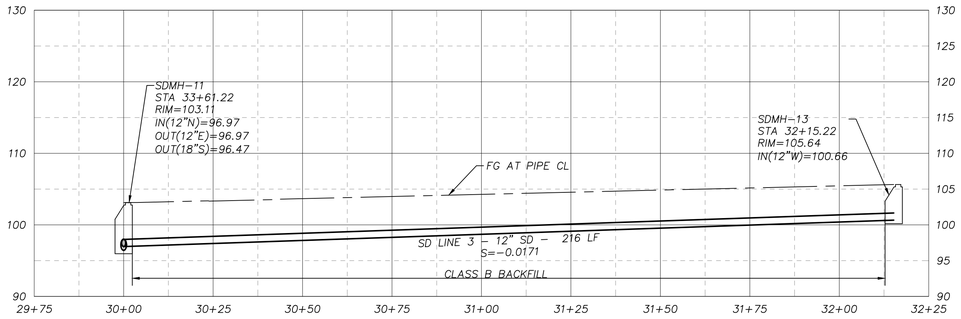
SE 29TH AVE STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



SE 29TH AVE STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



SE HILLSIDE CT STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'

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STORM SEWER PROFILE

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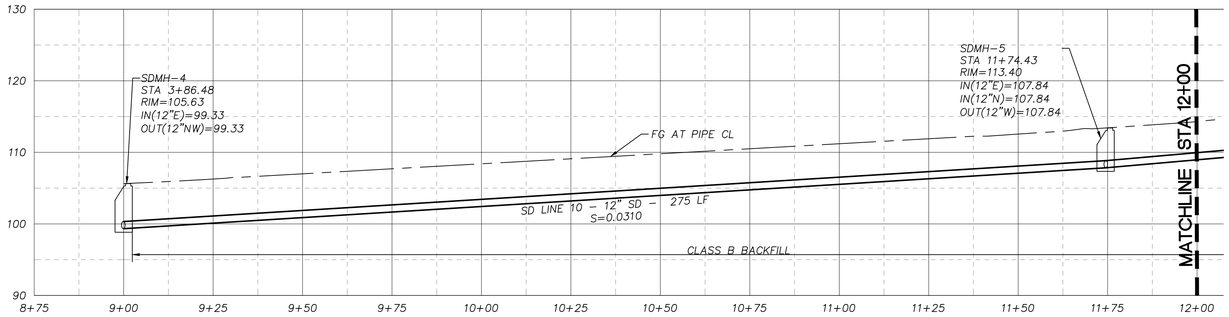
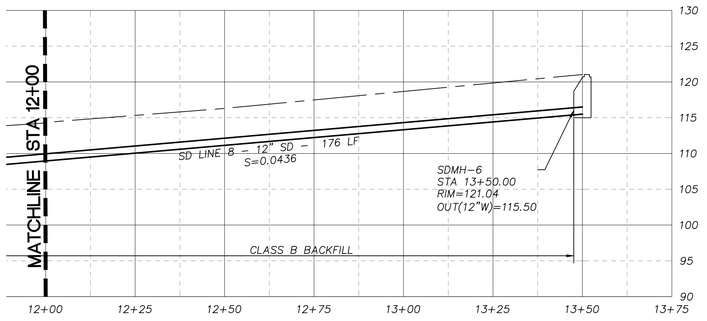
Checked By:	-
Sheet No:	

MP3.31



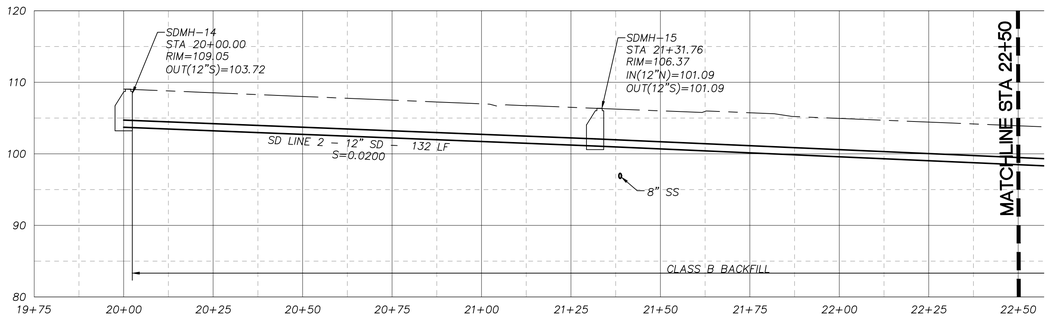
SE DWYER ST STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



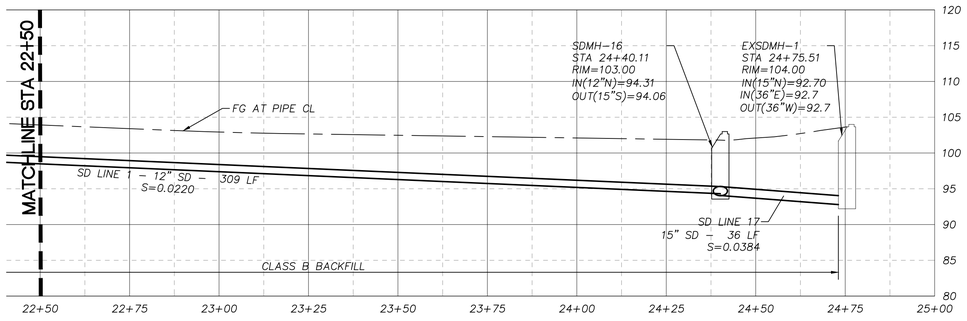
SE DWYER ST STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



SE 31ST AVE STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



SE 31ST AVE STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'

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STORM SEWER PROFILE

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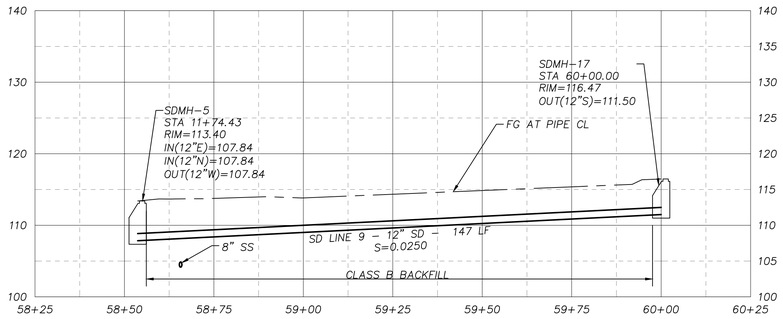
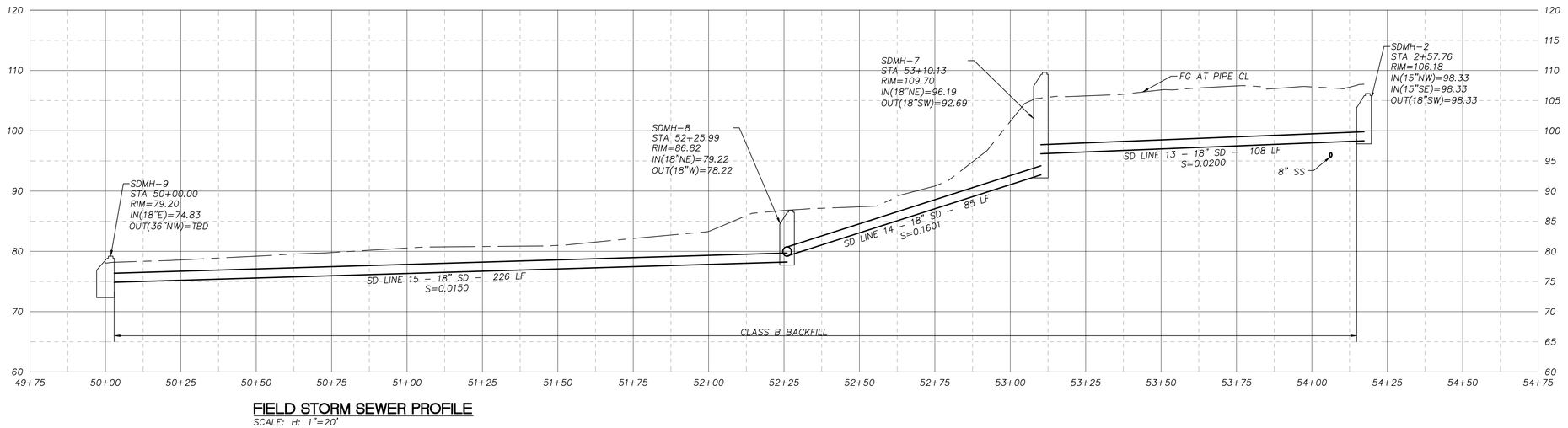
MP3.32



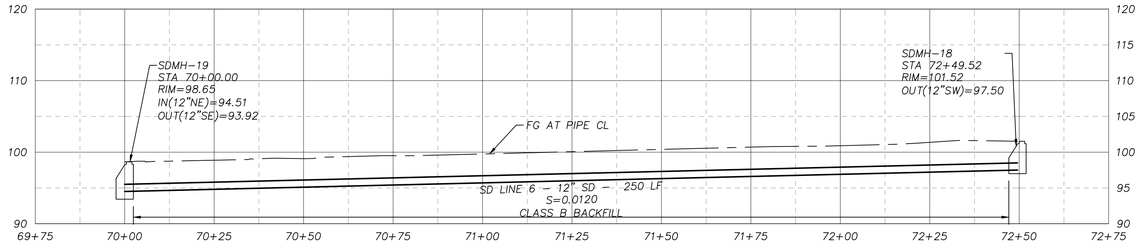
SE 31ST AVE STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



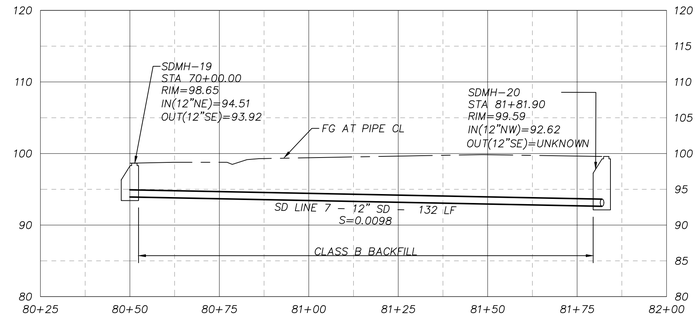
FIELD STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



HILLSIDE CT STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



28TH AVE STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'

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STORM SEWER PROFILE

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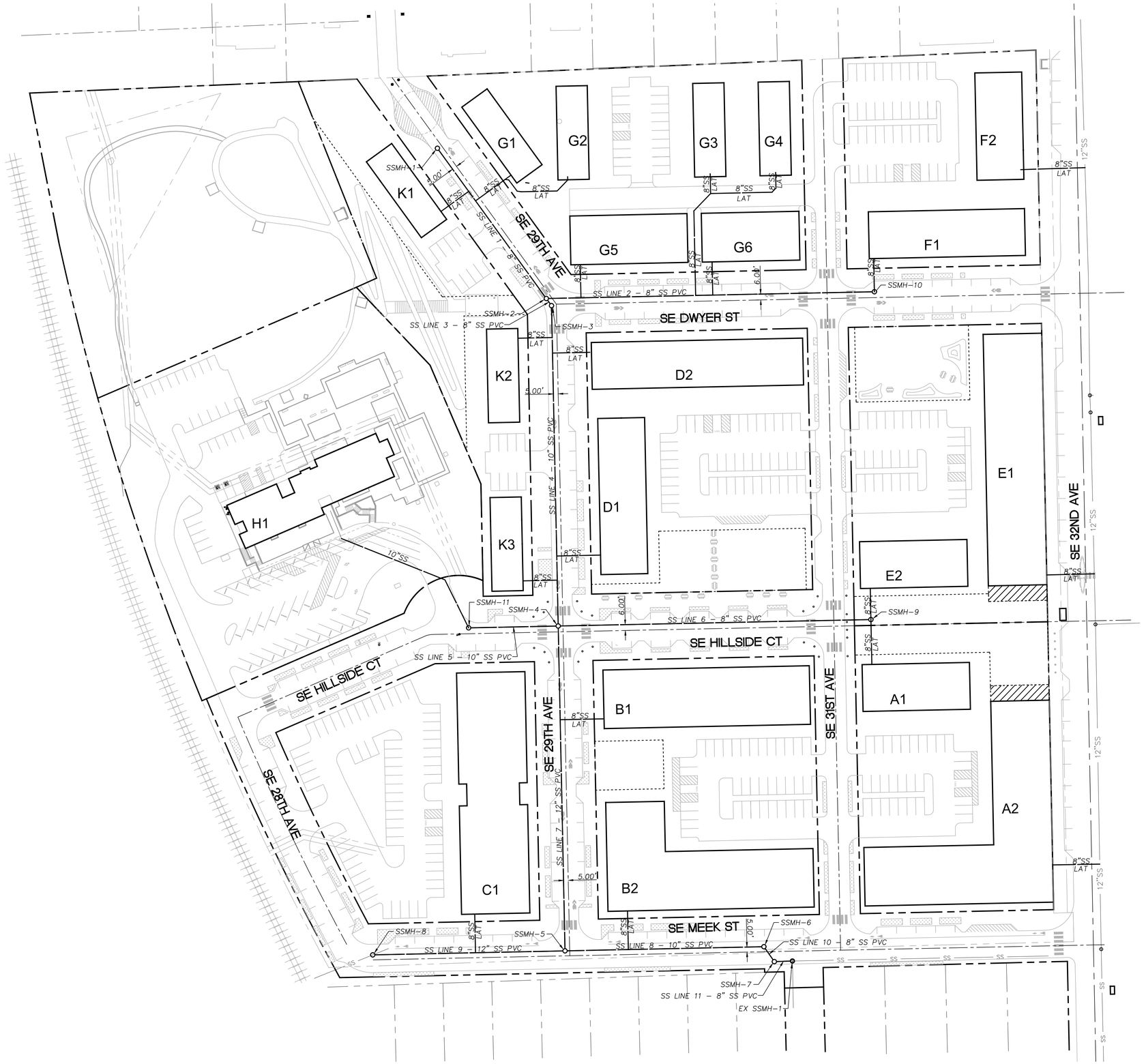
MP3.33



SANITARY SYSTEM PLAN
SCALE: 1"=50'

GRAPHIC SCALE
0 50 100
1 inch = 50 ft.

GENERAL SHEET NOTES

1. ALL CONSTRUCTION PER LATEST CITY OF MILWAUKIE PUBLIC WORKS STANDARDS.
2. SANITARY PIPE SHALL BE PVC (ASTM D3034).
3. SANITARY PIPE LOCATED 5 FEET NORTH OR WEST OF STREET CENTERLINE WHERE POSSIBLE.
4. MINIMUM DEPTH IS 8 FEET FOR MAINLINE AND 6 FEET FOR BUILDING SERVICE LATERALS.

LEGEND

SYMBOL	DESCRIPTION
X"SS	EX. SANITARY SEWER
X"SS - PVC	SANITARY SEWER
●	EX. SANITARY MANHOLE
○	PROPOSED SANITARY MANHOLE

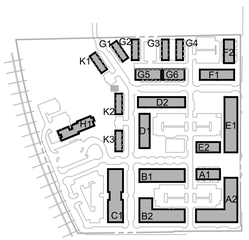
ABBREVIATIONS

EX.	EXISTING
FG	FINISHED GRADE
IE	INVERT ELEVATION
LF	LINEAL FEET
MH	MANHOLE
OD	OVERFLOW DRAIN
SD	STORM DRAIN
SS	SANITARY SEWER

KEYNOTES

1. NONE THIS SHEET

KEY PLAN



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Drawing:

SANITARY SEWER PLAN

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Date:	10/23/2020
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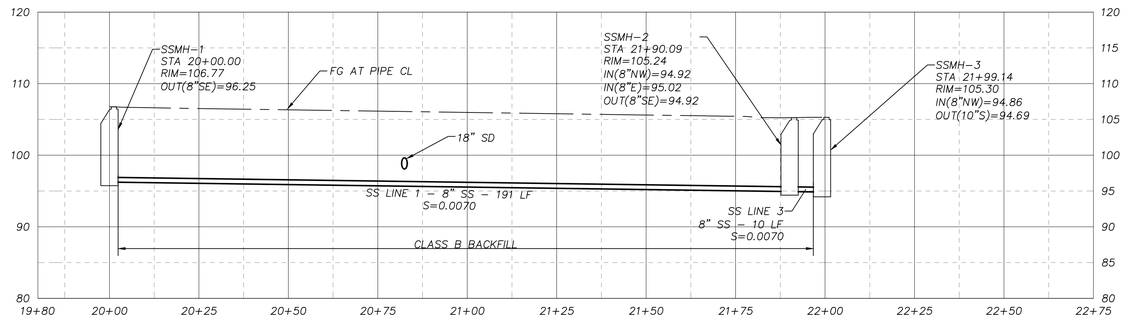
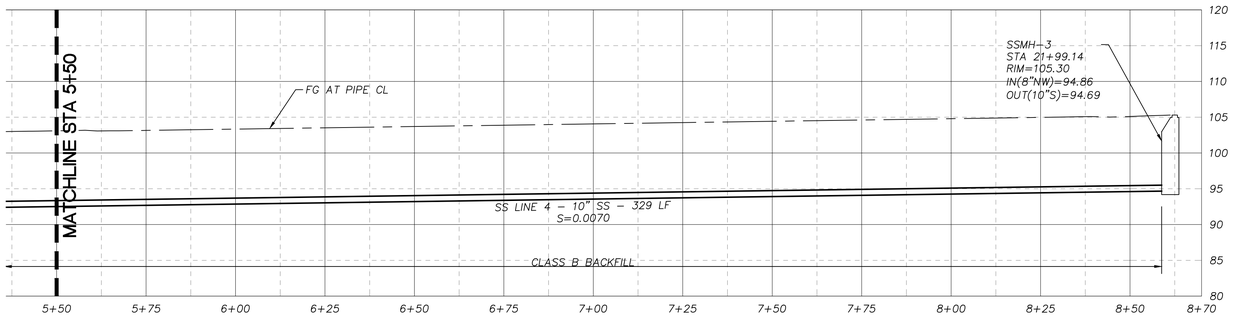
Checked By:	-
Sheet No:	

MP3.40



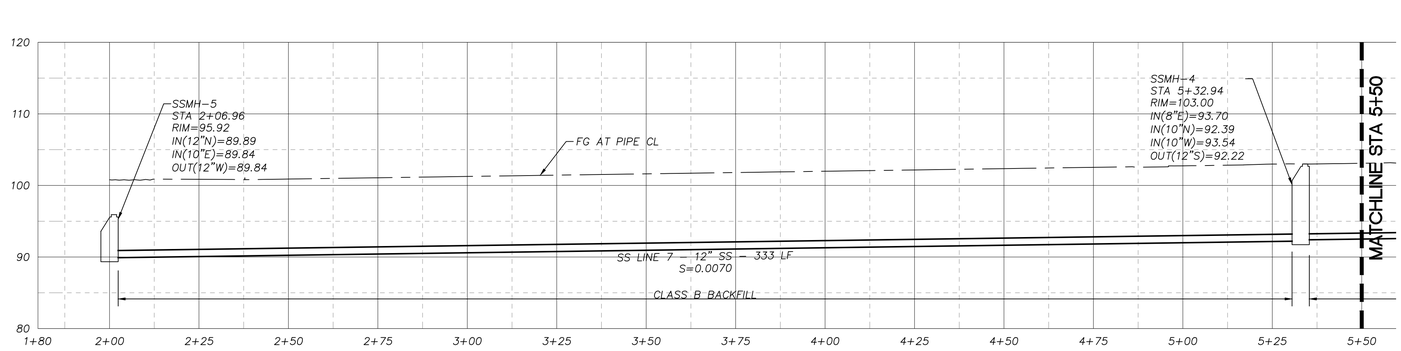
SE 29TH ST SANITARY SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



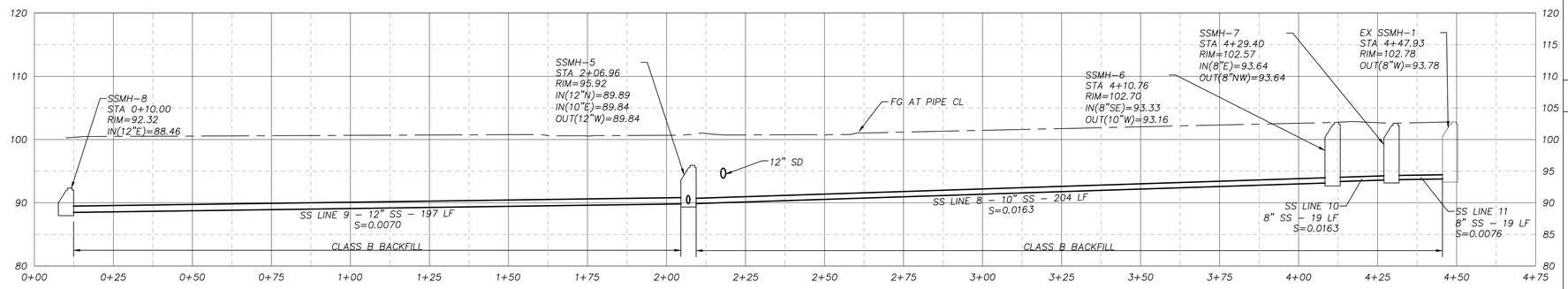
SE 29TH AVE SANITARY SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



SE 29TH AVE SANITARY SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



SE MEEK ST SANITARY SEWER PROFILE

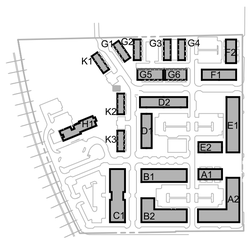
SCALE: H: 1"=20'
V: 1"=10'

GENERAL SHEET NOTES

LEGEND

KEYNOTES

KEY PLAN



S|E A
SCOTT|EDWARDS ARCHITECTURE LLP
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phone:(503) 226-3617 www.seallp.com

HILLSIDE MASTER PLAN

32ND AND MEEK ST.
MILWAUKIE, OR 97222

Humber Design Group, Inc.
Portland, OR • 503.946.6690 • hdgpdx.com

Drawing:

SANITARY SEWER PROFILE

Job No:	20064
Date:	10/23/2020
Drawn By:	-
Checked By:	-
Sheet No:	

MP3.41

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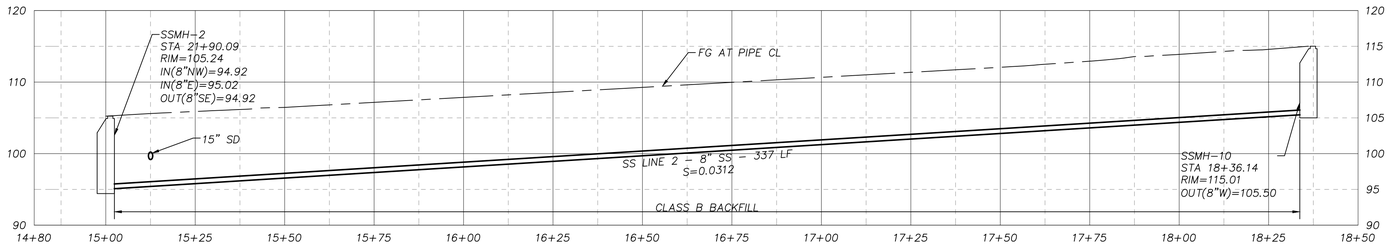
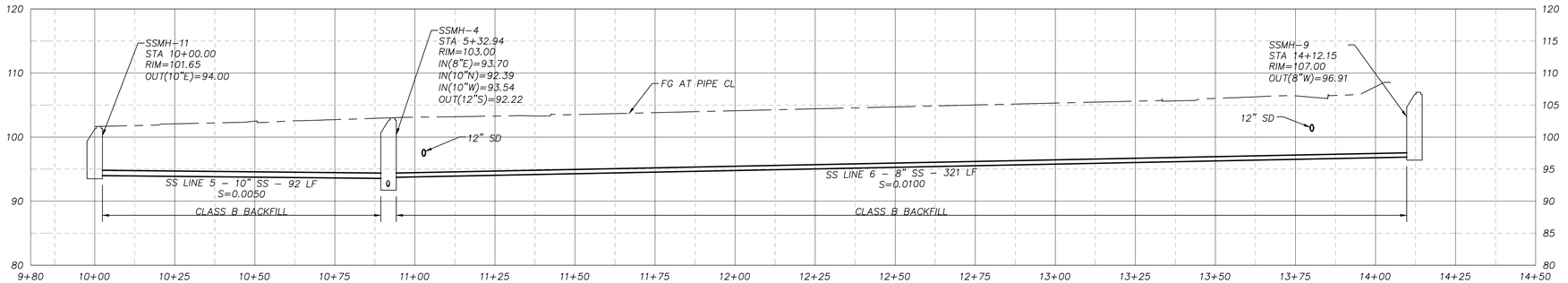


SE DWYER ST SANITARY SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



SE HILLSIDE CT SANITARY SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'

Drawing:

SANITARY SEWER PROFILE

Job No:	20064
Date:	10/23/2020
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Checked By:	-
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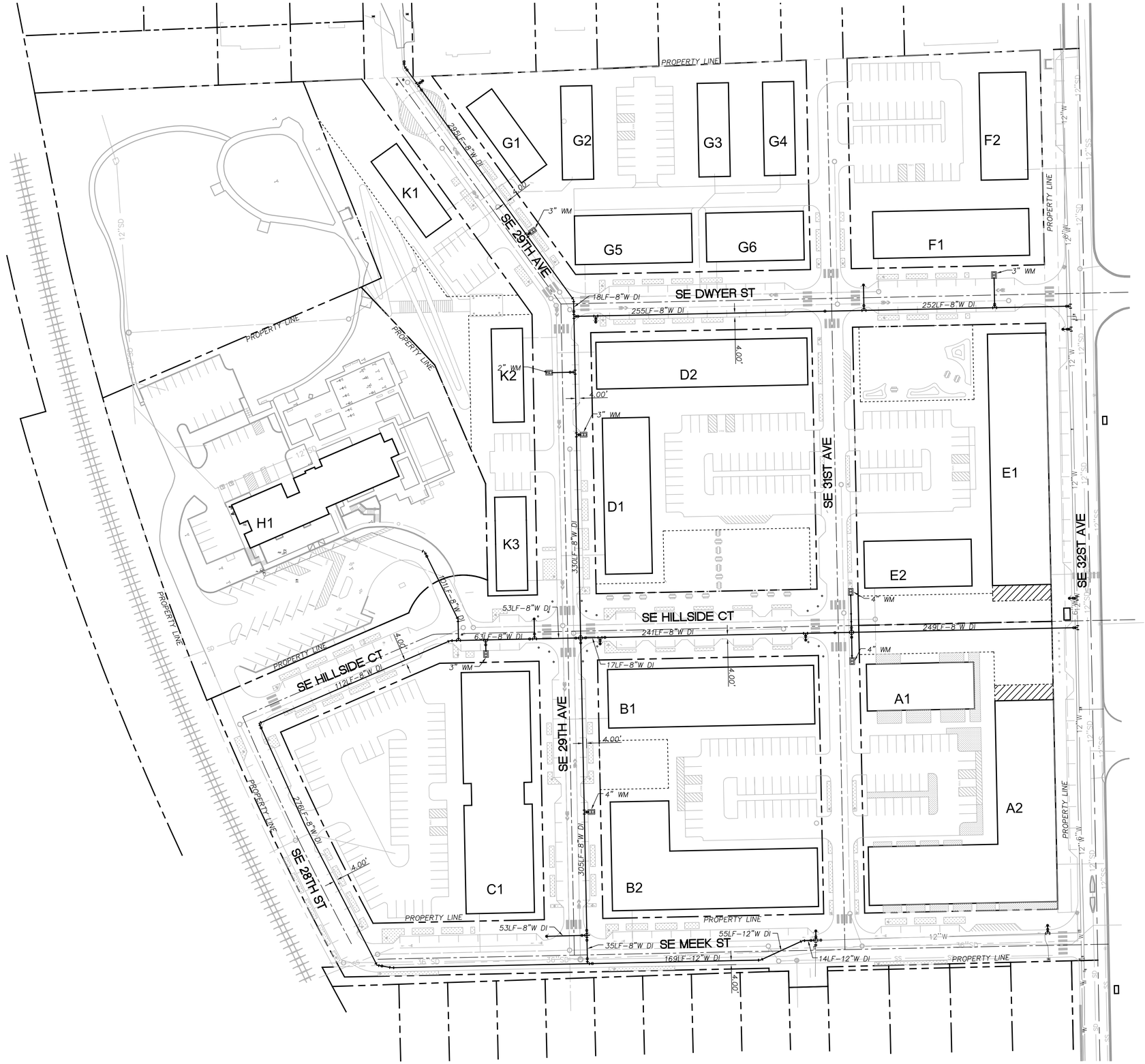


WATER SYSTEM PLAN
SCALE: 1"=50'

GRAPHIC SCALE
0 50 100
1 inch = 50 ft.

GENERAL SHEET NOTES

1. ALL CONSTRUCTION PER LATEST CITY OF MILWAUKIE PUBLIC WORKS STANDARDS.
2. ALL WATER PIPE SHALL BE DUCTILE IRON (DI), CEMENT MORTAR LINED WITH PUSH-ON MECHANICAL JOINTS.
3. ALL DUCTILE IRON FITTINGS SHALL BE PRESSURE RATED FOR 250 OR 350 PSI, AND SHALL BE FACTORY CEMENT LINED AND COATED. MINIMUM PIPE COVER IS 36-INCHES.
4. ALL VALVES 12-INCHES AND SMALLER SHALL BE GATE VALVES.

LEGEND

SYMBOL	DESCRIPTION
	PROPOSED FIRE HYDRANT
	GATE VALVE
	PROPOSED WATERLINE
8"W	EXISTING WATERLINE
	EXISTING GATE VALVE
	EXISTING FIRE HYDRANT

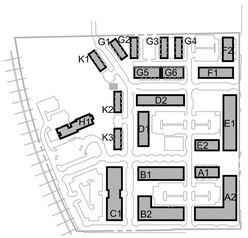
ABBREVIATIONS

DI	DUCTILE IRON
LF	LINEAR FEET
W	WATER
WM	WATER METER

KEYNOTES

1. NONE THIS SHEET.

KEY PLAN



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Drawing:

WATER SYSTEM PLAN

Job No:	20064
Date:	10/23/2020
Drawn By:	-
Checked By:	-
Sheet No:	

MP3.50

lancaster mobley

Hillside Master Plan

Transportation Impact Study

Milwaukie, Oregon

Date:
August 24, 2020

Prepared for:
Devin Ellin & Stephen McMurtrey
Housing Authority of Clackamas County (HACC)

Prepared by:
Terrington Smith, EIT
Jennifer Danziger, PE

Table of Figures

Table of Tables

Executive Summary

1. The Hillside Master Plan is a mixed-use development planned for the property located at 2889 SE Hillside Court in Milwaukie, Oregon. The site consists of tax lots 11E25CD00100 and 11E25CD00102 totaling approximately 16 acres. It currently contains the 100-unit Hillside Manor apartment building and 100 single-family detached houses. The proposed 600-unit development will construct 20 new buildings containing 500 multifamily housing units with some ground-floor commercial space and accessory space for Hillside resident and retain the 100-unit Hillside Manor. The existing single-family houses will be demolished. Site access is proposed via SE Meek Street and an extension of SE Dwyer Drive.
2. The proposed development is projected to generate a net additional 110 trips during the morning peak hour, a net additional 105 trips during the evening peak hour, and a net additional 1,426 trips during the average weekday compared with existing development of the site.
3. No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
4. Adequate sight distance is available at the site access to ensure safe and efficient operation of the intersection; however, sight lines at the SE Meek Street access on SE 32nd Avenue could be improved by removing some of the foliage on the southeast corner of the intersection.
5. The SE Meek Street site access will meet access spacing standards for SE 32nd Avenue but the SE Dwyer Drive intersection will not meet spacing due to the north. However, the average access spacing across the site frontage will meet the standard, and the number of potential conflict points along this section of SE 32nd Avenue will be reduced compared with existing conditions, improving the safety and flow of the street.
6. Left-turn lane warrants are projected to be met for the northbound approach of the intersection of SE Meek Street at SE 32nd Avenue; however, a northbound left-turn lane is not recommended for several reasons. Stopped vehicles in a northbound left-turn lane would obstruct the line of sight between northbound vehicles and pedestrians using the crosswalk on SE 32nd Avenue north of the intersection. While the separation of left-turning vehicles can reduce potential conflicts, it would also support higher travel speeds on a roadway where traffic-calming measures have been installed to slow travel speeds.
7. Preliminary traffic signal warrants will not be met at any of the study intersections under buildout conditions.
8. All study area intersections are expected to operate within the City of Milwaukie and ODOT standards under all analysis scenarios except for the intersection of SE Harrison Street at SE 42nd Avenue. This intersection will exceed City standards under background conditions and worsen by one second of delay under building conditions. However, no mitigation is recommended because traffic volumes will not meet signal warrants.
9. A vehicular connection between the site and SE 29th Avenue is not projected to significantly improve or degrade the performance of the affected study intersections compared with providing only a bicycle/pedestrian connection.
10. Regarding the proposed zone change, a comparison of reasonable worst-case development scenarios shows that the transportation system is capable of supporting changes to adopted plans and land use regulations and no modifications to the City's TSP are needed. Therefore, the conditions of the TPR are satisfied.

Project Description

Introduction

The Hillside Master Plan is a mixed-use development planned for the property located at 2889 SE Hillside Court in Milwaukie, Oregon. The site consists of tax lots 11E25CD00100 and 11E25CD00102 totaling approximately 16 acres. It currently contains the 100-unit Hillside Manor apartment building and 100 single-family detached houses. The proposed 600-unit development will construct 20 new buildings containing 500 multifamily housing units with some ground-floor commercial space and accessory space for Hillside resident and retain the 100-unit Hillside Manor. The existing single-family houses will be demolished. Site access is proposed via SE Meek Street and an extension of SE Dwyer Drive.

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the proposed development and to determine any mitigation that may be necessary to do so. Through scoping with City and ODOT staff, the following ten intersections were selected for analysis:

- SE Tacoma Street/SE Johnson Creek Boulevard at SE 32nd Avenue
- SE Balfour Street at SE 29th Avenue
- SE Balfour Street at SE 32nd Avenue
- SE Dwyer Drive (site access) at SE 32nd Avenue
- SE Meek Street (site access) at SE 32nd Avenue
- SE Harrison Street at Oregon Highway 224 (Highway 224
- SE Harrison Street at SE 32nd Avenue
- SE Harrison Street at SE 42nd Avenue
- SE Monroe Street at Highway 224
- Highway 224 at SE Oak Street

Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Location Description

The site is bordered by a vacant property to the south (the Murphy site); SE 32nd Avenue and Providence Milwaukie Hospital to the east; residential properties to the north; and railroad tracks and industrial lands to the west. The site is located less than a mile south of SE Johnson Creek Boulevard and is within a mile of Highway 99E and Highway 224. Development in the surrounding area is primarily residential, with industrial development west of the railroad adjacent to the site. The site is currently zoned as R-3 and occupied by 200 units of public housing.The nine-story Hillside Manor apartment building includes 100 multifamily homes which will remain after construction, however the remaining 100 detached single-family dwellings will be removed for the proposed project.

Vicinity Roadways

The proposed development is expected to impact eleven vicinity roadways near the site. Table 1 provides a description of each vicinity roadway.

Table 1: Vicinity Roadway Descriptions

Roadway	Jurisdiction	Functional Classification	Cross-Section	Speed	On-street Parking	Bicycle Lanes	Curbs	Sidewalks
SE Tacoma Street	City of Portland	Collector	2 to 3 Lanes	25 mph Posted	Not Permitted	Both Sides	Both Sides	Both Sides
SE Johnson Creek Boulevard	City of Portland	Collector	2 to 3 Lanes	25 mph Posted	Not Permitted	Both Sides	Both Sides	Both Sides
SE 32nd Avenue	City of Milwaukie	Collector	2 to 3 Lanes	25 mph Posted	Not Permitted	None	Both Sides	Both Sides
SE 29th Avenue	City of Milwaukie	Local Street	2 Lanes	25 mph Statutory	Permitted Both Sides	None	None	None
SE Balfour Street	City of Milwaukie	Local Street	2 Lanes	25 mph Statutory	Permitted Both Sides	None	None	None
SE Dwyer Street	City of Milwaukie	Local Street	2 Lanes	25 mph Statutory	Permitted South Side	None	Both Sides	Both Sides
SE Meek Street	City of Milwaukie	Local Street	2 Lanes	25 mph Statutory	Permitted Both Sides	None	Both Sides	Both Sides
Highway 224	ODOT	Regional Route	4 to 6 Lanes	40 mph Posted	Not Permitted	None	Both Sides	None
SE Harrison Street	City of Milwaukie	Arterial	2 to 4 Lanes	25 mph Posted	Partially Permitted	None	Both Sides	Both Sides
SE 42nd Avenue	City of Milwaukie	Arterial/Collector	2 to 3 Lanes	25 mph Posted	Permitted Both Sides	Both Sides	Both Sides	Both Sides
SE Monroe Street	City of Milwaukie	Local Street	2 Lanes	25 mph Posted	Permitted Both Sides	None	Both Sides	Both Sides
SE Oak Street	City of Milwaukie	Collector	2 to 6 Lanes	25 mph Statutory	Not Permitted	None	Both Sides	Both Sides

Notes: Functional Classification based on the City of Milwaukie Transportation System Plan

Study Intersections

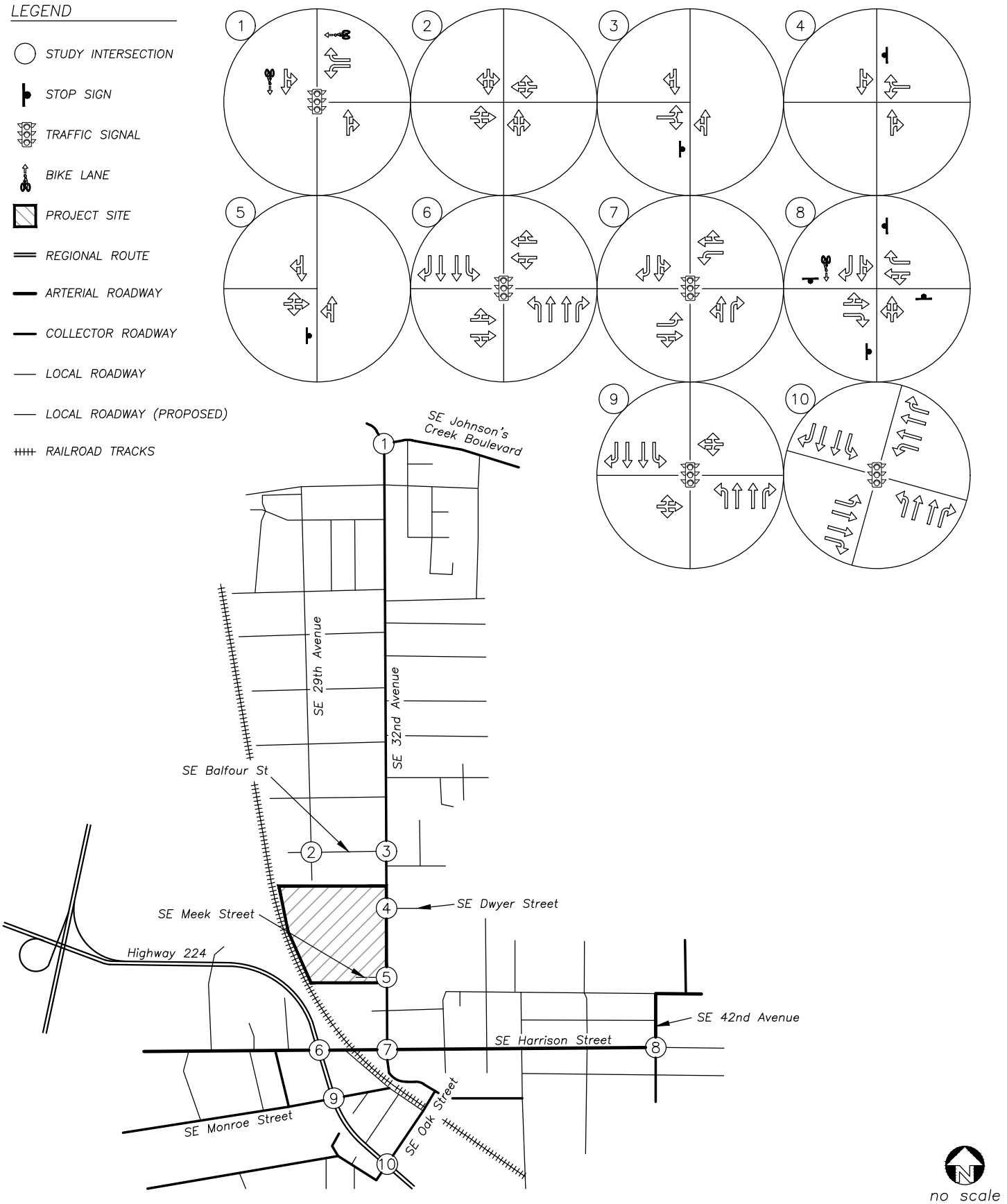
The proposed development is expected to impact ten vicinity intersections of significance. Table 2 provides a summarized description of the study intersections.

Table 2: Vicinity Intersection Descriptions

Number	Name	Geometry	Traffic Control	Phasing/Stopped Approaches
1	SE Tacoma Street/SE Johnson Creek Boulevard at SE 32nd Avenue	Three-Legged	Signalized	Split for NB/SB Approaches Right Overlap for WB Phase
2	SE Balfour Street at SE 29th Avenue	Four-Legged	Yield-Controlled	Yield Controlled All Approaches
3	SE Balfour Street at SE 32nd Avenue	Three-Legged	Stop Controlled	EB Stopped Approach
4	SE Dwyer Street at SE 32nd Avenue	Four-Legged	Stop Controlled	EB/WB Stopped Approach
5	SE Meek Street at SE 32nd Avenue	Three-Legged	Stop Controlled	EB Stopped Approach
6	SE Harrison Street at Highway 224	Four-Legged	Signalized	Permitted LT for EB/WB Approaches FYA for NB/SB Approaches
7	SE Harrison Street at SE 32nd Avenue	Four-Legged	Signalized	Protected LT for EB/WB Approaches Permitted LT for NB/SB Approaches
8	SE Harrison Street at SE 42nd Avenue	Four-Legged	Stop Controlled	All Way Stop Controlled
9	SE Monroe Street at Highway 224	Four-Legged	Signalized	Protected LT for NB/SB Approaches Permitted LT for EB/WB Approaches
10	Highway 224 at SE Oak Street	Four-Legged	Signalized	Permitted LT for NB/SB Approaches PM/PT LT for EB/WB Approaches

Note: Flashing-Yellow-Arrow denoted at FYA.

A vicinity map displaying the project site, vicinity streets, and the study intersections with their associated lane configurations and control types is shown in Figure 1.



VICINITY MAP

Figure 1

Hillside Master Plan

8/24/2020

Public Transit

The project site is located near three TriMet transit lines: bus line *#33 – McLoughlin/King Rd*, *#75 – Cesar Chavez/Lombard*, and *#152 – Milwaukie*. All three bus lines have stops located within a half-mile walking/biking distance of the site.

TriMet bus line *#33 – McLoughlin/King Rd* provides frequent service between Clackamas Community College Park & Ride and Clackamas Town Center Transit Center, with notable stops near Oregon City Health Center, Clackamas County Historic Museum, McLoughlin House, Oregon City Transit Center, Oregon City Shopping Center, and Milwaukie City Center. The nearest bus stops to the site are located along SE Harrison Street on both sides of SE 32nd Avenue. Adequate pedestrian facilities along SE 32nd Avenue such as sidewalks and crosswalks are available to connect the site with the bus stops along SE Harrison Street. Weekday service is scheduled from approximately 4:15 AM to 1:50 AM and has headways of approximately 15 to 70 minutes. Weekend service is scheduled from approximately 5:30 AM to 1:50 AM and has headways of approximately 15 to 60 minutes.

TriMet bus line *#75 – Cesar Chavez/Lombard* provides frequent service between Pier Park in the St. Johns Neighborhood and Milwaukie City Center, with notable stops near Roosevelt High School, Columbia Park, N Lombard Transit Center, NAYA, Hollywood/NE 42nd Avenue Transit Center, Reed College, Providence Milwaukie Hospital, and Ledding Library. Two bus stops abut the site, one at the current SE Hillsdale Court intersection and one at the SE Meek Street intersection. The northern stop is expected to relocate closer to the SE Dwyer Drive with site development. Weekday service is scheduled from approximately 4:45 AM and 1:30 AM and has headways of approximately 10 to 30 minutes. Weekend service is scheduled from approximately 5:30 AM to 1:40 AM and has headways of approximately 15 to 40 minutes.

TriMet bus line *#152 – Milwaukie* provides service between Milwaukie City Center and Clackamas Town Center Transit Center, with a notable stop near Exceed Enterprises. The nearest bus stops to the site are located along SE Harrison Street between SE 29th Avenue and Highway 224. Adequate crossing measures such as sidewalks and crosswalks are available along SE 32nd Avenue and SE Harrison Street to connect the site with the bus stops. Weekday service is scheduled from approximately 6:30 AM to 6:35 PM and has headways of approximately 30 to 40 minutes.

Site Trips

Trip Generation

The Hillside Master Plan includes the construction of town homes, apartment buildings, commercial space, and a community center. The multi-family housing buildings vary in size and planned for three or four stories. Two buildings will include ground-floor commercial space. One building will include ground-floor space available for use by residents of the Hillside community and is not expected to generate external trips to/from the surrounding transportation system. In total, the Hillside Master Plan proposes to replace 100 existing single-family houses with 500 multi-family housing units while maintaining the 100-unit Hillside Manor for a total of 600 housing units on site after construction.

To estimate trips that are currently generated by the site, as well as new trips that will be generated by the proposed Hillside development, trip rates from the *Trip Generation Manual*[1] were used. Land use codes were used based on the number of dwelling units for residential buildings with and without commercial space on the first floor.

Modal Split

2018 data from the United States Census Bureau's American Community Survey indicates that about 15 percent of workers in Portland travel to work via transit, bicycling, or walking[2]. Based on this value, the fact that fewer transit options serve the subject site than Portland's employment centers, and the site's proximity to the Springwater Corridor, it was estimated that 90 percent of site trips will be vehicle trips and 10 percent of site trips will be non-vehicular trips. The modal split was also applied to the existing land uses onsite while estimating the trip generation of the site under existing conditions.

The net site trips after applying reductions associated with modal splits are summarized in Table 3. Note the Hillside Manor apartment building will remain with the proposed development and is not included in either the existing or future development calculations.

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 10th Edition, 2017.
[2] United States Census Bureau: American FactFinder, Commuting Characteristics by Sex, 2018. https://data.census.gov/cedsci/table?t=Commuting&tid=ACSST1Y2018.S0801&hidePreview=false&vintage=2018

Table 3: Trip Generation Summary

	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Existing Conditions									
Single Family Housing	210	100 Units	19	55	74	62	37	99	944
Multi-Family Housing (Mid-Rise)	221	100 Units	9	27	36	27	17	44	544
Total Site Generated Trips			28	82	110	89	54	143	1488
Modal Split Reduction (10%)			*3*	*8*	*11*	*9*	*5*	*14*	*148*
Net External Trips			25	74	99	80	49	129	1340
Hillside Development									
Multi-Family Housing (Low-Rise)	220	39 Units	4	14	18	14	8	22	286
Multi-Family Housing (Mid-Rise)	221	415 Units	38	111	149	112	72	184	2258
Multi-Family Housing w/ First Floor Commercial	231	146 Units	15	51	66	34	20	54	530
Total Site Generated Trips			57	176	233	160	100	260	3074
Modal Split Reduction (10%)			*6*	*18*	*24*	*16*	*10*	*26*	*308*
Net External Trips			51	158	209	144	90	234	2766
Net Increase in Extenral Trips			**26**	**84**	**110**	**64**	**41**	**105**	**1426**

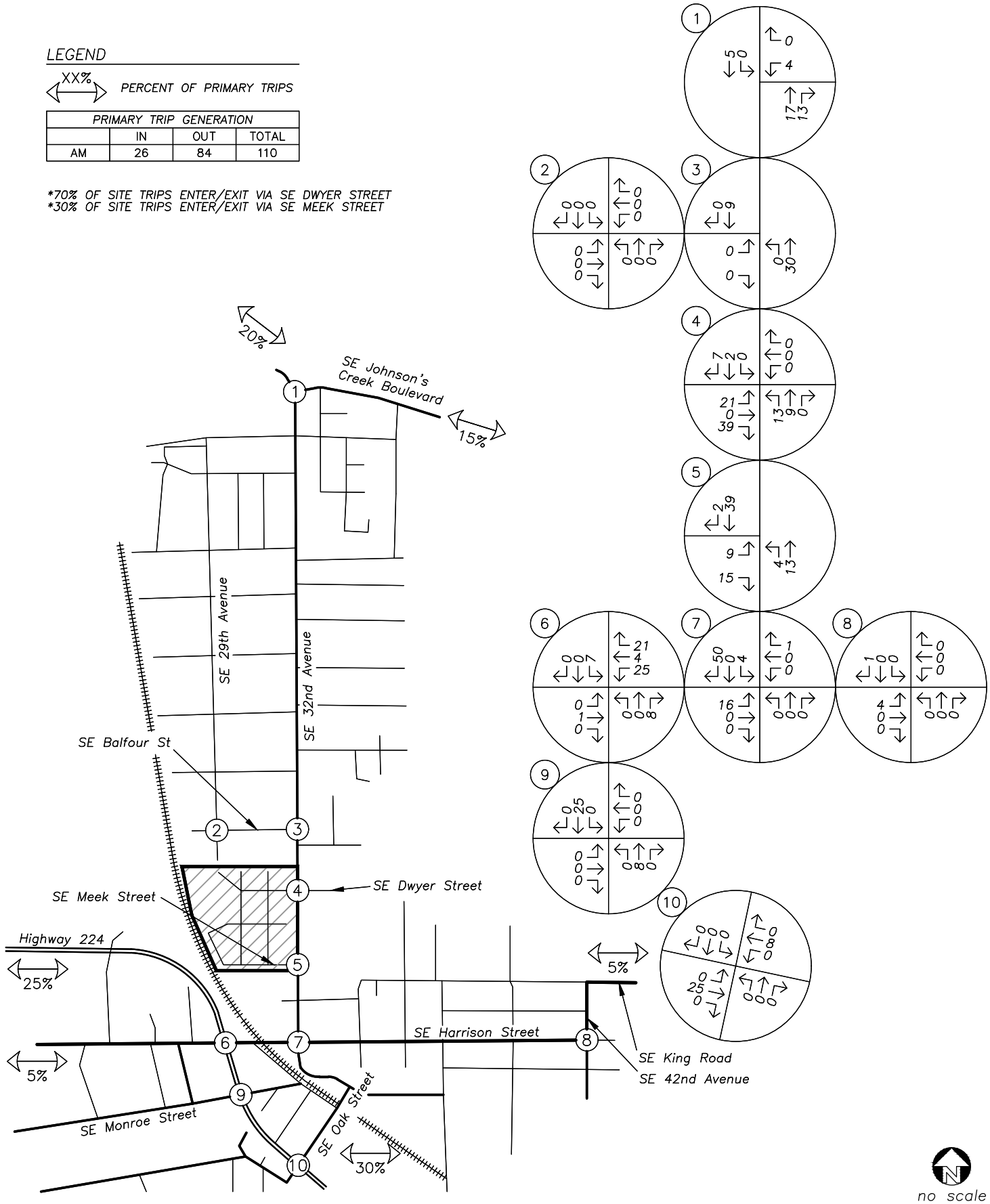
The trip generation calculations show that the proposed development is projected to generate a net additional 110 trips during the morning peak hour, a net additional 105 trips during the evening peak hour, and a net additional 1,426 trips during the average weekday. Detailed trip generation calculations are included in the technical appendix of this report.

Trip Distribution

The directional distribution of site trips to/from the project site was estimated based on the locations of likely trip destinations, locations of major transportation facilities in the site vicinity, and existing travel patterns at the study intersections. The following trip distribution was estimated and used for analysis:

- Approximately 30 percent of site trips will travel to/from the south along Highway 224
- Approximately 25 percent of site trips will travel to/from the north along Highway 224
- Approximately 20 percent of site trips will travel to/from the north along SE 32nd Avenue
- Approximately 15 percent of site trips will travel to/from the east along SE Johnson Creek Boulevard
- Approximately 5 percent of site trips will travel to/from the west along SE Harrison Street.
- Approximately 5 percent of site trips will travel to/from the east along SE King Road

The trip distribution and assignment for the site trips generated by the proposed development during the morning and evening peak hours is shown in Figure 2 and Figure 3 respectively.

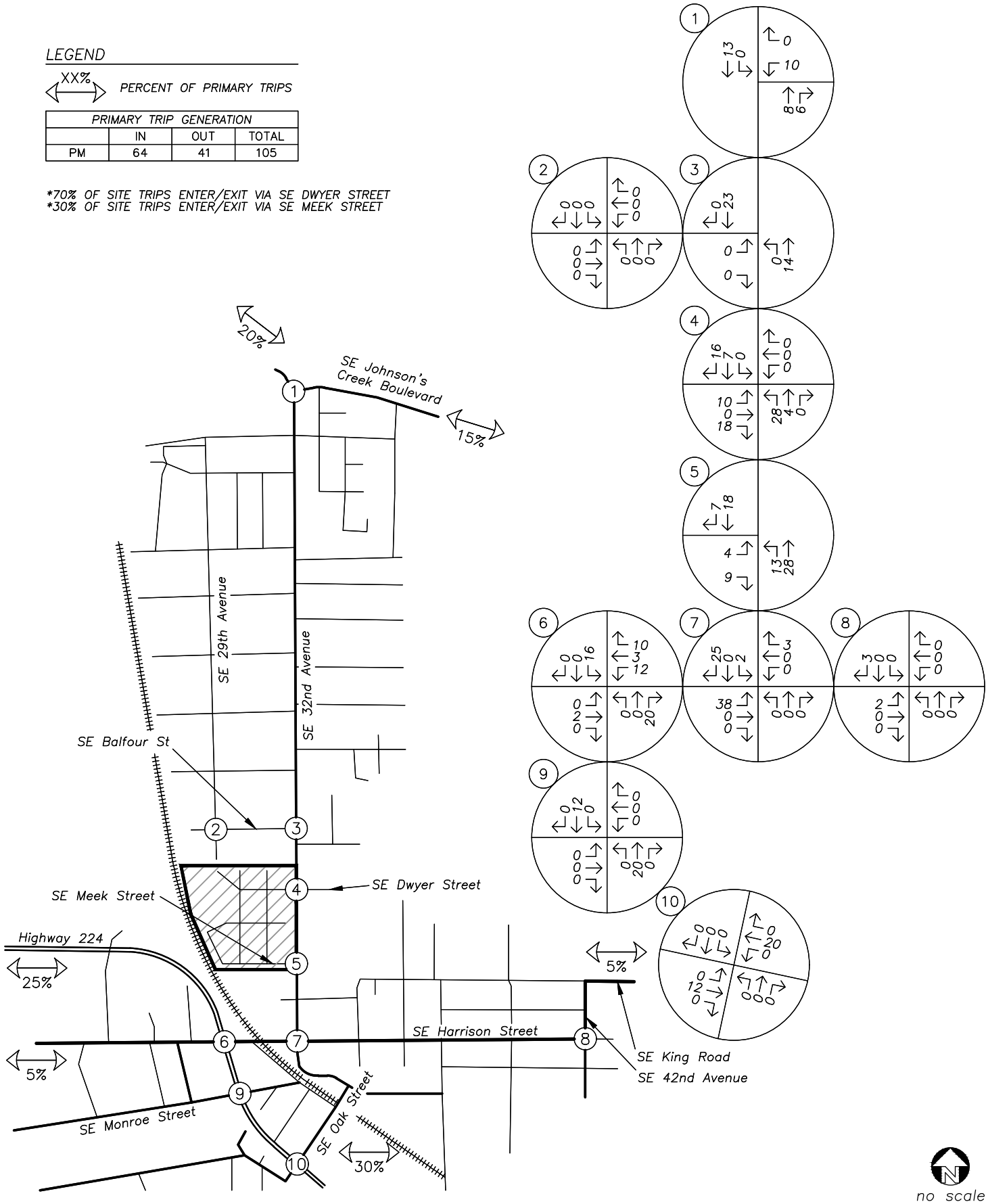


SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Site Trips
AM Peak Hour

Figure 2

Hillside Master Plan
8/24/2020



SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Site Trips
PM Peak Hour

Figure 3

Hillside Master Plan
8/24/2020

Traffic Volumes

Existing Conditions

Historic traffic data from two transportation impact studies, *Hillside Development Preliminary Master Plan* (dated December 21st, 2018) and *Monroe Apartments Transportation Impact Study* (dated July 16th, 2019), were used to estimate existing year turning movement volumes at six of the study intersections:

- SE Tacoma Street/SE Johnson Creek Boulevard at SE 32nd Avenue
- SE Harrison Street at Highway 224
- SE Harrison Street at SE 32nd Avenue
- SE Harrison Street SE 42nd Avenue
- SE Monroe Street at Highway 224
- Highway 224 at SE Oak Street

Year 2018 Data

As part of the *Hillside Development Preliminary Master Plan*, traffic counts were conducted at the intersection of SE Harrison Street at SE 32nd Avenue on Tuesday, September 18, 2018 from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. At the intersections of SE Tacoma Street/SE Johnson Creek Boulevard at SE 32nd Avenue and SE Harrison Street at SE 42nd Avenue, traffic counts were conducted on Tuesday, September 25, 2018, from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.

To reflect existing year 2020 conditions from the 2018 count data, a compounded growth rate of two percent per year over a two-year period was applied to the traffic volumes.

Year 2019 Data

As part of the *Monroe Apartments Transportation Impact Study*, traffic counts were conducted on Thursday, February 7th, 2019 from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. at the intersections of SE Harrison Street at Highway 224, SE Monroe Street at Highway 224, and Highway 224 at SE Oak Street.

A growth rate for through traffic along Highway 224 was derived using ODOT's 2038 Future Volume Table in accordance with ODOT's APM. Using data corresponding to milepost 0.70 of ODOT highway number 171, an average linear growth factor of 1.004 was calculated for the one-year growth scenario. The growth factor was applied to through traffic volumes along Highway 224 to approximate year 2020 existing conditions. For all other turning movements at the Highway 224 study intersections, a compounded growth rate of two percent per year was applied to the traffic volumes to approximate year 2020 existing conditions.

Year 2020 Data

Traffic counts were collected on Tuesday, July 14th, 2020 from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. at the following intersections:

- SE Balfour Street at SE 29th Avenue
- SE Balfour Street at SE 32nd Avenue
- SE Dwyer Drive at SE 32nd Avenue
- SE Harrison Street at SE 32nd Avenue

Traffic counts were collected while the COVID-19 viral pandemic was considered a significant public health concern throughout the State of Oregon. Subsequently, traffic volumes had been significantly depressed statewide as of mid-March and into July. To reflect normal travel conditions at the intersections, adjustment factors for the morning and evening peak hours were calculated utilizing the count data at SE Harrison Street at SE 32nd Avenue collected prior to, and subsequent to, March 2020. The adjustment factors were calculated with the following methodology:

- The estimated year 2020 traffic volumes at the intersection of SE Harrison Street at SE 32nd Avenue were compared to the collected intersection volumes from July 2020. Based on the difference in volumes at the intersection, adjustment factors of 1.787 and 1.407 were calculated for the morning and evening peak hours, respectively.
- The adjustment factors were applied to all volumes at the remaining intersections.

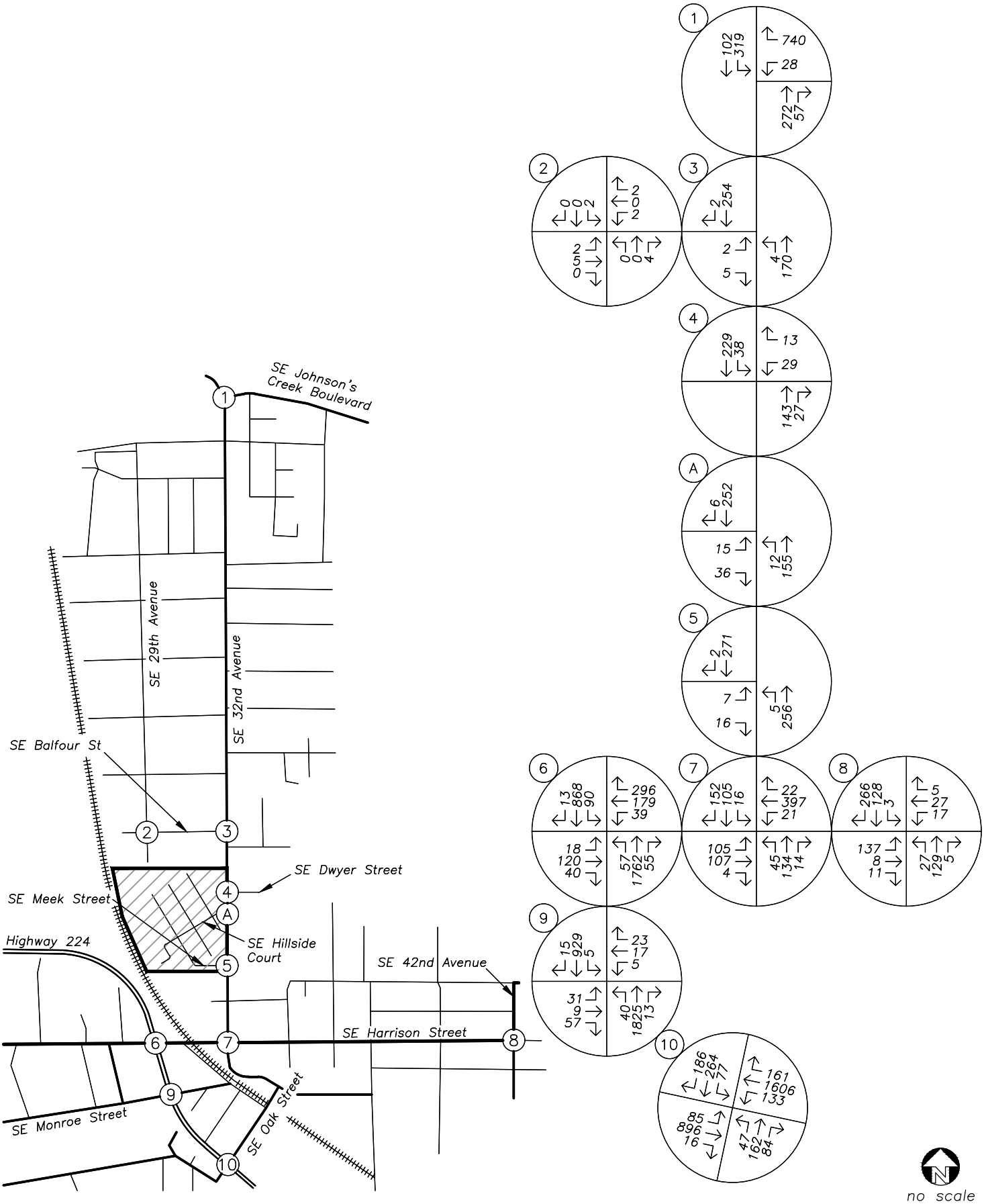
SE Hillside Court and SE Meek Street

Existing traffic volumes at the intersections of SE Hillside Court at SE 32nd Avenue and SE Meek Street at SE 32nd Avenue were estimated by balancing volumes with COVID-19 adjusted volumes at the intersections of SE Dwyer Drive at SE 32nd Avenue and SE Harrison Street at SE 32nd Avenue. For traffic entering/exiting the site via SE Hillside Court and SE Meek Street, traffic volumes were estimated based on ITE rates in the *Trip Generation Manual*. Land use codes 210, *Single Family Detached Housing*, and 221, *Multi-Family Housing (Mid-Rise)* were used to estimate the trips generated by the existing 100 single family houses onsite and the 100 units of the Hillside Manor apartment building, respectively.

A similar trip distribution as described in the Trip Distribution section was assigned the existing site trips, with approximately 30 percent of site trips traveling to/from the north along SE 32nd Avenue and 70 percent of site trips traveling to/from the south along SE 32nd Avenue. Due to the existing street layout of the site, it was assumed that 30 percent of site trips would utilize SE Meek Street to access the site and 70 percent of site trips would utilize SE Hillside Court.

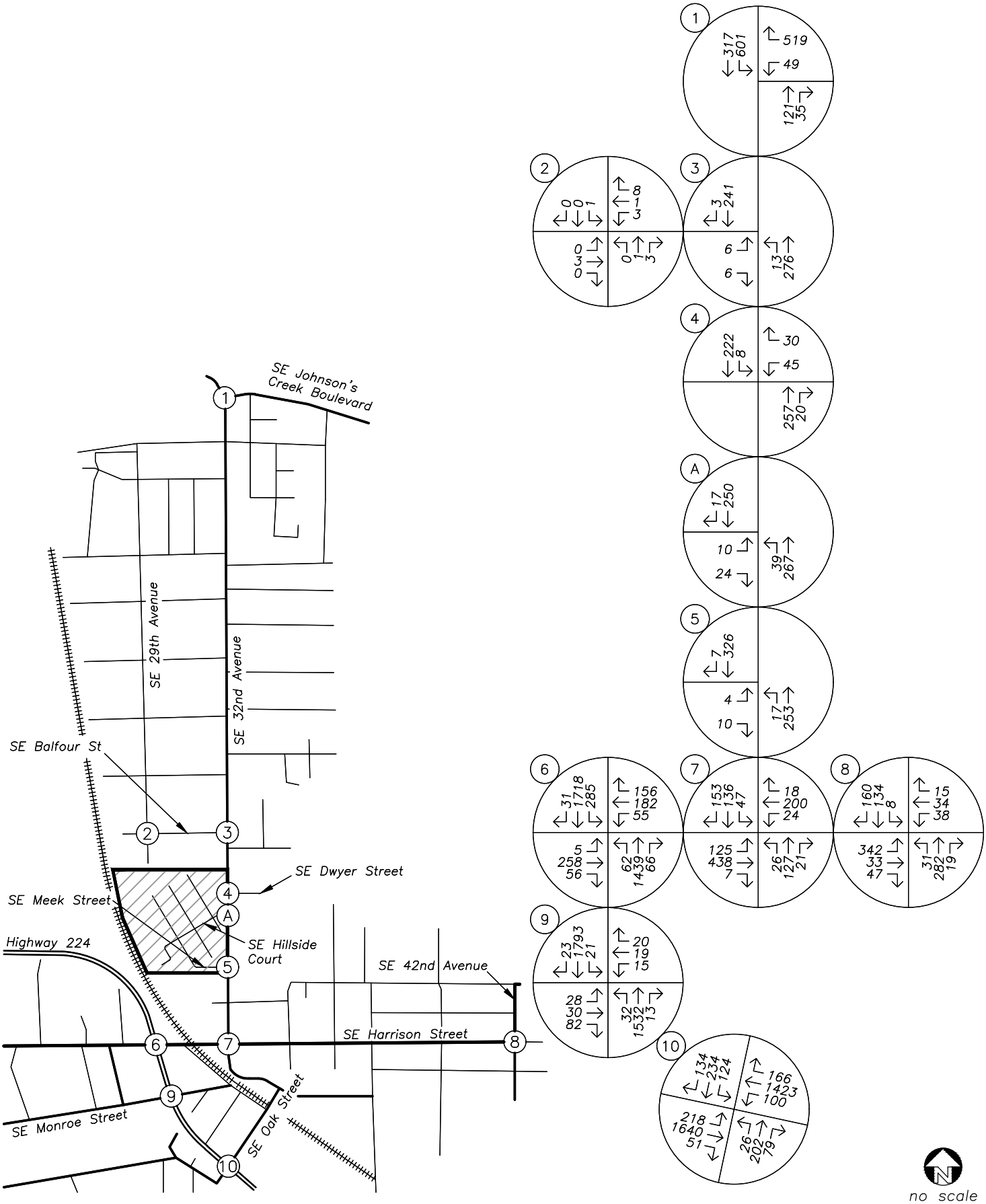
For all study intersections, data corresponding to each intersection's respective morning and evening peak hour was used for analysis.

Figure 4 and Figure 5 show the existing traffic volumes at the study intersections during the morning and evening peak hours, respectively. The intersection of SE Hillside Court at SE 32nd Avenue is not included as a study intersection because it and will not exist upon buildout of the site; however for the purpose of showing existing traffic patterns, the intersection is included in the figures and designated as intersection 'A'.



TRAFFIC VOLUMES
2020 Existing Conditions
AM Peak Hour

Figure 4
Hillside Master Plan
8/24/2020



TRAFFIC VOLUMES
2020 Existing Conditions
PM Peak Hour

Figure 5
Hillside Master Plan
8/24/2020

Background Conditions

To provide an analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. To calculate the future traffic volumes, a compounded growth rate of 0.725 percent per year for an assumed buildout condition of six years was applied to the measured existing traffic volumes to approximate year 2026 background conditions. The growth rate was derived from the City of Milwaukie's *Transportation System Plan* (TSP)[3]; According to Figure 8-2A in the TSP, traffic volumes along SE Johnson Creek Boulevard, SE 32nd Avenue, and Highway 224 are expected to increase by an average of 18 percent over 23 years. An 18 percent increase in traffic over a 23-year period was calculated to be equivalent to applying a compounded growth rate of 0.725 percent per year for 23 years.

For through traffic along Highway 224, an average linear growth factor of 1.024 was calculated for the six-year growth scenario. This growth factor was calculated using the same methodology as described in the Existing Conditions section. The growth factor was applied to through traffic volumes along Highway 224 to approximate year 2026 background conditions.

In addition to the traffic volume growth described above, trips associated with three in-process developments within the site vicinity, that are currently approved but not yet fully constructed or occupied, were added to the background traffic volumes. The following projects were assumed to be completed and occupied by year 2026:

- Milwaukie Mixed-Use Development at 9391 SE 32nd Avenue
- Walnut Addition Plat (9 lots)
- Monroe Apartments

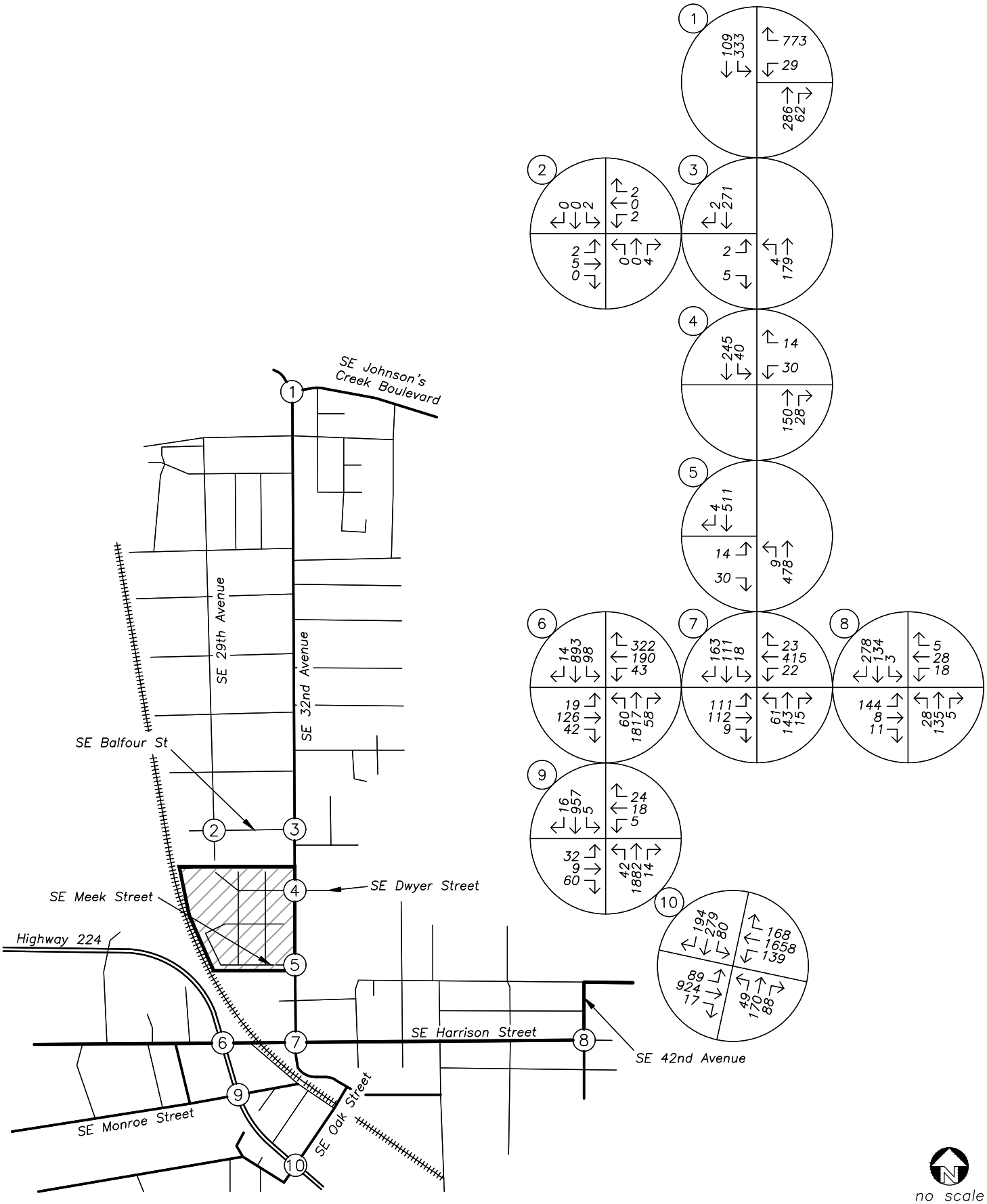
The Transportation Impact Study of each development was used to obtain trip generation and trip assigment data corresponding to their respective developments. The trip assignments assumed in these reports was used to quantify the total volume of site trips travelling through the study intersections related to this report.

The Walnut Addition Plat does not have a corresponding Transportation Impact Study, so to quantify the in-process trips associated with this development, the *Trip Generation Manual* was used to estimate the trips generated by the nine single-family dwellings expected to be built and occupied by year 2026. The trips were then distributed and assigned to the study intersections using the same trip distribution assumptions described in the Site Trips section.

Figures showing the total in-process trips at the study intersections for the AM and PM peak hours are included in the technical appendix.

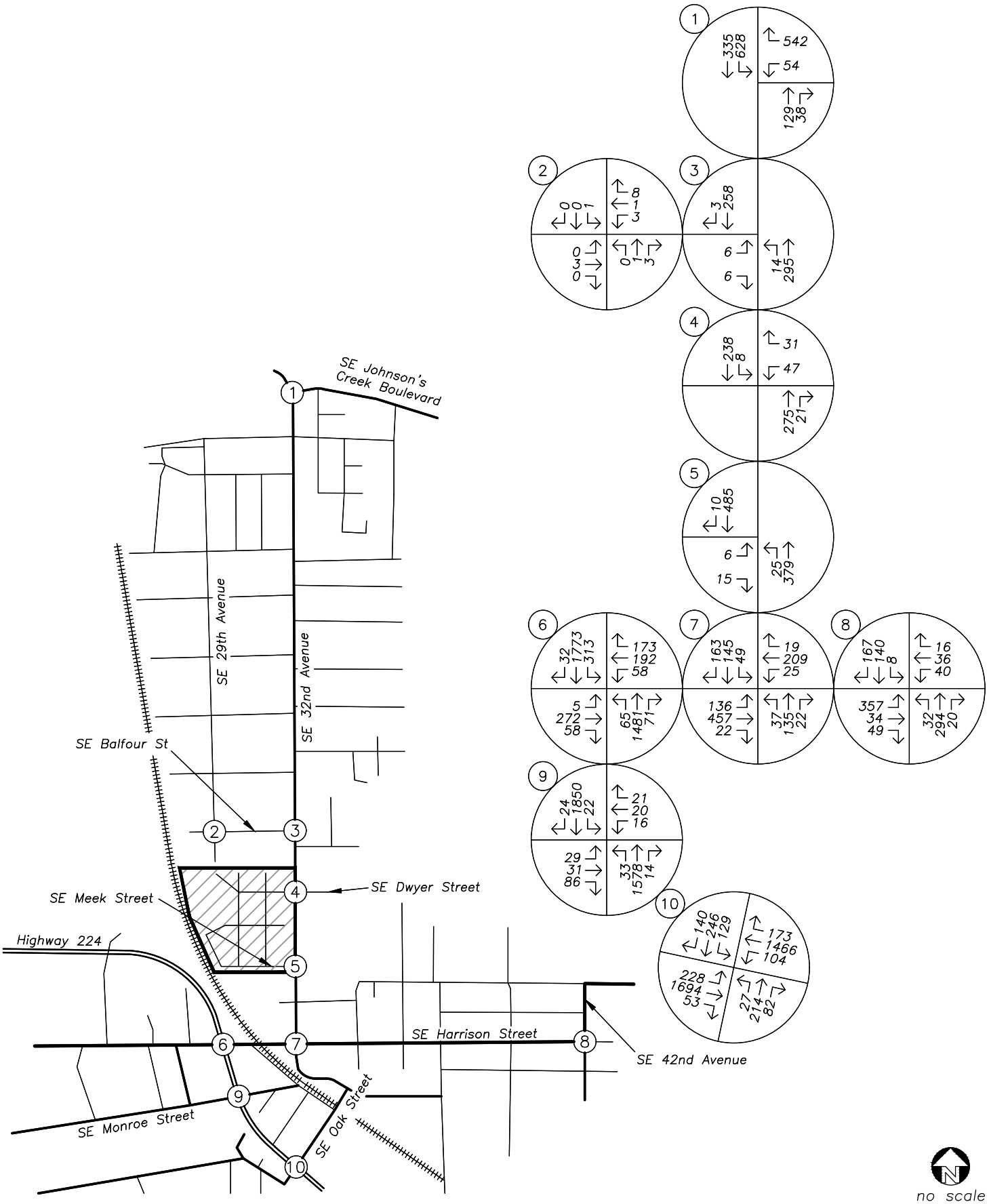
Figure 6 and Figure 7 show the total background traffic volumes at the study intersections during the morning and evening peak hours, respectively.

[3] City of Milwaukie, DKS Associates. *Transportation System Plan*, Revised October 2018



TRAFFIC VOLUMES
2026 Background Conditions
AM Peak Hour

Figure 6
Hillside Master Plan
8/24/2020

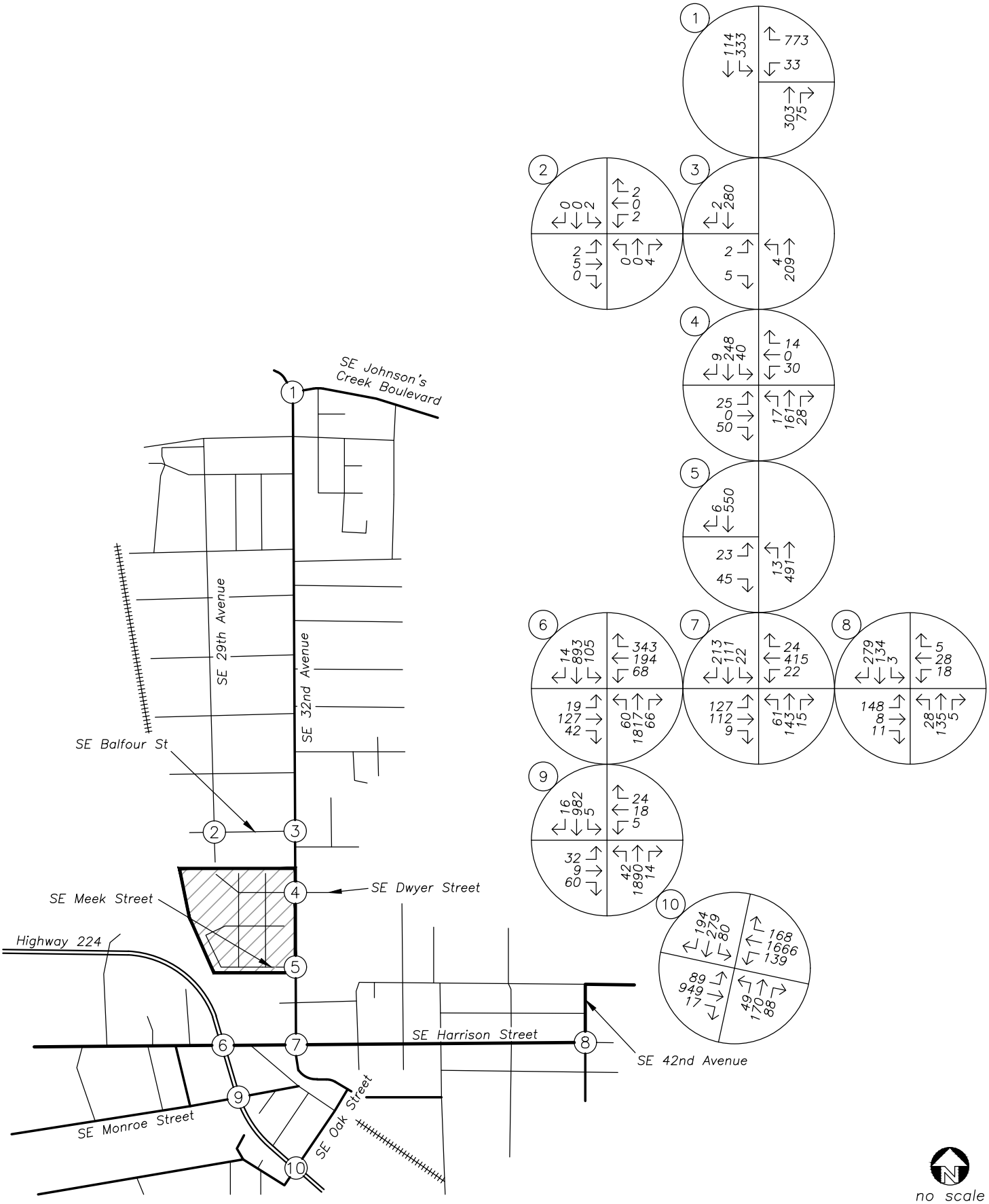


TRAFFIC VOLUMES
2026 Background Conditions
PM Peak Hour

Figure 7
Hillside Master Plan
8/24/2020

Buildout Conditions

Peak hour trips calculated to be generated by the proposed development, as described earlier within the Site Trips section, were added to the projected year 2026 background traffic volumes to obtain the expected 2026 buildout volumes. Furthermore, trips associated with the Hillside Manor apartment building were reassigned to SE Dwyer Drive since SE Dwyer Drive will replace SE Hillside Court as the northern site access along SE 32nd Avenue. Figure 8 and Figure 9 show the buildout traffic volumes at the study intersections during the morning and evening peak hours, respectively.

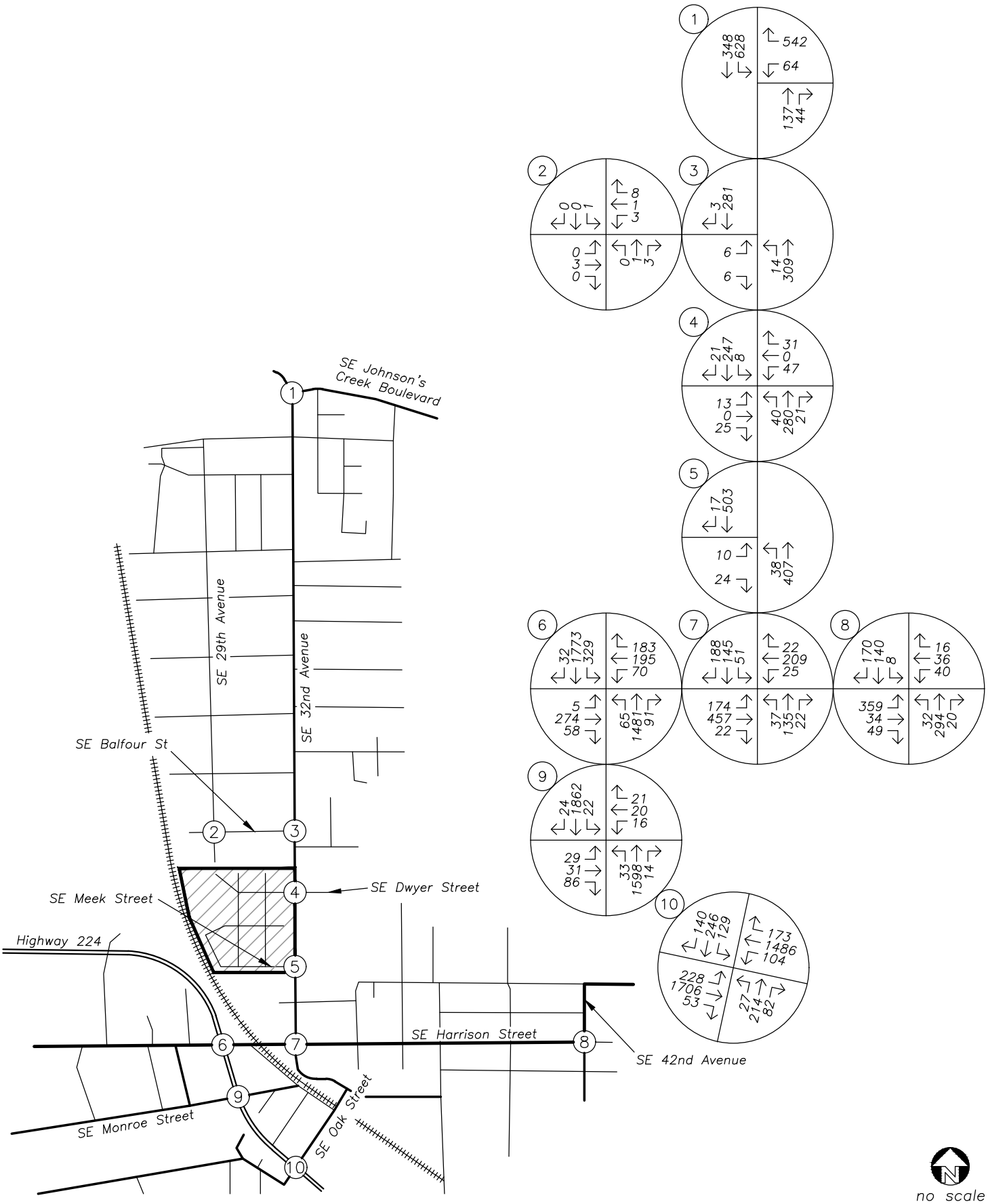


TRAFFIC VOLUMES

2026 Buildout Conditions
AM Peak Hour

Figure 8

Hillside Master Plan
8/24/2020



TRAFFIC VOLUMES

2026 Buildout Conditions
PM Peak Hour

Figure 9

Hillside Master Plan
8/24/2020

Safety Analysis

Crash History Review

Using data obtained from ODOT's Crash Analysis and Reporting Unit, a review was performed of the most recent five years of available crash data at the study intersections (January 2014 through December 2018). The crash data was evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for each intersection. Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated under the common assumption that traffic counted during the evening peak hour represents approximately ten percent of annual average daily traffic (AADT) at each intersection. Crash rates in excess of 1.00 crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

Regarding crash severity, ODOT classifies crashes in the following categories:

- Property Damage Only (PDO)
- Possible Injury (Injury C)
- Suspected Minor Injury or Non-Incapacitating Injury (Injury B)
- Suspected Serious Injury or Incapacitating Injury (Injury A)

Fatality or Fatal InjuryThe study intersections along Highway 224 are ODOT facilities which adhere to the crash analysis methodologies within ODOT's *Analysis Procedures Manual* (APM). According to *Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control* of the APM, intersections which experience crash rates in excess of 90th percentile crash rates should be "flagged for further analysis". For signalized intersections in urban settings, the 90th percentile rate for four-legged intersections is 0.860 CMEV.

Table 4 provides a summary of crash types while Table 5 summarizes crash severities and rates for each of the study intersections. Detailed crash reports are included in the technical appendix to this report.

Table 4: Crash Type Summary

	Intersection	Crash Type									Total Crashes
		Rear End	Turn	Angle	Fixed Object	Side Swipe	Head On	Other	Ped	Bike	
1	SE Tacoma Street/ SE Johnson Creek Boulevard at SE 32nd Avenue	7	1	0	1	0	0	1	0	0	10
2	SE Balfour Street at SE 29th Avenue	0	0	0	0	0	0	0	0	0	0
3	SE Balfour Street at SE 32nd Avenue	0	1	0	0	0	0	0	0	0	1
4	SE Dwyer Street at SE 32nd Avenue	0	0	0	0	0	0	0	0	0	0
5	SE Meek Street at SE 32nd Avenue	0	0	0	0	0	0	0	0	0	0
6	SE Harrison Street at Highway 224	11	8	7	0	1	0	0	0	2	29
7	SE Harrison Street at SE 32nd Avenue	1	6	3	1	0	0	0	1	0	12
8	SE Harrison Street at SE 42nd Avenue	0	1	2	0	0	0	0	0	0	3
9	SE Monroe Street at Highway 224	8	1	2	0	0	0	0	0	0	11
10	Highway 224 at SE Oak Street	9	8	4	0	1	0	1	1	1	25

Table 5: Crash Severity and Rate Summary

Intersection		Crash Type					Total Crashes	AADT	Crash Rate
		PDO	C	B	A	Fatal			
1	SE Tacoma Street/ SE Johnson Creek Boulevard at SE 32nd Avenue	2	6	2	0	0	10	16,420	0.33
2	SE Balfour Street at SE 29th Avenue	0	0	0	0	0	0	200	0.00
3	SE Balfour Street at SE 32nd Avenue	0	1	0	0	0	1	5,450	0.10
4	SE Dwyer Street at SE 32nd Avenue	0	0	0	0	0	0	5,820	0.00
5	SE Meek Street at SE 32nd Avenue	0	0	0	0	0	0	6,170	0.00
6	SE Harrison Street at Highway 224	11	13	3	1	1	29	43,130	0.37
7	SE Harrison Street at SE 32nd Avenue	3	8	1	0	0	12	13,220	0.50
8	SE Harrison Street at SE 42nd Avenue	1	2	0	0	0	3	11,430	0.14
9	SE Monroe Street at Highway 224	3	7	0	1	0	11	36,080	0.17
10	Highway 224 at SE Oak Street	9	12	2	2	0	25	43,970	0.31

Based on the review of the crash data, there were five crashes which involved either a pedestrian or bicyclist and five crashes which resulted in injuries consistent with *Injury A* classification or a fatality. All occurred at intersections along Highway 224. An in-depth analysis of these intersections and crashes is detailed in the following sections.

SE Harrison Street at Highway 224

The intersection of SE Harrison Street at Highway 224 had one crash that was classified as *Injury A*, one crash which resulted in a fatality, and two crashes that involved a bicyclist.

- The *Injury A* collision occurred when the driver of a northbound passenger car disregarded the traffic signal and collided with a southbound left-turning passenger car. The driver of the northbound vehicle sustained injuries consistent with *Injury C* classification while the driver of the southbound vehicle sustained injuries consistent with *Injury A* classification.
- One crash at the study intersection resulted in a fatality. The crash involved one southbound passenger car and one eastbound motorcycle, and occurred at 3:00 PM on Sunday, January 25th, 2015. Driving conditions at the time of the collision were daylight with clear weather and dry roadways. The crash

occurred when the driver of the passenger car disregarded the traffic signal and collided with the motorcycle. The driver of the passenger car sustained no injuries while the motorcyclist sustained fatal injuries.

- A westbound bicyclist, utilizing an intersection crosswalk, disregarded the traffic signal and collided with a southbound passenger car. The bicyclist sustained injuries consistent with *Injury B* classification while the driver of the passenger car sustained no injuries.
- A westbound bicyclist, utilizing an intersection crosswalk, disregarded the traffic signal and collided with a southbound passenger car. The bicyclist sustained injuries consistent with *Injury C* classification while the driver of the passenger car sustained no injuries. The bicyclist was reported to be illegally in the roadway and wearing non-reflective clothing at the time of the crash.

SE Monroe Street at Highway 224

The intersection of SE Monroe Street at Highway 224 had one crash that was classified as *Injury A*. The collision occurred when the driver of an eastbound passenger car was inattentive, disregarded the traffic signal, and collided with a northbound passenger car. The driver of the eastbound vehicle sustained no injuries while the driver of the northbound passenger car was injured.

SE Oak Street at OR-224

The intersection of SE Oak Street at Highway 224 had three crashes that involved either a pedestrian or a bicyclist, one of which was classified as *Injury A*, and one vehicular crash which was classified as *Injury A*. The following includes a listed description of each crash:

- The driver of a northwest-bound right-turning passenger car failed to yield right-of-way to a northwest/southeast traveling bicyclist, who was utilizing an intersection crosswalk. The bicyclist sustained injuries consistent with *Injury C* classification.
- The driver of a southwest-bound passenger car rear-ended a southwest-bound passenger car that was stopped at the intersection. The driver and passenger of the oncoming passenger car sustained injuries consistent with *Injury A* classification while the driver of the stopped vehicle sustained no injuries.
- A southwest/northeast traveling bicyclist, who was utilizing an intersection crosswalk, disregarded the traffic signal, illegally entered the intersection, and collided with a southeast-bound passenger car. The bicyclist sustained injuries consistent with *Injury A* classification while the driver of the passenger car sustained injuries consistent with *Injury B* classification.
- The driver of a southwest-bound left-turning passenger car failed to yield right-of-way to a northeast/southwest traveling pedestrian, who was utilizing an intersection crosswalk. The pedestrian sustained injuries consistent with *Injury C* classification.

Analysis Conclusions

Based on a review of the most recent five years of available crash data, no significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. In addition, none of the study intersections exhibit crash rates near or above the 1.0 CMEV threshold nor do any of the study intersections along Highway 224 have a crash rate exceeding ODOT's 90th percentile rate. Accordingly, no safety mitigation is recommended per the crash data analysis.

Sight Distance Evaluation

Intersection sight distance was measured at the proposed site accesses along SE 32nd Avenue and evaluated in accordance with the standards established in *A Policy of Geometric Design of Highways and Streets*[4]. According to AASHTO, the driver's eye is assumed to be 15 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The vehicle driver's eye height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement.

Stopping sight distance is considered the minimum requirement to ensure safe operation of the driveway. This distance allows the driver of a vehicle traveling on the major street to react to a turning vehicle or other object in the roadway and, if necessary, come to a complete stop to avoid a collision. To ensure safe operation of a driveway, the extent of available intersection sight distance must at least equal the minimum required stopping sight distance. As further described in the AASHTO Green Book, "Sight distance is provided at intersections to allow the drivers of stopped vehicles a sufficient view of the intersecting highway to decide when to enter the intersecting highway or to cross it. If the available sight distance for an entering vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, a major-road vehicle may need to stop or slow to accommodate the maneuver by a minor-road vehicle."

Based on the posted speed of 25 mph on SE 32nd Avenue, and the roadway's flat grade, the minimum recommended intersection sight distance is 280 feet and the minimum required stopping sight distance is 155 feet.

SE Dwyer Drive

Sight distances were measured to be in excess of 280 feet to the north and south of the proposed location of SE Dwyer Drive. It should be noted that measurements could not be conducted from the standard 15 feet behind the edge of the traveled way due to obstructing on-site foliage. However, provided this foliage is removed during construction, no other physical obstructions were noted that would limit sight distances to less than those measured in the field if measured from the standard 15 feet.

Therefore, adequate sight distance is available at the site access to ensure safe and efficient operation of the intersection of SE Dwyer Drive at SE 32nd Avenue. Accordingly, no sight distance related mitigation is necessary or recommended at this access.

SE Meek Street

At 15 feet from the near edge of the travel lane, sight distances at the intersection of SE Meek Street at SE 32nd Avenue were measured to be in excess of 280 feet to the north and 180 feet to the south. Sight distance to the south was limited by foliage on the adjacent property and does not meet the 280-foot recommendation set by AASHTO. However, sight distance exceeds the required 155 feet of stopping sight distance. Therefore, adequate sight distance is available to ensure safe operation of the intersection of SE Meek Street at SE 32nd Avenue.

To further investigate the available sight distance at this intersection, sight distance measurements were also taken 10 feet from the near edge of the nearest travel lane. In this case, the front of a standard passenger car would be at least 2 feet behind the edge of the travel lane, giving clearance between the passenger car and

[4] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 6th Edition, 2011.

vehicular traffic on SE 32nd Avenue. This result shows that a driver can safely approach SE 32nd Avenue with the driver's eye 10 feet from the near edge of the nearest travel lane. From a position measured 10 feet from the edge of the traveled way, sight distance was measured to be in excess of 280 feet to the north and south.

Given that adequate stopping sight distance is available 15 feet from the edge of the nearest travel lane along SE 32nd Avenue, and adequate intersection sight distance is available 10 feet from the edge of the nearest travel lane, no sight distance related mitigation is necessary or recommended at this access. However, the applicant will work with City staff and the adjacent property own to improve sight lines through the removal of some foliage on the southwest corner of the intersection.

Warrant Analysis

Left-turn lane warrants were examined for the site access intersections along SE 32nd Avenue, and preliminary signal warrants were examined for the intersection of SE Harrison Street at SE 42nd Avenue.

Left-Turn Lane Warrants

A left-turn refuge lane is primarily a safety consideration for the major-street, removing left-turning vehicles from the through traffic stream. The left-turn lane warrants used were developed from the *National Cooperative Highway Research Project's* (NCHRP) *Report 457*. Turn lane warrants were evaluated based on the number of advancing and opposing vehicles as well as the number of turning vehicles, the travel speed, and the number of through lanes.

Left-turn lane warrants are projected to be met for the northbound approach of the intersection of SE Meek Street at SE 32nd Avenue during the evening peak hour under year 2026 buildout conditions. However, due to the intersection's proximity to a transit stop crosswalk and the low posted speed along SE 32nd Avenue, constructing a left-turn lane could raise safety issues. Stopped vehicles in a northbound left-turn lane would obstruct the line of sight between northbound vehicles and pedestrians crossing SE 32nd Avenue. The restricted line of sight would cause a shorter reaction time for vehicles to yield the right-of-way to pedestrians and increase the potential for pedestrian-related collisions. Furthermore, removing left-turning vehicles from the through traffic stream by installing a left-turn lane could encourage through traffic to travel at higher speeds along SE 32nd Avenue. SE 32nd Avenue, with its various traffic calming measures such as concrete median islands and numerous crosswalks, has a low-speed character that would be enhanced by not installing a left-turn lane. Thus, the installation of a northbound left-turn lane at the intersection of SE Meek Street at SE 32nd Avenue is not recommended.

Preliminary Traffic Signal Warrants

Preliminary traffic signal warrants were examined for the two site accesses on SE 32nd Avenue to determine whether the installation of a new traffic signal will be warranted at the intersection upon completion of the proposed development. Preliminary signal warrants were examined based on the number of lanes and traffic volumes along the major and minor street approach during the evening peak hour.

Due to insufficient traffic volumes in any analysis case, traffic signal warrants ar not projected to be met at the intersections of SE Dwyer Drive at SE 32nd Avenue and SE Meek Street at SE 32nd Avenue under any of the analysis scenarios.

Preliminary traffic signal warrants were also examined for the intersection of SE Harrison Street at SE 42nd Avenue to determine whether the installation of a new traffic signal will be warranted at the intersection upon completion of the proposed development. Preliminary signal warrants were examined based on the number of lanes and traffic volumes along the major and minor street approach during the evening peak hour. Since SE Harrison Street and SE 42nd Avenue are both classified as collector roadways, warrants were evaluated in three cases: assigning SE Harrison Street as the major street, assigning SE 42nd Avenue as the major street, and assigning the westbound and southbound approaches as the major street approaches.

Due to insufficient traffic volumes in any analysis case, traffic signal warrants are not projected to be met at the intersection of SE Harrison Street at SE 42nd Avenue under any of the analysis scenarios.

Detailed warrant analyses for are included in the technical appendix to this report.

Access Spacing Standards

According to City of Milwaukie Municipal Code Section *12.16.040 Access Requirements and Standards*, spacing for accessways along Collector roadways shall be a minimum of 300 feet, measured between the nearest edge of driveway aprons between accessways or the nearest edge of the driveway apron to the nearest face of curb of the intersecting street (or nearest edge of pavement if no curb is available).

Based on an assessment of the proposed site access intersections and the roadways adjacent to the site, access spacing standards are met to the south of SE Meek Street and between SE Meek Street and SE Dwyer Drive. To the north of SE Dwyer Drive, access spacing between SE Dwyer Drive and the nearest offsite driveway was measured to be approximately 240 feet. This spacing is below the City standard of 300 feet; however, the proposed site access aligns with SE Dwyer Drive and the redevelopment will demolish three existing driveways along SE 32nd Avenue north of SE Dwyer Drive. Overall, the average access spacing across the site frontage will meet the standard, and the number of potential conflict points along this section of SE 32nd Avenue is reduced compared with existing conditions, improving the safety and flow of the street.

Safe Pedestrian Routes to Schools

According to the North Clackamas School District's school boundary maps, there are three nearby public schools which may reasonably serve the site:

- Ardenwald Elementary
- Wilbur Rowe Middle School
- Milwaukie High School

Ardenwald Elementary

Ardenwald Elementary is located within a 0.75-mile walking/biking distance to the north of the site. Pedestrian travel between the school and site is available by way of SE 32nd Avenue and SE Roswell Street, as shown in Figure 10. Complete sidewalks are available along both sides of SE 32nd Avenue, and along the south side of SE Roswell Street. Marked crosswalks/sidewalks are available at intersections along the east side of SE 32nd Avenue and along the south side of SE Roswell Street.

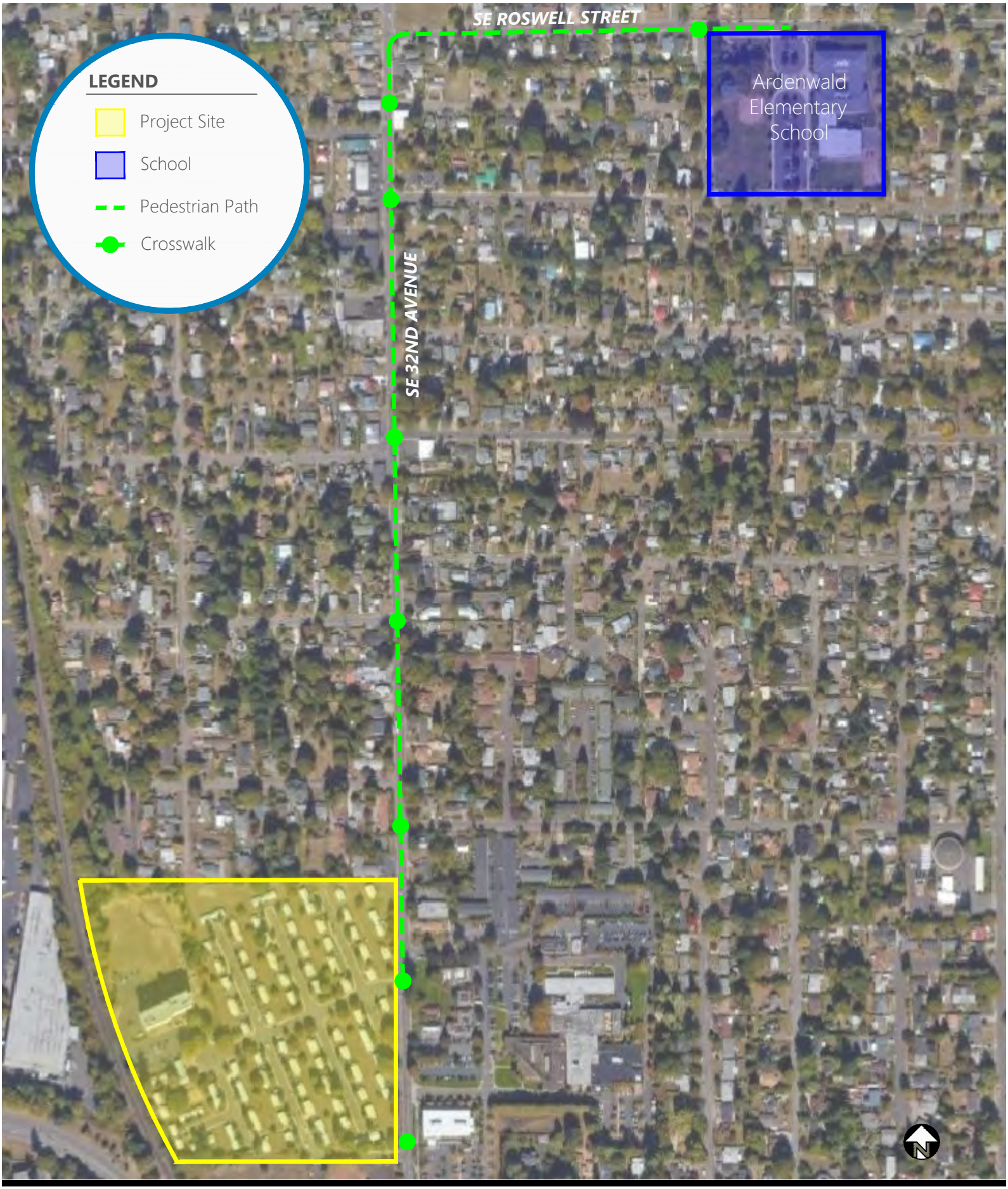
Wilbur Rowe Middle School

Wilbur Rowe Middle School is located within a 1.25-mile walking/biking distance to the south of the site. Pedestrian travel between the school and site is available by way of SE 32nd Avenue, SE Railroad Avenue, SE Monroe Street (segment east of SE Oak Street), SE 37th Avenue (segment north of Highway 224), SE Edison Street, SE 37th Avenue (segment south of Highway 224), SE Grogan Avenue, and SE 36th Avenue, as shown in Figure 11. Sidewalks are generally complete along both sides of SE 32nd Avenue, the north side of SE Railroad Avenue (segment west of SE Oak Street), the south side of SE Monroe Street (segment east of SE Oak Street), the west side of SE 37th Avenue (segment north of Highway 224), both sides of SE Edison Street, east side of SE 37th Avenue (segment south of Highway 224), both sides of SE Grogan Avenue, and both sides of SE 36th Avenue.

Relevant marked crossings are available across SE Harrison Street (one at the east side of SE 32nd Avenue), SE Railroad Avenue (one on the east side of SE Oak Street), SE 37th Avenue (two marked crosswalks on the segment north of Highway 224), SE Edison Street (two marked crosswalks), Highway 224 (two signalized marked crosswalks), and SE Lake Road (two marked crosswalks). While no marked crosswalks are available crossing the segment of SE 37th Avenue south of Highway 224, low vehicular travel speeds (posted speed of 25 mph) and relatively low vehicular volumes allow pedestrians the ability to safely cross the roadway at the intersection with SE Grogan Avenue.

Milwaukie High School

Milwaukie High School & Milwaukie Academy of the Arts are located within a 0.75-mile walking/biking distance to the southwest of the site. Pedestrian travel between the school and site is available by way of SE 32nd Avenue, SE Harrison Street, SE 28th Avenue, and SE Washington Street, as shown in Figure 12. Complete sidewalks are available along both sides of these roadways, with marked crossings across SE Harrison Street, SE Railroad Avenue, Highway 224 (two relevant signalized marked crosswalks), and SE Washington Street (six relevant marked crosswalks).



lancaster mobley

SAFE ROUTES TO SCHOOL
Ardenwald Elementary School

Figure 10
Hillside Master Plan
8/24/2020

lancaster mobley

SAFE ROUTES TO SCHOOL
Wilbur Rowe Middle School

Figure 11
Hillside Master Plan
8/24/2020

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SAFE ROUTES TO SCHOOL
Milwaukie High School

Figure 12
Hillside Master Plan
8/24/2020

Operational Analysis

A capacity and delay analysis was conducted for each of the study intersections per the unsignalized intersection analysis methodologies in the *Highway Capacity Manual*[5] (HCM). Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates very little or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Performance Standards

According to Chapter 3 of the City of Milwaukie's *Transportation System Plan*, signalized and unsignalized intersections under City jurisdiction are required to operate at LOS D or better. For intersections under ODOT jurisdiction (i.e. intersections along Highway 224), per *Table 7: Volume to Capacity Ratio Targets within Portland Metropolitan Region* of the *Oregon Highway Plan* (OHP), intersections are required to operate with v/c ratios of 0.99 or less. The v/c ratios for signalized intersections were post-processed as per methodologies outlined in the APM.

Delay & Capacity Analysis

The v/c, delay, and LOS results of the capacity analysis are shown in Table 6 for the morning and evening peak hours. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

Based on the results of the operational analysis, all other study intersections are currently operating acceptably per City of Milwaukie and ODOT standards and are projected to continue operating acceptably through the 2026 buildout year of the site except for the intersection of SE Harrison Street at SE 42nd Avenue. The delay and capacity analysis shows that the intersection of SE Harrison Street at SE 42nd Avenue is projected to operate above City of Milwaukie operational standards under year 2026 background conditions, regardless of the Hillside Master Plan. Delays are anticipated to worse by one second under 2026 buildout conditions.

The intersection of SE Harrison Street at SE 42nd Avenue is currently all-way stop controlled and is planned to be signalized to facilitate dominant traffic flow[6].However, the warrant analysis shows that the intersection is not projected to meet preliminary signal warrants upon buildout of the site. Since it does not meet preliminary signal warrants, it is not recommended or necessary to signalize the intersection of SE Harrison Street at SE 42nd Avenue as part of the Hillside development. Therefore, no operational mitigation is necessary or recommended at the intersection.

[5] Transportation Research Board, *Highway Capacity Manual, 6th Edition*, 2016.
[6] Table 8-10: Street Network Master Plan Projects. *Milwaukie Transportation System Plan*. October 20, 2018.

Table 6: Intersection Capacity Analysis Summary

Intersection & Condition	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
1 SE Tacoma Street/SE Johnson Creek Boulevard at SE 32nd Avenue						
2020 Existing Conditions	B	12	0.58	B	18	0.80
2026 Background Conditions	B	13	0.61	C	23	0.84
2026 Buildout Conditions	B	14	0.64	C	26	0.87
2 SE Balfour Street at SE 29th Avenue						
2020 Existing Conditions	A	7	0.01	A	7	0.02
2026 Background Conditions	A	7	0.01	A	7	0.02
2026 Buildout Conditions	A	7	0.01	A	7	0.02
3 SE Balfour Street at SE 32nd Avenue						
2020 Existing Conditions	B	11	0.01	B	12	0.03
2026 Background Conditions	B	11	0.01	B	12	0.03
2026 Buildout Conditions	B	11	0.01	B	12	0.03
4 SE Dwyer Drive at SE 32nd Avenue						
2020 Existing Conditions	B	14	0.11	B	14	0.17
2026 Background Conditions	B	14	0.12	B	14	0.19
2026 Buildout Conditions	C	16	0.17	C	17	0.23
5 SE Meek Street at SE 32nd Avenue						
2020 Existing Conditions	C	17	0.15	B	14	0.06
2026 Background Conditions	C	18	0.17	B	15	0.06
2026 Buildout Conditions	C	23	0.29	C	16	0.11
6 SE Harrison Street at Highway 224						
2020 Existing Conditions	B	20	0.83	B	19	0.80
2026 Background Conditions	C	24	0.88	C	20	0.85
2026 Buildout Conditions	C	28	0.92	C	22	0.87
7 SE Harrison Street at SE 32nd Avenue						
2020 Existing Conditions	B	14	0.56	B	18	0.61
2026 Background Conditions	C	27	0.60	C	27	0.64
2026 Buildout Conditions	C	29	0.60	C	28	0.62
8 SE Harrison Street at SE 42nd Avenue						
2020 Existing Conditions	B	12	0.38	D	34	0.80
2026 Background Conditions	B	13	0.41	**E**	**41**	0.85
2026 Buildout Conditions	B	13	0.41	**E**	**42**	0.85
9 SE Monroe Street at Highway 224						
2020 Existing Conditions	A	7	0.68	A	8	0.67
2026 Background Conditions	A	7	0.70	A	9	0.70
2026 Buildout Conditions	A	7	0.71	A	9	0.70
10 Highway 224 at SE Oak Street						
2020 Existing Conditions	C	30	0.68	C	34	0.80
2026 Background Conditions	C	30	0.70	D	38	0.83
2026 Buildout Conditions	C	30	0.71	D	39	0.84

BOLDED results indicate operation above acceptable jurisdictional standards.

SE 29th Avenue Connection

The Hillside Master Plan has the potential to connect its internal street system to SE 29th Avenue on the north side of the site. This connection would extend SE 29th Avenue to connect with SE Dwyer Drive within the property and has the option to either accommodate vehicular traffic or provide connection to SE 29th Avenue for pedestrian and bicycle uses exclusively. The analysis summarized in Table 6 assumed that only bicycles and pedestrians would have direct access between the proposed Hillside development SE 29th Avenue.

To understand the potential impacts that a vehicular connection with SE 29th Avenue would have on the study intersections, a delay and capacity analysis was also completed. Two factors were considered in estimating the traffic demand on SE 29th Avenue: 1) how much traffic from the proposed development enter the neighborhood to the north using by SE 29th Avenue instead of SE 32nd Avenue and 2) how much traffic from the neighborhood would travel through the Hillside development instead of using SE 32nd Avenue.

To estimate the vehicular demand from the proposed Hillside development, the internal site layout of buildings and parking was considered. Based on the proposed layout of the site's streets, buildings, and parking spaces, about two percent of site trips could reasonably be expected to utilize SE 29th Avenue to enter/exit the site during the morning and evening peak hours. The incentive for other areas of the site to travel into the northern neighborhood is low because there are no significant destinations within the neighborhood and all traffic would eventually need to access SE 32nd Avenue. Further, delays from the site accesses (SE Dwyer Drive and SE Meek Street) onto SE 32nd Avenue are expected to be minimal so there is little incentive to find an alternate route from the site. Lastly, the streets in the northern neighborhood are narrow and not conducive to through travel. Overall, a five percent assignment of site traffic to SE 29th Avenue was used to present a conservative analysis.

The potential for vehicular traffic from the northern neighborhood to travel through the Hillside development is expected to be minimal. The travel distance from the intersection of SE Balfour Street at SE 29th Avenue to SE Meek Street at SE 32nd Avenue is currently approximately 1,900 feet. Cutting through the proposed Hillside development would save approximately 100 feet of travel, which would not yield a perceivable travel time savings and would be unlikely to incentivize cut-through traffic. The current peak hour counts at the SE Balfour Street/SE 29th Avenue intersection are below 20 vehicles, which reflect; thus, the potential demand is also very low. Considering the small potential travel savings and the small potential demand, no existing traffic was reassigned through the Hillside development using the SE 29th Avenue connection.

Table 7 shows the v/c, delay, and LOS results of the intersections affected by redistributing five percent of trips from SE Dwyer Drive and SE Meek Street to SE 29th Avenue and SE Balfour Street. Figures showing traffic volumes at the affected intersections during the morning and evening peak hours are included in the technical appendix.

Table 7: Capacity Analysis Summary - SE 29th Avenue Connection

Intersection	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
2 SE Balfour Street at SE 29th Avenue	A	7	0.02	A	7	0.03
3 SE Balfour Street at SE 32nd Avenue	B	11	0.02	B	12	0.03
4 SE Dwyer Drive at SE 32nd Avenue	C	16	0.17	C	17	0.23
5 SE Meek Street at SE 32nd Avenue	C	23	0.29	C	16	0.11

BOLDED results indicate operation above acceptable jurisdictional standards.

The delay and capacity analysis shows that a vehicular connection between the site and SE 29th Avenue is not projected to significantly improve or degrade the performance of the affected study intersections compared with providing only a bicycle/pedestrian connection.

Transportation Planning Rule Analysis

The Transportation Planning Rule (TPR) is in place to ensure that the transportation system is capable of supporting possible increases in traffic intensity that could result from changes to adopted plans and land-use regulations. The applicable elements of the TPR are each quoted directly in italics below, with responses following.

660-012-0060

(1) If an amendment to a functional plan, an acknowledged comprehensive plan, or a land use regulation (including a zoning map) would significantly affect an existing or planned transportation facility, then the local government must put in place measures as provided in section (2) of this rule, unless the amendment is allowed under section (3), (9) or (10) of this rule. A plan or land use regulation amendment significantly affects a transportation facility if it would:

(a) Change the functional classification of an existing or planned transportation facility (exclusive of correction of map errors in an adopted plan);

(b) Change standards implementing a functional classification system; or

(c) Result in any of the effects listed in paragraphs (A) through (C) of this subsection based on projected conditions measured at the end of the planning period identified in the adopted TSP. As part of evaluating projected conditions, the amount of traffic projected to be generated within the area of the amendment may be reduced if the amendment includes an enforceable, ongoing requirement that would demonstrably limit traffic generation, including, but not limited to, transportation demand management. This reduction may diminish or completely eliminate the significant effect of the amendment.

(A) Types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;

(B) Degrade the performance of an existing or planned transportation facility such that it would not meet the performance standards identified in the TSP or comprehensive plan; or

(C) Degrade the performance of an existing or planned transportation facility that is otherwise projected to not meet the performance standards identified in the TSP or comprehensive plan.

Based on the analysis findings in the report, subsections (a) and (b) are not triggered since the proposed zone change will not impact or alter the functional classification of any existing or planned facility and the proposal does not include a change to any functional classification standards.

Estimated Traffic Demand

The Hillside Master Plan proposes a zone change for the property from medium-density residential zoning (R-3) to a split of high-density residential and general mixed-use zoning (R-1 and GMU). To determine the potential impacts the zone change could have on the surrounding transportation system, the trip generation of the site in the reasonable worst-case development scenario under existing and proposed zoning was estimated.

The reasonable worst-case development scenario of the site under existing and proposed zoning was selected based on the permitted land uses listed in Table 19.302.2 of the City of Milwaukie's municipal code. For the GMU zone, the Hillside Master Plan proposes a more restrictive list of permitted land uses in the GMU zone. This list is included in the technical appendix of this report. Within the permitted land uses listed in the City's municipal code as well as the modified list of permitted land uses in the GMU zone, the land uses selected to represent the worst-case development scenario were single-family housing for the R-3 zone and multifamily housing for the R-3 and GMU zones. These land uses are expected to have the highest trip generation potential and are considered the most trip-intensive land uses of the site.

The maximum allowable density of residential units permitted onsite under existing and proposed zoning was derived from the City of Milwaukie's municipal code. Table 19.302.4 of the City's municipal code requires R-3 zoned properties to have a maximum density of 14.5 dwelling units per acre. Some consideration was given to maintaining the existing Hillside Manor as multi-family housing but redevelopment of that portion of the site as single-family housing produced a higher trip rate than maintaining the building, therefore, the entire site was considered for redevelopment at its maximum potential. Since the subject site is approximately 16 acres, this gives a reasonable worst-case development potential of 232 units under existing R-3 zoning.

For R-1 and GMU zones, the required density is 17.4 units per acre and 50 stand-alone units per acre, respectively. The Hillside Master Plan proposes an average 24.2 units per acre in the proposed R-1 zone of the site and 70 units per acre in the GMU zone of the site. Thus, the Hillside development is assumed to be a reasonable worst-case scenario under proposed zoning. Since the Hillside Manor apartment building is planned to remain after the zone change, trips generated by the Hillside Manor were included in the proposed zoning analysis.

The *Trip Generation Manual* was used to estimate trips generated by the site under existing zoning, and the trips generated by the Hillside development as described in the Site Trips section of this report (in addition to trips associated with the Hillside Manor) were considered to be the site trips under proposed zoning. Table 8 summarizes the net difference of site trips under existing zoning and proposed zoning.

Table 8: Trip Generation Summary - Zone Change Analysis

	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Existing Zoning (R-3)									
Single Family Housing	210	232	43	129	172	145	85	230	2,190
Modal Split Reduction (10%)			*4*	*13*	*17*	*15*	*9*	*23*	*220*
Net External Trips			39	116	155	130	76	207	1970
Proposed Zoning (R-1, GMU)									
Multi-Family Housing (Low-Rise)	220	39 Units	4	14	18	14	8	22	286
Multi-Family Housing (Mid-Rise)	221	415 Units	38	111	149	112	72	184	2258
Multi-Family Housing w/ First Floor Commercial	231	146 Units	15	51	66	34	20	54	530
Total Site Generated Trips			57	176	233	160	100	260	3074
Modal Split (10%)			*6*	*18*	*24*	*16*	*10*	*26*	*308*
Net External Trips			51	158	209	144	90	234	2766
Net Difference			12	42	54	14	14	27	796

As required by the City of Milwaukie, an analysis of the study intersections in the 20-year planning horizon was done to determine the potential impacts the proposed zone change could have on the transportation system. A compounded growth rate of 0.725 percent per year for an assumed buildout condition for 20 years was applied to the year 2020 traffic volumes to approximate year 2040 background conditions. This growth rate is consistent with the growth rate derived from the City of Milwaukie's TSP and as described in the Site Trips section.

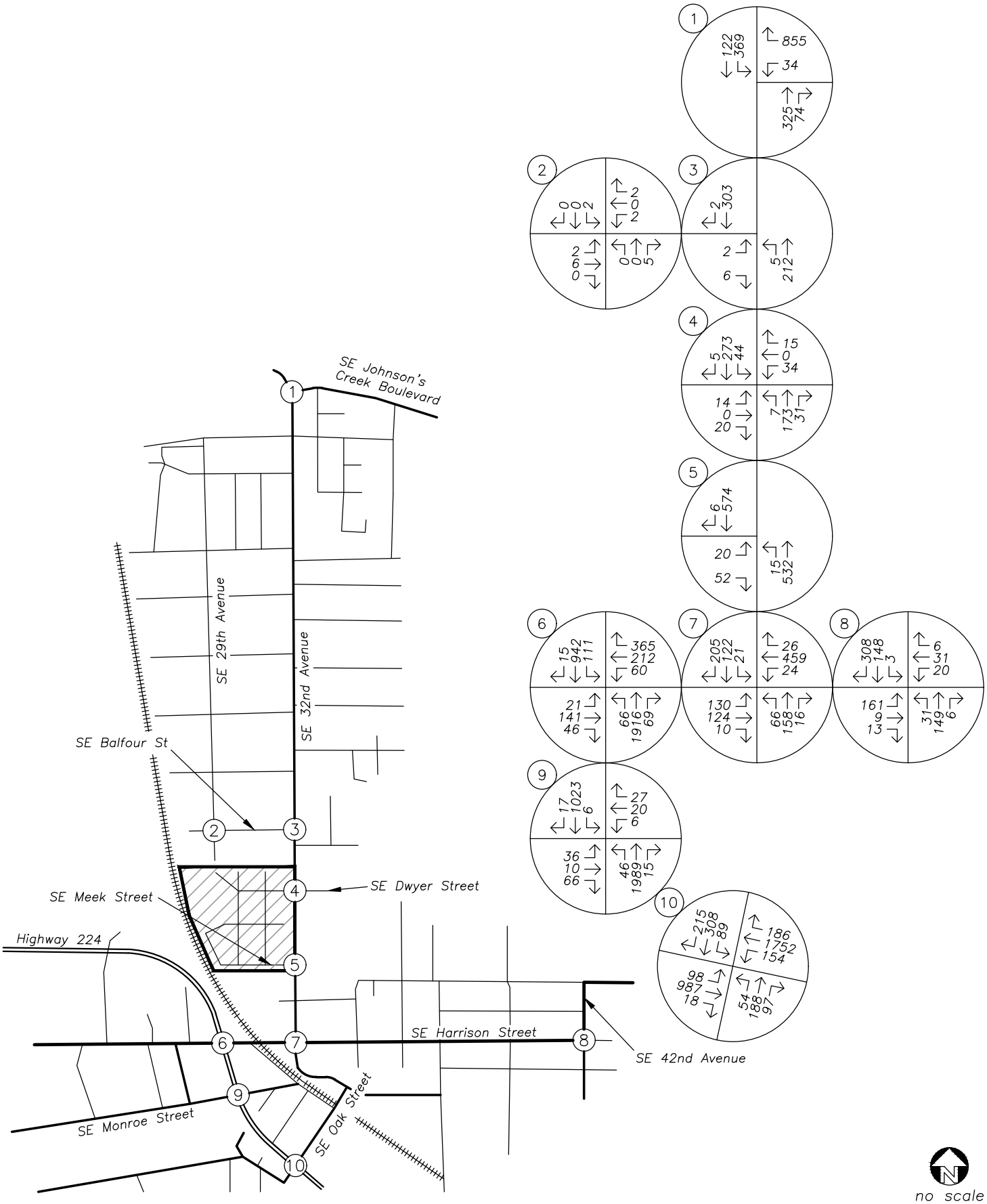
The net site trips shown in Table 8 were then added to the year 2040 background traffic volumes to obtain traffic volumes at the study intersections under the proposed zoning. Figure 13 and Figure 14 show the year 2040 traffic volumes under proposed zoning for the morning and evening peak hours, respectively.

Planned Transportation Improvements

According to Table 8-10 of the City of Milwaukie's TSP, the intersections of SE Harrison Street at Highway 224, SE Harrison Street at SE 42nd Avenue, and Highway 224 at SE Oak Street are identified in the Street Network Master Plan as intersections with deficiencies and are planned to be improved as follows:

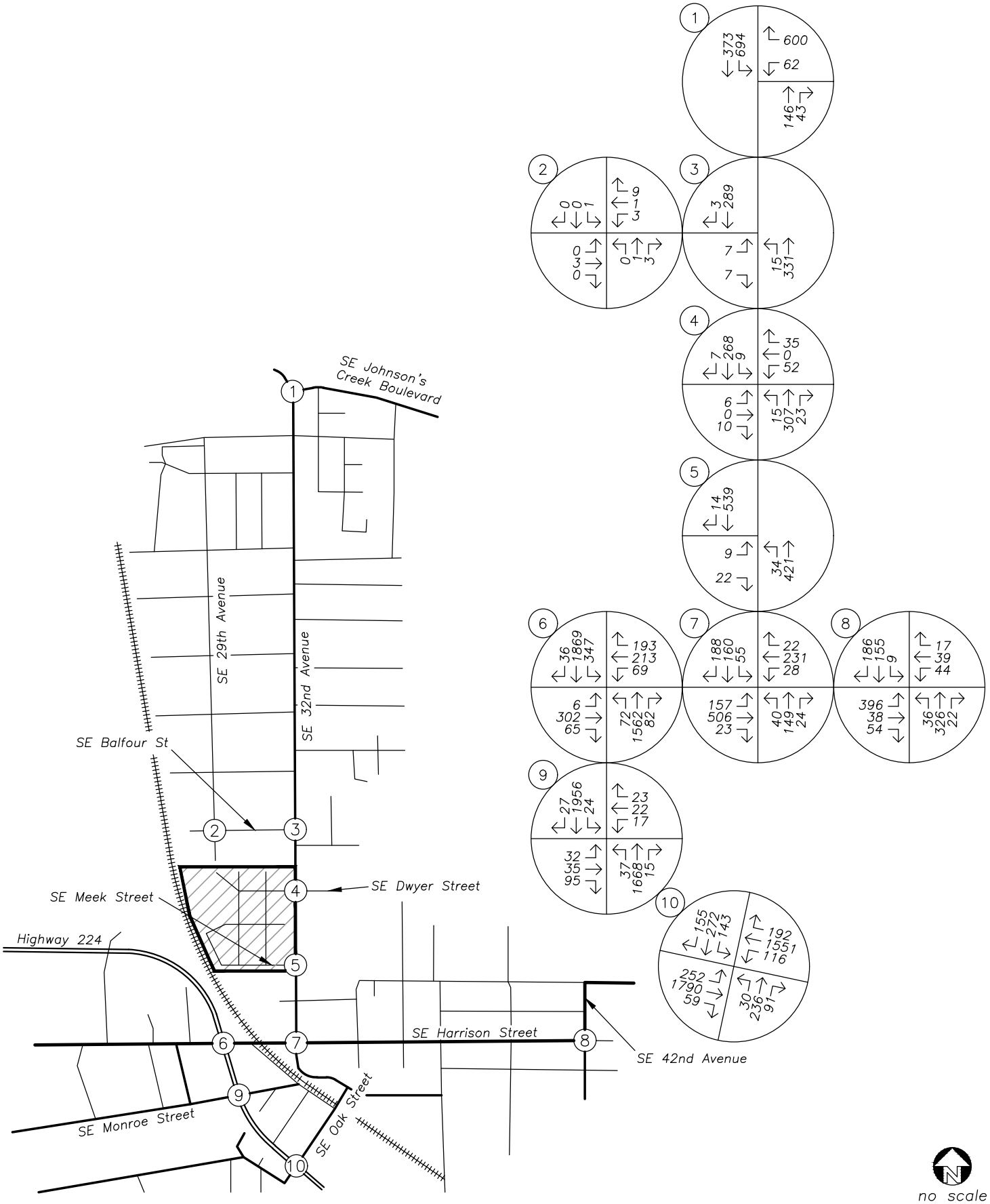
- The intersection of Highway 224 at SE Oak Street is planned to be improved by adding left-turn lanes and protected signal phasing for left-turn approaches on SE Oak Street. This is listed as a high priority project. SE Oak Street currently has left-turn lanes but does not have separate left-turn phasing.

- The intersection of SE Harrison Street at Highway 224 is planned to be improved by adding left-turn lanes and protected signal phasing for left-turn approaches on SE Harrison Street. This is listed as a medium priority project. No improvements have been made to date at this location.
- The intersection of SE Harrison Street at SE 42nd Avenue is planned to be signalized to facilitate dominant traffic flow. This is listed as a low priority project.



TRAFFIC VOLUMES
2040 Planning Horizon
AM Peak Hour

Figure 13
Hillside Master Plan
8/24/2020



TRAFFIC VOLUMES

2040 Planning Horizon

PM Peak Hour

Figure 14

Hillside Master Plan

8/24/2020

Operational Analysis

A capacity and delay analysis was conducted for each study intersection assuming the improvement projects mentioned above will be complete by year 2040. The v/c, delay, and LOS results of the capacity and delay analysis are shown in Table 9 for the morning and evening peak hours. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

Table 9: Capacity Analysis Summary - Year 2040 Planning Horizon

Intersection	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
1 SE Tacoma Street/SE Johnson Creek Boulevard at SE 32nd Avenue	B	15	0.68	D	38	0.94
2 SE Balfour Street at SE 29th Avenue	A	7	0.02	A	7	0.02
3 SE Balfour Street at SE 32nd Avenue	B	11	0.02	B	13	0.03
4 SE Dwyer Drive at SE 32nd Avenue	C	16	0.16	C	17	0.25
5 SE Meek Street at SE 32nd Avenue	C	23	0.31	C	17	0.10
6 SE Harrison Street at Highway 224	D	52	0.93	D	48	0.93
7 SE Harrison Street at SE 32nd Avenue	D	43	0.65	C	35	0.67
8 SE Harrison Street at SE 42nd Avenue	A	9	0.39	B	15	0.67
9 SE Monroe Street at Highway 224	C	24	0.75	A	10	0.74
10 Highway 224 at SE Oak Street	D	49	0.83	D	35	0.93

BOLDED results indicate operation above acceptable jurisdictional standards.

The delay and capacity analysis shows that upon the proposed zone change, the study intersections are projected to operate acceptably per the performance standards identified in the city of Milwaukie's TSP. The proposed zone change will not further degrade the performance of any existing or planned transportation facility beyond what is allowed in the current zone. Accordingly, the Transportation Planning Rule is satisfied.

Conclusions

Regarding the proposed development, the results presented in this TIS conclude:

- No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
- Adequate sight distance is available at the site access to ensure safe and efficient operation of the intersection; however, sight lines at the SE Meek Street access on SE 32nd Avenue could be improved by removing some of the foliage on the southeast corner of the intersection.
- The SE Meek Street site access will meet access spacing standards for SE 32nd Avenue but the SE Dwyer Drive intersection will not meet spacing due to the north. However, the average access spacing across the site frontage will meet the standard, and the number of potential conflict points along this section of SE 32nd Avenue will be reduced compared with existing conditions, improving the safety and flow of the street.
- Left-turn lane warrants are projected to be met for the northbound approach of the intersection of SE Meek Street at SE 32nd Avenue; however, a northbound left-turn lane is not recommended for several reasons. Stopped vehicles in a northbound left-turn lane would obstruct the line of sight between northbound vehicles and pedestrians using the crosswalk on SE 32nd Avenue north of the intersection. While the separation of left-turning vehicles can reduce potential conflicts, it would also support higher travel speeds on a roadway where traffic-calming measures have been installed to slow travel speeds.
- Preliminary traffic signal warrants are not projected to be met at any of the study intersections under buildout conditions.
- All study area intersections are calculated to operate within the City of Milwaukie and ODOT standards under all analysis scenarios except for the intersection of SE Harrison Street at SE 42nd Avenue. This analysis shows this intersection will exceed City standards under background conditions and worsen by one second of delay under building conditions. However, no mitigation is recommended because traffic volumes will not meet signal warrants.
- A vehicular connection between the site and SE 29th Avenue is not projected to significantly improve or degrade the performance of the affected study intersections compared with providing only a bicycle/pedestrian connection.

Regarding the proposed zone change, a comparison of reasonable worst-case development scenarios shows that the transportation system is capable of supporting changes to adopted plans and land use regulations and no modifications to the City's TSP are needed. Therefore, the conditions of the TPR are satisfied.

Appendix

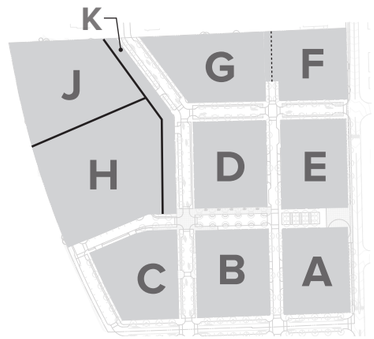
TABULATIONS

Lot A	= 1.25 ac	**100 du/ac**
Lot B	= 1.39 ac	**71 du/ac**
Lot C	= 1.36 ac	**40 du/ac**
Lot D	= 1.38 ac	**34 du/ac**
Lot E	= 1.29 ac	**81 du/ac**
Lot F	= 1.05 ac	**38 du/ac**
Lot G	= 1.52 ac	**17 du/ac**
Lot H	= 2.68 ac	**37 du/ac**
Lot J	= 1.95 ac	**0 du/ac**
Lot K	= 0.85 ac	**14 du/ac**
Total	= **14.72 ac**	

Hillside Manor (existing)	= 100 units
Hillside Park (replacement units)	= 100 units
Net New Units (to be developed)	= 400 units
Grand Total	= **600 units**

Off-street parking	= 319 stalls
On-street parking	= 175 stalls
Total	= **494 stalls**

KEY PLAN



LEGEND

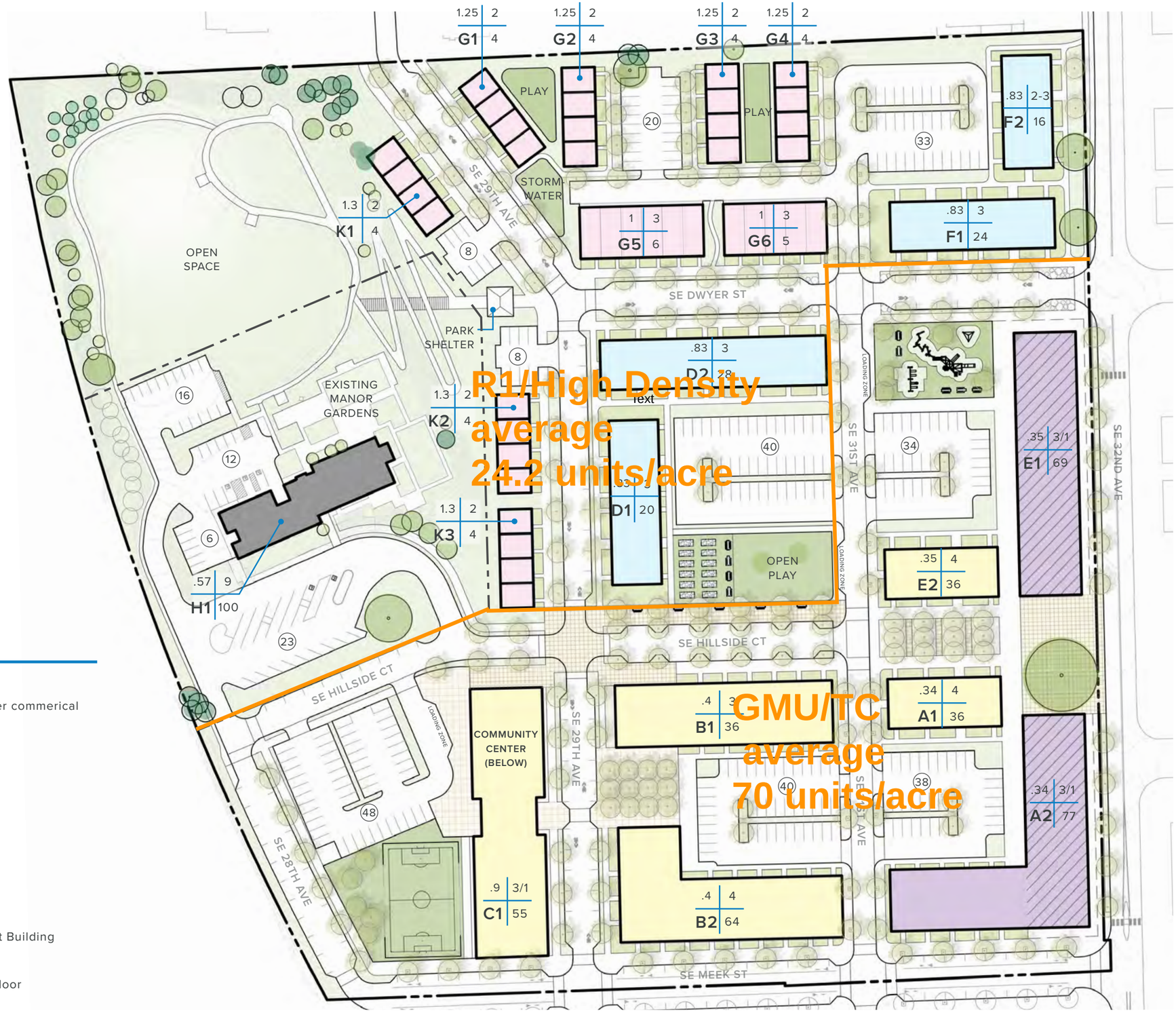
parking ratio
.5 3/1 — # of stories / over commerical
E1 50 — # of units
Building

Proposed New Tree

Existing Deciduous <12” >12” >30”

Existing Conifer <12” >12” >30”

- Townhouse
- Walk-Up Apartment
- Apartment Building (residential all floors)
- Mixed-Use Apartment Building
- Commercial ground floor
- Community center ground floor

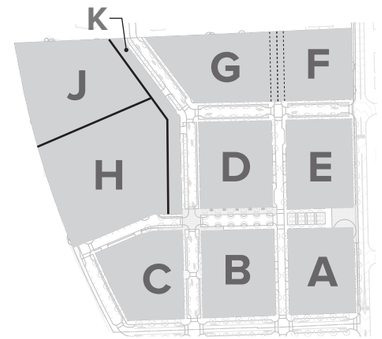


LEGEND

- parking ratio
- .5 | 3/1 — # of stories / over commerical
- E1 | 50 — # of units
- Building

- Townhouse
- Walk-Up Apartment
- Apartment Building (residential all floors)
- Mixed-Use Apartment Building
- Commercial ground floor

KEY PLAN



TABULATIONS

Lot A	= 1.25 ac	**100 du/ac**
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Lot C	= 1.36 ac	**40 du/ac**
Lot D	= 1.38 ac	**34 du/ac**
Lot E	= 1.29 ac	**81 du/ac**
Lot F	= 1.05 ac	**38 du/ac**
Lot G	= 1.52 ac	**17 du/ac**
Lot H	= 2.68 ac	**37 du/ac**
Lot J	= 1.95 ac	
Lot K	= 0.85 ac	**14 du/ac**
Total	= **14.72 ac**	

Manor (Existing)	= 100 units
New Units	= 500 units
Total	= **600 units**
Off-street parking	= 337 stalls
On-street parking	= 163 stalls
Total	= **500 stalls**

Modified GMU use chart for Hillside Master Plan

GMU Uses

Commercial Uses	GMU code	Hillside Application	Notes
General office	Permitted	Yes.	Total available commercial space on Lots A + E will be 20,000 sq. ft. Anticipated uses will be a blend of these permitted uses with the total of all uses combined not exceeding 20,000 sq. ft. Further limits on mix of uses may be determined by TIS
Drinking establishments	Permitted	Yes	
Eating establishments	Permitted	Yes	
Indoor recreation (gyms, yoga studios, dance studios)	Permitted	Yes. Max size limit of 5,000 sq. ft.	
Retail-oriented sales	Permitted	Yes.	
Personal/business services	Permitted	Yes.	
Day care	Permitted	Yes	
Repair-oriented (includes repair of electronics, bicycles, clocks, jewelry, guns, small appliances, and office equipment; tailors; shoe repair; locksmiths; and upholsterers.)	Permitted	Yes. Max size limit of 5,000 sq. ft.	
Community service uses (includes schools, government offices, religious institutions, community meeting buildings, private club/lodge and recreational facilities – mainly outdoor.)	Community Service Use approval (Type III review)	Yes. Limited to 15,000 sq. ft. Anticipated to be primarily for Hillside residents with some larger neighborhood use.	The Pre-App notes indicate that we can establish this through the PD approval (no Type III CSU required). The application materials should specify the use and purpose of this building (Hillside residents only, or open to the public)? Ask HACC if we should limit the list of uses in column 1.
Marijuana retailer	Permitted	No	
Commercial lodging (hotel, motel, etc.)	Permitted	No	
Vehicle sales and rentals (only when in a completely enclosed building)	Permitted	No	
Vehicle repair and service	Permitted	No	

(only when in a completely enclosed building)			
Manufacturing and production (limited to 5,000 sq ft per use and only permitted when associated with a retail-oriented sales or eating/ drinking establishment use.)	Permitted	No	
Residential Uses:			
Rowhouse, Multi-family, Cottage Cluster housing, Live-work units, Senior and Retirement housing	Permitted	Yes	
Mixed-Use	Permitted	Yes	
Boarding house	Conditional Use	No	

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 100

AM PEAK HOUR

Trip Rate: 0.74

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	**19**	**55**	**74**

PM PEAK HOUR

Trip Rate: 0.99

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	**62**	**37**	**99**

WEEKDAY

Trip Rate: 9.44

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**472**	**472**	**944**

SATURDAY

Trip Rate: 9.54

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**477**	**477**	**954**

Source: Trip Generation Manual, Tenth Edition

TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 232

AM PEAK HOUR

Trip Rate: 0.74

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	**43**	**129**	**172**

PM PEAK HOUR

Trip Rate: 0.99

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	**145**	**85**	**230**

WEEKDAY

Trip Rate: 9.44

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**1,095**	**1,095**	**2,190**

SATURDAY

Trip Rate: 9.54

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**1,107**	**1,107**	**2,214**

Source: Trip Generation Manual, Tenth Edition

TRIP GENERATION CALCULATIONS

Land Use: Multifamily Housing (Low-Rise)
Land Use Code: 220
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 39

AM PEAK HOUR

Trip Rate: 0.46

	Enter	Exit	Total
Directional Distribution	23%	77%	
Trip Ends	**4**	**14**	**18**

PM PEAK HOUR

Trip Rate: 0.56

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	**14**	**8**	**22**

WEEKDAY

Trip Rate: 7.32

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**143**	**143**	**286**

SATURDAY

Trip Rate: 8.14

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**159**	**159**	**318**

Source: TRIP GENERATION, Tenth Edition

TRIP GENERATION CALCULATIONS

Land Use: Multifamily Housing (Mid-Rise)
Land Use Code: 221
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 100

AM PEAK HOUR

Trip Rate: 0.36

	Enter	Exit	Total
Directional Distribution	26%	74%	
Trip Ends	**9**	**27**	**36**

PM PEAK HOUR

Trip Rate: 0.44

	Enter	Exit	Total
Directional Distribution	61%	39%	
Trip Ends	**27**	**18**	**45**

WEEKDAY

Trip Rate: 5.44

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**272**	**272**	**544**

SATURDAY

Trip Rate: 4.91

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**246**	**246**	**492**

Source: TRIP GENERATION, Tenth Edition

TRIP GENERATION CALCULATIONS

Land Use: Multifamily Housing (Mid-Rise)
Land Use Code: 221
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 415

AM PEAK HOUR

Trip Rate: 0.36

	Enter	Exit	Total
Directional Distribution	26%	74%	
Trip Ends	**39**	**110**	**149**

PM PEAK HOUR

Trip Rate: 0.44

	Enter	Exit	Total
Directional Distribution	61%	39%	
Trip Ends	**112**	**72**	**184**

WEEKDAY

Trip Rate: 5.44

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**1,129**	**1,129**	**2,258**

SATURDAY

Trip Rate: 4.91

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**1,019**	**1,019**	**2,038**

Source: TRIP GENERATION, Tenth Edition

TRIP GENERATION CALCULATIONS

Land Use: Mid-Ride Residential with 1st Floor Commercial
Land Use Code: 231
Setting/Location General Urban/Suburban
Variable: Occupied Dwelling Units
Variable Value: 146

AM PEAK HOUR

Trip Rate: 0.45

	Enter	Exit	Total
Directional Distribution	23%	77%	
Trip Ends	**15**	**51**	**66**

PM PEAK HOUR

Trip Rate: 0.37

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	**34**	**20**	**54**

WEEKDAY

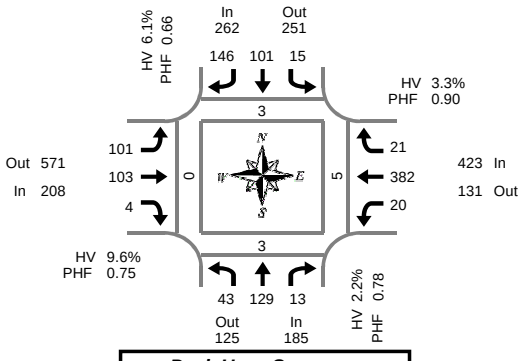
Trip Rate: 3.62

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**265**	**264**	**529**

Source: TRIP GENERATION, Tenth Edition

Total Vehicle Summary

All Traffic Data
Services Inc.
Clay Carney
(503) 833-2740



SE 32nd Ave & SE Harrison St

Tuesday, September 18, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:15 AM to 8:15 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	5	4	0	0	0	3	12	0	4	9	0	0	0	29	0	0	66	1	0	1	0
7:05 AM	3	11	0	0	0	4	6	1	7	7	0	0	1	33	4	0	76	0	0	0	0
7:10 AM	5	9	0	0	0	4	7	0	6	8	1	0	2	28	4	0	74	0	0	0	0
7:15 AM	2	12	0	1	0	5	10	2	5	19	0	0	0	28	3	1	84	0	0	0	0
7:20 AM	7	8	0	0	0	6	12	0	10	6	0	0	2	34	2	0	87	1	0	1	0
7:25 AM	4	9	1	0	3	4	13	0	4	8	0	1	1	44	4	0	95	0	0	0	0
7:30 AM	5	11	0	1	3	14	12	0	6	6	0	0	3	26	0	0	86	0	0	0	0
7:35 AM	2	10	0	0	0	14	19	0	3	11	0	0	0	29	1	0	89	0	0	0	0
7:40 AM	2	14	1	0	0	18	19	0	7	4	1	0	0	34	2	0	102	0	0	0	0
7:45 AM	3	9	3	0	1	6	7	0	11	8	1	0	4	37	0	0	90	0	1	1	0
7:50 AM	5	12	3	0	1	10	13	0	4	4	0	0	3	26	1	0	82	0	0	0	0
7:55 AM	3	19	2	0	4	7	4	0	14	7	0	0	1	33	4	0	98	1	1	1	0
8:00 AM	3	10	2	0	1	10	9	0	15	3	0	0	3	32	3	0	91	0	0	1	0
8:05 AM	2	6	1	0	2	4	16	0	10	16	0	1	2	31	0	0	90	1	1	1	0
8:10 AM	5	9	0	0	0	3	12	0	12	11	2	0	1	28	1	0	84	0	0	0	0
8:15 AM	3	4	1	0	1	7	7	0	12	8	0	0	3	17	0	0	63	0	4	0	2
8:20 AM	3	8	3	0	1	5	12	0	10	9	0	0	0	32	1	0	84	0	0	1	0
8:25 AM	3	8	3	0	2	9	10	0	20	14	0	1	0	23	3	0	95	0	1	0	0
8:30 AM	1	7	1	0	0	4	10	0	14	11	0	0	1	18	0	2	67	0	0	1	0
8:35 AM	3	15	1	0	0	13	8	0	11	12	0	0	2	20	2	0	87	0	0	0	1
8:40 AM	4	8	0	0	1	6	12	0	6	10	1	0	1	28	0	0	77	0	0	0	0
8:45 AM	3	9	2	0	2	3	5	0	11	11	0	1	2	18	5	0	71	0	1	0	0
8:50 AM	0	7	2	0	1	13	14	0	6	9	0	0	3	20	0	0	75	1	1	0	0
8:55 AM	1	2	2	0	1	11	10	0	10	28	0	0	3	22	3	0	93	1	0	1	0
Total Survey	77	221	28	2	24	183	259	3	218	239	6	4	38	670	43	3	2,006	6	10	9	3

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	13	24	0	0	0	11	25	1	17	24	1	0	3	90	8	0	216	1	0	1	0
7:15 AM	13	29	1	1	3	15	35	2	19	33	0	1	3	106	9	1	266	1	0	1	0
7:30 AM	9	35	1	1	3	46	50	0	16	21	1	0	3	89	3	0	277	0	0	0	0
7:45 AM	11	40	8	0	6	23	24	0	29	19	1	0	8	96	5	0	270	1	2	2	0
8:00 AM	10	25	3	0	3	17	37	0	37	30	2	1	6	91	4	0	265	1	1	2	0
8:15 AM	9	20	7	0	4	21	29	0	42	31	0	1	3	72	4	0	242	0	5	1	2
8:30 AM	8	30	2	0	1	23	30	0	31	33	1	0	4	66	2	2	231	0	0	1	1
8:45 AM	4	18	6	0	4	27	29	0	27	48	0	1	8	60	8	0	239	2	2	1	0
Total Survey	77	221	28	2	24	183	259	3	218	239	6	4	38	670	43	3	2,006	6	10	9	3

Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	185	125	310	2	262	251	513	2	208	571	779	2	423	131	554	1	1,078	3	3	5	0
%HV	2.2%				6.1%				9.6%				3.3%				5.0%				
PHF	0.78				0.66				0.75				0.90				0.96				

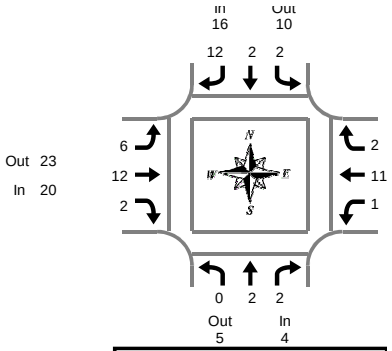
By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	43	129	13	185	15	101	146	262	101	103	4	208	20	382	21	423	1,078
%HV	0.0%	1.6%	15.4%	2.2%	13.3%	2.0%	8.2%	6.1%	5.9%	11.7%	50.0%	9.6%	5.0%	2.9%	9.5%	3.3%	5.0%
PHF	0.67	0.79	0.41	0.78	0.54	0.55	0.73	0.66	0.65	0.78	0.50	0.75	0.63	0.90	0.58	0.90	0.96

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	46	128	10	2	12	95	134	3	81	97	3	1	17	381	25	1	1,029	3	2	4	0
7:15 AM	43	129	13	2	15	101	146	2	101	103	4	2	20	382	21	1	1,078	3	3	5	0
7:30 AM	39	120	19	1	16	107	140	0	124	101	4	2	20	348	16	0	1,054	2	8	5	2
7:45 AM	38	115	20	0	14	84	120	0	139	113	4	2	21	325	15	2	1,008	2	8	6	3
8:00 AM	31	93	18	0	12	88	125	0	137	142	3	3	21	289	18	2	977	3	8	5	3

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SE 32nd Ave & SE Harrison St

Tuesday, September 18, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:15 AM to 8:15 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	2
7:05 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
7:10 AM	0	0	0	0	0	0	0	0	1	3	0	4	0	1	0	1	5
7:15 AM	0	0	0	0	0	1	0	1	1	3	0	4	0	0	1	1	6
7:20 AM	0	0	0	0	0	0	2	2	1	3	0	4	0	1	0	1	7
7:25 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	2	0	2	5
7:30 AM	0	0	0	0	1	0	1	2	0	1	0	1	0	1	0	1	4
7:35 AM	0	0	0	0	0	0	2	2	0	1	0	1	0	1	0	1	4
7:40 AM	0	0	0	0	0	0	0	0	1	0	1	2	0	1	0	1	3
7:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	2	3
7:50 AM	0	0	1	1	0	0	1	1	1	0	0	1	0	2	0	2	5
7:55 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	2
8:00 AM	0	1	1	2	0	0	2	2	0	0	0	0	0	2	0	2	6
8:05 AM	0	0	0	0	1	1	2	4	0	1	0	1	0	0	0	0	5
8:10 AM	0	0	0	0	0	0	2	2	1	0	1	2	0	0	0	0	4
8:15 AM	0	1	0	1	0	0	0	0	1	0	0	1	0	1	0	1	3
8:20 AM	0	0	1	1	0	0	0	0	0	1	0	1	0	1	1	2	4
8:25 AM	0	0	0	0	0	0	2	2	0	1	0	1	0	1	0	1	4
8:30 AM	0	0	0	0	0	1	1	2	2	1	0	3	0	1	0	1	6
8:35 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	1	0	1	3
8:40 AM	0	1	0	1	0	1	1	2	1	1	0	2	0	0	0	0	5
8:45 AM	0	0	0	0	1	0	0	1	1	1	0	2	0	4	0	4	7
8:50 AM	0	1	0	1	0	1	0	1	1	0	0	1	0	1	0	1	4
8:55 AM	0	0	0	0	0	0	1	1	1	1	0	2	0	0	0	0	3
Total Survey	0	6	3	9	3	5	18	26	15	23	2	40	1	23	3	27	102

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	1	1	2	4	0	6	0	2	0	2	9
7:15 AM	0	1	0	1	0	1	2	3	2	8	0	10	0	3	1	4	18
7:30 AM	0	0	0	0	1	0	3	4	1	2	1	4	0	3	0	3	11
7:45 AM	0	0	1	1	0	0	1	1	2	1	0	3	1	3	1	5	10
8:00 AM	0	1	1	2	1	1	6	8	1	1	1	3	0	2	0	2	15
8:15 AM	0	1	1	2	0	0	2	2	1	2	0	3	0	3	1	4	11
8:30 AM	0	2	0	2	0	2	2	4	3	3	0	6	0	2	0	2	14
8:45 AM	0	1	0	1	1	1	1	3	3	2	0	5	0	5	0	5	14
Total Survey	0	6	3	9	3	5	18	26	15	23	2	40	1	23	3	27	102

Heavy Vehicle Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound SE 32nd Ave			Southbound SE 32nd Ave			Eastbound SE Harrison St			Westbound SE Harrison St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	4	5	9	16	10	26	20	23	43	14	16	30	54
PHF	0.33			0.50			0.50			0.70			0.75

By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	2	2	4	2	2	12	16	6	12	2	20	1	11	2	14	54
PHF	0.00	0.50	0.25	0.33	0.50	0.50	0.50	0.50	0.75	0.38	0.50	0.50	0.25	0.69	0.50	0.70	0.75

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

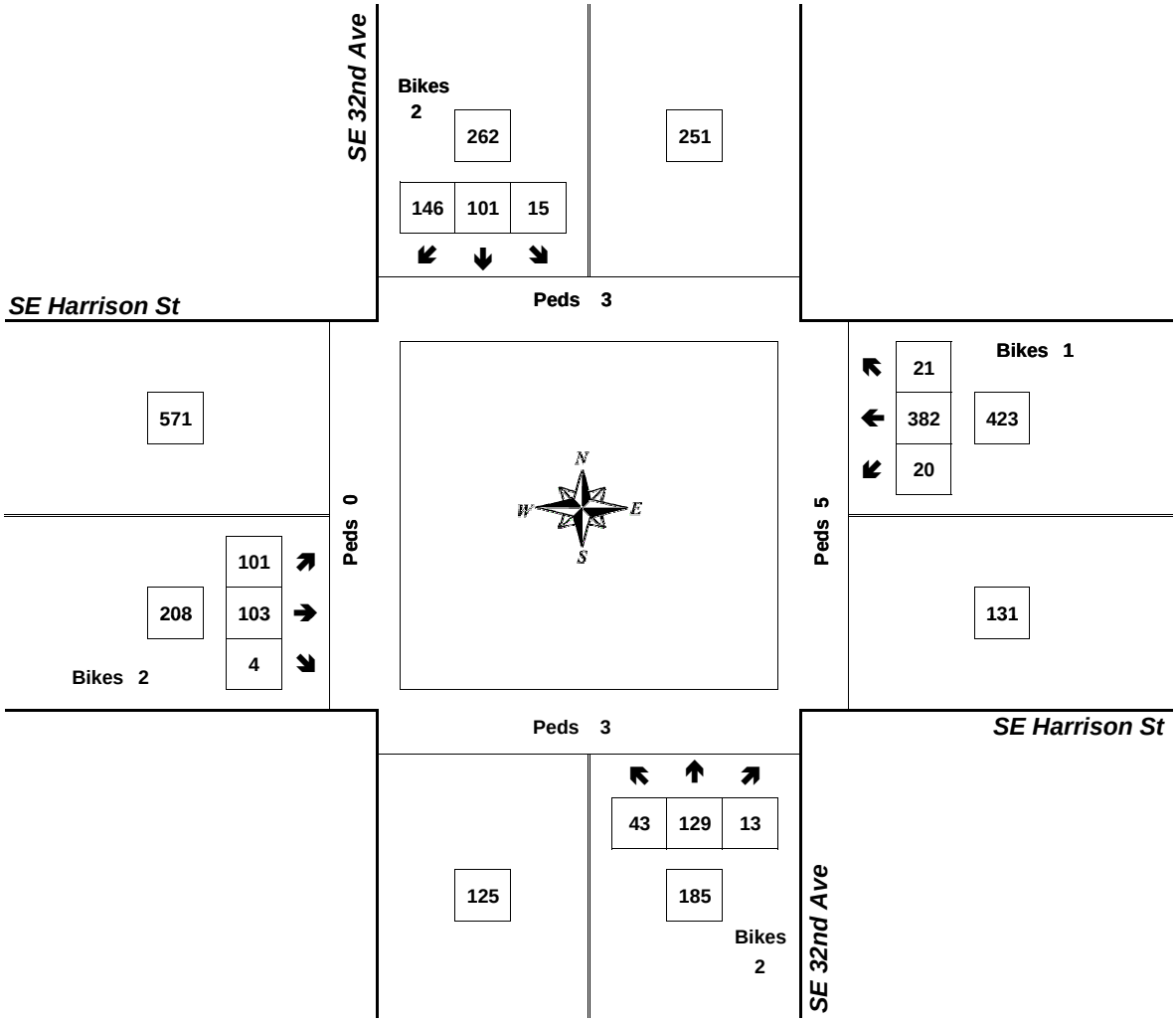
Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	1	1	2	1	1	7	9	7	15	1	23	1	11	2	14	48
7:15 AM	0	2	2	4	2	2	12	16	6	12	2	20	1	11	2	14	54
7:30 AM	0	2	3	5	2	1	12	15	5	6	2	13	1	11	2	14	47
7:45 AM	0	4	3	7	1	3	11	15	7	7	1	15	1	10	2	13	50
8:00 AM	0	5	2	7	2	4	11	17	8	8	1	17	0	12	1	13	54

Peak Hour Summary

Clay Carney
(503) 833-2740

SE 32nd Ave & SE Harrison St

7:15 AM to 8:15 AM
Tuesday, September 18, 2018

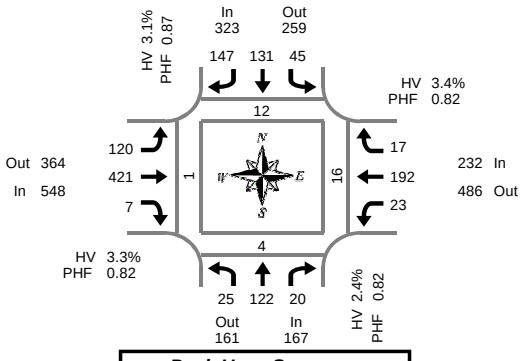


Approach	PHF	HV%	Volume
EB	0.75	9.6%	208
WB	0.90	3.3%	423
NB	0.78	2.2%	185
SB	0.66	6.1%	262
Intersection	0.96	5.0%	1,078

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

SE 32nd Ave & SE Harrison St

Tuesday, September 18, 2018
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	1	10	1	0	4	10	12	0	8	34	0	0	2	17	0	0	99	0	0	0	0
4:05 PM	1	11	6	1	1	13	10	0	10	37	0	0	2	17	0	0	108	2	0	3	0
4:10 PM	4	7	3	0	7	11	6	0	10	38	2	2	4	12	0	0	104	1	0	0	0
4:15 PM	1	10	4	0	6	12	9	0	7	30	0	0	2	20	1	0	102	0	0	2	1
4:20 PM	2	11	2	2	6	9	9	0	6	26	2	0	0	18	3	0	94	1	0	1	0
4:25 PM	3	3	1	0	8	10	9	0	6	17	0	0	5	15	3	0	80	0	0	3	0
4:30 PM	4	7	3	1	3	10	13	0	13	34	1	0	3	14	0	0	105	1	0	2	0
4:35 PM	3	11	3	0	3	8	15	0	10	44	0	0	1	19	4	0	121	6	0	4	0
4:40 PM	2	12	0	0	6	5	14	0	19	41	0	0	2	18	2	0	121	1	0	1	0
4:45 PM	1	15	4	0	4	12	15	0	7	32	2	0	1	22	2	0	117	2	1	2	0
4:50 PM	2	10	1	0	4	15	15	0	4	23	1	1	4	20	0	0	99	1	3	1	0
4:55 PM	4	10	0	0	2	12	14	0	10	38	0	0	2	18	1	0	111	0	0	2	0
5:00 PM	1	6	1	0	1	18	11	0	6	27	0	0	1	12	2	0	86	0	0	1	0
5:05 PM	1	7	0	0	4	14	14	1	5	20	0	1	1	12	2	0	80	0	0	0	0
5:10 PM	2	15	3	0	5	9	11	0	11	52	1	0	3	18	2	0	132	1	0	0	1
5:15 PM	3	10	2	1	5	13	9	0	9	36	1	0	1	14	2	0	105	0	0	3	0
5:20 PM	1	11	2	0	4	7	7	1	16	41	0	0	0	12	0	0	101	0	0	0	0
5:25 PM	1	8	1	0	4	8	9	1	10	33	1	1	4	13	0	1	92	0	0	0	0
5:30 PM	1	15	1	0	3	8	7	0	12	33	0	0	2	16	0	0	98	0	0	0	0
5:35 PM	5	8	1	0	6	11	10	0	5	24	1	1	2	14	1	0	88	0	0	0	0
5:40 PM	0	8	1	0	3	17	11	0	7	23	3	0	1	24	1	0	99	0	0	0	0
5:45 PM	0	5	0	0	1	5	13	0	5	26	0	0	1	15	1	0	72	2	1	4	1
5:50 PM	4	6	2	0	2	11	5	1	12	32	0	1	3	18	0	0	95	0	0	1	0
5:55 PM	4	5	0	1	2	13	10	0	8	30	1	0	1	18	2	0	94	3	0	1	0
Total Survey	51	221	42	6	94	261	258	4	216	771	16	7	48	396	29	1	2,403	21	5	31	3

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	6	28	10	1	12	34	28	0	28	109	2	2	8	46	0	0	311	3	0	3	0
4:15 PM	6	24	7	2	20	31	27	0	19	73	2	0	7	53	7	0	276	1	0	6	1
4:30 PM	9	30	6	1	12	23	42	0	42	119	1	0	6	51	6	0	347	8	0	7	0
4:45 PM	7	35	5	0	10	39	44	0	21	93	3	1	7	60	3	0	327	3	4	5	0
5:00 PM	4	28	4	0	10	41	36	1	22	99	1	1	5	42	6	0	298	1	0	1	1
5:15 PM	5	29	5	1	13	28	25	2	35	110	2	1	5	39	2	1	298	0	0	3	0
5:30 PM	6	31	3	0	12	36	28	0	24	80	4	1	5	54	2	0	285	0	0	0	0
5:45 PM	8	16	2	1	5	29	28	1	25	88	1	1	5	51	3	0	261	5	1	6	1
Total Survey	51	221	42	6	94	261	258	4	216	771	16	7	48	396	29	1	2,403	21	5	31	3

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	167	161	328	2	323	259	582	3	548	364	912	3	232	486	718	1	1,270
%HV	2.4%				3.1%				3.3%				3.4%				3.1%
PHF	0.82				0.87				0.82				0.82				0.88

Pedestrians Crosswalk			
North	South	East	West
12	4	16	1

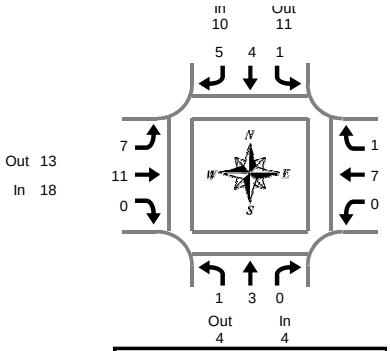
By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	25	122	20	167	45	131	147	323	120	421	7	548	23	192	17	232	1,270
%HV	4.0%	2.5%	0.0%	2.4%	2.2%	3.1%	3.4%	3.1%	5.8%	2.6%	0.0%	3.3%	0.0%	3.6%	5.9%	3.4%	3.1%
PHF	0.69	0.80	0.71	0.82	0.80	0.73	0.84	0.87	0.71	0.82	0.58	0.82	0.82	0.80	0.53	0.82	0.88

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	28	117	28	4	54	127	141	0	110	394	8	3	28	210	16	0	1,261	15	4	21	1
4:15 PM	26	117	22	3	52	134	149	1	104	384	7	2	25	206	22	0	1,248	13	4	19	2
4:30 PM	25	122	20	2	45	131	147	3	120	421	7	3	23	192	17	1	1,270	12	4	16	1
4:45 PM	22	123	17	1	45	144	133	3	102	382	10	4	22	195	13	1	1,208	4	4	9	1
5:00 PM	23	104	14	2	40	134	117	4	106	377	8	4	20	186	13	1	1,142	6	1	10	2

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



SE 32nd Ave & SE Harrison St

Tuesday, September 18, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	1	1	0	2	0	2	0	2	4
4:05 PM	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	2
4:10 PM	0	0	0	0	0	0	2	2	0	3	0	3	0	0	0	0	5
4:15 PM	0	0	0	0	0	0	0	0	1	2	0	3	0	0	0	0	3
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	3	0	3	0	0	1	1	1	3	0	4	0	1	0	1	9
4:35 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
4:40 PM	0	0	0	0	0	0	1	1	0	1	0	1	0	1	1	2	4
4:45 PM	0	0	0	0	0	2	0	2	1	3	0	4	0	0	0	0	6
4:50 PM	1	0	0	1	0	0	1	1	0	2	0	2	0	1	0	1	5
4:55 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	1	1	0	2	0	1	0	1	3
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
5:10 PM	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	1	1	1	1	0	2	0	0	0	0	3
5:20 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	2
5:25 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
5:30 PM	0	0	0	0	0	0	1	1	1	1	0	2	0	1	0	1	4
5:35 PM	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	2
5:40 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
5:50 PM	0	0	0	0	0	0	1	1	1	0	0	1	0	1	0	1	3
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	3	0	4	1	4	11	16	12	21	0	33	0	13	1	14	67

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	3	3	1	5	0	6	0	2	0	2	11
4:15 PM	0	0	0	0	0	0	0	0	1	2	0	3	0	2	0	2	5
4:30 PM	0	3	0	3	0	1	2	3	1	4	0	5	0	3	1	4	15
4:45 PM	1	0	0	1	0	3	1	4	1	5	0	6	0	1	0	1	12
5:00 PM	0	0	0	0	1	0	1	2	1	1	0	2	0	2	0	2	6
5:15 PM	0	0	0	0	0	0	1	1	4	1	0	5	0	1	0	1	7
5:30 PM	0	0	0	0	0	0	2	2	1	3	0	4	0	1	0	1	7
5:45 PM	0	0	0	0	0	0	1	1	2	0	0	2	0	1	0	1	4
Total Survey	1	3	0	4	1	4	11	16	12	21	0	33	0	13	1	14	67

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SE 32nd Ave			Southbound SE 32nd Ave			Eastbound SE Harrison St			Westbound SE Harrison St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	4	4	8	10	11	21	18	13	31	8	12	20	40
PHF	0.33			0.63			0.64			0.50			0.67

By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	3	0	4	1	4	5	10	7	11	0	18	0	7	1	8	40
PHF	0.25	0.25	0.00	0.33	0.25	0.33	0.63	0.63	0.44	0.46	0.00	0.64	0.00	0.58	0.25	0.50	0.67

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

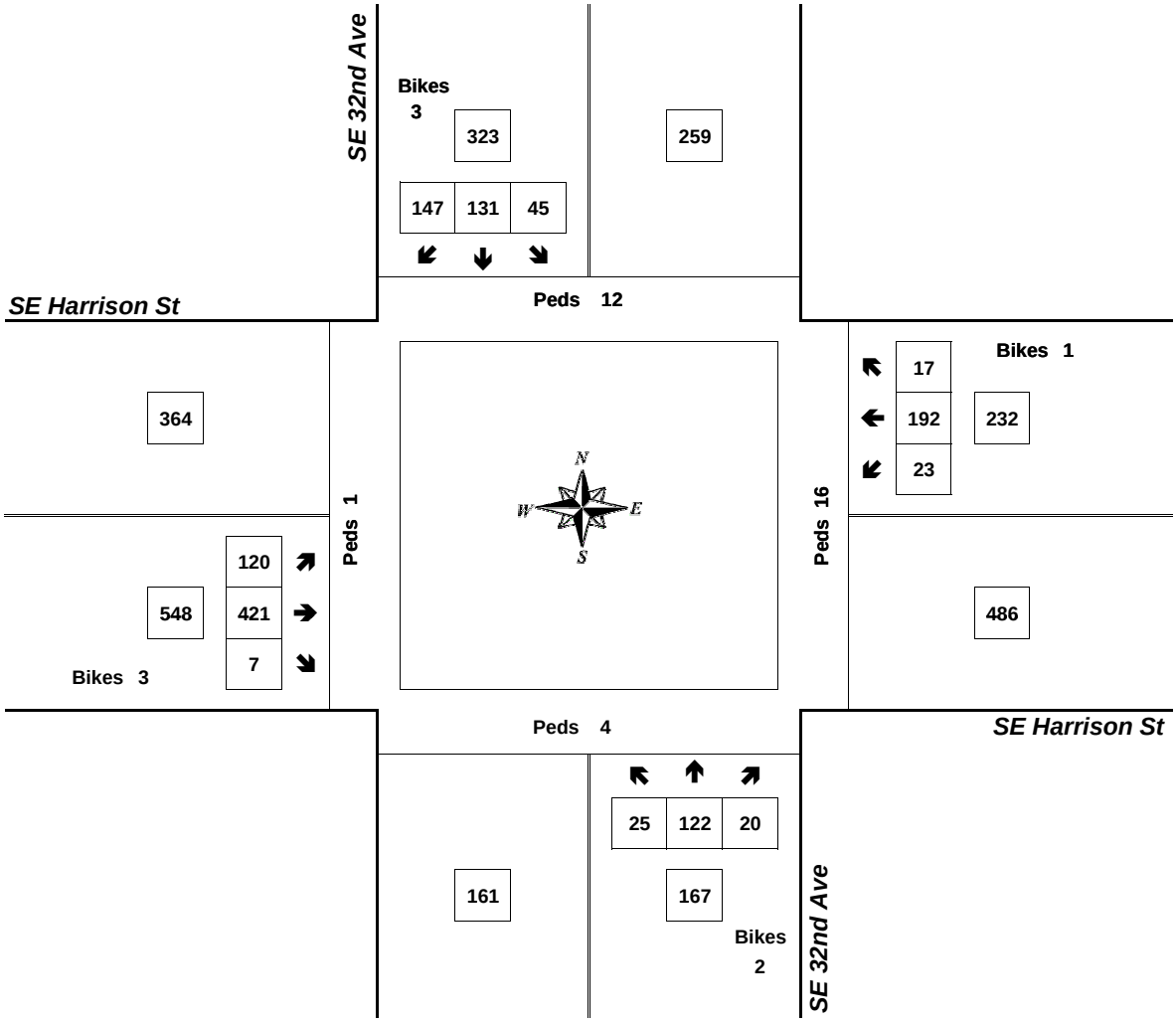
Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	1	3	0	4	0	4	6	10	4	16	0	20	0	8	1	9	43
4:15 PM	1	3	0	4	1	4	4	9	4	12	0	16	0	8	1	9	38
4:30 PM	1	3	0	4	1	4	5	10	7	11	0	18	0	7	1	8	40
4:45 PM	1	0	0	1	1	3	5	9	7	10	0	17	0	5	0	5	32
5:00 PM	0	0	0	0	1	0	5	6	8	5	0	13	0	5	0	5	24

Peak Hour Summary

Clay Carney
(503) 833-2740

SE 32nd Ave & SE Harrison St

4:30 PM to 5:30 PM
Tuesday, September 18, 2018

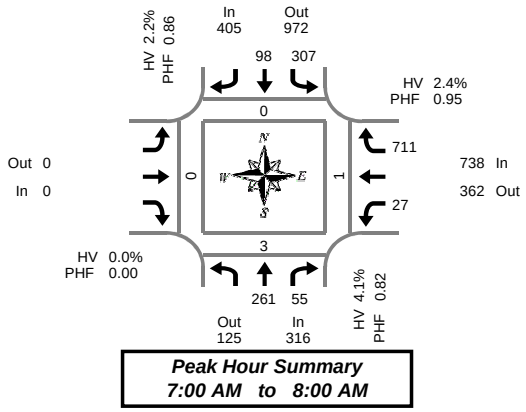


Approach	PHF	HV%	Volume
EB	0.82	3.3%	548
WB	0.82	3.4%	232
NB	0.82	2.4%	167
SB	0.87	3.1%	323
Intersection	0.88	3.1%	1,270

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



SE 32nd Ave & SE Johnson Creek Blvd

Tuesday, September 25, 2018
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
7:00 AM	17	2	0		27	10		0				0	4		57	0	117	0	0	0	0
7:05 AM	30	3	0		18	7		0				0	0		60	2	118	0	0	0	0
7:10 AM	21	3	0		27	8		0				0	0		70	0	129	0	1	0	0
7:15 AM	20	2	3		24	8		0				0	2		58	4	114	0	0	0	0
7:20 AM	24	1	1		23	5		1				0	0		64	2	117	0	2	0	0
7:25 AM	25	2	2		18	6		2				0	2		54	1	107	0	0	1	0
7:30 AM	23	8	1		25	10		1				0	3		62	0	131	0	0	0	0
7:35 AM	20	4	1		32	8		1				0	2		63	1	129	0	0	0	0
7:40 AM	31	10	4		28	8		0				0	0		56	2	133	0	0	0	0
7:45 AM	17	10	2		31	11		0				0	8		45	3	122	0	0	0	0
7:50 AM	20	3	2		32	8		1				0	3		62	0	128	0	0	0	0
7:55 AM	13	7	0		22	9		0				0	3		60	5	114	0	0	0	0
8:00 AM	18	4	0		30	6		1				0	2		55	0	115	0	0	0	0
8:05 AM	18	3	2		17	7		1				0	2		42	1	89	0	0	0	0
8:10 AM	22	2	0		35	11		1				0	2		54	1	126	0	1	0	0
8:15 AM	16	3	1		20	7		0				0	4		44	0	94	0	0	0	0
8:20 AM	14	0	1		32	6		1				0	6		52	2	110	0	0	0	0
8:25 AM	20	1	3		22	8		0				0	4		59	0	114	0	1	2	0
8:30 AM	10	2	1		24	6		0				0	2		52	1	96	0	0	0	0
8:35 AM	10	4	0		38	5		0				0	2		43	2	102	0	1	1	0
8:40 AM	13	6	0		34	4		0				0	1		54	2	112	0	0	0	0
8:45 AM	10	3	0		21	4		1				0	2		35	1	75	3	0	0	0
8:50 AM	13	3	1		25	4		1				0	5		53	1	103	0	0	0	0
8:55 AM	15	6	0		18	10		0				0	3		38	3	90	0	1	0	0
Total Survey	440	92	25		623	176		12				0	62		1,292	34	2,685	3	7	4	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
7:00 AM	68	8	0		72	25		0				0	4		187	2	364	0	1	0	0
7:15 AM	69	5	6		65	19		3				0	4		176	7	338	0	2	1	0
7:30 AM	74	22	6		85	26		2				0	5		181	3	393	0	0	0	0
7:45 AM	50	20	4		85	28		1				0	14		167	8	364	0	0	0	0
8:00 AM	58	9	2		82	24		3				0	6		151	2	330	0	1	0	0
8:15 AM	50	4	5		74	21		1				0	14		155	2	318	0	1	2	0
8:30 AM	33	12	1		96	15		0				0	5		149	5	310	0	1	1	0
8:45 AM	38	12	1		64	18		2				0	10		126	5	268	3	1	0	0
Total Survey	440	92	25		623	176		12				0	62		1,292	34	2,685	3	7	4	0

Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	316	125	441	16	405	972	1,377	6	0	0	0	0	738	362	1,100	20	1,459	0	3	1	0
%HV	4.1%				2.2%				0.0%				2.4%				2.7%				
PHF	0.82				0.86				0.00				0.95				0.93				

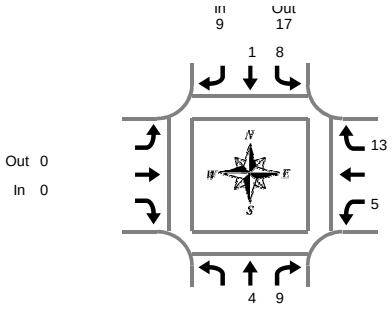
By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Total
		T	R	Total	L	T		Total				Total	L		R	Total	
Volume		261	55	316	307	98		405				0	27		711	738	1,459
%HV	NA	1.5%	16.4%	4.1%	2.6%	1.0%	NA	2.2%	NA	NA	NA	0.0%	18.5%	NA	1.8%	2.4%	2.7%
PHF		0.88	0.57	0.82	0.84	0.88		0.86				0.00	0.48		0.93	0.95	0.93

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
7:00 AM	261	55	16		307	98		6				0	27		711	20	1,459	0	3	1	0
7:15 AM	251	56	18		317	97		9				0	29		675	20	1,425	0	3	1	0
7:30 AM	232	55	17		326	99		7				0	39		654	15	1,405	0	2	2	0
7:45 AM	191	45	12		337	88		5				0	39		622	17	1,322	0	3	3	0
8:00 AM	179	37	9		316	78		6				0	35		581	14	1,226	3	4	3	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SE 32nd Ave & SE Johnson Creek Blvd

Tuesday, September 25, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total
	T	R	Total		L	T		Total				Total	L		R	Total	
7:00 AM	0	1	1		0	1		1				0	1		2	3	5
7:05 AM	0	1	1		0	0		0				0	0		0	0	1
7:10 AM	0	0	0		1	0		1				0	0		1	1	2
7:15 AM	0	1	1		2	0		2				0	1		1	2	5
7:20 AM	0	0	0		0	0		0				0	0		2	2	2
7:25 AM	1	1	2		1	0		1				0	0		1	1	4
7:30 AM	0	0	0		0	0		0				0	1		1	2	2
7:35 AM	0	1	1		2	0		2				0	0		1	1	4
7:40 AM	1	0	1		0	0		0				0	0		0	0	1
7:45 AM	0	2	2		1	0		1				0	1		0	1	4
7:50 AM	1	0	1		0	0		0				0	0		2	2	3
7:55 AM	1	2	3		1	0		1				0	1		2	3	7
8:00 AM	0	0	0		0	0		0				0	0		3	3	3
8:05 AM	1	0	1		1	0		1				0	0		0	0	2
8:10 AM	0	0	0		2	0		2				0	2		3	5	7
8:15 AM	0	1	1		2	0		2				0	0		1	1	4
8:20 AM	0	0	0		1	0		1				0	1		0	1	2
8:25 AM	0	0	0		4	0		4				0	0		2	2	6
8:30 AM	0	1	1		1	0		1				0	0		1	1	3
8:35 AM	0	0	0		1	0		1				0	2		2	4	5
8:40 AM	2	0	2		1	0		1				0	0		0	0	3
8:45 AM	0	0	0		1	0		1				0	0		2	2	3
8:50 AM	0	0	0		3	0		3				0	1		5	6	9
8:55 AM	0	1	1		1	1		2				0	1		2	3	6
Total Survey	7	12	19		26	2		28				0	12		34	46	93

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total
	T	R	Total		L	T		Total				Total	L		R	Total	
7:00 AM	0	2	2		1	1		2				0	1		3	4	8
7:15 AM	1	2	3		3	0		3				0	1		4	5	11
7:30 AM	1	1	2		2	0		2				0	1		2	3	7
7:45 AM	2	4	6		2	0		2				0	2		4	6	14
8:00 AM	1	0	1		3	0		3				0	2		6	8	12
8:15 AM	0	1	1		7	0		7				0	1		3	4	12
8:30 AM	2	1	3		3	0		3				0	2		3	5	11
8:45 AM	0	1	1		5	1		6				0	2		9	11	18
Total Survey	7	12	19		26	2		28				0	12		34	46	93

Heavy Vehicle Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound SE 32nd Ave			Southbound SE 32nd Ave			Eastbound SE Johnson Creek Blvd			Westbound SE Johnson Creek Blvd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	13	6	19	9	17	26	0	0	0	18	17	35	40
PHF	0.54			0.75			0.00			0.75			0.71

By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Total
	T	R	Total		L	T		Total				Total	L		R	Total	
Volume	4	9	13		8	1		9				0	5		13	18	40
PHF	0.50	0.56	0.54		0.67	0.25		0.75				0.00	0.63		0.81	0.75	0.71

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

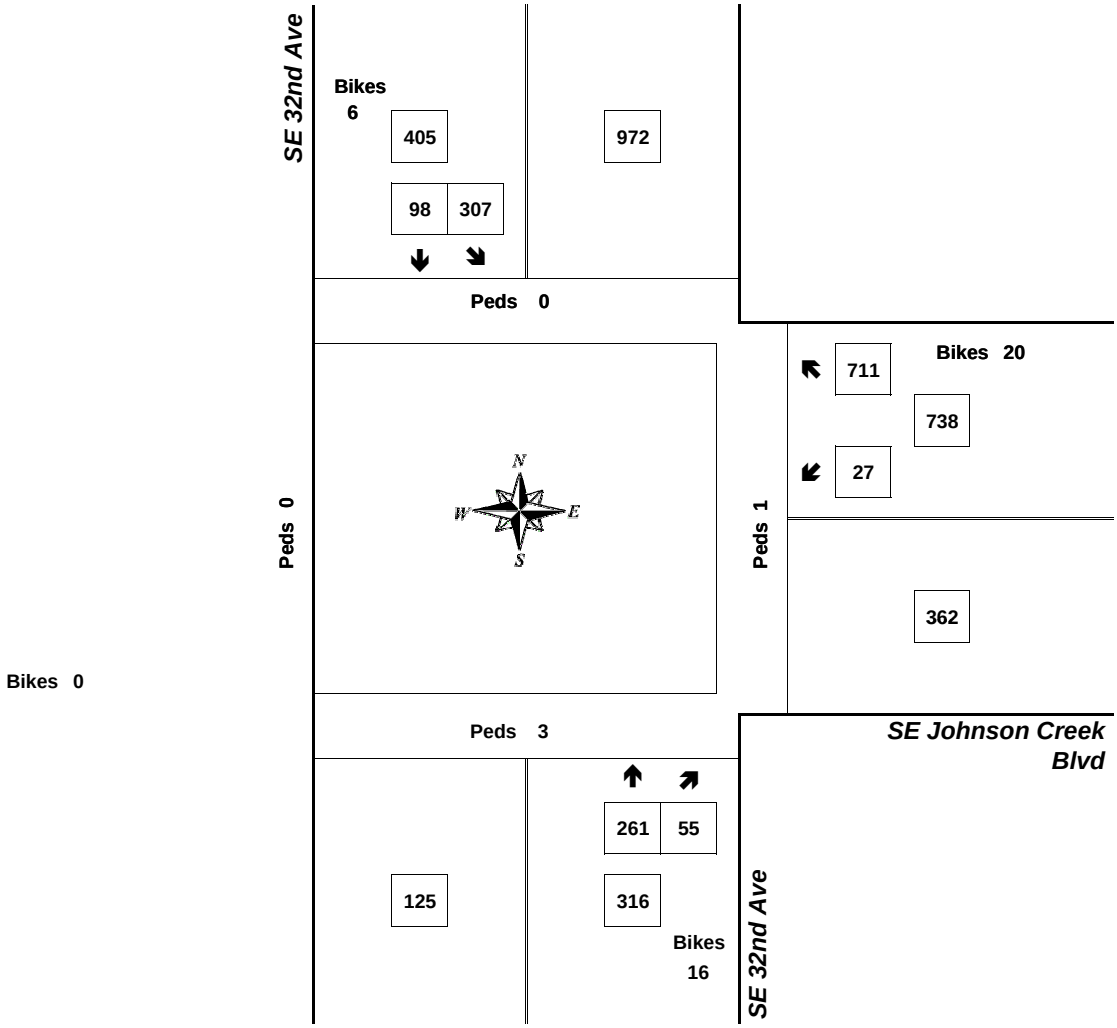
Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total
	T	R	Total		L	T		Total				Total	L		R	Total	
7:00 AM	4	9	13		8	1		9				0	5		13	18	40
7:15 AM	5	7	12		10	0		10				0	6		16	22	44
7:30 AM	4	6	10		14	0		14				0	6		15	21	45
7:45 AM	5	6	11		15	0		15				0	7		16	23	49
8:00 AM	3	3	6		18	1		19				0	7		21	28	53

Peak Hour Summary

Clay Carney
(503) 833-2740

SE 32nd Ave & SE Johnson Creek Blvd

7:00 AM to 8:00 AM
Tuesday, September 25, 2018

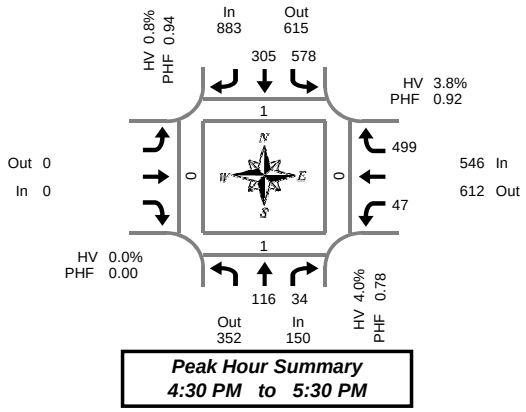


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.95	2.4%	738
NB	0.82	4.1%	316
SB	0.86	2.2%	405
Intersection	0.93	2.7%	1,459

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

Clay Carney
(503) 833-2740



SE 32nd Ave & SE Johnson Creek Blvd

Tuesday, September 25, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM	8	4	0		37	27		0				0	8		35	0	119	0	0	0	0
4:05 PM	5	5	0		33	18		1				0	9		34	0	104	0	1	0	0
4:10 PM	12	4	0		60	32		0				0	2		35	0	145	0	0	0	0
4:15 PM	3	2	0		47	26		2				0	4		38	0	120	0	1	0	0
4:20 PM	11	6	0		38	26		1				0	5		36	0	122	0	0	0	0
4:25 PM	9	3	0		40	29		0				0	5		33	2	119	0	0	1	0
4:30 PM	4	2	0		48	28		5				0	3		36	0	121	0	0	0	0
4:35 PM	15	4	0		39	25		0				0	5		33	0	121	0	0	0	0
4:40 PM	7	1	0		49	24		3				0	3		43	0	127	1	0	0	0
4:45 PM	9	1	0		54	26		0				0	2		48	0	140	0	0	0	0
4:50 PM	9	3	0		54	25		4				0	4		40	1	135	0	0	0	0
4:55 PM	10	2	0		49	22		0				0	6		42	3	131	0	0	0	0
5:00 PM	8	3	0		53	25		1				0	5		37	3	131	0	0	0	0
5:05 PM	12	3	0		55	31		1				0	3		40	0	144	0	0	0	0
5:10 PM	7	4	2		47	22		0				0	4		43	3	127	0	0	0	0
5:15 PM	18	4	0		43	31		3				0	2		46	0	144	0	0	0	0
5:20 PM	10	5	0		41	27		3				0	5		41	1	129	0	0	0	0
5:25 PM	7	2	0		46	19		3				0	5		50	1	129	0	1	0	0
5:30 PM	12	1	1		38	20		1				0	2		37	0	110	0	0	0	0
5:35 PM	10	2	0		43	18		3				0	0		38	0	111	1	0	0	0
5:40 PM	13	3	0		32	32		0				0	2		49	3	131	0	0	0	0
5:45 PM	6	3	0		48	21		0				0	4		42	1	124	0	3	0	0
5:50 PM	12	4	0		48	24		5				0	3		44	1	135	0	0	0	0
5:55 PM	8	5	0		40	30		2				0	6		31	0	120	0	0	1	0
Total Survey	225	76	3		1,082	608		38				0	97		951	19	3,039	2	6	2	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM	25	13	0		130	77		1				0	19		104	0	368	0	1	0	0
4:15 PM	23	11	0		125	81		3				0	14		107	2	361	0	1	1	0
4:30 PM	26	7	0		136	77		8				0	11		112	0	369	1	0	0	0
4:45 PM	28	6	0		157	73		4				0	12		130	4	406	0	0	0	0
5:00 PM	27	10	2		155	78		2				0	12		120	6	402	0	0	0	0
5:15 PM	35	11	0		130	77		9				0	12		137	2	402	0	1	0	0
5:30 PM	35	6	1		113	70		4				0	4		124	3	352	1	0	0	0
5:45 PM	26	12	0		136	75		7				0	13		117	2	379	0	3	1	0
Total Survey	225	76	3		1,082	608		38				0	97		951	19	3,039	2	6	2	0

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	150	352	502	2	883	615	1,498	23	0	0	0	0	546	612	1,158	12	1,579	1	1	0	0
%HV	4.0%				0.8%				0.0%				3.8%				2.2%				
PHF	0.78				0.94				0.00				0.92				0.95				

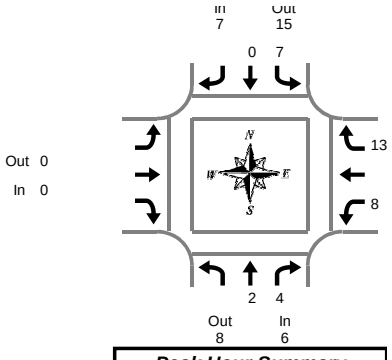
By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Total
	T	R	Total		T			Total				Total	L		R	Total	
Volume	116	34	150		578	305		883				0	47		499	546	1,579
%HV	NA	1.7%	11.8%	4.0%	1.2%	0.0%	NA	0.8%	NA	NA	NA	0.0%	17.0%	NA	2.6%	3.8%	2.2%
PHF		0.78	0.65	0.78	0.92	0.91		0.94				0.00	0.78		0.91	0.92	0.95

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM	102	37	0		548	308		16				0	56		453	6	1,504	1	2	1	0
4:15 PM	104	34	2		573	309		17				0	49		469	12	1,538	1	1	1	0
4:30 PM	116	34	2		578	305		23				0	47		499	12	1,579	1	1	0	0
4:45 PM	125	33	3		555	298		19				0	40		511	15	1,562	1	1	0	0
5:00 PM	123	39	3		534	300		22				0	41		498	13	1,535	1	4	1	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SE 32nd Ave & SE Johnson Creek Blvd

Tuesday, September 25, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total
	T	R	Total		L	T		Total				Total	L		R	Total	
4:00 PM	0	0	0		4	1		5				0	1		1	2	7
4:05 PM	0	1	1		2	0		2				0	1		0	1	4
4:10 PM	0	0	0		0	0		0				0	0		2	2	2
4:15 PM	0	0	0		0	0		0				0	0		0	0	0
4:20 PM	0	1	1		3	0		3				0	1		1	2	6
4:25 PM	0	0	0		0	0		0				0	0		2	2	2
4:30 PM	0	0	0		2	0		2				0	1		1	2	4
4:35 PM	0	1	1		0	0		0				0	1		2	3	4
4:40 PM	0	0	0		0	0		0				0	0		0	0	0
4:45 PM	0	0	0		0	0		0				0	1		3	4	4
4:50 PM	1	1	2		2	0		2				0	0		2	2	6
4:55 PM	0	0	0		1	0		1				0	0		0	0	1
5:00 PM	0	0	0		1	0		1				0	1		1	2	3
5:05 PM	0	0	0		0	0		0				0	2		1	3	3
5:10 PM	0	0	0		1	0		1				0	1		1	2	3
5:15 PM	0	1	1		0	0		0				0	0		0	0	1
5:20 PM	1	1	2		0	0		0				0	0		2	2	4
5:25 PM	0	0	0		0	0		0				0	1		0	1	1
5:30 PM	0	0	0		0	0		0				0	0		1	1	1
5:35 PM	0	1	1		1	0		1				0	0		2	2	4
5:40 PM	0	0	0		0	1		1				0	0		1	1	2
5:45 PM	0	0	0		2	0		2				0	0		1	1	3
5:50 PM	0	1	1		2	0		2				0	1		0	1	4
5:55 PM	0	0	0		0	0		0				0	0		1	1	1
Total Survey	2	8	10		21	2		23				0	12		25	37	70

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total
	T	R	Total		L	T		Total				Total	L		R	Total	
4:00 PM	0	1	1		6	1		7				0	2		3	5	13
4:15 PM	0	1	1		3	0		3				0	1		3	4	8
4:30 PM	0	1	1		2	0		2				0	2		3	5	8
4:45 PM	1	1	2		3	0		3				0	1		5	6	11
5:00 PM	0	0	0		2	0		2				0	4		3	7	9
5:15 PM	1	2	3		0	0		0				0	1		2	3	6
5:30 PM	0	1	1		1	1		2				0	0		4	4	7
5:45 PM	0	1	1		4	0		4				0	1		2	3	8
Total Survey	2	8	10		21	2		23				0	12		25	37	70

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SE 32nd Ave			Southbound SE 32nd Ave			Eastbound SE Johnson Creek Blvd			Westbound SE Johnson Creek Blvd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	6	8	14	7	15	22	0	0	0	21	11	32	34
PHF	0.50			0.44			0.00			0.75			0.77

By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Total
	T	R	Total		L	T		Total				Total	L		R	Total	
Volume	2	4	6		7	0		7				0	8		13	21	34
PHF	0.50	0.50	0.50		0.44	0.00		0.44				0.00	0.50		0.65	0.75	0.77

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

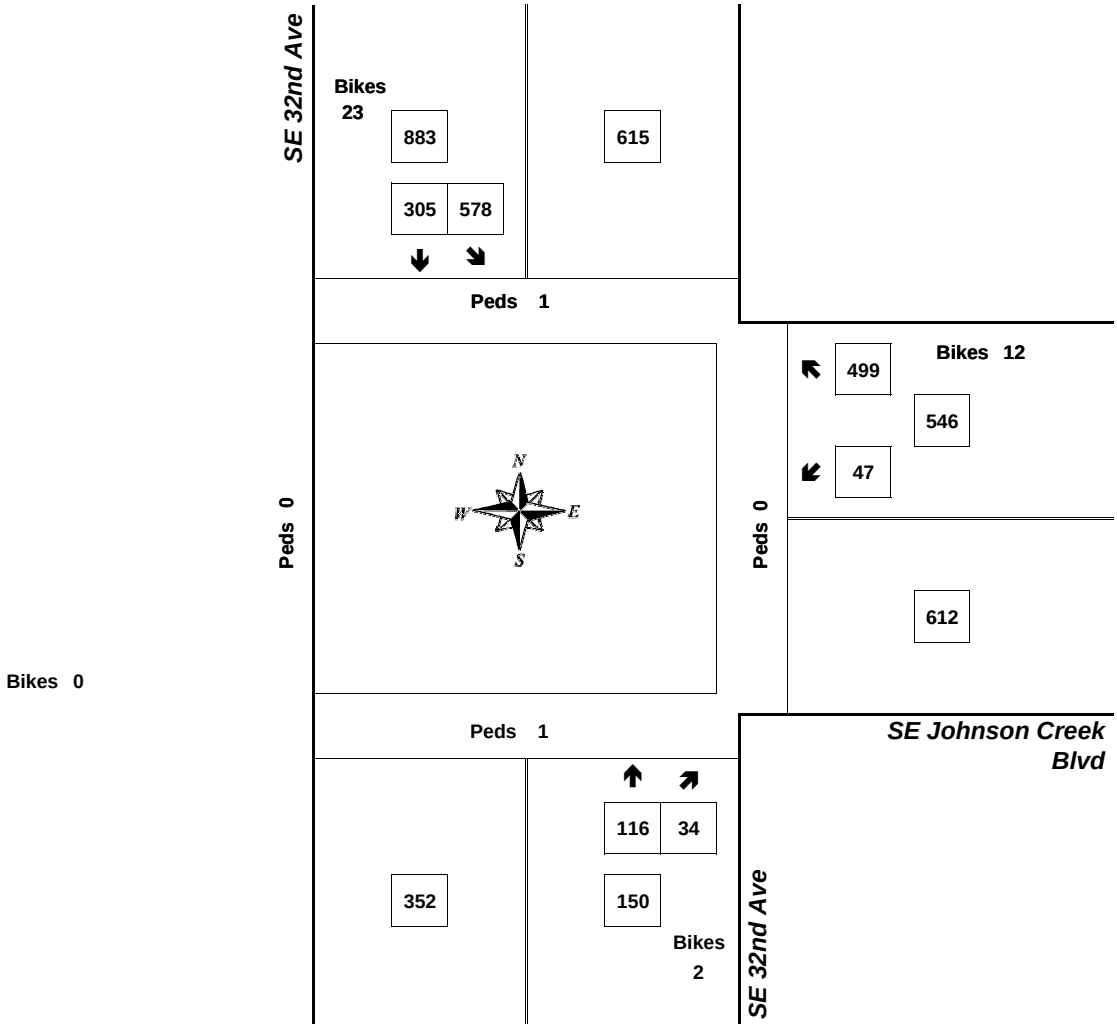
Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total
	T	R	Total		L	T		Total				Total	L		R	Total	
4:00 PM	1	4	5		14	1		15				0	6		14	20	40
4:15 PM	1	3	4		10	0		10				0	8		14	22	36
4:30 PM	2	4	6		7	0		7				0	8		13	21	34
4:45 PM	2	4	6		6	1		7				0	6		14	20	33
5:00 PM	1	4	5		7	1		8				0	6		11	17	30

Peak Hour Summary

Clay Carney
(503) 833-2740

SE 32nd Ave & SE Johnson Creek Blvd

4:30 PM to 5:30 PM
Tuesday, September 25, 2018

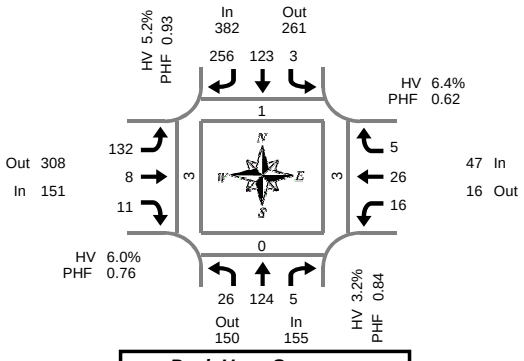


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.92	3.8%	546
NB	0.78	4.0%	150
SB	0.94	0.8%	883
Intersection	0.95	2.2%	1,579

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:25 AM to 8:25 AM

SE 42nd Ave & SE Harrison St

Tuesday, September 25, 2018
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	4	6	0	0	0	2	19	0	8	0	1	0	0	2	0	0	42	0	0	1	1
7:05 AM	3	5	0	0	0	6	21	0	12	3	1	1	0	1	0	0	52	0	0	0	0
7:10 AM	4	3	0	0	0	10	23	0	5	0	0	0	0	2	0	0	47	0	0	1	0
7:15 AM	3	7	2	0	0	5	23	0	4	1	1	0	0	4	1	0	51	0	0	1	2
7:20 AM	2	6	1	0	0	10	17	0	7	0	1	0	0	1	0	0	45	1	0	0	0
7:25 AM	6	7	0	0	0	10	18	0	9	0	0	0	1	2	0	0	53	0	0	0	0
7:30 AM	2	11	1	0	0	12	29	0	8	0	1	1	0	4	0	0	68	0	0	0	0
7:35 AM	3	12	0	0	0	7	20	0	12	0	1	0	1	0	0	0	56	0	0	1	0
7:40 AM	1	15	1	0	1	7	20	0	9	1	1	0	0	3	0	0	59	0	0	0	0
7:45 AM	1	12	0	0	1	2	23	0	11	1	1	0	5	6	0	0	63	0	0	0	0
7:50 AM	4	12	0	0	0	12	30	0	8	0	0	0	1	3	0	0	70	0	0	0	1
7:55 AM	2	4	2	0	1	9	18	0	10	2	0	0	0	2	2	0	52	0	0	0	0
8:00 AM	4	9	0	0	0	13	14	0	17	0	0	0	1	2	0	0	60	0	0	0	0
8:05 AM	2	11	0	0	0	15	17	0	13	1	3	0	1	1	1	0	65	0	0	0	1
8:10 AM	1	8	1	0	0	12	28	0	14	2	0	0	4	1	1	0	72	1	0	1	1
8:15 AM	0	14	0	0	0	17	14	0	11	1	1	0	1	0	1	0	60	0	0	1	0
8:20 AM	0	9	0	0	0	7	25	0	10	0	3	0	1	2	0	0	57	0	0	0	0
8:25 AM	2	6	0	0	0	3	18	0	8	0	4	0	1	2	0	0	44	0	0	0	0
8:30 AM	3	12	0	0	0	12	14	0	8	2	0	0	0	2	0	0	53	0	1	1	0
8:35 AM	3	11	3	0	0	7	11	0	5	2	0	0	0	2	0	0	44	1	0	1	0
8:40 AM	1	9	0	0	0	11	16	0	7	0	2	0	0	1	0	0	47	0	0	1	0
8:45 AM	2	4	0	0	1	10	9	0	6	0	0	0	1	0	0	0	33	0	0	1	0
8:50 AM	1	17	0	0	0	10	17	0	12	1	0	0	1	1	0	0	60	0	0	3	0
8:55 AM	0	7	1	0	0	11	10	0	12	1	3	0	0	2	0	0	47	0	0	1	0
Total Survey	54	217	12	0	4	220	454	0	226	18	24	2	19	46	6	0	1,300	3	1	14	6

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	11	14	0	0	0	18	63	0	25	3	2	1	0	5	0	0	141	0	0	2	1
7:15 AM	11	20	3	0	0	25	58	0	20	1	2	0	1	7	1	0	149	1	0	1	2
7:30 AM	6	38	2	0	1	26	69	0	29	1	3	1	1	7	0	0	183	0	0	1	0
7:45 AM	7	28	2	0	2	23	71	0	29	3	1	0	6	11	2	0	185	0	0	0	1
8:00 AM	7	28	1	0	0	40	59	0	44	3	3	0	6	4	2	0	197	1	0	1	2
8:15 AM	2	29	0	0	0	27	57	0	29	1	8	0	3	4	1	0	161	0	0	1	0
8:30 AM	7	32	3	0	0	30	41	0	20	4	2	0	0	5	0	0	144	1	1	3	0
8:45 AM	3	28	1	0	1	31	36	0	30	2	3	0	2	3	0	0	140	0	0	5	0
Total Survey	54	217	12	0	4	220	454	0	226	18	24	2	19	46	6	0	1,300	3	1	14	6

Peak Hour Summary
7:25 AM to 8:25 AM

By Approach	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	155	150	305	0	382	261	643	0	151	308	459	1	47	16	63	0	735	1	0	3	3
%HV	3.2%				5.2%				6.0%				6.4%				5.0%				
PHF	0.84				0.93				0.76				0.62				0.93				

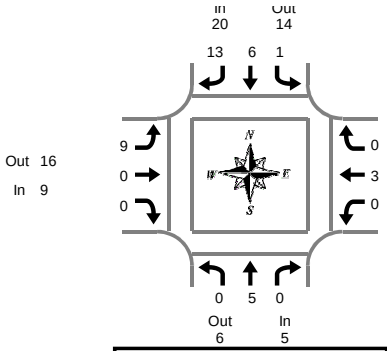
By Movement	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	26	124	5	155	3	123	256	382	132	8	11	151	16	26	5	47	735
%HV	0.0%	4.0%	0.0%	3.2%	33.3%	4.9%	5.1%	5.2%	6.8%	0.0%	0.0%	6.0%	0.0%	11.5%	0.0%	6.4%	5.0%
PHF	0.59	0.79	0.63	0.84	0.38	0.70	0.88	0.93	0.75	0.50	0.69	0.76	0.67	0.54	0.42	0.62	0.93

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	35	100	7	0	3	92	261	0	103	8	8	2	8	30	3	0	658	1	0	4	4
7:15 AM	31	114	8	0	3	114	257	0	122	8	9	1	14	29	5	0	714	2	0	3	5
7:30 AM	22	123	5	0	3	116	256	0	131	8	15	1	16	26	5	0	726	1	0	3	3
7:45 AM	23	117	6	0	2	120	228	0	122	11	14	0	15	24	5	0	687	2	1	5	3
8:00 AM	19	117	5	0	1	128	193	0	123	10	16	0	11	16	3	0	642	2	1	10	2

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SE 42nd Ave & SE Harrison St

Tuesday, September 25, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:25 AM to 8:25 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	2
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	0	0	0	0	0	2	2	1	0	0	1	0	0	0	0	3
7:15 AM	0	0	1	1	0	0	1	1	1	0	0	1	0	0	0	0	3
7:20 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
7:25 AM	0	0	0	0	0	2	2	4	1	0	0	1	0	0	0	0	5
7:30 AM	0	0	0	0	0	0	2	2	1	0	0	1	0	0	0	0	3
7:35 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
7:40 AM	0	2	0	2	1	0	0	1	2	0	0	2	0	0	0	0	5
7:45 AM	0	0	0	0	0	0	3	3	0	0	0	0	0	2	0	2	5
7:50 AM	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
7:55 AM	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	2
8:00 AM	0	2	0	2	0	1	0	1	2	0	0	2	0	0	0	0	5
8:05 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
8:10 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
8:15 AM	0	0	0	0	0	2	1	3	0	0	0	0	0	0	0	0	3
8:20 AM	0	0	0	0	0	0	2	2	1	0	0	1	0	1	0	1	4
8:25 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
8:35 AM	0	1	1	2	0	0	0	0	1	0	0	1	0	0	0	0	3
8:40 AM	0	1	0	1	0	0	0	0	1	0	1	2	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
8:50 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
8:55 AM	0	0	0	0	0	1	2	3	2	0	1	3	0	0	0	0	6
Total Survey	0	10	2	12	1	7	22	30	16	0	2	18	0	3	0	3	63

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	3	3	2	0	0	2	0	0	0	0	5
7:15 AM	0	0	1	1	0	2	4	6	2	0	0	2	0	0	0	0	9
7:30 AM	0	2	0	2	1	0	3	4	3	0	0	3	0	0	0	0	9
7:45 AM	0	1	0	1	0	1	5	6	0	0	0	0	0	2	0	2	9
8:00 AM	0	2	0	2	0	1	0	1	4	0	0	4	0	0	0	0	7
8:15 AM	0	1	0	1	0	2	3	5	1	0	0	1	0	1	0	1	8
8:30 AM	0	2	1	3	0	0	1	1	2	0	1	3	0	0	0	0	7
8:45 AM	0	2	0	2	0	1	3	4	2	0	1	3	0	0	0	0	9
Total Survey	0	10	2	12	1	7	22	30	16	0	2	18	0	3	0	3	63

Heavy Vehicle Peak Hour Summary
7:25 AM to 8:25 AM

By Approach	Northbound SE 42nd Ave			Southbound SE 42nd Ave			Eastbound SE Harrison St			Westbound SE Harrison St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	5	6	11	20	14	34	9	16	25	3	1	4	37
PHF	0.42			0.71			0.56			0.38			0.77

By Movement	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	5	0	5	1	6	13	20	9	0	0	9	0	3	0	3	37
PHF	0.00	0.42	0.00	0.42	0.25	0.75	0.65	0.71	0.56	0.00	0.00	0.56	0.00	0.38	0.00	0.38	0.77

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

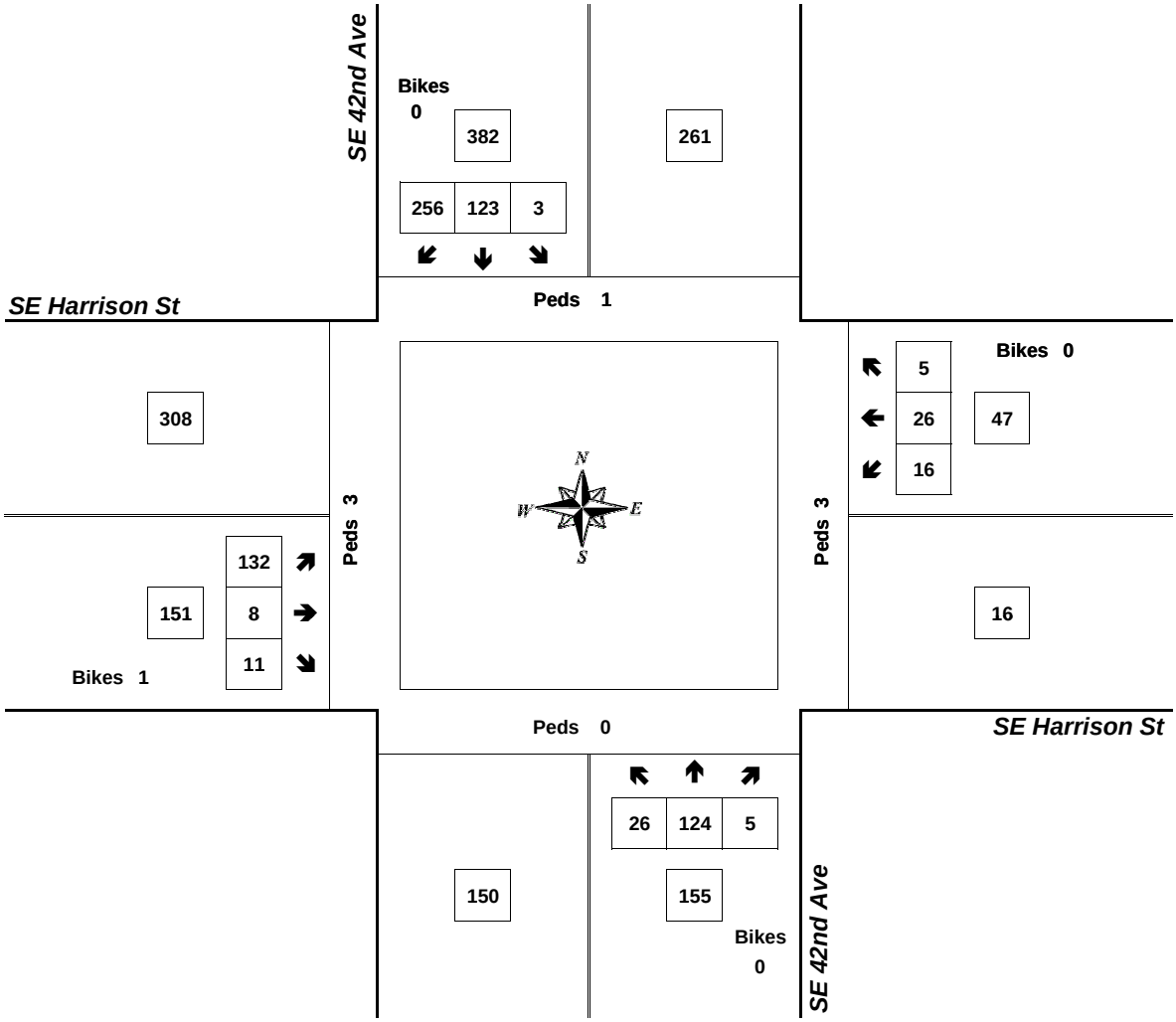
Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	3	1	4	1	3	15	19	7	0	0	7	0	2	0	2	32
7:15 AM	0	5	1	6	1	4	12	17	9	0	0	9	0	2	0	2	34
7:30 AM	0	6	0	6	1	4	11	16	8	0	0	8	0	3	0	3	33
7:45 AM	0	6	1	7	0	4	9	13	7	0	1	8	0	3	0	3	31
8:00 AM	0	7	1	8	0	4	7	11	9	0	2	11	0	1	0	1	31

Peak Hour Summary

Clay Carney
(503) 833-2740

SE 42nd Ave & SE Harrison St

7:25 AM to 8:25 AM
Tuesday, September 25, 2018

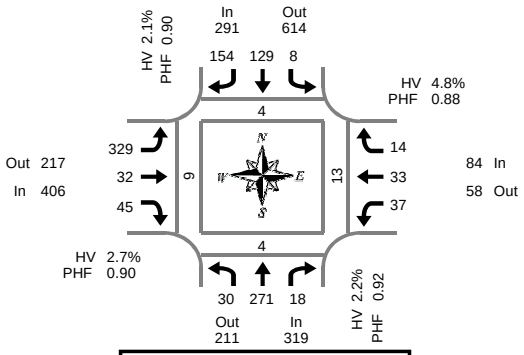


Approach	PHF	HV%	Volume
EB	0.76	6.0%	151
WB	0.62	6.4%	47
NB	0.84	3.2%	155
SB	0.93	5.2%	382
Intersection	0.93	5.0%	735

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data
Services Inc.
Clay Carney
(503) 833-2740



SE 42nd Ave & SE Harrison St

Tuesday, September 25, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:50 PM to 5:50 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	2	26	0	0	0	8	9	0	21	1	1	0	0	3	2	0	73	0	0	2	3
4:05 PM	3	18	3	0	0	10	14	0	19	1	1	0	3	1	0	0	73	0	0	2	0
4:10 PM	4	28	1	0	0	7	12	0	19	1	3	0	0	6	1	0	82	0	0	1	0
4:15 PM	1	23	2	0	0	13	10	0	24	3	2	0	1	2	1	0	82	0	1	2	0
4:20 PM	2	20	1	0	0	9	5	0	23	3	6	0	3	1	0	0	73	0	0	0	0
4:25 PM	2	28	1	0	0	8	18	0	22	4	9	0	1	0	0	0	93	0	0	0	0
4:30 PM	3	18	1	0	0	8	9	0	21	3	2	0	2	4	1	0	72	1	0	0	0
4:35 PM	1	18	0	0	0	5	17	0	22	4	4	0	4	1	0	0	76	0	0	0	0
4:40 PM	1	24	3	0	0	8	11	0	26	1	3	0	0	2	0	0	79	1	0	0	0
4:45 PM	2	17	2	0	0	10	13	0	30	1	2	0	2	3	1	0	83	1	0	0	0
4:50 PM	1	27	2	0	0	16	11	0	25	3	1	0	1	3	1	0	91	0	0	0	0
4:55 PM	3	17	2	0	0	10	15	1	27	3	2	0	2	4	1	0	86	1	1	0	0
5:00 PM	0	20	3	0	1	13	15	0	30	0	3	0	2	3	3	0	93	0	0	1	3
5:05 PM	2	30	5	0	1	8	13	0	22	2	3	1	1	4	3	0	94	0	1	2	0
5:10 PM	5	20	0	0	0	7	12	0	36	5	6	0	3	4	0	0	98	0	0	0	2
5:15 PM	1	23	1	0	0	10	12	0	16	4	8	0	2	3	1	0	81	0	0	0	0
5:20 PM	5	21	2	0	2	10	13	0	31	1	3	0	7	2	2	0	99	1	1	1	2
5:25 PM	5	25	1	0	0	10	15	0	26	1	1	0	1	0	2	0	87	0	1	2	0
5:30 PM	1	22	0	0	2	11	14	0	30	3	6	0	4	4	0	0	97	0	0	2	2
5:35 PM	3	22	1	0	0	15	10	0	30	2	1	0	7	1	1	0	93	0	0	1	0
5:40 PM	4	20	1	0	0	7	12	0	30	5	6	0	2	4	0	0	91	1	0	2	0
5:45 PM	0	24	0	0	2	12	12	0	26	3	5	0	5	1	0	0	90	1	0	2	0
5:50 PM	4	10	1	0	1	13	17	0	23	5	2	0	4	4	0	0	84	0	0	1	1
5:55 PM	1	14	3	0	1	9	11	0	16	2	4	1	1	3	2	0	67	0	0	0	0
Total Survey	56	515	36	0	10	237	300	1	595	61	84	2	58	63	22	0	2,037	7	5	21	13

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	9	72	4	0	0	25	35	0	59	3	5	0	3	10	3	0	228	0	0	5	3
4:15 PM	5	71	4	0	0	30	33	0	69	10	17	0	5	3	1	0	248	0	1	2	0
4:30 PM	5	60	4	0	0	21	37	0	69	8	9	0	6	7	1	0	227	2	0	0	0
4:45 PM	6	61	6	0	0	36	39	1	82	7	5	0	5	10	3	0	260	2	1	0	0
5:00 PM	7	70	8	0	2	28	40	0	88	7	12	1	6	11	6	0	285	0	1	3	5
5:15 PM	11	69	4	0	2	30	40	0	73	6	12	0	10	5	5	0	267	1	2	3	2
5:30 PM	8	64	2	0	2	33	36	0	90	10	13	0	13	9	1	0	281	1	0	5	2
5:45 PM	5	48	4	0	4	34	40	0	65	10	11	1	10	8	2	0	241	1	0	3	1
Total Survey	56	515	36	0	10	237	300	1	595	61	84	2	58	63	22	0	2,037	7	5	21	13

Peak Hour Summary
4:50 PM to 5:50 PM

By Approach	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	319	211	530	0	291	614	905	1	406	217	623	1	84	58	142	0	1,100	4	4	13	9
%HV	2.2%				2.1%				2.7%				4.8%				2.5%				
PHF	0.92				0.90				0.90				0.88				0.96				

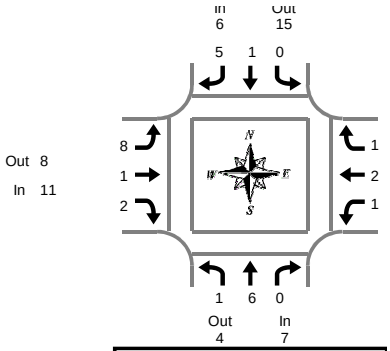
By Movement	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	30	271	18	319	8	129	154	291	329	32	45	406	37	33	14	84	1,100
%HV	3.3%	2.2%	0.0%	2.2%	0.0%	0.8%	3.2%	2.1%	2.4%	3.1%	4.4%	2.7%	2.7%	6.1%	7.1%	4.8%	2.5%
PHF	0.68	0.93	0.45	0.92	0.50	0.83	0.90	0.90	0.91	0.73	0.66	0.90	0.66	0.75	0.50	0.88	0.96

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	25	264	18	0	0	112	144	1	279	28	36	0	19	30	8	0	963	4	2	7	3
4:15 PM	23	262	22	0	2	115	149	1	308	32	43	1	22	31	11	0	1,020	4	3	5	5
4:30 PM	29	260	22	0	4	115	156	1	312	28	38	1	27	33	15	0	1,039	5	4	6	7
4:45 PM	32	264	20	0	6	127	155	1	333	30	42	1	34	35	15	0	1,093	4	4	11	9
5:00 PM	31	251	18	0	10	125	156	0	316	33	48	2	39	33	14	0	1,074	3	3	14	10

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SE 42nd Ave & SE Harrison St

Tuesday, September 25, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:50 PM to 5:50 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
4:05 PM	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	1	1	3	0	0	3	0	0	0	0	4
4:20 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
4:25 PM	0	2	0	2	0	0	2	2	0	0	0	0	0	0	0	0	4
4:30 PM	0	1	0	1	0	0	1	1	1	0	0	1	0	0	0	0	3
4:35 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
4:40 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	2
4:50 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	1	0	1	3
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	1	0	1	1	2	1	0	0	1	0	0	0	0	4
5:05 PM	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	3	4
5:10 PM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
5:20 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
5:25 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	2	2	3	0	0	3	0	0	0	0	5
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	1	0	0	1	0	0	1	1	1	0	1	2	0	0	0	0	4
5:45 PM	0	2	0	2	0	0	0	0	1	0	0	1	0	0	0	0	3
5:50 PM	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	2
5:55 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
Total Survey	1	10	0	11	0	1	14	15	16	1	2	19	2	4	1	7	52

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	0	1	0	0	1	1	1	0	0	1	0	1	0	1	4
4:15 PM	0	2	0	2	0	0	4	4	3	0	0	3	0	0	0	0	9
4:30 PM	0	1	0	1	0	0	3	3	1	0	0	1	0	0	0	0	5
4:45 PM	0	1	0	1	0	0	1	1	1	1	0	2	0	1	0	1	5
5:00 PM	0	3	0	3	0	1	1	2	1	0	1	2	1	1	1	3	10
5:15 PM	0	0	0	0	0	0	1	1	2	0	0	2	0	0	0	0	3
5:30 PM	1	0	0	1	0	0	3	3	4	0	1	5	0	0	0	0	9
5:45 PM	0	2	0	2	0	0	0	0	3	0	0	3	1	1	0	2	7
Total Survey	1	10	0	11	0	1	14	15	16	1	2	19	2	4	1	7	52

Heavy Vehicle Peak Hour Summary
4:50 PM to 5:50 PM

By Approach	Northbound SE 42nd Ave			Southbound SE 42nd Ave			Eastbound SE Harrison St			Westbound SE Harrison St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	7	4	11	6	15	21	11	8	19	4	1	5	28
PHF	0.58			0.50			0.55			0.33			0.70

By Movement	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	6	0	7	0	1	5	6	8	1	2	11	1	2	1	4	28
PHF	0.25	0.50	0.00	0.58	0.00	0.25	0.42	0.50	0.50	0.25	0.50	0.55	0.25	0.50	0.25	0.33	0.70

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

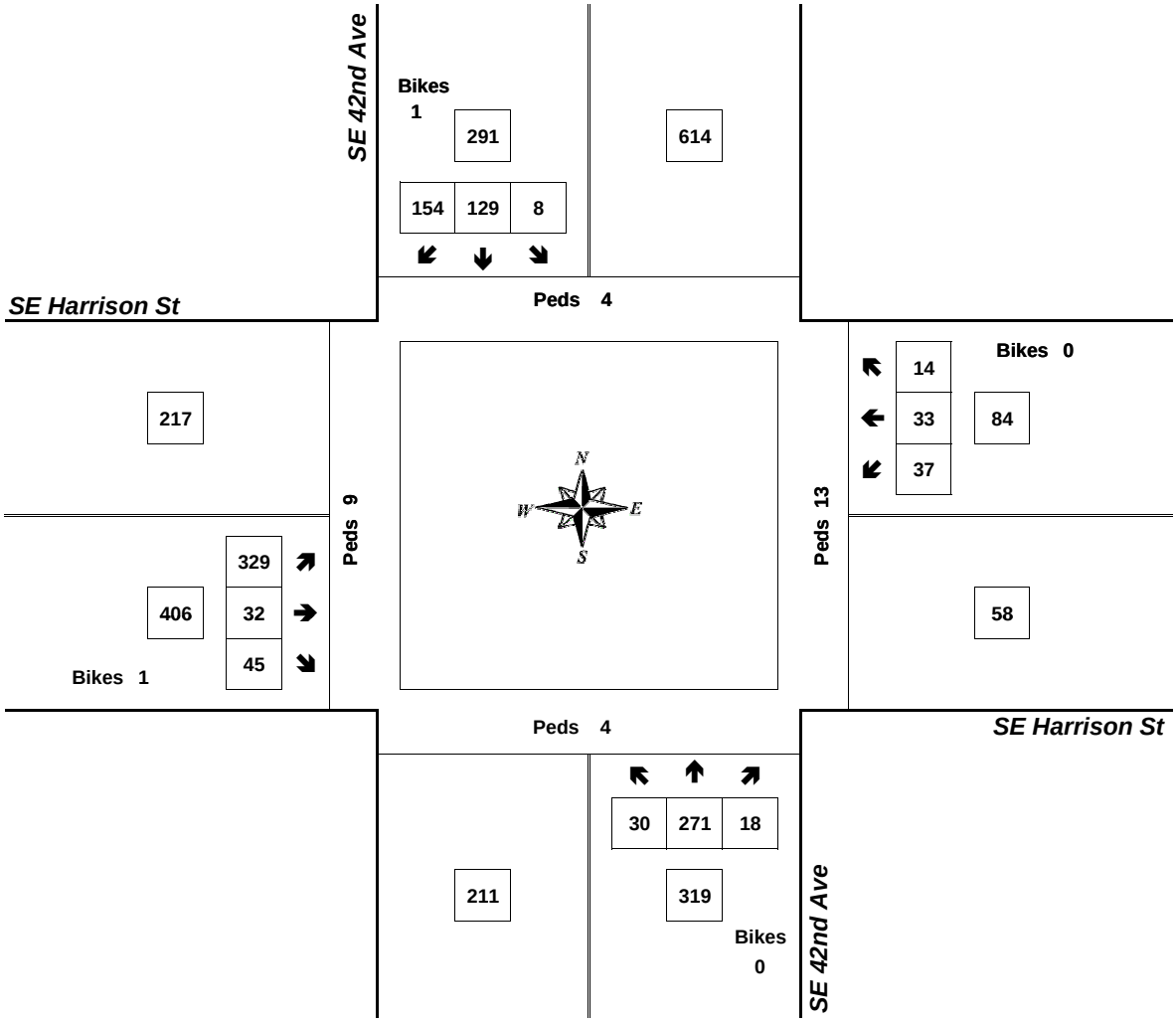
Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	5	0	5	0	0	9	9	6	1	0	7	0	2	0	2	23
4:15 PM	0	7	0	7	0	1	9	10	6	1	1	8	1	2	1	4	29
4:30 PM	0	5	0	5	0	1	6	7	5	1	1	7	1	2	1	4	23
4:45 PM	1	4	0	5	0	1	6	7	8	1	2	11	1	2	1	4	27
5:00 PM	1	5	0	6	0	1	5	6	10	0	2	12	2	2	1	5	29

Peak Hour Summary

Clay Carney
(503) 833-2740

SE 42nd Ave & SE Harrison St

4:50 PM to 5:50 PM
Tuesday, September 25, 2018

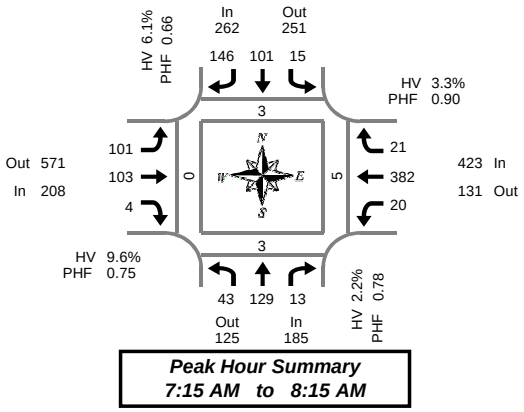


Approach	PHF	HV%	Volume
EB	0.90	2.7%	406
WB	0.88	4.8%	84
NB	0.92	2.2%	319
SB	0.90	2.1%	291
Intersection	0.96	2.5%	1,100

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



SE 32nd Ave & SE Harrison St

Tuesday, September 18, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:15 AM to 8:15 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	5	4	0	0	0	3	12	0	4	9	0	0	0	29	0	0	66	1	0	1	0
7:05 AM	3	11	0	0	0	4	6	1	7	7	0	0	1	33	4	0	76	0	0	0	0
7:10 AM	5	9	0	0	0	4	7	0	6	8	1	0	2	28	4	0	74	0	0	0	0
7:15 AM	2	12	0	1	0	5	10	2	5	19	0	0	0	28	3	1	84	0	0	0	0
7:20 AM	7	8	0	0	0	6	12	0	10	6	0	0	2	34	2	0	87	1	0	1	0
7:25 AM	4	9	1	0	3	4	13	0	4	8	0	1	1	44	4	0	95	0	0	0	0
7:30 AM	5	11	0	1	3	14	12	0	6	6	0	0	3	26	0	0	86	0	0	0	0
7:35 AM	2	10	0	0	0	14	19	0	3	11	0	0	0	29	1	0	89	0	0	0	0
7:40 AM	2	14	1	0	0	18	19	0	7	4	1	0	0	34	2	0	102	0	0	0	0
7:45 AM	3	9	3	0	1	6	7	0	11	8	1	0	4	37	0	0	90	0	1	1	0
7:50 AM	5	12	3	0	1	10	13	0	4	4	0	0	3	26	1	0	82	0	0	0	0
7:55 AM	3	19	2	0	4	7	4	0	14	7	0	0	1	33	4	0	98	1	1	1	0
8:00 AM	3	10	2	0	1	10	9	0	15	3	0	0	3	32	3	0	91	0	0	1	0
8:05 AM	2	6	1	0	2	4	16	0	10	16	0	1	2	31	0	0	90	1	1	1	0
8:10 AM	5	9	0	0	0	3	12	0	12	11	2	0	1	28	1	0	84	0	0	0	0
8:15 AM	3	4	1	0	1	7	7	0	12	8	0	0	3	17	0	0	63	0	4	0	2
8:20 AM	3	8	3	0	1	5	12	0	10	9	0	0	0	32	1	0	84	0	0	1	0
8:25 AM	3	8	3	0	2	9	10	0	20	14	0	1	0	23	3	0	95	0	1	0	0
8:30 AM	1	7	1	0	0	4	10	0	14	11	0	0	1	18	0	2	67	0	0	1	0
8:35 AM	3	15	1	0	0	13	8	0	11	12	0	0	2	20	2	0	87	0	0	0	1
8:40 AM	4	8	0	0	1	6	12	0	6	10	1	0	1	28	0	0	77	0	0	0	0
8:45 AM	3	9	2	0	2	3	5	0	11	11	0	1	2	18	5	0	71	0	1	0	0
8:50 AM	0	7	2	0	1	13	14	0	6	9	0	0	3	20	0	0	75	1	1	0	0
8:55 AM	1	2	2	0	1	11	10	0	10	28	0	0	3	22	3	0	93	1	0	1	0
Total Survey	77	221	28	2	24	183	259	3	218	239	6	4	38	670	43	3	2,006	6	10	9	3

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	13	24	0	0	0	11	25	1	17	24	1	0	3	90	8	0	216	1	0	1	0
7:15 AM	13	29	1	1	3	15	35	2	19	33	0	1	3	106	9	1	266	1	0	1	0
7:30 AM	9	35	1	1	3	46	50	0	16	21	1	0	3	89	3	0	277	0	0	0	0
7:45 AM	11	40	8	0	6	23	24	0	29	19	1	0	8	96	5	0	270	1	2	2	0
8:00 AM	10	25	3	0	3	17	37	0	37	30	2	1	6	91	4	0	265	1	1	2	0
8:15 AM	9	20	7	0	4	21	29	0	42	31	0	1	3	72	4	0	242	0	5	1	2
8:30 AM	8	30	2	0	1	23	30	0	31	33	1	0	4	66	2	2	231	0	0	1	1
8:45 AM	4	18	6	0	4	27	29	0	27	48	0	1	8	60	8	0	239	2	2	1	0
Total Survey	77	221	28	2	24	183	259	3	218	239	6	4	38	670	43	3	2,006	6	10	9	3

Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	185	125	310	2	262	251	513	2	208	571	779	2	423	131	554	1	1,078	3	3	5	0
%HV	2.2%				6.1%				9.6%				3.3%				5.0%				
PHF	0.78				0.66				0.75				0.90				0.96				

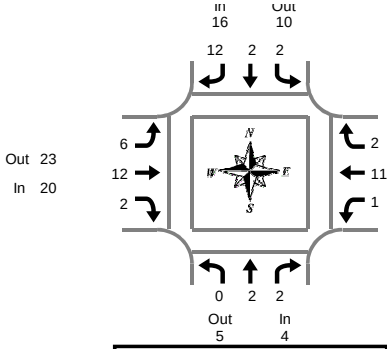
By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	43	129	13	185	15	101	146	262	101	103	4	208	20	382	21	423	1,078
%HV	0.0%	1.6%	15.4%	2.2%	13.3%	2.0%	8.2%	6.1%	5.9%	11.7%	50.0%	9.6%	5.0%	2.9%	9.5%	3.3%	5.0%
PHF	0.67	0.79	0.41	0.78	0.54	0.55	0.73	0.66	0.65	0.78	0.50	0.75	0.63	0.90	0.58	0.90	0.96

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	46	128	10	2	12	95	134	3	81	97	3	1	17	381	25	1	1,029	3	2	4	0
7:15 AM	43	129	13	2	15	101	146	2	101	103	4	2	20	382	21	1	1,078	3	3	5	0
7:30 AM	39	120	19	1	16	107	140	0	124	101	4	2	20	348	16	0	1,054	2	8	5	2
7:45 AM	38	115	20	0	14	84	120	0	139	113	4	2	21	325	15	2	1,008	2	8	6	3
8:00 AM	31	93	18	0	12	88	125	0	137	142	3	3	21	289	18	2	977	3	8	5	3

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SE 32nd Ave & SE Harrison St

Tuesday, September 18, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:15 AM to 8:15 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	2
7:05 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
7:10 AM	0	0	0	0	0	0	0	0	1	3	0	4	0	1	0	1	5
7:15 AM	0	0	0	0	0	1	0	1	1	3	0	4	0	0	1	1	6
7:20 AM	0	0	0	0	0	0	2	2	1	3	0	4	0	1	0	1	7
7:25 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	2	0	2	5
7:30 AM	0	0	0	0	1	0	1	2	0	1	0	1	0	1	0	1	4
7:35 AM	0	0	0	0	0	0	2	2	0	1	0	1	0	1	0	1	4
7:40 AM	0	0	0	0	0	0	0	0	1	0	1	2	0	1	0	1	3
7:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	2	3
7:50 AM	0	0	1	1	0	0	1	1	1	0	0	1	0	2	0	2	5
7:55 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	2
8:00 AM	0	1	1	2	0	0	2	2	0	0	0	0	0	2	0	2	6
8:05 AM	0	0	0	0	1	1	2	4	0	1	0	1	0	0	0	0	5
8:10 AM	0	0	0	0	0	0	2	2	1	0	1	2	0	0	0	0	4
8:15 AM	0	1	0	1	0	0	0	0	1	0	0	1	0	1	0	1	3
8:20 AM	0	0	1	1	0	0	0	0	0	1	0	1	0	1	1	2	4
8:25 AM	0	0	0	0	0	0	2	2	0	1	0	1	0	1	0	1	4
8:30 AM	0	0	0	0	0	1	1	2	2	1	0	3	0	1	0	1	6
8:35 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	1	0	1	3
8:40 AM	0	1	0	1	0	1	1	2	1	1	0	2	0	0	0	0	5
8:45 AM	0	0	0	0	1	0	0	1	1	1	0	2	0	4	0	4	7
8:50 AM	0	1	0	1	0	1	0	1	1	0	0	1	0	1	0	1	4
8:55 AM	0	0	0	0	0	0	1	1	1	1	0	2	0	0	0	0	3
Total Survey	0	6	3	9	3	5	18	26	15	23	2	40	1	23	3	27	102

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	1	1	2	4	0	6	0	2	0	2	9
7:15 AM	0	1	0	1	0	1	2	3	2	8	0	10	0	3	1	4	18
7:30 AM	0	0	0	0	1	0	3	4	1	2	1	4	0	3	0	3	11
7:45 AM	0	0	1	1	0	0	1	1	2	1	0	3	1	3	1	5	10
8:00 AM	0	1	1	2	1	1	6	8	1	1	1	3	0	2	0	2	15
8:15 AM	0	1	1	2	0	0	2	2	1	2	0	3	0	3	1	4	11
8:30 AM	0	2	0	2	0	2	2	4	3	3	0	6	0	2	0	2	14
8:45 AM	0	1	0	1	1	1	1	3	3	2	0	5	0	5	0	5	14
Total Survey	0	6	3	9	3	5	18	26	15	23	2	40	1	23	3	27	102

Heavy Vehicle Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound SE 32nd Ave			Southbound SE 32nd Ave			Eastbound SE Harrison St			Westbound SE Harrison St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	4	5	9	16	10	26	20	23	43	14	16	30	54
PHF	0.33			0.50			0.50			0.70			0.75

By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	2	2	4	2	2	12	16	6	12	2	20	1	11	2	14	54
PHF	0.00	0.50	0.25	0.33	0.50	0.50	0.50	0.50	0.75	0.38	0.50	0.50	0.25	0.69	0.50	0.70	0.75

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

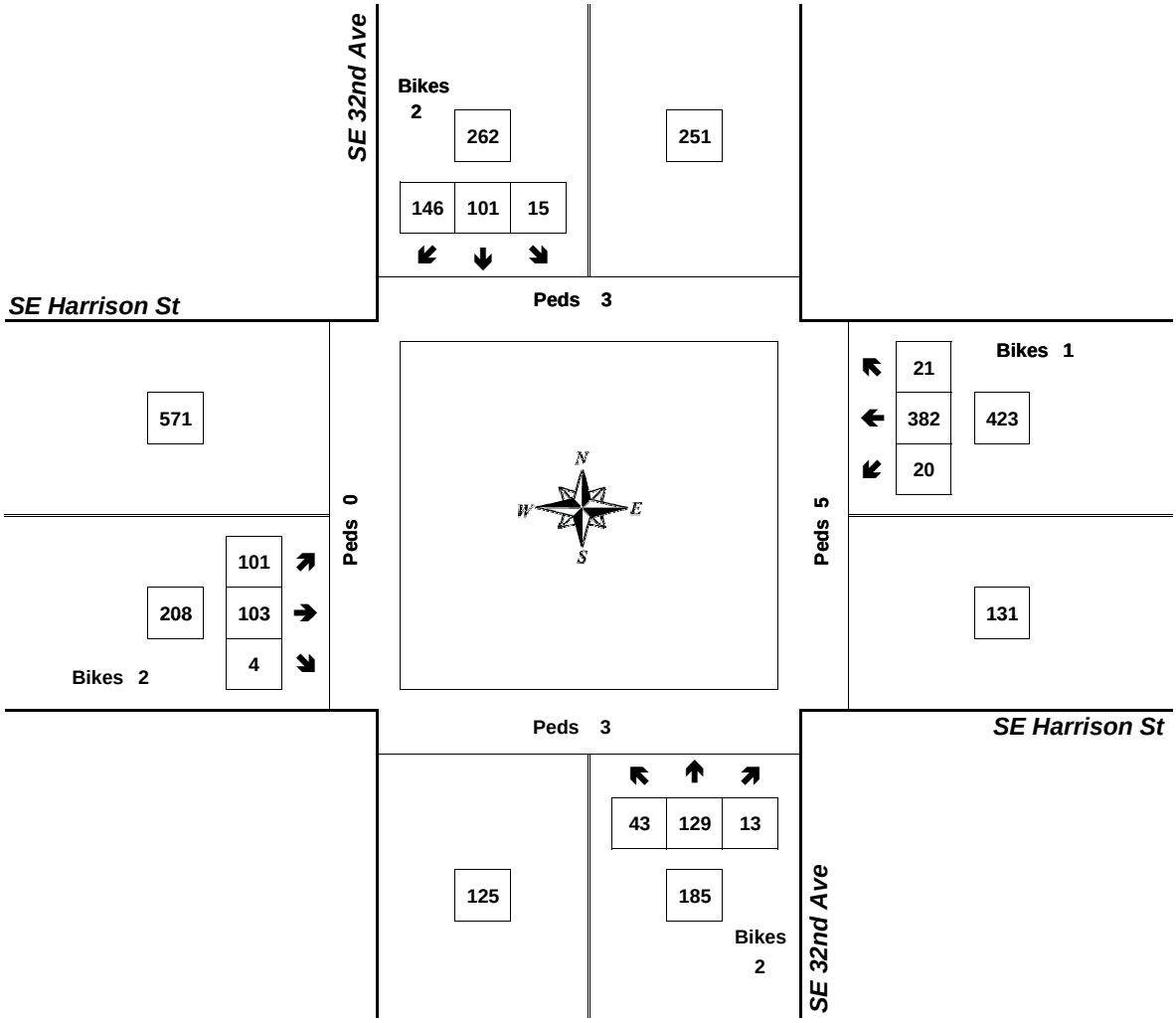
Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	1	1	2	1	1	7	9	7	15	1	23	1	11	2	14	48
7:15 AM	0	2	2	4	2	2	12	16	6	12	2	20	1	11	2	14	54
7:30 AM	0	2	3	5	2	1	12	15	5	6	2	13	1	11	2	14	47
7:45 AM	0	4	3	7	1	3	11	15	7	7	1	15	1	10	2	13	50
8:00 AM	0	5	2	7	2	4	11	17	8	8	1	17	0	12	1	13	54

Peak Hour Summary

Clay Carney
(503) 833-2740

SE 32nd Ave & SE Harrison St

7:15 AM to 8:15 AM
Tuesday, September 18, 2018

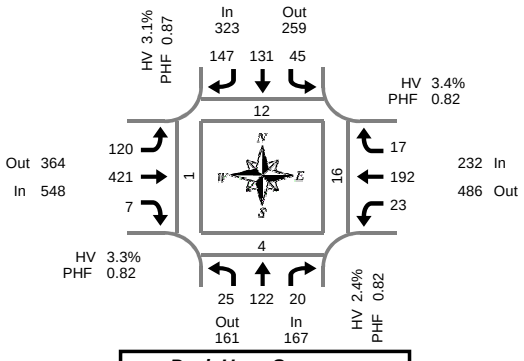


Approach	PHF	HV%	Volume
EB	0.75	9.6%	208
WB	0.90	3.3%	423
NB	0.78	2.2%	185
SB	0.66	6.1%	262
Intersection	0.96	5.0%	1,078

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data
Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

SE 32nd Ave & SE Harrison St

Tuesday, September 18, 2018
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	1	10	1	0	4	10	12	0	8	34	0	0	2	17	0	0	99	0	0	0	0
4:05 PM	1	11	6	1	1	13	10	0	10	37	0	0	2	17	0	0	108	2	0	3	0
4:10 PM	4	7	3	0	7	11	6	0	10	38	2	2	4	12	0	0	104	1	0	0	0
4:15 PM	1	10	4	0	6	12	9	0	7	30	0	0	2	20	1	0	102	0	0	2	1
4:20 PM	2	11	2	2	6	9	9	0	6	26	2	0	0	18	3	0	94	1	0	1	0
4:25 PM	3	3	1	0	8	10	9	0	6	17	0	0	5	15	3	0	80	0	0	3	0
4:30 PM	4	7	3	1	3	10	13	0	13	34	1	0	3	14	0	0	105	1	0	2	0
4:35 PM	3	11	3	0	3	8	15	0	10	44	0	0	1	19	4	0	121	6	0	4	0
4:40 PM	2	12	0	0	6	5	14	0	19	41	0	0	2	18	2	0	121	1	0	1	0
4:45 PM	1	15	4	0	4	12	15	0	7	32	2	0	1	22	2	0	117	2	1	2	0
4:50 PM	2	10	1	0	4	15	15	0	4	23	1	1	4	20	0	0	99	1	3	1	0
4:55 PM	4	10	0	0	2	12	14	0	10	38	0	0	2	18	1	0	111	0	0	2	0
5:00 PM	1	6	1	0	1	18	11	0	6	27	0	0	1	12	2	0	86	0	0	1	0
5:05 PM	1	7	0	0	4	14	14	1	5	20	0	1	1	12	2	0	80	0	0	0	0
5:10 PM	2	15	3	0	5	9	11	0	11	52	1	0	3	18	2	0	132	1	0	0	1
5:15 PM	3	10	2	1	5	13	9	0	9	36	1	0	1	14	2	0	105	0	0	3	0
5:20 PM	1	11	2	0	4	7	7	1	16	41	0	0	0	12	0	0	101	0	0	0	0
5:25 PM	1	8	1	0	4	8	9	1	10	33	1	1	4	13	0	1	92	0	0	0	0
5:30 PM	1	15	1	0	3	8	7	0	12	33	0	0	2	16	0	0	98	0	0	0	0
5:35 PM	5	8	1	0	6	11	10	0	5	24	1	1	2	14	1	0	88	0	0	0	0
5:40 PM	0	8	1	0	3	17	11	0	7	23	3	0	1	24	1	0	99	0	0	0	0
5:45 PM	0	5	0	0	1	5	13	0	5	26	0	0	1	15	1	0	72	2	1	4	1
5:50 PM	4	6	2	0	2	11	5	1	12	32	0	1	3	18	0	0	95	0	0	1	0
5:55 PM	4	5	0	1	2	13	10	0	8	30	1	0	1	18	2	0	94	3	0	1	0
Total Survey	51	221	42	6	94	261	258	4	216	771	16	7	48	396	29	1	2,403	21	5	31	3

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	6	28	10	1	12	34	28	0	28	109	2	2	8	46	0	0	311	3	0	3	0
4:15 PM	6	24	7	2	20	31	27	0	19	73	2	0	7	53	7	0	276	1	0	6	1
4:30 PM	9	30	6	1	12	23	42	0	42	119	1	0	6	51	6	0	347	8	0	7	0
4:45 PM	7	35	5	0	10	39	44	0	21	93	3	1	7	60	3	0	327	3	4	5	0
5:00 PM	4	28	4	0	10	41	36	1	22	99	1	1	5	42	6	0	298	1	0	1	1
5:15 PM	5	29	5	1	13	28	25	2	35	110	2	1	5	39	2	1	298	0	0	3	0
5:30 PM	6	31	3	0	12	36	28	0	24	80	4	1	5	54	2	0	285	0	0	0	0
5:45 PM	8	16	2	1	5	29	28	1	25	88	1	1	5	51	3	0	261	5	1	6	1
Total Survey	51	221	42	6	94	261	258	4	216	771	16	7	48	396	29	1	2,403	21	5	31	3

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	167	161	328	2	323	259	582	3	548	364	912	3	232	486	718	1	1,270
%HV	2.4%				3.1%				3.3%				3.4%				3.1%
PHF	0.82				0.87				0.82				0.82				0.88

Pedestrians Crosswalk			
North	South	East	West
12	4	16	1

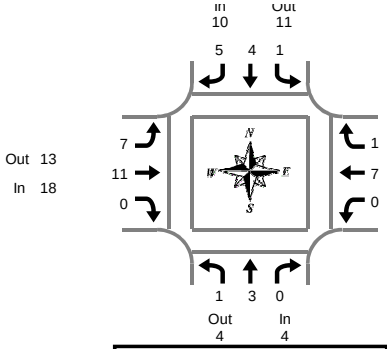
By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	25	122	20	167	45	131	147	323	120	421	7	548	23	192	17	232	1,270
%HV	4.0%	2.5%	0.0%	2.4%	2.2%	3.1%	3.4%	3.1%	5.8%	2.6%	0.0%	3.3%	0.0%	3.6%	5.9%	3.4%	3.1%
PHF	0.69	0.80	0.71	0.82	0.80	0.73	0.84	0.87	0.71	0.82	0.58	0.82	0.82	0.80	0.53	0.82	0.88

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	28	117	28	4	54	127	141	0	110	394	8	3	28	210	16	0	1,261	15	4	21	1
4:15 PM	26	117	22	3	52	134	149	1	104	384	7	2	25	206	22	0	1,248	13	4	19	2
4:30 PM	25	122	20	2	45	131	147	3	120	421	7	3	23	192	17	1	1,270	12	4	16	1
4:45 PM	22	123	17	1	45	144	133	3	102	382	10	4	22	195	13	1	1,208	4	4	9	1
5:00 PM	23	104	14	2	40	134	117	4	106	377	8	4	20	186	13	1	1,142	6	1	10	2

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SE 32nd Ave & SE Harrison St

Tuesday, September 18, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	1	1	0	2	0	2	0	2	4
4:05 PM	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	2
4:10 PM	0	0	0	0	0	0	2	2	0	3	0	3	0	0	0	0	5
4:15 PM	0	0	0	0	0	0	0	0	1	2	0	3	0	0	0	0	3
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	3	0	3	0	0	1	1	1	3	0	4	0	1	0	1	9
4:35 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
4:40 PM	0	0	0	0	0	0	1	1	0	1	0	1	0	1	1	2	4
4:45 PM	0	0	0	0	0	2	0	2	1	3	0	4	0	0	0	0	6
4:50 PM	1	0	0	1	0	0	1	1	0	2	0	2	0	1	0	1	5
4:55 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	1	1	0	2	0	1	0	1	3
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
5:10 PM	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	1	1	1	1	0	2	0	0	0	0	3
5:20 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	2
5:25 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
5:30 PM	0	0	0	0	0	0	1	1	1	1	0	2	0	1	0	1	4
5:35 PM	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	2
5:40 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
5:50 PM	0	0	0	0	0	0	1	1	1	0	0	1	0	1	0	1	3
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	3	0	4	1	4	11	16	12	21	0	33	0	13	1	14	67

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	3	3	1	5	0	6	0	2	0	2	11
4:15 PM	0	0	0	0	0	0	0	0	1	2	0	3	0	2	0	2	5
4:30 PM	0	3	0	3	0	1	2	3	1	4	0	5	0	3	1	4	15
4:45 PM	1	0	0	1	0	3	1	4	1	5	0	6	0	1	0	1	12
5:00 PM	0	0	0	0	1	0	1	2	1	1	0	2	0	2	0	2	6
5:15 PM	0	0	0	0	0	0	1	1	4	1	0	5	0	1	0	1	7
5:30 PM	0	0	0	0	0	0	2	2	1	3	0	4	0	1	0	1	7
5:45 PM	0	0	0	0	0	0	1	1	2	0	0	2	0	1	0	1	4
Total Survey	1	3	0	4	1	4	11	16	12	21	0	33	0	13	1	14	67

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SE 32nd Ave			Southbound SE 32nd Ave			Eastbound SE Harrison St			Westbound SE Harrison St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	4	4	8	10	11	21	18	13	31	8	12	20	40
PHF	0.33			0.63			0.64			0.50			0.67

By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	3	0	4	1	4	5	10	7	11	0	18	0	7	1	8	40
PHF	0.25	0.25	0.00	0.33	0.25	0.33	0.63	0.63	0.44	0.46	0.00	0.64	0.00	0.58	0.25	0.50	0.67

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

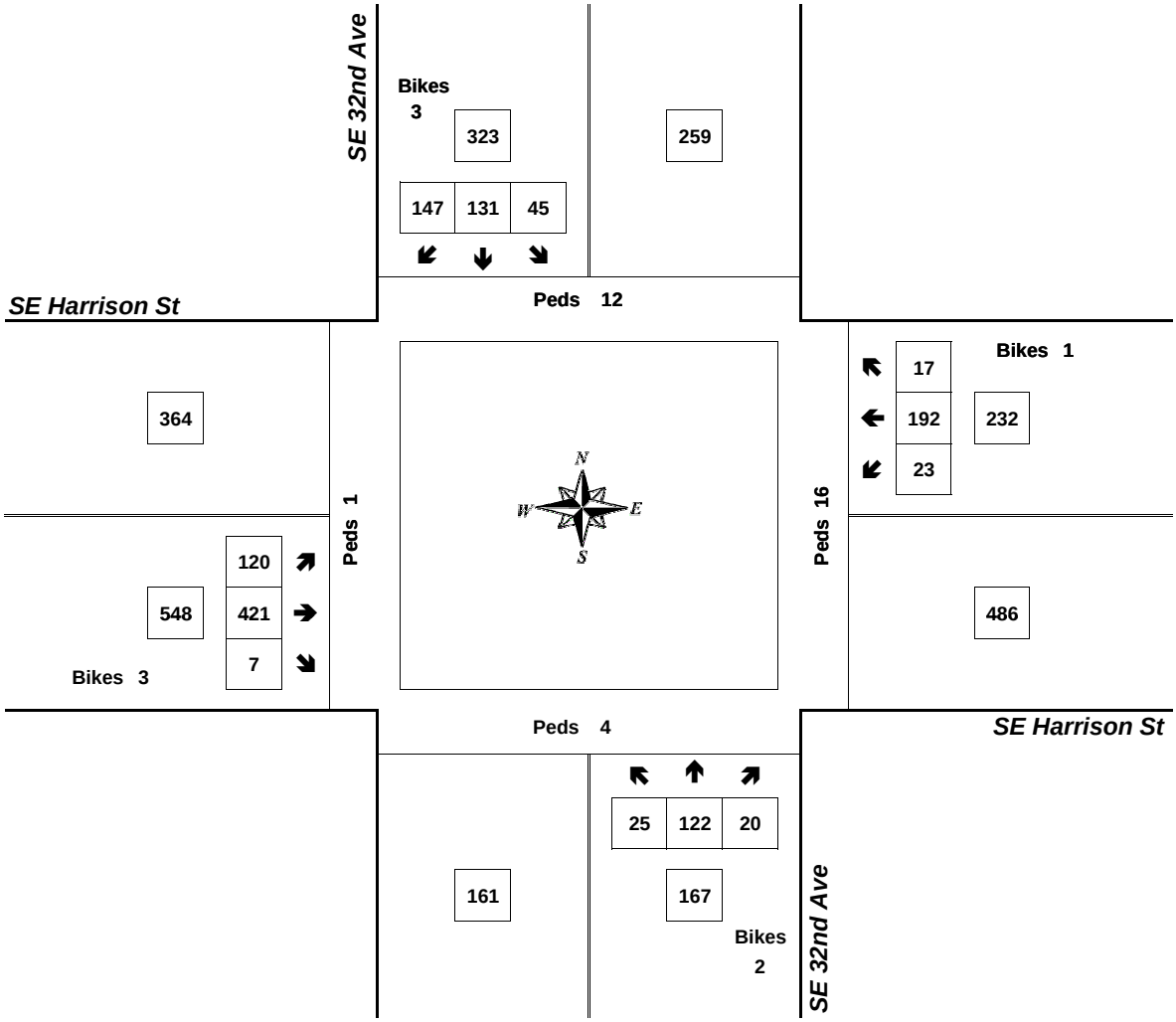
Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	1	3	0	4	0	4	6	10	4	16	0	20	0	8	1	9	43
4:15 PM	1	3	0	4	1	4	4	9	4	12	0	16	0	8	1	9	38
4:30 PM	1	3	0	4	1	4	5	10	7	11	0	18	0	7	1	8	40
4:45 PM	1	0	0	1	1	3	5	9	7	10	0	17	0	5	0	5	32
5:00 PM	0	0	0	0	1	0	5	6	8	5	0	13	0	5	0	5	24

Peak Hour Summary

Clay Carney
(503) 833-2740

SE 32nd Ave & SE Harrison St

4:30 PM to 5:30 PM
Tuesday, September 18, 2018

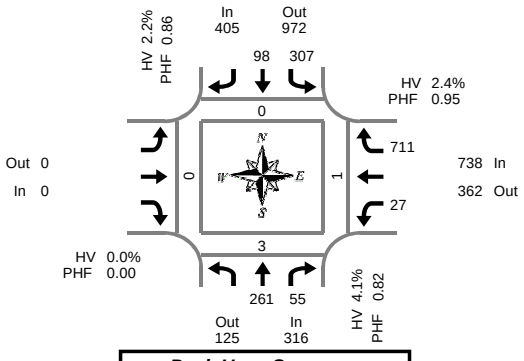


Approach	PHF	HV%	Volume
EB	0.82	3.3%	548
WB	0.82	3.4%	232
NB	0.82	2.4%	167
SB	0.87	3.1%	323
Intersection	0.88	3.1%	1,270

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



SE 32nd Ave & SE Johnson Creek Blvd

Tuesday, September 25, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
7:00 AM	17	2	0		27	10		0				0	4		57	0	117	0	0	0	0
7:05 AM	30	3	0		18	7		0				0	0		60	2	118	0	0	0	0
7:10 AM	21	3	0		27	8		0				0	0		70	0	129	0	1	0	0
7:15 AM	20	2	3		24	8		0				0	2		58	4	114	0	0	0	0
7:20 AM	24	1	1		23	5		1				0	0		64	2	117	0	2	0	0
7:25 AM	25	2	2		18	6		2				0	2		54	1	107	0	0	1	0
7:30 AM	23	8	1		25	10		1				0	3		62	0	131	0	0	0	0
7:35 AM	20	4	1		32	8		1				0	2		63	1	129	0	0	0	0
7:40 AM	31	10	4		28	8		0				0	0		56	2	133	0	0	0	0
7:45 AM	17	10	2		31	11		0				0	8		45	3	122	0	0	0	0
7:50 AM	20	3	2		32	8		1				0	3		62	0	128	0	0	0	0
7:55 AM	13	7	0		22	9		0				0	3		60	5	114	0	0	0	0
8:00 AM	18	4	0		30	6		1				0	2		55	0	115	0	0	0	0
8:05 AM	18	3	2		17	7		1				0	2		42	1	89	0	0	0	0
8:10 AM	22	2	0		35	11		1				0	2		54	1	126	0	1	0	0
8:15 AM	16	3	1		20	7		0				0	4		44	0	94	0	0	0	0
8:20 AM	14	0	1		32	6		1				0	6		52	2	110	0	0	0	0
8:25 AM	20	1	3		22	8		0				0	4		59	0	114	0	1	2	0
8:30 AM	10	2	1		24	6		0				0	2		52	1	96	0	0	0	0
8:35 AM	10	4	0		38	5		0				0	2		43	2	102	0	1	1	0
8:40 AM	13	6	0		34	4		0				0	1		54	2	112	0	0	0	0
8:45 AM	10	3	0		21	4		1				0	2		35	1	75	3	0	0	0
8:50 AM	13	3	1		25	4		1				0	5		53	1	103	0	0	0	0
8:55 AM	15	6	0		18	10		0				0	3		38	3	90	0	1	0	0
Total Survey	440	92	25		623	176		12				0	62		1,292	34	2,685	3	7	4	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
7:00 AM	68	8	0		72	25		0				0	4		187	2	364	0	1	0	0
7:15 AM	69	5	6		65	19		3				0	4		176	7	338	0	2	1	0
7:30 AM	74	22	6		85	26		2				0	5		181	3	393	0	0	0	0
7:45 AM	50	20	4		85	28		1				0	14		167	8	364	0	0	0	0
8:00 AM	58	9	2		82	24		3				0	6		151	2	330	0	1	0	0
8:15 AM	50	4	5		74	21		1				0	14		155	2	318	0	1	2	0
8:30 AM	33	12	1		96	15		0				0	5		149	5	310	0	1	1	0
8:45 AM	38	12	1		64	18		2				0	10		126	5	268	3	1	0	0
Total Survey	440	92	25		623	176		12				0	62		1,292	34	2,685	3	7	4	0

Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	316	125	441	16	405	972	1,377	6	0	0	0	0	738	362	1,100	20	1,459	0	3	1	0
%HV	4.1%				2.2%				0.0%				2.4%				2.7%				
PHF	0.82				0.86				0.00				0.95				0.93				

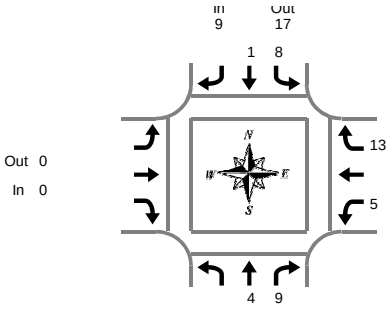
By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Total
	T	R	Total		L	T		Total				Total	L		R	Total	
Volume	261	55	316		307	98		405				0	27		711	738	1,459
%HV	NA	1.5%	16.4%	4.1%	2.6%	1.0%	NA	2.2%	NA	NA	NA	0.0%	18.5%	NA	1.8%	2.4%	2.7%
PHF		0.88	0.57	0.82	0.84	0.88		0.86				0.00	0.48		0.93	0.95	0.93

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
7:00 AM	261	55	16		307	98		6				0	27		711	20	1,459	0	3	1	0
7:15 AM	251	56	18		317	97		9				0	29		675	20	1,425	0	3	1	0
7:30 AM	232	55	17		326	99		7				0	39		654	15	1,405	0	2	2	0
7:45 AM	191	45	12		337	88		5				0	39		622	17	1,322	0	3	3	0
8:00 AM	179	37	9		316	78		6				0	35		581	14	1,226	3	4	3	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SE 32nd Ave & SE Johnson Creek Blvd

Tuesday, September 25, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total
	T	R	Total		L	T		Total				Total	L		R	Total	
7:00 AM	0	1	1		0	1		1				0	1		2	3	5
7:05 AM	0	1	1		0	0		0				0	0		0	0	1
7:10 AM	0	0	0		1	0		1				0	0		1	1	2
7:15 AM	0	1	1		2	0		2				0	1		1	2	5
7:20 AM	0	0	0		0	0		0				0	0		2	2	2
7:25 AM	1	1	2		1	0		1				0	0		1	1	4
7:30 AM	0	0	0		0	0		0				0	1		1	2	2
7:35 AM	0	1	1		2	0		2				0	0		1	1	4
7:40 AM	1	0	1		0	0		0				0	0		0	0	1
7:45 AM	0	2	2		1	0		1				0	1		0	1	4
7:50 AM	1	0	1		0	0		0				0	0		2	2	3
7:55 AM	1	2	3		1	0		1				0	1		2	3	7
8:00 AM	0	0	0		0	0		0				0	0		3	3	3
8:05 AM	1	0	1		1	0		1				0	0		0	0	2
8:10 AM	0	0	0		2	0		2				0	2		3	5	7
8:15 AM	0	1	1		2	0		2				0	0		1	1	4
8:20 AM	0	0	0		1	0		1				0	1		0	1	2
8:25 AM	0	0	0		4	0		4				0	0		2	2	6
8:30 AM	0	1	1		1	0		1				0	0		1	1	3
8:35 AM	0	0	0		1	0		1				0	2		2	4	5
8:40 AM	2	0	2		1	0		1				0	0		0	0	3
8:45 AM	0	0	0		1	0		1				0	0		2	2	3
8:50 AM	0	0	0		3	0		3				0	1		5	6	9
8:55 AM	0	1	1		1	1		2				0	1		2	3	6
Total Survey	7	12	19		26	2		28				0	12		34	46	93

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total
	T	R	Total		L	T		Total				Total	L		R	Total	
7:00 AM	0	2	2		1	1		2				0	1		3	4	8
7:15 AM	1	2	3		3	0		3				0	1		4	5	11
7:30 AM	1	1	2		2	0		2				0	1		2	3	7
7:45 AM	2	4	6		2	0		2				0	2		4	6	14
8:00 AM	1	0	1		3	0		3				0	2		6	8	12
8:15 AM	0	1	1		7	0		7				0	1		3	4	12
8:30 AM	2	1	3		3	0		3				0	2		3	5	11
8:45 AM	0	1	1		5	1		6				0	2		9	11	18
Total Survey	7	12	19		26	2		28				0	12		34	46	93

Heavy Vehicle Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound SE 32nd Ave			Southbound SE 32nd Ave			Eastbound SE Johnson Creek Blvd			Westbound SE Johnson Creek Blvd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	13	6	19	9	17	26	0	0	0	18	17	35	40
PHF	0.54			0.75			0.00			0.75			0.71

By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Total
	T	R	Total		L	T		Total				Total	L		R	Total	
Volume	4	9	13		8	1		9				0	5		13	18	40
PHF	0.50	0.56	0.54		0.67	0.25		0.75				0.00	0.63		0.81	0.75	0.71

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

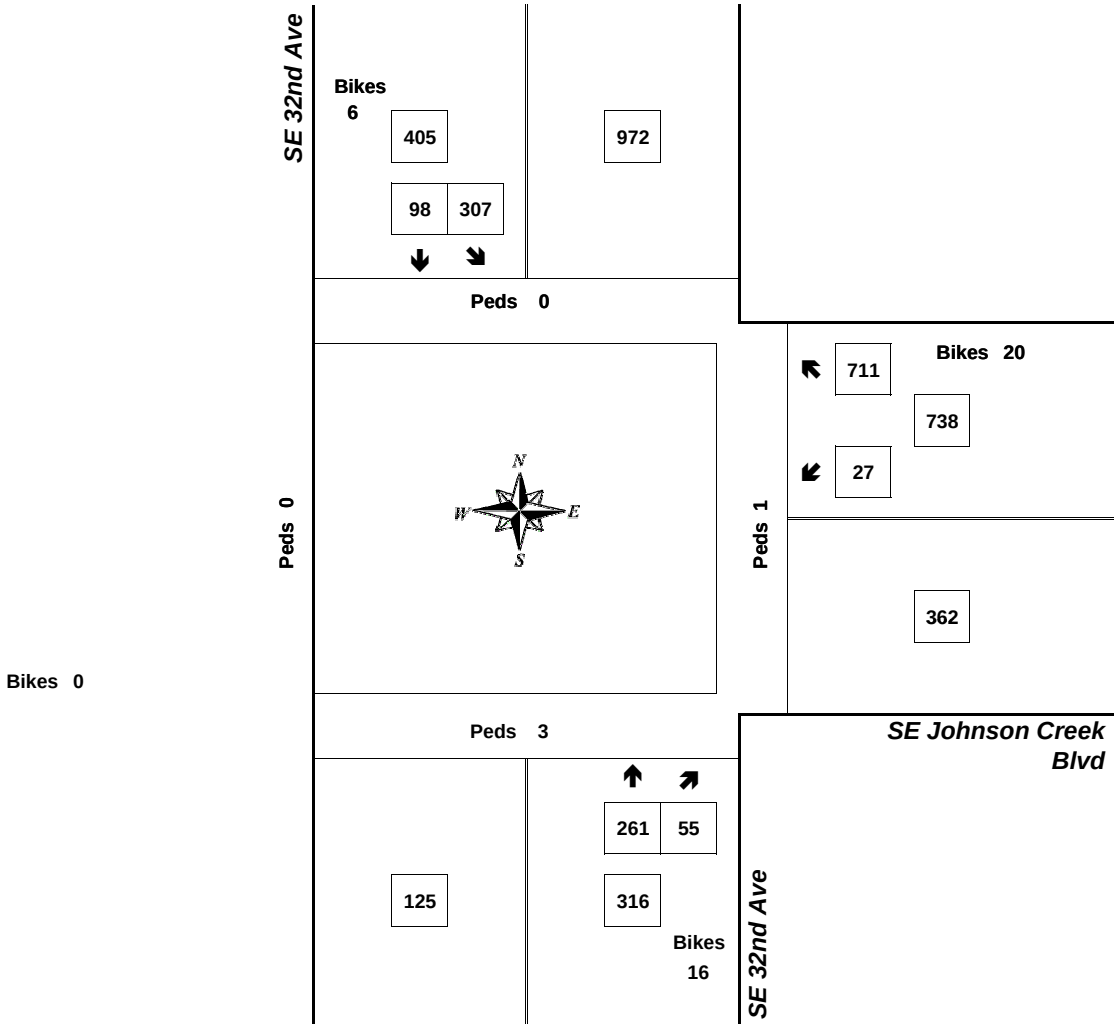
Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total
	T	R	Total		L	T		Total				Total	L		R	Total	
7:00 AM	4	9	13		8	1		9				0	5		13	18	40
7:15 AM	5	7	12		10	0		10				0	6		16	22	44
7:30 AM	4	6	10		14	0		14				0	6		15	21	45
7:45 AM	5	6	11		15	0		15				0	7		16	23	49
8:00 AM	3	3	6		18	1		19				0	7		21	28	53

Peak Hour Summary

Clay Carney
(503) 833-2740

SE 32nd Ave & SE Johnson Creek Blvd

7:00 AM to 8:00 AM
Tuesday, September 25, 2018

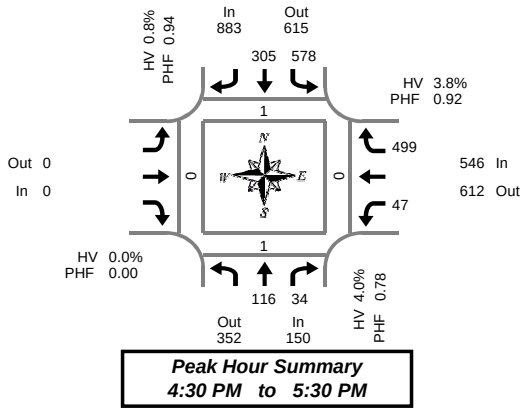


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.95	2.4%	738
NB	0.82	4.1%	316
SB	0.86	2.2%	405
Intersection	0.93	2.7%	1,459

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

Clay Carney
(503) 833-2740



SE 32nd Ave & SE Johnson Creek Blvd

Tuesday, September 25, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM	8	4	0		37	27		0				0	8		35	0	119	0	0	0	0
4:05 PM	5	5	0		33	18		1				0	9		34	0	104	0	1	0	0
4:10 PM	12	4	0		60	32		0				0	2		35	0	145	0	0	0	0
4:15 PM	3	2	0		47	26		2				0	4		38	0	120	0	1	0	0
4:20 PM	11	6	0		38	26		1				0	5		36	0	122	0	0	0	0
4:25 PM	9	3	0		40	29		0				0	5		33	2	119	0	0	1	0
4:30 PM	4	2	0		48	28		5				0	3		36	0	121	0	0	0	0
4:35 PM	15	4	0		39	25		0				0	5		33	0	121	0	0	0	0
4:40 PM	7	1	0		49	24		3				0	3		43	0	127	1	0	0	0
4:45 PM	9	1	0		54	26		0				0	2		48	0	140	0	0	0	0
4:50 PM	9	3	0		54	25		4				0	4		40	1	135	0	0	0	0
4:55 PM	10	2	0		49	22		0				0	6		42	3	131	0	0	0	0
5:00 PM	8	3	0		53	25		1				0	5		37	3	131	0	0	0	0
5:05 PM	12	3	0		55	31		1				0	3		40	0	144	0	0	0	0
5:10 PM	7	4	2		47	22		0				0	4		43	3	127	0	0	0	0
5:15 PM	18	4	0		43	31		3				0	2		46	0	144	0	0	0	0
5:20 PM	10	5	0		41	27		3				0	5		41	1	129	0	0	0	0
5:25 PM	7	2	0		46	19		3				0	5		50	1	129	0	1	0	0
5:30 PM	12	1	1		38	20		1				0	2		37	0	110	0	0	0	0
5:35 PM	10	2	0		43	18		3				0	0		38	0	111	1	0	0	0
5:40 PM	13	3	0		32	32		0				0	2		49	3	131	0	0	0	0
5:45 PM	6	3	0		48	21		0				0	4		42	1	124	0	3	0	0
5:50 PM	12	4	0		48	24		5				0	3		44	1	135	0	0	0	0
5:55 PM	8	5	0		40	30		2				0	6		31	0	120	0	0	1	0
Total Survey	225	76	3		1,082	608		38				0	97		951	19	3,039	2	6	2	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM	25	13	0		130	77		1				0	19		104	0	368	0	1	0	0
4:15 PM	23	11	0		125	81		3				0	14		107	2	361	0	1	1	0
4:30 PM	26	7	0		136	77		8				0	11		112	0	369	1	0	0	0
4:45 PM	28	6	0		157	73		4				0	12		130	4	406	0	0	0	0
5:00 PM	27	10	2		155	78		2				0	12		120	6	402	0	0	0	0
5:15 PM	35	11	0		130	77		9				0	12		137	2	402	0	1	0	0
5:30 PM	35	6	1		113	70		4				0	4		124	3	352	1	0	0	0
5:45 PM	26	12	0		136	75		7				0	13		117	2	379	0	3	1	0
Total Survey	225	76	3		1,082	608		38				0	97		951	19	3,039	2	6	2	0

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	150	352	502	2	883	615	1,498	23	0	0	0	0	546	612	1,158	12	1,579	1	1	0	0
%HV	4.0%				0.8%				0.0%				3.8%				2.2%				
PHF	0.78				0.94				0.00				0.92				0.95				

By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Total
		T	R	Total	L	T		Total				Total	L		R	Total	
Volume		116	34	150	578	305		883				0	47		499	546	1,579
%HV	NA	1.7%	11.8%	4.0%	1.2%	0.0%	NA	0.8%	NA	NA	NA	0.0%	17.0%	NA	2.6%	3.8%	2.2%
PHF		0.78	0.65	0.78	0.92	0.91		0.94				0.00	0.78		0.91	0.92	0.95

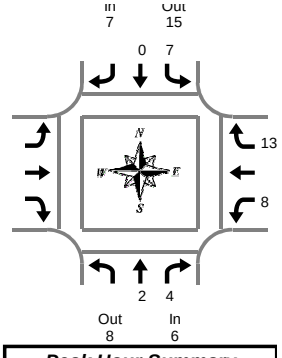
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM	102	37	0		548	308		16				0	56		453	6	1,504	1	2	1	0
4:15 PM	104	34	2		573	309		17				0	49		469	12	1,538	1	1	1	0
4:30 PM	116	34	2		578	305		23				0	47		499	12	1,579	1	1	0	0
4:45 PM	125	33	3		555	298		19				0	40		511	15	1,562	1	1	0	0
5:00 PM	123	39	3		534	300		22				0	41		498	13	1,535	1	4	1	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740

Out 0
In 0



SE 32nd Ave & SE Johnson Creek Blvd

Tuesday, September 25, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total
	T	R	Total		L	T		Total				Total	L		R	Total	
4:00 PM	0	0	0		4	1		5				0	1		1	2	7
4:05 PM	0	1	1		2	0		2				0	1		0	1	4
4:10 PM	0	0	0		0	0		0				0	0		2	2	2
4:15 PM	0	0	0		0	0		0				0	0		0	0	0
4:20 PM	0	1	1		3	0		3				0	1		1	2	6
4:25 PM	0	0	0		0	0		0				0	0		2	2	2
4:30 PM	0	0	0		2	0		2				0	1		1	2	4
4:35 PM	0	1	1		0	0		0				0	1		2	3	4
4:40 PM	0	0	0		0	0		0				0	0		0	0	0
4:45 PM	0	0	0		0	0		0				0	1		3	4	4
4:50 PM	1	1	2		2	0		2				0	0		2	2	6
4:55 PM	0	0	0		1	0		1				0	0		0	0	1
5:00 PM	0	0	0		1	0		1				0	1		1	2	3
5:05 PM	0	0	0		0	0		0				0	2		1	3	3
5:10 PM	0	0	0		1	0		1				0	1		1	2	3
5:15 PM	0	1	1		0	0		0				0	0		0	0	1
5:20 PM	1	1	2		0	0		0				0	0		2	2	4
5:25 PM	0	0	0		0	0		0				0	1		0	1	1
5:30 PM	0	0	0		0	0		0				0	0		1	1	1
5:35 PM	0	1	1		1	0		1				0	0		2	2	4
5:40 PM	0	0	0		0	1		1				0	0		1	1	2
5:45 PM	0	0	0		2	0		2				0	0		1	1	3
5:50 PM	0	1	1		2	0		2				0	1		0	1	4
5:55 PM	0	0	0		0	0		0				0	0		1	1	1
Total Survey	2	8	10		21	2		23				0	12		25	37	70

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total
	T	R	Total		L	T		Total				Total	L		R	Total	
4:00 PM	0	1	1		6	1		7				0	2		3	5	13
4:15 PM	0	1	1		3	0		3				0	1		3	4	8
4:30 PM	0	1	1		2	0		2				0	2		3	5	8
4:45 PM	1	1	2		3	0		3				0	1		5	6	11
5:00 PM	0	0	0		2	0		2				0	4		3	7	9
5:15 PM	1	2	3		0	0		0				0	1		2	3	6
5:30 PM	0	1	1		1	1		2				0	0		4	4	7
5:45 PM	0	1	1		4	0		4				0	1		2	3	8
Total Survey	2	8	10		21	2		23				0	12		25	37	70

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SE 32nd Ave			Southbound SE 32nd Ave			Eastbound SE Johnson Creek Blvd			Westbound SE Johnson Creek Blvd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	6	8	14	7	15	22	0	0	0	21	11	32	34
PHF	0.50			0.44			0.00			0.75			0.77

By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Total
	T	R	Total		L	T		Total				Total	L		R	Total	
Volume	2	4	6		7	0		7				0	8		13	21	34
PHF	0.50	0.50	0.50		0.44	0.00		0.44				0.00	0.50		0.65	0.75	0.77

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

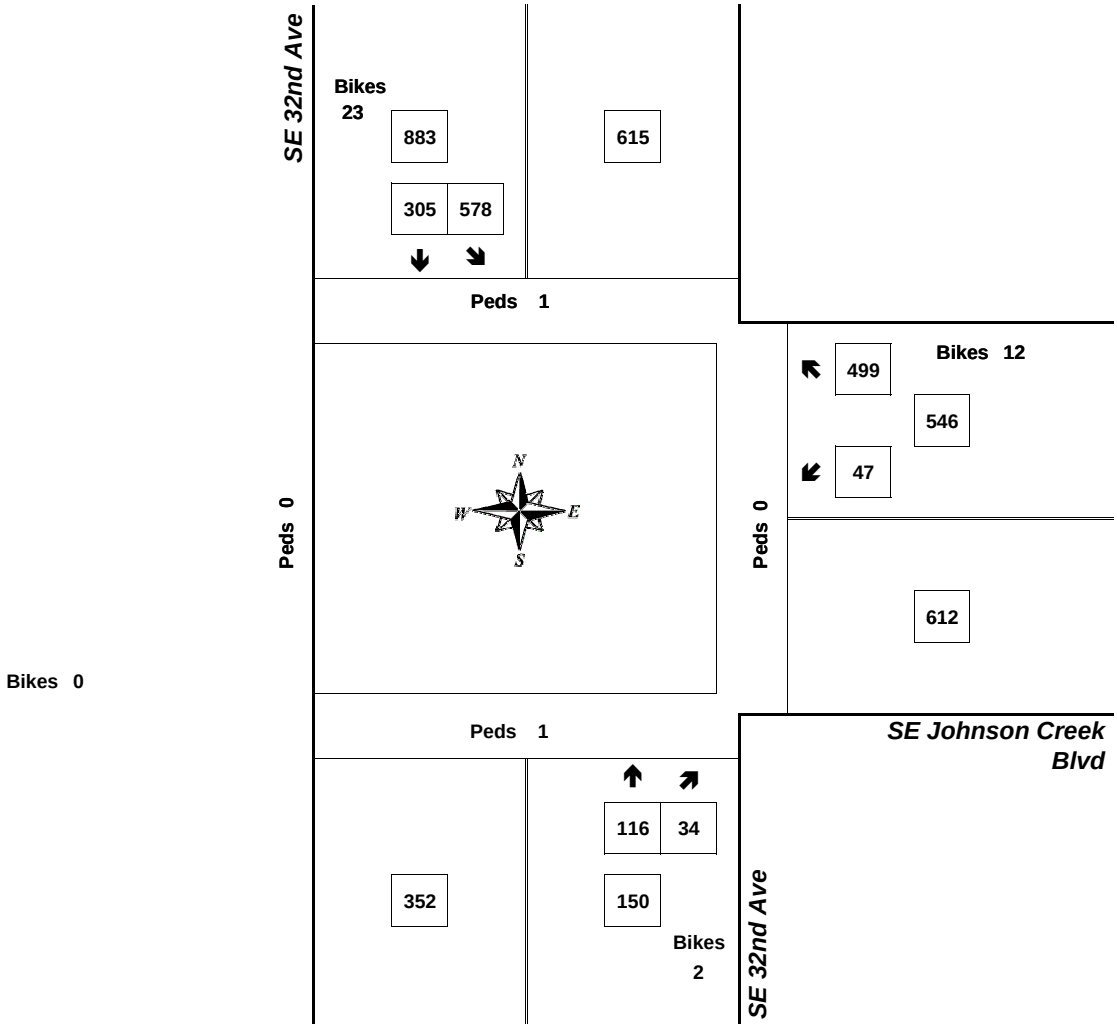
Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total
	T	R	Total		L	T		Total				Total	L		R	Total	
4:00 PM	1	4	5		14	1		15				0	6		14	20	40
4:15 PM	1	3	4		10	0		10				0	8		14	22	36
4:30 PM	2	4	6		7	0		7				0	8		13	21	34
4:45 PM	2	4	6		6	1		7				0	6		14	20	33
5:00 PM	1	4	5		7	1		8				0	6		11	17	30

Peak Hour Summary

Clay Carney
(503) 833-2740

SE 32nd Ave & SE Johnson Creek Blvd

4:30 PM to 5:30 PM
Tuesday, September 25, 2018

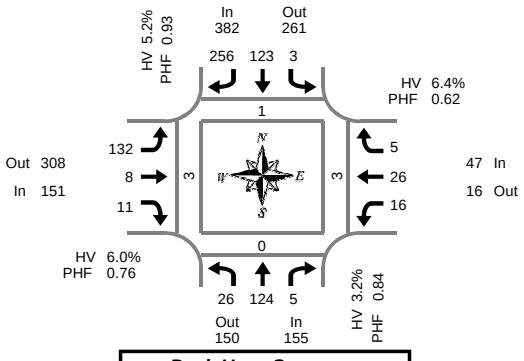


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.92	3.8%	546
NB	0.78	4.0%	150
SB	0.94	0.8%	883
Intersection	0.95	2.2%	1,579

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:25 AM to 8:25 AM

SE 42nd Ave & SE Harrison St

Tuesday, September 25, 2018
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	4	6	0	0	0	2	19	0	8	0	1	0	0	2	0	0	42	0	0	1	1
7:05 AM	3	5	0	0	0	6	21	0	12	3	1	1	0	1	0	0	52	0	0	0	0
7:10 AM	4	3	0	0	0	10	23	0	5	0	0	0	0	2	0	0	47	0	0	1	0
7:15 AM	3	7	2	0	0	5	23	0	4	1	1	0	0	4	1	0	51	0	0	1	2
7:20 AM	2	6	1	0	0	10	17	0	7	0	1	0	0	1	0	0	45	1	0	0	0
7:25 AM	6	7	0	0	0	10	18	0	9	0	0	0	1	2	0	0	53	0	0	0	0
7:30 AM	2	11	1	0	0	12	29	0	8	0	1	1	0	4	0	0	68	0	0	0	0
7:35 AM	3	12	0	0	0	7	20	0	12	0	1	0	1	0	0	0	56	0	0	1	0
7:40 AM	1	15	1	0	1	7	20	0	9	1	1	0	0	3	0	0	59	0	0	0	0
7:45 AM	1	12	0	0	1	2	23	0	11	1	1	0	5	6	0	0	63	0	0	0	0
7:50 AM	4	12	0	0	0	12	30	0	8	0	0	0	1	3	0	0	70	0	0	0	1
7:55 AM	2	4	2	0	1	9	18	0	10	2	0	0	0	2	2	0	52	0	0	0	0
8:00 AM	4	9	0	0	0	13	14	0	17	0	0	0	1	2	0	0	60	0	0	0	0
8:05 AM	2	11	0	0	0	15	17	0	13	1	3	0	1	1	1	0	65	0	0	0	1
8:10 AM	1	8	1	0	0	12	28	0	14	2	0	0	4	1	1	0	72	1	0	1	1
8:15 AM	0	14	0	0	0	17	14	0	11	1	1	0	1	0	1	0	60	0	0	1	0
8:20 AM	0	9	0	0	0	7	25	0	10	0	3	0	1	2	0	0	57	0	0	0	0
8:25 AM	2	6	0	0	0	3	18	0	8	0	4	0	1	2	0	0	44	0	0	0	0
8:30 AM	3	12	0	0	0	12	14	0	8	2	0	0	0	2	0	0	53	0	1	1	0
8:35 AM	3	11	3	0	0	7	11	0	5	2	0	0	0	2	0	0	44	1	0	1	0
8:40 AM	1	9	0	0	0	11	16	0	7	0	2	0	0	1	0	0	47	0	0	1	0
8:45 AM	2	4	0	0	1	10	9	0	6	0	0	0	1	0	0	0	33	0	0	1	0
8:50 AM	1	17	0	0	0	10	17	0	12	1	0	0	1	1	0	0	60	0	0	3	0
8:55 AM	0	7	1	0	0	11	10	0	12	1	3	0	0	2	0	0	47	0	0	1	0
Total Survey	54	217	12	0	4	220	454	0	226	18	24	2	19	46	6	0	1,300	3	1	14	6

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	11	14	0	0	0	18	63	0	25	3	2	1	0	5	0	0	141	0	0	2	1
7:15 AM	11	20	3	0	0	25	58	0	20	1	2	0	1	7	1	0	149	1	0	1	2
7:30 AM	6	38	2	0	1	26	69	0	29	1	3	1	1	7	0	0	183	0	0	1	0
7:45 AM	7	28	2	0	2	23	71	0	29	3	1	0	6	11	2	0	185	0	0	0	1
8:00 AM	7	28	1	0	0	40	59	0	44	3	3	0	6	4	2	0	197	1	0	1	2
8:15 AM	2	29	0	0	0	27	57	0	29	1	8	0	3	4	1	0	161	0	0	1	0
8:30 AM	7	32	3	0	0	30	41	0	20	4	2	0	0	5	0	0	144	1	1	3	0
8:45 AM	3	28	1	0	1	31	36	0	30	2	3	0	2	3	0	0	140	0	0	5	0
Total Survey	54	217	12	0	4	220	454	0	226	18	24	2	19	46	6	0	1,300	3	1	14	6

Peak Hour Summary
7:25 AM to 8:25 AM

By Approach	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	155	150	305	0	382	261	643	0	151	308	459	1	47	16	63	0	735	1	0	3	3
%HV	3.2%				5.2%				6.0%				6.4%				5.0%				
PHF	0.84				0.93				0.76				0.62				0.93				

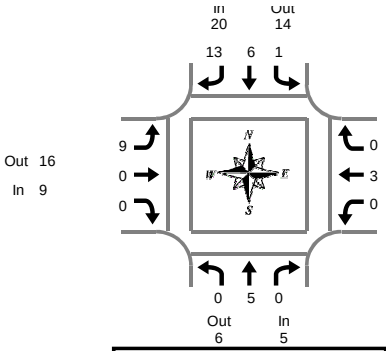
By Movement	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	26	124	5	155	3	123	256	382	132	8	11	151	16	26	5	47	735
%HV	0.0%	4.0%	0.0%	3.2%	33.3%	4.9%	5.1%	5.2%	6.8%	0.0%	0.0%	6.0%	0.0%	11.5%	0.0%	6.4%	5.0%
PHF	0.59	0.79	0.63	0.84	0.38	0.70	0.88	0.93	0.75	0.50	0.69	0.76	0.67	0.54	0.42	0.62	0.93

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	35	100	7	0	3	92	261	0	103	8	8	2	8	30	3	0	658	1	0	4	4
7:15 AM	31	114	8	0	3	114	257	0	122	8	9	1	14	29	5	0	714	2	0	3	5
7:30 AM	22	123	5	0	3	116	256	0	131	8	15	1	16	26	5	0	726	1	0	3	3
7:45 AM	23	117	6	0	2	120	228	0	122	11	14	0	15	24	5	0	687	2	1	5	3
8:00 AM	19	117	5	0	1	128	193	0	123	10	16	0	11	16	3	0	642	2	1	10	2

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



SE 42nd Ave & SE Harrison St

Tuesday, September 25, 2018
7:00 AM to 9:00 AM

Peak Hour Summary
7:25 AM to 8:25 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	2
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	0	0	0	0	0	2	2	1	0	0	1	0	0	0	0	3
7:15 AM	0	0	1	1	0	0	1	1	1	0	0	1	0	0	0	0	3
7:20 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
7:25 AM	0	0	0	0	0	2	2	4	1	0	0	1	0	0	0	0	5
7:30 AM	0	0	0	0	0	0	2	2	1	0	0	1	0	0	0	0	3
7:35 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
7:40 AM	0	2	0	2	1	0	0	1	2	0	0	2	0	0	0	0	5
7:45 AM	0	0	0	0	0	0	3	3	0	0	0	0	0	2	0	2	5
7:50 AM	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
7:55 AM	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	2
8:00 AM	0	2	0	2	0	1	0	1	2	0	0	2	0	0	0	0	5
8:05 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
8:10 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
8:15 AM	0	0	0	0	0	2	1	3	0	0	0	0	0	0	0	0	3
8:20 AM	0	0	0	0	0	0	2	2	1	0	0	1	0	1	0	1	4
8:25 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
8:35 AM	0	1	1	2	0	0	0	0	1	0	0	1	0	0	0	0	3
8:40 AM	0	1	0	1	0	0	0	0	1	0	1	2	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
8:50 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
8:55 AM	0	0	0	0	0	1	2	3	2	0	1	3	0	0	0	0	6
Total Survey	0	10	2	12	1	7	22	30	16	0	2	18	0	3	0	3	63

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	3	3	2	0	0	2	0	0	0	0	5
7:15 AM	0	0	1	1	0	2	4	6	2	0	0	2	0	0	0	0	9
7:30 AM	0	2	0	2	1	0	3	4	3	0	0	3	0	0	0	0	9
7:45 AM	0	1	0	1	0	1	5	6	0	0	0	0	0	2	0	2	9
8:00 AM	0	2	0	2	0	1	0	1	4	0	0	4	0	0	0	0	7
8:15 AM	0	1	0	1	0	2	3	5	1	0	0	1	0	1	0	1	8
8:30 AM	0	2	1	3	0	0	1	1	2	0	1	3	0	0	0	0	7
8:45 AM	0	2	0	2	0	1	3	4	2	0	1	3	0	0	0	0	9
Total Survey	0	10	2	12	1	7	22	30	16	0	2	18	0	3	0	3	63

Heavy Vehicle Peak Hour Summary
7:25 AM to 8:25 AM

By Approach	Northbound SE 42nd Ave			Southbound SE 42nd Ave			Eastbound SE Harrison St			Westbound SE Harrison St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	5	6	11	20	14	34	9	16	25	3	1	4	37
PHF	0.42			0.71			0.56			0.38			0.77

By Movement	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	5	0	5	1	6	13	20	9	0	0	9	0	3	0	3	37
PHF	0.00	0.42	0.00	0.42	0.25	0.75	0.65	0.71	0.56	0.00	0.00	0.56	0.00	0.38	0.00	0.38	0.77

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

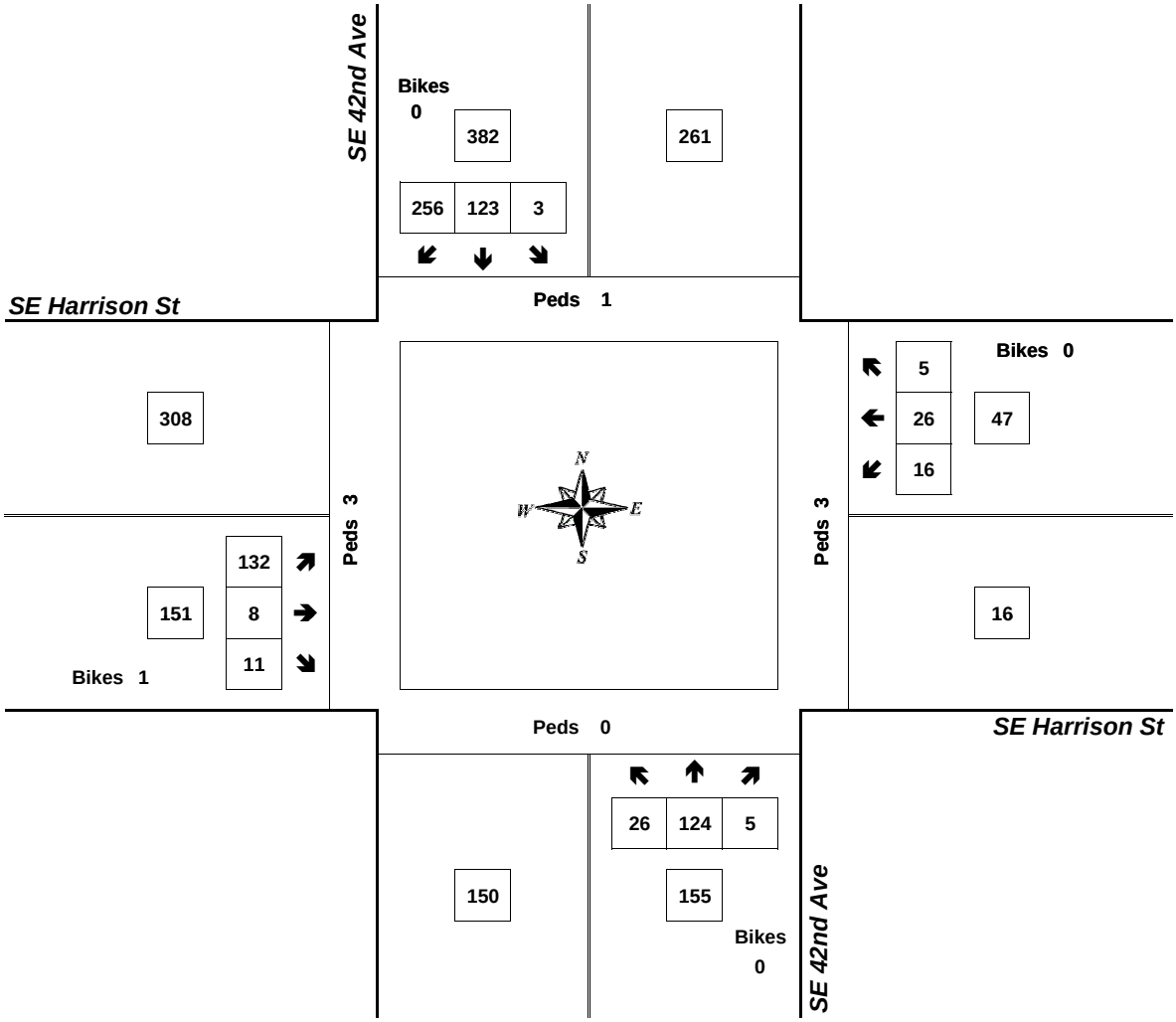
Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	3	1	4	1	3	15	19	7	0	0	7	0	2	0	2	32
7:15 AM	0	5	1	6	1	4	12	17	9	0	0	9	0	2	0	2	34
7:30 AM	0	6	0	6	1	4	11	16	8	0	0	8	0	3	0	3	33
7:45 AM	0	6	1	7	0	4	9	13	7	0	1	8	0	3	0	3	31
8:00 AM	0	7	1	8	0	4	7	11	9	0	2	11	0	1	0	1	31

Peak Hour Summary

Clay Carney
(503) 833-2740

SE 42nd Ave & SE Harrison St

7:25 AM to 8:25 AM
Tuesday, September 25, 2018

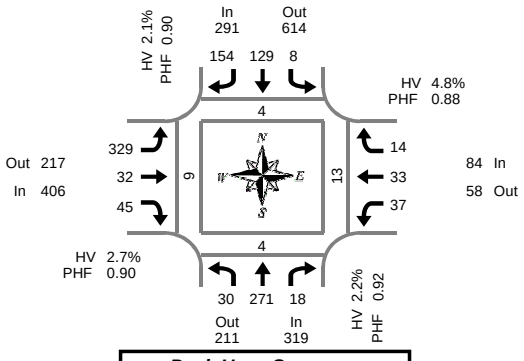


Approach	PHF	HV%	Volume
EB	0.76	6.0%	151
WB	0.62	6.4%	47
NB	0.84	3.2%	155
SB	0.93	5.2%	382
Intersection	0.93	5.0%	735

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:50 PM to 5:50 PM

SE 42nd Ave & SE Harrison St

Tuesday, September 25, 2018
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	2	26	0	0	0	8	9	0	21	1	1	0	0	3	2	0	73	0	0	2	3
4:05 PM	3	18	3	0	0	10	14	0	19	1	1	0	3	1	0	0	73	0	0	2	0
4:10 PM	4	28	1	0	0	7	12	0	19	1	3	0	0	6	1	0	82	0	0	1	0
4:15 PM	1	23	2	0	0	13	10	0	24	3	2	0	1	2	1	0	82	0	1	2	0
4:20 PM	2	20	1	0	0	9	5	0	23	3	6	0	3	1	0	0	73	0	0	0	0
4:25 PM	2	28	1	0	0	8	18	0	22	4	9	0	1	0	0	0	93	0	0	0	0
4:30 PM	3	18	1	0	0	8	9	0	21	3	2	0	2	4	1	0	72	1	0	0	0
4:35 PM	1	18	0	0	0	5	17	0	22	4	4	0	4	1	0	0	76	0	0	0	0
4:40 PM	1	24	3	0	0	8	11	0	26	1	3	0	0	2	0	0	79	1	0	0	0
4:45 PM	2	17	2	0	0	10	13	0	30	1	2	0	2	3	1	0	83	1	0	0	0
4:50 PM	1	27	2	0	0	16	11	0	25	3	1	0	1	3	1	0	91	0	0	0	0
4:55 PM	3	17	2	0	0	10	15	1	27	3	2	0	2	4	1	0	86	1	1	0	0
5:00 PM	0	20	3	0	1	13	15	0	30	0	3	0	2	3	3	0	93	0	0	1	3
5:05 PM	2	30	5	0	1	8	13	0	22	2	3	1	1	4	3	0	94	0	1	2	0
5:10 PM	5	20	0	0	0	7	12	0	36	5	6	0	3	4	0	0	98	0	0	0	2
5:15 PM	1	23	1	0	0	10	12	0	16	4	8	0	2	3	1	0	81	0	0	0	0
5:20 PM	5	21	2	0	2	10	13	0	31	1	3	0	7	2	2	0	99	1	1	1	2
5:25 PM	5	25	1	0	0	10	15	0	26	1	1	0	1	0	2	0	87	0	1	2	0
5:30 PM	1	22	0	0	2	11	14	0	30	3	6	0	4	4	0	0	97	0	0	2	2
5:35 PM	3	22	1	0	0	15	10	0	30	2	1	0	7	1	1	0	93	0	0	1	0
5:40 PM	4	20	1	0	0	7	12	0	30	5	6	0	2	4	0	0	91	1	0	2	0
5:45 PM	0	24	0	0	2	12	12	0	26	3	5	0	5	1	0	0	90	1	0	2	0
5:50 PM	4	10	1	0	1	13	17	0	23	5	2	0	4	4	0	0	84	0	0	1	1
5:55 PM	1	14	3	0	1	9	11	0	16	2	4	1	1	3	2	0	67	0	0	0	0
Total Survey	56	515	36	0	10	237	300	1	595	61	84	2	58	63	22	0	2,037	7	5	21	13

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	9	72	4	0	0	25	35	0	59	3	5	0	3	10	3	0	228	0	0	5	3
4:15 PM	5	71	4	0	0	30	33	0	69	10	17	0	5	3	1	0	248	0	1	2	0
4:30 PM	5	60	4	0	0	21	37	0	69	8	9	0	6	7	1	0	227	2	0	0	0
4:45 PM	6	61	6	0	0	36	39	1	82	7	5	0	5	10	3	0	260	2	1	0	0
5:00 PM	7	70	8	0	2	28	40	0	88	7	12	1	6	11	6	0	285	0	1	3	5
5:15 PM	11	69	4	0	2	30	40	0	73	6	12	0	10	5	5	0	267	1	2	3	2
5:30 PM	8	64	2	0	2	33	36	0	90	10	13	0	13	9	1	0	281	1	0	5	2
5:45 PM	5	48	4	0	4	34	40	0	65	10	11	1	10	8	2	0	241	1	0	3	1
Total Survey	56	515	36	0	10	237	300	1	595	61	84	2	58	63	22	0	2,037	7	5	21	13

Peak Hour Summary
4:50 PM to 5:50 PM

By Approach	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	319	211	530	0	291	614	905	1	406	217	623	1	84	58	142	0	1,100	4	4	13	9
%HV	2.2%				2.1%				2.7%				4.8%				2.5%				
PHF	0.92				0.90				0.90				0.88				0.96				

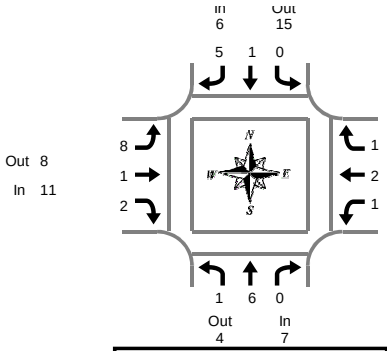
By Movement	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	30	271	18	319	8	129	154	291	329	32	45	406	37	33	14	84	1,100
%HV	3.3%	2.2%	0.0%	2.2%	0.0%	0.8%	3.2%	2.1%	2.4%	3.1%	4.4%	2.7%	2.7%	6.1%	7.1%	4.8%	2.5%
PHF	0.68	0.93	0.45	0.92	0.50	0.83	0.90	0.90	0.91	0.73	0.66	0.90	0.66	0.75	0.50	0.88	0.96

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	25	264	18	0	0	112	144	1	279	28	36	0	19	30	8	0	963	4	2	7	3
4:15 PM	23	262	22	0	2	115	149	1	308	32	43	1	22	31	11	0	1,020	4	3	5	5
4:30 PM	29	260	22	0	4	115	156	1	312	28	38	1	27	33	15	0	1,039	5	4	6	7
4:45 PM	32	264	20	0	6	127	155	1	333	30	42	1	34	35	15	0	1,093	4	4	11	9
5:00 PM	31	251	18	0	10	125	156	0	316	33	48	2	39	33	14	0	1,074	3	3	14	10

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



SE 42nd Ave & SE Harrison St

Tuesday, September 25, 2018
4:00 PM to 6:00 PM

Peak Hour Summary
4:50 PM to 5:50 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
4:05 PM	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	1	1	3	0	0	3	0	0	0	0	4
4:20 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
4:25 PM	0	2	0	2	0	0	2	2	0	0	0	0	0	0	0	0	4
4:30 PM	0	1	0	1	0	0	1	1	1	0	0	1	0	0	0	0	3
4:35 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
4:40 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	2
4:50 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	1	0	1	3
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	1	0	1	1	2	1	0	0	1	0	0	0	0	4
5:05 PM	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	3	4
5:10 PM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
5:20 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
5:25 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	2	2	3	0	0	3	0	0	0	0	5
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	1	0	0	1	0	0	1	1	1	0	1	2	0	0	0	0	4
5:45 PM	0	2	0	2	0	0	0	0	1	0	0	1	0	0	0	0	3
5:50 PM	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	2
5:55 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
Total Survey	1	10	0	11	0	1	14	15	16	1	2	19	2	4	1	7	52

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	0	1	0	0	1	1	1	0	0	1	0	1	0	1	4
4:15 PM	0	2	0	2	0	0	4	4	3	0	0	3	0	0	0	0	9
4:30 PM	0	1	0	1	0	0	3	3	1	0	0	1	0	0	0	0	5
4:45 PM	0	1	0	1	0	0	1	1	1	1	0	2	0	1	0	1	5
5:00 PM	0	3	0	3	0	1	1	2	1	0	1	2	1	1	1	3	10
5:15 PM	0	0	0	0	0	0	1	1	2	0	0	2	0	0	0	0	3
5:30 PM	1	0	0	1	0	0	3	3	4	0	1	5	0	0	0	0	9
5:45 PM	0	2	0	2	0	0	0	0	3	0	0	3	1	1	0	2	7
Total Survey	1	10	0	11	0	1	14	15	16	1	2	19	2	4	1	7	52

Heavy Vehicle Peak Hour Summary
4:50 PM to 5:50 PM

By Approach	Northbound SE 42nd Ave			Southbound SE 42nd Ave			Eastbound SE Harrison St			Westbound SE Harrison St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	7	4	11	6	15	21	11	8	19	4	1	5	28
PHF	0.58			0.50			0.55			0.33			0.70

By Movement	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	6	0	7	0	1	5	6	8	1	2	11	1	2	1	4	28
PHF	0.25	0.50	0.00	0.58	0.00	0.25	0.42	0.50	0.50	0.25	0.50	0.55	0.25	0.50	0.25	0.33	0.70

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

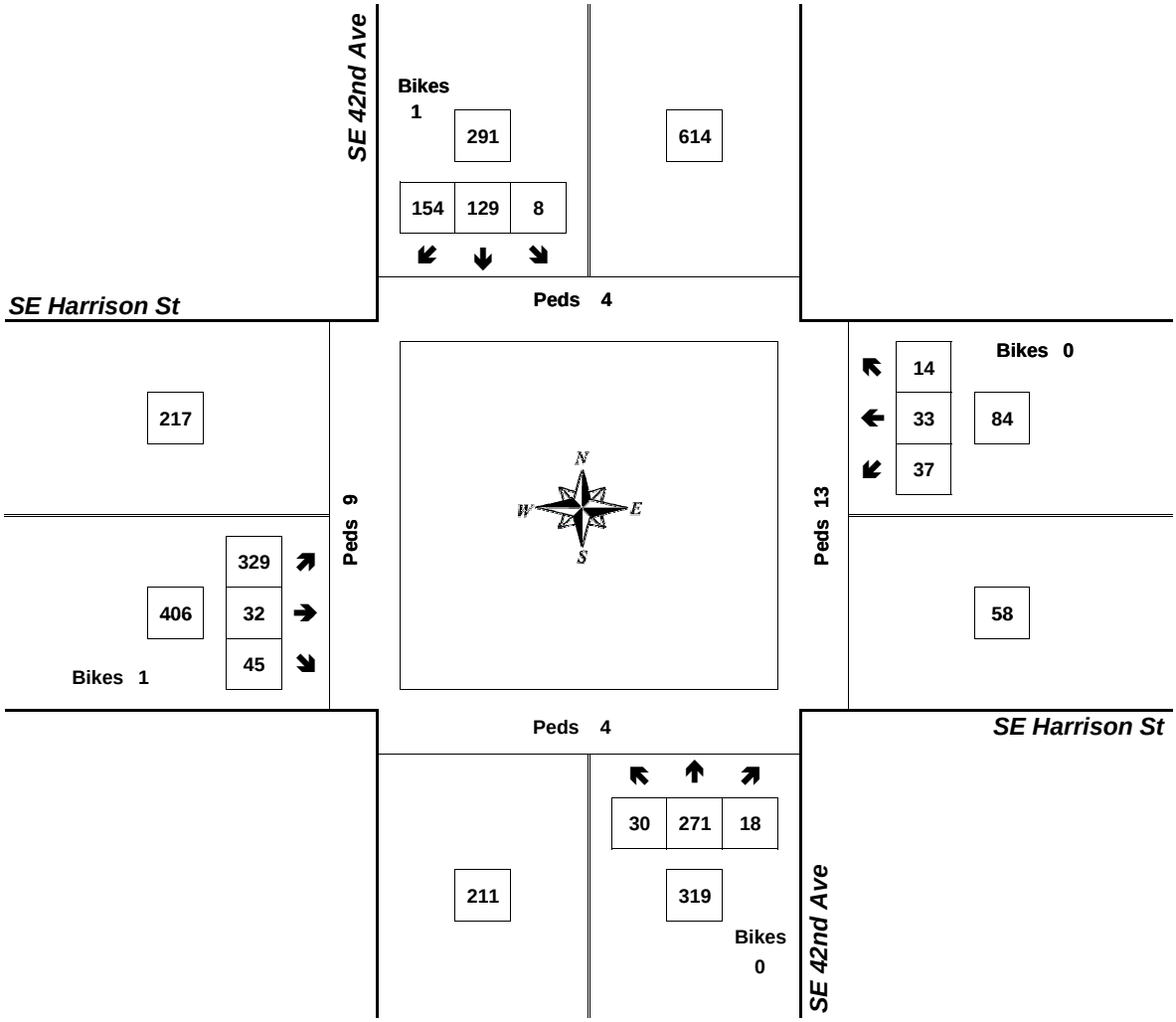
Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	5	0	5	0	0	9	9	6	1	0	7	0	2	0	2	23
4:15 PM	0	7	0	7	0	1	9	10	6	1	1	8	1	2	1	4	29
4:30 PM	0	5	0	5	0	1	6	7	5	1	1	7	1	2	1	4	23
4:45 PM	1	4	0	5	0	1	6	7	8	1	2	11	1	2	1	4	27
5:00 PM	1	5	0	6	0	1	5	6	10	0	2	12	2	2	1	5	29

Peak Hour Summary

Clay Carney
(503) 833-2740

SE 42nd Ave & SE Harrison St

4:50 PM to 5:50 PM
Tuesday, September 25, 2018



Approach	PHF	HV%	Volume
EB	0.90	2.7%	406
WB	0.88	4.8%	84
NB	0.92	2.2%	319
SB	0.90	2.1%	291
Intersection	0.96	2.5%	1,100

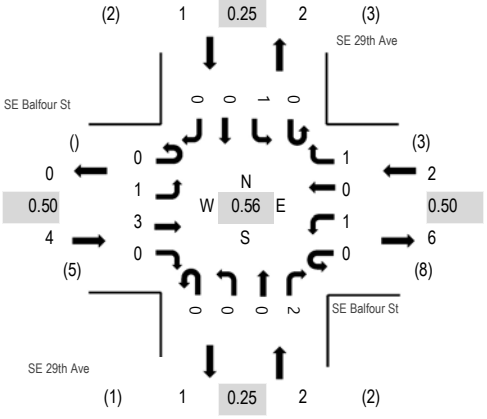
Count Period: 4:00 PM to 6:00 PM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

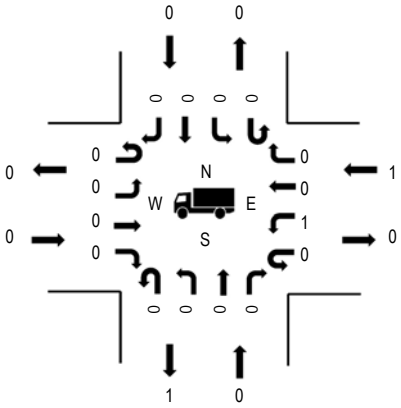
Location: SE 29th Ave & SE Balfour St AM
Date: Tuesday, July 14, 2020
Peak Hour: 07:20 AM - 08:20 AM
Peak 15-Minutes: 07:25 AM - 07:40 AM

Peak Hour

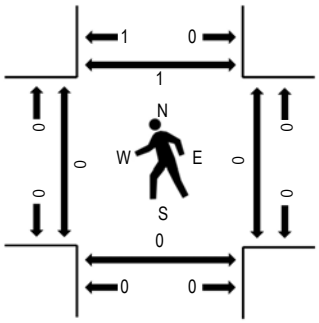
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.50
WB	50.0%	0.50
NB	0.0%	0.25
SB	0.0%	0.25
All	11.1%	0.56

Traffic Counts - Motorized Vehicles

Interval Start Time	SE Balfour St Eastbound				SE Balfour St Westbound				SE 29th Ave Northbound				SE 29th Ave Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
7:25 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	9
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
7:35 AM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	2	8
7:40 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2	6
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
7:55 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	6
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:15 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:40 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2	
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Count Total	0	1	4	0	0	1	0	2	0	0	0	2	0	2	0	0	12	
Peak Hour	0	1	3	0	0	1	0	1	0	0	0	2	0	1	0	0	9	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	1	1	7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	1	1
7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	0	0	1	0	1	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0	8:00 AM	0	0	1	0	1	8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM	0	0	1	0	1	8:55 AM	0	0	0	0	0
Count Total	0	0	1	0	1	Count Total	0	0	2	1	3	Count Total	0	0	0	1	1
Peak Hour	0	0	1	0	1	Peak Hour	0	0	1	0	1	Peak Hour	0	0	0	1	1

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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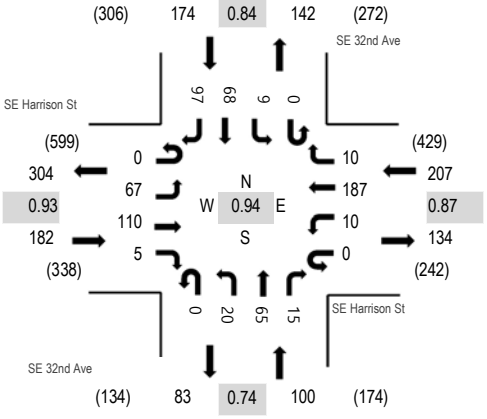
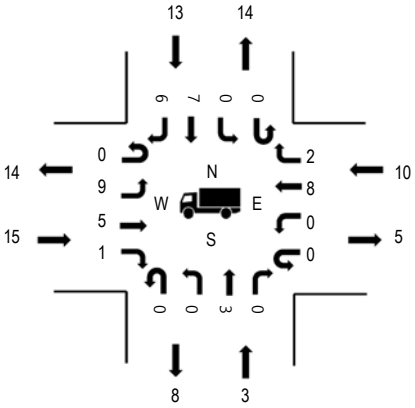
Location: SE 32nd Ave & SE Harrison St AM
Date: Tuesday, July 14, 2020
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour

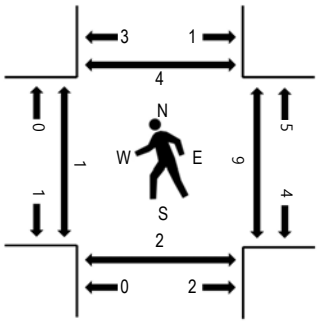
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	8.2%	0.93
WB	4.8%	0.87
NB	3.0%	0.74
SB	7.5%	0.84
All	6.2%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	SE Harrison St Eastbound				SE Harrison St Westbound				SE 32nd Ave Northbound				SE 32nd Ave Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	3	10	0	0	0	14	2	0	2	2	0	0	1	2	8	44	584
7:05 AM	0	3	6	0	0	1	17	0	0	1	3	0	0	2	1	3	37	591
7:10 AM	0	5	8	0	0	1	13	0	0	1	3	2	0	0	3	2	38	616
7:15 AM	0	4	4	0	0	0	17	1	0	0	5	0	0	1	7	6	45	624
7:20 AM	0	8	6	0	0	0	12	1	0	0	3	0	0	0	4	8	42	628
7:25 AM	0	6	8	1	0	2	12	2	0	2	6	1	0	3	1	7	51	655
7:30 AM	0	5	3	0	0	1	21	2	0	4	3	1	0	0	4	8	52	654
7:35 AM	0	7	12	0	0	0	17	0	0	1	3	1	0	2	5	10	58	653
7:40 AM	0	3	6	0	0	2	24	1	0	0	8	1	0	1	3	9	58	654
7:45 AM	0	3	9	0	0	0	19	2	0	2	8	0	0	0	7	9	59	645
7:50 AM	0	11	11	0	0	1	16	2	0	0	6	0	0	0	4	5	56	650
7:55 AM	0	5	8	1	0	0	18	1	0	2	3	0	0	1	0	5	44	652
8:00 AM	0	7	8	0	0	1	15	3	0	3	5	1	0	1	5	2	51	663
8:05 AM	0	4	15	0	0	0	20	1	0	1	7	2	0	0	4	8	62	
8:10 AM	0	6	7	0	0	2	14	0	0	0	3	0	0	0	6	8	46	
8:15 AM	0	7	11	1	0	1	9	1	0	1	1	1	0	0	8	8	49	
8:20 AM	0	5	10	1	0	0	19	2	0	5	10	0	0	2	4	11	69	
8:25 AM	0	7	7	0	0	0	17	0	0	4	3	1	0	1	7	3	50	
8:30 AM	0	4	8	1	0	0	21	0	0	0	6	0	0	0	2	9	51	
8:35 AM	0	5	11	0	0	1	18	2	0	1	4	1	0	2	4	10	59	
8:40 AM	0	7	3	0	0	0	14	1	0	0	6	1	0	1	8	8	49	
8:45 AM	0	7	11	0	0	2	17	0	0	3	6	5	0	0	5	8	64	
8:50 AM	0	4	10	2	0	1	11	0	0	1	9	3	0	2	7	8	58	
8:55 AM	0	4	9	0	0	2	12	0	0	1	5	0	0	0	8	14	55	
Count Total	0	130	201	7	0	18	387	24	0	35	118	21	0	20	109	177	1,247	
Peak Hour	0	67	110	5	0	10	187	10	0	20	65	15	0	9	68	97	663	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	0	0	1	1	7:00 AM	0	0	0	1	1	7:00 AM	0	0	0	0	0
7:05 AM	2	0	0	1	3	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	1	0	2	0	3	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	2	0	3	1	6	7:20 AM	0	0	0	0	0	7:20 AM	0	2	2	1	5
7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0	7:25 AM	0	1	2	1	4
7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0	7:30 AM	0	0	2	1	3
7:35 AM	1	1	0	1	3	7:35 AM	0	0	0	0	0	7:35 AM	0	0	1	1	2
7:40 AM	0	0	1	1	2	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	1	0	0	0	1	7:45 AM	0	0	0	2	2	7:45 AM	0	0	1	1	2
7:50 AM	3	0	1	2	6	7:50 AM	0	1	0	0	1	7:50 AM	0	1	0	0	1
7:55 AM	2	0	1	0	3	7:55 AM	0	0	0	0	0	7:55 AM	0	1	1	0	2
8:00 AM	2	0	2	1	5	8:00 AM	0	0	0	0	0	8:00 AM	0	1	1	0	2
8:05 AM	0	1	1	2	4	8:05 AM	0	0	0	0	0	8:05 AM	0	0	1	1	2
8:10 AM	1	1	1	1	4	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	4	0	0	1	5	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	1	0	1	3	5	8:20 AM	0	1	0	0	1	8:20 AM	0	0	1	0	1
8:25 AM	0	0	0	2	2	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	1	0	1	0	2	8:30 AM	0	0	0	0	0	8:30 AM	1	0	0	0	1
8:35 AM	2	0	2	0	4	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	1	1	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	3	0	1	1	5	8:45 AM	0	0	0	0	0	8:45 AM	0	0	1	1	2
8:50 AM	0	0	0	1	1	8:50 AM	0	0	0	0	0	8:50 AM	0	0	1	0	1
8:55 AM	1	1	1	0	3	8:55 AM	0	0	0	0	0	8:55 AM	1	1	4	2	8
Count Total	27	4	18	20	69	Count Total	0	2	0	3	5	Count Total	2	7	18	9	36
Peak Hour	15	3	10	13	41	Peak Hour	0	1	0	0	1	Peak Hour	2	2	9	4	17

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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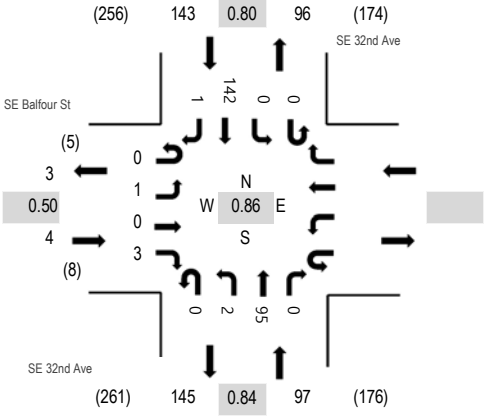
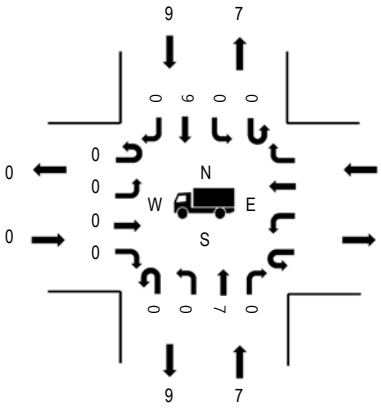
Location: SE 32nd Ave & SE Balfour St AM
Date: Tuesday, July 14, 2020
Peak Hour: 07:55 AM - 08:55 AM
Peak 15-Minutes: 08:40 AM - 08:55 AM

Peak Hour

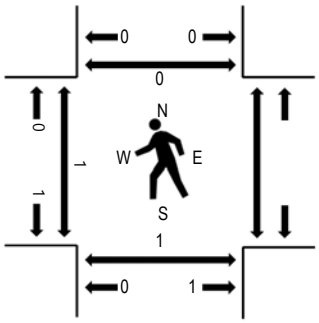
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.50
WB		
NB	7.2%	0.84
SB	6.3%	0.80
All	6.6%	0.86

Traffic Counts - Motorized Vehicles

Interval Start Time	SE Balfour St Eastbound				Westbound				SE 32nd Ave Northbound				SE 32nd Ave Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	0	0	0					0	0	9	0	0	0	10	0	19	199
7:05 AM	0	0	0	0					0	0	2	0	0	0	5	0	7	197
7:10 AM	0	0	0	0					0	0	2	0	0	0	11	0	13	211
7:15 AM	0	0	0	0					0	0	10	0	0	0	9	0	19	217
7:20 AM	0	0	0	1					0	0	3	0	0	0	13	0	17	219
7:25 AM	0	0	0	0					0	0	11	0	0	0	4	0	15	218
7:30 AM	0	0	0	0					0	0	7	0	0	0	11	0	18	222
7:35 AM	0	0	0	2					0	0	6	0	0	0	14	0	22	225
7:40 AM	0	0	0	1					0	0	7	0	0	0	8	1	17	221
7:45 AM	0	0	0	0					0	0	8	0	0	0	11	0	19	225
7:50 AM	0	0	0	0					0	0	9	0	0	0	3	0	12	228
7:55 AM	0	0	0	0					0	1	11	0	0	0	9	0	21	244
8:00 AM	0	0	0	0					0	0	7	0	0	0	10	0	17	241
8:05 AM	0	0	0	0					0	0	8	0	0	0	13	0	21	
8:10 AM	0	0	0	0					0	0	5	0	0	0	14	0	19	
8:15 AM	0	1	0	1					0	0	7	0	0	0	12	0	21	
8:20 AM	0	0	0	0					0	0	6	0	0	0	10	0	16	
8:25 AM	0	0	0	0					0	1	11	0	0	0	7	0	19	
8:30 AM	0	0	0	0					0	0	9	0	0	0	12	0	21	
8:35 AM	0	0	0	1					0	0	5	0	0	0	12	0	18	
8:40 AM	0	0	0	1					0	0	9	0	0	0	11	0	21	
8:45 AM	0	0	0	0					0	0	8	0	0	0	14	0	22	
8:50 AM	0	0	0	0					0	0	9	0	0	0	18	1	28	
8:55 AM	0	0	0	0					0	1	4	0	0	0	13	0	18	
Count Total	0	1	0	7					0	3	173	0	0	0	254	2	440	
Peak Hour	0	1	0	3					0	2	95	0	0	0	142	1	244	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	1		0	1	7:00 AM	0	0		0	0	7:00 AM	0	0		0	0
7:05 AM	0	0		0	0	7:05 AM	1	0		0	1	7:05 AM	0	0		0	0
7:10 AM	0	0		0	0	7:10 AM	0	0		0	0	7:10 AM	0	0		0	0
7:15 AM	0	2		0	2	7:15 AM	0	1		0	1	7:15 AM	2	0		0	2
7:20 AM	0	0		1	1	7:20 AM	0	1		0	1	7:20 AM	0	0		0	0
7:25 AM	0	0		0	0	7:25 AM	0	0		0	0	7:25 AM	0	0		0	0
7:30 AM	0	0		0	0	7:30 AM	0	0		0	0	7:30 AM	0	0		0	0
7:35 AM	0	1		2	3	7:35 AM	0	0		0	0	7:35 AM	0	0		0	0
7:40 AM	0	0		0	0	7:40 AM	0	0		1	1	7:40 AM	0	0		0	0
7:45 AM	0	1		1	2	7:45 AM	0	0		0	0	7:45 AM	0	0		0	0
7:50 AM	0	0		0	0	7:50 AM	0	0		0	0	7:50 AM	0	2		0	2
7:55 AM	0	0		0	0	7:55 AM	0	0		0	0	7:55 AM	0	0		0	0
8:00 AM	0	1		1	2	8:00 AM	0	1		0	1	8:00 AM	0	0		0	0
8:05 AM	0	1		1	2	8:05 AM	0	0		0	0	8:05 AM	0	0		0	0
8:10 AM	0	2		1	3	8:10 AM	0	0		0	0	8:10 AM	0	0		0	0
8:15 AM	0	1		1	2	8:15 AM	0	0		0	0	8:15 AM	0	0		0	0
8:20 AM	0	0		2	2	8:20 AM	0	0		1	1	8:20 AM	0	0		0	0
8:25 AM	0	1		0	1	8:25 AM	0	0		1	1	8:25 AM	0	1		0	1
8:30 AM	0	0		1	1	8:30 AM	1	0		0	1	8:30 AM	0	0		0	0
8:35 AM	0	0		1	1	8:35 AM	0	0		0	0	8:35 AM	0	0		0	0
8:40 AM	0	0		0	0	8:40 AM	0	0		0	0	8:40 AM	0	0		0	0
8:45 AM	0	1		1	2	8:45 AM	0	0		0	0	8:45 AM	0	0		0	0
8:50 AM	0	0		0	0	8:50 AM	0	1		0	1	8:50 AM	1	0		0	1
8:55 AM	0	1		0	1	8:55 AM	0	0		1	1	8:55 AM	1	0		0	1
Count Total	0	13		13	26	Count Total	2	4		4	10	Count Total	4	3		0	7
Peak Hour	0	7		9	16	Peak Hour	1	2		2	5	Peak Hour	1	1		0	2

ALL TRAFFIC DATA SERVICES

(303) 216-2439
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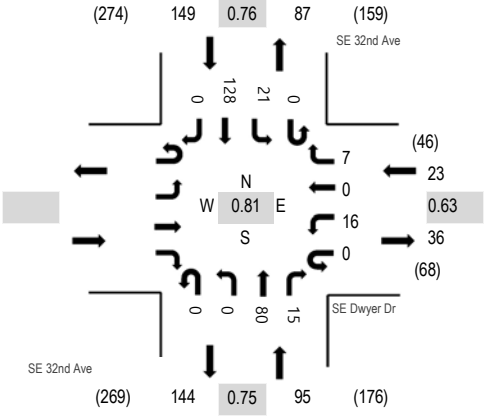
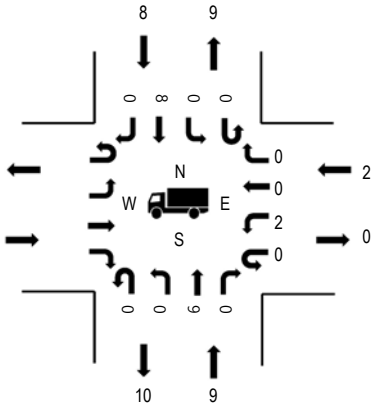
Location: SE 32nd Ave & SE Dwyer Dr AM
Date: Tuesday, July 14, 2020
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour

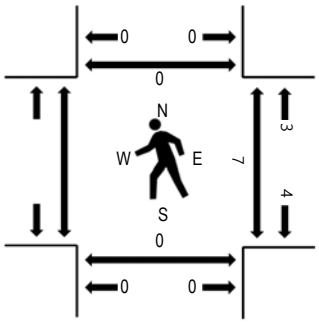
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB		
WB	8.7%	0.63
NB	9.5%	0.75
SB	5.4%	0.76
All	7.1%	0.81

Traffic Counts - Motorized Vehicles

Interval Start Time	Eastbound				SE Dwyer Dr Westbound				SE 32nd Ave Northbound				SE 32nd Ave Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM					0	0	0	2	0	0	3	2	0	1	14	0	22	229
7:05 AM					0	0	0	0	0	0	3	2	0	1	8	0	14	228
7:10 AM					0	0	0	0	0	0	3	2	0	1	5	0	11	237
7:15 AM					0	0	0	1	0	0	7	0	0	0	9	0	17	250
7:20 AM					0	0	0	0	0	0	5	2	0	1	14	0	22	250
7:25 AM					0	3	0	1	0	0	6	3	0	0	9	0	22	249
7:30 AM					0	3	0	4	0	0	7	1	0	0	5	0	20	246
7:35 AM					0	1	0	0	0	0	4	1	0	2	16	0	24	243
7:40 AM					0	4	0	1	0	0	3	1	0	1	11	0	21	238
7:45 AM					0	2	0	1	0	0	7	0	0	3	11	0	24	241
7:50 AM					0	0	0	0	0	0	8	4	0	1	4	0	17	241
7:55 AM					0	0	0	0	0	0	6	1	0	2	6	0	15	256
8:00 AM					0	2	0	1	0	0	8	0	0	4	6	0	21	267
8:05 AM					0	3	0	2	0	0	5	1	0	1	11	0	23	
8:10 AM					0	1	0	0	0	0	5	2	0	2	14	0	24	
8:15 AM					0	2	0	1	0	0	4	0	0	0	10	0	17	
8:20 AM					0	1	0	0	0	0	5	2	0	0	13	0	21	
8:25 AM					0	1	0	1	0	0	8	1	0	1	7	0	19	
8:30 AM					0	0	0	0	0	0	8	0	0	0	9	0	17	
8:35 AM					0	2	0	0	0	0	7	1	0	2	7	0	19	
8:40 AM					0	2	0	1	0	0	6	2	0	0	13	0	24	
8:45 AM					0	1	0	0	0	0	10	1	0	2	10	0	24	
8:50 AM					0	0	0	0	0	0	9	4	0	4	15	0	32	
8:55 AM					0	1	0	1	0	0	5	1	0	5	13	0	26	
Count Total					0	29	0	17	0	0	142	34	0	34	240	0	496	
Peak Hour					0	16	0	7	0	0	80	15	0	21	128	0	267	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM		0	0	1	1	7:00 AM		0	0	1	1	7:00 AM		0	1	0	1
7:05 AM		1	0	1	2	7:05 AM		0	0	0	0	7:05 AM		0	0	0	0
7:10 AM		0	0	1	1	7:10 AM		0	0	0	0	7:10 AM		0	0	0	0
7:15 AM		1	0	0	1	7:15 AM		0	0	0	0	7:15 AM		0	0	0	0
7:20 AM		1	0	1	2	7:20 AM		0	0	0	0	7:20 AM		0	0	0	0
7:25 AM		0	0	0	0	7:25 AM		0	0	0	0	7:25 AM		0	1	0	1
7:30 AM		0	0	0	0	7:30 AM		0	0	0	0	7:30 AM		0	1	0	1
7:35 AM		1	0	1	2	7:35 AM		0	0	0	0	7:35 AM		0	1	0	1
7:40 AM		0	0	1	1	7:40 AM		0	1	1	2	7:40 AM		0	0	0	0
7:45 AM		1	0	0	1	7:45 AM		0	0	0	0	7:45 AM		0	0	0	0
7:50 AM		1	0	1	2	7:50 AM		1	0	0	1	7:50 AM		0	0	0	0
7:55 AM		0	0	0	0	7:55 AM		0	0	0	0	7:55 AM		0	1	0	1
8:00 AM		1	1	0	2	8:00 AM		0	0	0	0	8:00 AM		0	0	0	0
8:05 AM		1	1	2	4	8:05 AM		0	0	0	0	8:05 AM		0	0	0	0
8:10 AM		1	0	0	1	8:10 AM		0	0	0	0	8:10 AM		0	1	0	1
8:15 AM		1	0	1	2	8:15 AM		0	0	0	0	8:15 AM		0	1	0	1
8:20 AM		1	0	2	3	8:20 AM		0	0	0	0	8:20 AM		0	0	0	0
8:25 AM		0	0	1	1	8:25 AM		0	0	0	0	8:25 AM		0	0	0	0
8:30 AM		1	0	0	1	8:30 AM		0	0	1	1	8:30 AM		0	0	0	0
8:35 AM		1	0	0	1	8:35 AM		0	0	0	0	8:35 AM		0	0	0	0
8:40 AM		0	0	1	1	8:40 AM		0	0	0	0	8:40 AM		0	1	0	1
8:45 AM		1	0	0	1	8:45 AM		0	0	0	0	8:45 AM		0	1	0	1
8:50 AM		0	0	1	1	8:50 AM		0	0	0	0	8:50 AM		0	2	0	2
8:55 AM		1	0	0	1	8:55 AM		0	0	0	0	8:55 AM		0	1	0	1
Count Total		15	2	15	32	Count Total		1	1	3	5	Count Total		0	12	0	12
Peak Hour		9	2	8	19	Peak Hour		0	0	1	1	Peak Hour		0	7	0	7

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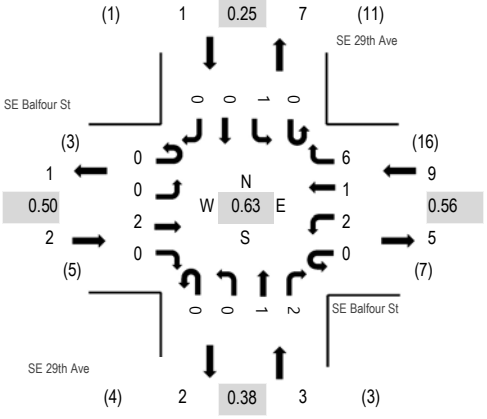
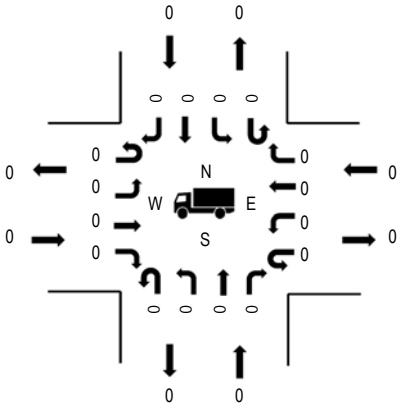
Location: SE 29th Ave & SE Balfour St PM
Date: Tuesday, July 14, 2020
Peak Hour: 05:00 PM - 06:00 PM
Peak 15-Minutes: 05:40 PM - 05:55 PM

Peak Hour

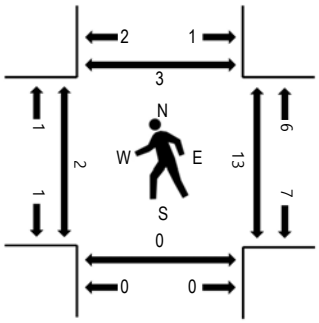
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.50
WB	0.0%	0.56
NB	0.0%	0.38
SB	0.0%	0.25
All	0.0%	0.63

Traffic Counts - Motorized Vehicles

Interval Start Time	SE Balfour St Eastbound				SE Balfour St Westbound				SE 29th Ave Northbound				SE 29th Ave Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3	10
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
4:35 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2	12
4:40 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	11
4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	13
4:50 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	12
4:55 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	14
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:10 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	3	
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:20 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
5:35 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
5:40 PM	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	3	
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:50 PM	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	3	
5:55 PM	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	3	
Count Total	0	1	4	0	0	4	3	9	0	0	1	2	0	1	0	0	25	
Peak Hour	0	0	2	0	0	2	1	6	0	0	1	2	0	1	0	0	15	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	1	0	1	4:45 PM	0	0	0	0	0
4:50 PM	0	0	1	0	1	4:50 PM	0	0	0	1	1	4:50 PM	0	0	0	0	0
4:55 PM	1	0	0	0	1	4:55 PM	0	0	0	0	0	4:55 PM	0	0	1	0	1
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	0	1	1	2
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	2	0	2
5:10 PM	0	0	0	0	0	5:10 PM	0	0	1	0	1	5:10 PM	0	0	4	1	5
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	2	0	2
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	1	0	1	0	2
5:40 PM	0	0	0	0	0	5:40 PM	0	0	1	1	2	5:40 PM	0	0	1	1	2
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	2	0	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	1	1	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	1	0	0	0	1
Count Total	1	0	1	0	2	Count Total	0	0	3	3	6	Count Total	2	0	14	3	19
Peak Hour	0	0	0	0	0	Peak Hour	0	0	2	2	4	Peak Hour	2	0	13	3	18

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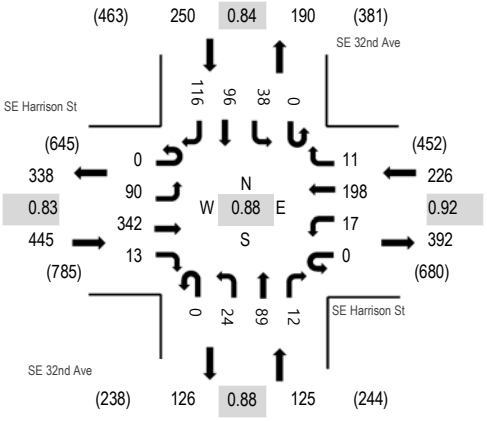
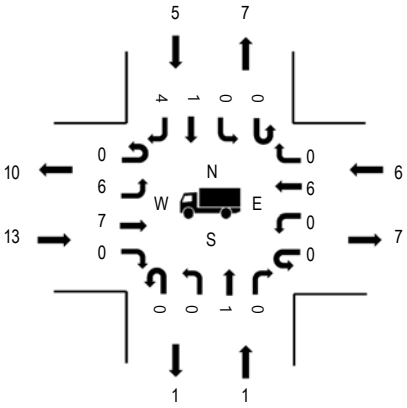
Location: SE 32nd Ave & SE Harrison St PM
Date: Tuesday, July 14, 2020
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:35 PM - 04:50 PM

Peak Hour

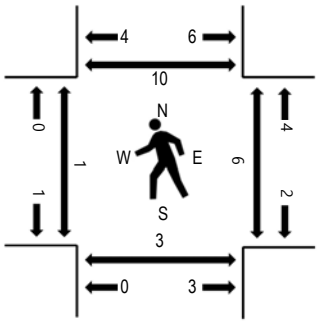
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.9%	0.83
WB	2.7%	0.92
NB	0.8%	0.88
SB	2.0%	0.84
All	2.4%	0.88

Traffic Counts - Motorized Vehicles

Interval Start Time	SE Harrison St Eastbound				SE Harrison St Westbound				SE 32nd Ave Northbound				SE 32nd Ave Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	8	28	2	0	0	15	0	0	3	3	0	0	3	11	13	86	1,046
4:05 PM	0	3	30	1	0	1	18	1	0	5	9	1	0	2	5	11	87	1,040
4:10 PM	0	6	31	0	0	1	15	1	0	3	5	1	0	2	11	7	83	1,033
4:15 PM	0	10	35	0	0	1	24	2	0	1	6	0	0	0	9	18	106	1,029
4:20 PM	0	9	28	1	0	3	9	1	0	3	8	1	0	3	6	8	80	1,001
4:25 PM	0	8	23	2	0	2	12	1	0	3	7	1	0	1	4	9	73	991
4:30 PM	0	1	8	0	0	1	16	1	0	0	8	0	0	10	4	9	58	996
4:35 PM	0	9	52	2	0	1	19	0	0	4	9	2	0	6	8	12	124	1,009
4:40 PM	0	8	28	2	0	2	18	1	0	1	9	2	0	4	13	10	98	969
4:45 PM	0	12	19	2	0	2	19	1	0	0	3	1	0	3	9	4	75	933
4:50 PM	0	7	33	0	0	2	14	1	0	0	11	2	0	0	14	6	90	931
4:55 PM	0	9	27	1	0	1	19	1	0	1	11	1	0	4	2	9	86	911
5:00 PM	0	6	25	0	0	0	15	0	0	1	8	0	0	0	12	13	80	898
5:05 PM	0	6	18	0	0	1	19	2	0	1	4	2	0	2	10	15	80	
5:10 PM	0	9	14	0	0	0	16	2	0	1	8	2	0	3	15	9	79	
5:15 PM	0	8	28	2	0	2	14	2	0	2	4	3	0	2	5	6	78	
5:20 PM	0	9	28	0	0	3	16	0	0	1	6	1	0	1	1	4	70	
5:25 PM	0	14	17	0	0	1	16	3	0	5	6	2	0	2	7	5	78	
5:30 PM	0	4	14	1	0	0	16	0	0	1	14	1	0	4	7	9	71	
5:35 PM	0	11	26	0	0	2	15	5	0	3	3	2	0	1	9	7	84	
5:40 PM	0	3	22	0	0	0	11	2	0	1	5	2	0	4	7	5	62	
5:45 PM	0	7	20	1	0	1	16	3	0	2	6	1	0	3	8	5	73	
5:50 PM	0	7	13	0	0	2	21	2	0	1	6	1	0	1	8	8	70	
5:55 PM	0	8	18	1	0	1	17	0	0	2	8	3	0	2	5	8	73	
Count Total	0	182	585	18	0	30	390	32	0	45	167	32	0	63	190	210	1,944	
Peak Hour	0	90	342	13	0	17	198	11	0	24	89	12	0	38	96	116	1,046	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	0	1	0	2	4:00 PM	0	0	0	0	0	4:00 PM	0	1	1	0	2
4:05 PM	1	0	0	0	1	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	1	0	0	0	1	4:10 PM	0	0	0	0	0	4:10 PM	0	1	1	0	2
4:15 PM	1	0	1	1	3	4:15 PM	2	0	0	0	2	4:15 PM	0	1	1	0	2
4:20 PM	1	1	0	1	3	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	0	1	0	2	4:25 PM	0	0	0	0	0	4:25 PM	0	1	0	1	2
4:30 PM	1	0	1	1	3	4:30 PM	0	0	0	0	0	4:30 PM	1	1	0	1	3
4:35 PM	1	0	0	0	1	4:35 PM	0	1	0	0	1	4:35 PM	0	0	3	1	4
4:40 PM	1	0	0	0	1	4:40 PM	0	0	1	0	1	4:40 PM	0	0	0	2	2
4:45 PM	2	0	1	1	4	4:45 PM	0	0	0	0	0	4:45 PM	0	0	2	4	6
4:50 PM	1	0	1	0	2	4:50 PM	0	1	0	1	2	4:50 PM	0	0	1	1	2
4:55 PM	1	0	0	1	2	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	1	0	1	5:00 PM	0	0	1	0	1	5:00 PM	0	0	1	1	2
5:05 PM	1	0	0	0	1	5:05 PM	1	0	0	0	1	5:05 PM	0	0	0	0	0
5:10 PM	1	0	1	1	3	5:10 PM	0	0	1	0	1	5:10 PM	0	1	1	1	3
5:15 PM	0	0	2	0	2	5:15 PM	0	0	0	0	0	5:15 PM	0	1	1	1	3
5:20 PM	2	0	0	0	2	5:20 PM	0	0	0	0	0	5:20 PM	0	0	2	0	2
5:25 PM	1	0	0	1	2	5:25 PM	1	0	0	0	1	5:25 PM	0	0	1	2	3
5:30 PM	1	1	1	2	5	5:30 PM	0	0	0	0	0	5:30 PM	0	0	1	3	4
5:35 PM	3	0	0	0	3	5:35 PM	0	0	1	0	1	5:35 PM	0	0	0	0	0
5:40 PM	1	0	1	0	2	5:40 PM	0	0	0	1	1	5:40 PM	0	0	1	0	1
5:45 PM	0	0	0	1	1	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	1	1
5:50 PM	1	0	1	1	3	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	1	1
5:55 PM	1	0	0	0	1	5:55 PM	0	0	1	0	1	5:55 PM	0	0	0	0	0
Count Total	25	2	13	11	51	Count Total	4	2	5	2	13	Count Total	1	7	17	20	45
Peak Hour	13	1	6	5	25	Peak Hour	2	2	1	1	6	Peak Hour	1	5	9	10	25

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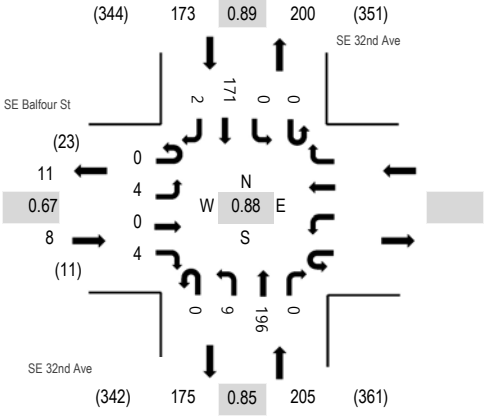
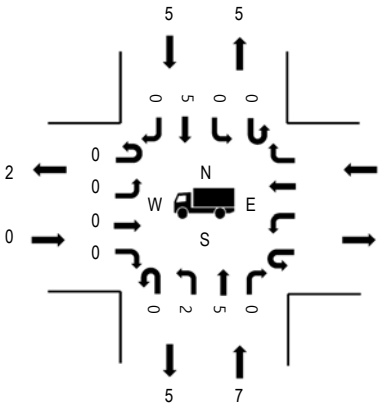
Location: SE 32nd Ave & SE Balfour St PM
Date: Tuesday, July 14, 2020
Peak Hour: 04:40 PM - 05:40 PM
Peak 15-Minutes: 05:25 PM - 05:40 PM

Peak Hour

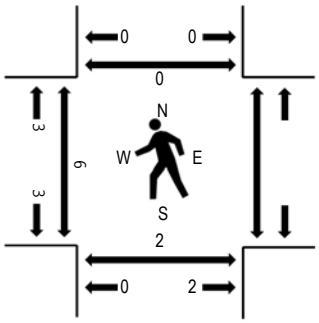
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.67
WB		
NB	3.4%	0.85
SB	2.9%	0.89
All	3.1%	0.88

Traffic Counts - Motorized Vehicles

Interval Start Time	SE Balfour St Eastbound				Westbound				SE 32nd Ave Northbound				SE 32nd Ave Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	0	0					0	1	14	0	0	0	16	0	31	359
4:05 PM	0	0	0	0					0	0	14	0	0	0	12	0	26	357
4:10 PM	0	1	0	0					0	0	9	0	0	0	17	0	27	369
4:15 PM	0	0	0	0					0	0	9	0	0	0	15	0	24	373
4:20 PM	0	0	0	0					0	1	18	0	0	0	8	0	27	372
4:25 PM	0	0	0	1					0	0	14	0	0	0	16	0	31	373
4:30 PM	0	0	0	0					0	0	14	0	0	0	20	0	34	379
4:35 PM	0	0	0	0					0	1	14	0	0	0	14	3	32	376
4:40 PM	0	0	0	1					0	0	17	0	0	0	13	0	31	386
4:45 PM	0	0	0	0					0	2	11	0	0	0	18	0	31	378
4:50 PM	0	0	0	0					0	1	18	0	0	0	14	0	33	373
4:55 PM	0	0	0	2					0	0	14	0	0	0	16	0	32	366
5:00 PM	0	0	0	0					0	0	12	0	0	0	17	0	29	357
5:05 PM	0	1	0	0					0	0	19	0	0	0	16	2	38	
5:10 PM	0	1	0	0					0	1	16	0	0	0	13	0	31	
5:15 PM	0	0	0	0					0	0	17	0	0	0	6	0	23	
5:20 PM	0	0	0	0					0	1	16	0	0	0	11	0	28	
5:25 PM	0	1	0	0					0	1	18	0	0	0	17	0	37	
5:30 PM	0	0	0	0					0	1	19	0	0	0	11	0	31	
5:35 PM	0	1	0	1					0	2	19	0	0	0	19	0	42	
5:40 PM	0	0	0	0					0	1	11	0	0	0	11	0	23	
5:45 PM	0	0	0	0					0	1	10	0	0	0	15	0	26	
5:50 PM	0	0	0	1					0	1	11	0	0	0	11	2	26	
5:55 PM	0	0	0	0					0	0	12	0	0	0	10	1	23	
Count Total	0	5	0	6					0	15	346	0	0	0	336	8	716	
Peak Hour	0	4	0	4					0	9	196	0	0	0	171	2	386	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

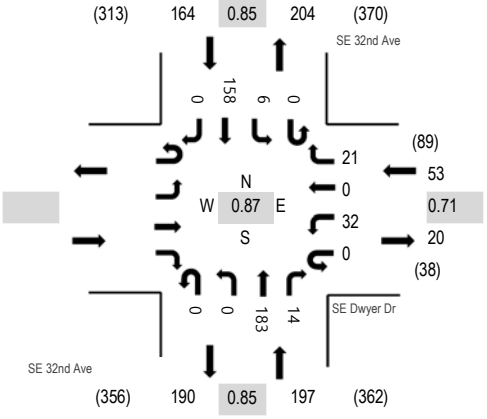
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0		0	0	4:00 PM	0	0		0	0	4:00 PM	0	0		0	0
4:05 PM	0	1		0	1	4:05 PM	0	0		0	0	4:05 PM	0	0		0	0
4:10 PM	0	0		1	1	4:10 PM	0	0		0	0	4:10 PM	0	0		0	0
4:15 PM	0	0		0	0	4:15 PM	0	0		0	0	4:15 PM	0	0		0	0
4:20 PM	0	0		0	0	4:20 PM	0	1		0	1	4:20 PM	0	0		0	0
4:25 PM	0	1		1	2	4:25 PM	0	0		0	0	4:25 PM	1	0		0	1
4:30 PM	0	0		0	0	4:30 PM	0	0		0	0	4:30 PM	0	0		0	0
4:35 PM	0	0		0	0	4:35 PM	0	1		0	1	4:35 PM	0	0		0	0
4:40 PM	0	1		0	1	4:40 PM	0	0		1	1	4:40 PM	2	0		0	2
4:45 PM	0	1		1	2	4:45 PM	0	2		0	2	4:45 PM	0	0		0	0
4:50 PM	0	1		0	1	4:50 PM	1	0		0	1	4:50 PM	0	0		0	0
4:55 PM	0	1		1	2	4:55 PM	0	0		1	1	4:55 PM	0	0		0	0
5:00 PM	0	0		0	0	5:00 PM	0	0		0	0	5:00 PM	1	0		0	1
5:05 PM	0	1		1	2	5:05 PM	0	1		0	1	5:05 PM	0	0		0	0
5:10 PM	0	0		1	1	5:10 PM	0	0		0	0	5:10 PM	2	0		0	2
5:15 PM	0	0		0	0	5:15 PM	0	0		0	0	5:15 PM	0	0		0	0
5:20 PM	0	0		0	0	5:20 PM	0	0		0	0	5:20 PM	0	0		0	0
5:25 PM	0	1		1	2	5:25 PM	0	0		0	0	5:25 PM	1	2		0	3
5:30 PM	0	1		0	1	5:30 PM	0	0		0	0	5:30 PM	0	0		0	0
5:35 PM	0	0		0	0	5:35 PM	0	0		0	0	5:35 PM	0	0		0	0
5:40 PM	0	1		1	2	5:40 PM	0	0		0	0	5:40 PM	0	0		0	0
5:45 PM	0	0		0	0	5:45 PM	0	0		0	0	5:45 PM	2	0		0	2
5:50 PM	0	0		0	0	5:50 PM	0	0		0	0	5:50 PM	0	0		0	0
5:55 PM	0	0		0	0	5:55 PM	0	0		0	0	5:55 PM	0	0		0	0
Count Total	0	10		8	18	Count Total	1	5		2	8	Count Total	9	2		0	11
Peak Hour	0	7		5	12	Peak Hour	1	3		2	6	Peak Hour	6	2		0	8

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

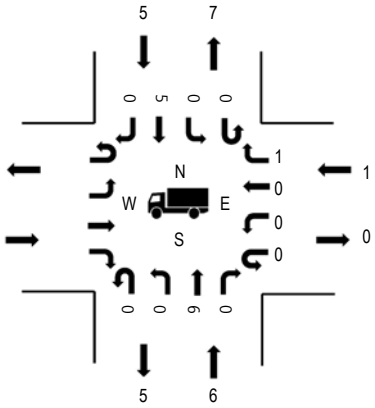
Location: SE 32nd Ave & SE Dwyer Dr PM
Date: Tuesday, July 14, 2020
Peak Hour: 04:35 PM - 05:35 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour

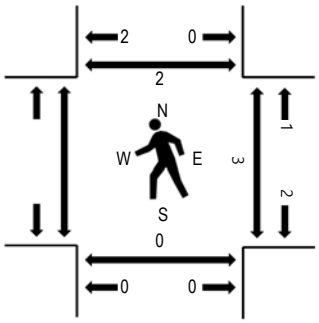
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

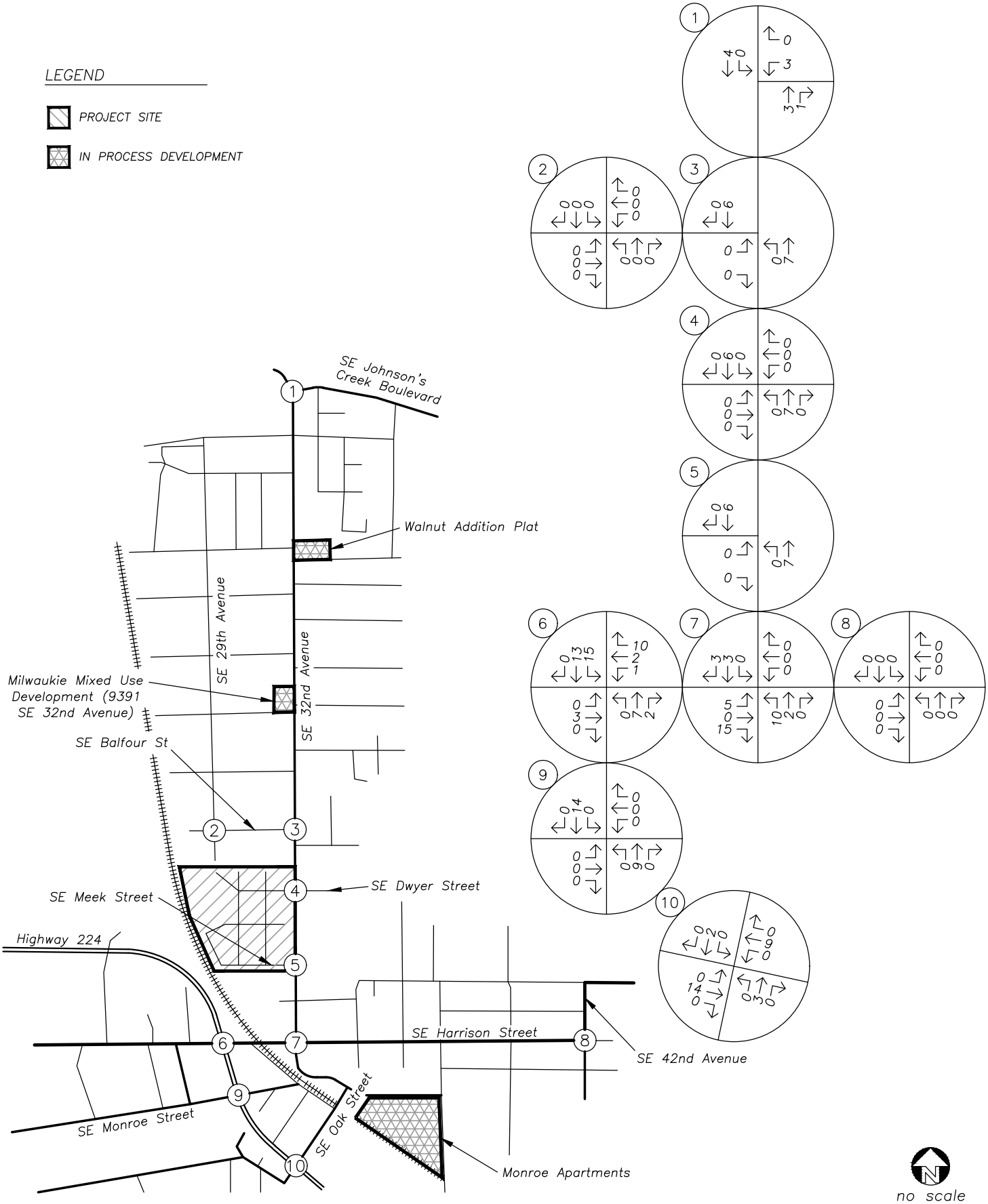
	HV%	PHF
EB		
WB	1.9%	0.71
NB	3.0%	0.85
SB	3.0%	0.85
All	2.9%	0.87

Traffic Counts - Motorized Vehicles

Interval Start Time	Eastbound				SE Dwyer Dr Westbound				SE 32nd Ave Northbound				SE 32nd Ave Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM					0	2	0	1	0	0	15	1	0	2	15	0	36	364
4:05 PM					0	0	0	2	0	0	8	2	0	1	11	0	24	367
4:10 PM					0	0	0	1	0	0	12	0	0	0	12	0	25	382
4:15 PM					0	3	0	0	0	0	10	3	0	0	12	0	28	398
4:20 PM					0	3	0	0	0	0	18	1	0	0	10	0	32	399
4:25 PM					0	3	0	1	0	0	16	1	0	0	7	0	28	396
4:30 PM					0	0	0	1	0	0	6	0	0	0	19	0	26	404
4:35 PM					0	3	0	2	0	0	18	0	0	1	13	0	37	414
4:40 PM					0	5	0	2	0	0	10	1	0	0	14	0	32	412
4:45 PM					0	1	0	1	0	0	16	0	0	1	14	0	33	407
4:50 PM					0	3	0	0	0	0	15	1	0	1	13	0	33	405
4:55 PM					0	0	0	1	0	0	14	0	0	0	15	0	30	409
5:00 PM					0	3	0	2	0	0	13	3	0	0	18	0	39	400
5:05 PM					0	7	0	2	0	0	11	2	0	0	17	0	39	
5:10 PM					0	4	0	1	0	0	22	1	0	1	12	0	41	
5:15 PM					0	2	0	2	0	0	14	2	0	1	8	0	29	
5:20 PM					0	2	0	4	0	0	13	1	0	1	8	0	29	
5:25 PM					0	1	0	3	0	0	17	2	0	0	13	0	36	
5:30 PM					0	1	0	1	0	0	20	1	0	0	13	0	36	
5:35 PM					0	1	0	3	0	0	17	1	0	1	12	0	35	
5:40 PM					0	2	0	3	0	0	12	0	0	0	10	0	27	
5:45 PM					0	5	0	1	0	0	9	3	0	1	12	0	31	
5:50 PM					0	2	0	1	0	0	17	1	0	0	16	0	37	
5:55 PM					0	1	0	0	0	0	12	0	0	0	8	0	21	
Count Total					0	54	0	35	0	0	335	27	0	11	302	0	764	
Peak Hour					0	32	0	21	0	0	183	14	0	6	158	0	414	

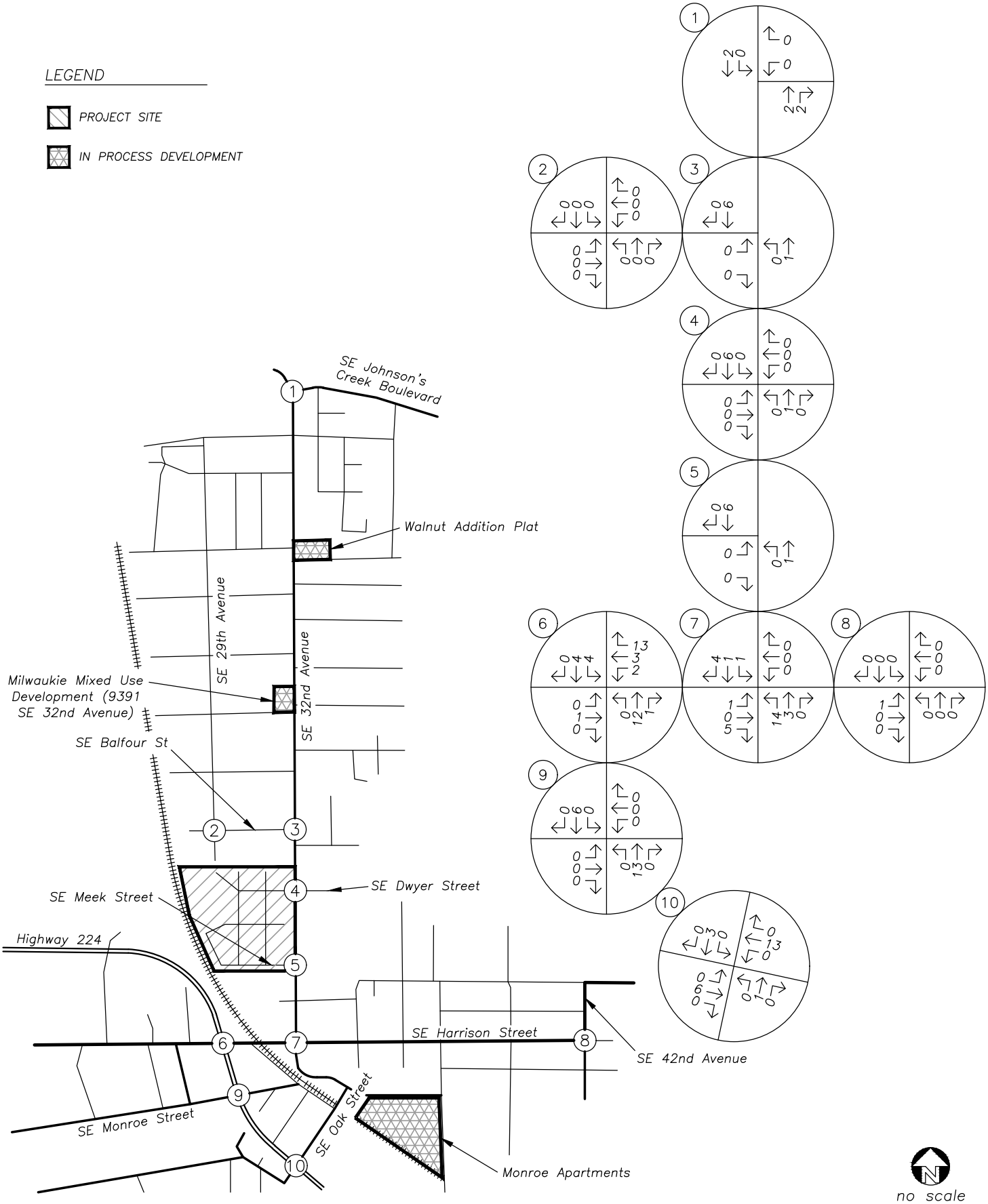
Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM		0	0	0	0	4:00 PM		0	0	0	0	4:00 PM		0	0	0	0
4:05 PM		0	0	0	0	4:05 PM		0	0	0	0	4:05 PM		0	0	0	0
4:10 PM		1	0	1	2	4:10 PM		0	0	0	0	4:10 PM		0	0	0	0
4:15 PM		0	0	0	0	4:15 PM		0	0	0	0	4:15 PM		0	0	0	0
4:20 PM		0	0	1	1	4:20 PM		0	0	0	0	4:20 PM		0	1	0	1
4:25 PM		1	0	0	1	4:25 PM		0	0	0	0	4:25 PM		0	0	0	0
4:30 PM		0	0	1	1	4:30 PM		0	0	0	0	4:30 PM		0	0	0	0
4:35 PM		0	0	0	0	4:35 PM		0	0	0	0	4:35 PM		0	0	0	0
4:40 PM		1	0	0	1	4:40 PM		0	0	1	1	4:40 PM		0	0	2	2
4:45 PM		0	0	1	1	4:45 PM		0	0	0	0	4:45 PM		0	0	0	0
4:50 PM		1	0	0	1	4:50 PM		0	1	0	1	4:50 PM		0	0	0	0
4:55 PM		1	0	1	2	4:55 PM		0	0	0	0	4:55 PM		0	3	0	3
5:00 PM		0	0	0	0	5:00 PM		0	0	0	0	5:00 PM		0	0	0	0
5:05 PM		0	0	1	1	5:05 PM		0	0	0	0	5:05 PM		0	0	0	0
5:10 PM		1	0	1	2	5:10 PM		1	0	0	1	5:10 PM		0	0	0	0
5:15 PM		0	0	0	0	5:15 PM		0	0	0	0	5:15 PM		0	0	0	0
5:20 PM		0	1	0	1	5:20 PM		0	0	0	0	5:20 PM		0	1	0	1
5:25 PM		0	0	1	1	5:25 PM		0	0	0	0	5:25 PM		0	0	0	0
5:30 PM		2	0	0	2	5:30 PM		0	0	0	0	5:30 PM		0	0	0	0
5:35 PM		0	0	0	0	5:35 PM		0	0	0	0	5:35 PM		0	0	0	0
5:40 PM		1	0	1	2	5:40 PM		0	0	0	0	5:40 PM		0	0	0	0
5:45 PM		0	0	0	0	5:45 PM		0	0	0	0	5:45 PM		0	0	0	0
5:50 PM		0	1	0	1	5:50 PM		0	0	0	0	5:50 PM		0	0	0	0
5:55 PM		0	0	0	0	5:55 PM		0	0	0	0	5:55 PM		0	0	0	0
Count Total		9	2	9	20	Count Total		1	1	1	3	Count Total		0	5	2	7
Peak Hour		6	1	5	12	Peak Hour		1	1	1	3	Peak Hour		0	4	2	6



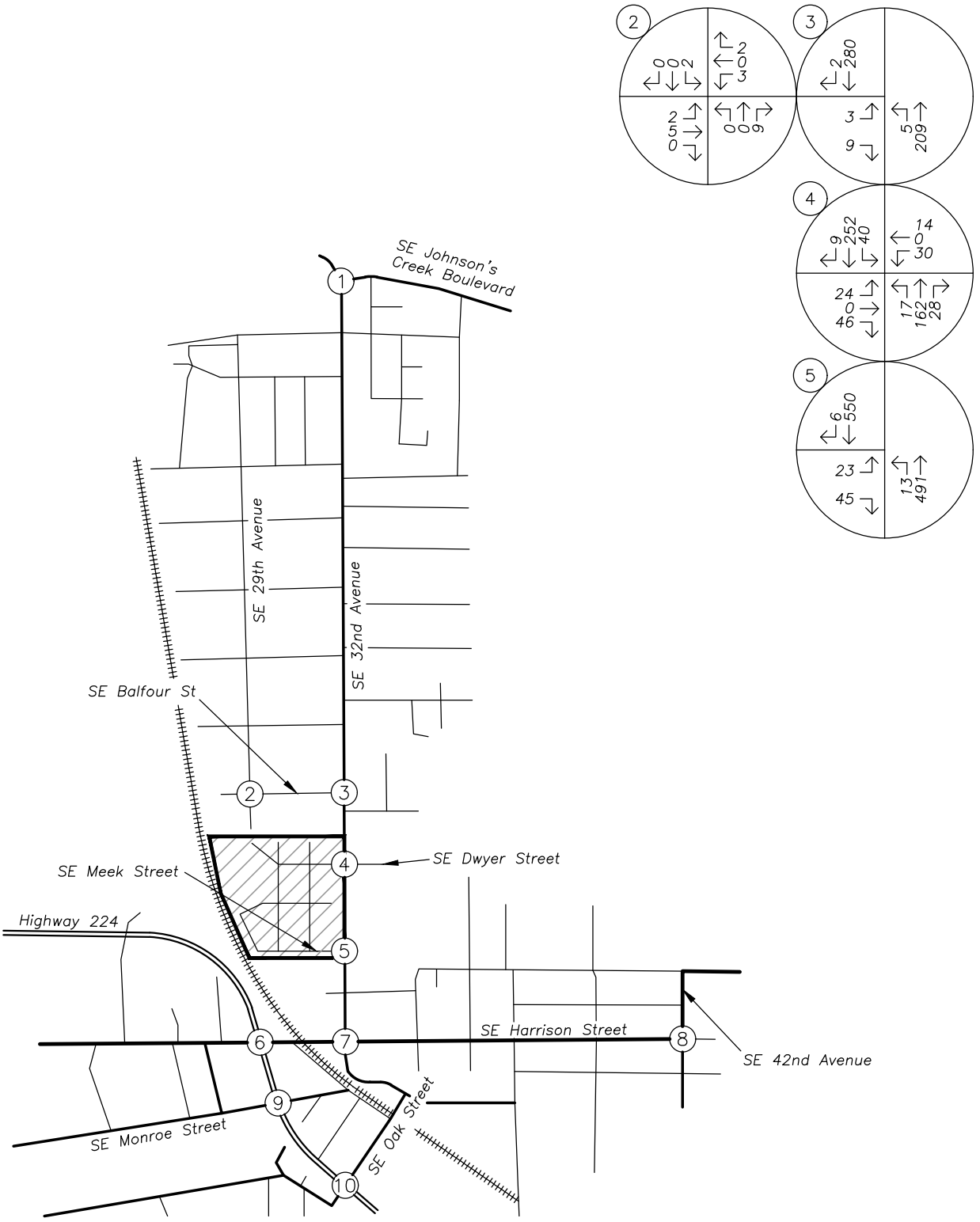
TRAFFIC VOLUMES

In-Process Trips
PM Peak Hour



TRAFFIC VOLUMES

In-Process Trips
AM Peak Hour

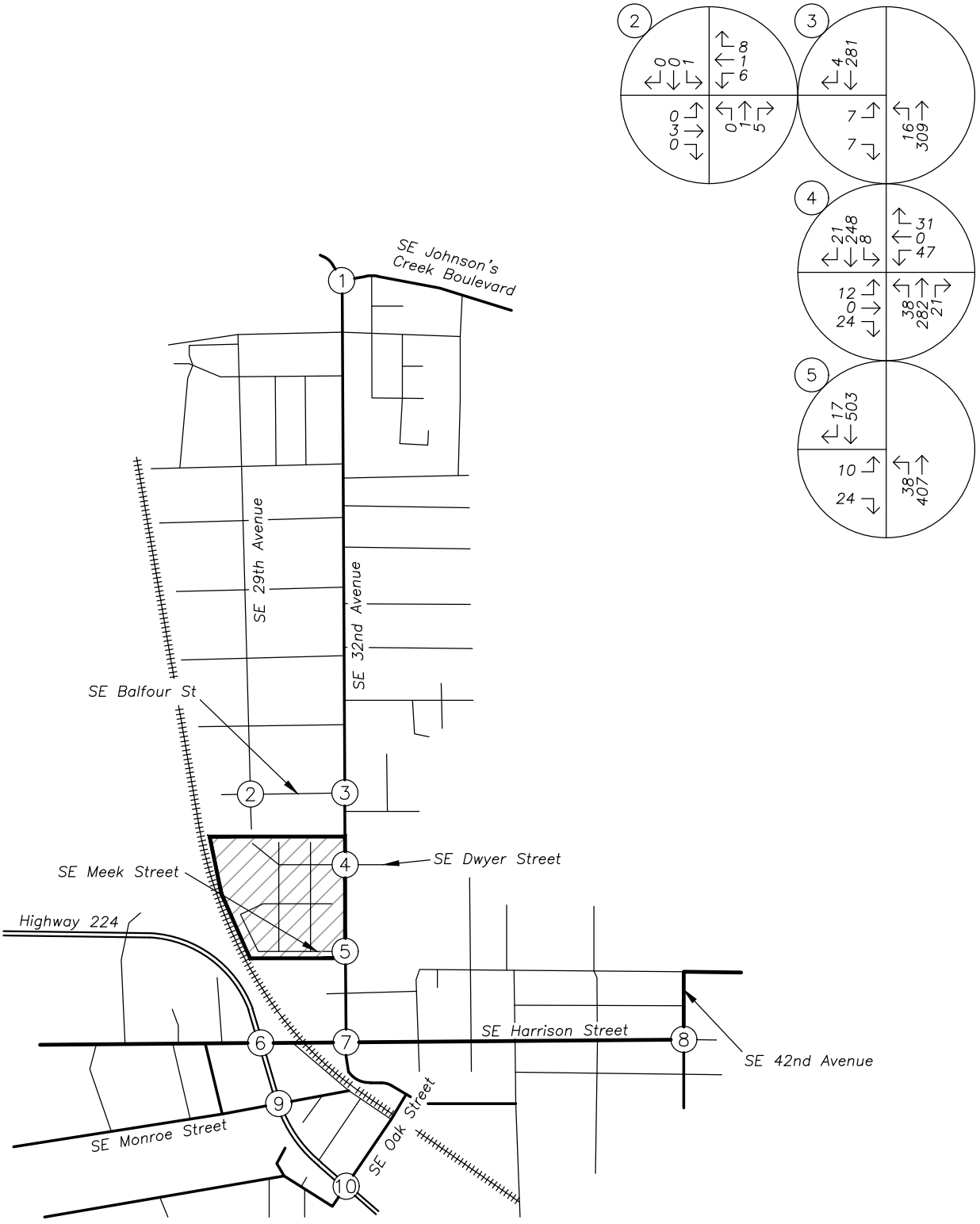


no scale

TRAFFIC VOLUMES

2026 Buildout Conditions with SE 29th Avenue Connection

AM Peak Hour



no scale

TRAFFIC VOLUMES

2026 Buildout Conditions with SE 29th Avenue Connection
PM Peak Hour

CITY OF PORTLAND SE, MULTNOMAH COUNTY

JOHNSON CREEK BLVD at 32ND AVE, City of Portland SE, Multnomah County, 01/01/2014 to 12/31/2018

1 - 4 of 10 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N S	I H V	S L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / TYPE / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
13913	N	N	N					12/09/2015	16	SE JOHNSON CREEK BLVD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NO RPT								WE	0	SE 32ND AVE	N		TRF SIGNAL	N	WET	REAR		PRVTE	N -S									000	00
N								12P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	49	M	OR-Y		026	000		29
N								45 27 45.18	-122 37 47.45																OR<25				
																	02	NONE 0	STOP										
																		PRVTE	N -S									011	00
																		PSNGR CAR		01	DRVR	INJC	37	F	OTH-Y		000	000	00
																									OR<25				
08305	N	N	N					07/18/2016	16	SE JOHNSON CREEK BLVD	INTER	3-LEG	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											29
NONE								MO	0	SE 32ND AVE	N		STOP SIGN	N	DRY	REAR		PRVTE	N -S									000	00
N								4P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	17	M	OR-Y		026	000		29
N								45 27 45.18	-122 37 47.45																OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	N -S									015	00
																		PSNGR CAR		01	DRVR	INJC	26	F	OTH-Y		000	000	00
																									OR<25				
00795	N	N	N		N	N		01/31/2018	16	SE JOHNSON CREEK BLVD	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											07,29
CITY								WE	0	SE 32ND AVE	N		TRF SIGNAL	N	WET	REAR		PRVTE	N -S									000	00
N								10A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	M	UNK	043,026		000		07,29
N								45 27 45.18	-122 37 47.44																UNK				
																	02	NONE 0	STOP										
																		PRVTE	N -S									011	00
																		PSNGR CAR		01	DRVR	INJC	50	F	OR-Y		000	000	00
																									OR<25				
00998	N	N	N		N	N		01/12/2015	16	SE JOHNSON CREEK BLVD	INTER	3-LEG	N	N	CLR	S-1STOP	01	UNKN 9	STRGHT											07
CITY								MO	0	SE 32ND AVE	E		STOP SIGN	N	DRY	REAR		UNKN	E -W									000	00
N								6A			06	0		N	DLIT	INJ		UNKNOWN		01	DRVR	NONE	00	Unk	UNK		026	000		07
N								45 27 45.18	-122 37 47.45																UNK				
																	02	NONE 0	STOP										
																		PRVTE	E -W									011	00
																		PSNGR CAR		01	DRVR	INJC	29	M	OR-Y		000	000	00
																									OR<25				
82647	N	N	N					06/12/2016	17	SE JOHNSON CREEK BLVD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE								SU	0	SE 32ND AVE	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S -N									000	00
N								3P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	38	F	OR-Y		026	000		29
N								45 27 45.18	-122 37 47.45																OR<25				
																	02	NONE 0	STOP										
																		PRVTE	S -N									011	00
																		PSNGR CAR		01	DRVR	INJC	44	F	OR-Y		000	000	00
																									OR<25				

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	M R J U G S	S N V	W I N L	C O H K	DATE / DAY / TIME / LAT	CLASS / DIST FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 0	STOP										
																	PRVTE	S -N									011	00
																	PSNGR CAR		02	PSNG	INJC	46	M			000	000	00
85236	N	N	N				11/10/2016	16	SE JOHNSON CREEK BLVD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										27
NONE							TH	0	SE 32ND AVE	S		STOP SIGN	N	DRY	REAR		N/A	N -S									000	00
N							4P			05	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 27 45.18	-122 37 47.45																UNK				
																02	NONE 9	STOP										
																	N/A	N -S									011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
84187	N	N	N				10/08/2017	16	SE JOHNSON CREEK BLVD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE							SU	0	SE 32ND AVE	S		TRF SIGNAL	N	DRY	REAR		N/A	S -N									000	00
N							6P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 27 45.18	-122 37 47.45																UNK				
																02	NONE 9	STOP										
																	N/A	S -N									011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
07532	N	N	N	N	N		06/29/2016	16	SE JOHNSON CREEK BLVD	INTER	3-LEG	N	Y	CLD	FIX OBJ	01	NONE 0	TURN-R										055	17,08
CITY							WE	0	SE 32ND AVE	CN		TRF SIGNAL	N	DRY	FIX		PRVTE	E -N									000	055	00
N							8A			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	71	M	OR-Y		001	028		17,08
N							45 27 45.18	-122 37 47.45																OR<25				
06838	Y	N	N	N	N		06/27/2017	16	SE JOHNSON CREEK BLVD	INTER	3-LEG	N	N	CLR	OVERTURN	01	NONE 0	TURN-L											01
CITY							TU	0	SE 32ND AVE	CN		TRF SIGNAL	N	DRY	NCOL		PRVTE	N -E									000		00
N							2P			03	0		N	DAY	INJ		MTRCYCLE		01	DRVR	NONE	51	M	OR-Y		047,080	000		01
N							45 27 45.18	-122 37 47.45																OR<25				
																01	NONE 0	TURN-L										
																	PRVTE	N -E									000		00
																	MTRCYCLE		02	PSNG	INJB	53	F			000	000		00
85281	N	N	N				12/12/2017	16	SE JOHNSON CREEK BLVD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-R										02
NONE							TU	0	SE 32ND AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	E -N									016		00
N							5P			02	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJB	68	F	OR-Y		028	000		02
N							45 27 45.18	-122 37 47.45																OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	S -N									000		00
																	PSNGR CAR		01	DRVR	NONE	00	F	OTH-Y		000	000		00
																								OR<25				

CITY OF MILWAUKIE, CLACKAMAS COUNTY

32ND AVE at BALFOUR ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

1 - 1 of 1 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03154	Y	N	N				08/04/2015	17	BALFOUR ST	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L											03,01,32
CITY							TU	0	32ND AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE	W -N									000		00
N							8A			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	24	M	OR-Y		047,052,021	000		03,01,32
N							45 27 6.41	-122 37 47.37																OR<25					
																02	NONE 0	TURN-L											
																	PRVTE	S -W									000		00
																	PSNGR CAR		01	DRVR	NONE	29	F	OR-Y		000	000		00
																								OR<25					

CITY OF MILWAUKIE, CLACKAMAS COUNTY

CLACKAMAS HY at HARRISON ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

1 - 4 of 29 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	S I H L	W C R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
89450	N	N	N				09/12/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE							FR		HARRISON ST	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N -S									000		00
N							11A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		026	000		29
N							45 26 47.55	-122 37 56.24	017100100S00															OR<25					
																02	NONE 0	STOP											
																	PRVTE	N -S									011		00
																	PSNGR CAR		01	DRVR	INJB	71	F	OR-Y		000	000		00
																								OR<25					
01258	Y	Y	N		N	N	04/14/2018	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											01,13,29
CITY							SA		HARRISON ST	N		TRF SIGNAL	N	WET	REAR		PRVTE	N -S									000		00
N							4P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		047,026,045	000		01,13,29
N							45 26 47.55	-122 37 56.24	017100100S00															OR<25					
																02	NONE 0	STRGHT											
																	PRVTE	N -S									011		00
																	PSNGR CAR		01	DRVR	INJC	68	M	OR-Y		000	000		00
																								OR<25					
																02	NONE 0	STRGHT											
																	PRVTE	N -S									011		00
																	PSNGR CAR		02	PSNG	INJC	61	F			000	000		00
01900	N	N	N		N	N	06/03/2018	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	BIKE														110	04
CITY							SU		HARRISON ST	N		TRF SIGNAL	N	DRY	ANGL			-											
N							3P			06	0		N	DAY	INJ			STRGHT	01	BIKE	INJB	68	M		I XWLK	020	035	110	04
N							45 26 47.55	-122 37 56.23	017100100S00									E W											
																01	NONE 0	STRGHT											
																	PRVTE	N -S									000		00
																	PSNGR CAR		01	DRVR	NONE	36	M	OR-Y		000	000		00
																								OR<25					
02097	N	N	N				06/17/2018	12	CLACKAMAS HY	INTER	CROSS	N	N	UNK	BIKE	01	NONE 0	STRGHT											04,18,19
CITY							SU		HARRISON ST	N		TRF SIGNAL	N	WET	ANGL		PRVTE	N -S									000		00
N							8P			06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	76	M	OR-Y		000	000		00
N							45 26 47.55	-122 37 56.23	017100100S00															OR<25					
																		-											
																		STRGHT	01	BIKE	INJC	57	M		I XWLK	020	035		04,18,19
																		E W											

CITY OF MILWAUKIE, CLACKAMAS COUNTY

CLACKAMAS HY at HARRISON ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

5 - 7 of 29 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N S	S I H V	C O R L	W K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01148	N	N	N					04/02/2015	16	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										004	29
NONE								TH		HARRISON ST	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E -W								000		00
N								10A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	41	F	OR-Y		026	000		29
N								45 26 47.55	-122 37 56.24	0171AB100S00															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	E -W									011	004	00
																		PSNGR CAR		01	DRVR	INJC	20	F	OR-Y		000	000		00
																									OR<25				
84017	N	N	N					04/18/2017	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NO RPT								TU		HARRISON ST	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E -W								000		00
N								12P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	38	M	OTH-Y		026	000		29
N								45 26 47.55	-122 37 56.24	017100100S00															N-RES				
																	02	NONE 0	STOP										
																		PRVTE	E -W									011		00
																		PSNGR CAR		01	DRVR	INJC	64	M	OR-Y		000	000		00
																									OR>25				
02530	N	N	N		N	N		06/26/2017	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
CITY								MO		HARRISON ST	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S -N								000		00
N								1P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		026	000		29
N								45 26 47.55	-122 37 56.24	017100100S00															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	S -N									011		00
																		PSNGR CAR		01	DRVR	INJC	38	F	OR-Y		000	000		00
																									OR<25				
																	02	NONE 0	STOP										
																		PRVTE	S -N									011		00
																		PSNGR CAR		02	PSNG	INJC	37	M			000	000		00
04572	Y	Y	N		N	N		11/01/2017	12	CLACKAMAS HY	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											04,06,01
CITY								WE		HARRISON ST	S		TRF SIGNAL	N	DRY	SS-O		PRVTE	S -N								000		00
N								8P			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	38	M	SUSP		020,032,047	000		04,06,01
N								45 26 47.55	-122 37 56.24	017100100S00															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	S -N									011		00
																		PSNGR CAR		01	DRVR	INJC	35	F	OR-Y		000	000		00
																									OR<25				
																	03	NONE 0	STOP										
																		PRVTE	S -N									011		00
																		PSNGR CAR		01	DRVR	NONE	25	M	OR-Y		000	000		00
																									OR<25				

CITY OF MILWAUKIE, CLACKAMAS COUNTY

CLACKAMAS HY at HARRISON ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

8 - 12 of 29 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	S I H L	C O R K	W DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																03	NONE 0 PRVTE PSNGR CAR	STOP S -N	02	PSNG	NO<5	02	M			000	011 000		00 00
02121	N	N	N	N	N		06/19/2018	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
CITY			TU						HARRISON ST	S		TRF SIGNAL	N	DRY	REAR		N/A	S -N									000		00
N N			7A				45 26 47.55	-122 37 56.24	017100100S00	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
																02	NONE 9 N/A PSNGR CAR	STOP S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	011 000		00 00
00686	N	N	N				02/24/2015	16	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											004	29
NO RPT			TU						HARRISON ST	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E									000		00
N N			7A				45 26 47.55	-122 37 56.24	0171AB100S00	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	47	M	OR-Y OR<25		026	000		29
																02	NONE 0 PRVTE PSNGR CAR	STOP W -E	01	DRVR	INJC	26	F	OR-Y OR<25		000	011 000	004	00 00
02296	N	N	N				05/21/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT												29
NONE			SA						HARRISON ST	W		TRF SIGNAL	N	WET	REAR		N/A	W -E									000		00
N N			12A				45 26 47.55	-122 37 56.24	017100100S00	06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
																02	NONE 9 N/A PSNGR CAR	STOP W -E	01	DRVR	NONE	00	Unk	UNK UNK		000	011 000		00 00
05468	N	Y	N				11/24/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	UNK	S-1STOP	01	NONE 0	STRGHT												29
CITY			TH						HARRISON ST	W		TRF SIGNAL	N	UNK	REAR		PRVTE	W -E									000		00
N N			1A				45 26 47.55	-122 37 56.24	017100100S00	06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	26	M	OR-Y OR<25		026	000		29
																01	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	02	PSNG	INJC	27	M			000	000 000		00 00
																02	NONE 0 PRVTE TRUCK	STOP W -E	01	DRVR	NONE	49	M	OR-Y OR<25		000	011 000		00 00

CITY OF MILWAUKIE, CLACKAMAS COUNTY

CLACKAMAS HY at HARRISON ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

13 - 16 of 29 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N S	S I H V	W C O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
02620	N	N	N				07/08/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	TURN-R										29
NONE							TU		HARRISON ST	CN		TRF SIGNAL	N	DRY	REAR		PRVTE	W -S									000	00
N							6P			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	27	F	OR-Y		026	000	29
N							45 26 47.55	-122 37 56.24	017100100S00															OR<25				
																02	NONE 0	STOP										
																	PRVTE	W -E									011	00
																	PSNGR CAR		01	DRVR	NONE	47	M	OR-Y		000	000	00
																								OR<25				
04813	N	N	N				11/26/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
CITY							WE		HARRISON ST	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	N -S									000	00
N							2P			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	58	F	OR-Y		000	000	00
N							45 26 47.55	-122 37 56.24	017100100S00															OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	E -W									000	00
																	PSNGR CAR		01	DRVR	NONE	78	F	OR-Y		020	000	04
																								OR<25				
00489	N	N	N		N	N	01/25/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
CITY							SU		HARRISON ST	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	N -S									000	00
N							3P			03	0		N	DAY	FAT		PSNGR CAR		01	DRVR	NONE	37	M	OR-Y		020	000	04
N							45 26 47.55	-122 37 56.24	017100100S00															OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	W -E									000	00
																	MTRCYCLE		01	DRVR	KILL	42	M	OR-Y		000	000	00
																								OR<25				
01129	N	N	N		N	N	03/31/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 0	STRGHT										04
CITY							TU		HARRISON ST	CN		TRF SIGNAL	N	WET	TURN		PRVTE	S -N									000	00
N							4P			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	84	F	OR-Y		020	000	04
N							45 26 47.55	-122 37 56.24	017100100S00															OR<25				
																01	NONE 0	STRGHT										
																	PRVTE	S -N									000	00
																	PSNGR CAR		02	PSNG	INJB	72	F			000	000	00
																02	NONE 0	TURN-L										
																	PRVTE	N -E									000	00
																	PSNGR CAR		01	DRVR	INJC	55	M	OR-Y		000	000	00
																								OR<25				
01895	N	N	N				05/18/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	TURN-R									004	29
NONE							MO		HARRISON ST	CN		TRF SIGNAL	N	DRY	REAR		PRVTE	E -N									000	00
N							3P			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	39	M	OR-Y		026	000	29
N							45 26 47.55	-122 37 56.24	017100100S00															OR<25				

CITY OF MILWAUKIE, CLACKAMAS COUNTY

CLACKAMAS HY at HARRISON ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

17 - 20 of 29 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	M R U G	J I N S	S C H V	W O R L	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 0	STOP										
																	PRVTE	E -N								013	004	00
																	PSNGR CAR		01	DRVR	INJC	53	M	OR-Y		000	000	00
																								OR<25				
																02	NONE 0	STOP										
																	PRVTE	E -N								013	004	00
																	PSNGR CAR		02	PSNG	INJC	59	F			000	000	00
00101	N	N	N				01/09/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										02
NONE							FR		HARRISON ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	E -W								000		00
N							7A			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	48	F	OR-Y		000	000		00
N							45 26 47.55	-122 37 56.24	017100100S00															OR<25					
																02	NONE 0	TURN-L										
																	UNKN	W -N									000		00
																	UNKNOWN		01	DRVR	NONE	00	M	UNK		028,004	000		02
																								UNK				
01634	N	N	N		N	N	04/10/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										04
CITY							SU		HARRISON ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -N								000		00
N							10P			04	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	23	F	OR-Y		020	000		04
N							45 26 47.55	-122 37 56.24	017100100S00															OR<25					
																02	NONE 0	TURN-L										
																	PRVTE	N -E									000		00
																	PSNGR CAR		01	DRVR	INJA	25	M	OTH-Y		000	000		00
																								N-RES				
04092	N	N	N				09/06/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										02
CITY							TU		HARRISON ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -S								000		00
N							12P			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	46	M	OR-Y		000	000		00
N							45 26 47.55	-122 37 56.24	017100100S00															OR<25					
																01	NONE 0	STRGHT										
																	PRVTE	N -S									000		00
																	PSNGR CAR		02	PSNG	INJC	21	F			000	000		00
																02	NONE 0	TURN-L										
																	PRVTE	S -W									000		00
																	PSNGR CAR		01	DRVR	NONE	29	F	OR-Y		028,004	000		02
																								OR<25				
05942	N	N	N				12/18/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										02
NONE							SU		HARRISON ST	CN		TRF SIGNAL	N	ICE	TURN		PRVTE	W -E								000		00
N							6P			03	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		000	000		00
N							45 26 47.55	-122 37 56.24	017100100S00															OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES / LOC	PED / ERROR	ACT	EVENT	CAUSE
																01	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	02	PSNG	INJC	45	F		000	000		00 00
																02	NONE 0 PRVTE PSNGR CAR	TURN-L E -S	01	DRVR	NONE	19	F	OR-Y OR<25	028,004	000		00 02
00458	N	N	N				01/27/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1TURN	01	NONE 9	TURN-R										08
NONE							WE		HARRISON ST	CN		TRF SIGNAL	N	DRY	TURN		N/A	W -S								000	00
N N							10A 45 26 47.55	-122 37 56.24	017100100S00	03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK	000	000		00
																02	NONE 9 N/A PSNGR CAR	STRGHT W -E	01	DRVR	NONE	00	Unk	UNK UNK	000	000		00 00
00923	N	N	N		N	N	02/26/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 9	TURN-L										02
CITY							FR		HARRISON ST	CN		TRF SIGNAL	N	WET	TURN		N/A	E -S								000	00
N N							9P 45 26 47.55	-122 37 56.24	017100100S00	03	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK	000	000		00
																02	NONE 9 N/A PSNGR CAR	STRGHT W -E	01	DRVR	NONE	00	Unk	UNK UNK	000	000		00 00
05819	N	N	N				12/14/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT									093	04
NO RPT							WE		HARRISON ST	CN		TRF SIGNAL	N	DRY	ANGL		N/A	E -W								000	00
N N							8A 45 26 47.55	-122 37 56.24	017100100S00	02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK	000	000		00
																02	NONE 9 N/A PSNGR CAR	STRGHT S -N	01	DRVR	NONE	00	Unk	UNK UNK	000	000		00 00
00650	N	N	N		N	N	02/18/2017	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										04
CITY							SA		HARRISON ST	CN		TRF SIGNAL	N	WET	ANGL		PRVTE	E -W								000	00
N N							8P 45 26 47.55	-122 37 56.24	017100100S00	01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	21	F	OR-Y OR<25	000	000		00
																01	NONE 0 PRVTE PSNGR CAR	STRGHT E -W	02	PSNG	INJC	21	M		000	000		00 00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	M R G S	J U N V	S I H L	W C O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																01	NONE 0 PRVTE PSNGR CAR	STRGHT E -W	03	PSNG	INJC	23	M			000	000		00 00
																02	NONE 0 PRVTE PSNGR CAR	STRGHT N -S	01	DRVR	NONE	35	M	OR-Y OR<25		020	000		00 04
02402 NONE N N	N	N	N				06/18/2017 SU 8A 45 26 47.55 -122 37 56.24	12	CLACKAMAS HY HARRISON ST 017100100S00	INTER CN 04	CROSS 0	N TRF SIGNAL	N N	CLR DRY DAY	ANGL-OTH ANGL PDO	01	NONE 9 N/A PSNGR CAR	STRGHT S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	000		02 00 00
																02	NONE 9 N/A PSNGR CAR	STRGHT W -E	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
03992 NONE N N	N	N	N				09/26/2017 TU 6A 45 26 47.55 -122 37 56.24	12	CLACKAMAS HY HARRISON ST 017100100S00	INTER CN 01	CROSS 0	N TRF SIGNAL	N N	CLR DRY DAY	O-1 L-TURN TURN PDO	01	NONE 9 N/A PSNGR CAR	TURN-L W -N	01	DRVR	NONE	00	Unk	UNK UNK		000	000		02,08 00 00
																02	NONE 9 N/A PSNGR CAR	STRGHT E -W	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
03832 CITY N N	N	N	N	N	N		10/22/2018 MO 10A 45 26 47.55 -122 37 56.24	12	CLACKAMAS HY HARRISON ST 017100100S00	INTER CN 03	CROSS 0	N TRF SIGNAL	N N	CLR DRY DAY	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT N -S	01	DRVR	NONE	43	M	OR-Y OR<25		020	000		04 00 04
																02	NONE 1 PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	INJC	69	M	OR-Y OR<25		000	000		00 00
02869 NONE N N	N	N	N				08/16/2018 TH 6A 45 26 47.58 -122 37 56.25	12	CLACKAMAS HY HARRISON ST 017100100S00	INTER CN 02	CROSS 0	N TRF SIGNAL	N N	CLR DRY DAWN	ANGL-OTH ANGL PDO	01	NONE 9 N/A PSNGR CAR	STRGHT E -W	01	DRVR	NONE	00	Unk	UNK UNK		000	000		04 00 00
																02	NONE 9 N/A PSNGR CAR	STRGHT S -N	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00

CITY OF MILWAUKIE, CLACKAMAS COUNTY

32ND AVE at HARRISON ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

1 - 5 of 12 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02423	N	N	N		N	N	06/19/2015	16	HARRISON ST	INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	TURN-L											02
CITY							FR	0	32ND AVE	NE		TRF SIGNAL	N	DRY	TURN		PRVTE	N -E									000	00
N							10P			06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	34	M	OTH-Y		028	000	02
N							45 26 47.73	-122 37 46.89																N-RES				
																02	NONE 0	STRGHT										
																	PRVTE	S -N									000	00
																	PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		000	000	00
																								OR<25				
00765	N	N	N				02/25/2017	16	HARRISON ST	INTER	CROSS	N	N	CLR	PED	01	NONE 0	TURN-L											02
CITY							SA	0	32ND AVE	E		TRF SIGNAL	N	DRY	PED		PRVTE	N -E									000	00
N							10A			05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	83	M	OR-Y		029	000	02
N							45 26 47.73	-122 37 46.89																OR<25				
																		- STRGHT	01	PED	INJC	23	M		I XWLK	000	035		00
																		S N										
01009	N	N	N				03/14/2017	16	HARRISON ST	INTER	CROSS	N	Y	RAIN	FIX OBJ	01	NONE 9	TURN-L										053	08
NONE							TU	0	32ND AVE	S		TRF SIGNAL	N	WET	FIX		N/A	E -S									000	00
N							10A			05	0		N	DAY	PDO		FARM TRCTR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 26 47.73	-122 37 46.89																UNK				
02153	N	N	N				06/05/2014	16	HARRISON ST	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE							TH	0	32ND AVE	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E									000	00
N							2P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	60	M	OR-Y		026	000	29
N							45 26 47.73	-122 37 46.89																OR<25				
																02	NONE 0	STOP										
																	PRVTE	W -E									011	00
																	PSNGR CAR		01	DRVR	INJC	34	M	OR-Y		000	000	00
																								OR<25				
01294	N	N	N		N	N	04/03/2014	16	HARRISON ST	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 0	TURN-L											04
CITY							TH	0	32ND AVE	CN		TRF SIGNAL	N	WET	TURN		PRVTE	E -S									000	00
N							7P			03	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	22	M	OR-Y		000	000	00
N							45 26 47.7304439	-122 37 46.890228																OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	W -E									000	00
																	PSNGR CAR		01	DRVR	NONE	40	F	OR-Y		020	000	04
																								OR<25				

CITY OF MILWAUKIE, CLACKAMAS COUNTY

32ND AVE at HARRISON ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

6 - 9 of 12 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	U N V	J H L	S C K	W O R	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
04096	N	N	N					10/05/2015	16	HARRISON ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-R										02
NONE								MO	0	32ND AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	E -N								000	00
N								10A			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	61	F	OR-Y		028	000	02
N								45 26 47.73	-122 37 46.89																OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	S -N									000	00
																		PSNGR CAR		01	DRVR	NONE	41	F	OR-Y		000	000	00
																									OR<25				
00702	N	N	N		N	N		02/12/2016	16	HARRISON ST	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										04
CITY								FR	0	32ND AVE	CN		TRF SIGNAL	N	WET	ANGL		PRVTE	N -S								000	00
N								5P			01	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	INJC	28	F	OR-Y		000	000	00
N								45 26 47.73	-122 37 46.89																OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	E -W									000	00
																		PSNGR CAR		01	DRVR	INJC	37	M	OR-Y		020	000	04
																									OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	E -W									000	00
																		PSNGR CAR		02	PSNG	INJB	29	F			000	000	00
																	02	NONE 0	STRGHT										
																		PRVTE	E -W									000	00
																		PSNGR CAR		03	PSNG	INJB	09	F			000	000	00
01812	N	N	N		N	N		04/20/2016	16	HARRISON ST	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L										02
CITY								WE	0	32ND AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	W -N								000	00
N								12P			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	17	F	OR-Y		028	000	02
N								45 26 47.73	-122 37 46.89																OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	E -W									000	00
																		PSNGR CAR		01	DRVR	NONE	30	F	OR-Y		000	000	00
																									OR<25				
03255	N	N	N		N	N		07/19/2016	16	HARRISON ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
CITY								TU	0	32ND AVE	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	S -N								000	00
N								1P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	34	F	OR-Y		020	000	04
N								45 26 47.73	-122 37 46.89																OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	W -E									000	00
																		PSNGR CAR		01	DRVR	INJC	88	M	OR-Y		000	000	00
																									OR<25				

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
05321	Y	N	N	N	N		11/16/2016	16	HARRISON ST	INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	STRGHT											02,01,08
CITY			WE	0	32ND AVE	CN		TRF SIGNAL	N	WET	TURN		PRVTE	S -N												000		00
N			10A			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	60	F	OR-Y		000	000		00
N			45 26 47.73	-122 37 46.89																				OR<25				
																02	NONE 0	TURN-L										
																	PRVTE	N -E								000		00
																	PSNGR CAR		01	DRVR	INJC	52	F	OR-Y		028,047,004	000		02,01,08
																								OR<25				
00181	N	N	N	N	N		01/16/2018	16	HARRISON ST	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										013	02,08
CITY			TU	0	32ND AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -S												000		00
N			5P			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	32	F	OR-Y		000	000		00
N			45 26 47.73	-122 37 46.89																				OR<25				
																02	NONE 0	TURN-L										
																	PRVTE	S -W								000	013	00
																	PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		028,004	000		02,08
																								OR<25				
																03	NONE 0	STOP										
																	PRVTE	S -W								022		00
																	PSNGR CAR		01	DRVR	NONE	36	F	OR-Y		000	000		00
																								OR<25				
04147	N	N	N	N	N		11/13/2018	16	HARRISON ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										053	04
CITY			TU	0	32ND AVE	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	W -E												000		00
N			10A			04	0		N	DAY	INJ		TRUCK		01	DRVR	INJC	40	M	OR-Y		000	000		00
N			45 26 47.73	-122 37 46.89																				OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	S -N								000	053	00
																	PSNGR CAR		01	DRVR	INJC	38	F	OR-Y		020	000		04
																								OR<25				

CITY OF MILWAUKIE, CLACKAMAS COUNTY

42ND AVE at HARRISON ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

1 - 3 of 3 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	I H L	C O R K	W	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02412	N	N	N					01/11/2016	16	HARRISON ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT											02
NONE								MO	0	42ND AVE	CN		STOP SIGN	N	DRY	ANGL		N/A	S -N									015	00
N								2P			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N								45 26 47.83 -122 37 10.33																	UNK				
																	02	NONE 9	STRGHT										
																		N/A	W -E									015	00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																									UNK				
04451	N	N	N		N	N		10/25/2017	16	HARRISON ST	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT											02
CITY								WE	0	42ND AVE	CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N									015	00
N								2P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	67	F	OR-Y		028	000	02
N								45 26 47.83 -122 37 10.33																	OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	W -E									015	00
																		PSNGR CAR		01	DRVR	NONE	50	M	OR-Y		000	000	00
																									OR<25				
04125	N	N	N					11/10/2018	16	HARRISON ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L											03
NONE								SA	0	42ND AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE	W -N									000	00
N								5P			03	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	76	F	OR-Y		021	000	03
N								45 26 47.83 -122 37 10.33																	OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	N -S									015	00
																		PSNGR CAR		01	DRVR	INJC	37	F	OR-Y		000	000	00
																									OR<25				

CITY OF MILWAUKIE, CLACKAMAS COUNTY

CLACKAMAS HY at MONROE ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

1 - 4 of 11 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	S I H L	C O R K	W	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
03680	N	N	N		N	N		09/19/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE								FR		MONROE ST	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N -S								000	00
N								5P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		043,026	000	07
N								45 26 42.66	-122 37 54.11	017100100S00															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	N -S									011	00
																		PSNGR CAR		01	DRVR	INJC	27	F	OR-Y		000	000	00
																									OR<25				
01531	N	N	N					04/07/2017	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										29
NONE								FR		MONROE ST	N		TRF SIGNAL	N	WET	REAR		PRVTE	N -S								000	00
N								11A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	58	M	OR-Y		026	000	29
N								45 26 42.66	-122 37 54.11	017100100S00															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	N -S									011	00
																		PSNGR CAR		01	DRVR	INJC	38	F	OR-Y		000	000	00
																									OR<25				
																	02	NONE 0	STOP										
																		PRVTE	N -S									011	00
																		PSNGR CAR		02	PSNG	INJC	43	M			000	000	00
00526	N	N	N					02/12/2018	12	CLACKAMAS HY	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										22,29
CITY								MO		MONROE ST	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N -S								000	22
N								4P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		026	000	29
N								45 26 42.66	-122 37 54.11	017100100S00															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	N -S									012	00
																		PSNGR CAR		01	DRVR	INJC	42	F	OR-Y		000	000	00
																									OR<25				
																	02	NONE 0	STOP										
																		PRVTE	N -S									012	00
																		PSNGR CAR		02	PSNG	INJC	11	F			000	000	00
00337	N	N	N		N	N		01/25/2014	17	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
CITY								SA		MONROE ST	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E -W								000	00
N								4P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		026	000	07
N								45 26 42.6596999	-122 37 54.1050599	0171AC100S00															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	E -W									011	00
																		PSNGR CAR		01	DRVR	INJC	33	F	OR-Y		000	000	00
																									OR<25				

CITY OF MILWAUKIE, CLACKAMAS COUNTY

CLACKAMAS HY at MONROE ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

5 - 8 of 11 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
05472	N	N	N		N	N	12/18/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	UNK	S-1STOP	01	NONE 0	STRGHT											29
CITY			FR						MONROE ST	S		TRF SIGNAL	N	WET	REAR		PRVTE	S -N									000	00
N			6P							06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	54	F	OR-Y		026	000	29
N			45 26 42.66	-122 37 54.11	017100100S00																			OR<25				
																02	NONE 0	STOP										
																	PRVTE	S -N									011	00
																	PSNGR CAR		01	DRVR	INJC	48	F	OR-Y		000	000	00
																								OR<25				
																02	NONE 0	STOP										
																	PRVTE	S -N									011	00
																	PSNGR CAR		02	PSNG	INJC	31	F			000	000	00
00122	N	N	N				01/09/2017	12	CLACKAMAS HY	INTER	CROSS	N	N	UNK	S-1STOP	01	NONE 0	STRGHT											29
NONE			MO						MONROE ST	S		TRF SIGNAL	N	WET	REAR		PRVTE	S -N									000	00
N			1P							06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	68	M	OR-Y		026	000	29
N			45 26 42.66	-122 37 54.11	017100100S00																			OR<25				
																02	NONE 0	STOP										
																	PRVTE	S -N									011	00
																	PSNGR CAR		01	DRVR	INJC	62	M	OR-Y		000	000	00
																								OR<25				
02828	N	N	N				08/13/2018	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE			MO						MONROE ST	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S -N									000	00
N			3P							06	0		N	DAY	INJ		TRUCK		01	DRVR	NONE	39	M	OR-Y		026	000	29
N			45 26 42.67	-122 37 54.12	017100100S00																			OR>25				
																02	NONE 0	STOP										
																	PRVTE	S -N									011	00
																	PSNGR CAR		01	DRVR	INJC	68	F	OR-Y		000	000	00
																								OR<25				
01678	N	N	N				05/01/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
NONE			TH						MONROE ST	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	S -N									000	00
N			8A							04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	70	M	OR-Y		000	000	00
N			45 26 42.6596999	-122 37 54.1050599	017100100S00																			OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	W -E									000	00
																	PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		020	000	04
																								OR<25				
02411	N	N	N				06/17/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1TURN	01	NONE 0	TURN-R											08
NONE			WE						MONROE ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	W -S									000	00
N			11A							03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	62	F	OR-Y		006	000	08
N			45 26 42.66	-122 37 54.11	017100100S00																			OR<25				

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	S I H L	C O R K	W	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	02	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	NONE	58	F	OR-Y OR<25		000	000		00 00
03574	N	N	N					09/01/2015 TU 2P 45 26 42.66 -122 37 54.11	12	CLACKAMAS HY MONROE ST 017100100S00	INTER CN 04	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	NONE	58	M	OR-Y OR<25		026	000 000		29 00 29
																	02	NONE 0 PRVTE PSNGR CAR	STOP W -E	01	DRVR	NONE	85	M	OR-Y OR<25		000	011 000		00 00
02887	N	N	N		N	N		06/27/2016 CITY 6P 45 26 42.66 -122 37 54.11	12	CLACKAMAS HY MONROE ST 017100100S00	INTER CN 04	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	NONE	23	M	OR-Y OR<25		016,020	000 038		27,04 00 27,04
																	02	NONE 0 PRVTE PSNGR CAR	STRGHT S -N	01	DRVR	INJA	38	M	OR-Y OR<25		000	000 000		00 00

CITY OF MILWAUKIE, CLACKAMAS COUNTY

CLACKAMAS HY at OAK ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

1 - 4 of 25 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N S	S I H V	W C R L	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
00407	N	N	N				01/03/2017	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE							TU		OAK ST	NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE-SW									000		00
N							7A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		026	000		29
N							45 26 36.14	-122 37 47.2	017100100S00															OR<25					
																02	NONE 0	STOP											
																	PRVTE	NE-SW									011		00
																	PSNGR CAR		01	DRVR	INJC	47	F	OR-Y		000	000		00
																								OR<25					
04906	N	N	N		N	N	11/20/2017	12	CLACKAMAS HY	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											29
CITY							MO		OAK ST	NE		TRF SIGNAL	N	WET	REAR		PRVTE	NE-SW									000		00
N							11A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJA	60	M	OR-Y		028	000		29
N							45 26 36.14	-122 37 47.2	017100100S00															OR<25					
																01	NONE 0	STRGHT											
																	PRVTE	NE-SW									000		00
																	PSNGR CAR		02	PSNG	INJA	54	F			000	000		00
																02	NONE 0	STOP											
																	PRVTE	NE-SW									011		00
																	PSNGR CAR		01	DRVR	NONE	40	M	OR-Y		000	000		00
																								OR<25					
05477	N	N	N				12/21/2017	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NONE							TH		OAK ST	NE		TRF SIGNAL	N	DRY	REAR		N/A	NE-SW									000		00
N							3P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 26 36.14	-122 37 47.2	017100100S00															UNK					
																02	NONE 9	STOP											
																	N/A	NE-SW									011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
01260	N	N	N		N	N	04/14/2018	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										013	27,29
CITY							SA		OAK ST	NE		TRF SIGNAL	N	WET	REAR		PRVTE	NE-SW									000		00
N							7P			06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	INJC	18	M	OR-Y		026	000		27,29
N							45 26 36.14	-122 37 47.2	017100100S00															OR<25					
																02	NONE 0	STOP											
																	PRVTE	NE-SW									011	013	00
																	PSNGR CAR		01	DRVR	INJC	24	F	OR-Y		000	000		00
																								OR<25					
																03	NONE 0	STOP											
																	PRVTE	NE-SW									022		00
																	PSNGR CAR		01	DRVR	NONE	31	M	OR-Y		000	000		00
																								OR<25					

CITY OF MILWAUKIE, CLACKAMAS COUNTY

CLACKAMAS HY at OAK ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

5 - 8 of 25 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
00114	N	N	N		N	N	01/09/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	BIKE	01	NONE 0	STRGHT											19,18,04
CITY			TH						OAK ST	SE		TRF SIGNAL	N	WET	ANGL		PRVTE	NW-SE									000	00
N			6P							05	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJB	68	F	OR-Y		000	000	00
N			45 26 36.1367879					-122 37 47.199576	017100100S00															OR<25				
																		- STRGHT SW NE	01	BIKE	INJA	32	M		I XWLK	020	035	19,18,04
00797	N	N	N		N	N	03/04/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											27,32
NONE			WE						OAK ST	SE		TRF SIGNAL	N	DRY	REAR		PRVTE	SE-NW									000	00
N			4P							06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	27	M	OR-Y		016,026,052	000	27,32
N			45 26 36.14					-122 37 47.2	017100100S00															OR<25				
																02	NONE 0	STOP										
																	PRVTE	SE-NW									011	00
																	PSNGR CAR		01	DRVR	NONE	29	F	OR-Y		000	000	00
																								OR<25				
01260	N	N	N				04/08/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	UNK	S-1STOP	01	NONE 0	STRGHT											07
NONE			WE						OAK ST	SE		TRF SIGNAL	N	UNK	REAR		PRVTE	SE-NW									000	00
N			5P							06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	28	F	SUSP		043,026	000	07
N			45 26 36.14					-122 37 47.2	017100100S00															OR<25				
																02	NONE 0	STOP										
																	PRVTE	SE-NW									011	00
																	PSNGR CAR		01	DRVR	NONE	34	M	OR-Y		000	000	00
																								OR<25				
05281	N	N	N		N	N	11/14/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	PED	01	NONE 0	TURN-L											02,19
CITY			MO						OAK ST	SE		TRF SIGNAL	N	WET	PED		PRVTE	NE-SE									000	00
N			6P							05	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	52	F	OR-Y		029	000	02
N			45 26 36.14					-122 37 47.2	017100100S00															OR<25				
																		- STRGHT NE SW	01	PED	INJC	45	M		I XWLK	000	035	19
01184	N	N	N		N	N	03/14/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 9	STRGHT											13
CITY			MO						OAK ST	SE		TRF SIGNAL	N	DRY	SS-O		N/A	SE-NW									000	00
N			4P							06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N			45 26 36.14					-122 37 47.2	017100100S00															UNK				

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	S I H L	W C O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
																02	NONE 9 N/A PSNGR CAR	STRGHT SE-NW	01	DRVR	NONE	00	Unk	UNK UNK		000	000	00 00
81298	N	N	N				10/15/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE							TH		OAK ST	NW		TRF SIGNAL	N	DRY	REAR		PRVTE	NW-SE									000	00
N N							3P 45 26 36.14	-122 37 47.2	017100100S00	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	57	M	OR-Y OR<25		026	000	29
																02	NONE 0 PRVTE PSNGR CAR	STOP NW-SE	01	DRVR	INJC	77	M	OR-Y OR<25		000	012 000	00 00
04617	N	N	N		N	N	11/05/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	O-1STOP	01	NONE 1	BACK										10
CITY							TH		OAK ST	NW		TRF SIGNAL	N	WET	BACK		PRVTE	SE-NW									000	00
N N							5P 45 26 36.14	-122 37 47.2	017100100S00	06	0		N	DLIT	INJ		SEMI TOW		01	DRVR	NONE	50	M	OTH-Y N-RES		011	000	10
																02	NONE 0 PRVTE PSNGR CAR	STOP NW-SE	01	DRVR	INJC	36	F	OR-Y OR<25		000	011 000	00 00
02231	N	N	N				05/17/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE							TU		OAK ST	NW		TRF SIGNAL	N	DRY	REAR		N/A	NW-SE									000	00
N N							4P 45 26 36.14	-122 37 47.2	017100100S00	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000	00
																02	NONE 9 N/A PSNGR CAR	STOP NW-SE	01	DRVR	NONE	00	Unk	UNK UNK		000	011 000	00 00
05300	N	N	N				12/13/2017	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										27,29
CITY							WE		OAK ST	NW		TRF SIGNAL	N	DRY	REAR		PRVTE	NW-SE									000	00
N N							4A 45 26 36.14	-122 37 47.2	017100100S00	06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJB	28	F	OR-Y OR<25		026	038	27,29
																02	NONE 0 PRVTE PSNGR CAR	STOP NW-SE	01	DRVR	NONE	32	M	OR-Y OR<25		000	012 000	00 00
00249	N	N	N				01/19/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
NONE							SU		OAK ST	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	SW-NE									000	00
N N							4P 45 26 36.1367879	-122 37 47.199576	017100100S00	04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y UNK		020	000	04

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	I H L	S C O W K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 0	STRGHT										
																	PRVTE	NW-SE									000	00
																	PSNGR CAR		01	DRVR	INJC	59	M	OR-Y		000	000	00
																								OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	NW-SE									000	00
																	PSNGR CAR		02	PSNG	INJC	57	M			000	000	00
00913	N	N	N	N	N		03/04/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	TURN-L										02,04
CITY			TU						OAK ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	NE-SE									000	00
N			6P							04	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	INJC	29	M	OTH-Y		028	000	02
N			45 26 36.1367879					-122 37 47.199576	017100100S00															OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	SW-NE									000	00
																	PSNGR CAR		01	DRVR	INJC	37	M	OR-Y		020	000	04
																								OR<25				
01129	N	N	N				03/21/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										02
NO RPT			FR						OAK ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SW-NE									000	00
N			6P							04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	41	F	OR-Y		000	000	00
N			45 26 36.1367879					-122 37 47.199576	017100100S00															OR<25				
																02	NONE 0	TURN-L										
																	PRVTE	NE-SE									000	00
																	PSNGR CAR		01	DRVR	NONE	56	F	OR-Y		028,004	000	02
																								OR<25				
04126	N	N	N	N	N		10/17/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										04
CITY			FR						OAK ST	CN		TRF SIGNAL	N	WET	ANGL		PRVTE	SW-NE									000	00
N			10P							02	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	77	M	OR-Y		020	000	04
N			45 26 36.14					-122 37 47.2	017100100S00															OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	SE-NW									000	00
																	PSNGR CAR		01	DRVR	INJC	27	M	OR-Y		000	000	00
																								OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	SE-NW									000	00
																	PSNGR CAR		02	PSNG	INJC	21	M			000	000	00
																02	NONE 0	STRGHT										
																	PRVTE	SE-NW									000	00
																	PSNGR CAR		03	PSNG	INJC	23	M			000	000	00

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	I H L	C S K	O R	W DAY / TIME / LAT	DATE / DIST FROM / LONG	CLASS / CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
04501	N	N	N					11/07/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
NO RPT								FR		OAK ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	NE-SW								000		00
N								9A			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	33	F	OR-Y		000	000	00
N								45 26 36.14	-122 37 47.2	017100100S00															OR<25				
																	01	NONE 0	STRGHT										
																		PRVTE	NE-SW									000	00
																		PSNGR CAR		02	PSNG	NO<5	01	F			000	000	00
																	02	NONE 0	TURN-R										
																		PRVTE	NW-SW									015	00
																		PSNGR CAR		01	DRVR	NONE	69	F	OR-Y		028	000	02
																									OR<25				
04516	N	N	N		N	N		11/08/2014	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L										02
CITY								SA		OAK ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	NE-SE								000		00
N								11A			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	64	M	OR-Y		028	000	02
N								45 26 36.14	-122 37 47.2	017100100S00															OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	SW-NE									000	00
																		PSNGR CAR		01	DRVR	INJC	61	F	OR-Y		000	000	00
																									OR<25				
00538	N	N	N		N	N		02/01/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										013	04
CITY								MO		OAK ST	CN		TRF SIGNAL	N	WET	ANGL		PRVTE	SE-NW								000		00
N								8P			02	0		N	DARK	INJ		PSNGR CAR		01	DRVR	INJC	32	F	OR-Y		020	000	04
N								45 26 36.14	-122 37 47.2	017100100S00															OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	SW-NE									000	013 00
																		PSNGR CAR		01	DRVR	INJC	39	F	OR-Y		000	000	00
																									OR<25				
																	03	NONE 0	STOP										
																		PRVTE	NE-SW									022	00
																		PSNGR CAR		01	DRVR	INJC	18	F	OR-Y		000	000	00
																									OR<25				
00556	N	N	N		N	N		02/03/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 0	STRGHT										02
CITY								WE		OAK ST	CN		TRF SIGNAL	N	WET	TURN		PRVTE	NE-SW								000		00
N								3P			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	76	M	OR-Y		000	000	00
N								45 26 36.14	-122 37 47.2	017100100S00															OR<25				
																	02	NONE 0	TURN-L										
																		PRVTE	SW-NW									000	00
																		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		028,004	000	02
																									OR<25				

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
04816	N	N	N		N	N	10/18/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT											04
CITY			TU				OAK ST		CN		TRF SIGNAL	N	WET	ANGL			PRVTE	SW-NE									000	00
N			6P						04	0		N	DAY	INJ			PSNGR CAR		01	DRVR	NONE	45	M	OR-Y		000	000	00
N			45 26 36.14		-122 37 47.2		017100100S00																	OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	NW-SE									000	00
																	PSNGR CAR		01	DRVR	INJC	27	M	OR-Y		028	000	04
																								UNK				
01981	N	N	N		N	N	05/02/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L											02
CITY			MO				OAK ST		CN		TRF SIGNAL	N	DRY	TURN			N/A	NE-SE									000	00
N			12P						04	0		N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N			45 26 36.14		-122 37 47.2		017100100S00																	UNK				
																02	NONE 9	STRGHT										
																	N/A	SW-NE									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
03380	N	N	N				07/21/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	STRGHT											02,08
CITY			TH				OAK ST		CN		TRF SIGNAL	N	DRY	TURN			N/A	SW-NE									000	00
N			11A						04	0		N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N			45 26 36.14		-122 37 47.2		017100100S00																	UNK				
																02	NONE 9	TURN-L										
																	N/A	NE-SE									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
04759	N	N	N				11/12/2017	12	CLACKAMAS HY	INTER		N	N	RAIN	O-1 L-TURN	01	NONE 9	STRGHT											02,08
NONE			SU				OAK ST		CN		TRF SIGNAL	N	WET	TURN			N/A	NE-SW									000	00
N			6P						01	0		N	DUSK	PDO			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N			45 26 36.14		-122 37 47.2		017100100S00			(04)														UNK				
																02	NONE 9	TURN-L										
																	N/A	SW-NW									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				

Left-Turn Lane Warrant Analysis

Project: Hillside Master Plan
Intersection: SE Dwyer Street at SE 32nd Avenue (Northbound)
Date: 8/24/2020
Scenario: 2026 Buildout Conditions - AM Peak Hour

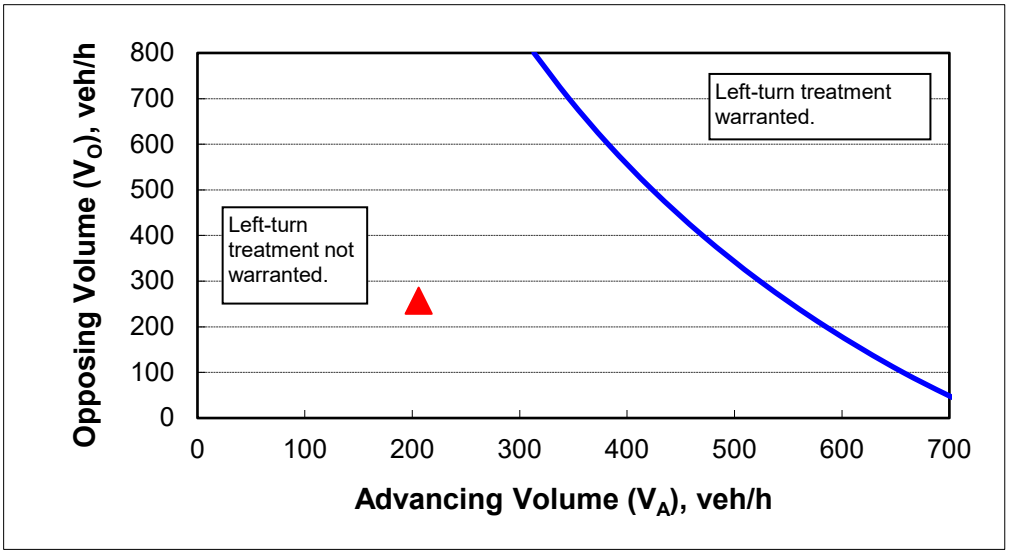
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	8%
Advancing volume (V_A), veh/h:	206
Opposing volume (V_O), veh/h:	257

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	549
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Hillside Master Plan
Intersection: SE Dwyer Street at SE 32nd Avenue (Southbound)
Date: 8/24/2020
Scenario: 2026 Buildout Conditions - AM Peak Hour

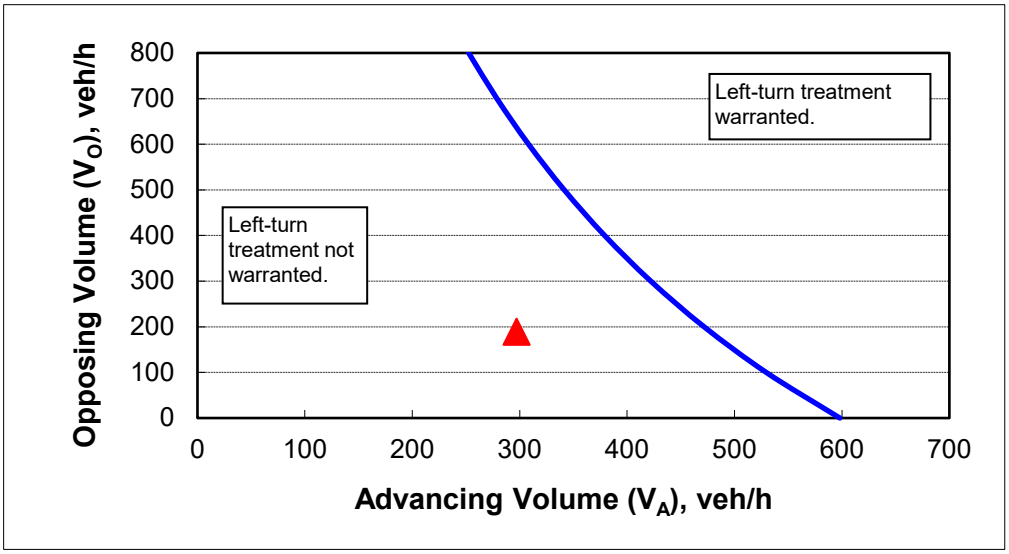
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	13%
Advancing volume (V_A), veh/h:	297
Opposing volume (V_O), veh/h:	189

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	478
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Hillside Master Plan
Intersection: SE Dwyer Street at SE 32nd Avenue (Northbound)
Date: 8/24/2020
Scenario: 2026 Buildout Conditions - PM Peak Hour

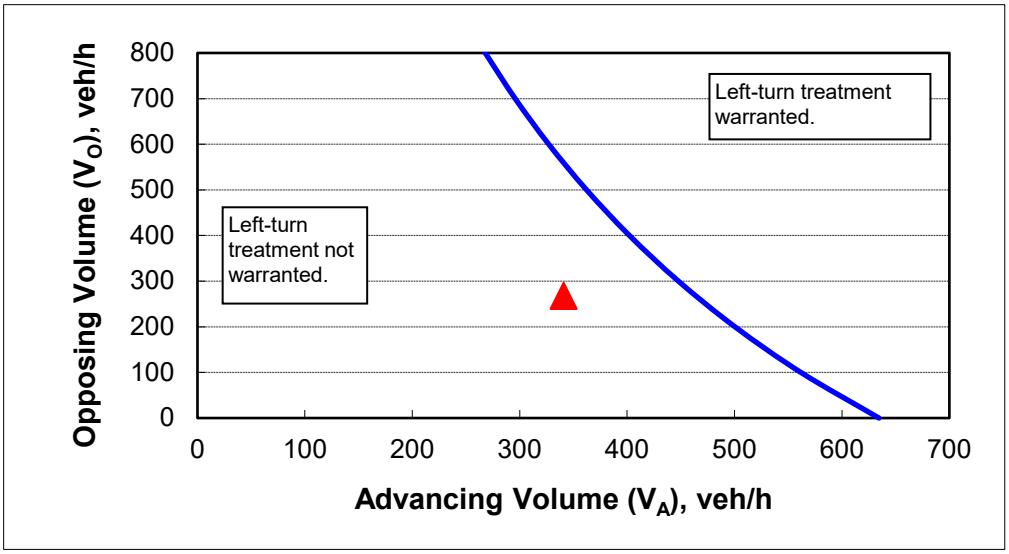
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	12%
Advancing volume (V_A), veh/h:	341
Opposing volume (V_O), veh/h:	268

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	464
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Hillside Master Plan
Intersection: SE Dwyer Street at SE 32nd Avenue (Southbound)
Date: 8/24/2020
Scenario: 2026 Buildout Conditions - PM Peak Hour

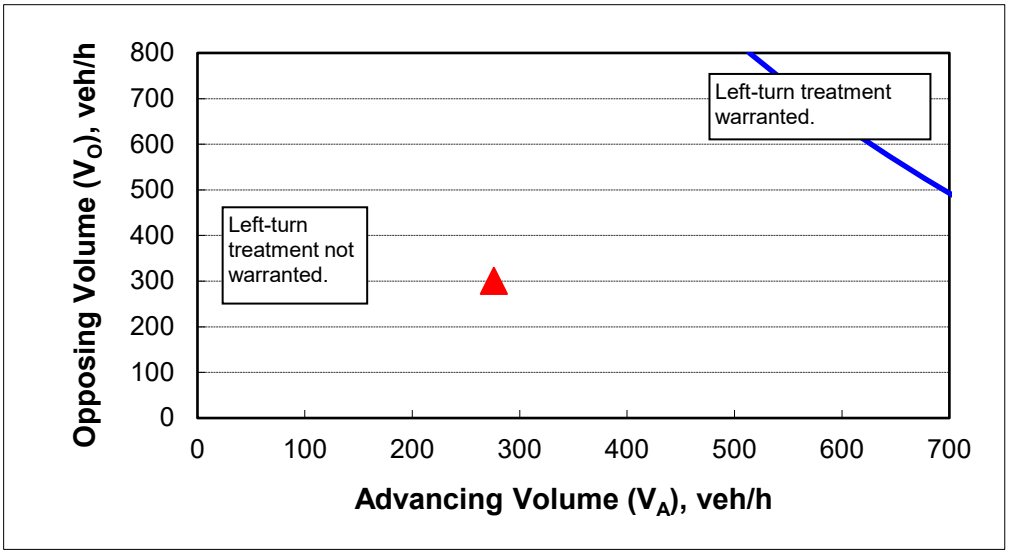
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	3%
Advancing volume (V_A), veh/h:	276
Opposing volume (V_O), veh/h:	301

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	858
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Hillside Master Plan
Intersection: SE Meek Street at SE 32nd Avenue (Northbound)
Date: 8/24/2020
Scenario: 2026 Buildout Conditions - AM Peak Hour

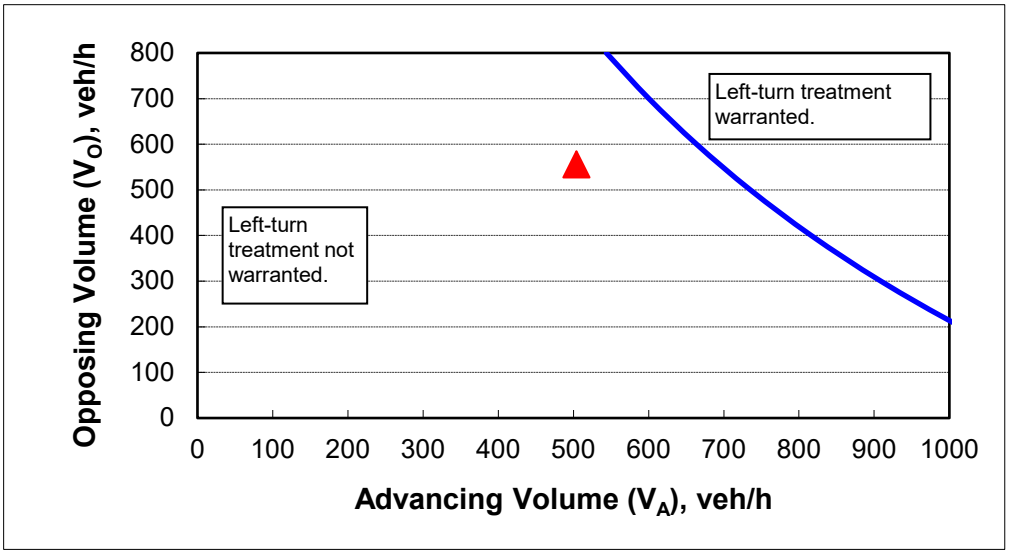
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	3%
Advancing volume (V_A), veh/h:	504
Opposing volume (V_O), veh/h:	556

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	694
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Hillside Master Plan
Intersection: SE Meek Street at SE 32nd Avenue (Northbound)
Date: 8/24/2020
Scenario: 2026 Buildout Conditions - PM Peak Hour

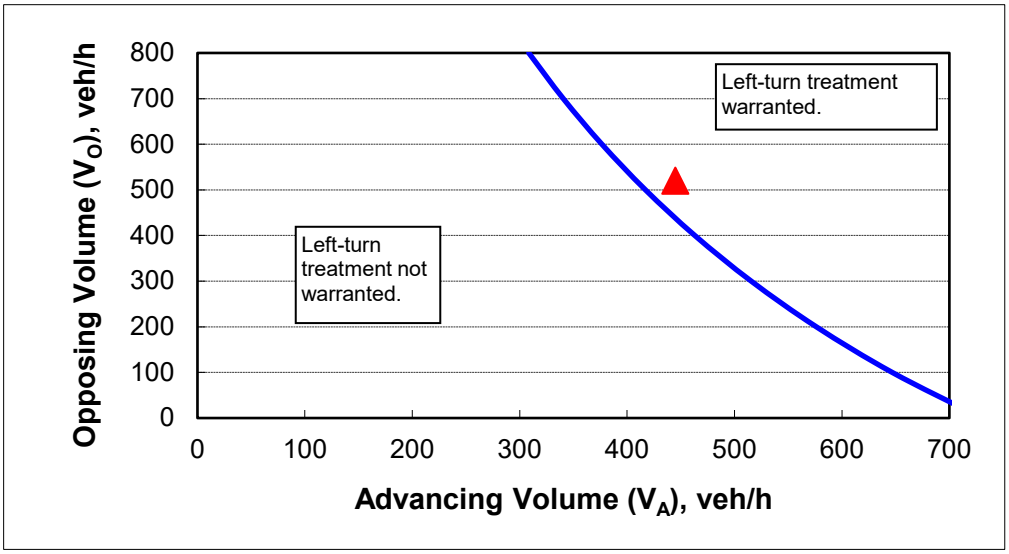
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	9%
Advancing volume (V_A), veh/h:	445
Opposing volume (V_O), veh/h:	520

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	409
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Traffic Signal Warrant Analysis

Project: Hillside Master Plan
Date: 7/30/2020
Scenario: 2026 Buildout Conditions

Major Street:	SE Harrison Street (EB)/ SE 42nd Avenue (SB)	Minor Street:	SE Harrison Street (WB)/ SE 42nd Avenue (NB)
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	760	PM Peak Hour Volumes:	402

Warrant Used:

X — 100 percent of standard warrants used

_____ — 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	7,600	8,850	
Minor Street*	4,020	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	7,600	13,300	
Minor Street*	4,020	1,350	**No**
Combination Warrant			
Major Street	7,600	10,640	
Minor Street*	4,020	2,120	**No**

Note: Minor street right-turning traffic volumes reduced by 85% of the right-turn capacity.

Traffic Signal Warrant Analysis

Project: Hillside Master Plan
Date: 7/30/2020
Scenario: 2026 Buildout Conditions

Major Street:	SE Harrison Street	Minor Street:	SE 42nd Avenue
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	534	PM Peak Hour Volumes:	474

Warrant Used:

X — 100 percent of standard warrants used

_____ — 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	5,340	8,850	
Minor Street*	4,740	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	5,340	13,300	
Minor Street*	4,740	1,350	**No**
Combination Warrant			
Major Street	5,340	10,640	
Minor Street*	4,740	2,120	**No**

Note: Minor street right-turning traffic volumes reduced by 85% of the right-turn capacity.

Traffic Signal Warrant Analysis

Project: Hillside Master Plan
Date: 7/30/2020
Scenario: 2026 Buildout Conditions

Major Street:	SE 42nd Avenue	Minor Street:	SE Harrison Street
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	664	PM Peak Hour Volumes:	469

Warrant Used:

X — 100 percent of standard warrants used

_____ — 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	6,640	8,850	
Minor Street*	4,690	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	6,640	13,300	
Minor Street*	4,690	1,350	**No**
Combination Warrant			
Major Street	6,640	10,640	
Minor Street*	4,690	2,120	**No**

Note: Minor street right-turning traffic volumes reduced by 85% of the right-turn capacity.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	28	740	272	57	319	102
Future Volume (vph)	28	740	272	57	319	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	0.98	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	0.98			1.00
Flt Protected	0.95	1.00	1.00			0.96
Satd. Flow (prot)	1770	1547	1849			1795
Flt Permitted	0.95	1.00	1.00			0.96
Satd. Flow (perm)	1770	1547	1849			1795
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	30	796	292	61	343	110
RTOR Reduction (vph)	0	178	7	0	0	0
Lane Group Flow (vph)	30	618	346	0	0	453
Confl. Peds. (#/hr)	3			1	1	
Confl. Bikes (#/hr)		6				
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	3		1		2	2
Permitted Phases		1 2				
Actuated Green, G (s)	1.6	49.8	20.5			25.3
Effective Green, g (s)	1.6	49.8	20.5			25.3
Actuated g/C Ratio	0.02	0.78	0.32			0.39
Clearance Time (s)	4.0		4.0			4.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	44	1201	591			708
v/s Ratio Prot	c0.02		c0.19			c0.25
v/s Ratio Perm		0.40				
v/c Ratio	0.68	0.51	0.58			0.64
Uniform Delay, d1	31.0	2.7	18.2			15.7
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	35.7	0.4	1.5			1.9
Delay (s)	66.7	3.0	19.7			17.6
Level of Service	E	A	B			B
Approach Delay (s)	5.3		19.7			17.6
Approach LOS	A		B			B

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	64.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	5	0	2	0	2	0	0	4	2	0	0
Future Vol, veh/h	2	5	0	2	0	2	0	0	4	2	0	0
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	9	0	4	0	4	0	0	7	4	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	6.8	6.4	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	29%	50%	100%
Vol Thru, %	0%	71%	0%	0%
Vol Right, %	100%	0%	50%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	7	4	2
LT Vol	0	2	2	2
Through Vol	0	5	0	0
RT Vol	4	0	2	0
Lane Flow Rate	7	12	7	4
Geometry Grp	1	1	1	1
Degree of Util (X)	0.007	0.014	0.007	0.004
Departure Headway (Hd)	3.336	3.98	3.727	4.138
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1077	904	964	868
Service Time	1.344	1.985	1.733	2.147
HCM Lane V/C Ratio	0.006	0.013	0.007	0.005
HCM Control Delay	6.4	7	6.8	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0	0

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	5	4	170	254	2
Future Vol, veh/h	2	5	4	170	254	2
Conflicting Peds, #/hr	0	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	7	7	6	6
Mvmt Flow	2	6	5	198	295	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	505	298	298	0	-	0
Stage 1	297	-	-	-	-	-
Stage 2	208	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.263	-	-	-
Pot Cap-1 Maneuver	530	746	1235	-	-	-
Stage 1	758	-	-	-	-	-
Stage 2	832	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	526	745	1234	-	-	-
Mov Cap-2 Maneuver	526	-	-	-	-	-
Stage 1	753	-	-	-	-	-
Stage 2	831	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1234	-	666	-	-
HCM Lane V/C Ratio	0.004	-	0.012	-	-
HCM Control Delay (s)	7.9	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	0	29	0	13	0	143	27	38	229	0
Future Vol, veh/h	0	0	0	29	0	13	0	143	27	38	229	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	7	7	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	9	9	9	10	10	10	5	5	5
Mvmt Flow	0	0	0	36	0	16	0	177	33	47	283	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	579	594	283	578	578	201	283	0	0	217	0	0
Stage 1	377	377	-	201	201	-	-	-	-	-	-	-
Stage 2	202	217	-	377	377	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.19	6.59	6.29	4.2	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.581	4.081	3.381	2.29	-	-	2.245	-	-
Pot Cap-1 Maneuver	429	421	761	417	417	822	1235	-	-	1335	-	-
Stage 1	649	619	-	785	722	-	-	-	-	-	-	-
Stage 2	805	727	-	630	604	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	407	400	761	401	397	817	1235	-	-	1326	-	-
Mov Cap-2 Maneuver	407	400	-	401	397	-	-	-	-	-	-	-
Stage 1	649	593	-	780	717	-	-	-	-	-	-	-
Stage 2	789	722	-	604	579	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.5	0	1.1
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1235	-	-	-	476	1326	-	-
HCM Lane V/C Ratio	-	-	-	-	0.109	0.035	-	-
HCM Control Delay (s)	0	-	-	0	13.5	7.8	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0.1	-	-

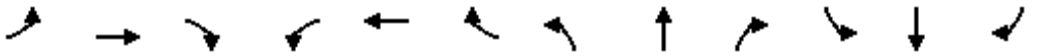
Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	29	9	457	484	4
Future Vol, veh/h	13	29	9	457	484	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	16	36	11	564	598	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1187	601	603	0	-	0
Stage 1	601	-	-	-	-	-
Stage 2	586	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	210	504	984	-	-	-
Stage 1	551	-	-	-	-	-
Stage 2	560	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	207	504	984	-	-	-
Mov Cap-2 Maneuver	207	-	-	-	-	-
Stage 1	542	-	-	-	-	-
Stage 2	560	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.1	0.2	0
HCM LOS	C		

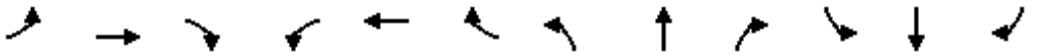
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	984	-	349	-	-
HCM Lane V/C Ratio	0.011	-	0.149	-	-
HCM Control Delay (s)	8.7	0	17.1	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	120	40	39	179	296	57	1762	55	90	868	13
Future Volume (vph)	18	120	40	39	179	296	57	1762	55	90	868	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95			0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00			0.99		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3018			3134		1719	3438	1538	1703	3406	1524
Flt Permitted		0.73			0.91		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		2228			2860		1719	3438	1538	1703	3406	1524
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	19	129	43	42	192	318	61	1895	59	97	933	14
RTOR Reduction (vph)	0	23	0	0	131	0	0	0	20	0	0	5
Lane Group Flow (vph)	0	168	0	0	421	0	61	1895	39	97	933	9
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	15%	15%	15%	4%	4%	4%	5%	5%	5%	6%	6%	6%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		21.0			21.0		7.9	72.8	72.8	10.2	75.1	75.1
Effective Green, g (s)		22.0			22.0		7.9	75.8	75.8	10.2	78.1	78.1
Actuated g/C Ratio		0.18			0.18		0.07	0.63	0.63	0.08	0.65	0.65
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		408			524		113	2171	971	144	2216	991
v/s Ratio Prot							0.04	c0.55		c0.06	0.27	
v/s Ratio Perm		0.08			c0.15				0.03			0.01
v/c Ratio		0.41			0.80		0.54	0.87	0.04	0.67	0.42	0.01
Uniform Delay, d1		43.3			46.9		54.3	18.1	8.4	53.3	10.1	7.4
Progression Factor		1.00			1.00		1.26	0.80	0.20	1.00	1.00	1.00
Incremental Delay, d2		0.7			8.7		3.5	3.8	0.1	11.8	0.6	0.0
Delay (s)		44.0			55.6		72.1	18.2	1.7	65.0	10.7	7.4
Level of Service		D			E		E	B	A	E	B	A
Approach Delay (s)		44.0			55.6			19.4			15.7	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



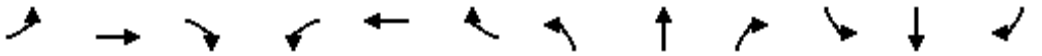
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	120	40	39	179	296	57	1762	55	90	868	13
Future Volume (veh/h)	18	120	40	39	179	296	57	1762	55	90	868	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1678	1678	1678	1841	1841	1841	1826	1826	1826	1811	1811	1811
Adj Flow Rate, veh/h	19	129	43	42	192	318	61	1895	59	97	933	14
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	15	15	15	4	4	4	5	5	5	6	6	6
Cap, veh/h	39	258	101	36	85	283	78	2187	975	120	2255	1006
Arrive On Green	0.19	0.20	0.19	0.19	0.20	0.19	0.09	1.00	1.00	0.07	0.66	0.66
Sat Flow, veh/h	2	1292	504	1	427	1416	1739	3469	1547	1725	3441	1535
Grp Volume(v), veh/h	69	0	122	234	0	318	61	1895	59	97	933	14
Grp Sat Flow(s),veh/h/ln	363	0	1435	428	0	1416	1739	1735	1547	1725	1721	1535
Q Serve(g_s), s	7.2	0.0	9.0	18.8	0.0	24.0	4.1	0.0	0.0	6.7	15.4	0.4
Cycle Q Clear(g_c), s	7.2	0.0	9.0	18.8	0.0	24.0	4.1	0.0	0.0	6.7	15.4	0.4
Prop In Lane	0.28		0.35	0.18		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	287	0	0	283	78	2187	975	120	2255	1006
V/C Ratio(X)	0.00	0.00	0.43	0.00	0.00	1.12	0.79	0.87	0.06	0.81	0.41	0.01
Avail Cap(c_a), veh/h	0	0	287	0	0	283	159	2187	975	158	2255	1006
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.79	0.00	0.79	0.64	0.64	0.64	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	42.1	0.0	0.0	48.5	54.1	0.0	0.0	55.0	9.8	7.2
Incr Delay (d2), s/veh	0.0	0.0	1.0	0.0	0.0	85.2	10.6	3.2	0.1	20.2	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	3.3	0.0	0.0	15.2	1.9	1.0	0.0	3.5	5.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	43.1	0.0	0.0	133.7	64.7	3.2	0.1	75.2	10.3	7.2
LnGrp LOS	A	A	D	A	A	F	E	A	A	E	B	A
Approach Vol, veh/h		191			552			2015			1044	
Approach Delay, s/veh		27.7			77.0			5.0			16.3	
Approach LOS		C			E			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	82.6		28.0	12.4	79.6		28.0				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	11.0	70.0		23.0	11.0	70.0		23.0				
Max Q Clear Time (g_c+I1), s	6.1	17.4		26.0	8.7	2.0		11.0				
Green Ext Time (p_c), s	0.0	7.8		0.0	0.0	28.6		0.8				

Intersection Summary		
HCM 6th Ctrl Delay		19.7
HCM 6th LOS		B

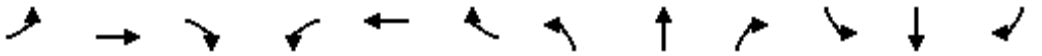
Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	107	4	21	397	22	45	134	14	16	105	152
Future Volume (vph)	105	107	4	21	397	22	45	134	14	16	105	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1641	1717		1748	1828			1840	1535		1779	1502
Flt Permitted	0.95	1.00		0.68	1.00			0.89	1.00		0.94	1.00
Satd. Flow (perm)	1641	1717		1257	1828			1652	1535		1686	1502
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	109	111	4	22	414	23	47	140	15	17	109	158
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	12	0	0	122
Lane Group Flow (vph)	109	114	0	22	435	0	0	187	3	0	126	36
Confl. Peds. (#/hr)	3		3	3		3			5	5		
Confl. Bikes (#/hr)			2			1			2			2
Heavy Vehicles (%)	10%	10%	10%	3%	3%	3%	2%	2%	2%	6%	6%	6%
Turn Type	Prot	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases				6			8		8	4		4
Actuated Green, G (s)	7.6	26.5		22.7	20.8			12.6	12.6		12.6	12.6
Effective Green, g (s)	7.6	26.5		22.7	20.8			12.6	12.6		12.6	12.6
Actuated g/C Ratio	0.14	0.48		0.41	0.38			0.23	0.23		0.23	0.23
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	226	827		535	691			378	351		386	344
v/s Ratio Prot	c0.07	0.07		0.00	c0.24							
v/s Ratio Perm				0.02				c0.11	0.00		0.07	0.02
v/c Ratio	0.48	0.14		0.04	0.63			0.49	0.01		0.33	0.11
Uniform Delay, d1	21.9	7.9		9.6	14.0			18.4	16.4		17.7	16.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.6	0.1		0.0	1.8			1.0	0.0		0.5	0.1
Delay (s)	23.5	8.0		9.6	15.8			19.5	16.4		18.2	16.9
Level of Service	C	A		A	B			B	B		B	B
Approach Delay (s)		15.5			15.5			19.2			17.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	107	4	21	397	22	45	134	14	16	105	152
Future Volume (veh/h)	105	107	4	21	397	22	45	134	14	16	105	152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.96	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1856	1856	1856	1870	1870	1870	1811	1811	1811
Adj Flow Rate, veh/h	109	111	4	22	414	23	47	140	15	17	109	158
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	3	3	3	2	2	2	6	6	6
Cap, veh/h	140	680	25	667	597	33	175	272	296	133	317	291
Arrive On Green	0.08	0.41	0.41	0.02	0.34	0.34	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1668	1679	60	1767	1739	97	275	1406	1527	115	1636	1501
Grp Volume(v), veh/h	109	0	115	22	0	437	187	0	15	126	0	158
Grp Sat Flow(s),veh/h/ln	1668	0	1739	1767	0	1835	1681	0	1527	1750	0	1501
Q Serve(g_s), s	2.4	0.0	1.6	0.3	0.0	7.6	1.3	0.0	0.3	0.0	0.0	3.5
Cycle Q Clear(g_c), s	2.4	0.0	1.6	0.3	0.0	7.6	3.5	0.0	0.3	2.2	0.0	3.5
Prop In Lane	1.00		0.03	1.00		0.05	0.25		1.00	0.13		1.00
Lane Grp Cap(c), veh/h	140	0	705	667	0	630	448	0	296	450	0	291
V/C Ratio(X)	0.78	0.00	0.16	0.03	0.00	0.69	0.42	0.00	0.05	0.28	0.00	0.54
Avail Cap(c_a), veh/h	949	0	1413	1394	0	1491	1218	0	1034	1267	0	1017
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.6	0.0	7.0	7.5	0.0	10.5	13.4	0.0	12.1	12.9	0.0	13.4
Incr Delay (d2), s/veh	9.0	0.0	0.1	0.0	0.0	1.4	0.6	0.0	0.1	0.3	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.4	0.1	0.0	2.6	1.2	0.0	0.1	0.8	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.6	0.0	7.1	7.6	0.0	11.8	14.0	0.0	12.2	13.2	0.0	15.0
LnGrp LOS	C	A	A	A	A	B	B	A	B	B	A	B
Approach Vol, veh/h		224			459			202			284	
Approach Delay, s/veh		16.1			11.6			13.8			14.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	20.0		12.2	7.1	17.7		12.2				
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	16.0	30.0		25.0	21.0	30.0		25.0				
Max Q Clear Time (g_c+I1), s	2.3	3.6		5.5	4.4	9.6		5.5				
Green Ext Time (p_c), s	0.0	0.6		1.2	0.2	2.9		1.1				

Intersection Summary			
HCM 6th Ctrl Delay		13.5	
HCM 6th LOS		B	

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	137	8	11	17	27	5	27	129	5	3	128	266
Future Vol, veh/h	137	8	11	17	27	5	27	129	5	3	128	266
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	6	6	6	6	6	6	3	3	3	5	5	5
Mvmt Flow	147	9	12	18	29	5	29	139	5	3	138	286
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

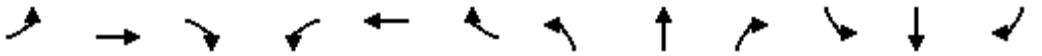
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	11.8	9.8	11.1	10.3
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	17%	94%	0%	39%	0%	2%	0%
Vol Thru, %	80%	6%	0%	61%	0%	98%	0%
Vol Right, %	3%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	161	145	11	44	5	131	266
LT Vol	27	137	0	17	0	3	0
Through Vol	129	8	0	27	0	128	0
RT Vol	5	0	11	0	5	0	266
Lane Flow Rate	173	156	12	47	5	141	286
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.281	0.29	0.018	0.087	0.009	0.215	0.379
Departure Headway (Hd)	5.848	6.687	5.498	6.635	5.726	5.584	4.867
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	618	539	654	542	627	647	744
Service Time	3.848	4.398	3.209	4.351	3.442	3.284	2.567
HCM Lane V/C Ratio	0.28	0.289	0.018	0.087	0.008	0.218	0.384
HCM Control Delay	11.1	12.1	8.3	10	8.5	9.8	10.5
HCM Lane LOS	B	B	A	A	A	A	B
HCM 95th-tile Q	1.1	1.2	0.1	0.3	0	0.8	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	9	57	5	17	23	40	1825	13	5	929	15
Future Volume (vph)	31	9	57	5	17	23	40	1825	13	5	929	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.99		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1689			1713		1719	3438	1504	1687	3374	1509
Flt Permitted		0.91			0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1557			1681		1719	3438	1504	1687	3374	1509
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	33	10	61	5	18	24	43	1941	14	5	988	16
RTOR Reduction (vph)	0	43	0	0	21	0	0	0	3	0	0	4
Lane Group Flow (vph)	0	61	0	0	26	0	43	1941	11	5	988	12
Confl. Peds. (#/hr)	2		3	3		2			1	1		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	5%	5%	5%	7%	7%	7%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		13.2			13.2		7.0	89.4	89.4	1.4	83.8	83.8
Effective Green, g (s)		14.2			14.2		7.0	92.4	92.4	1.4	86.8	86.8
Actuated g/C Ratio		0.12			0.12		0.06	0.77	0.77	0.01	0.72	0.72
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		184			198		100	2647	1158	19	2440	1091
v/s Ratio Prot							c0.03	c0.56		0.00	0.29	
v/s Ratio Perm		c0.04			0.02				0.01			0.01
v/c Ratio		0.33			0.13		0.43	0.73	0.01	0.26	0.40	0.01
Uniform Delay, d1		48.5			47.4		54.6	7.3	3.2	58.8	6.5	4.6
Progression Factor		1.00			1.00		1.26	0.36	1.00	1.14	0.57	1.00
Incremental Delay, d2		1.1			0.3		2.3	1.4	0.0	6.7	0.5	0.0
Delay (s)		49.6			47.7		71.3	4.0	3.2	73.8	4.2	4.6
Level of Service		D			D		E	A	A	E	A	A
Approach Delay (s)		49.6			47.7			5.5			4.5	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



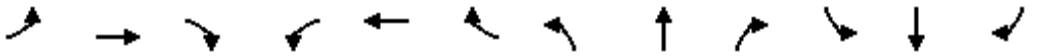
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	9	57	5	17	23	40	1825	13	5	929	15
Future Volume (veh/h)	31	9	57	5	17	23	40	1825	13	5	929	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1826	1826	1826	1796	1796	1796
Adj Flow Rate, veh/h	33	10	61	5	18	24	43	1941	14	5	988	16
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	2	2	2	5	5	5	7	7	7
Cap, veh/h	68	32	85	36	76	83	55	2779	1239	9	2644	1179
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	0.03	0.80	0.80	0.01	0.77	0.77
Sat Flow, veh/h	301	342	912	33	813	883	1739	3469	1546	1711	3413	1521
Grp Volume(v), veh/h	104	0	0	47	0	0	43	1941	14	5	988	16
Grp Sat Flow(s),veh/h/ln	1555	0	0	1729	0	0	1739	1735	1546	1711	1706	1521
Q Serve(g_s), s	7.6	0.0	0.0	3.1	0.0	0.0	2.9	30.3	0.2	0.3	11.0	0.3
Cycle Q Clear(g_c), s	7.6	0.0	0.0	3.1	0.0	0.0	2.9	30.3	0.2	0.3	11.0	0.3
Prop In Lane	0.32		0.59	0.11		0.51	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	0	0	0	0	55	2779	1239	9	2644	1179
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.70	0.01	0.57	0.37	0.01
Avail Cap(c_a), veh/h	0	0	0	0	0	0	145	2779	1239	143	2644	1179
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.66	0.66	0.66	0.91	0.91	0.91
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	57.7	5.4	2.4	59.6	4.3	3.1
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	14.8	1.0	0.0	43.9	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	1.5	7.7	0.1	0.3	3.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	72.5	6.4	2.4	103.4	4.7	3.1
LnGrp LOS	A	A	A	A	A	A	E	A	A	F	A	A
Approach Vol, veh/h		104			47			1998			1009	
Approach Delay, s/veh		0.0			0.0			7.8			5.1	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	97.0		15.2	4.6	100.1		15.2				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	10.0	79.0		15.0	10.0	79.0		15.0				
Max Q Clear Time (g_c+I1), s	4.9	13.0		5.1	2.3	32.3		9.6				
Green Ext Time (p_c), s	0.0	8.6		0.1	0.0	25.1		0.2				

Intersection Summary		
HCM 6th Ctrl Delay		6.5
HCM 6th LOS		A

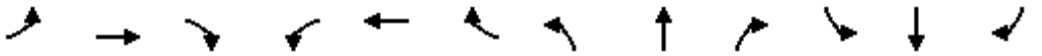
Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	896	16	133	1606	161	47	162	84	77	264	186
Future Volume (vph)	85	896	16	133	1606	161	47	162	84	77	264	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3438	1538	1703	3406	1504	1714	3438	1514	1714	3438	1510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.42	1.00	1.00	0.60	1.00	1.00
Satd. Flow (perm)	1719	3438	1538	1703	3406	1504	766	3438	1514	1087	3438	1510
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	87	914	16	136	1639	164	48	165	86	79	269	190
RTOR Reduction (vph)	0	0	6	0	0	51	0	0	74	0	0	122
Lane Group Flow (vph)	87	914	10	136	1639	113	48	165	12	79	269	68
Confl. Peds. (#/hr)	1					1	5		4	4		5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	10.0	73.8	73.8	13.9	77.7	77.7	16.3	16.3	16.3	16.3	16.3	16.3
Effective Green, g (s)	10.0	76.8	76.8	13.9	80.7	80.7	17.3	17.3	17.3	17.3	17.3	17.3
Actuated g/C Ratio	0.08	0.64	0.64	0.12	0.67	0.67	0.14	0.14	0.14	0.14	0.14	0.14
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	143	2200	984	197	2290	1011	110	495	218	156	495	217
v/s Ratio Prot	c0.05	0.27		0.08	c0.48			0.05			c0.08	
v/s Ratio Perm			0.01			0.07	0.06		0.01	0.07		0.04
v/c Ratio	0.61	0.42	0.01	0.69	0.72	0.11	0.44	0.33	0.06	0.51	0.54	0.31
Uniform Delay, d1	53.1	10.6	7.8	51.0	12.4	7.0	46.9	46.2	44.3	47.4	47.7	46.0
Progression Factor	0.76	0.49	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.7	0.5	0.0	10.0	1.9	0.2	2.8	0.4	0.1	2.6	1.2	0.8
Delay (s)	47.1	5.7	7.8	60.9	14.4	7.2	49.7	46.6	44.4	50.0	48.9	46.8
Level of Service	D	A	A	E	B	A	D	D	D	D	D	D
Approach Delay (s)		9.3			17.0			46.4			48.3	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	896	16	133	1606	161	47	162	84	77	264	186
Future Volume (veh/h)	85	896	16	133	1606	161	47	162	84	77	264	186
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1811	1811	1811	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	87	914	16	136	1639	164	48	165	86	79	269	190
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	5	5	5	6	6	6	5	5	5	5	5	5
Cap, veh/h	276	2216	988	162	1890	842	148	579	256	197	579	253
Arrive On Green	0.16	0.64	0.64	0.09	0.55	0.55	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1739	3469	1547	1725	3441	1534	907	3469	1533	1096	3469	1513
Grp Volume(v), veh/h	87	914	16	136	1639	164	48	165	86	79	269	190
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1725	1721	1534	907	1735	1533	1096	1735	1513
Q Serve(g_s), s	5.3	15.5	0.5	9.3	49.2	6.5	6.1	5.0	5.9	8.2	8.4	14.4
Cycle Q Clear(g_c), s	5.3	15.5	0.5	9.3	49.2	6.5	14.5	5.0	5.9	13.1	8.4	14.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	276	2216	988	162	1890	842	148	579	256	197	579	253
V/C Ratio(X)	0.31	0.41	0.02	0.84	0.87	0.19	0.32	0.28	0.34	0.40	0.46	0.75
Avail Cap(c_a), veh/h	276	2216	988	230	2065	920	185	723	319	243	723	315
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	10.6	7.9	53.4	23.3	13.7	51.7	43.7	44.1	49.5	45.1	47.6
Incr Delay (d2), s/veh	0.6	0.5	0.0	16.7	5.7	0.5	1.3	0.3	0.8	1.3	0.6	7.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	5.6	0.1	4.7	19.8	2.3	1.4	2.2	2.3	2.3	3.7	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.3	11.1	7.9	70.1	29.0	14.2	52.9	44.0	44.9	50.8	45.7	55.3
LnGrp LOS	D	B	A	E	C	B	D	D	D	D	D	E
Approach Vol, veh/h		1017			1939			299			538	
Approach Delay, s/veh		14.0			30.6			45.7			49.8	
Approach LOS		B			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.3	80.7		24.0	26.1	69.9		24.0				
Change Period (Y+Rc), s	4.0	7.0		5.0	7.0	* 7		5.0				
Max Green Setting (Gmax), s	16.0	64.0		24.0	11.0	* 69		24.0				
Max Q Clear Time (g_c+I1), s	11.3	17.5		16.4	7.3	51.2		16.5				
Green Ext Time (p_c), s	0.1	7.5		1.8	0.1	11.7		0.9				

Intersection Summary		
HCM 6th Ctrl Delay		30.1
HCM 6th LOS		C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	49	519	121	35	601	317
Future Volume (vph)	49	519	121	35	601	317
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	0.97	0.99			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	0.97			1.00
Flt Protected	0.95	1.00	1.00			0.97
Satd. Flow (prot)	1736	1512	1761			1822
Flt Permitted	0.95	1.00	1.00			0.97
Satd. Flow (perm)	1736	1512	1761			1822
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	52	546	127	37	633	334
RTOR Reduction (vph)	0	120	12	0	0	0
Lane Group Flow (vph)	52	426	152	0	0	967
Confl. Peds. (#/hr)	1	1				
Confl. Bikes (#/hr)		12		2		
Heavy Vehicles (%)	4%	4%	4%	4%	1%	1%
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	3		1		2	2
Permitted Phases		1 2				
Actuated Green, G (s)	2.8	56.2	8.2			44.0
Effective Green, g (s)	2.8	56.2	8.2			44.0
Actuated g/C Ratio	0.04	0.78	0.11			0.61
Clearance Time (s)	4.0		4.0			4.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	67	1178	200			1111
v/s Ratio Prot	c0.03		c0.09			c0.53
v/s Ratio Perm		0.28				
v/c Ratio	0.78	0.36	0.76			0.87
Uniform Delay, d1	34.3	2.4	31.0			11.7
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	42.0	0.2	15.7			7.6
Delay (s)	76.3	2.6	46.7			19.3
Level of Service	E	A	D			B
Approach Delay (s)	9.0		46.7			19.3
Approach LOS	A		D			B

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	72.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Intersection Delay, s/veh	6.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	3	0	3	1	8	0	1	3	1	0	0
Future Vol, veh/h	0	3	0	3	1	8	0	1	3	1	0	0
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	5	0	5	2	13	0	2	5	2	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	6.6	6.5	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	25%	100%
Vol Thru, %	25%	100%	8%	0%
Vol Right, %	75%	0%	67%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	3	12	1
LT Vol	0	0	3	1
Through Vol	1	3	1	0
RT Vol	3	0	8	0
Lane Flow Rate	6	5	19	2
Geometry Grp	1	1	1	1
Degree of Util (X)	0.006	0.005	0.019	0.002
Departure Headway (Hd)	3.492	3.928	3.567	4.146
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1029	916	1009	867
Service Time	1.498	1.932	1.57	2.152
HCM Lane V/C Ratio	0.006	0.005	0.019	0.002
HCM Control Delay	6.5	7	6.6	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	6	13	276	241	3
Future Vol, veh/h	6	6	13	276	241	3
Conflicting Peds, #/hr	0	2	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	3	3	3	3
Mvmt Flow	7	7	15	314	274	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	626	284	283	0	-	0
Stage 1	282	-	-	-	-	-
Stage 2	344	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.13	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.227	-	-	-
Pot Cap-1 Maneuver	451	760	1274	-	-	-
Stage 1	770	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	439	754	1267	-	-	-
Mov Cap-2 Maneuver	439	-	-	-	-	-
Stage 1	755	-	-	-	-	-
Stage 2	718	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1267	-	555	-	-
HCM Lane V/C Ratio	0.012	-	0.025	-	-
HCM Control Delay (s)	7.9	0	11.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	45	0	30	0	257	20	8	222	0
Future Vol, veh/h	0	0	0	45	0	30	0	257	20	8	222	0
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	3	3	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	2	2	2	3	3	3	3	3	3
Mvmt Flow	0	0	0	52	0	34	0	295	23	9	255	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	599	594	255	583	583	312	255	0	0	321	0	0
Stage 1	273	273	-	310	310	-	-	-	-	-	-	-
Stage 2	326	321	-	273	273	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.12	6.52	6.22	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.518	4.018	3.318	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	416	421	789	424	424	728	1304	-	-	1233	-	-
Stage 1	737	688	-	700	659	-	-	-	-	-	-	-
Stage 2	691	655	-	733	684	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	393	416	789	420	419	725	1304	-	-	1229	-	-
Mov Cap-2 Maneuver	393	416	-	420	419	-	-	-	-	-	-	-
Stage 1	737	682	-	698	657	-	-	-	-	-	-	-
Stage 2	657	653	-	726	678	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.6	0	0.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1304	-	-	-	505	1229	-	-
HCM Lane V/C Ratio	-	-	-	-	0.171	0.007	-	-
HCM Control Delay (s)	0	-	-	0	13.6	8	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.6	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	14	24	356	459	10
Future Vol, veh/h	6	14	24	356	459	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	3	3	3	3
Mvmt Flow	7	16	28	409	528	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	999	534	539	0	-	0
Stage 1	534	-	-	-	-	-
Stage 2	465	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.13	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.227	-	-	-
Pot Cap-1 Maneuver	272	550	1024	-	-	-
Stage 1	592	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	262	550	1024	-	-	-
Mov Cap-2 Maneuver	262	-	-	-	-	-
Stage 1	571	-	-	-	-	-
Stage 2	636	-	-	-	-	-

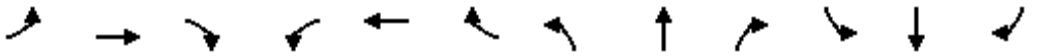
Approach	EB	NB	SB
HCM Control Delay, s	14.2	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1024	-	414	-	-
HCM Lane V/C Ratio	0.027	-	0.056	-	-
HCM Control Delay (s)	8.6	0	14.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	258	56	55	182	156	62	1439	66	285	1718	31
Future Volume (vph)	5	258	56	55	182	156	62	1439	66	285	1718	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95			0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00			0.99		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3335			3217		1752	3505	1547	1752	3505	1547
Flt Permitted		0.95			0.71		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3162			2306		1752	3505	1547	1752	3505	1547
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	266	58	57	188	161	64	1484	68	294	1771	32
RTOR Reduction (vph)	0	14	0	0	87	0	0	0	31	0	0	10
Lane Group Flow (vph)	0	315	0	0	319	0	64	1484	37	294	1771	22
Confl. Peds. (#/hr)	6		4	4		6	1		1	1		1
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		21.0			21.0		8.1	68.1	68.1	24.9	84.9	84.9
Effective Green, g (s)		22.0			22.0		8.1	71.1	71.1	24.9	87.9	87.9
Actuated g/C Ratio		0.17			0.17		0.06	0.55	0.55	0.19	0.68	0.68
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		535			390		109	1916	846	335	2369	1046
v/s Ratio Prot							0.04	c0.42		c0.17	0.51	
v/s Ratio Perm		0.10			c0.14				0.02			0.01
v/c Ratio		0.59			0.82		0.59	0.77	0.04	0.88	0.75	0.02
Uniform Delay, d1		49.8			52.1		59.3	23.1	13.7	51.1	13.8	6.9
Progression Factor		1.00			1.00		1.28	0.37	0.12	1.00	1.00	1.00
Incremental Delay, d2		1.7			12.5		6.5	2.6	0.1	21.8	2.2	0.0
Delay (s)		51.5			64.5		82.5	11.2	1.8	72.9	16.0	7.0
Level of Service		D			E		F	B	A	E	B	A
Approach Delay (s)		51.5			64.5			13.6			23.8	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



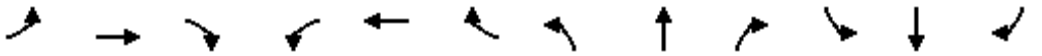
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	258	56	55	182	156	62	1439	66	285	1718	31
Future Volume (veh/h)	5	258	56	55	182	156	62	1439	66	285	1718	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	266	58	57	188	161	64	1484	68	294	1771	32
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	4	4	4	3	3	3	3	3	3
Cap, veh/h	29	428	100	37	129	192	81	1921	856	319	2396	1068
Arrive On Green	0.17	0.18	0.17	0.17	0.18	0.17	0.09	1.00	1.00	0.18	0.68	0.68
Sat Flow, veh/h	0	2347	551	2	710	1055	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	165	0	164	181	0	225	64	1484	68	294	1771	32
Grp Sat Flow(s),veh/h/ln	1342	0	1556	295	0	1473	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	10.7	0.0	12.5	16.3	0.0	19.2	4.6	0.0	0.0	21.3	42.1	0.9
Cycle Q Clear(g_c), s	10.7	0.0	12.5	16.3	0.0	19.2	4.6	0.0	0.0	21.3	42.1	0.9
Prop In Lane	0.03		0.35	0.31		0.72	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	284	0	0	268	81	1921	856	319	2396	1068
V/C Ratio(X)	0.00	0.00	0.58	0.00	0.00	0.84	0.79	0.77	0.08	0.92	0.74	0.03
Avail Cap(c_a), veh/h	0	0	311	0	0	295	150	1921	856	353	2396	1068
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.92	0.00	0.92	0.78	0.78	0.78	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	48.8	0.0	0.0	51.7	58.4	0.0	0.0	52.3	13.4	6.8
Incr Delay (d2), s/veh	0.0	0.0	2.2	0.0	0.0	16.4	12.2	2.4	0.1	27.3	2.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	5.1	0.0	0.0	8.4	2.2	0.6	0.0	11.7	15.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	51.0	0.0	0.0	68.1	70.6	2.4	0.1	79.6	15.5	6.9
LnGrp LOS	A	A	D	A	A	E	E	A	A	E	B	A
Approach Vol, veh/h		329			406			1616			2097	
Approach Delay, s/veh		25.4			37.7			5.0			24.4	
Approach LOS		C			D			A			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	92.3		27.7	27.5	74.8		27.7				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	11.0	78.0		25.0	26.0	63.0		25.0				
Max Q Clear Time (g_c+I1), s	6.6	44.1		21.2	23.3	2.0		14.5				
Green Ext Time (p_c), s	0.0	18.5		0.9	0.2	17.2		1.4				

Intersection Summary		
HCM 6th Ctrl Delay		18.6
HCM 6th LOS		B

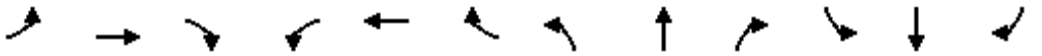
Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	438	7	24	200	18	26	127	21	47	136	153
Future Volume (vph)	125	438	7	24	200	18	26	127	21	47	136	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1752	1839		1752	1817			1847	1511		1813	1543
Flt Permitted	0.95	1.00		0.95	1.00			0.92	1.00		0.87	1.00
Satd. Flow (perm)	1752	1839		1752	1817			1704	1511		1602	1543
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	142	498	8	27	227	20	30	144	24	53	155	174
RTOR Reduction (vph)	0	1	0	0	3	0	0	0	18	0	0	130
Lane Group Flow (vph)	142	505	0	27	244	0	0	174	6	0	208	44
Confl. Peds. (#/hr)	12		4	4		12	1		16	16		1
Confl. Bikes (#/hr)			3			1			2			3
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	8.1	23.0		2.3	17.2			13.3	13.3		13.3	13.3
Effective Green, g (s)	8.1	23.0		2.3	17.2			13.3	13.3		13.3	13.3
Actuated g/C Ratio	0.15	0.44		0.04	0.33			0.25	0.25		0.25	0.25
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	269	804		76	594			430	382		405	390
v/s Ratio Prot	c0.08	c0.27		0.02	0.13							
v/s Ratio Perm								0.10	0.00		c0.13	0.03
v/c Ratio	0.53	0.63		0.36	0.41			0.40	0.02		0.51	0.11
Uniform Delay, d1	20.5	11.5		24.4	13.8			16.4	14.7		16.9	15.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	1.5		2.8	0.5			0.6	0.0		1.1	0.1
Delay (s)	22.4	13.0		27.3	14.2			17.0	14.8		18.0	15.2
Level of Service	C	B		C	B			B	B		B	B
Approach Delay (s)		15.1			15.5			16.7			16.7	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	52.6	Sum of lost time (s)	14.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	438	7	24	200	18	26	127	21	47	136	153
Future Volume (veh/h)	125	438	7	24	200	18	26	127	21	47	136	153
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.96	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	142	498	8	27	227	20	30	144	24	53	155	174
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	3	3	3
Cap, veh/h	182	623	10	42	440	39	94	349	552	108	256	557
Arrive On Green	0.10	0.34	0.34	0.02	0.26	0.26	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1767	1820	29	1767	1674	147	35	958	1516	56	704	1530
Grp Volume(v), veh/h	142	0	506	27	0	247	174	0	24	208	0	174
Grp Sat Flow(s),veh/h/ln	1767	0	1849	1767	0	1821	992	0	1516	760	0	1530
Q Serve(g_s), s	4.1	0.0	12.9	0.8	0.0	6.0	1.0	0.0	0.5	1.6	0.0	4.2
Cycle Q Clear(g_c), s	4.1	0.0	12.9	0.8	0.0	6.0	17.6	0.0	0.5	17.9	0.0	4.2
Prop In Lane	1.00		0.02	1.00		0.08	0.17		1.00	0.25		1.00
Lane Grp Cap(c), veh/h	182	0	633	42	0	479	443	0	552	364	0	557
V/C Ratio(X)	0.78	0.00	0.80	0.64	0.00	0.52	0.39	0.00	0.04	0.57	0.00	0.31
Avail Cap(c_a), veh/h	715	0	1069	545	0	1053	636	0	730	555	0	737
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.7	0.0	15.5	25.1	0.0	16.3	12.4	0.0	10.7	13.1	0.0	11.8
Incr Delay (d2), s/veh	7.1	0.0	2.4	14.6	0.0	0.9	0.6	0.0	0.0	1.4	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	5.2	0.5	0.0	2.4	1.3	0.0	0.2	1.7	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.8	0.0	17.9	39.7	0.0	17.2	12.9	0.0	10.7	14.5	0.0	12.2
LnGrp LOS	C	A	B	D	A	B	B	A	B	B	A	B
Approach Vol, veh/h		648			274			198			382	
Approach Delay, s/veh		20.5			19.4			12.7			13.4	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	23.0		24.8	9.4	18.8		24.8				
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	16.0	30.0		25.0	21.0	30.0		25.0				
Max Q Clear Time (g_c+I1), s	2.8	14.9		19.9	6.1	8.0		19.6				
Green Ext Time (p_c), s	0.0	3.0		0.9	0.3	1.5		0.5				

Intersection Summary			
HCM 6th Ctrl Delay		17.5	
HCM 6th LOS		B	

Intersection	
Intersection Delay, s/veh	22.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	342	33	47	38	34	15	31	282	19	8	134	160
Future Vol, veh/h	342	33	47	38	34	15	31	282	19	8	134	160
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	3	3	3	5	5	5	2	2	2	2	2	2
Mvmt Flow	356	34	49	40	35	16	32	294	20	8	140	167
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

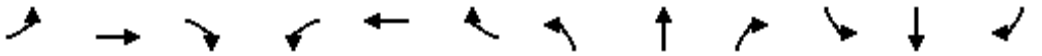
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	31.4	12.2	23.9	12.6
HCM LOS	D	B	C	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	9%	91%	0%	53%	0%	6%	0%
Vol Thru, %	85%	9%	0%	47%	0%	94%	0%
Vol Right, %	6%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	332	375	47	72	15	142	160
LT Vol	31	342	0	38	0	8	0
Through Vol	282	33	0	34	0	134	0
RT Vol	19	0	47	0	15	0	160
Lane Flow Rate	346	391	49	75	16	148	167
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.68	0.803	0.085	0.17	0.031	0.3	0.303
Departure Headway (Hd)	7.075	7.401	6.218	8.158	7.161	7.296	6.55
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	512	488	576	439	498	493	548
Service Time	5.121	5.146	3.962	5.924	4.926	5.05	4.304
HCM Lane V/C Ratio	0.676	0.801	0.085	0.171	0.032	0.3	0.305
HCM Control Delay	23.9	34.1	9.5	12.6	10.2	13.2	12.1
HCM Lane LOS	C	D	A	B	B	B	B
HCM 95th-tile Q	5.1	7.5	0.3	0.6	0.1	1.2	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	30	82	15	19	20	32	1532	13	21	1793	23
Future Volume (vph)	28	30	82	15	19	20	32	1532	13	21	1793	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99			1.00		1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1667			1770		1752	3505	1568	1752	3505	1519
Flt Permitted		0.94			0.81		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1581			1451		1752	3505	1568	1752	3505	1519
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	29	31	85	15	20	21	33	1579	13	22	1848	24
RTOR Reduction (vph)	0	41	0	0	18	0	0	0	3	0	0	6
Lane Group Flow (vph)	0	104	0	0	38	0	33	1579	10	22	1848	18
Confl. Peds. (#/hr)	1		3	3		1	4					4
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		14.3			14.3		5.4	94.8	94.8	4.9	94.3	94.3
Effective Green, g (s)		15.3			15.3		5.4	97.8	97.8	4.9	97.3	97.3
Actuated g/C Ratio		0.12			0.12		0.04	0.75	0.75	0.04	0.75	0.75
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		186			170		72	2636	1179	66	2623	1136
v/s Ratio Prot							c0.02	0.45		0.01	c0.53	
v/s Ratio Perm		c0.07			0.03				0.01			0.01
v/c Ratio		0.56			0.23		0.46	0.60	0.01	0.33	0.70	0.02
Uniform Delay, d1		54.1			52.0		60.9	7.3	4.0	61.0	8.7	4.2
Progression Factor		1.00			1.00		1.41	0.64	1.00	1.19	0.25	0.00
Incremental Delay, d2		3.6			0.7		3.0	0.7	0.0	2.0	1.1	0.0
Delay (s)		57.7			52.7		88.8	5.3	4.0	74.7	3.2	0.0
Level of Service		E			D		F	A	A	E	A	A
Approach Delay (s)		57.7			52.7			7.0			4.0	
Approach LOS		E			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



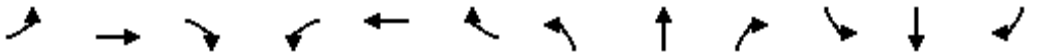
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	30	82	15	19	20	32	1532	13	21	1793	23
Future Volume (veh/h)	28	30	82	15	19	20	32	1532	13	21	1793	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1900	1900	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	29	31	85	15	20	21	33	1579	13	22	1848	24
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	0	0	0	3	3	3	3	3	3
Cap, veh/h	55	56	110	64	83	68	42	2728	1214	30	2704	1203
Arrive On Green	0.11	0.12	0.12	0.11	0.12	0.12	0.02	0.77	0.77	0.02	0.77	0.77
Sat Flow, veh/h	182	479	937	249	712	577	1767	3526	1568	1767	3526	1568
Grp Volume(v), veh/h	145	0	0	56	0	0	33	1579	13	22	1848	24
Grp Sat Flow(s),veh/h/ln	1598	0	0	1538	0	0	1767	1763	1568	1767	1763	1568
Q Serve(g_s), s	11.2	0.0	0.0	4.0	0.0	0.0	2.4	23.9	0.2	1.6	33.4	0.5
Cycle Q Clear(g_c), s	11.2	0.0	0.0	4.0	0.0	0.0	2.4	23.9	0.2	1.6	33.4	0.5
Prop In Lane	0.20		0.59	0.27		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	0	0	0	0	42	2728	1214	30	2704	1203
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.58	0.01	0.74	0.68	0.02
Avail Cap(c_a), veh/h	0	0	0	0	0	0	136	2728	1214	136	2704	1203
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.58	0.58	0.58	0.59	0.59	0.59
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	63.1	6.0	3.4	63.6	7.4	3.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	16.9	0.5	0.0	18.7	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	1.3	7.1	0.1	0.9	10.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	80.0	6.6	3.4	82.3	8.3	3.6
LnGrp LOS	A	A	A	A	A	A	F	A	A	F	A	A
Approach Vol, veh/h		145			56			1625			1894	
Approach Delay, s/veh		0.0			0.0			8.0			9.1	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.1	103.7		19.2	6.2	104.6		19.2				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	10.0	83.0		20.0	10.0	84.0		20.0				
Max Q Clear Time (g_c+I1), s	4.4	35.4		6.0	3.6	25.9		13.2				
Green Ext Time (p_c), s	0.0	23.3		0.2	0.0	18.7		0.4				

Intersection Summary		
HCM 6th Ctrl Delay		8.1
HCM 6th LOS		A

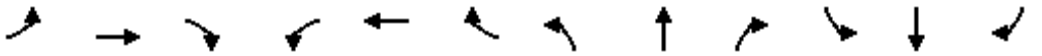
Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	218	1640	51	100	1423	166	26	202	79	124	234	134
Future Volume (vph)	218	1640	51	100	1423	166	26	202	79	124	234	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1547	1770	3539	1556	1732	3471	1518	1739	3505	1543
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.49	1.00	1.00	0.54	1.00	1.00
Satd. Flow (perm)	1752	3505	1547	1770	3539	1556	894	3471	1518	985	3505	1543
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	234	1763	55	108	1530	178	28	217	85	133	252	144
RTOR Reduction (vph)	0	0	19	0	0	54	0	0	69	0	0	117
Lane Group Flow (vph)	234	1763	36	108	1530	124	28	217	16	133	252	27
Confl. Peds. (#/hr)	5		1	1		5	3		10	10		3
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	4%	4%	4%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	23.0	77.5	77.5	12.8	67.3	67.3	23.7	23.7	23.7	23.7	23.7	23.7
Effective Green, g (s)	23.0	80.5	80.5	12.8	70.3	70.3	24.7	24.7	24.7	24.7	24.7	24.7
Actuated g/C Ratio	0.18	0.62	0.62	0.10	0.54	0.54	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	309	2170	957	174	1913	841	169	659	288	187	665	293
v/s Ratio Prot	0.13	c0.50		0.06	c0.43			0.06			0.07	
v/s Ratio Perm			0.02			0.08	0.03		0.01	c0.14		0.02
v/c Ratio	0.76	0.81	0.04	0.62	0.80	0.15	0.17	0.33	0.06	0.71	0.38	0.09
Uniform Delay, d1	50.8	19.0	9.6	56.3	24.2	14.9	44.0	45.5	43.1	49.3	46.0	43.4
Progression Factor	0.86	0.71	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.9	2.7	0.1	6.7	3.6	0.4	0.5	0.3	0.1	12.0	0.4	0.1
Delay (s)	51.7	16.2	10.2	63.0	27.8	15.3	44.5	45.8	43.2	61.3	46.3	43.6
Level of Service	D	B	B	E	C	B	D	D	D	E	D	D
Approach Delay (s)		20.0			28.6			45.0			49.3	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



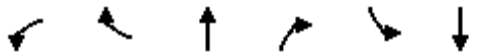
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	1640	51	100	1423	166	26	202	79	124	234	134
Future Volume (veh/h)	218	1640	51	100	1423	166	26	202	79	124	234	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1870	1870	1870	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	234	1763	55	108	1530	178	28	217	85	133	252	144
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	2	2	2	4	4	4	3	3	3
Cap, veh/h	393	2094	932	133	1503	668	230	837	369	256	844	367
Arrive On Green	0.44	1.00	1.00	0.07	0.42	0.42	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1767	3526	1569	1781	3554	1579	967	3497	1540	1061	3526	1533
Grp Volume(v), veh/h	234	1763	55	108	1530	178	28	217	85	133	252	144
Grp Sat Flow(s),veh/h/ln	1767	1763	1569	1781	1777	1579	967	1749	1540	1061	1763	1533
Q Serve(g_s), s	13.0	0.0	0.0	7.8	55.0	9.5	3.2	6.5	5.8	15.1	7.6	10.3
Cycle Q Clear(g_c), s	13.0	0.0	0.0	7.8	55.0	9.5	10.8	6.5	5.8	21.7	7.6	10.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	393	2094	932	133	1503	668	230	837	369	256	844	367
V/C Ratio(X)	0.60	0.84	0.06	0.81	1.02	0.27	0.12	0.26	0.23	0.52	0.30	0.39
Avail Cap(c_a), veh/h	393	2094	932	219	1503	668	296	1076	474	328	1085	472
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.66	0.66	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.7	0.0	0.0	59.3	37.5	24.4	44.9	40.1	39.8	48.9	40.5	41.5
Incr Delay (d2), s/veh	1.6	2.9	0.1	11.3	27.7	1.0	0.2	0.2	0.3	1.6	0.2	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.8	0.0	3.9	28.6	3.7	0.8	2.9	2.3	4.2	3.4	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.3	2.9	0.1	70.6	65.2	25.4	45.2	40.3	40.1	50.5	40.7	42.2
LnGrp LOS	C	A	A	E	F	C	D	D	D	D	D	D
Approach Vol, veh/h		2052			1816			330			529	
Approach Delay, s/veh		6.3			61.6			40.6			43.6	
Approach LOS		A			E			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.7	81.2		35.1	35.9	59.0		35.1				
Change Period (Y+Rc), s	4.0	7.0		5.0	7.0	* 7		5.0				
Max Green Setting (Gmax), s	16.0	59.0		39.0	23.0	* 52		39.0				
Max Q Clear Time (g_c+I1), s	9.8	2.0		23.7	15.0	57.0		12.8				
Green Ext Time (p_c), s	0.1	23.3		2.5	0.4	0.0		1.9				

Intersection Summary			
HCM 6th Ctrl Delay		34.1	
HCM 6th LOS		C	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	29	773	286	62	333	109
Future Volume (vph)	29	773	286	62	333	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	0.98	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	0.98			1.00
Flt Protected	0.95	1.00	1.00			0.96
Satd. Flow (prot)	1770	1547	1847			1795
Flt Permitted	0.95	1.00	1.00			0.96
Satd. Flow (perm)	1770	1547	1847			1795
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	31	831	308	67	358	117
RTOR Reduction (vph)	0	182	8	0	0	0
Lane Group Flow (vph)	31	649	367	0	0	475
Confl. Peds. (#/hr)	3			1	1	
Confl. Bikes (#/hr)		6				
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	3		1		2	2
Permitted Phases		1 2				
Actuated Green, G (s)	1.6	50.9	21.1			25.8
Effective Green, g (s)	1.6	50.9	21.1			25.8
Actuated g/C Ratio	0.02	0.78	0.32			0.40
Clearance Time (s)	4.0		4.0			4.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	43	1207	597			710
v/s Ratio Prot	c0.02		c0.20			c0.26
v/s Ratio Perm		0.42				
v/c Ratio	0.72	0.54	0.61			0.67
Uniform Delay, d1	31.6	2.7	18.6			16.2
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	45.2	0.5	1.9			2.4
Delay (s)	76.8	3.2	20.5			18.6
Level of Service	E	A	C			B
Approach Delay (s)	5.8		20.5			18.6
Approach LOS	A		C			B

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	5	0	2	0	2	0	0	4	2	0	0
Future Vol, veh/h	2	5	0	2	0	2	0	0	4	2	0	0
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	9	0	4	0	4	0	0	7	4	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	6.8	6.4	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	29%	50%	100%
Vol Thru, %	0%	71%	0%	0%
Vol Right, %	100%	0%	50%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	7	4	2
LT Vol	0	2	2	2
Through Vol	0	5	0	0
RT Vol	4	0	2	0
Lane Flow Rate	7	12	7	4
Geometry Grp	1	1	1	1
Degree of Util (X)	0.007	0.014	0.007	0.004
Departure Headway (Hd)	3.336	3.98	3.727	4.138
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1077	904	964	868
Service Time	1.344	1.985	1.733	2.147
HCM Lane V/C Ratio	0.006	0.013	0.007	0.005
HCM Control Delay	6.4	7	6.8	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0	0

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	5	4	179	271	2
Future Vol, veh/h	2	5	4	179	271	2
Conflicting Peds, #/hr	0	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	7	7	6	6
Mvmt Flow	2	6	5	208	315	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	535	318	318	0	-	0
Stage 1	317	-	-	-	-	-
Stage 2	218	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.263	-	-	-
Pot Cap-1 Maneuver	510	727	1214	-	-	-
Stage 1	743	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	506	726	1213	-	-	-
Mov Cap-2 Maneuver	506	-	-	-	-	-
Stage 1	739	-	-	-	-	-
Stage 2	822	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1213	-	646	-	-
HCM Lane V/C Ratio	0.004	-	0.013	-	-
HCM Control Delay (s)	8	0	10.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	30	0	14	0	150	28	40	245	0
Future Vol, veh/h	0	0	0	30	0	14	0	150	28	40	245	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	7	7	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	9	9	9	10	10	10	5	5	5
Mvmt Flow	0	0	0	37	0	17	0	185	35	49	302	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	611	627	302	610	610	210	302	0	0	227	0	0
Stage 1	400	400	-	210	210	-	-	-	-	-	-	-
Stage 2	211	227	-	400	400	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.19	6.59	6.29	4.2	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.581	4.081	3.381	2.29	-	-	2.245	-	-
Pot Cap-1 Maneuver	409	403	742	397	400	813	1215	-	-	1324	-	-
Stage 1	630	605	-	776	715	-	-	-	-	-	-	-
Stage 2	796	720	-	613	590	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	387	382	742	381	379	808	1215	-	-	1315	-	-
Mov Cap-2 Maneuver	387	382	-	381	379	-	-	-	-	-	-	-
Stage 1	630	578	-	771	710	-	-	-	-	-	-	-
Stage 2	779	715	-	585	563	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.9	0	1.1
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1215	-	-	-	458	1315	-	-
HCM Lane V/C Ratio	-	-	-	-	0.119	0.038	-	-
HCM Control Delay (s)	0	-	-	0	13.9	7.8	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0.1	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	30	9	478	511	4
Future Vol, veh/h	14	30	9	478	511	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	17	37	11	590	631	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1246	634	636	0	-	0
Stage 1	634	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	194	483	957	-	-	-
Stage 1	532	-	-	-	-	-
Stage 2	545	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	191	483	957	-	-	-
Mov Cap-2 Maneuver	191	-	-	-	-	-
Stage 1	523	-	-	-	-	-
Stage 2	545	-	-	-	-	-

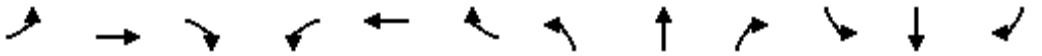
Approach	EB	NB	SB
HCM Control Delay, s	18.3	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	957	-	325	-	-
HCM Lane V/C Ratio	0.012	-	0.167	-	-
HCM Control Delay (s)	8.8	0	18.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	126	42	43	190	322	60	1817	58	98	893	14
Future Volume (vph)	19	126	42	43	190	322	60	1817	58	98	893	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95			0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00			0.99		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3018			3131		1719	3438	1538	1703	3406	1524
Flt Permitted		0.72			0.91		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		2169			2849		1719	3438	1538	1703	3406	1524
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	20	135	45	46	204	346	65	1954	62	105	960	15
RTOR Reduction (vph)	0	23	0	0	129	0	0	0	21	0	0	5
Lane Group Flow (vph)	0	177	0	0	467	0	65	1954	41	105	960	10
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	15%	15%	15%	4%	4%	4%	5%	5%	5%	6%	6%	6%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		22.0			22.0		8.0	71.6	71.6	10.4	74.0	74.0
Effective Green, g (s)		23.0			23.0		8.0	74.6	74.6	10.4	77.0	77.0
Actuated g/C Ratio		0.19			0.19		0.07	0.62	0.62	0.09	0.64	0.64
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		415			546		114	2137	956	147	2185	977
v/s Ratio Prot							0.04	c0.57		c0.06	0.28	
v/s Ratio Perm		0.08			c0.16				0.03			0.01
v/c Ratio		0.43			0.85		0.57	0.91	0.04	0.71	0.44	0.01
Uniform Delay, d1		42.7			46.9		54.3	19.9	8.8	53.4	10.7	7.8
Progression Factor		1.00			1.00		1.26	0.76	0.21	1.00	1.00	1.00
Incremental Delay, d2		0.7			12.4		4.7	5.5	0.1	15.2	0.6	0.0
Delay (s)		43.4			59.3		73.3	20.7	1.9	68.5	11.4	7.8
Level of Service		D			E		E	C	A	E	B	A
Approach Delay (s)		43.4			59.3			21.8			16.9	
Approach LOS		D			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	126	42	43	190	322	60	1817	58	98	893	14
Future Volume (veh/h)	19	126	42	43	190	322	60	1817	58	98	893	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1678	1678	1678	1841	1841	1841	1826	1826	1826	1811	1811	1811
Adj Flow Rate, veh/h	20	135	45	46	204	346	65	1954	62	105	960	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	15	15	15	4	4	4	5	5	5	6	6	6
Cap, veh/h	39	258	101	36	77	283	82	2170	968	129	2246	1002
Arrive On Green	0.19	0.20	0.19	0.19	0.20	0.19	0.09	1.00	1.00	0.07	0.65	0.65
Sat Flow, veh/h	2	1291	507	1	385	1416	1739	3469	1547	1725	3441	1535
Grp Volume(v), veh/h	73	0	127	250	0	346	65	1954	62	105	960	15
Grp Sat Flow(s),veh/h/ln	366	0	1434	386	0	1416	1739	1735	1547	1725	1721	1535
Q Serve(g_s), s	120.0	0.0	9.4	20.7	0.0	24.0	4.4	0.0	0.0	7.2	16.1	0.4
Cycle Q Clear(g_c), s	120.0	0.0	9.4	20.7	0.0	24.0	4.4	0.0	0.0	7.2	16.1	0.4
Prop In Lane	0.28		0.35	0.18		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	287	0	0	283	82	2170	968	129	2246	1002
V/C Ratio(X)	0.00	0.00	0.44	0.00	0.00	1.22	0.79	0.90	0.06	0.82	0.43	0.01
Avail Cap(c_a), veh/h	0	0	287	0	0	283	159	2170	968	158	2246	1002
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.77	0.00	0.77	0.62	0.62	0.62	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	42.3	0.0	0.0	48.5	53.7	0.0	0.0	54.7	10.0	7.3
Incr Delay (d2), s/veh	0.0	0.0	1.1	0.0	0.0	122.0	9.9	4.3	0.1	23.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	3.5	0.0	0.0	18.1	2.0	1.3	0.0	3.9	5.7	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	43.4	0.0	0.0	170.5	63.6	4.3	0.1	77.7	10.6	7.3
LnGrp LOS	A	A	D	A	A	F	E	A	A	E	B	A
Approach Vol, veh/h		200			596			2081			1080	
Approach Delay, s/veh		27.6			99.0			6.0			17.1	
Approach LOS		C			F			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.7	82.3		28.0	13.0	79.0		28.0				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	11.0	70.0		23.0	11.0	70.0		23.0				
Max Q Clear Time (g_c+I1), s	6.4	18.1		26.0	9.2	2.0		122.0				
Green Ext Time (p_c), s	0.0	8.1		0.0	0.0	30.5		0.0				

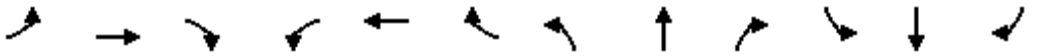
Intersection Summary		
HCM 6th Ctrl Delay		24.1
HCM 6th LOS		C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	112	9	22	415	23	61	143	15	18	111	163
Future Volume (vph)	111	112	9	22	415	23	61	143	15	18	111	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1641	1706		1748	1828			1835	1534		1778	1503
Flt Permitted	0.95	1.00		0.68	1.00			0.86	1.00		0.94	1.00
Satd. Flow (perm)	1641	1706		1244	1828			1600	1534		1677	1503
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	116	117	9	23	432	24	64	149	16	19	116	170
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	12	0	0	129
Lane Group Flow (vph)	116	123	0	23	454	0	0	213	4	0	135	41
Confl. Peds. (#/hr)	3		3	3		3			5	5		
Confl. Bikes (#/hr)			2			1			2			2
Heavy Vehicles (%)	10%	10%	10%	3%	3%	3%	2%	2%	2%	6%	6%	6%
Turn Type	Prot	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases				6			8		8	4		4
Actuated Green, G (s)	8.0	28.1		23.9	22.0			14.1	14.1		14.1	14.1
Effective Green, g (s)	8.0	28.1		23.9	22.0			14.1	14.1		14.1	14.1
Actuated g/C Ratio	0.14	0.48		0.41	0.38			0.24	0.24		0.24	0.24
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	225	825		528	692			388	372		406	364
v/s Ratio Prot	c0.07	0.07		0.00	c0.25							
v/s Ratio Perm				0.02				c0.13	0.00		0.08	0.03
v/c Ratio	0.52	0.15		0.04	0.66			0.55	0.01		0.33	0.11
Uniform Delay, d1	23.3	8.3		10.2	14.9			19.2	16.7		18.1	17.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	0.1		0.0	2.3			1.6	0.0		0.5	0.1
Delay (s)	25.2	8.4		10.2	17.2			20.8	16.7		18.6	17.3
Level of Service	C	A		B	B			C	B		B	B
Approach Delay (s)		16.5			16.8			20.5			17.9	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	112	9	22	415	23	61	143	15	18	111	163
Future Volume (veh/h)	111	112	9	22	415	23	61	143	15	18	111	163
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1856	1856	1856	1870	1870	1870	1811	1811	1811
Adj Flow Rate, veh/h	116	117	9	23	432	24	64	149	16	19	116	170
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	3	3	3	2	2	2	6	6	6
Cap, veh/h	146	585	45	517	518	29	80	149	604	68	311	592
Arrive On Green	0.09	0.36	0.36	0.02	0.30	0.30	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	1668	1602	123	1767	1739	97	14	381	1540	6	794	1509
Grp Volume(v), veh/h	116	0	126	23	0	456	213	0	16	135	0	170
Grp Sat Flow(s),veh/h/ln	1668	0	1726	1767	0	1835	394	0	1540	800	0	1509
Q Serve(g_s), s	4.3	0.0	3.1	0.6	0.0	14.6	0.7	0.0	0.4	0.6	0.0	4.9
Cycle Q Clear(g_c), s	4.3	0.0	3.1	0.6	0.0	14.6	24.7	0.0	0.4	24.7	0.0	4.9
Prop In Lane	1.00		0.07	1.00		0.05	0.30		1.00	0.14		1.00
Lane Grp Cap(c), veh/h	146	0	630	517	0	547	229	0	604	379	0	592
V/C Ratio(X)	0.80	0.00	0.20	0.04	0.00	0.83	0.93	0.00	0.03	0.36	0.00	0.29
Avail Cap(c_a), veh/h	557	0	823	930	0	875	237	0	612	388	0	600
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.2	0.0	13.7	14.8	0.0	20.6	17.1	0.0	11.8	14.2	0.0	13.1
Incr Delay (d2), s/veh	9.5	0.0	0.2	0.0	0.0	3.9	39.1	0.0	0.0	0.6	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	1.2	0.2	0.0	6.4	4.4	0.0	0.1	1.2	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.6	0.0	13.8	14.8	0.0	24.5	56.2	0.0	11.8	14.7	0.0	13.4
LnGrp LOS	D	A	B	B	A	C	E	A	B	B	A	B
Approach Vol, veh/h		242			479			229			305	
Approach Delay, s/veh		25.2			24.1			53.1			14.0	
Approach LOS		C			C			D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	28.2		29.8	9.6	24.0		29.8				
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	16.0	30.0		25.0	21.0	30.0		25.0				
Max Q Clear Time (g_c+I1), s	2.6	5.1		26.7	6.3	16.6		26.7				
Green Ext Time (p_c), s	0.0	0.7		0.0	0.2	2.5		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		27.1	
HCM 6th LOS		C	

Intersection	
Intersection Delay, s/veh	11.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	144	8	11	18	28	5	28	135	5	3	134	278
Future Vol, veh/h	144	8	11	18	28	5	28	135	5	3	134	278
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	6	6	6	6	6	6	3	3	3	5	5	5
Mvmt Flow	155	9	12	19	30	5	30	145	5	3	144	299
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

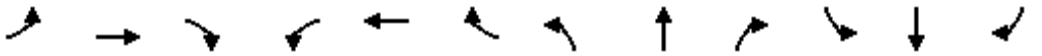
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	12.2	10	11.4	10.7
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	17%	95%	0%	39%	0%	2%	0%
Vol Thru, %	80%	5%	0%	61%	0%	98%	0%
Vol Right, %	3%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	168	152	11	46	5	137	278
LT Vol	28	144	0	18	0	3	0
Through Vol	135	8	0	28	0	134	0
RT Vol	5	0	11	0	5	0	278
Lane Flow Rate	181	163	12	49	5	147	299
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.296	0.307	0.018	0.093	0.009	0.231	0.409
Departure Headway (Hd)	5.901	6.767	5.575	6.735	5.823	5.643	4.926
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	609	531	642	532	614	641	735
Service Time	3.932	4.5	3.308	4.473	3.56	3.343	2.626
HCM Lane V/C Ratio	0.297	0.307	0.019	0.092	0.008	0.229	0.407
HCM Control Delay	11.4	12.5	8.4	10.2	8.6	10	11
HCM Lane LOS	B	B	A	B	A	A	B
HCM 95th-tile Q	1.2	1.3	0.1	0.3	0	0.9	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	9	60	5	18	24	42	1882	14	5	957	16
Future Volume (vph)	32	9	60	5	18	24	42	1882	14	5	957	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.99		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1688			1711		1719	3438	1504	1687	3374	1509
Flt Permitted		0.91			0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1553			1676		1719	3438	1504	1687	3374	1509
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	34	10	64	5	19	26	45	2002	15	5	1018	17
RTOR Reduction (vph)	0	45	0	0	23	0	0	0	3	0	0	5
Lane Group Flow (vph)	0	63	0	0	27	0	45	2002	12	5	1018	12
Confl. Peds. (#/hr)	2		3	3		2			1	1		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	5%	5%	5%	7%	7%	7%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		12.1			12.1		7.1	90.5	90.5	1.4	84.8	84.8
Effective Green, g (s)		13.1			13.1		7.1	93.5	93.5	1.4	87.8	87.8
Actuated g/C Ratio		0.11			0.11		0.06	0.78	0.78	0.01	0.73	0.73
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		169			182		101	2678	1171	19	2468	1104
v/s Ratio Prot							c0.03	c0.58		0.00	0.30	
v/s Ratio Perm		c0.04			0.02				0.01			0.01
v/c Ratio		0.38			0.15		0.45	0.75	0.01	0.26	0.41	0.01
Uniform Delay, d1		49.7			48.4		54.5	7.0	2.9	58.8	6.2	4.4
Progression Factor		1.00			1.00		1.25	0.37	1.00	1.14	0.55	1.00
Incremental Delay, d2		1.4			0.4		2.3	1.5	0.0	6.6	0.5	0.0
Delay (s)		51.1			48.8		70.5	4.0	3.0	73.9	3.8	4.4
Level of Service		D			D		E	A	A	E	A	A
Approach Delay (s)		51.1			48.8			5.5			4.2	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



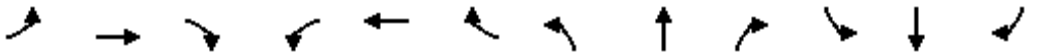
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	9	60	5	18	24	42	1882	14	5	957	16
Future Volume (veh/h)	32	9	60	5	18	24	42	1882	14	5	957	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1826	1826	1826	1796	1796	1796
Adj Flow Rate, veh/h	34	10	64	5	19	26	45	2002	15	5	1018	17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	2	2	2	5	5	5	7	7	7
Cap, veh/h	68	31	87	36	77	87	57	2771	1235	9	2630	1172
Arrive On Green	0.09	0.10	0.10	0.09	0.10	0.10	0.03	0.80	0.80	0.01	0.77	0.77
Sat Flow, veh/h	300	322	906	35	795	900	1739	3469	1546	1711	3413	1521
Grp Volume(v), veh/h	108	0	0	50	0	0	45	2002	15	5	1018	17
Grp Sat Flow(s),veh/h/ln	1529	0	0	1730	0	0	1739	1735	1546	1711	1706	1521
Q Serve(g_s), s	7.9	0.0	0.0	3.3	0.0	0.0	3.1	33.0	0.2	0.3	11.7	0.3
Cycle Q Clear(g_c), s	7.9	0.0	0.0	3.3	0.0	0.0	3.1	33.0	0.2	0.3	11.7	0.3
Prop In Lane	0.31		0.59	0.10		0.52	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	0	0	0	0	57	2771	1235	9	2630	1172
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.72	0.01	0.57	0.39	0.01
Avail Cap(c_a), veh/h	0	0	0	0	0	0	145	2771	1235	143	2630	1172
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.62	0.62	0.62	0.90	0.90	0.90
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	57.6	5.8	2.5	59.6	4.5	3.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	13.3	1.0	0.0	43.5	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	1.5	8.4	0.1	0.3	3.3	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	70.9	6.8	2.5	103.0	4.9	3.2
LnGrp LOS	A	A	A	A	A	A	E	A	A	F	A	A
Approach Vol, veh/h		108			50			2062			1040	
Approach Delay, s/veh		0.0			0.0			8.2			5.3	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.0	96.5		15.5	4.6	99.8		15.5				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	10.0	79.0		15.0	10.0	79.0		15.0				
Max Q Clear Time (g_c+I1), s	5.1	13.7		5.3	2.3	35.0		9.9				
Green Ext Time (p_c), s	0.0	9.0		0.1	0.0	25.6		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	6.9
HCM 6th LOS	A

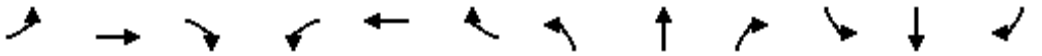
Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	924	17	139	1658	168	49	170	88	80	279	194
Future Volume (vph)	89	924	17	139	1658	168	49	170	88	80	279	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3438	1538	1703	3406	1504	1714	3438	1514	1714	3438	1510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.41	1.00	1.00	0.59	1.00	1.00
Satd. Flow (perm)	1719	3438	1538	1703	3406	1504	734	3438	1514	1066	3438	1510
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	91	943	17	142	1692	171	50	173	90	82	285	198
RTOR Reduction (vph)	0	0	6	0	0	53	0	0	77	0	0	120
Lane Group Flow (vph)	91	943	11	142	1692	118	50	173	13	82	285	78
Confl. Peds. (#/hr)	1					1	5		4	4		5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	10.1	72.9	72.9	14.2	77.0	77.0	16.9	16.9	16.9	16.9	16.9	16.9
Effective Green, g (s)	10.1	75.9	75.9	14.2	80.0	80.0	17.9	17.9	17.9	17.9	17.9	17.9
Actuated g/C Ratio	0.08	0.63	0.63	0.12	0.67	0.67	0.15	0.15	0.15	0.15	0.15	0.15
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	144	2174	972	201	2270	1002	109	512	225	159	512	225
v/s Ratio Prot	c0.05	0.27		0.08	c0.50			0.05			c0.08	
v/s Ratio Perm			0.01			0.08	0.07		0.01	0.08		0.05
v/c Ratio	0.63	0.43	0.01	0.71	0.75	0.12	0.46	0.34	0.06	0.52	0.56	0.35
Uniform Delay, d1	53.2	11.2	8.2	50.9	13.3	7.2	46.6	45.7	43.8	47.1	47.4	45.8
Progression Factor	0.77	0.51	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.2	0.6	0.0	10.8	2.3	0.2	3.0	0.4	0.1	2.8	1.3	0.9
Delay (s)	49.0	6.3	8.2	61.7	15.5	7.5	49.7	46.1	43.9	49.9	48.7	46.7
Level of Service	D	A	A	E	B	A	D	D	D	D	D	D
Approach Delay (s)		10.0			18.1			46.1			48.2	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	924	17	139	1658	168	49	170	88	80	279	194
Future Volume (veh/h)	89	924	17	139	1658	168	49	170	88	80	279	194
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1811	1811	1811	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	91	943	17	142	1692	171	50	173	90	82	285	198
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	5	5	5	6	6	6	5	5	5	5	5	5
Cap, veh/h	250	2189	976	169	1927	859	146	594	263	198	594	259
Arrive On Green	0.14	0.63	0.63	0.10	0.56	0.56	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1739	3469	1547	1725	3441	1534	887	3469	1534	1084	3469	1514
Grp Volume(v), veh/h	91	943	17	142	1692	171	50	173	90	82	285	198
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1725	1721	1534	887	1735	1534	1084	1735	1514
Q Serve(g_s), s	5.7	16.5	0.5	9.7	51.1	6.6	6.5	5.2	6.2	8.6	8.9	15.0
Cycle Q Clear(g_c), s	5.7	16.5	0.5	9.7	51.1	6.6	15.4	5.2	6.2	13.8	8.9	15.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	250	2189	976	169	1927	859	146	594	263	198	594	259
V/C Ratio(X)	0.36	0.43	0.02	0.84	0.88	0.20	0.34	0.29	0.34	0.41	0.48	0.76
Avail Cap(c_a), veh/h	250	2189	976	230	2065	920	179	723	320	239	723	315
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	11.2	8.3	53.2	22.9	13.1	51.8	43.4	43.8	49.4	44.9	47.4
Incr Delay (d2), s/veh	0.8	0.6	0.0	18.1	6.1	0.5	1.4	0.3	0.8	1.4	0.6	8.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	6.0	0.2	5.0	20.5	2.3	1.5	2.3	2.4	2.4	3.9	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.2	11.8	8.3	71.4	28.9	13.6	53.2	43.6	44.5	50.8	45.5	56.1
LnGrp LOS	D	B	A	E	C	B	D	D	D	D	D	E
Approach Vol, veh/h		1051			2005			313			565	
Approach Delay, s/veh		14.8			30.6			45.4			50.0	
Approach LOS		B			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.7	79.7		24.5	24.3	71.2		24.5				
Change Period (Y+Rc), s	4.0	7.0		5.0	7.0	* 7		5.0				
Max Green Setting (Gmax), s	16.0	64.0		24.0	11.0	* 69		24.0				
Max Q Clear Time (g_c+I1), s	11.7	18.5		17.0	7.7	53.1		17.4				
Green Ext Time (p_c), s	0.1	7.8		1.8	0.0	11.1		0.9				

Intersection Summary												
HCM 6th Ctrl Delay			30.3									
HCM 6th LOS			C									

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	54	542	129	38	628	335
Future Volume (vph)	54	542	129	38	628	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	0.97	0.99			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	0.97			1.00
Flt Protected	0.95	1.00	1.00			0.97
Satd. Flow (prot)	1736	1512	1760			1822
Flt Permitted	0.95	1.00	1.00			0.97
Satd. Flow (perm)	1736	1512	1760			1822
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	57	571	136	40	661	353
RTOR Reduction (vph)	0	133	12	0	0	0
Lane Group Flow (vph)	57	438	164	0	0	1014
Confl. Peds. (#/hr)	1	1				
Confl. Bikes (#/hr)		12		2		
Heavy Vehicles (%)	4%	4%	4%	4%	1%	1%
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	3		1		2	2
Permitted Phases		1 2				
Actuated Green, G (s)	3.9	56.0	8.2			43.8
Effective Green, g (s)	3.9	56.0	8.2			43.8
Actuated g/C Ratio	0.05	0.77	0.11			0.60
Clearance Time (s)	4.0		4.0			4.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	92	1159	197			1093
v/s Ratio Prot	c0.03		c0.09			c0.56
v/s Ratio Perm		0.29				
v/c Ratio	0.62	0.38	0.83			0.93
Uniform Delay, d1	33.8	2.8	31.7			13.2
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	11.8	0.2	25.1			13.1
Delay (s)	45.6	3.0	56.9			26.3
Level of Service	D	A	E			C
Approach Delay (s)	6.9		56.9			26.3
Approach LOS	A		E			C

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	73.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Intersection Delay, s/veh	6.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	3	0	3	1	8	0	1	3	1	0	0
Future Vol, veh/h	0	3	0	3	1	8	0	1	3	1	0	0
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	5	0	5	2	13	0	2	5	2	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	6.6	6.5	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	25%	100%
Vol Thru, %	25%	100%	8%	0%
Vol Right, %	75%	0%	67%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	3	12	1
LT Vol	0	0	3	1
Through Vol	1	3	1	0
RT Vol	3	0	8	0
Lane Flow Rate	6	5	19	2
Geometry Grp	1	1	1	1
Degree of Util (X)	0.006	0.005	0.019	0.002
Departure Headway (Hd)	3.492	3.928	3.567	4.146
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1029	916	1009	867
Service Time	1.498	1.932	1.57	2.152
HCM Lane V/C Ratio	0.006	0.005	0.019	0.002
HCM Control Delay	6.5	7	6.6	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	6	14	295	258	3
Future Vol, veh/h	6	6	14	295	258	3
Conflicting Peds, #/hr	0	2	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	3	3	3	3
Mvmt Flow	7	7	16	335	293	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	668	303	302	0	-	0
Stage 1	301	-	-	-	-	-
Stage 2	367	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.13	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.227	-	-	-
Pot Cap-1 Maneuver	426	741	1253	-	-	-
Stage 1	755	-	-	-	-	-
Stage 2	705	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	414	735	1246	-	-	-
Mov Cap-2 Maneuver	414	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	701	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1246	-	530	-	-
HCM Lane V/C Ratio	0.013	-	0.026	-	-
HCM Control Delay (s)	7.9	0	12	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	47	0	31	0	275	21	8	238	0
Future Vol, veh/h	0	0	0	47	0	31	0	275	21	8	238	0
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	3	3	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	2	2	2	3	3	3	3	3	3
Mvmt Flow	0	0	0	54	0	36	0	316	24	9	274	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	640	635	274	623	623	333	274	0	0	343	0	0
Stage 1	292	292	-	331	331	-	-	-	-	-	-	-
Stage 2	348	343	-	292	292	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.12	6.52	6.22	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.518	4.018	3.318	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	391	399	770	398	402	709	1283	-	-	1210	-	-
Stage 1	720	675	-	682	645	-	-	-	-	-	-	-
Stage 2	672	641	-	716	671	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	368	394	770	394	397	706	1283	-	-	1207	-	-
Mov Cap-2 Maneuver	368	394	-	394	397	-	-	-	-	-	-	-
Stage 1	720	669	-	680	643	-	-	-	-	-	-	-
Stage 2	637	639	-	710	665	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	14.3	0	0.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1283	-	-	-	478	1207	-	-
HCM Lane V/C Ratio	-	-	-	-	0.188	0.008	-	-
HCM Control Delay (s)	0	-	-	0	14.3	8	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.7	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	15	25	379	485	10
Future Vol, veh/h	6	15	25	379	485	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	3	3	3	3
Mvmt Flow	7	17	29	436	557	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1057	563	568	0	-	0
Stage 1	563	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.13	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.227	-	-	-
Pot Cap-1 Maneuver	251	530	999	-	-	-
Stage 1	574	-	-	-	-	-
Stage 2	617	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	241	530	999	-	-	-
Mov Cap-2 Maneuver	241	-	-	-	-	-
Stage 1	552	-	-	-	-	-
Stage 2	617	-	-	-	-	-

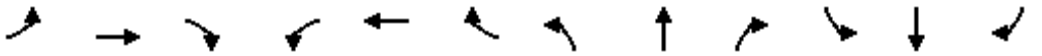
Approach	EB	NB	SB
HCM Control Delay, s	14.7	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	999	-	395	-	-
HCM Lane V/C Ratio	0.029	-	0.061	-	-
HCM Control Delay (s)	8.7	0	14.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	272	58	58	192	173	65	1481	71	313	1773	32
Future Volume (vph)	5	272	58	58	192	173	65	1481	71	313	1773	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95			0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00			0.99		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3337			3211		1752	3505	1547	1752	3505	1547
Flt Permitted		0.95			0.70		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3163			2275		1752	3505	1547	1752	3505	1547
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	280	60	60	198	178	67	1527	73	323	1828	33
RTOR Reduction (vph)	0	14	0	0	100	0	0	0	34	0	0	11
Lane Group Flow (vph)	0	331	0	0	336	0	67	1527	39	323	1828	22
Confl. Peds. (#/hr)	6		4	4		6	1		1	1		1
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		21.9			21.9		8.2	65.9	65.9	26.2	83.9	83.9
Effective Green, g (s)		22.9			22.9		8.2	68.9	68.9	26.2	86.9	86.9
Actuated g/C Ratio		0.18			0.18		0.06	0.53	0.53	0.20	0.67	0.67
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		557			400		110	1857	819	353	2342	1034
v/s Ratio Prot							0.04	c0.44		c0.18	0.52	
v/s Ratio Perm		0.10			c0.15				0.03			0.01
v/c Ratio		0.59			0.84		0.61	0.82	0.05	0.92	0.78	0.02
Uniform Delay, d1		49.3			51.8		59.3	25.5	14.7	50.8	14.9	7.2
Progression Factor		1.00			1.00		1.29	0.43	0.13	1.00	1.00	1.00
Incremental Delay, d2		1.7			14.7		7.4	3.4	0.1	27.4	2.7	0.0
Delay (s)		51.0			66.5		84.0	14.3	2.0	78.2	17.6	7.3
Level of Service		D			E		F	B	A	E	B	A
Approach Delay (s)		51.0			66.5			16.6			26.4	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	272	58	58	192	173	65	1481	71	313	1773	32
Future Volume (veh/h)	5	272	58	58	192	173	65	1481	71	313	1773	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	280	60	60	198	178	67	1527	73	323	1828	33
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	4	4	4	3	3	3	3	3	3
Cap, veh/h	29	436	103	37	119	207	85	1843	822	346	2364	1054
Arrive On Green	0.18	0.19	0.18	0.18	0.19	0.18	0.10	1.00	1.00	0.20	0.67	0.67
Sat Flow, veh/h	0	2308	543	2	632	1093	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	173	0	172	197	0	239	67	1527	73	323	1828	33
Grp Sat Flow(s),veh/h/ln	1293	0	1558	261	0	1466	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	11.3	0.0	13.1	17.7	0.0	20.5	4.8	0.0	0.0	23.4	46.1	0.9
Cycle Q Clear(g_c), s	11.3	0.0	13.1	17.7	0.0	20.5	4.8	0.0	0.0	23.4	46.1	0.9
Prop In Lane	0.03		0.35	0.30		0.75	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	295	0	0	277	85	1843	822	346	2364	1054
V/C Ratio(X)	0.00	0.00	0.58	0.00	0.00	0.86	0.79	0.83	0.09	0.93	0.77	0.03
Avail Cap(c_a), veh/h	0	0	312	0	0	293	150	1843	822	353	2364	1054
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.91	0.00	0.91	0.76	0.76	0.76	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	48.2	0.0	0.0	51.4	58.1	0.0	0.0	51.4	14.7	7.2
Incr Delay (d2), s/veh	0.0	0.0	2.5	0.0	0.0	19.8	11.6	3.4	0.2	31.0	2.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	5.4	0.0	0.0	9.2	2.3	0.9	0.0	13.1	17.1	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	50.8	0.0	0.0	71.2	69.7	3.4	0.2	82.5	17.2	7.3
LnGrp LOS	A	A	D	A	A	E	E	A	A	F	B	A
Approach Vol, veh/h		345			436			1667			2184	
Approach Delay, s/veh		25.4			39.0			6.0			26.7	
Approach LOS		C			D			A			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.2	91.2		28.6	29.5	72.0		28.6				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	11.0	78.0		25.0	26.0	63.0		25.0				
Max Q Clear Time (g_c+I1), s	6.8	48.1		22.5	25.4	2.0		15.1				
Green Ext Time (p_c), s	0.0	17.9		0.7	0.1	18.2		1.5				

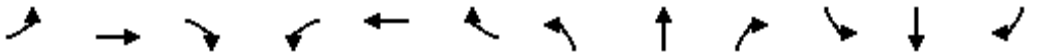
Intersection Summary		
HCM 6th Ctrl Delay		20.3
HCM 6th LOS		C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	457	22	25	209	19	37	135	22	49	145	163
Future Volume (vph)	136	457	22	25	209	19	37	135	22	49	145	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1752	1830		1752	1816			1843	1509		1813	1543
Flt Permitted	0.95	1.00		0.95	1.00			0.89	1.00		0.87	1.00
Satd. Flow (perm)	1752	1830		1752	1816			1650	1509		1591	1543
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	155	519	25	28	238	22	42	153	25	56	165	185
RTOR Reduction (vph)	0	2	0	0	4	0	0	0	19	0	0	138
Lane Group Flow (vph)	155	542	0	28	256	0	0	195	6	0	221	47
Confl. Peds. (#/hr)	12		4	4		12	1		16	16		1
Confl. Bikes (#/hr)			3			1			2			3
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	8.6	24.4		2.3	18.1			14.0	14.0		14.0	14.0
Effective Green, g (s)	8.6	24.4		2.3	18.1			14.0	14.0		14.0	14.0
Actuated g/C Ratio	0.16	0.45		0.04	0.33			0.26	0.26		0.26	0.26
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	275	816		73	600			422	386		407	394
v/s Ratio Prot	c0.09	c0.30		0.02	0.14							
v/s Ratio Perm								0.12	0.00		c0.14	0.03
v/c Ratio	0.56	0.66		0.38	0.43			0.46	0.02		0.54	0.12
Uniform Delay, d1	21.3	11.9		25.5	14.3			17.2	15.2		17.6	15.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.6	2.1		3.3	0.5			0.8	0.0		1.5	0.1
Delay (s)	24.0	14.0		28.8	14.7			18.0	15.2		19.1	15.8
Level of Service	C	B		C	B			B	B		B	B
Approach Delay (s)		16.2			16.1			17.7			17.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	54.7	Sum of lost time (s)	14.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	136	457	22	25	209	19	37	135	22	49	145	163
Future Volume (veh/h)	136	457	22	25	209	19	37	135	22	49	145	163
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.96	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	155	519	25	28	238	22	42	153	25	56	165	185
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	3	3	3
Cap, veh/h	201	613	30	43	434	40	71	209	609	73	172	614
Arrive On Green	0.11	0.35	0.35	0.02	0.26	0.26	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	1767	1752	84	1767	1666	154	1	522	1519	1	429	1533
Grp Volume(v), veh/h	155	0	544	28	0	260	195	0	25	221	0	185
Grp Sat Flow(s),veh/h/ln	1767	0	1836	1767	0	1819	523	0	1519	430	0	1533
Q Serve(g_s), s	5.3	0.0	17.1	1.0	0.0	7.7	0.1	0.0	0.6	0.1	0.0	5.1
Cycle Q Clear(g_c), s	5.3	0.0	17.1	1.0	0.0	7.7	25.0	0.0	0.6	25.0	0.0	5.1
Prop In Lane	1.00		0.05	1.00		0.08	0.22		1.00	0.25		1.00
Lane Grp Cap(c), veh/h	201	0	643	43	0	475	280	0	609	245	0	614
V/C Ratio(X)	0.77	0.00	0.85	0.65	0.00	0.55	0.70	0.00	0.04	0.90	0.00	0.30
Avail Cap(c_a), veh/h	595	0	884	454	0	876	280	0	609	245	0	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.8	0.0	18.7	30.1	0.0	19.9	15.1	0.0	11.4	15.7	0.0	12.7
Incr Delay (d2), s/veh	6.1	0.0	5.7	14.9	0.0	1.0	7.4	0.0	0.0	33.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	7.7	0.6	0.0	3.2	2.3	0.0	0.2	4.2	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	0.0	24.4	45.0	0.0	20.9	22.5	0.0	11.4	48.7	0.0	13.0
LnGrp LOS	C	A	C	D	A	C	C	A	B	D	A	B
Approach Vol, veh/h		699			288			220			406	
Approach Delay, s/veh		26.3			23.2			21.2			32.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	26.8		30.0	11.1	21.3		30.0				
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	16.0	30.0		25.0	21.0	30.0		25.0				
Max Q Clear Time (g_c+I1), s	3.0	19.1		27.0	7.3	9.7		27.0				
Green Ext Time (p_c), s	0.0	2.8		0.0	0.3	1.5		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		26.6	
HCM 6th LOS		C	

Intersection	
Intersection Delay, s/veh	26.2
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	357	34	49	40	36	16	32	294	20	8	140	167
Future Vol, veh/h	357	34	49	40	36	16	32	294	20	8	140	167
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	3	3	3	5	5	5	2	2	2	2	2	2
Mvmt Flow	372	35	51	42	38	17	33	306	21	8	146	174
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

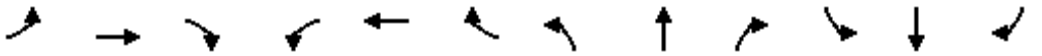
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	37.4	12.6	27.3	13.3
HCM LOS	E	B	D	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	9%	91%	0%	53%	0%	5%	0%
Vol Thru, %	85%	9%	0%	47%	0%	95%	0%
Vol Right, %	6%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	346	391	49	76	16	148	167
LT Vol	32	357	0	40	0	8	0
Through Vol	294	34	0	36	0	140	0
RT Vol	20	0	49	0	16	0	167
Lane Flow Rate	360	407	51	79	17	154	174
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.726	0.855	0.09	0.185	0.034	0.321	0.326
Departure Headway (Hd)	7.247	7.554	6.369	8.392	7.393	7.495	6.749
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	497	481	561	426	482	478	531
Service Time	5.304	5.307	4.121	6.171	5.172	5.261	4.514
HCM Lane V/C Ratio	0.724	0.846	0.091	0.185	0.035	0.322	0.328
HCM Control Delay	27.3	40.9	9.8	13.1	10.4	13.8	12.8
HCM Lane LOS	D	E	A	B	B	B	B
HCM 95th-tile Q	5.9	8.8	0.3	0.7	0.1	1.4	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	31	86	16	20	21	33	1578	14	22	1850	24
Future Volume (vph)	29	31	86	16	20	21	33	1578	14	22	1850	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99			1.00		1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1666			1771		1752	3505	1568	1752	3505	1519
Flt Permitted		0.94			0.79		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1577			1421		1752	3505	1568	1752	3505	1519
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	30	32	89	16	21	22	34	1627	14	23	1907	25
RTOR Reduction (vph)	0	41	0	0	18	0	0	0	3	0	0	6
Lane Group Flow (vph)	0	110	0	0	41	0	34	1627	11	23	1907	19
Confl. Peds. (#/hr)	1		3	3		1	4					4
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		14.5			14.5		5.4	94.6	94.6	4.9	94.1	94.1
Effective Green, g (s)		15.5			15.5		5.4	97.6	97.6	4.9	97.1	97.1
Actuated g/C Ratio		0.12			0.12		0.04	0.75	0.75	0.04	0.75	0.75
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		188			169		72	2631	1177	66	2617	1134
v/s Ratio Prot							c0.02	0.46		0.01	c0.54	
v/s Ratio Perm		c0.07			0.03				0.01			0.01
v/c Ratio		0.58			0.24		0.47	0.62	0.01	0.35	0.73	0.02
Uniform Delay, d1		54.2			51.9		60.9	7.5	4.1	61.0	9.1	4.2
Progression Factor		1.00			1.00		1.42	0.62	1.00	1.19	0.22	0.00
Incremental Delay, d2		4.5			0.8		3.0	0.7	0.0	2.0	1.1	0.0
Delay (s)		58.7			52.7		89.6	5.3	4.1	74.5	3.2	0.0
Level of Service		E			D		F	A	A	E	A	A
Approach Delay (s)		58.7			52.7			7.0			4.0	
Approach LOS		E			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



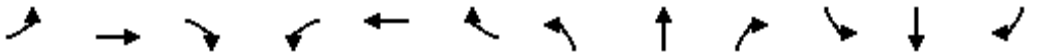
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	31	86	16	20	21	33	1578	14	22	1850	24
Future Volume (veh/h)	29	31	86	16	20	21	33	1578	14	22	1850	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1900	1900	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	30	32	89	16	21	22	34	1627	14	23	1907	25
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	0	0	0	3	3	3	3	3	3
Cap, veh/h	56	56	113	66	84	68	43	2713	1207	31	2688	1196
Arrive On Green	0.11	0.12	0.12	0.11	0.12	0.12	0.02	0.77	0.77	0.02	0.76	0.76
Sat Flow, veh/h	186	464	933	252	696	564	1767	3526	1568	1767	3526	1568
Grp Volume(v), veh/h	151	0	0	59	0	0	34	1627	14	23	1907	25
Grp Sat Flow(s),veh/h/ln	1583	0	0	1513	0	0	1767	1763	1568	1767	1763	1568
Q Serve(g_s), s	11.7	0.0	0.0	4.2	0.0	0.0	2.5	25.7	0.3	1.7	36.4	0.5
Cycle Q Clear(g_c), s	11.7	0.0	0.0	4.2	0.0	0.0	2.5	25.7	0.3	1.7	36.4	0.5
Prop In Lane	0.20		0.59	0.27		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	0	0	0	0	43	2713	1207	31	2688	1196
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.60	0.01	0.75	0.71	0.02
Avail Cap(c_a), veh/h	0	0	0	0	0	0	136	2713	1207	136	2688	1196
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.53	0.53	0.53	0.54	0.54	0.54
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	63.1	6.4	3.5	63.6	8.0	3.7
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	15.1	0.5	0.0	17.7	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	1.3	7.7	0.1	0.9	11.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	78.1	6.9	3.5	81.3	8.9	3.7
LnGrp LOS	A	A	A	A	A	A	E	A	A	F	A	A
Approach Vol, veh/h		151			59			1675			1955	
Approach Delay, s/veh		0.0			0.0			8.3			9.6	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	103.1		19.7	6.3	104.1		19.7				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	10.0	83.0		20.0	10.0	84.0		20.0				
Max Q Clear Time (g_c+I1), s	4.5	38.4		6.2	3.7	27.7		13.7				
Green Ext Time (p_c), s	0.0	23.9		0.2	0.0	19.6		0.4				

Intersection Summary	
HCM 6th Ctrl Delay	8.6
HCM 6th LOS	A

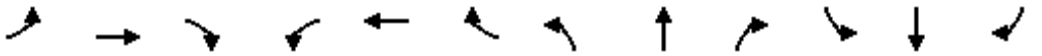
Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	228	1694	53	104	1466	173	27	214	82	129	246	140
Future Volume (vph)	228	1694	53	104	1466	173	27	214	82	129	246	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1547	1770	3539	1556	1732	3471	1518	1739	3505	1543
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.48	1.00	1.00	0.53	1.00	1.00
Satd. Flow (perm)	1752	3505	1547	1770	3539	1556	874	3471	1518	961	3505	1543
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	245	1822	57	112	1576	186	29	230	88	139	265	151
RTOR Reduction (vph)	0	0	20	0	0	55	0	0	71	0	0	121
Lane Group Flow (vph)	245	1822	38	112	1576	131	29	230	17	139	265	30
Confl. Peds. (#/hr)	5		1	1		5	3		10	10		3
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	4%	4%	4%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	23.1	76.3	76.3	13.0	66.2	66.2	24.7	24.7	24.7	24.7	24.7	24.7
Effective Green, g (s)	23.1	79.3	79.3	13.0	69.2	69.2	25.7	25.7	25.7	25.7	25.7	25.7
Actuated g/C Ratio	0.18	0.61	0.61	0.10	0.53	0.53	0.20	0.20	0.20	0.20	0.20	0.20
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	311	2138	943	177	1883	828	172	686	300	189	692	305
v/s Ratio Prot	0.14	c0.52		0.06	c0.45			0.07			0.08	
v/s Ratio Perm			0.02			0.08	0.03		0.01	c0.14		0.02
v/c Ratio	0.79	0.85	0.04	0.63	0.84	0.16	0.17	0.34	0.06	0.74	0.38	0.10
Uniform Delay, d1	51.1	20.6	10.1	56.2	25.6	15.5	43.3	44.8	42.3	49.0	45.3	42.7
Progression Factor	0.86	0.74	1.13	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.4	3.4	0.1	7.2	4.6	0.4	0.5	0.3	0.1	13.8	0.4	0.1
Delay (s)	53.6	18.6	11.5	63.4	30.3	15.9	43.7	45.1	42.4	62.8	45.6	42.8
Level of Service	D	B	B	E	C	B	D	D	D	E	D	D
Approach Delay (s)		22.4			30.8			44.3			49.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



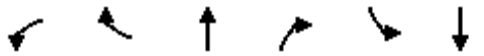
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	228	1694	53	104	1466	173	27	214	82	129	246	140
Future Volume (veh/h)	228	1694	53	104	1466	173	27	214	82	129	246	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1870	1870	1870	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	245	1822	57	112	1576	186	29	230	88	139	265	151
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	2	2	2	4	4	4	3	3	3
Cap, veh/h	380	2060	916	137	1503	668	231	862	380	258	869	378
Arrive On Green	0.43	1.00	1.00	0.08	0.42	0.42	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1767	3526	1568	1781	3554	1579	949	3497	1541	1046	3526	1533
Grp Volume(v), veh/h	245	1822	57	112	1576	186	29	230	88	139	265	151
Grp Sat Flow(s),veh/h/ln	1767	1763	1568	1781	1777	1579	949	1749	1541	1046	1763	1533
Q Serve(g_s), s	14.2	0.0	0.0	8.1	55.0	10.0	3.3	6.9	5.9	16.1	8.0	10.7
Cycle Q Clear(g_c), s	14.2	0.0	0.0	8.1	55.0	10.0	11.3	6.9	5.9	23.0	8.0	10.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	380	2060	916	137	1503	668	231	862	380	258	869	378
V/C Ratio(X)	0.64	0.88	0.06	0.82	1.05	0.28	0.13	0.27	0.23	0.54	0.30	0.40
Avail Cap(c_a), veh/h	380	2060	916	219	1503	668	289	1076	474	322	1085	472
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.63	0.63	0.63	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.1	0.0	0.0	59.1	37.5	24.5	44.5	39.5	39.1	48.8	39.9	40.9
Incr Delay (d2), s/veh	2.4	3.9	0.1	12.1	37.0	1.0	0.2	0.2	0.3	1.8	0.2	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	1.1	0.0	4.0	30.5	3.9	0.8	3.0	2.3	4.4	3.5	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.5	3.9	0.1	71.2	74.5	25.6	44.7	39.7	39.4	50.5	40.1	41.6
LnGrp LOS	D	A	A	E	F	C	D	D	D	D	D	D
Approach Vol, veh/h		2124			1874			347			555	
Approach Delay, s/veh		7.5			69.4			40.0			43.1	
Approach LOS		A			E			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	80.0		36.1	34.9	59.0		36.1				
Change Period (Y+Rc), s	4.0	7.0		5.0	7.0	* 7		5.0				
Max Green Setting (Gmax), s	16.0	59.0		39.0	23.0	* 52		39.0				
Max Q Clear Time (g_c+I1), s	10.1	2.0		25.0	16.2	57.0		13.3				
Green Ext Time (p_c), s	0.1	24.8		2.6	0.4	0.0		2.0				

Intersection Summary			
HCM 6th Ctrl Delay		37.5	
HCM 6th LOS		D	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	33	773	303	75	333	114
Future Volume (vph)	33	773	303	75	333	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	0.98	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	0.97			1.00
Flt Protected	0.95	1.00	1.00			0.96
Satd. Flow (prot)	1770	1547	1841			1796
Flt Permitted	0.95	1.00	1.00			0.96
Satd. Flow (perm)	1770	1547	1841			1796
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	35	831	326	81	358	123
RTOR Reduction (vph)	0	180	9	0	0	0
Lane Group Flow (vph)	35	651	398	0	0	481
Confl. Peds. (#/hr)	3			1	1	
Confl. Bikes (#/hr)		6				
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	3		1		2	2
Permitted Phases		1 2				
Actuated Green, G (s)	1.6	52.1	22.1			26.0
Effective Green, g (s)	1.6	52.1	22.1			26.0
Actuated g/C Ratio	0.02	0.78	0.33			0.39
Clearance Time (s)	4.0		4.0			4.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	42	1212	611			702
v/s Ratio Prot	c0.02		c0.22			c0.27
v/s Ratio Perm		0.42				
v/c Ratio	0.83	0.54	0.65			0.69
Uniform Delay, d1	32.3	2.7	18.9			16.8
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	77.0	0.5	2.5			2.8
Delay (s)	109.3	3.2	21.4			19.6
Level of Service	F	A	C			B
Approach Delay (s)	7.4		21.4			19.6
Approach LOS	A		C			B

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	5	0	2	0	2	0	0	4	2	0	0
Future Vol, veh/h	2	5	0	2	0	2	0	0	4	2	0	0
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	9	0	4	0	4	0	0	7	4	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	6.8	6.4	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	29%	50%	100%
Vol Thru, %	0%	71%	0%	0%
Vol Right, %	100%	0%	50%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	7	4	2
LT Vol	0	2	2	2
Through Vol	0	5	0	0
RT Vol	4	0	2	0
Lane Flow Rate	7	12	7	4
Geometry Grp	1	1	1	1
Degree of Util (X)	0.007	0.014	0.007	0.004
Departure Headway (Hd)	3.336	3.98	3.727	4.138
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1077	904	964	868
Service Time	1.344	1.985	1.733	2.147
HCM Lane V/C Ratio	0.006	0.013	0.007	0.005
HCM Control Delay	6.4	7	6.8	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0	0

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	5	4	209	280	2
Future Vol, veh/h	2	5	4	209	280	2
Conflicting Peds, #/hr	0	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	7	7	6	6
Mvmt Flow	2	6	5	243	326	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	581	329	329	0	-	0
Stage 1	328	-	-	-	-	-
Stage 2	253	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.263	-	-	-
Pot Cap-1 Maneuver	479	717	1203	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	794	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	476	716	1202	-	-	-
Mov Cap-2 Maneuver	476	-	-	-	-	-
Stage 1	730	-	-	-	-	-
Stage 2	793	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1202	-	626	-	-
HCM Lane V/C Ratio	0.004	-	0.013	-	-
HCM Control Delay (s)	8	0	10.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	0	50	30	0	14	17	161	28	40	248	9
Future Vol, veh/h	25	0	50	30	0	14	17	161	28	40	248	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	7	7	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	9	9	9	10	10	10	5	5	5
Mvmt Flow	31	0	62	37	0	17	21	199	35	49	306	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	677	693	312	707	681	224	317	0	0	241	0	0
Stage 1	410	410	-	266	266	-	-	-	-	-	-	-
Stage 2	267	283	-	441	415	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.19	6.59	6.29	4.2	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.581	4.081	3.381	2.29	-	-	2.245	-	-
Pot Cap-1 Maneuver	369	369	733	341	364	798	1199	-	-	1308	-	-
Stage 1	623	599	-	724	676	-	-	-	-	-	-	-
Stage 2	743	681	-	582	581	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	343	342	733	295	338	793	1199	-	-	1299	-	-
Mov Cap-2 Maneuver	343	342	-	295	338	-	-	-	-	-	-	-
Stage 1	611	571	-	704	658	-	-	-	-	-	-	-
Stage 2	712	663	-	508	554	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	16.4	0.7	1.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1199	-	-	532	369	1299	-	-
HCM Lane V/C Ratio	0.018	-	-	0.174	0.147	0.038	-	-
HCM Control Delay (s)	8.1	0	-	13.2	16.4	7.9	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.5	0.1	-	-

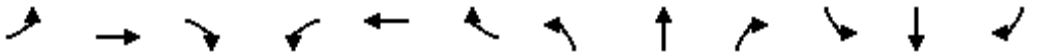
Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	23	45	13	491	550	6
Future Vol, veh/h	23	45	13	491	550	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	28	56	16	606	679	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1321	683	686	0	-	0
Stage 1	683	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	174	453	917	-	-	-
Stage 1	505	-	-	-	-	-
Stage 2	530	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	169	453	917	-	-	-
Mov Cap-2 Maneuver	169	-	-	-	-	-
Stage 1	492	-	-	-	-	-
Stage 2	530	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.5	0.2	0
HCM LOS	C		

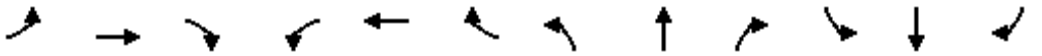
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	917	-	289	-	-
HCM Lane V/C Ratio	0.018	-	0.29	-	-
HCM Control Delay (s)	9	0	22.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.2	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	127	42	68	194	343	60	1817	66	105	893	14
Future Volume (vph)	19	127	42	68	194	343	60	1817	66	105	893	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95			0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00			0.99		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3019			3133		1719	3438	1538	1703	3406	1524
Flt Permitted		0.71			0.85		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		2141			2675		1719	3438	1538	1703	3406	1524
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	20	137	45	73	209	369	65	1954	71	113	960	15
RTOR Reduction (vph)	0	22	0	0	127	0	0	0	22	0	0	6
Lane Group Flow (vph)	0	180	0	0	524	0	65	1954	49	113	960	9
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	15%	15%	15%	4%	4%	4%	5%	5%	5%	6%	6%	6%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		23.5			23.5		8.0	70.0	70.0	10.5	72.5	72.5
Effective Green, g (s)		24.5			24.5		8.0	73.0	73.0	10.5	75.5	75.5
Actuated g/C Ratio		0.20			0.20		0.07	0.61	0.61	0.09	0.63	0.63
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		437			546		114	2091	935	149	2142	958
v/s Ratio Prot							0.04	c0.57		c0.07	0.28	
v/s Ratio Perm		0.08			c0.20				0.03			0.01
v/c Ratio		0.41			0.96		0.57	0.93	0.05	0.76	0.45	0.01
Uniform Delay, d1		41.5			47.3		54.3	21.3	9.5	53.5	11.5	8.3
Progression Factor		1.00			1.00		1.26	0.83	0.24	1.00	1.00	1.00
Incremental Delay, d2		0.6			28.1		4.7	6.9	0.1	19.6	0.7	0.0
Delay (s)		42.1			75.4		73.1	24.7	2.4	73.1	12.2	8.3
Level of Service		D			E		E	C	A	E	B	A
Approach Delay (s)		42.1			75.4			25.5			18.4	
Approach LOS		D			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



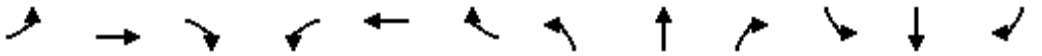
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	127	42	68	194	343	60	1817	66	105	893	14
Future Volume (veh/h)	19	127	42	68	194	343	60	1817	66	105	893	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1678	1678	1678	1841	1841	1841	1826	1826	1826	1811	1811	1811
Adj Flow Rate, veh/h	20	137	45	73	209	369	65	1954	71	113	960	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	15	15	15	4	4	4	5	5	5	6	6	6
Cap, veh/h	39	260	101	38	37	283	82	2152	960	137	2246	1002
Arrive On Green	0.19	0.20	0.19	0.19	0.20	0.19	0.09	1.00	1.00	0.08	0.65	0.65
Sat Flow, veh/h	2	1302	503	2	185	1416	1739	3469	1547	1725	3441	1535
Grp Volume(v), veh/h	74	0	128	282	0	369	65	1954	71	113	960	15
Grp Sat Flow(s),veh/h/ln	372	0	1435	187	0	1416	1739	1735	1547	1725	1721	1535
Q Serve(g_s), s	120.0	0.0	9.5	24.1	0.0	24.0	4.4	0.0	0.0	7.7	16.1	0.4
Cycle Q Clear(g_c), s	120.0	0.0	9.5	24.1	0.0	24.0	4.4	0.0	0.0	7.7	16.1	0.4
Prop In Lane	0.27		0.35	0.26		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	287	0	0	283	82	2152	960	137	2246	1002
V/C Ratio(X)	0.00	0.00	0.45	0.00	0.00	1.30	0.79	0.91	0.07	0.82	0.43	0.01
Avail Cap(c_a), veh/h	0	0	287	0	0	283	159	2152	960	158	2246	1002
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.77	0.00	0.77	0.62	0.62	0.62	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	42.3	0.0	0.0	48.5	53.7	0.0	0.0	54.4	10.0	7.3
Incr Delay (d2), s/veh	0.0	0.0	1.1	0.0	0.0	155.0	9.9	4.6	0.1	25.6	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	3.5	0.0	0.0	20.7	2.0	1.4	0.0	4.3	5.7	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	43.4	0.0	0.0	203.5	63.6	4.6	0.1	80.0	10.6	7.3
LnGrp LOS	A	A	D	A	A	F	E	A	A	E	B	A
Approach Vol, veh/h		202			651			2090			1088	
Approach Delay, s/veh		27.6			115.3			6.3			17.8	
Approach LOS		C			F			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.7	82.3		28.0	13.5	78.5		28.0				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	11.0	70.0		23.0	11.0	70.0		23.0				
Max Q Clear Time (g_c+I1), s	6.4	18.1		26.1	9.7	2.0		122.0				
Green Ext Time (p_c), s	0.0	8.1		0.0	0.0	30.6		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		28.1	
HCM 6th LOS		C	

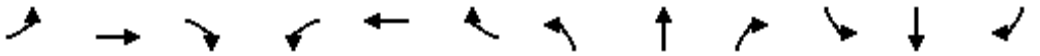
Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	112	9	22	415	24	61	143	15	22	111	213
Future Volume (vph)	127	112	9	22	415	24	61	143	15	22	111	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1641	1706		1748	1827			1835	1534		1776	1502
Flt Permitted	0.95	1.00		0.68	1.00			0.86	1.00		0.92	1.00
Satd. Flow (perm)	1641	1706		1244	1827			1598	1534		1653	1502
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	132	117	9	23	432	25	64	149	16	23	116	222
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	12	0	0	169
Lane Group Flow (vph)	132	123	0	23	455	0	0	213	4	0	139	53
Confl. Peds. (#/hr)	3		3	3		3			5	5		
Confl. Bikes (#/hr)			2			1			2			2
Heavy Vehicles (%)	10%	10%	10%	3%	3%	3%	2%	2%	2%	6%	6%	6%
Turn Type	Prot	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases				6			8		8	4		4
Actuated Green, G (s)	8.6	29.6		24.8	22.9			14.4	14.4		14.4	14.4
Effective Green, g (s)	8.6	29.6		24.8	22.9			14.4	14.4		14.4	14.4
Actuated g/C Ratio	0.14	0.49		0.41	0.38			0.24	0.24		0.24	0.24
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	235	843		531	698			384	368		397	361
v/s Ratio Prot	c0.08	0.07		0.00	c0.25							
v/s Ratio Perm				0.02				c0.13	0.00		0.08	0.04
v/c Ratio	0.56	0.15		0.04	0.65			0.55	0.01		0.35	0.15
Uniform Delay, d1	23.9	8.3		10.4	15.2			19.9	17.3		18.9	17.9
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.1	0.1		0.0	2.2			1.7	0.0		0.5	0.2
Delay (s)	26.9	8.3		10.5	17.4			21.7	17.3		19.4	18.1
Level of Service	C	A		B	B			C	B		B	B
Approach Delay (s)		17.9			17.1			21.4			18.6	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	59.9	Sum of lost time (s)	14.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	127	112	9	22	415	24	61	143	15	22	111	213
Future Volume (veh/h)	127	112	9	22	415	24	61	143	15	22	111	213
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1856	1856	1856	1870	1870	1870	1811	1811	1811
Adj Flow Rate, veh/h	132	117	9	23	432	25	64	149	16	23	116	222
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	3	3	3	2	2	2	6	6	6
Cap, veh/h	166	604	46	514	516	30	77	142	593	67	264	581
Arrive On Green	0.10	0.38	0.38	0.02	0.30	0.30	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	1668	1602	123	1767	1734	100	10	370	1540	5	686	1509
Grp Volume(v), veh/h	132	0	126	23	0	457	213	0	16	139	0	222
Grp Sat Flow(s),veh/h/ln	1668	0	1726	1767	0	1834	380	0	1540	692	0	1509
Q Serve(g_s), s	5.0	0.0	3.2	0.6	0.0	15.0	0.5	0.0	0.4	0.5	0.0	6.8
Cycle Q Clear(g_c), s	5.0	0.0	3.2	0.6	0.0	15.0	24.8	0.0	0.4	24.8	0.0	6.8
Prop In Lane	1.00		0.07	1.00		0.05	0.30		1.00	0.17		1.00
Lane Grp Cap(c), veh/h	166	0	650	514	0	546	219	0	593	331	0	581
V/C Ratio(X)	0.80	0.00	0.19	0.04	0.00	0.84	0.97	0.00	0.03	0.42	0.00	0.38
Avail Cap(c_a), veh/h	545	0	805	918	0	855	224	0	598	337	0	586
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.3	0.0	13.5	15.1	0.0	21.1	18.0	0.0	12.3	15.1	0.0	14.3
Incr Delay (d2), s/veh	8.3	0.0	0.1	0.0	0.0	4.3	51.8	0.0	0.0	0.8	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	1.2	0.2	0.0	6.7	5.2	0.0	0.1	1.3	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.7	0.0	13.6	15.2	0.0	25.4	69.9	0.0	12.3	15.9	0.0	14.7
LnGrp LOS	D	A	B	B	A	C	E	A	B	B	A	B
Approach Vol, veh/h		258			480			229			361	
Approach Delay, s/veh		25.4			24.9			65.8			15.2	
Approach LOS		C			C			E			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	29.5		29.9	10.5	24.3		29.9				
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	16.0	30.0		25.0	21.0	30.0		25.0				
Max Q Clear Time (g_c+I1), s	2.6	5.2		26.8	7.0	17.0		26.8				
Green Ext Time (p_c), s	0.0	0.7		0.0	0.3	2.5		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		29.4	
HCM 6th LOS		C	

Intersection	
Intersection Delay, s/veh	11.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	148	8	11	18	28	5	28	135	5	3	134	279
Future Vol, veh/h	148	8	11	18	28	5	28	135	5	3	134	279
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	6	6	6	6	6	6	3	3	3	5	5	5
Mvmt Flow	159	9	12	19	30	5	30	145	5	3	144	300
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

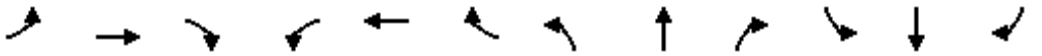
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	12.3	10	11.4	10.8
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	17%	95%	0%	39%	0%	2%	0%
Vol Thru, %	80%	5%	0%	61%	0%	98%	0%
Vol Right, %	3%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	168	156	11	46	5	137	279
LT Vol	28	148	0	18	0	3	0
Through Vol	135	8	0	28	0	134	0
RT Vol	5	0	11	0	5	0	279
Lane Flow Rate	181	168	12	49	5	147	300
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.297	0.316	0.018	0.093	0.009	0.232	0.412
Departure Headway (Hd)	5.923	6.776	5.584	6.752	5.84	5.662	4.945
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	607	532	641	531	612	638	732
Service Time	3.954	4.508	3.316	4.491	3.579	3.362	2.645
HCM Lane V/C Ratio	0.298	0.316	0.019	0.092	0.008	0.23	0.41
HCM Control Delay	11.4	12.6	8.4	10.2	8.6	10.1	11.1
HCM Lane LOS	B	B	A	B	A	B	B
HCM 95th-tile Q	1.2	1.3	0.1	0.3	0	0.9	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	9	60	5	18	24	42	1890	14	5	982	16
Future Volume (vph)	32	9	60	5	18	24	42	1890	14	5	982	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.99		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1688			1711		1719	3438	1504	1687	3374	1509
Flt Permitted		0.90			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1549			1674		1719	3438	1504	1687	3374	1509
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	34	10	64	5	19	26	45	2011	15	5	1045	17
RTOR Reduction (vph)	0	45	0	0	23	0	0	0	3	0	0	5
Lane Group Flow (vph)	0	63	0	0	27	0	45	2011	12	5	1045	12
Confl. Peds. (#/hr)	2		3	3		2			1	1		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	5%	5%	5%	7%	7%	7%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		11.8			11.8		7.1	90.8	90.8	1.4	85.1	85.1
Effective Green, g (s)		12.8			12.8		7.1	93.8	93.8	1.4	88.1	88.1
Actuated g/C Ratio		0.11			0.11		0.06	0.78	0.78	0.01	0.73	0.73
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		165			178		101	2687	1175	19	2477	1107
v/s Ratio Prot							c0.03	c0.58		0.00	0.31	
v/s Ratio Perm		c0.04			0.02				0.01			0.01
v/c Ratio		0.38			0.15		0.45	0.75	0.01	0.26	0.42	0.01
Uniform Delay, d1		49.9			48.7		54.5	6.9	2.9	58.8	6.1	4.3
Progression Factor		1.00			1.00		1.25	0.37	1.00	1.16	0.55	1.00
Incremental Delay, d2		1.5			0.4		2.3	1.5	0.0	6.5	0.5	0.0
Delay (s)		51.4			49.1		70.3	4.0	2.9	74.5	3.9	4.3
Level of Service		D			D		E	A	A	E	A	A
Approach Delay (s)		51.4			49.1			5.5			4.2	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



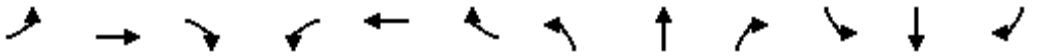
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	9	60	5	18	24	42	1890	14	5	982	16
Future Volume (veh/h)	32	9	60	5	18	24	42	1890	14	5	982	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1826	1826	1826	1796	1796	1796
Adj Flow Rate, veh/h	34	10	64	5	19	26	45	2011	15	5	1045	17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	2	2	2	5	5	5	7	7	7
Cap, veh/h	68	31	87	36	77	87	57	2771	1235	9	2630	1172
Arrive On Green	0.09	0.10	0.10	0.09	0.10	0.10	0.03	0.80	0.80	0.01	0.77	0.77
Sat Flow, veh/h	300	322	906	35	795	900	1739	3469	1546	1711	3413	1521
Grp Volume(v), veh/h	108	0	0	50	0	0	45	2011	15	5	1045	17
Grp Sat Flow(s),veh/h/ln	1529	0	0	1730	0	0	1739	1735	1546	1711	1706	1521
Q Serve(g_s), s	7.9	0.0	0.0	3.3	0.0	0.0	3.1	33.3	0.2	0.3	12.1	0.3
Cycle Q Clear(g_c), s	7.9	0.0	0.0	3.3	0.0	0.0	3.1	33.3	0.2	0.3	12.1	0.3
Prop In Lane	0.31		0.59	0.10		0.52	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	0	0	0	0	57	2771	1235	9	2630	1172
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.73	0.01	0.57	0.40	0.01
Avail Cap(c_a), veh/h	0	0	0	0	0	0	145	2771	1235	143	2630	1172
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.62	0.62	0.62	0.90	0.90	0.90
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	57.6	5.8	2.5	59.6	4.5	3.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	13.3	1.1	0.0	43.5	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	1.5	8.5	0.1	0.3	3.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	70.9	6.8	2.5	103.0	5.0	3.2
LnGrp LOS	A	A	A	A	A	A	E	A	A	F	A	A
Approach Vol, veh/h		108			50			2071			1067	
Approach Delay, s/veh		0.0			0.0			8.2			5.4	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.0	96.5		15.5	4.6	99.8		15.5				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	10.0	79.0		15.0	10.0	79.0		15.0				
Max Q Clear Time (g_c+I1), s	5.1	14.1		5.3	2.3	35.3		9.9				
Green Ext Time (p_c), s	0.0	9.3		0.1	0.0	25.6		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	6.9
HCM 6th LOS	A

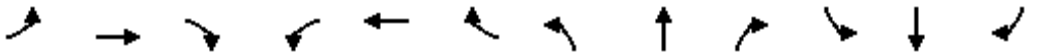
Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	949	17	139	1666	168	49	170	88	80	279	194
Future Volume (vph)	89	949	17	139	1666	168	49	170	88	80	279	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3438	1538	1703	3406	1504	1714	3438	1514	1714	3438	1510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.41	1.00	1.00	0.59	1.00	1.00
Satd. Flow (perm)	1719	3438	1538	1703	3406	1504	734	3438	1514	1066	3438	1510
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	91	968	17	142	1700	171	50	173	90	82	285	198
RTOR Reduction (vph)	0	0	6	0	0	53	0	0	77	0	0	119
Lane Group Flow (vph)	91	968	11	142	1700	118	50	173	13	82	285	79
Confl. Peds. (#/hr)	1					1	5		4	4		5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	10.1	72.9	72.9	14.2	77.0	77.0	16.9	16.9	16.9	16.9	16.9	16.9
Effective Green, g (s)	10.1	75.9	75.9	14.2	80.0	80.0	17.9	17.9	17.9	17.9	17.9	17.9
Actuated g/C Ratio	0.08	0.63	0.63	0.12	0.67	0.67	0.15	0.15	0.15	0.15	0.15	0.15
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	144	2174	972	201	2270	1002	109	512	225	159	512	225
v/s Ratio Prot	c0.05	0.28		0.08	c0.50			0.05			c0.08	
v/s Ratio Perm			0.01			0.08	0.07		0.01	0.08		0.05
v/c Ratio	0.63	0.45	0.01	0.71	0.75	0.12	0.46	0.34	0.06	0.52	0.56	0.35
Uniform Delay, d1	53.2	11.3	8.2	50.9	13.3	7.2	46.6	45.7	43.8	47.1	47.4	45.8
Progression Factor	0.77	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.1	0.6	0.0	10.8	2.3	0.2	3.0	0.4	0.1	2.8	1.3	0.9
Delay (s)	49.2	6.3	8.2	61.7	15.6	7.5	49.7	46.1	43.9	49.9	48.7	46.8
Level of Service	D	A	A	E	B	A	D	D	D	D	D	D
Approach Delay (s)		9.9			18.2			46.1			48.2	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	949	17	139	1666	168	49	170	88	80	279	194
Future Volume (veh/h)	89	949	17	139	1666	168	49	170	88	80	279	194
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1811	1811	1811	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	91	968	17	142	1700	171	50	173	90	82	285	198
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	5	5	5	6	6	6	5	5	5	5	5	5
Cap, veh/h	247	2189	976	169	1932	861	146	594	263	198	594	259
Arrive On Green	0.14	0.63	0.63	0.10	0.56	0.56	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1739	3469	1547	1725	3441	1534	887	3469	1534	1084	3469	1514
Grp Volume(v), veh/h	91	968	17	142	1700	171	50	173	90	82	285	198
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1725	1721	1534	887	1735	1534	1084	1735	1514
Q Serve(g_s), s	5.7	17.1	0.5	9.7	51.4	6.6	6.5	5.2	6.2	8.6	8.9	15.0
Cycle Q Clear(g_c), s	5.7	17.1	0.5	9.7	51.4	6.6	15.4	5.2	6.2	13.8	8.9	15.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	247	2189	976	169	1932	861	146	594	263	198	594	259
V/C Ratio(X)	0.37	0.44	0.02	0.84	0.88	0.20	0.34	0.29	0.34	0.41	0.48	0.76
Avail Cap(c_a), veh/h	247	2189	976	230	2065	920	179	723	320	239	723	315
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.6	11.3	8.3	53.2	22.8	13.0	51.8	43.4	43.8	49.4	44.9	47.4
Incr Delay (d2), s/veh	0.8	0.6	0.0	18.1	6.1	0.5	1.4	0.3	0.8	1.4	0.6	8.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	6.2	0.2	5.0	20.6	2.3	1.5	2.3	2.4	2.4	3.9	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.4	11.9	8.3	71.4	28.9	13.5	53.2	43.6	44.5	50.8	45.5	56.1
LnGrp LOS	D	B	A	E	C	B	D	D	D	D	D	E
Approach Vol, veh/h		1076			2013			313			565	
Approach Delay, s/veh		14.9			30.6			45.4			50.0	
Approach LOS		B			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.7	79.7		24.5	24.1	71.4		24.5				
Change Period (Y+Rc), s	4.0	7.0		5.0	7.0	* 7		5.0				
Max Green Setting (Gmax), s	16.0	64.0		24.0	11.0	* 69		24.0				
Max Q Clear Time (g_c+I1), s	11.7	19.1		17.0	7.7	53.4		17.4				
Green Ext Time (p_c), s	0.1	8.1		1.8	0.0	11.0		0.9				

Intersection Summary			
HCM 6th Ctrl Delay		30.3	
HCM 6th LOS		C	

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	5	0	3	0	2	0	0	9	2	0	0
Future Vol, veh/h	2	5	0	3	0	2	0	0	9	2	0	0
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	9	0	5	0	4	0	0	16	4	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.1	6.9	6.4	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	29%	60%	100%
Vol Thru, %	0%	71%	0%	0%
Vol Right, %	100%	0%	40%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	7	5	2
LT Vol	0	2	3	2
Through Vol	0	5	0	0
RT Vol	9	0	2	0
Lane Flow Rate	16	12	9	4
Geometry Grp	1	1	1	1
Degree of Util (X)	0.015	0.014	0.009	0.004
Departure Headway (Hd)	3.339	3.997	3.822	4.149
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1076	900	940	866
Service Time	1.348	2.002	1.829	2.158
HCM Lane V/C Ratio	0.015	0.013	0.01	0.005
HCM Control Delay	6.4	7.1	6.9	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0	0

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	9	5	209	280	2
Future Vol, veh/h	3	9	5	209	280	2
Conflicting Peds, #/hr	0	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	7	7	6	6
Mvmt Flow	3	10	6	243	326	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	583	329	329	0	-	0
Stage 1	328	-	-	-	-	-
Stage 2	255	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.263	-	-	-
Pot Cap-1 Maneuver	478	717	1203	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	792	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	474	716	1202	-	-	-
Mov Cap-2 Maneuver	474	-	-	-	-	-
Stage 1	729	-	-	-	-	-
Stage 2	791	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1202	-	635	-	-
HCM Lane V/C Ratio	0.005	-	0.022	-	-
HCM Control Delay (s)	8	0	10.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	24	0	46	30	0	14	17	162	28	40	252	9
Future Vol, veh/h	24	0	46	30	0	14	17	162	28	40	252	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	7	7	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	9	9	9	10	10	10	5	5	5
Mvmt Flow	30	0	57	37	0	17	21	200	35	49	311	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	683	699	317	710	687	225	322	0	0	242	0	0
Stage 1	415	415	-	267	267	-	-	-	-	-	-	-
Stage 2	268	284	-	443	420	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.19	6.59	6.29	4.2	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.581	4.081	3.381	2.29	-	-	2.245	-	-
Pot Cap-1 Maneuver	366	366	728	339	361	797	1194	-	-	1307	-	-
Stage 1	619	596	-	723	675	-	-	-	-	-	-	-
Stage 2	742	680	-	580	578	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	340	340	728	295	335	792	1194	-	-	1298	-	-
Mov Cap-2 Maneuver	340	340	-	295	335	-	-	-	-	-	-	-
Stage 1	607	569	-	703	657	-	-	-	-	-	-	-
Stage 2	711	662	-	510	551	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	16.4	0.7	1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1194	-	-	523	369	1298	-	-
HCM Lane V/C Ratio	0.018	-	-	0.165	0.147	0.038	-	-
HCM Control Delay (s)	8.1	0	-	13.2	16.4	7.9	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.5	0.1	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	23	45	13	491	550	6
Future Vol, veh/h	23	45	13	491	550	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	28	56	16	606	679	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1321	683	686	0	-	0
Stage 1	683	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	174	453	917	-	-	-
Stage 1	505	-	-	-	-	-
Stage 2	530	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	169	453	917	-	-	-
Mov Cap-2 Maneuver	169	-	-	-	-	-
Stage 1	492	-	-	-	-	-
Stage 2	530	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.5	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	917	-	289	-	-
HCM Lane V/C Ratio	0.018	-	0.29	-	-
HCM Control Delay (s)	9	0	22.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.2	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	64	542	137	44	628	348
Future Volume (vph)	64	542	137	44	628	348
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	0.97	0.99			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	0.97			1.00
Flt Protected	0.95	1.00	1.00			0.97
Satd. Flow (prot)	1736	1512	1756			1823
Flt Permitted	0.95	1.00	1.00			0.97
Satd. Flow (perm)	1736	1512	1756			1823
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	67	571	144	46	661	366
RTOR Reduction (vph)	0	133	12	0	0	0
Lane Group Flow (vph)	67	438	178	0	0	1027
Confl. Peds. (#/hr)	1	1				
Confl. Bikes (#/hr)		12		2		
Heavy Vehicles (%)	4%	4%	4%	4%	1%	1%
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	3		1		2	2
Permitted Phases		1 2				
Actuated Green, G (s)	3.9	56.0	8.2			43.8
Effective Green, g (s)	3.9	56.0	8.2			43.8
Actuated g/C Ratio	0.05	0.77	0.11			0.60
Clearance Time (s)	4.0		4.0			4.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	92	1159	197			1093
v/s Ratio Prot	c0.04		c0.10			c0.56
v/s Ratio Perm		0.29				
v/c Ratio	0.73	0.38	0.90			0.94
Uniform Delay, d1	34.0	2.8	32.0			13.4
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	24.8	0.2	37.9			14.7
Delay (s)	58.8	3.0	69.9			28.1
Level of Service	E	A	E			C
Approach Delay (s)	8.9		69.9			28.1
Approach LOS	A		E			C

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	73.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Intersection Delay, s/veh	6.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	3	0	3	1	8	0	1	3	1	0	0
Future Vol, veh/h	0	3	0	3	1	8	0	1	3	1	0	0
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	5	0	5	2	13	0	2	5	2	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	6.6	6.5	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	25%	100%
Vol Thru, %	25%	100%	8%	0%
Vol Right, %	75%	0%	67%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	3	12	1
LT Vol	0	0	3	1
Through Vol	1	3	1	0
RT Vol	3	0	8	0
Lane Flow Rate	6	5	19	2
Geometry Grp	1	1	1	1
Degree of Util (X)	0.006	0.005	0.019	0.002
Departure Headway (Hd)	3.492	3.928	3.567	4.146
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1029	916	1009	867
Service Time	1.498	1.932	1.57	2.152
HCM Lane V/C Ratio	0.006	0.005	0.019	0.002
HCM Control Delay	6.5	7	6.6	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	6	14	309	281	3
Future Vol, veh/h	6	6	14	309	281	3
Conflicting Peds, #/hr	0	2	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	3	3	3	3
Mvmt Flow	7	7	16	351	319	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	710	329	328	0	-	0
Stage 1	327	-	-	-	-	-
Stage 2	383	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.13	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.227	-	-	-
Pot Cap-1 Maneuver	403	717	1226	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	694	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	392	712	1219	-	-	-
Mov Cap-2 Maneuver	392	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	690	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1219	-	506	-	-
HCM Lane V/C Ratio	0.013	-	0.027	-	-
HCM Control Delay (s)	8	0	12.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	0	25	47	0	31	40	280	21	8	247	21
Future Vol, veh/h	13	0	25	47	0	31	40	280	21	8	247	21
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	3	3	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	2	2	2	3	3	3	3	3	3
Mvmt Flow	15	0	29	54	0	36	46	322	24	9	284	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	760	755	296	758	755	339	308	0	0	349	0	0
Stage 1	314	314	-	429	429	-	-	-	-	-	-	-
Stage 2	446	441	-	329	326	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.12	6.52	6.22	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.518	4.018	3.318	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	325	340	748	324	338	703	1247	-	-	1204	-	-
Stage 1	701	660	-	604	584	-	-	-	-	-	-	-
Stage 2	595	580	-	684	648	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	295	321	748	298	319	700	1247	-	-	1201	-	-
Mov Cap-2 Maneuver	295	321	-	298	319	-	-	-	-	-	-	-
Stage 1	669	654	-	574	555	-	-	-	-	-	-	-
Stage 2	538	552	-	652	642	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.1	17.1	0.9	0.2
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1247	-	-	490	386	1201	-	-
HCM Lane V/C Ratio	0.037	-	-	0.089	0.232	0.008	-	-
HCM Control Delay (s)	8	0	-	13.1	17.1	8	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.9	0	-	-

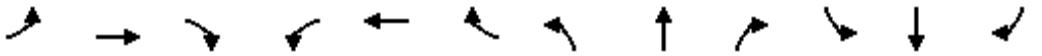
Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	24	38	407	503	17
Future Vol, veh/h	10	24	38	407	503	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	3	3	3	3
Mvmt Flow	11	28	44	468	578	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1144	588	598	0	-	0
Stage 1	588	-	-	-	-	-
Stage 2	556	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.13	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.227	-	-	-
Pot Cap-1 Maneuver	223	513	974	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	578	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	209	513	974	-	-	-
Mov Cap-2 Maneuver	209	-	-	-	-	-
Stage 1	525	-	-	-	-	-
Stage 2	578	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.2	0.8	0
HCM LOS	C		

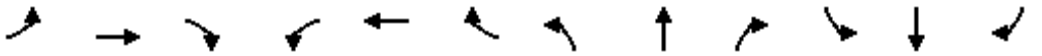
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	974	-	359	-	-
HCM Lane V/C Ratio	0.045	-	0.109	-	-
HCM Control Delay (s)	8.9	0	16.2	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	274	58	70	195	183	65	1481	91	329	1773	32
Future Volume (vph)	5	274	58	70	195	183	65	1481	91	329	1773	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95			0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00			0.99		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3337			3207		1752	3505	1547	1752	3505	1547
Flt Permitted		0.95			0.68		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3163			2213		1752	3505	1547	1752	3505	1547
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	282	60	72	201	189	67	1527	94	339	1828	33
RTOR Reduction (vph)	0	14	0	0	98	0	0	0	41	0	0	11
Lane Group Flow (vph)	0	333	0	0	364	0	67	1527	53	339	1828	22
Confl. Peds. (#/hr)	6		4	4		6	1		1	1		1
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		23.2			23.2		8.2	64.1	64.1	26.7	82.6	82.6
Effective Green, g (s)		24.2			24.2		8.2	67.1	67.1	26.7	85.6	85.6
Actuated g/C Ratio		0.19			0.19		0.06	0.52	0.52	0.21	0.66	0.66
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		588			411		110	1809	798	359	2307	1018
v/s Ratio Prot							0.04	c0.44		c0.19	0.52	
v/s Ratio Perm		0.11			c0.16				0.03			0.01
v/c Ratio		0.57			0.88		0.61	0.84	0.07	0.94	0.79	0.02
Uniform Delay, d1		48.1			51.5		59.3	27.0	15.8	50.9	15.9	7.7
Progression Factor		1.00			1.00		1.31	0.49	0.16	1.00	1.00	1.00
Incremental Delay, d2		1.3			19.7		7.4	4.0	0.1	33.1	2.9	0.0
Delay (s)		49.4			71.2		84.8	17.3	2.6	84.0	18.7	7.7
Level of Service		D			E		F	B	A	F	B	A
Approach Delay (s)		49.4			71.2			19.2			28.6	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	101.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



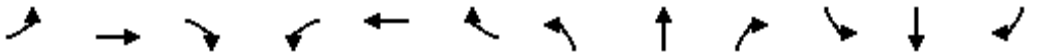
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	274	58	70	195	183	65	1481	91	329	1773	32
Future Volume (veh/h)	5	274	58	70	195	183	65	1481	91	329	1773	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	282	60	72	201	189	67	1527	94	339	1828	33
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	4	4	4	3	3	3	3	3	3
Cap, veh/h	29	444	105	38	107	213	85	1806	805	353	2342	1044
Arrive On Green	0.19	0.20	0.19	0.19	0.20	0.19	0.10	1.00	1.00	0.20	0.66	0.66
Sat Flow, veh/h	0	2273	537	2	549	1092	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	173	0	174	208	0	254	67	1527	94	339	1828	33
Grp Sat Flow(s),veh/h/ln	1251	0	1559	177	0	1467	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	11.3	0.0	13.2	19.5	0.0	21.9	4.8	0.0	0.0	24.7	47.0	0.9
Cycle Q Clear(g_c), s	11.3	0.0	13.2	19.5	0.0	21.9	4.8	0.0	0.0	24.7	47.0	0.9
Prop In Lane	0.03		0.34	0.35		0.74	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	305	0	0	287	85	1806	805	353	2342	1044
V/C Ratio(X)	0.00	0.00	0.57	0.00	0.00	0.89	0.79	0.85	0.12	0.96	0.78	0.03
Avail Cap(c_a), veh/h	0	0	312	0	0	293	150	1806	805	353	2342	1044
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.88	0.00	0.88	0.75	0.75	0.75	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	47.5	0.0	0.0	51.3	58.1	0.0	0.0	51.5	15.2	7.5
Incr Delay (d2), s/veh	0.0	0.0	2.4	0.0	0.0	23.2	11.5	3.9	0.2	37.1	2.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	5.4	0.0	0.0	10.0	2.3	1.0	0.0	14.3	17.5	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	49.9	0.0	0.0	74.5	69.6	3.9	0.2	88.6	17.9	7.5
LnGrp LOS	A	A	D	A	A	E	E	A	A	F	B	A
Approach Vol, veh/h		347			462			1688			2200	
Approach Delay, s/veh		25.1			40.9			6.3			28.6	
Approach LOS		C			D			A			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.2	90.3		29.4	30.0	70.6		29.4				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	11.0	78.0		25.0	26.0	63.0		25.0				
Max Q Clear Time (g_c+I1), s	6.8	49.0		23.9	26.7	2.0		15.2				
Green Ext Time (p_c), s	0.0	17.6		0.4	0.0	18.3		1.5				

Intersection Summary		
HCM 6th Ctrl Delay		21.5
HCM 6th LOS		C

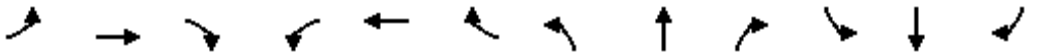
Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	457	22	25	209	22	37	135	22	51	145	188
Future Volume (vph)	174	457	22	25	209	22	37	135	22	51	145	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1752	1830		1752	1812			1843	1506		1812	1543
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.86	1.00
Satd. Flow (perm)	1752	1830		1752	1812			1648	1506		1581	1543
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	198	519	25	28	238	25	42	153	25	58	165	214
RTOR Reduction (vph)	0	2	0	0	4	0	0	0	19	0	0	162
Lane Group Flow (vph)	198	542	0	28	259	0	0	195	6	0	223	52
Confl. Peds. (#/hr)	12		4	4		12	1		16	16		1
Confl. Bikes (#/hr)			3			1			2			3
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	12.4	28.0		2.4	18.0			14.4	14.4		14.4	14.4
Effective Green, g (s)	12.4	28.0		2.4	18.0			14.4	14.4		14.4	14.4
Actuated g/C Ratio	0.21	0.48		0.04	0.31			0.24	0.24		0.24	0.24
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	369	871		71	554			403	368		387	377
v/s Ratio Prot	c0.11	c0.30		0.02	0.14							
v/s Ratio Perm								0.12	0.00		c0.14	0.03
v/c Ratio	0.54	0.62		0.39	0.47			0.48	0.02		0.58	0.14
Uniform Delay, d1	20.6	11.5		27.5	16.5			19.0	16.8		19.5	17.4
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.5	1.4		3.6	0.6			0.9	0.0		2.1	0.2
Delay (s)	22.1	12.9		31.1	17.1			19.9	16.9		21.6	17.5
Level of Service	C	B		C	B			B	B		C	B
Approach Delay (s)		15.3			18.5			19.6			19.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	58.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	457	22	25	209	22	37	135	22	51	145	188
Future Volume (veh/h)	174	457	22	25	209	22	37	135	22	51	145	188
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.95	1.00		0.96	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	198	519	25	28	238	25	42	153	25	58	165	214
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	3	3	3
Cap, veh/h	251	614	30	44	382	40	70	208	609	73	166	614
Arrive On Green	0.14	0.35	0.35	0.02	0.23	0.23	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	1767	1752	84	1767	1642	172	0	520	1519	0	413	1533
Grp Volume(v), veh/h	198	0	544	28	0	263	195	0	25	223	0	214
Grp Sat Flow(s),veh/h/ln	1767	0	1836	1767	0	1814	520	0	1519	414	0	1533
Q Serve(g_s), s	6.8	0.0	17.1	1.0	0.0	8.1	0.0	0.0	0.6	0.0	0.0	6.1
Cycle Q Clear(g_c), s	6.8	0.0	17.1	1.0	0.0	8.1	25.0	0.0	0.6	25.0	0.0	6.1
Prop In Lane	1.00		0.05	1.00		0.10	0.22		1.00	0.26		1.00
Lane Grp Cap(c), veh/h	251	0	643	44	0	422	278	0	609	238	0	614
V/C Ratio(X)	0.79	0.00	0.85	0.64	0.00	0.62	0.70	0.00	0.04	0.94	0.00	0.35
Avail Cap(c_a), veh/h	595	0	883	453	0	872	278	0	609	238	0	614
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.8	0.0	18.7	30.2	0.0	21.5	15.1	0.0	11.4	15.8	0.0	13.0
Incr Delay (d2), s/veh	5.4	0.0	5.6	14.8	0.0	1.5	7.6	0.0	0.0	40.9	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	7.7	0.6	0.0	3.4	2.3	0.0	0.2	4.7	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	0.0	24.4	44.9	0.0	23.0	22.7	0.0	11.4	56.6	0.0	13.4
LnGrp LOS	C	A	C	D	A	C	C	A	B	E	A	B
Approach Vol, veh/h		742			291			220			437	
Approach Delay, s/veh		26.2			25.1			21.4			35.4	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	26.9		30.0	12.9	19.5		30.0				
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	16.0	30.0		25.0	21.0	30.0		25.0				
Max Q Clear Time (g_c+I1), s	3.0	19.1		27.0	8.8	10.1		27.0				
Green Ext Time (p_c), s	0.0	2.8		0.0	0.4	1.5		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			27.8									
HCM 6th LOS			C									

Intersection	
Intersection Delay, s/veh	26.5
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	359	34	49	40	36	16	32	294	20	8	140	170
Future Vol, veh/h	359	34	49	40	36	16	32	294	20	8	140	170
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	3	3	3	5	5	5	2	2	2	2	2	2
Mvmt Flow	374	35	51	42	38	17	33	306	21	8	146	177
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

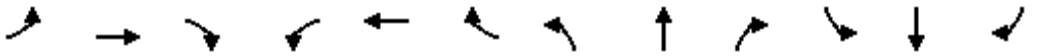
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	38.1	12.6	27.4	13.3
HCM LOS	E	B	D	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	9%	91%	0%	53%	0%	5%	0%
Vol Thru, %	85%	9%	0%	47%	0%	95%	0%
Vol Right, %	6%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	346	393	49	76	16	148	170
LT Vol	32	359	0	40	0	8	0
Through Vol	294	34	0	36	0	140	0
RT Vol	20	0	49	0	16	0	170
Lane Flow Rate	360	409	51	79	17	154	177
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.727	0.86	0.09	0.185	0.034	0.322	0.333
Departure Headway (Hd)	7.263	7.563	6.378	8.411	7.412	7.508	6.762
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	497	479	560	425	481	478	529
Service Time	5.322	5.319	4.133	6.193	5.193	5.273	4.527
HCM Lane V/C Ratio	0.724	0.854	0.091	0.186	0.035	0.322	0.335
HCM Control Delay	27.4	41.6	9.8	13.1	10.5	13.8	12.9
HCM Lane LOS	D	E	A	B	B	B	B
HCM 95th-tile Q	5.9	8.9	0.3	0.7	0.1	1.4	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	31	86	16	20	21	33	1598	14	22	1862	24
Future Volume (vph)	29	31	86	16	20	21	33	1598	14	22	1862	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99			1.00		1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1666			1771		1752	3505	1568	1752	3505	1519
Flt Permitted		0.94			0.79		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1577			1421		1752	3505	1568	1752	3505	1519
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	30	32	89	16	21	22	34	1647	14	23	1920	25
RTOR Reduction (vph)	0	41	0	0	18	0	0	0	3	0	0	6
Lane Group Flow (vph)	0	110	0	0	41	0	34	1647	11	23	1920	19
Confl. Peds. (#/hr)	1		3	3		1	4					4
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		14.5			14.5		5.4	94.6	94.6	4.9	94.1	94.1
Effective Green, g (s)		15.5			15.5		5.4	97.6	97.6	4.9	97.1	97.1
Actuated g/C Ratio		0.12			0.12		0.04	0.75	0.75	0.04	0.75	0.75
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		188			169		72	2631	1177	66	2617	1134
v/s Ratio Prot							c0.02	0.47		0.01	c0.55	
v/s Ratio Perm		c0.07			0.03				0.01			0.01
v/c Ratio		0.58			0.24		0.47	0.63	0.01	0.35	0.73	0.02
Uniform Delay, d1		54.2			51.9		60.9	7.6	4.1	61.0	9.2	4.2
Progression Factor		1.00			1.00		1.43	0.62	1.00	1.18	0.23	0.00
Incremental Delay, d2		4.5			0.8		2.9	0.7	0.0	1.9	1.1	0.0
Delay (s)		58.7			52.7		89.8	5.4	4.1	74.0	3.3	0.0
Level of Service		E			D		F	A	A	E	A	A
Approach Delay (s)		58.7			52.7			7.1			4.1	
Approach LOS		E			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



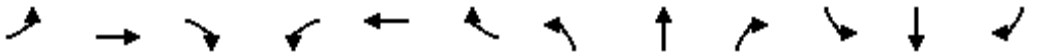
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	31	86	16	20	21	33	1598	14	22	1862	24
Future Volume (veh/h)	29	31	86	16	20	21	33	1598	14	22	1862	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1900	1900	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	30	32	89	16	21	22	34	1647	14	23	1920	25
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	0	0	0	3	3	3	3	3	3
Cap, veh/h	56	56	113	66	84	68	43	2713	1207	31	2688	1196
Arrive On Green	0.11	0.12	0.12	0.11	0.12	0.12	0.02	0.77	0.77	0.02	0.76	0.76
Sat Flow, veh/h	186	464	933	252	696	564	1767	3526	1568	1767	3526	1568
Grp Volume(v), veh/h	151	0	0	59	0	0	34	1647	14	23	1920	25
Grp Sat Flow(s),veh/h/ln	1583	0	0	1513	0	0	1767	1763	1568	1767	1763	1568
Q Serve(g_s), s	11.7	0.0	0.0	4.2	0.0	0.0	2.5	26.3	0.3	1.7	36.9	0.5
Cycle Q Clear(g_c), s	11.7	0.0	0.0	4.2	0.0	0.0	2.5	26.3	0.3	1.7	36.9	0.5
Prop In Lane	0.20		0.59	0.27		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	0	0	0	0	43	2713	1207	31	2688	1196
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.61	0.01	0.75	0.71	0.02
Avail Cap(c_a), veh/h	0	0	0	0	0	0	136	2713	1207	136	2688	1196
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.51	0.51	0.51	0.53	0.53	0.53
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	63.1	6.5	3.5	63.6	8.0	3.7
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	14.6	0.5	0.0	17.4	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	1.3	7.9	0.1	0.9	11.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	77.6	7.0	3.5	81.0	8.9	3.7
LnGrp LOS	A	A	A	A	A	A	E	A	A	F	A	A
Approach Vol, veh/h		151			59			1695			1968	
Approach Delay, s/veh		0.0			0.0			8.4			9.7	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	103.1		19.7	6.3	104.1		19.7				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	10.0	83.0		20.0	10.0	84.0		20.0				
Max Q Clear Time (g_c+I1), s	4.5	38.9		6.2	3.7	28.3		13.7				
Green Ext Time (p_c), s	0.0	24.0		0.2	0.0	20.0		0.4				

Intersection Summary	
HCM 6th Ctrl Delay	8.6
HCM 6th LOS	A

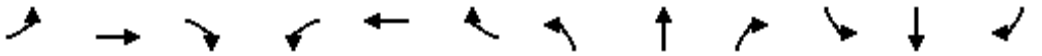
Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	228	1706	53	104	1486	173	27	214	82	129	246	140
Future Volume (vph)	228	1706	53	104	1486	173	27	214	82	129	246	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1547	1770	3539	1556	1732	3471	1518	1739	3505	1543
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.48	1.00	1.00	0.53	1.00	1.00
Satd. Flow (perm)	1752	3505	1547	1770	3539	1556	874	3471	1518	961	3505	1543
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	245	1834	57	112	1598	186	29	230	88	139	265	151
RTOR Reduction (vph)	0	0	20	0	0	55	0	0	71	0	0	121
Lane Group Flow (vph)	245	1834	38	112	1598	131	29	230	17	139	265	30
Confl. Peds. (#/hr)	5		1	1		5	3		10	10		3
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	4%	4%	4%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	23.1	76.3	76.3	13.0	66.2	66.2	24.7	24.7	24.7	24.7	24.7	24.7
Effective Green, g (s)	23.1	79.3	79.3	13.0	69.2	69.2	25.7	25.7	25.7	25.7	25.7	25.7
Actuated g/C Ratio	0.18	0.61	0.61	0.10	0.53	0.53	0.20	0.20	0.20	0.20	0.20	0.20
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	311	2138	943	177	1883	828	172	686	300	189	692	305
v/s Ratio Prot	0.14	c0.52		0.06	c0.45			0.07			0.08	
v/s Ratio Perm			0.02			0.08	0.03		0.01	c0.14		0.02
v/c Ratio	0.79	0.86	0.04	0.63	0.85	0.16	0.17	0.34	0.06	0.74	0.38	0.10
Uniform Delay, d1	51.1	20.7	10.1	56.2	25.9	15.5	43.3	44.8	42.3	49.0	45.3	42.7
Progression Factor	0.86	0.74	1.15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.4	3.5	0.1	7.2	5.0	0.4	0.5	0.3	0.1	13.8	0.4	0.1
Delay (s)	53.3	18.8	11.7	63.4	30.9	15.9	43.7	45.1	42.4	62.8	45.6	42.8
Level of Service	D	B	B	E	C	B	D	D	D	E	D	D
Approach Delay (s)		22.6			31.4			44.3			49.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	228	1706	53	104	1486	173	27	214	82	129	246	140
Future Volume (veh/h)	228	1706	53	104	1486	173	27	214	82	129	246	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1870	1870	1870	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	245	1834	57	112	1598	186	29	230	88	139	265	151
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	2	2	2	4	4	4	3	3	3
Cap, veh/h	380	2060	916	137	1503	668	231	862	380	258	869	378
Arrive On Green	0.43	1.00	1.00	0.08	0.42	0.42	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1767	3526	1568	1781	3554	1579	949	3497	1541	1046	3526	1533
Grp Volume(v), veh/h	245	1834	57	112	1598	186	29	230	88	139	265	151
Grp Sat Flow(s),veh/h/ln	1767	1763	1568	1781	1777	1579	949	1749	1541	1046	1763	1533
Q Serve(g_s), s	14.2	0.0	0.0	8.1	55.0	10.0	3.3	6.9	5.9	16.1	8.0	10.7
Cycle Q Clear(g_c), s	14.2	0.0	0.0	8.1	55.0	10.0	11.3	6.9	5.9	23.0	8.0	10.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	380	2060	916	137	1503	668	231	862	380	258	869	378
V/C Ratio(X)	0.64	0.89	0.06	0.82	1.06	0.28	0.13	0.27	0.23	0.54	0.30	0.40
Avail Cap(c_a), veh/h	380	2060	916	219	1503	668	289	1076	474	322	1085	472
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.62	0.62	0.62	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.1	0.0	0.0	59.1	37.5	24.5	44.5	39.5	39.1	48.8	39.9	40.9
Incr Delay (d2), s/veh	2.3	4.1	0.1	12.1	41.9	1.0	0.2	0.2	0.3	1.8	0.2	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	1.2	0.0	4.0	31.5	3.9	0.8	3.0	2.3	4.4	3.5	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.5	4.1	0.1	71.2	79.4	25.6	44.7	39.7	39.4	50.5	40.1	41.6
LnGrp LOS	D	A	A	E	F	C	D	D	D	D	D	D
Approach Vol, veh/h		2136			1896			347			555	
Approach Delay, s/veh		7.6			73.7			40.0			43.1	
Approach LOS		A			E			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	80.0		36.1	34.9	59.0		36.1				
Change Period (Y+Rc), s	4.0	7.0		5.0	7.0	* 7		5.0				
Max Green Setting (Gmax), s	16.0	59.0		39.0	23.0	* 52		39.0				
Max Q Clear Time (g_c+I1), s	10.1	2.0		25.0	16.2	57.0		13.3				
Green Ext Time (p_c), s	0.1	25.1		2.6	0.4	0.0		2.0				

Intersection Summary			
HCM 6th Ctrl Delay		39.2	
HCM 6th LOS		D	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	3	0	6	1	8	0	1	5	1	0	0
Future Vol, veh/h	0	3	0	6	1	8	0	1	5	1	0	0
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	5	0	10	2	13	0	2	8	2	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	6.8	6.5	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	40%	100%
Vol Thru, %	17%	100%	7%	0%
Vol Right, %	83%	0%	53%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	6	3	15	1
LT Vol	0	0	6	1
Through Vol	1	3	1	0
RT Vol	5	0	8	0
Lane Flow Rate	10	5	24	2
Geometry Grp	1	1	1	1
Degree of Util (X)	0.009	0.005	0.024	0.002
Departure Headway (Hd)	3.45	3.935	3.681	4.156
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1041	913	977	865
Service Time	1.458	1.942	1.686	2.164
HCM Lane V/C Ratio	0.01	0.005	0.025	0.002
HCM Control Delay	6.5	7	6.8	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	7	16	309	281	4
Future Vol, veh/h	7	7	16	309	281	4
Conflicting Peds, #/hr	0	2	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	3	3	3	3
Mvmt Flow	8	8	18	351	319	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	715	330	330	0	-	0
Stage 1	328	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.13	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.227	-	-	-
Pot Cap-1 Maneuver	400	716	1224	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	691	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	388	711	1217	-	-	-
Mov Cap-2 Maneuver	388	-	-	-	-	-
Stage 1	716	-	-	-	-	-
Stage 2	687	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1217	-	502	-	-
HCM Lane V/C Ratio	0.015	-	0.032	-	-
HCM Control Delay (s)	8	0	12.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	12	0	24	47	0	31	38	282	21	8	248	21
Future Vol, veh/h	12	0	24	47	0	31	38	282	21	8	248	21
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	3	3	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	2	2	2	3	3	3	3	3	3
Mvmt Flow	14	0	28	54	0	36	44	324	24	9	285	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	759	754	297	756	754	341	309	0	0	351	0	0
Stage 1	315	315	-	427	427	-	-	-	-	-	-	-
Stage 2	444	439	-	329	327	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.12	6.52	6.22	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.518	4.018	3.318	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	326	341	747	325	338	701	1246	-	-	1202	-	-
Stage 1	700	659	-	606	585	-	-	-	-	-	-	-
Stage 2	597	582	-	684	648	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	296	322	747	300	319	698	1246	-	-	1199	-	-
Mov Cap-2 Maneuver	296	322	-	300	319	-	-	-	-	-	-	-
Stage 1	669	653	-	578	558	-	-	-	-	-	-	-
Stage 2	541	555	-	653	642	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	17	0.9	0.2
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1246	-	-	495	388	1199	-	-
HCM Lane V/C Ratio	0.035	-	-	0.084	0.231	0.008	-	-
HCM Control Delay (s)	8	0	-	12.9	17	8	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.9	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	24	38	407	503	17
Future Vol, veh/h	10	24	38	407	503	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	3	3	3	3
Mvmt Flow	11	28	44	468	578	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1144	588	598	0	-	0
Stage 1	588	-	-	-	-	-
Stage 2	556	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.13	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.227	-	-	-
Pot Cap-1 Maneuver	223	513	974	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	578	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	209	513	974	-	-	-
Mov Cap-2 Maneuver	209	-	-	-	-	-
Stage 1	525	-	-	-	-	-
Stage 2	578	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.2	0.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	974	-	359	-	-
HCM Lane V/C Ratio	0.045	-	0.109	-	-
HCM Control Delay (s)	8.9	0	16.2	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	34	855	325	74	369	122
Future Volume (vph)	34	855	325	74	369	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	0.98	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	0.97			1.00
Flt Protected	0.95	1.00	1.00			0.96
Satd. Flow (prot)	1770	1547	1845			1795
Flt Permitted	0.95	1.00	1.00			0.96
Satd. Flow (perm)	1770	1547	1845			1795
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	37	919	349	80	397	131
RTOR Reduction (vph)	0	193	8	0	0	0
Lane Group Flow (vph)	37	726	421	0	0	528
Confl. Peds. (#/hr)	3			1	1	
Confl. Bikes (#/hr)		6				
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	3		1		2	2
Permitted Phases		1 2				
Actuated Green, G (s)	1.7	55.0	22.8			28.2
Effective Green, g (s)	1.7	55.0	22.8			28.2
Actuated g/C Ratio	0.02	0.79	0.33			0.41
Clearance Time (s)	4.0		4.0			4.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	43	1222	604			727
v/s Ratio Prot	c0.02		c0.23			c0.29
v/s Ratio Perm		0.47				
v/c Ratio	0.86	0.59	0.70			0.73
Uniform Delay, d1	33.8	2.9	20.4			17.4
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	85.1	0.8	3.5			3.6
Delay (s)	118.9	3.7	23.9			21.1
Level of Service	F	A	C			C
Approach Delay (s)	8.1		23.9			21.1
Approach LOS	A		C			C

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	69.6	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	6	0	2	0	2	0	0	5	2	0	0
Future Vol, veh/h	2	6	0	2	0	2	0	0	5	2	0	0
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	11	0	4	0	4	0	0	9	4	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	6.8	6.4	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	25%	50%	100%
Vol Thru, %	0%	75%	0%	0%
Vol Right, %	100%	0%	50%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	8	4	2
LT Vol	0	2	2	2
Through Vol	0	6	0	0
RT Vol	5	0	2	0
Lane Flow Rate	9	14	7	4
Geometry Grp	1	1	1	1
Degree of Util (X)	0.008	0.016	0.007	0.004
Departure Headway (Hd)	3.339	3.977	3.732	4.144
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1075	905	963	867
Service Time	1.348	1.979	1.737	2.152
HCM Lane V/C Ratio	0.008	0.015	0.007	0.005
HCM Control Delay	6.4	7	6.8	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0	0

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	6	5	212	303	2
Future Vol, veh/h	2	6	5	212	303	2
Conflicting Peds, #/hr	0	1	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	7	7	6	6
Mvmt Flow	2	7	6	247	352	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	613	355	355	0	-	0
Stage 1	354	-	-	-	-	-
Stage 2	259	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.263	-	-	-
Pot Cap-1 Maneuver	459	693	1176	-	-	-
Stage 1	715	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	455	692	1175	-	-	-
Mov Cap-2 Maneuver	455	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	788	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1175	-	612	-	-
HCM Lane V/C Ratio	0.005	-	0.015	-	-
HCM Control Delay (s)	8.1	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	14	0	20	34	0	15	7	173	31	44	273	5
Future Vol, veh/h	14	0	20	34	0	15	7	173	31	44	273	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	7	7	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	9	9	9	10	10	10	5	5	5
Mvmt Flow	17	0	25	42	0	19	9	214	38	54	337	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	709	725	340	719	709	240	343	0	0	259	0	0
Stage 1	448	448	-	258	258	-	-	-	-	-	-	-
Stage 2	261	277	-	461	451	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.19	6.59	6.29	4.2	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.19	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.581	4.081	3.381	2.29	-	-	2.245	-	-
Pot Cap-1 Maneuver	352	354	707	335	351	782	1173	-	-	1288	-	-
Stage 1	594	576	-	731	682	-	-	-	-	-	-	-
Stage 2	748	685	-	567	559	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	328	330	707	306	327	777	1173	-	-	1279	-	-
Mov Cap-2 Maneuver	328	330	-	306	327	-	-	-	-	-	-	-
Stage 1	589	546	-	719	671	-	-	-	-	-	-	-
Stage 2	724	674	-	519	530	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	16.4	0.3	1.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1173	-	-	479	376	1279	-	-
HCM Lane V/C Ratio	0.007	-	-	0.088	0.161	0.042	-	-
HCM Control Delay (s)	8.1	0	-	13.2	16.4	7.9	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.6	0.1	-	-

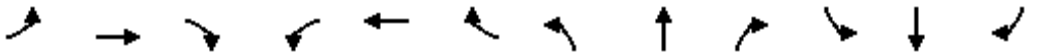
Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	52	15	532	574	6
Future Vol, veh/h	20	52	15	532	574	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	25	64	19	657	709	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1408	713	716	0	-	0
Stage 1	713	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	155	435	894	-	-	-
Stage 1	489	-	-	-	-	-
Stage 2	499	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	150	435	894	-	-	-
Mov Cap-2 Maneuver	150	-	-	-	-	-
Stage 1	473	-	-	-	-	-
Stage 2	499	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.3	0.2	0
HCM LOS	C		

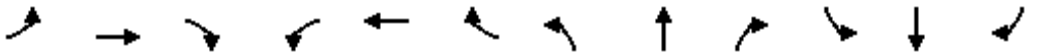
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	894	-	285	-	-
HCM Lane V/C Ratio	0.021	-	0.312	-	-
HCM Control Delay (s)	9.1	0	23.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.3	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	141	46	60	212	365	66	1916	69	111	942	15
Future Volume (vph)	21	141	46	60	212	365	66	1916	69	111	942	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1569	3024		1736	1827	1540	1719	3438	1538	1703	3406	1524
Flt Permitted	0.28	1.00		0.45	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	465	3024		818	1827	1540	1719	3438	1538	1703	3406	1524
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	148	48	63	223	384	69	2017	73	117	992	16
RTOR Reduction (vph)	0	26	0	0	0	56	0	0	29	0	0	6
Lane Group Flow (vph)	22	170	0	63	223	328	69	2017	44	117	992	10
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	15%	15%	15%	4%	4%	4%	5%	5%	5%	6%	6%	6%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4	5	1	6		5	2	
Permitted Phases	8			4		4			6			2
Actuated Green, G (s)	16.6	14.2		21.4	16.6	27.8	7.7	69.8	69.8	11.2	73.3	73.3
Effective Green, g (s)	16.6	15.2		21.4	17.6	27.8	7.7	72.8	72.8	11.2	76.3	76.3
Actuated g/C Ratio	0.14	0.13		0.18	0.15	0.23	0.06	0.61	0.61	0.09	0.64	0.64
Clearance Time (s)	4.0	5.0		4.0	5.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	86	383		182	267	356	110	2085	933	158	2165	969
v/s Ratio Prot	0.01	0.06		c0.01	0.12	c0.09	0.04	c0.59		0.07	c0.29	
v/s Ratio Perm	0.03			0.05		0.13			0.03			0.01
v/c Ratio	0.26	0.44		0.35	0.84	0.92	0.63	0.97	0.05	0.74	0.46	0.01
Uniform Delay, d1	45.5	48.5		42.1	49.8	45.0	54.8	22.5	9.6	53.0	11.2	8.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.97	0.80	2.74	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.8		1.1	19.7	28.5	7.1	9.9	0.1	16.9	0.7	0.0
Delay (s)	47.0	49.3		43.3	69.5	73.6	60.0	27.9	26.3	69.9	11.9	8.0
Level of Service	D	D		D	E	E	E	C	C	E	B	A
Approach Delay (s)		49.1			69.3			28.9			17.9	
Approach LOS		D			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	141	46	60	212	365	66	1916	69	111	942	15
Future Volume (veh/h)	21	141	46	60	212	365	66	1916	69	111	942	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1678	1678	1678	1841	1841	1841	1826	1826	1826	1811	1811	1811
Adj Flow Rate, veh/h	22	148	48	63	223	384	69	2017	73	117	992	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	15	15	15	4	4	4	5	5	5	6	6	6
Cap, veh/h	99	279	87	189	261	324	88	2195	979	129	2260	1008
Arrive On Green	0.02	0.12	0.11	0.04	0.14	0.13	0.02	0.21	0.21	0.08	0.66	0.66
Sat Flow, veh/h	1598	2386	746	1753	1841	1553	1739	3469	1547	1725	3441	1535
Grp Volume(v), veh/h	22	97	99	63	223	384	69	2017	73	117	992	16
Grp Sat Flow(s),veh/h/ln	1598	1594	1538	1753	1841	1553	1739	1735	1547	1725	1721	1535
Q Serve(g_s), s	1.5	6.9	7.3	3.8	14.2	16.0	4.7	68.3	4.6	8.1	16.7	0.4
Cycle Q Clear(g_c), s	1.5	6.9	7.3	3.8	14.2	16.0	4.7	68.3	4.6	8.1	16.7	0.4
Prop In Lane	1.00		0.49	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	99	186	180	189	261	324	88	2195	979	129	2260	1008
V/C Ratio(X)	0.22	0.52	0.55	0.33	0.86	1.19	0.78	0.92	0.07	0.90	0.44	0.02
Avail Cap(c_a), veh/h	124	199	192	203	261	324	145	2195	979	129	2260	1008
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.74	0.74	0.74	0.57	0.57	0.57	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.0	49.8	50.3	44.3	50.3	47.5	58.3	44.5	19.2	55.1	9.9	7.1
Incr Delay (d2), s/veh	1.1	2.3	2.9	0.8	18.2	104.3	8.3	4.7	0.1	51.1	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.9	3.0	1.7	7.9	19.1	2.3	33.0	1.7	5.3	5.8	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.2	52.1	53.1	45.1	68.5	151.8	66.6	49.2	19.3	106.2	10.5	7.2
LnGrp LOS	D	D	D	D	E	F	E	D	B	F	B	A
Approach Vol, veh/h		218			670			2159			1125	
Approach Delay, s/veh		52.2			114.0			48.7			20.4	
Approach LOS		D			F			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	82.8	6.1	21.0	13.0	79.9	9.1	18.0
Change Period (Y+Rc), s	4.0	7.0	4.0	5.0	4.0	7.0	4.0	5.0
Max Green Setting (Gmax), s	10.0	70.0	4.0	16.0	9.0	71.0	6.0	14.0
Max Q Clear Time (g_c+I1), s	6.7	18.7	3.5	18.0	10.1	70.3	5.8	9.3
Green Ext Time (p_c), s	0.0	8.5	0.0	0.0	0.0	0.6	0.0	0.4

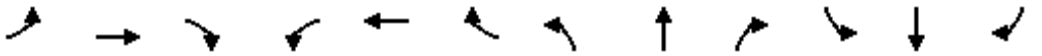
Intersection Summary	
HCM 6th Ctrl Delay	51.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	124	10	24	459	26	66	158	16	21	122	205
Future Volume (vph)	130	124	10	24	459	26	66	158	16	21	122	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1641	1705		1748	1827			1836	1533		1778	1503
Flt Permitted	0.95	1.00		0.67	1.00			0.86	1.00		0.93	1.00
Satd. Flow (perm)	1641	1705		1230	1827			1595	1533		1665	1503
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	135	129	10	25	478	27	69	165	17	22	127	214
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	13	0	0	162
Lane Group Flow (vph)	135	137	0	25	503	0	0	234	4	0	149	52
Confl. Peds. (#/hr)	3		3	3		3			5	5		
Confl. Bikes (#/hr)			2			1			2			2
Heavy Vehicles (%)	10%	10%	10%	3%	3%	3%	2%	2%	2%	6%	6%	6%
Turn Type	Prot	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases				6			8		8	4		4
Actuated Green, G (s)	8.9	32.5		27.6	25.6			15.7	15.7		15.7	15.7
Effective Green, g (s)	8.9	32.5		27.6	25.6			15.7	15.7		15.7	15.7
Actuated g/C Ratio	0.14	0.51		0.43	0.40			0.24	0.24		0.24	0.24
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	227	863		544	728			390	374		407	367
v/s Ratio Prot	c0.08	0.08		0.00	c0.28							
v/s Ratio Perm				0.02				c0.15	0.00		0.09	0.03
v/c Ratio	0.59	0.16		0.05	0.69			0.60	0.01		0.37	0.14
Uniform Delay, d1	26.0	8.5		10.6	16.0			21.5	18.4		20.1	19.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.1	0.1		0.0	2.8			2.5	0.0		0.6	0.2
Delay (s)	30.1	8.6		10.6	18.9			24.0	18.4		20.7	19.2
Level of Service	C	A		B	B			C	B		C	B
Approach Delay (s)		19.2			18.5			23.6			19.8	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



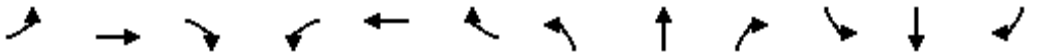
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	124	10	24	459	26	66	158	16	21	122	205
Future Volume (veh/h)	130	124	10	24	459	26	66	158	16	21	122	205
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1856	1856	1856	1870	1870	1870	1811	1811	1811
Adj Flow Rate, veh/h	135	129	10	25	478	27	69	165	17	22	127	214
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	3	3	3	2	2	2	6	6	6
Cap, veh/h	173	648	50	544	561	32	69	130	566	61	266	554
Arrive On Green	0.10	0.40	0.40	0.02	0.32	0.32	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1668	1601	124	1767	1737	98	0	353	1540	0	723	1508
Grp Volume(v), veh/h	135	0	139	25	0	505	234	0	17	149	0	214
Grp Sat Flow(s),veh/h/ln	1668	0	1726	1767	0	1835	353	0	1540	723	0	1508
Q Serve(g_s), s	5.4	0.0	3.5	0.6	0.0	17.5	0.0	0.0	0.5	0.0	0.0	7.1
Cycle Q Clear(g_c), s	5.4	0.0	3.5	0.6	0.0	17.5	25.0	0.0	0.5	25.0	0.0	7.1
Prop In Lane	1.00		0.07	1.00		0.05	0.29		1.00	0.15		1.00
Lane Grp Cap(c), veh/h	173	0	698	544	0	593	198	0	566	326	0	554
V/C Ratio(X)	0.78	0.00	0.20	0.05	0.00	0.85	1.18	0.00	0.03	0.46	0.00	0.39
Avail Cap(c_a), veh/h	515	0	761	921	0	809	198	0	566	326	0	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.7	0.0	13.1	14.8	0.0	21.5	19.2	0.0	13.8	16.5	0.0	15.9
Incr Delay (d2), s/veh	7.4	0.0	0.1	0.0	0.0	6.5	120.9	0.0	0.0	1.0	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	1.3	0.3	0.0	8.1	8.7	0.0	0.2	1.6	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	0.0	13.3	14.8	0.0	28.0	140.1	0.0	13.8	17.5	0.0	16.3
LnGrp LOS	D	A	B	B	A	C	F	A	B	B	A	B
Approach Vol, veh/h		274			530			251			363	
Approach Delay, s/veh		25.0			27.4			131.5			16.8	
Approach LOS		C			C			F			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	32.5		30.0	11.1	27.0		30.0				
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	16.0	30.0		25.0	21.0	30.0		25.0				
Max Q Clear Time (g_c+I1), s	2.6	5.5		27.0	7.4	19.5		27.0				
Green Ext Time (p_c), s	0.0	0.8		0.0	0.3	2.5		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		42.7	
HCM 6th LOS		D	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	9	13	20	31	6	31	149	6	3	148	308
Future Volume (vph)	161	9	13	20	31	6	31	149	6	3	148	308
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5		4.5			4.5	4.5
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.98		1.00	0.98		1.00			1.00	0.99
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	1.00
Frt		1.00	0.85		1.00	0.85		1.00			1.00	0.85
Flt Protected		0.95	1.00		0.98	1.00		0.99			1.00	1.00
Satd. Flow (prot)		1712	1491		1757	1491		1820			1808	1521
Flt Permitted		0.95	1.00		0.98	1.00		0.93			0.99	1.00
Satd. Flow (perm)		1712	1491		1757	1491		1699			1798	1521
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	173	10	14	22	33	6	33	160	6	3	159	331
RTOR Reduction (vph)	0	0	10	0	0	5	0	1	0	0	0	145
Lane Group Flow (vph)	0	183	4	0	55	1	0	198	0	0	162	186
Confl. Peds. (#/hr)	1					1	3		3	3		3
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	3%	3%	3%	5%	5%	5%
Turn Type	Split	NA	Perm	Split	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	4	4		8	8			2			6	4
Permitted Phases			4			8	2			6		6
Actuated Green, G (s)		11.3	11.3		3.8	3.8		10.8			10.8	22.1
Effective Green, g (s)		11.3	11.3		3.8	3.8		10.8			10.8	22.1
Actuated g/C Ratio		0.29	0.29		0.10	0.10		0.27			0.27	0.56
Clearance Time (s)		4.5	4.5		4.5	4.5		4.5			4.5	4.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)		491	427		169	143		465			492	1026
v/s Ratio Prot		c0.11			c0.03							0.05
v/s Ratio Perm			0.00			0.00		c0.12			0.09	0.07
v/c Ratio		0.37	0.01		0.33	0.00		0.42			0.33	0.18
Uniform Delay, d1		11.2	10.0		16.6	16.1		11.7			11.4	4.2
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2		0.5	0.0		1.1	0.0		0.6			0.4	0.1
Delay (s)		11.7	10.1		17.7	16.1		12.4			11.8	4.3
Level of Service		B	B		B	B		B			B	A
Approach Delay (s)		11.6			17.6			12.4			6.8	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	39.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	161	9	13	20	31	6	31	149	6	3	148	308
Future Volume (veh/h)	161	9	13	20	31	6	31	149	6	3	148	308
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1856	1856	1856	1826	1826	1826
Adj Flow Rate, veh/h	173	10	14	22	33	6	33	160	6	3	159	331
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	6	6	6	6	6	6	3	3	3	5	5	5
Cap, veh/h	270	16	247	49	74	106	187	450	15	129	543	717
Arrive On Green	0.17	0.17	0.17	0.07	0.07	0.07	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1635	95	1496	710	1065	1530	141	1503	51	10	1811	1540
Grp Volume(v), veh/h	183	0	14	55	0	6	199	0	0	162	0	331
Grp Sat Flow(s),veh/h/ln	1729	0	1496	1776	0	1530	1695	0	0	1821	0	1540
Q Serve(g_s), s	2.9	0.0	0.2	0.9	0.0	0.1	0.0	0.0	0.0	0.0	0.0	4.2
Cycle Q Clear(g_c), s	2.9	0.0	0.2	0.9	0.0	0.1	2.5	0.0	0.0	2.0	0.0	4.2
Prop In Lane	0.95		1.00	0.40		1.00	0.17		0.03	0.02		1.00
Lane Grp Cap(c), veh/h	286	0	247	123	0	106	653	0	0	672	0	717
V/C Ratio(X)	0.64	0.00	0.06	0.45	0.00	0.06	0.30	0.00	0.00	0.24	0.00	0.46
Avail Cap(c_a), veh/h	1581	0	1369	1256	0	1083	1780	0	0	1971	0	1823
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.3	0.0	10.2	13.0	0.0	12.6	8.0	0.0	0.0	7.8	0.0	5.3
Incr Delay (d2), s/veh	2.4	0.0	0.1	2.5	0.0	0.2	0.3	0.0	0.0	0.2	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.1	0.4	0.0	0.0	0.7	0.0	0.0	0.6	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.7	0.0	10.3	15.5	0.0	12.8	8.2	0.0	0.0	8.0	0.0	5.7
LnGrp LOS	B	A	B	B	A	B	A	A	A	A	A	A
Approach Vol, veh/h		197			61			199			493	
Approach Delay, s/veh		13.4			15.2			8.2			6.5	
Approach LOS		B			B			A			A	

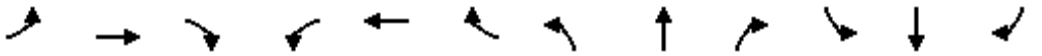
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		13.2		9.3		13.2		6.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		26.5		29.5		20.5				
Max Q Clear Time (g_c+I1), s		4.5		4.9		6.2		2.9				
Green Ext Time (p_c), s		1.3		1.1		2.2		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			8.9									
HCM 6th LOS			A									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	10	66	6	20	27	46	1989	15	6	1023	17
Future Volume (vph)	36	10	66	6	20	27	46	1989	15	6	1023	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.99		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1689			1711		1719	3438	1504	1687	3374	1509
Flt Permitted		0.87			0.95		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1497			1640		1719	3438	1504	1687	3374	1509
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	38	11	70	6	21	29	49	2116	16	6	1088	18
RTOR Reduction (vph)	0	44	0	0	26	0	0	0	3	0	0	5
Lane Group Flow (vph)	0	75	0	0	30	0	49	2116	13	6	1088	13
Confl. Peds. (#/hr)	2		3	3		2			1	1		
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	5%	5%	5%	7%	7%	7%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		11.1			11.1		7.2	91.5	91.5	1.4	85.7	85.7
Effective Green, g (s)		12.1			12.1		7.2	94.5	94.5	1.4	88.7	88.7
Actuated g/C Ratio		0.10			0.10		0.06	0.79	0.79	0.01	0.74	0.74
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		150			165		103	2707	1184	19	2493	1115
v/s Ratio Prot							c0.03	c0.62		0.00	0.32	
v/s Ratio Perm		c0.05			0.02				0.01			0.01
v/c Ratio		0.50			0.18		0.48	0.78	0.01	0.32	0.44	0.01
Uniform Delay, d1		51.1			49.4		54.6	7.0	2.7	58.8	6.0	4.1
Progression Factor		1.00			1.00		0.88	2.52	1.00	0.82	2.43	1.00
Incremental Delay, d2		2.6			0.5		2.0	1.3	0.0	8.6	0.5	0.0
Delay (s)		53.7			49.9		49.9	19.1	2.7	57.0	15.1	4.1
Level of Service		D			D		D	B	A	E	B	A
Approach Delay (s)		53.7			49.9			19.6			15.2	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



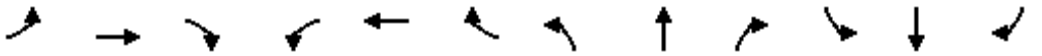
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	10	66	6	20	27	46	1989	15	6	1023	17
Future Volume (veh/h)	36	10	66	6	20	27	46	1989	15	6	1023	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1826	1826	1826	1796	1796	1796
Adj Flow Rate, veh/h	38	11	70	6	21	29	49	2116	16	6	1088	18
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	2	2	2	5	5	5	7	7	7
Cap, veh/h	71	30	88	39	81	93	63	2744	1223	10	2596	1157
Arrive On Green	0.09	0.10	0.10	0.09	0.10	0.10	0.01	0.26	0.26	0.01	0.76	0.76
Sat Flow, veh/h	309	289	853	55	787	903	1739	3469	1546	1711	3413	1521
Grp Volume(v), veh/h	119	0	0	56	0	0	49	2116	16	6	1088	18
Grp Sat Flow(s),veh/h/ln	1450	0	0	1745	0	0	1739	1735	1546	1711	1706	1521
Q Serve(g_s), s	8.8	0.0	0.0	3.7	0.0	0.0	3.4	67.7	0.9	0.4	13.4	0.3
Cycle Q Clear(g_c), s	8.8	0.0	0.0	3.7	0.0	0.0	3.4	67.7	0.9	0.4	13.4	0.3
Prop In Lane	0.32		0.59	0.11		0.52	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	0	0	0	0	63	2744	1223	10	2596	1157
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.77	0.01	0.58	0.42	0.02
Avail Cap(c_a), veh/h	0	0	0	0	0	0	145	2744	1223	143	2596	1157
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.41	0.41	0.41	0.90	0.90	0.90
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	58.8	34.3	9.6	59.5	5.0	3.5
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.9	0.0	38.9	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	1.6	31.5	0.2	0.3	3.9	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	67.0	35.2	9.6	98.3	5.5	3.5
LnGrp LOS	A	A	A	A	A	A	E	D	A	F	A	A
Approach Vol, veh/h		119			56			2181			1112	
Approach Delay, s/veh		0.0			0.0			35.7			6.0	
Approach LOS		A			A			D			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	95.3		16.4	4.7	98.9		16.4				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	10.0	79.0		15.0	10.0	79.0		15.0				
Max Q Clear Time (g_c+I1), s	5.4	15.4		5.7	2.4	69.7		10.8				
Green Ext Time (p_c), s	0.0	9.9		0.1	0.0	8.1		0.2				

Intersection Summary		
HCM 6th Ctrl Delay		24.4
HCM 6th LOS		C

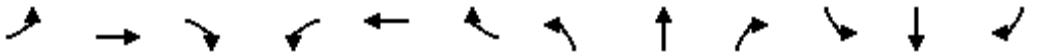
Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	987	18	154	1752	186	54	188	97	89	308	215
Future Volume (vph)	98	987	18	154	1752	186	54	188	97	89	308	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3438	1538	1703	3406	1504	1719	3438	1514	1719	3438	1510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1719	3438	1538	1703	3406	1504	1719	3438	1514	1719	3438	1510
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	100	1007	18	157	1788	190	55	192	99	91	314	219
RTOR Reduction (vph)	0	0	8	0	0	65	0	0	89	0	0	191
Lane Group Flow (vph)	100	1007	10	157	1788	125	55	192	10	91	314	28
Confl. Peds. (#/hr)	1					1	5		4	4		5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	12.3	62.9	62.9	15.6	66.2	66.2	7.1	10.6	10.6	10.9	14.4	14.4
Effective Green, g (s)	12.3	65.9	65.9	15.6	69.2	69.2	8.1	11.6	11.6	11.9	15.4	15.4
Actuated g/C Ratio	0.10	0.55	0.55	0.13	0.58	0.58	0.07	0.10	0.10	0.10	0.13	0.13
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	176	1888	844	221	1964	867	116	332	146	170	441	193
v/s Ratio Prot	0.06	c0.29		0.09	c0.53		0.03	0.06		c0.05	c0.09	
v/s Ratio Perm			0.01			0.08			0.01			0.02
v/c Ratio	0.57	0.53	0.01	0.71	0.91	0.14	0.47	0.58	0.07	0.54	0.71	0.15
Uniform Delay, d1	51.3	17.2	12.3	50.0	22.6	11.7	53.9	51.9	49.3	51.4	50.2	46.5
Progression Factor	1.31	1.73	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	1.0	0.0	10.3	7.8	0.3	3.0	2.4	0.2	3.2	5.4	0.3
Delay (s)	70.9	30.9	12.3	60.3	30.4	12.1	56.9	54.3	49.5	54.6	55.5	46.8
Level of Service	E	C	B	E	C	B	E	D	D	D	E	D
Approach Delay (s)		34.2			31.0			53.3			52.3	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	987	18	154	1752	186	54	188	97	89	308	215
Future Volume (veh/h)	98	987	18	154	1752	186	54	188	97	89	308	215
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1811	1811	1811	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	100	1007	18	157	1788	190	55	192	99	91	314	219
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	5	5	5	6	6	6	5	5	5	5	5	5
Cap, veh/h	259	2173	969	185	1924	858	72	260	114	116	347	150
Arrive On Green	0.15	0.63	0.63	0.11	0.56	0.56	0.04	0.08	0.08	0.07	0.10	0.10
Sat Flow, veh/h	1739	3469	1547	1725	3441	1534	1739	3469	1516	1739	3469	1503
Grp Volume(v), veh/h	100	1007	18	157	1788	190	55	192	99	91	314	219
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1725	1721	1534	1739	1735	1516	1739	1735	1503
Q Serve(g_s), s	6.2	18.3	0.5	10.7	57.2	4.5	3.8	6.5	7.8	6.2	10.7	8.6
Cycle Q Clear(g_c), s	6.2	18.3	0.5	10.7	57.2	4.5	3.8	6.5	7.8	6.2	10.7	8.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	2173	969	185	1924	858	72	260	114	116	347	150
V/C Ratio(X)	0.39	0.46	0.02	0.85	0.93	0.22	0.76	0.74	0.87	0.78	0.91	1.46
Avail Cap(c_a), veh/h	290	2173	969	273	1950	869	72	260	114	116	347	150
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.1	11.8	8.5	52.6	24.3	4.8	56.9	54.3	54.9	55.2	53.4	27.5
Incr Delay (d2), s/veh	0.8	0.6	0.0	15.0	9.5	0.6	36.5	10.5	46.9	28.9	26.1	238.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	6.7	0.2	5.3	23.7	2.6	2.4	3.2	4.5	3.7	6.0	13.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.9	12.5	8.5	67.7	33.7	5.4	93.4	64.9	101.9	84.1	79.6	266.3
LnGrp LOS	D	B	A	E	C	A	F	E	F	F	E	F
Approach Vol, veh/h		1125			2135			346			624	
Approach Delay, s/veh		15.5			33.7			80.0			145.7	
Approach LOS		B			C			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.9	79.1	8.0	16.0	24.9	71.1	11.0	13.0
Change Period (Y+Rc), s	4.0	7.0	4.0	5.0	7.0	* 7	4.0	5.0
Max Green Setting (Gmax), s	19.0	66.0	4.0	11.0	20.0	* 65	7.0	8.0
Max Q Clear Time (g_c+I1), s	12.7	20.3	5.8	12.7	8.2	59.2	8.2	9.8
Green Ext Time (p_c), s	0.2	8.6	0.0	0.0	0.2	4.9	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	49.2
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	62	600	146	43	694	373
Future Volume (vph)	62	600	146	43	694	373
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	1.00	1.00			1.00
Frpb, ped/bikes	1.00	0.97	0.99			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	0.97			1.00
Flt Protected	0.95	1.00	1.00			0.97
Satd. Flow (prot)	1736	1512	1761			1822
Flt Permitted	0.95	1.00	1.00			0.97
Satd. Flow (perm)	1736	1512	1761			1822
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	65	632	154	45	731	393
RTOR Reduction (vph)	0	147	12	0	0	0
Lane Group Flow (vph)	65	485	187	0	0	1124
Confl. Peds. (#/hr)	1	1				
Confl. Bikes (#/hr)		12		2		
Heavy Vehicles (%)	4%	4%	4%	4%	1%	1%
Turn Type	Prot	Perm	NA		Split	NA
Protected Phases	3		1		2	2
Permitted Phases		1 2				
Actuated Green, G (s)	3.9	56.0	8.2			43.8
Effective Green, g (s)	3.9	56.0	8.2			43.8
Actuated g/C Ratio	0.05	0.77	0.11			0.60
Clearance Time (s)	4.0		4.0			4.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	92	1159	197			1093
v/s Ratio Prot	c0.04		c0.11			c0.62
v/s Ratio Perm		0.32				
v/c Ratio	0.71	0.42	0.95			1.03
Uniform Delay, d1	34.0	2.9	32.2			14.6
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	21.8	0.2	50.1			34.7
Delay (s)	55.8	3.2	82.3			49.3
Level of Service	E	A	F			D
Approach Delay (s)	8.1		82.3			49.3
Approach LOS	A		F			D

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	73.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Intersection	
Intersection Delay, s/veh	6.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	3	0	3	1	9	0	1	3	1	0	0
Future Vol, veh/h	0	3	0	3	1	9	0	1	3	1	0	0
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	5	0	5	2	14	0	2	5	2	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	6.6	6.5	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	23%	100%
Vol Thru, %	25%	100%	8%	0%
Vol Right, %	75%	0%	69%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	3	13	1
LT Vol	0	0	3	1
Through Vol	1	3	1	0
RT Vol	3	0	9	0
Lane Flow Rate	6	5	21	2
Geometry Grp	1	1	1	1
Degree of Util (X)	0.006	0.005	0.02	0.002
Departure Headway (Hd)	3.494	3.929	3.548	4.148
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1029	916	1014	867
Service Time	1.5	1.932	1.551	2.154
HCM Lane V/C Ratio	0.006	0.005	0.021	0.002
HCM Control Delay	6.5	7	6.6	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	7	15	331	289	3
Future Vol, veh/h	7	7	15	331	289	3
Conflicting Peds, #/hr	0	2	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	3	3	3	3
Mvmt Flow	8	8	17	376	328	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	746	338	337	0	-	0
Stage 1	336	-	-	-	-	-
Stage 2	410	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.13	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.227	-	-	-
Pot Cap-1 Maneuver	384	709	1217	-	-	-
Stage 1	728	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	372	704	1210	-	-	-
Mov Cap-2 Maneuver	372	-	-	-	-	-
Stage 1	711	-	-	-	-	-
Stage 2	670	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.6	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1210	-	487	-	-
HCM Lane V/C Ratio	0.014	-	0.033	-	-
HCM Control Delay (s)	8	0	12.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	0	10	52	0	35	15	307	23	9	268	7
Future Vol, veh/h	6	0	10	52	0	35	15	307	23	9	268	7
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	3	3	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	2	2	2	3	3	3	3	3	3
Mvmt Flow	7	0	11	60	0	40	17	353	26	10	308	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	754	748	312	741	739	371	316	0	0	382	0	0
Stage 1	332	332	-	403	403	-	-	-	-	-	-	-
Stage 2	422	416	-	338	336	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.12	6.52	6.22	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.518	4.018	3.318	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	328	343	733	332	345	675	1239	-	-	1171	-	-
Stage 1	686	648	-	624	600	-	-	-	-	-	-	-
Stage 2	613	595	-	676	642	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	301	333	733	319	335	672	1239	-	-	1168	-	-
Mov Cap-2 Maneuver	301	333	-	319	335	-	-	-	-	-	-	-
Stage 1	674	642	-	612	588	-	-	-	-	-	-	-
Stage 2	565	583	-	659	636	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	16.8	0.3	0.3
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1239	-	-	477	404	1168	-	-
HCM Lane V/C Ratio	0.014	-	-	0.039	0.248	0.009	-	-
HCM Control Delay (s)	7.9	0	-	12.9	16.8	8.1	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1	0	-	-

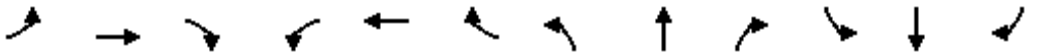
Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	22	34	421	539	14
Future Vol, veh/h	9	22	34	421	539	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	0	3	3	3	3
Mvmt Flow	10	25	39	484	620	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1190	628	636	0	-	0
Stage 1	628	-	-	-	-	-
Stage 2	562	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.13	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.227	-	-	-
Pot Cap-1 Maneuver	209	487	943	-	-	-
Stage 1	536	-	-	-	-	-
Stage 2	575	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	197	487	943	-	-	-
Mov Cap-2 Maneuver	197	-	-	-	-	-
Stage 1	505	-	-	-	-	-
Stage 2	575	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.8	0.7	0
HCM LOS	C		

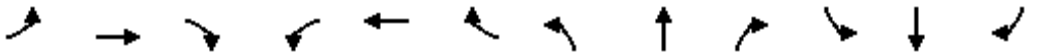
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	943	-	341	-	-
HCM Lane V/C Ratio	0.041	-	0.104	-	-
HCM Control Delay (s)	9	0	16.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	302	65	69	213	193	72	1562	82	347	1869	36
Future Volume (vph)	6	302	65	69	213	193	72	1562	82	347	1869	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1711	3337		1736	1827	1540	1752	3505	1547	1752	3505	1533
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1711	3337		1736	1827	1540	1752	3505	1547	1752	3505	1533
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	6	311	67	71	220	199	74	1610	85	358	1927	37
RTOR Reduction (vph)	0	14	0	0	0	40	0	0	46	0	0	14
Lane Group Flow (vph)	6	364	0	71	220	159	74	1610	39	358	1927	23
Confl. Peds. (#/hr)	6		4	4		6	1		1	1		1
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4	5	1	6		5	2	
Permitted Phases						4			6			2
Actuated Green, G (s)	0.8	18.2		6.3	23.7	52.0	7.8	57.2	57.2	28.3	77.7	77.7
Effective Green, g (s)	0.8	19.2		6.3	24.7	52.0	7.8	60.2	60.2	28.3	80.7	80.7
Actuated g/C Ratio	0.01	0.15		0.05	0.19	0.40	0.06	0.46	0.46	0.22	0.62	0.62
Clearance Time (s)	4.0	5.0		4.0	5.0	4.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	10	492		84	347	616	105	1623	716	381	2175	951
v/s Ratio Prot	0.00	c0.11		c0.04	0.12	0.06	0.04	c0.46		c0.20	0.55	
v/s Ratio Perm						0.05			0.03			0.01
v/c Ratio	0.60	0.74		0.85	0.63	0.26	0.70	0.99	0.05	0.94	0.89	0.02
Uniform Delay, d1	64.4	53.0		61.4	48.5	26.1	60.0	34.7	19.2	50.0	20.8	9.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.94	1.38	6.99	1.00	1.00	1.00
Incremental Delay, d2	70.6	5.9		50.5	3.8	0.2	15.1	17.7	0.1	30.7	5.8	0.0
Delay (s)	135.0	58.9		111.8	52.2	26.3	71.7	65.4	134.5	80.7	26.6	9.5
Level of Service	F	E		F	D	C	E	E	F	F	C	A
Approach Delay (s)		60.1			50.4			69.0			34.6	
Approach LOS		E			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	50.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



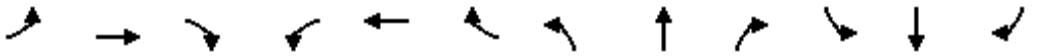
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	302	65	69	213	193	72	1562	82	347	1869	36
Future Volume (veh/h)	6	302	65	69	213	193	72	1562	82	347	1869	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1841	1841	1841	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	6	311	67	71	220	199	74	1610	85	358	1927	37
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	4	4	4	3	3	3	3	3	3
Cap, veh/h	10	349	74	81	300	576	94	1734	773	381	2307	1028
Arrive On Green	0.01	0.12	0.12	0.05	0.16	0.16	0.02	0.16	0.16	0.22	0.65	0.65
Sat Flow, veh/h	1739	2838	602	1753	1841	1542	1767	3526	1572	1767	3526	1571
Grp Volume(v), veh/h	6	188	190	71	220	199	74	1610	85	358	1927	37
Grp Sat Flow(s),veh/h/ln	1739	1735	1706	1753	1841	1542	1767	1763	1572	1767	1763	1571
Q Serve(g_s), s	0.4	13.9	14.3	5.2	14.8	12.1	5.4	58.6	6.0	25.9	54.1	1.1
Cycle Q Clear(g_c), s	0.4	13.9	14.3	5.2	14.8	12.1	5.4	58.6	6.0	25.9	54.1	1.1
Prop In Lane	1.00		0.35	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	10	213	210	81	300	576	94	1734	773	381	2307	1028
V/C Ratio(X)	0.58	0.88	0.90	0.88	0.73	0.35	0.79	0.93	0.11	0.94	0.84	0.04
Avail Cap(c_a), veh/h	54	213	210	81	300	576	109	1734	773	394	2307	1028
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.86	0.86	0.71	0.71	0.71	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.4	56.1	56.4	61.6	51.7	29.5	63.1	52.2	30.2	50.1	17.1	7.9
Incr Delay (d2), s/veh	41.6	32.0	36.9	55.3	7.7	0.3	20.6	7.7	0.2	29.8	3.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	8.0	8.4	3.6	7.5	4.6	3.0	29.5	2.5	14.4	20.7	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	106.0	88.0	93.3	116.9	59.4	29.8	83.8	59.9	30.4	80.0	20.9	8.0
LnGrp LOS	F	F	F	F	E	C	F	E	C	E	C	A
Approach Vol, veh/h		384			490			1769			2322	
Approach Delay, s/veh		90.9			55.7			59.5			29.8	
Approach LOS		F			E			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	89.1	4.8	25.2	32.0	68.0	10.0	20.0
Change Period (Y+Rc), s	4.0	7.0	4.0	5.0	4.0	7.0	4.0	5.0
Max Green Setting (Gmax), s	8.0	81.0	4.0	17.0	29.0	60.0	6.0	15.0
Max Q Clear Time (g_c+I1), s	7.4	56.1	2.4	16.8	27.9	60.6	7.2	16.3
Green Ext Time (p_c), s	0.0	16.9	0.0	0.1	0.1	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	47.6
HCM 6th LOS	D

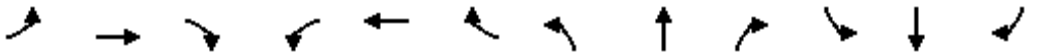
Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	506	23	28	231	22	40	149	24	55	160	188
Future Volume (vph)	157	506	23	28	231	22	40	149	24	55	160	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.95		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1752	1830		1752	1814			1843	1506		1812	1543
Flt Permitted	0.95	1.00		0.95	1.00			0.88	1.00		0.86	1.00
Satd. Flow (perm)	1752	1830		1752	1814			1644	1506		1574	1543
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	178	575	26	32	262	25	45	169	27	62	182	214
RTOR Reduction (vph)	0	2	0	0	4	0	0	0	20	0	0	159
Lane Group Flow (vph)	178	599	0	32	284	0	0	214	7	0	245	55
Confl. Peds. (#/hr)	12		4	4		12	1		16	16		1
Confl. Bikes (#/hr)			3			1			2			3
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		4
Actuated Green, G (s)	11.9	28.3		2.5	18.9			15.6	15.6		15.6	15.6
Effective Green, g (s)	11.9	28.3		2.5	18.9			15.6	15.6		15.6	15.6
Actuated g/C Ratio	0.20	0.47		0.04	0.31			0.26	0.26		0.26	0.26
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	345	857		72	567			424	388		406	398
v/s Ratio Prot	c0.10	c0.33		0.02	0.16							
v/s Ratio Perm								0.13	0.00		c0.16	0.04
v/c Ratio	0.52	0.70		0.44	0.50			0.50	0.02		0.60	0.14
Uniform Delay, d1	21.7	12.7		28.3	16.9			19.1	16.7		19.7	17.2
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.3	2.5		4.3	0.7			0.9	0.0		2.5	0.2
Delay (s)	23.0	15.2		32.6	17.6			20.1	16.7		22.2	17.4
Level of Service	C	B		C	B			C	B		C	B
Approach Delay (s)		17.0			19.1			19.7			20.0	
Approach LOS		B			B			B			B	

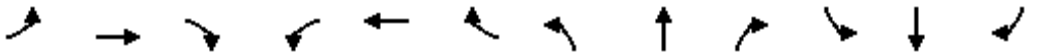
Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	60.4	Sum of lost time (s)	14.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	506	23	28	231	22	40	149	24	55	160	188
Future Volume (veh/h)	157	506	23	28	231	22	40	149	24	55	160	188
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.96	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	178	575	26	32	262	25	45	169	27	62	182	214
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	2	2	2	3	3	3
Cap, veh/h	228	659	30	48	454	43	67	204	582	69	163	587
Arrive On Green	0.13	0.37	0.37	0.03	0.27	0.27	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	1767	1758	79	1767	1660	158	0	533	1518	0	425	1532
Grp Volume(v), veh/h	178	0	601	32	0	287	214	0	27	244	0	214
Grp Sat Flow(s),veh/h/ln	1767	0	1837	1767	0	1819	533	0	1518	425	0	1532
Q Serve(g_s), s	6.4	0.0	19.8	1.2	0.0	8.9	0.0	0.0	0.7	0.0	0.0	6.5
Cycle Q Clear(g_c), s	6.4	0.0	19.8	1.2	0.0	8.9	25.0	0.0	0.7	25.0	0.0	6.5
Prop In Lane	1.00		0.04	1.00		0.09	0.21		1.00	0.25		1.00
Lane Grp Cap(c), veh/h	228	0	689	48	0	497	271	0	582	232	0	587
V/C Ratio(X)	0.78	0.00	0.87	0.67	0.00	0.58	0.79	0.00	0.05	1.05	0.00	0.36
Avail Cap(c_a), veh/h	569	0	845	434	0	837	271	0	582	232	0	587
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.5	0.0	18.9	31.4	0.0	20.5	16.5	0.0	12.6	17.1	0.0	14.4
Incr Delay (d2), s/veh	5.8	0.0	8.5	15.1	0.0	1.1	14.5	0.0	0.0	73.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	9.4	0.7	0.0	3.7	3.1	0.0	0.2	7.0	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.3	0.0	27.4	46.5	0.0	21.5	31.0	0.0	12.7	90.4	0.0	14.8
LnGrp LOS	C	A	C	D	A	C	C	A	B	F	A	B
Approach Vol, veh/h		779			319			241			458	
Approach Delay, s/veh		28.8			24.0			28.9			55.1	
Approach LOS		C			C			C			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	29.5		30.0	12.4	22.8		30.0				
Change Period (Y+Rc), s	4.0	5.0		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	16.0	30.0		25.0	21.0	30.0		25.0				
Max Q Clear Time (g_c+I1), s	3.2	21.8		27.0	8.4	10.9		27.0				
Green Ext Time (p_c), s	0.0	2.6		0.0	0.4	1.7		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		34.7	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	396	38	54	44	39	17	36	326	22	9	155	186
Future Volume (vph)	396	38	54	44	39	17	36	326	22	9	155	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5		4.5			4.5	4.5
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	1.00
Frpb, ped/bikes		1.00	0.97		1.00	0.97		1.00			1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	1.00
Frt		1.00	0.85		1.00	0.85		0.99			1.00	0.85
Flt Protected		0.96	1.00		0.97	1.00		1.00			1.00	1.00
Satd. Flow (prot)		1764	1524		1763	1497		1833			1857	1556
Flt Permitted		0.96	1.00		0.97	1.00		0.96			0.98	1.00
Satd. Flow (perm)		1764	1524		1763	1497		1766			1816	1556
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	412	40	56	46	41	18	38	340	23	9	161	194
RTOR Reduction (vph)	0	0	36	0	0	16	0	3	0	0	0	62
Lane Group Flow (vph)	0	453	20	0	87	2	0	398	0	0	170	132
Confl. Peds. (#/hr)	4		4	4		4	9		13	13		9
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA	Perm	Split	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	4	4		8	8			2			6	4
Permitted Phases			4			8	2			6		6
Actuated Green, G (s)		23.2	23.2		7.1	7.1		20.7			20.7	43.9
Effective Green, g (s)		23.2	23.2		7.1	7.1		20.7			20.7	43.9
Actuated g/C Ratio		0.36	0.36		0.11	0.11		0.32			0.32	0.68
Clearance Time (s)		4.5	4.5		4.5	4.5		4.5			4.5	4.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)		634	548		194	164		566			582	1167
v/s Ratio Prot		c0.26			c0.05							0.04
v/s Ratio Perm			0.01			0.00		c0.23			0.09	0.04
v/c Ratio		0.71	0.04		0.45	0.01		0.70			0.29	0.11
Uniform Delay, d1		17.8	13.4		26.9	25.6		19.2			16.4	3.6
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2		3.8	0.0		1.6	0.0		4.0			0.3	0.0
Delay (s)		21.6	13.4		28.5	25.6		23.2			16.7	3.6
Level of Service		C	B		C	C		C			B	A
Approach Delay (s)		20.7			28.0			23.2			9.7	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	64.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	396	38	54	44	39	17	36	326	22	9	155	186
Future Volume (veh/h)	396	38	54	44	39	17	36	326	22	9	155	186
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	0.99		0.98	0.99		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1826	1826	1826	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	412	40	56	46	41	18	38	340	23	9	161	194
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	5	5	5	2	2	2	2	2	2
Cap, veh/h	539	52	509	81	72	130	109	479	31	87	551	989
Arrive On Green	0.33	0.33	0.33	0.09	0.09	0.09	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1618	157	1530	941	838	1517	92	1578	102	30	1816	1518
Grp Volume(v), veh/h	452	0	56	87	0	18	401	0	0	170	0	194
Grp Sat Flow(s),veh/h/ln	1775	0	1530	1779	0	1517	1772	0	0	1845	0	1518
Q Serve(g_s), s	11.1	0.0	1.2	2.3	0.0	0.5	3.3	0.0	0.0	0.0	0.0	2.6
Cycle Q Clear(g_c), s	11.1	0.0	1.2	2.3	0.0	0.5	9.7	0.0	0.0	3.4	0.0	2.6
Prop In Lane	0.91		1.00	0.53		1.00	0.09		0.06	0.05		1.00
Lane Grp Cap(c), veh/h	591	0	509	153	0	130	619	0	0	638	0	989
V/C Ratio(X)	0.76	0.00	0.11	0.57	0.00	0.14	0.65	0.00	0.00	0.27	0.00	0.20
Avail Cap(c_a), veh/h	1113	0	960	658	0	562	1085	0	0	1125	0	1402
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.5	0.0	11.2	21.4	0.0	20.6	15.1	0.0	0.0	13.0	0.0	3.7
Incr Delay (d2), s/veh	2.1	0.0	0.1	3.3	0.0	0.5	1.1	0.0	0.0	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	0.4	1.0	0.0	0.2	3.7	0.0	0.0	1.3	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.6	0.0	11.3	24.7	0.0	21.0	16.2	0.0	0.0	13.2	0.0	3.8
LnGrp LOS	B	A	B	C	A	C	B	A	A	B	A	A
Approach Vol, veh/h		508			105			401			364	
Approach Delay, s/veh		16.0			24.1			16.2			8.2	
Approach LOS		B			C			B			A	

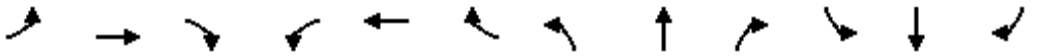
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		19.3		20.7		19.3		8.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		28.0		30.5		28.0		18.0				
Max Q Clear Time (g_c+I1), s		11.7		13.1		5.4		4.3				
Green Ext Time (p_c), s		2.4		3.1		1.7		0.4				

Intersection Summary												
HCM 6th Ctrl Delay			14.6									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	35	95	17	22	23	37	1668	15	24	1956	27
Future Volume (vph)	32	35	95	17	22	23	37	1668	15	24	1956	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99			1.00		1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.92			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1667			1771		1752	3505	1568	1752	3505	1519
Flt Permitted		0.93			0.76		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1569			1365		1752	3505	1568	1752	3505	1519
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	33	36	98	18	23	24	38	1720	15	25	2016	28
RTOR Reduction (vph)	0	41	0	0	17	0	0	0	4	0	0	8
Lane Group Flow (vph)	0	126	0	0	48	0	38	1720	11	25	2016	20
Confl. Peds. (#/hr)	1		3	3		1	4					4
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	3%	3%	3%	3%	3%	3%
Turn Type	D.Pm	NA		D.Pm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	4			8					6			2
Actuated Green, G (s)		15.2			15.2		6.9	93.7	93.7	5.1	91.9	91.9
Effective Green, g (s)		16.2			16.2		6.9	96.7	96.7	5.1	94.9	94.9
Actuated g/C Ratio		0.12			0.12		0.05	0.74	0.74	0.04	0.73	0.73
Clearance Time (s)		5.0			5.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		195			170		92	2607	1166	68	2558	1108
v/s Ratio Prot							c0.02	0.49		0.01	c0.58	
v/s Ratio Perm		c0.08			0.04				0.01			0.01
v/c Ratio		0.65			0.28		0.41	0.66	0.01	0.37	0.79	0.02
Uniform Delay, d1		54.2			51.6		59.6	8.4	4.3	60.9	11.2	4.8
Progression Factor		1.00			1.00		1.00	1.00	1.00	0.78	1.51	4.51
Incremental Delay, d2		7.1			0.9		3.0	1.3	0.0	1.7	1.3	0.0
Delay (s)		61.3			52.6		62.6	9.7	4.3	49.0	18.1	21.7
Level of Service		E			D		E	A	A	D	B	C
Approach Delay (s)		61.3			52.6			10.8			18.5	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



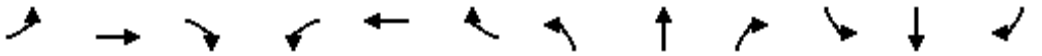
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	35	95	17	22	23	37	1668	15	24	1956	27
Future Volume (veh/h)	32	35	95	17	22	23	37	1668	15	24	1956	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1900	1900	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	33	36	98	18	23	24	38	1720	15	25	2016	28
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	0	0	0	3	3	3	3	3	3
Cap, veh/h	58	58	118	69	86	70	49	2677	1191	32	2644	1176
Arrive On Green	0.12	0.13	0.13	0.12	0.13	0.13	0.03	0.76	0.76	0.02	0.75	0.75
Sat Flow, veh/h	195	443	906	257	661	537	1767	3526	1568	1767	3526	1568
Grp Volume(v), veh/h	167	0	0	65	0	0	38	1720	15	25	2016	28
Grp Sat Flow(s),veh/h/ln	1544	0	0	1456	0	0	1767	1763	1568	1767	1763	1568
Q Serve(g_s), s	13.1	0.0	0.0	4.7	0.0	0.0	2.8	29.8	0.3	1.8	43.4	0.6
Cycle Q Clear(g_c), s	13.1	0.0	0.0	4.7	0.0	0.0	2.8	29.8	0.3	1.8	43.4	0.6
Prop In Lane	0.20		0.59	0.28		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	0	0	0	0	49	2677	1191	32	2644	1176
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.64	0.01	0.77	0.76	0.02
Avail Cap(c_a), veh/h	0	0	0	0	0	0	136	2677	1191	136	2644	1176
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.41	0.41	0.41	0.41	0.41	0.41
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	62.8	7.4	3.8	63.5	9.5	4.1
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	10.5	0.5	0.0	14.7	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	1.4	9.2	0.1	0.9	13.7	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	73.4	7.8	3.8	78.2	10.4	4.1
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	B	A
Approach Vol, veh/h		167			65			1773			2069	
Approach Delay, s/veh		0.0			0.0			9.2			11.1	
Approach LOS		A			A			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	101.5		20.9	6.4	102.7		20.9				
Change Period (Y+Rc), s	4.0	7.0		5.0	4.0	7.0		5.0				
Max Green Setting (Gmax), s	10.0	83.0		20.0	10.0	84.0		20.0				
Max Q Clear Time (g_c+I1), s	4.8	45.4		6.7	3.8	31.8		15.1				
Green Ext Time (p_c), s	0.0	23.6		0.2	0.0	21.2		0.4				

Intersection Summary		
HCM 6th Ctrl Delay	9.7	
HCM 6th LOS	A	

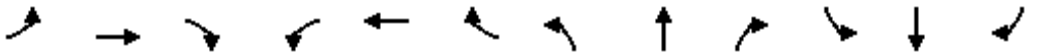
Notes

User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	252	1790	59	116	1551	192	30	236	91	143	272	155
Future Volume (vph)	252	1790	59	116	1551	192	30	236	91	143	272	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1548	1770	3539	1557	1734	3471	1519	1749	3505	1543
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.57	1.00	1.00	0.31	1.00	1.00
Satd. Flow (perm)	1752	3505	1548	1770	3539	1557	1046	3471	1519	564	3505	1543
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	271	1925	63	125	1668	206	32	254	98	154	292	167
RTOR Reduction (vph)	0	0	25	0	0	80	0	0	88	0	0	142
Lane Group Flow (vph)	271	1925	38	125	1668	126	32	254	10	154	292	25
Confl. Peds. (#/hr)	5		1	1		5	3		10	10		3
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	4%	4%	4%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	22.4	69.7	69.7	10.7	58.0	58.0	14.1	11.7	11.7	23.6	17.2	17.2
Effective Green, g (s)	22.4	72.7	72.7	10.7	61.0	61.0	16.1	12.7	12.7	24.6	18.2	18.2
Actuated g/C Ratio	0.19	0.61	0.61	0.09	0.51	0.51	0.13	0.11	0.11	0.21	0.15	0.15
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	327	2123	937	157	1798	791	159	367	160	203	531	234
v/s Ratio Prot	0.15	c0.55		0.07	c0.47		0.01	0.07		c0.06	0.08	
v/s Ratio Perm			0.02			0.08	0.02		0.01	c0.10		0.02
v/c Ratio	0.83	0.91	0.04	0.80	0.93	0.16	0.20	0.69	0.06	0.76	0.55	0.11
Uniform Delay, d1	47.0	20.7	9.6	53.6	27.4	15.8	45.8	51.8	48.3	42.1	47.1	43.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.7	7.1	0.1	23.7	9.9	0.4	0.6	5.6	0.2	14.9	1.2	0.2
Delay (s)	62.7	27.7	9.6	77.3	37.3	16.2	46.5	57.3	48.5	57.0	48.3	44.1
Level of Service	E	C	A	E	D	B	D	E	D	E	D	D
Approach Delay (s)		31.4			37.6			54.2			49.3	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	1790	59	116	1551	192	30	236	91	143	272	155
Future Volume (veh/h)	252	1790	59	116	1551	192	30	236	91	143	272	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1870	1870	1870	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	271	1925	63	125	1668	206	32	254	98	154	292	167
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	2	2	2	4	4	4	3	3	3
Cap, veh/h	313	2228	992	151	1829	813	158	321	138	199	452	194
Arrive On Green	0.18	0.63	0.63	0.08	0.51	0.51	0.03	0.09	0.09	0.07	0.13	0.13
Sat Flow, veh/h	1767	3526	1569	1781	3554	1580	1753	3497	1509	1767	3526	1515
Grp Volume(v), veh/h	271	1925	63	125	1668	206	32	254	98	154	292	167
Grp Sat Flow(s),veh/h/ln	1767	1763	1569	1781	1777	1580	1753	1749	1509	1767	1763	1515
Q Serve(g_s), s	17.9	53.1	1.8	8.3	51.5	5.6	2.0	8.5	7.6	8.0	9.4	8.7
Cycle Q Clear(g_c), s	17.9	53.1	1.8	8.3	51.5	5.6	2.0	8.5	7.6	8.0	9.4	8.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	313	2228	992	151	1829	813	158	321	138	199	452	194
V/C Ratio(X)	0.87	0.86	0.06	0.83	0.91	0.25	0.20	0.79	0.71	0.77	0.65	0.86
Avail Cap(c_a), veh/h	339	2228	992	163	1866	830	178	321	138	199	452	194
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.53	0.53	0.53	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	17.9	8.5	54.1	26.6	6.6	47.2	53.4	52.9	46.8	49.7	23.2
Incr Delay (d2), s/veh	11.4	2.6	0.1	27.2	8.4	0.7	0.6	12.7	15.4	17.2	3.2	30.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	19.7	0.6	4.8	22.3	3.2	0.9	4.3	3.5	1.7	4.4	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	20.5	8.5	81.2	35.0	7.4	47.9	66.1	68.3	64.0	52.9	53.3
LnGrp LOS	E	C	A	F	D	A	D	E	E	E	D	D
Approach Vol, veh/h		2259			1999			384			613	
Approach Delay, s/veh		24.8			35.1			65.1			55.8	
Approach LOS		C			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.1	79.9	6.6	19.4	28.2	65.8	11.0	15.0
Change Period (Y+Rc), s	4.0	7.0	4.0	5.0	7.0	* 7	4.0	5.0
Max Green Setting (Gmax), s	11.0	72.0	4.0	13.0	23.0	* 60	7.0	10.0
Max Q Clear Time (g_c+I1), s	10.3	55.1	4.0	11.4	19.9	53.5	10.0	10.5
Green Ext Time (p_c), s	0.0	12.7	0.0	0.4	0.2	5.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	35.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Humber Design Group, Inc.

October 23, 2020

City of Milwaukie
Attn: Steve Adams, City Engineer
6101 SE Johnson Creek Blvd.
Milwaukie, Oregon 97206

RE: Hillside Master Plan – Conceptual Stormwater Review

Dear Steve,

The purpose of this letter is to provide clear summary of the concept level design assumptions that were utilized in the development of the Hillside Master Plan. Conceptual stormwater design is based on current stormwater codes for the City of Milwaukie and U.S. Department of Housing and Urban Development, which is an assumed funding source.

I have attached a preliminary utility plan for your review, along with storm facility calculations based on the City of Portland, "Stormwater Management Manual – 2020 Facility Sizes Proposed" and Santa Barbra Unit Hydrograph calculations for various typical stormwater management alternatives that may be utilized in the public and private developments. Along with this supplemental information, you will find a summary and overview narrative on the next page.

Please feel free to contact me regarding any questions or comments. I hope this facility and methodology will meet with your approval.

Sincerely,

Humber Design Group, Inc.

Kristian McCombs, PE
Associate, Project Engineer
503-946-5358
Kristian.McCombs@hdgpdx.com

117 SE Taylor Street, Suite 001 :: Portland, Oregon 97214 :: 503.946.6690 :: www.hdgpdx.com

Project Overview

- This project is located at 2889 SE Hillside Court, Milwaukie Oregon and is composed of multiple single family and duplex buildings, a multi-unit Hillside Manor building, and a community building on a single lot. Only the Hillside Manor building will remain.
- The existing campus is served by a network of public roads.
- Proposed project would include up to 600 housing units and some commercial space on across the 16 acres of property.
- The development will be split into 9 new private lots divided by 6 new reconfigured public street extensions.

Storm Criteria Utilized

Criteria from the "City of Milwaukie Public Works Standards", Dated October 1, 2019.

- Storm detention facilities shall be designed to provide storage up to the 25-year storm event, with save overflow conveyance of the 100-year storm event.
- Allowable post-developed discharge rate for the 2-, 5-, 10-, and 25-year storm events shall be that of the predevelopment discharge rate.
- All water quality facilities shall meet the City of Portland, Stormwater Management Manual as amended and adopted by the City of Milwaukie and requirements of Subsection 2.0050
- Safely direct the 100-year storm event away from structures, stored then conveyed to public or private storm systems.

Criteria from the "HUD/NOAA/NEPA Funding Requirements"

- In addition to City of Milwaukie standards, it is likely that HUD/NOAA/NEPA water quantity standards will be required to be met to meet funding requirements. Since infiltration may not feasible on the site, allowable post development discharge shall also be in accordance with HUD/NOAA/NEPA standards, and discharge from half the 2-year, and the 2, 5 and 10-year shall match the pre-developed rate.
- All stormwater quality treatment practices and facilities will be designed to accept and fully treat the volume of water equal to 50-percent of the cumulative rainfall from the 2-year, 24-hour storm for that site to meet HUD/NOAA/NEPA requirements.

Storm Overview

- Greenstreet planters meeting City of Milwaukie and HUD criteria for water quality and detention are assumed for all public roads. These green street planters are assumed to have orifices as required to meet flow control requirements at this time as it is the most conservative approach in regard to planter area sizing.
- Private lots will have private stormwater facilities independently designed and located on each site. We have included preliminary conceptual designs that reflect some of the possible configurations these may take.
- After treatment and detention, water will be conveyed to a new public storm system network that has been sized convey the larger of either the 25-year SBUH storm or the 10-year Rational storm.
- The public system has two proposed discharge locations into the existing City of Milwaukie system, but these systems may discharge into the Meek Street Pipe Installation CIP project by the time of development.
- Events larger than the 100-year will be managed away from buildings and safely conveyed away from structures in the public ROW and is assumed that private sites shall be designed to meet this criterion.

Design information

Rainfall Events:

- WQ (PDX) = 1.60-inch, 24 hour, Assuming 2020 Portland SWMM Rate
- WQ (HUD) = 50% of volume of 2-year storm for HUD use 2.40-inches of rainfall
- 2 year = 2.40-inches of rainfall
- 5 year = 2.90-inches of rainfall
- 10 year = 3.40-inches of rainfall
- 25 year = 3.90-inches of rainfall
- 100 year = 4.40-inches of rainfall

Refer to the attached calculation sheet for additional information.

Infiltration Rate:
To be determined. The majority of the site is Woodburn Silt Loam, 3 to 8 percent slopes with Hydrologic Soils Group C soils which leads us to believe that significant infiltration may be unachievable in the surface level soils.

Water Quantity Values:

- For public green street planters or private surface vegetated facilities, the City of Portland, Bureau of Environmental Services Memo regarding "Stormwater Management Manual 2020 Facility Sizes Proposed" was utilizes for conceptual sizing. Based on the memo attached, surface vegetated facilities with offsite discharge and underdrain should be sized at 8-9% of the catchment area. **Refer to Supporting Documents D and F for additional information.**
- Basin B was used as for an example calculation for utilizing underground detention for meeting City of Milwaukie and HUD stormwater criteria on a private site.

On site example calculation for generic Underground Detention System (based onbasin area B):
Predeveloped basin = 60,000 sq. ft. CN = 76 Woods/Grass Combination
Post developed = 60,000 sq ft. 85% Impervious CN = 98, 15% Pervious CN = 79 grass cover
Example Detention System = (5) 100' 48" diameter pipes with multiple orifice control.
Refer to Supporting Documents G.

Water Quality Values:

- For public green street planters or private surface vegetated facilities, the City of Portland, Bureau of Environmental Services Memo regarding "Stormwater Management Manual 2020 Facility Sizes Proposed" was utilizes for conceptual sizing. Based on the memo attached, surface vegetated facilities with offsite discharge and underdrain should be sized at 8-9% of the catchment area. **Refer to Supporting Documents D and F for additional information. If detention in not required, the sizing can be downsized.**
- Basin B was used as for an example calculation for utilizing mechanical proprietary systems for meeting City of Milwaukie and HUD stormwater criteria on a private site.

On site example calculation for generic proprietary mechanical system (based on basin area B):
Predeveloped basin = 60,000 sq. ft.
Post developed = 60,000 sq ft. Assumed all impervious
Per City of Portland SWMM – Proprietary mechanical systems are sized using Rational Method
Q=CiA; where C=0.9 for impervious, i = 0.19 in/hr, and A = area in acres.
Example Contech StormFilter System = (18) 18" tall ZPG filter cartridges.
Refer to Supporting Documents D and F for additional information. If detention is not required, the sizing can be downsized.

Engineering Conclusion:

Based on compliance with City of Milwaukie standards, HUD funding requirements, and proper engineering techniques, the preliminary calculations demonstrated in this letter support the engineering opinion that the stormwater can be effectively managed for the proposed Hillside Master Plan. This preliminary analysis provides a sample roadmap of various stormwater solutions (based on 2020 standards) that can be further developed during the public and private design processes.

Support Documentation Index

Exhibit C

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STORMWATER CONVEYANCE CALCULATIONS

* This spreadsheet is based on King County SBUH method.

Design Storm: 25 YR
Storm Duration: 24 HRS
Precipitation: 3.9 IN
Manning's "n" 0.013 (FOR PVC STORM PIPE)

LINE	INC. AREA (AC)	INC. % IMP.	CUM. AREA TOTAL (AC)	CUM. AREA PERV. (AC)	CN PER.	CUM. AREA IMP. (AC)	CN IMP.	TIME (MIN)	Q (CFS)	PIPE Dia. (IN)	SLOPE (FT/FT)	Qf (CFS)	Q/Qf (%)	Depth (in)	Depth/ Dia.	V (fps)	LENGTH (FT)	INC. TIME (MIN)
SE 31st Ave - South																		
LINE 2 (Basins E,9)	1.743	87.76	1.7430	0.2133	79	1.5297	98	5.00	1.66	12	0.0200	5.05	0.33	4.74	0.40	5.75	132.0	0.38
LINE 1 (Add Basins A,8)	1.700	87.82	3.4430	0.4204	79	3.0226	98	5.38	3.23	12	0.0220	5.30	0.61	6.78	0.57	7.07	309.0	0.73
LINE 17 (Add Basin 1)	0.168	100.00	3.6105	0.4204	79	3.1901	98	6.11	3.31	15	0.0295	11.12	0.30	5.61	0.37	7.89	35.0	0.07
(Connects to Existing 36" MEEK ST)																		
SE Hillside Court - East																		
LINE 3 (Basins B,D,7)	3.108	87.80	3.1080	0.3792	79	2.7288	98	5.00	2.96	12	0.0171	4.67	0.63	6.95	0.58	6.29	215.0	0.57
(Connects to LINE 5)																		
SE 29th Ave - Middle																		
LINE 4 (Possibly K?, 10)	1.660	89.06	1.6600	0.1816	79	1.4784	98	5.00	1.60	12	0.0171	4.67	0.34	4.84	0.40	5.38	215.0	0.67
(Connects to LINE 5)																		
SE 29th Ave - South																		
LINE 5 (Upstream = Line 3+4, Add =Basins 6,C)	1.873	89.60	6.6406	0.7555	79	5.8850	98	5.67	6.20	18	0.0078	9.30	0.67	10.75	0.60	5.62	335.0	0.99
(Connects to Existing 36" MEEK ST)																		
SE Hillside Court - West																		
Line 6 (Basin 5)	0.374	100.00	0.3739	0.0000	79	0.3739	98	5.00	0.38	12	0.0120	3.91	0.10	2.54	0.21	3.16	250.0	1.32
line 7 (Upstream = Line 6, Add Basin 4)	0.180	100.00	0.5538	0.0000	79	0.5538	98	5.00	0.57	12	0.0098	3.54	0.16	3.25	0.27	3.29	132.0	0.67
(Connects to Existing public 12" main)																		
SE Dwyer St																		
LINE 8 (Basin 13)	0.292	100.00	0.2920	0.0000	79	0.2920	98	5.00	0.30	12	0.0436	7.46	0.04	1.64	0.14	4.62	176.0	0.63
(Connects to LINE 10)																		

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STORMWATER CONVEYANCE CALCULATIONS

* This spreadsheet is based on King County SBUH method.

Design Storm: 25 YR
Storm Duration: 24 HRS
Precipitation: 3.9 IN
Manning's "n" 0.013 (FOR PVC STORM PIPE)

LINE	INC. AREA (AC)	INC. % IMP.	CUM. AREA TOTAL (AC)	CUM. AREA PERV. (AC)	CN PER.	CUM. AREA IMP. (AC)	CN IMP.	TIME (MIN)	Q (CFS)	PIPE Dia. (IN)	SLOPE (FT/FT)	Qf (CFS)	Q/Qf (%)	Depth (in)	Depth/ Dia.	V (fps)	LENGTH (FT)	INC. TIME (MIN)
LINE 9 (Basin F,14)	1.239	87.76	1.2388	0.1516	79	1.0871	98	5.00	1.18	12	0.0250	5.65	0.21	3.73	0.31	5.68	146.0	0.43
(Connects to LINE 10)																		
LINE 10 (Upstream=Line 8+9, Add=Basins G,12)	1.836	87.75	3.3666	0.3765	79	2.9901	98	5.43	3.17	12	0.0310	6.29	0.50	6.04	0.50	8.01	274.0	0.57
(Connects to LINE 16)																		
SE 29th Ave at Dwyer St																		
LINE 16 (Upstream = Line 10, Add No Basins)	0.000	100.00	1.5308	0.1516	79	1.3792	98	5.43	1.45	12	0.0100	3.57	0.41	5.34	0.44	4.31	21.0	0.08
Line 11 (Upstream 16, Add Possibly K?)	1.212	86.74	4.2737	0.4640	79	3.8097	98	5.51	4.02	15	0.0050	4.58	0.88	10.93	0.73	4.20	108.0	0.43
(Connects to LINE 13)																		
SE 29th Ave -North																		
LINE 12 (Basin 15)	0.232	87.68	0.2318	0.0286	79	0.2032	98	5.00	0.22	15	0.0150	7.93	0.03	1.73	0.12	2.83	157.0	0.93
(Connects to LINE 13)																		
Easement through K																		
LINE 13 (Upstream = 11,12; Add Possible K?)	1.065	84.91	5.5705	0.6532	79	4.9172	98	5.93	5.13	18	0.0200	14.89	0.34	7.30	0.41	7.63	107.0	0.23
LINE 14 (Upstream = 13)	0.000	100.00	5.5705	0.6532	79	4.9172	98	6.16	5.09	18	0.1600	42.13	0.12	4.23	0.24	16.08	120.0	0.12
LINE 15 (Upstream = 14)	0.000	100.00	5.5705	0.6532	79	4.9172	98	6.28	5.06	18	0.0150	12.90	0.39	7.84	0.44	6.85	226.0	0.55
(Connects to Future CIP?)																		

EXHIBIT "D"

ENVIRONMENTAL SERVICES
CITY OF PORTLAND

Stormwater Management Manual 2020 Facility Sizes—Proposed

Spring 2020

Storm system and location make a difference for engineered facilities.

This document summarizes typical stormwater facility sizes designed using the Presumptive or Performance Approach by geographic area of Portland based on the proposed requirements in the 2020 SWMM. It combines requirements that are changing and those that are staying the same. This fact sheet does not cover most single family sites that will continue to use the Simplified Approach.

Stormwater management is required

Stormwater management supports the City of Portland's (the City) livability and improves watershed health by mitigating the impacts of urbanization and protecting our storm systems, drainageways, and combined sewers.

The City requires stormwater management for projects involving 500 square feet or more of impervious area. ***This includes:***

- Some paving projects in the public right-of-way.
- Parcel-based development on properties.

The Stormwater Management Manual (SWMM) is one of the ways the City addresses state and federal regulations related to stormwater.

Updates to SWMM requirements

The City's Bureau of Environmental Services (BES) updates the SWMM to keep stormwater policy in step with changing conditions and technology advancements. ***Goals of the 2020 update:***

- Improve clarity.
- Continue to comply with regulations.
- Increase technical rigor and facility performance.

Facility size/design changes required by the SWMM 2020

Stormwater management requirements and solutions depend on multiple factors, including:

- Site location.
- Geologic characteristics.
- Available storm system infrastructure.

The proposed 2020 SWMM contains technical changes affecting facility size requirements:

- Increase the water-quality storm size.
- Increase the infiltration rate of the imported growing media.
- Requirements for more orifice control for facilities that discharge offsite.

The following information describes typical facility sizes designed under the proposed 2020 SWMM requirements by facility type. Different requirements may apply based on individual site characteristics or storm-system availability.

The City uses the Stormwater Management Manual (SWMM) to protect both watershed resources and infrastructure investments. As each development or improvement project meets the requirements of the manual, it contributes to these important citywide goals:

- Protect watershed health by requiring infiltration wherever feasible, to mimic pre-development hydrologic conditions.
- Protect groundwater resources by removing pollutants from stormwater before discharging it into the ground.
- Protect streams and rivers by providing water quality treatment and flow control for stormwater before discharging it to surface water.
- Minimize long-term costs to the City for treating stormwater through public wastewater treatment plants.
- Protect the capacity of downstream infrastructure.
- Minimize sewer overflows and basement sewer backups.

For more information:

Adrienne Aiona

503-823-2051

besstormmanual@portlandoregon.gov

portlandoregon.gov/bes/swmm

Infiltration to groundwater to manage stormwater and reduce combined sewer overflows

REQUIREMENT (NO CHANGE):

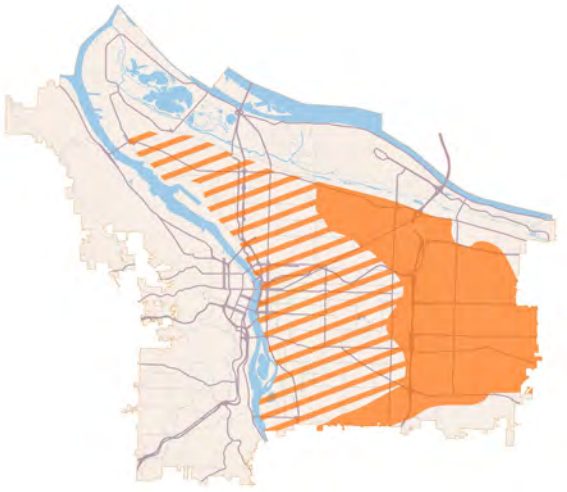
Fully infiltrate the 10-year storm event on sites with infiltration rates greater than 2 inches per hour.

FACILITY DESIGN CHANGES:

Surface vegetated:

- **Surface infiltration facilities will get smaller—**facilities will be sized based on an infiltration rate of 6 inches per hour for the imported growing media. This will decrease the footprint and increase feasibility of these facility types.
- **No setback will be required from the right-of-way property line**—This will increase opportunities for infiltration facilities and better align with zoning code landscape requirements.
- **Install surface infiltration facilities w/o rock to improve plant health—**Recommendation will be to install facilities without rock underneath, to improve plant health.

UICs: Additional guidance provided for deep infiltration testing and post-construction testing of drywells.



Infiltration

East of the Willamette River, infiltration is often the best option. The soils in parts of outer east Portland, and areas around I-205 (see map), include layers of coarse, fast-draining sediments deposited by the Missoula Floods. The geology is more mixed on the inner east side and in the northern neighborhoods, with good conditions for infiltration in some areas (see map).

Flow control—to maintain pipe capacity in the combined system

In the combined system, sites that discharge offsite must provide flow control to maintain pipe capacity.

REQUIREMENT (NO CHANGE):

Control the post-development 25-year, 24-hour storm peak flow to the predevelopment 10-year, 24-hour peak flow.

FACILITY DESIGN CHANGES:

Surface vegetated with offsite discharge (with an underdrain):

- **Add orifice control to underdrained facilities—**Environmental Services will require orifices on more facilities for reliable flow control.
- Facility size will decrease to about 5% of the catchment area.
- Facilities with small catchment areas that cannot meet flow control requirements will be required to filter the 25-year, 24-hour event.
- **Change underdrain in lined facilities to improve plant health—** underdrain configuration requirements will change to reduce the amount of drain rock, improving plant health.

Structured detention: To be used in limited circumstances when approved by Environmental Services.

Flow control — CSO

Older parts of Portland have a combined sewer system (see map). It collects stormwater and sanitary flows in the same pipes and treats them at the same plant. When infiltration is not feasible, sites are required to provide flow control to preserve pipe capacity and to prevent sewer backups in large storm events.

Water quality treatment—to protect the Willamette River and Columbia Slough

Water quality treatment required for sites discharging into large water bodies.

REQUIREMENT:

Provide water quality treatment for the "water-quality storm," which represents 90% of the average annual runoff.

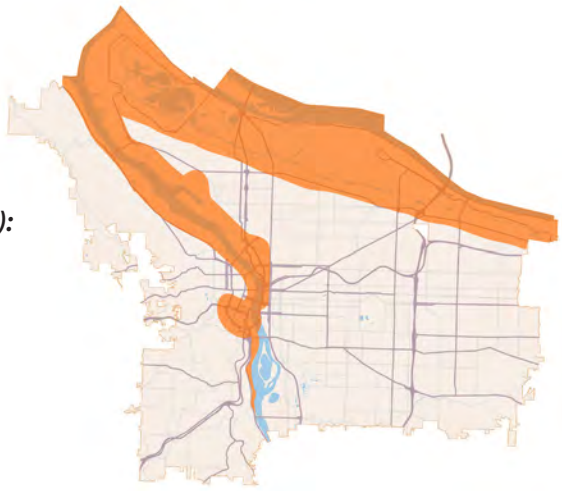
FACILITY DESIGN CHANGES:

Lined and unlined surface vegetated with offsite discharge (with underdrain):

- **Increase water quality storm—**the water-quality storm size will be 1.61 inches in 24 hours.
- Facilities will be sized based on an infiltration rate of 6 inches per hour for the imported growing media. This will balance the increase in the design storm size and result in a modest increase in facility size.
- Facility sizes will be less than 2% of the catchment area.
- Underdrain configuration requirements will change to reduce the amount of drain rock, improving plant health.

Rate-based facilities (manufactured stormwater treatment technologies):

- The intensity of the water-quality storm remains 0.19 inches per hour.
- Facilities on Environmental Services' approved list must be used.
- Allowed in limited circumstances if approved by Environmental Services.



Water Quality only

Along large water bodies, including the Willamette River and Columbia Slough, sites that cannot infiltrate must treat stormwater for water quality before discharging to surface waters (see map). These water bodies are large enough that flow control is not needed, however in some locations it is still required to preserve pipe capacity.

Water quality treatment and flow control to protect watershed heath

Environmental Services requires water-quality treatment and flow control at sites that discharge offsite to watersheds that flow into the Willamette River—such as Tryon, Fanno, and Johnson creeks.

REQUIREMENT (SOME CHANGES):

Provide treatment of water-quality storm (90% of average annual runoff)—and control post-development peak flows for a range of storm events.

FACILITY DESIGN CHANGES:

Surface vegetated facilities with offsite discharge (with an underdrain):

- **Add orifice control to underdrained facilities—**Environmental Services will require orifices on more facilities, for reliable flow control.
- Facility sizes will increase to 8-9% of the catchment area.
- Facilities with small catchment areas that cannot meet flow control requirements will be required to filter the 25-year, 24-hour event.
- Underdrain configuration requirements will change to reduce the amount of drain rock, improving plant health.

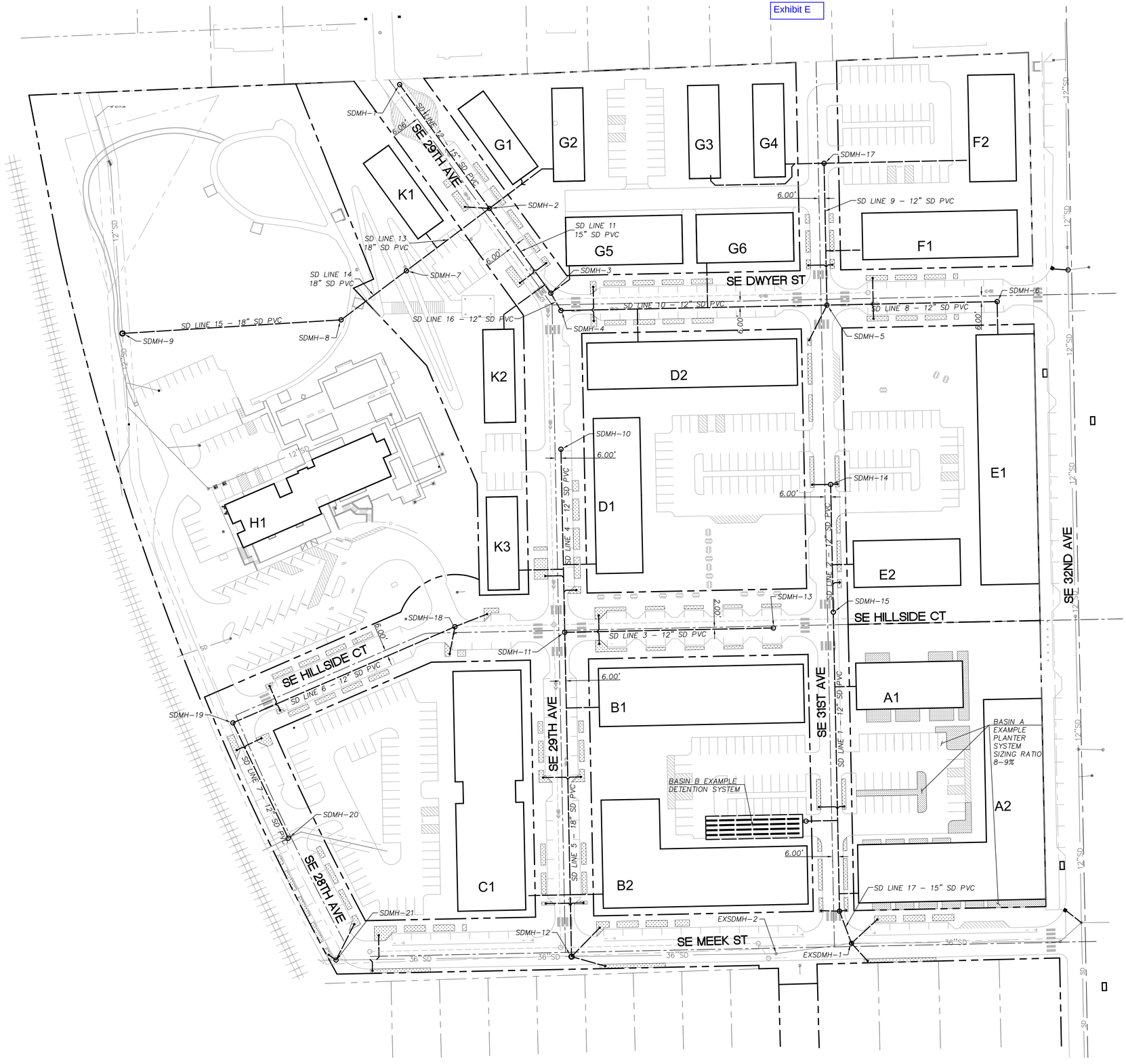
Water quality treatment paired with detention:

- Configurations with a water-quality facility paired with additional detention can meet water quality and flow control requirements.
- This combination can be used in limited circumstances when approved by Environmental Services.

Flow control + Water Quality

Where stormwater discharges to creeks, streams, and other smaller surface water bodies, both water quality treatment and flow control are required. Infiltration is often infeasible because of clay soils and landslide concerns. Treatment protects in-stream habitat from sediment and other pollutants. Flow control reduces channel erosion and flooding (see map).

Exhibit E



STORM SYSTEM PLAN
SCALE: 1"=50'

GENERAL SHEET NOTES

1. ALL CONSTRUCTION PER LATEST CITY OF MILWAUKIE PUBLIC WORKS STANDARDS.
2. STORM PIPE LESS THAN 24-INCH IN DIAMETER TO BE RIBBED PVC.
3. STORM PIPE LOCATED 5 FEET EAST OF STREET CENTERLINE WHERE POSSIBLE.
4. MINIMUM STORM PIPE COVER IS 36 INCHES.
5. EACH INDIVIDUAL LOT DEVELOPMENT SHALL MEET CURRENT CITY STORMWATER MANAGEMENT REQUIREMENTS FOR WATER QUALITY AND FLOW CONTROL.
6. ALL PUBLIC RIGHT OF WAY DEVELOPMENT IS PROPOSED TO HAVE STORMWATER MANAGEMENT MET BY SERIES OF GREEN STREET PLANTERS.

LEGEND

SYMBOL	DESCRIPTION
X" SD	EX. STORM DRAIN
X"SD – PVC	PROPOSED STORM DRAIN
	EX. STORM MANHOLE
	PROPOSED STORM MANHOLE
	OVERFLOW DRAIN
	PUBLIC STORM FACILITY SIZING FACTOR 8%

ABBREVIATIONS

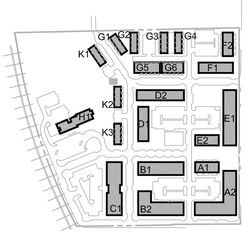
EX.	EXISTING
FG	FINISHED GRADE
IE	INVERT ELEVATION
LF	LINEAL FEET
MH	MANHOLE
OD	OVERFLOW DRAIN
SD	STORM DRAIN

KEYNOTES

1. NONE THIS SHEET

GRAPHIC SCALE
0 50 100
1 inch = 50 ft.

KEY PLAN



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HILLSIDE MASTER PLAN

32ND AND MEEK ST.
MILWAUKIE, OR 97222

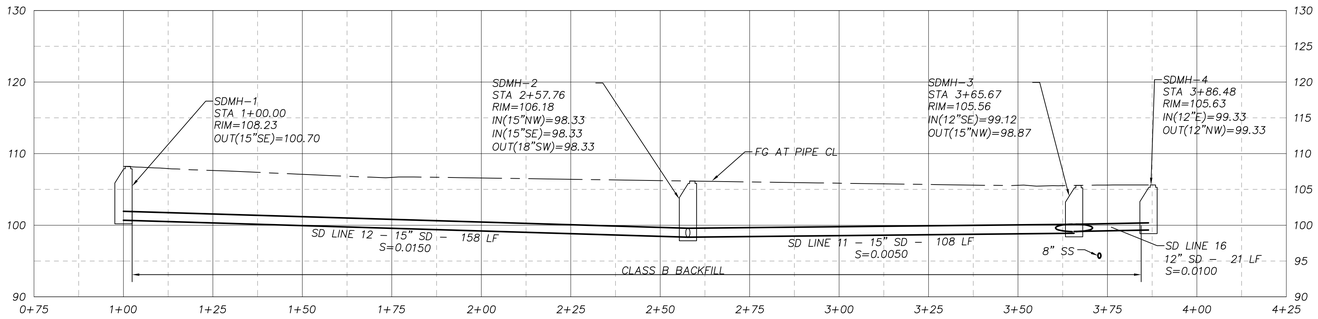
Humber Design Group, Inc.
Portland, OR • 503.946.6690 • hdgpdx.com

Drawing:

STORM SEWER PLAN

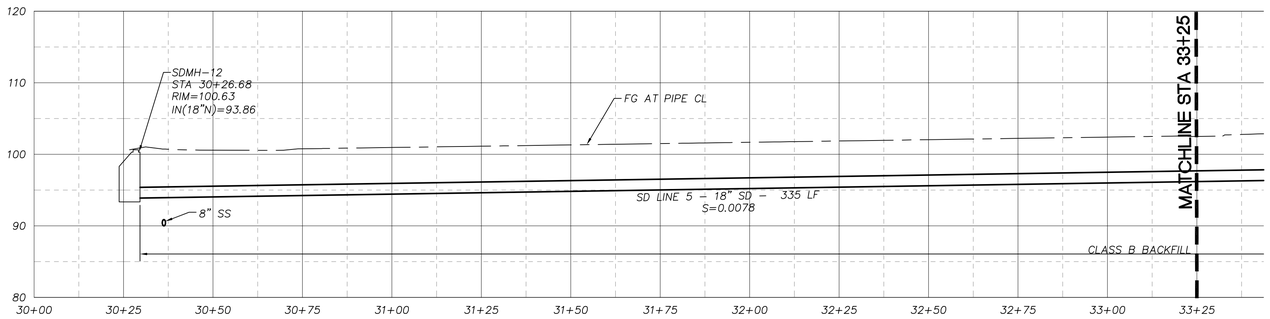
Job No:	20064
Date:	10/23/2020
Drawn By:	-
Checked By:	-
Sheet No:	

MP3.30



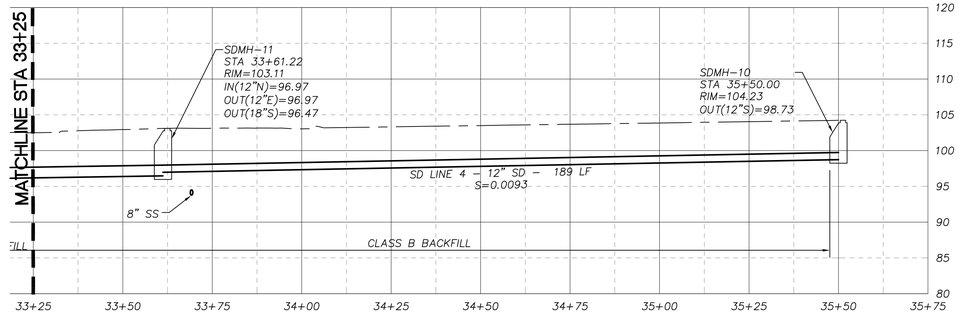
SE 29TH ST STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



SE 29TH AVE STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



SE 29TH AVE STORM SEWER PROFILE

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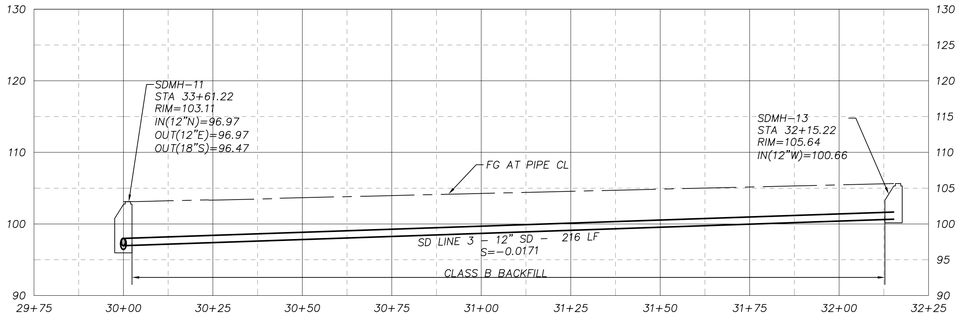

SE HILLSIDE CT STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'

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STORM SEWER PROFILE

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Checked By:	-
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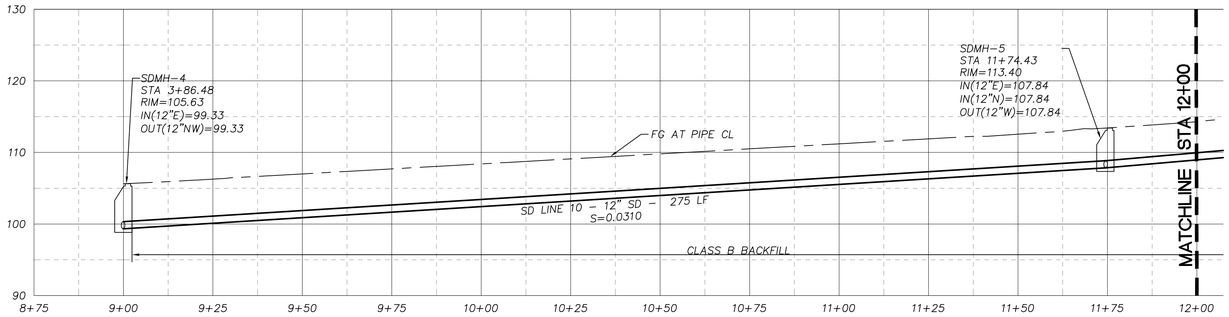
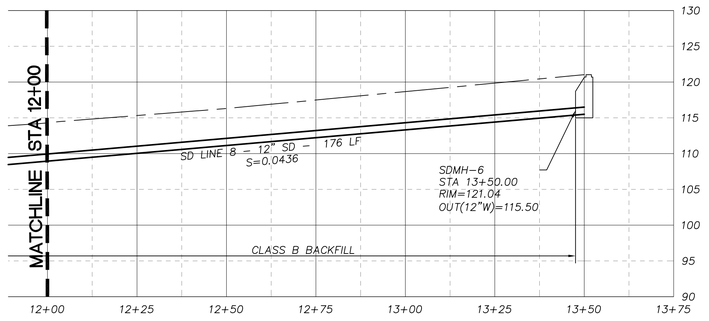


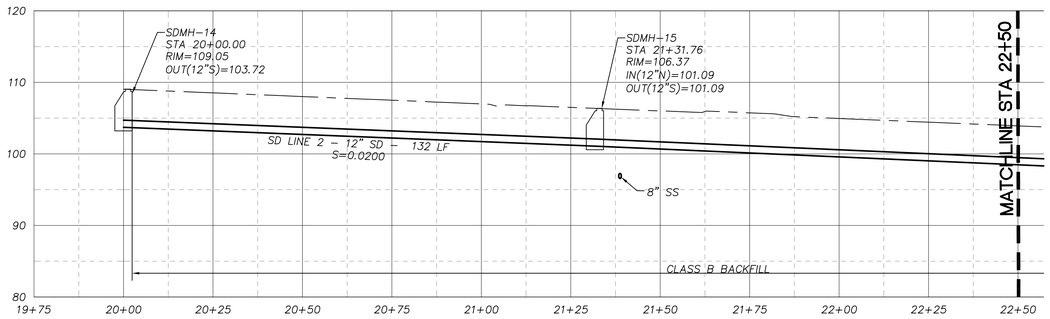
SE DWYER ST STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



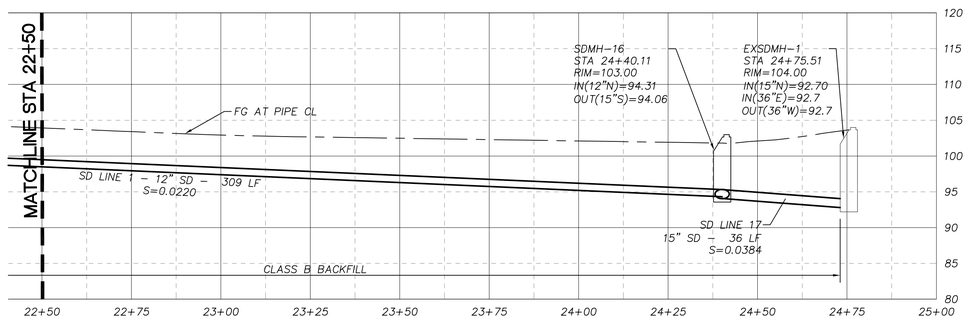
SE DWYER ST STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



SE 31ST AVE STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



SE 31ST AVE STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'

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STORM SEWER PROFILE

Job No:	20064
Date:	10/23/2020
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Checked By:	-

Sheet No:

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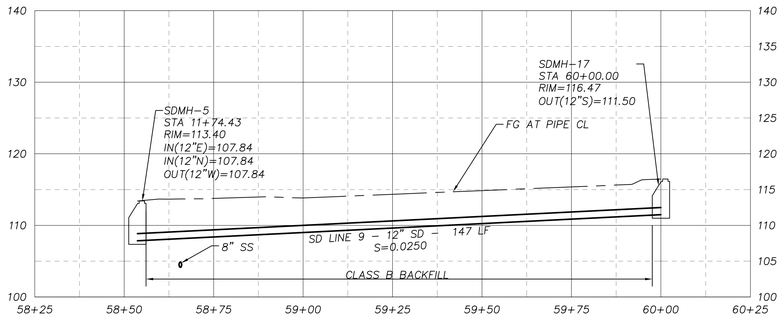
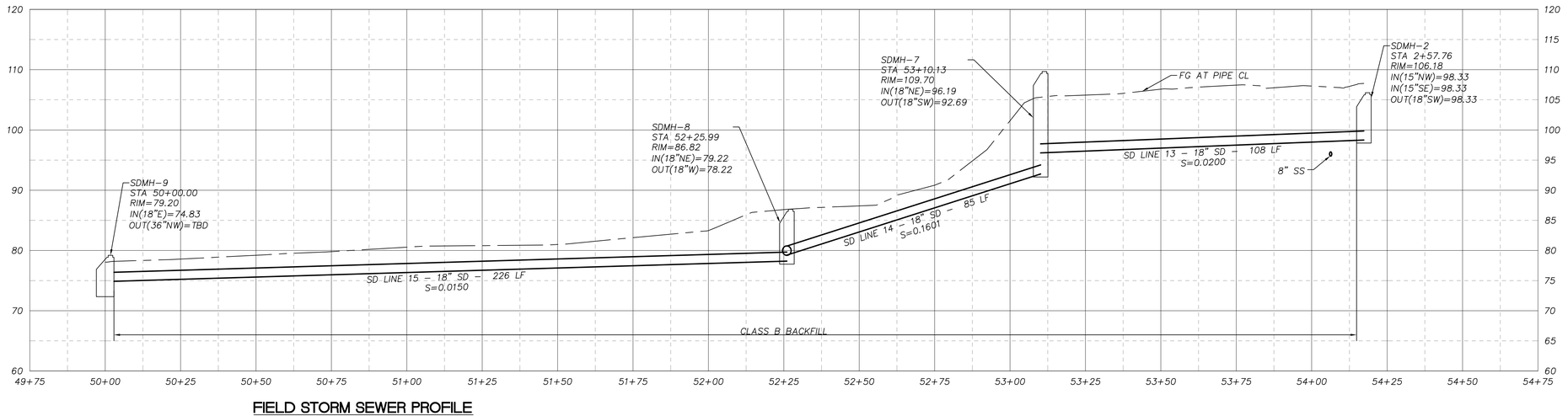


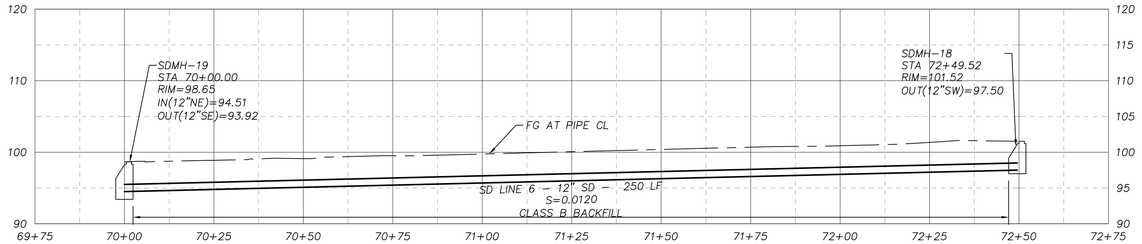
SE 31ST AVE STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



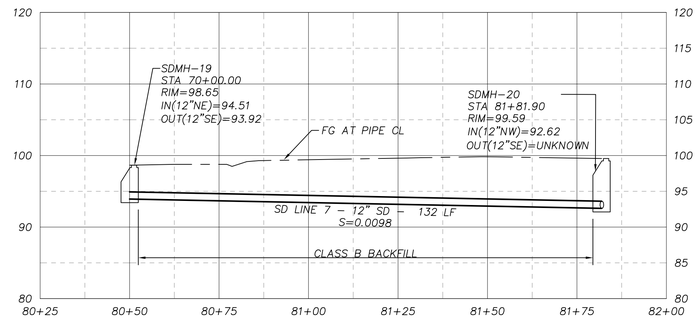
FIELD STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



HILLSIDE CT STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'



28TH AVE STORM SEWER PROFILE

SCALE: H: 1"=20'
V: 1"=10'

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STORM SEWER PROFILE

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Date:	10/23/2020
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Checked By:	-

Sheet No:

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EXHIBIT "F"

Summary for Subcatchment 1: Typical Greenstreet Basin

Runoff = 0.10 cfs @ 7.90 hrs, Volume= 1,357 cf, Depth= 2.17"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=2.40"

	Area (sf)	CN	Description
*	7,500	98	
	7,500		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1: Typical Greenstreet Basin

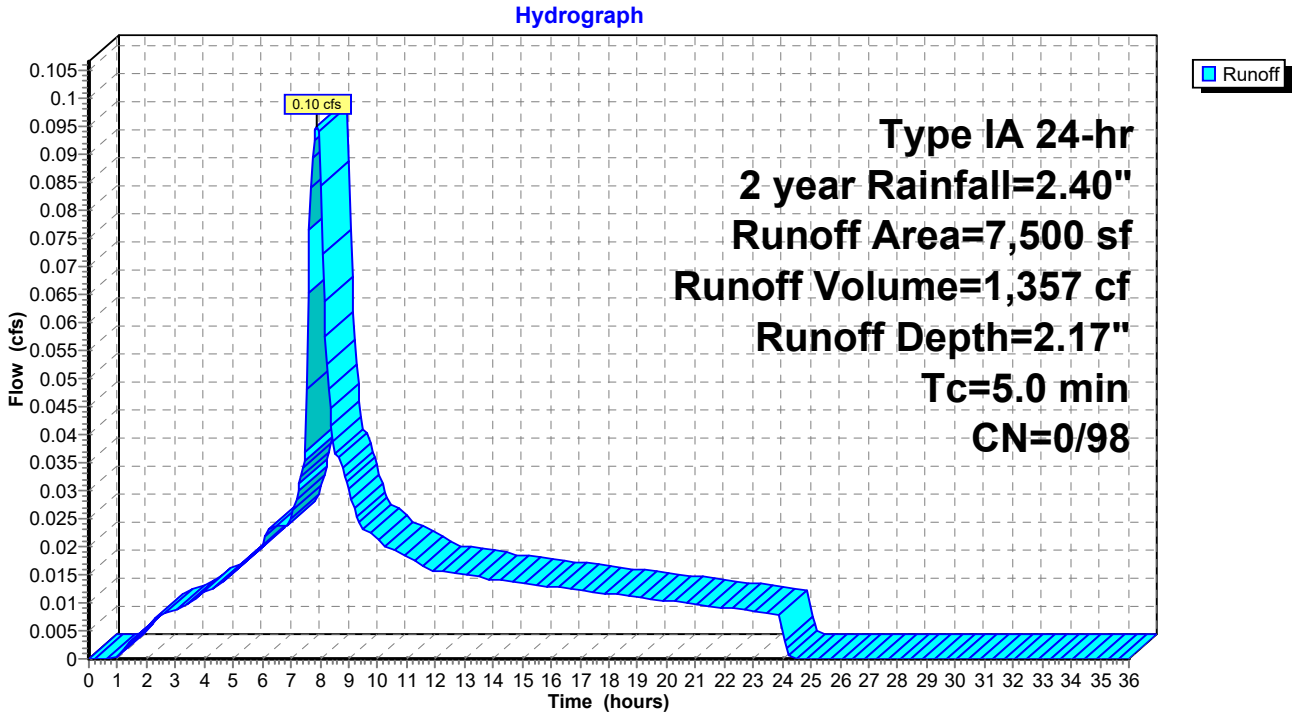


EXHIBIT "F"

Summary for Pond 2P: Typical Greenstreet Planter

Inflow Area = 7,500 sf,100.00% Impervious, Inflow Depth = 2.17" for 2 year event
Inflow = 0.10 cfs @ 7.90 hrs, Volume= 1,357 cf
Outflow = 0.03 cfs @ 7.20 hrs, Volume= 1,357 cf, Atten= 71%, Lag= 0.0 min
Discarded = 0.03 cfs @ 7.20 hrs, Volume= 1,357 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 100.28' @ 9.11 hrs Surf.Area= 600 sf Storage= 170 cf

Plug-Flow detention time= 31.9 min calculated for 1,357 cf (100% of inflow)
Center-of-Mass det. time= 31.9 min (707.0 - 675.2)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	600 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	600	0	0
101.00	600	600	600

7,500 sf basin with 600 sf planter. 600/7500= 8%

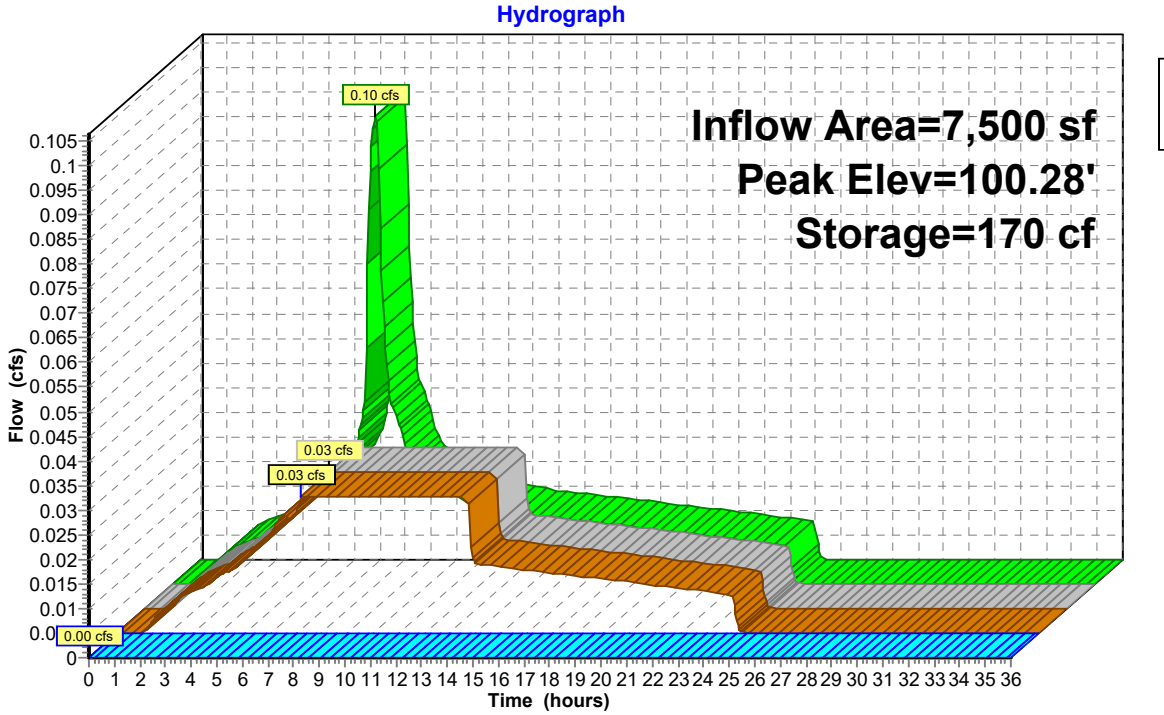
Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	100.50'	**12.0" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 7.20 hrs HW=100.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=100.00' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

EXHIBIT "F"

Pond 2P: Typical Greenstreet Planter



Primary = overflow 6" above soil media

Per HUD funding requirements to meet NOAA/NEPA requirements, a storm water facility must treat 1/2 the volume of the 2 year storm. The PDX SWMM 2020 sizing of 8% was tested to confirm it would meet HUD criteria and passed. 100% of the water from the 2-year storm was filtered through the BES media.

These calculations verify use of public greenstreets and private planters to meet City of Milwaukie and HUD Criteria.

EXHIBIT "G"

Summary for Subcatchment 1 B Pre: B Predevleloped

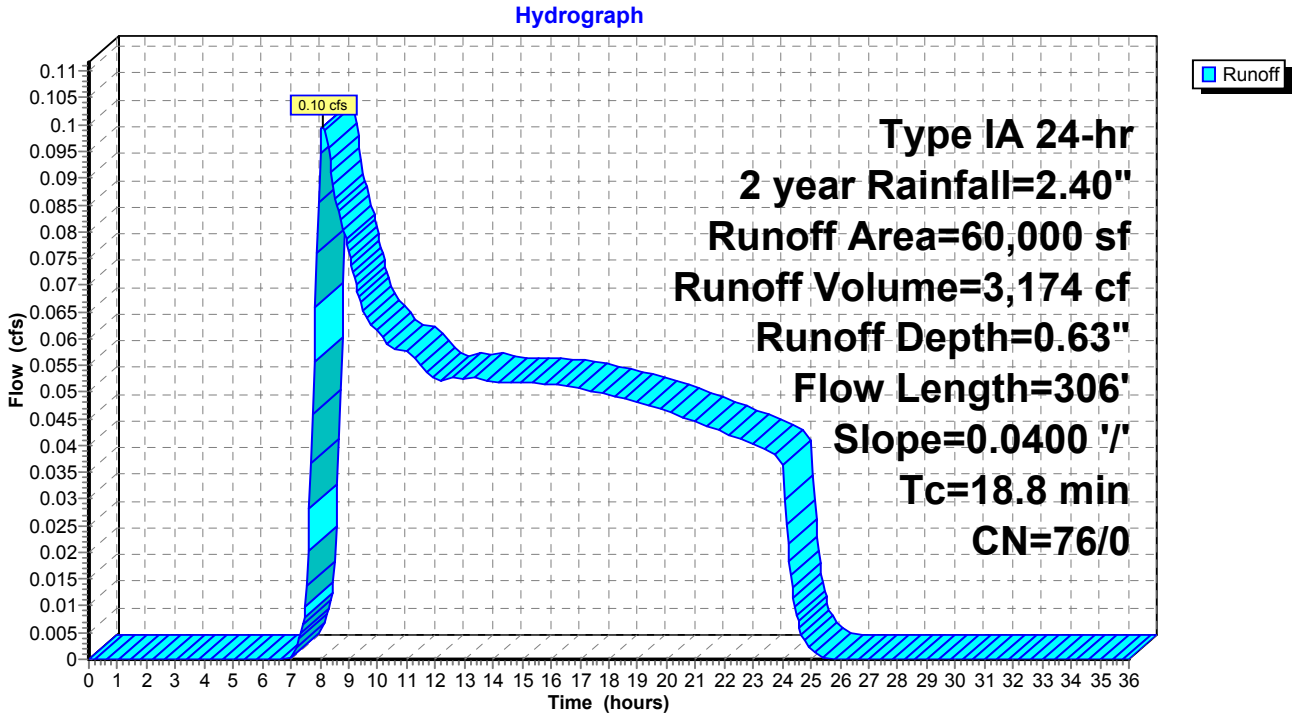
Runoff = 0.10 cfs @ 8.11 hrs, Volume= 3,174 cf, Depth= 0.63"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=2.40"

Area (sf)	CN	Description
60,000	76	Woods/grass comb., Fair, HSG C
60,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	75	0.0400	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.40"
3.8	231	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.8	306	Total			

Subcatchment 1 B Pre: B Predevleloped



Summary for Subcatchment 2 B Post: Post Developed

[49] Hint: Tc<2dt may require smaller dt

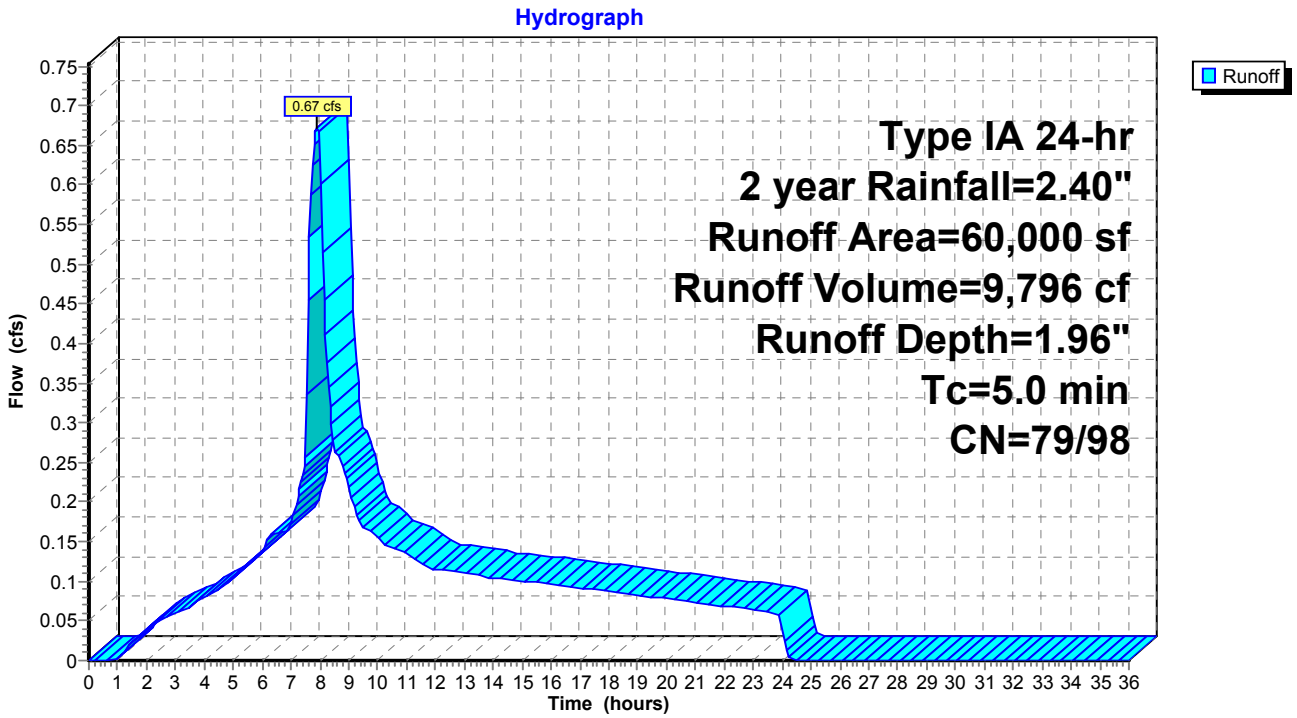
Runoff = 0.67 cfs @ 7.91 hrs, Volume= 9,796 cf, Depth= 1.96"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 year Rainfall=2.40"

	Area (sf)	CN	Description
*	50,912	98	Paved parking & roofs
	9,088	79	50-75% Grass cover, Fair, HSG C
	60,000	95	Weighted Average
	9,088		15.15% Pervious Area
	50,912		84.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2 B Post: Post Developed



Summary for Pond 3 B1: B Det Pipe

Inflow Area = 60,000 sf, 84.85% Impervious, Inflow Depth = 1.96" for 2 year event
Inflow = 0.67 cfs @ 7.91 hrs, Volume= 9,796 cf
Outflow = 0.09 cfs @ 16.38 hrs, Volume= 9,277 cf, Atten= 86%, Lag= 508.4 min
Primary = 0.09 cfs @ 16.38 hrs, Volume= 9,277 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 102.39' @ 16.38 hrs Surf.Area= 1,961 sf Storage= 3,919 cf

Plug-Flow detention time= 505.7 min calculated for 9,277 cf (95% of inflow)
Center-of-Mass det. time= 467.0 min (1,153.5 - 686.5)

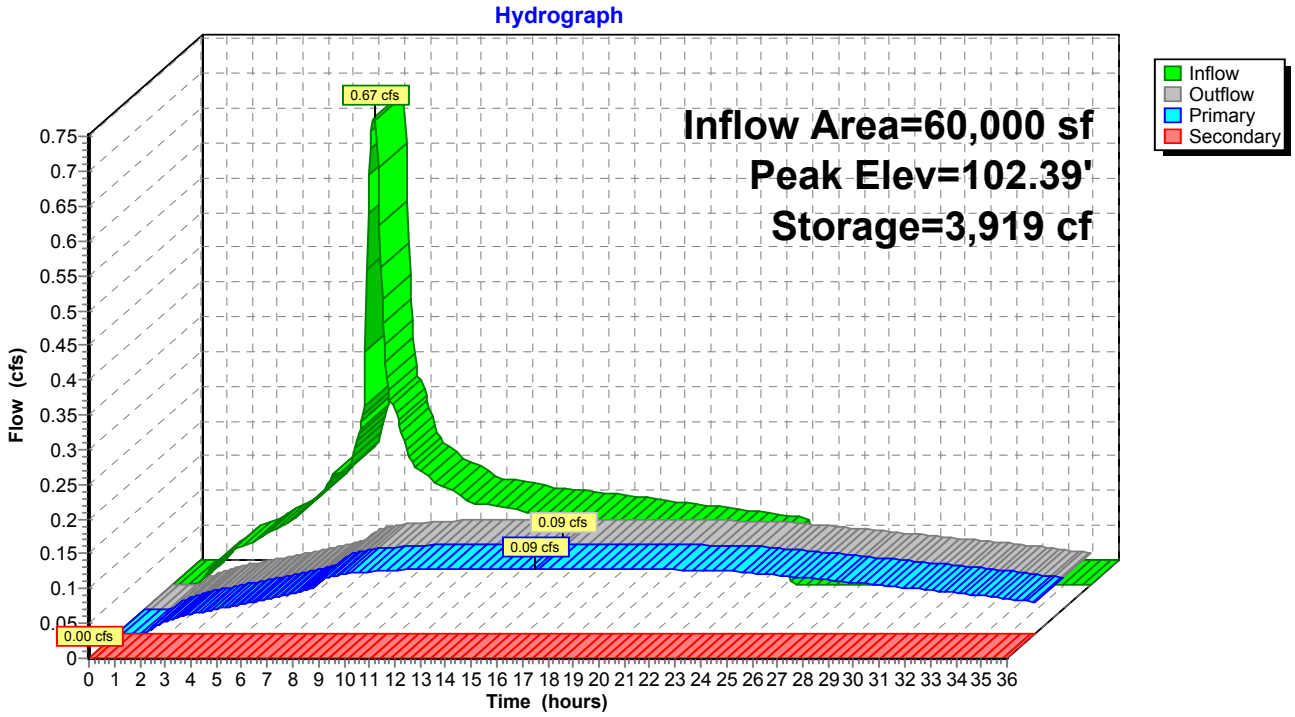
Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	6,283 cf	**48.0" Round CMP_Round 48"** x 5 L= 100.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**1.5" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads
#2	Primary	102.75'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	103.75'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.09 cfs @ 16.38 hrs HW=102.39' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.09 cfs @ 7.69 fps)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=100.00' (Free Discharge)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3 B1: B Det Pipe



Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1 B Pre: B Predevleloped Runoff Area=60,000 sf 0.00% Impervious Runoff Depth=0.95"
Flow Length=306' Slope=0.0400 '/' Tc=18.8 min CN=76/0 Runoff=0.19 cfs 4,741 cf

Subcatchment2 B Post: Post Developed Runoff Area=60,000 sf 84.85% Impervious Runoff Depth=2.43"
Tc=5.0 min CN=79/98 Runoff=0.83 cfs 12,167 cf

Pond 3 B1: B Det Pipe Peak Elev=102.91' Storage=4,904 cf Inflow=0.83 cfs 12,167 cf
Primary=0.13 cfs 11,124 cf Secondary=0.00 cfs 0 cf Outflow=0.13 cfs 11,124 cf

Total Runoff Area = 120,000 sf Runoff Volume = 16,909 cf Average Runoff Depth = 1.69"
57.57% Pervious = 69,088 sf 42.43% Impervious = 50,912 sf

Summary for Subcatchment 1 B Pre: B Predevleloped

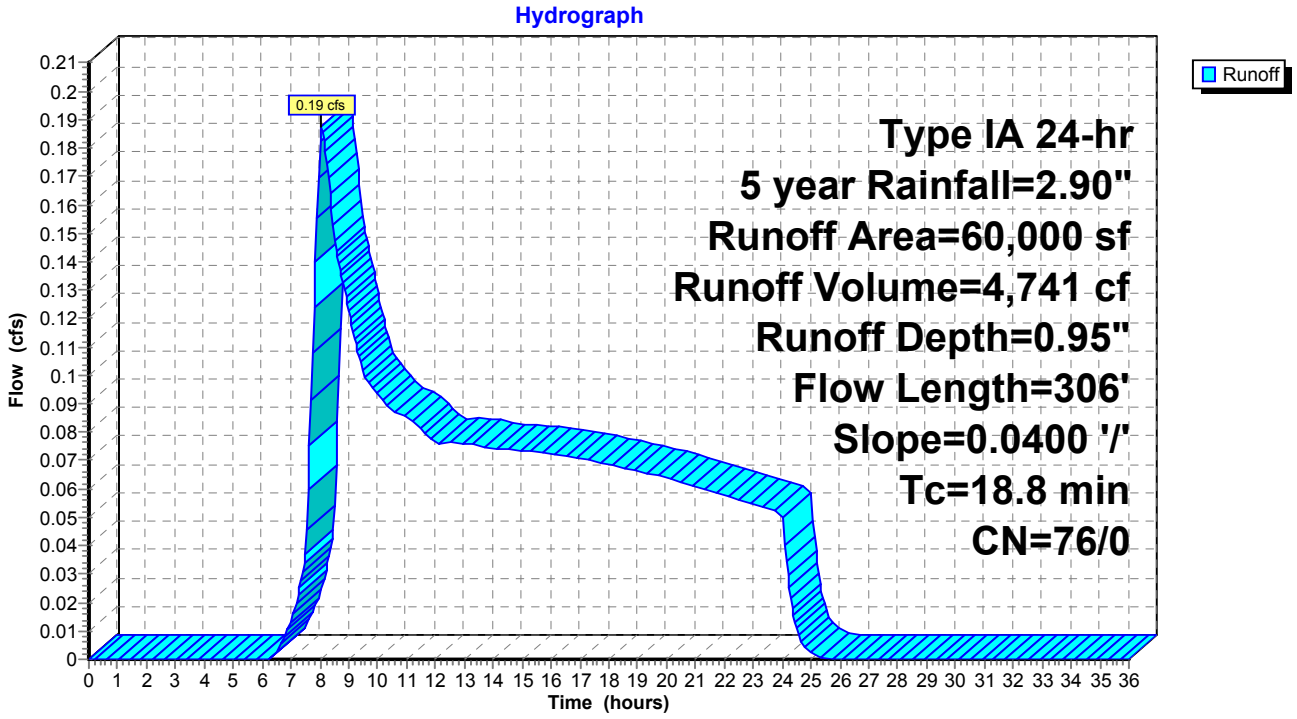
Runoff = 0.19 cfs @ 8.06 hrs, Volume= 4,741 cf, Depth= 0.95"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5 year Rainfall=2.90"

Area (sf)	CN	Description
60,000	76	Woods/grass comb., Fair, HSG C
60,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	75	0.0400	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.40"
3.8	231	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.8	306	Total			

Subcatchment 1 B Pre: B Predevleloped



Summary for Subcatchment 2 B Post: Post Developed

[49] Hint: Tc<2dt may require smaller dt

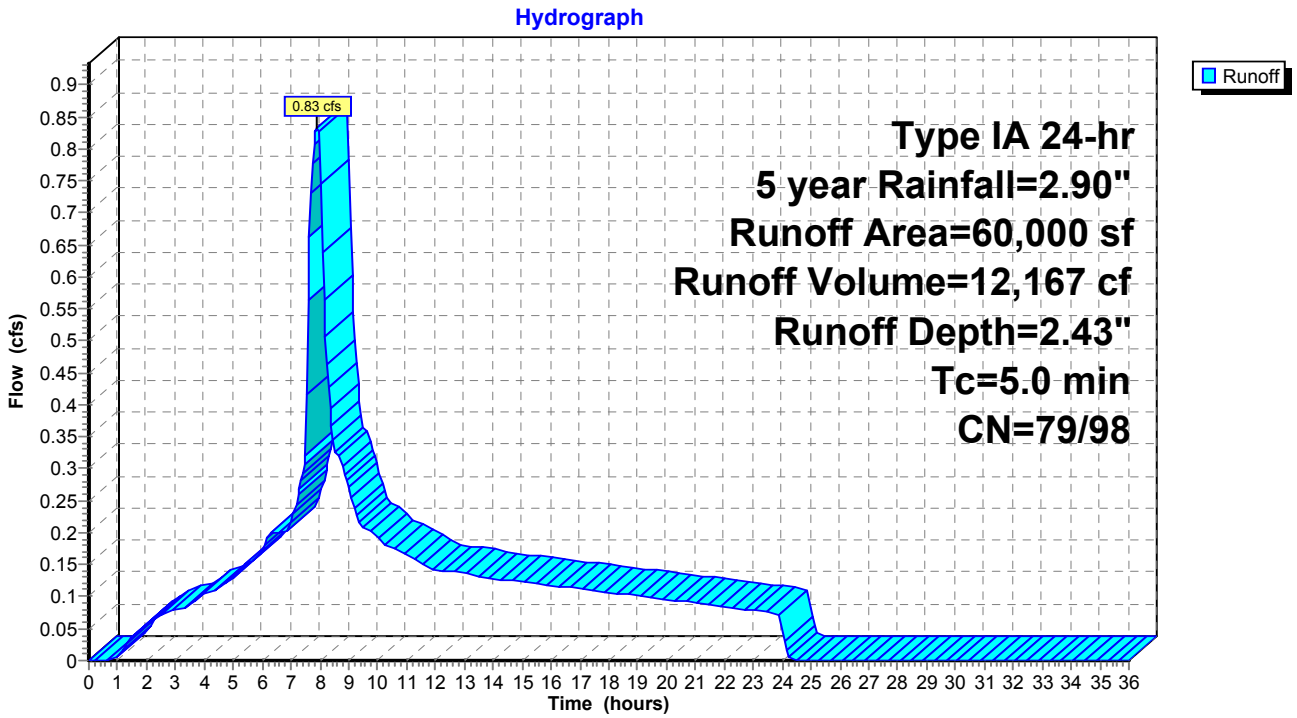
Runoff = 0.83 cfs @ 7.91 hrs, Volume= 12,167 cf, Depth= 2.43"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type IA 24-hr 5 year Rainfall=2.90"

	Area (sf)	CN	Description
*	50,912	98	Paved parking & roofs
	9,088	79	50-75% Grass cover, Fair, HSG C
	60,000	95	Weighted Average
	9,088		15.15% Pervious Area
	50,912		84.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2 B Post: Post Developed



Summary for Pond 3 B1: B Det Pipe

Inflow Area = 60,000 sf, 84.85% Impervious, Inflow Depth = 2.43" for 5 year event
Inflow = 0.83 cfs @ 7.91 hrs, Volume= 12,167 cf
Outflow = 0.13 cfs @ 13.40 hrs, Volume= 11,124 cf, Atten= 84%, Lag= 329.7 min
Primary = 0.13 cfs @ 13.40 hrs, Volume= 11,124 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 102.91' @ 13.40 hrs Surf.Area= 1,779 sf Storage= 4,904 cf

Plug-Flow detention time= 521.4 min calculated for 11,124 cf (91% of inflow)
Center-of-Mass det. time= 459.9 min (1,141.0 - 681.1)

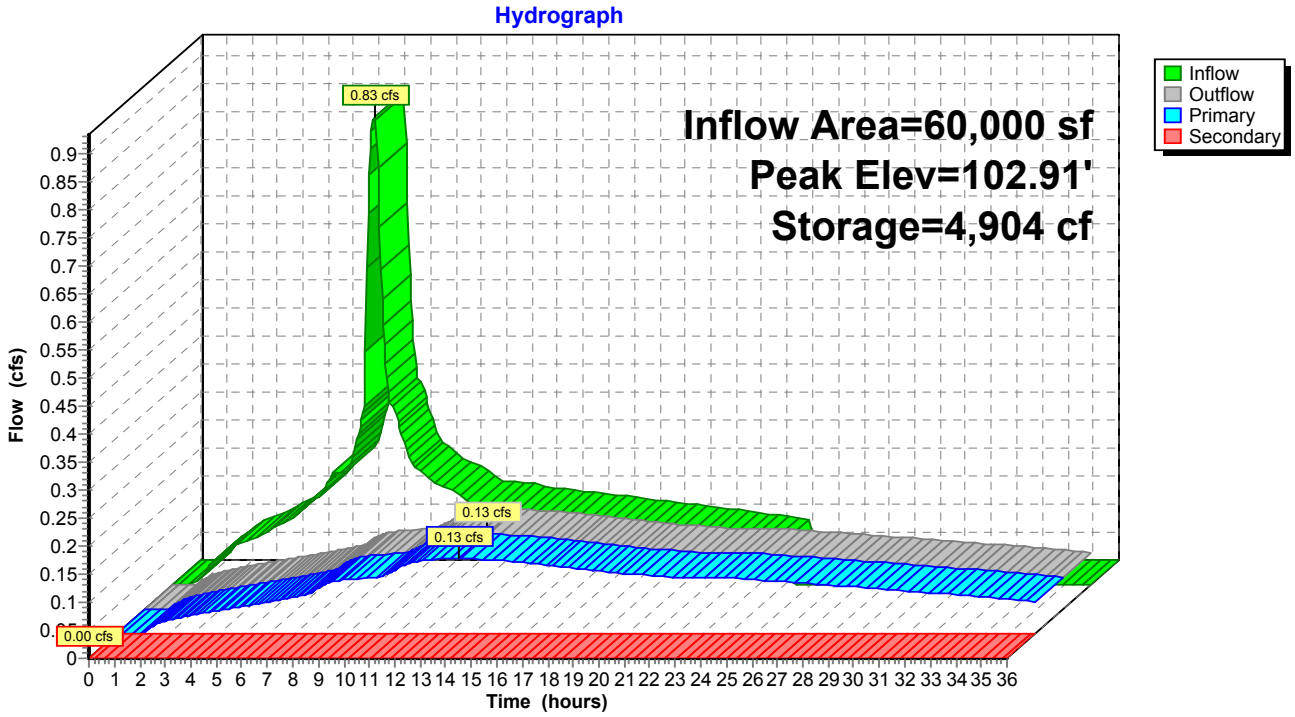
Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	6,283 cf	**48.0" Round CMP_Round 48"** x 5 L= 100.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**1.5" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads
#2	Primary	102.75'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	103.75'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.13 cfs @ 13.40 hrs HW=102.91' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.10 cfs @ 8.49 fps)
└**2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 1.38 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=100.00' (Free Discharge)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3 B1: B Det Pipe



Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1 B Pre: B Predevleloped Runoff Area=60,000 sf 0.00% Impervious Runoff Depth=1.29"
Flow Length=306' Slope=0.0400 '/' Tc=18.8 min CN=76/0 Runoff=0.29 cfs 6,466 cf

Subcatchment2 B Post: Post Developed Runoff Area=60,000 sf 84.85% Impervious Runoff Depth=2.91"
Tc=5.0 min CN=79/98 Runoff=1.00 cfs 14,563 cf

Pond 3 B1: B Det Pipe Peak Elev=103.29' Storage=5,529 cf Inflow=1.00 cfs 14,563 cf
Primary=0.18 cfs 13,394 cf Secondary=0.00 cfs 0 cf Outflow=0.18 cfs 13,394 cf

Total Runoff Area = 120,000 sf Runoff Volume = 21,029 cf Average Runoff Depth = 2.10"
57.57% Pervious = 69,088 sf 42.43% Impervious = 50,912 sf

Summary for Subcatchment 1 B Pre: B Predevleloped

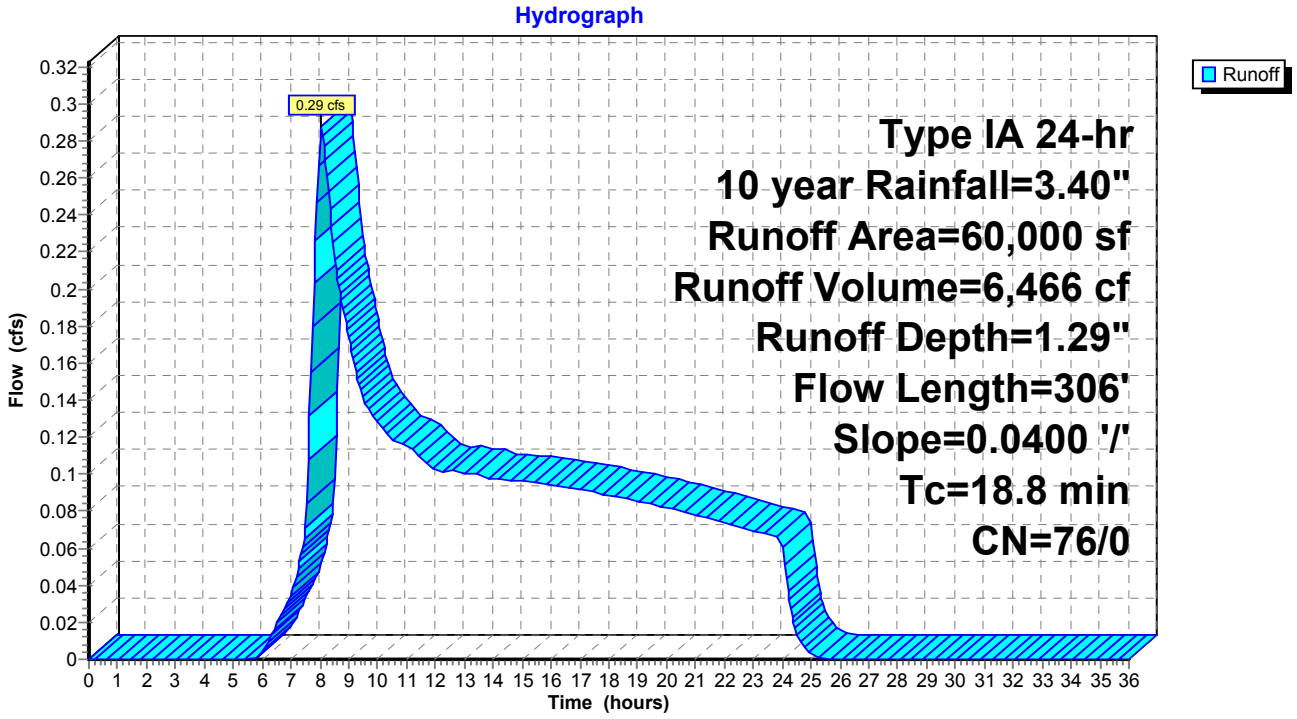
Runoff = 0.29 cfs @ 8.05 hrs, Volume= 6,466 cf, Depth= 1.29"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=3.40"

Area (sf)	CN	Description
60,000	76	Woods/grass comb., Fair, HSG C
60,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	75	0.0400	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.40"
3.8	231	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.8	306	Total			

Subcatchment 1 B Pre: B Predevleloped



Summary for Subcatchment 2 B Post: Post Developed

[49] Hint: Tc<2dt may require smaller dt

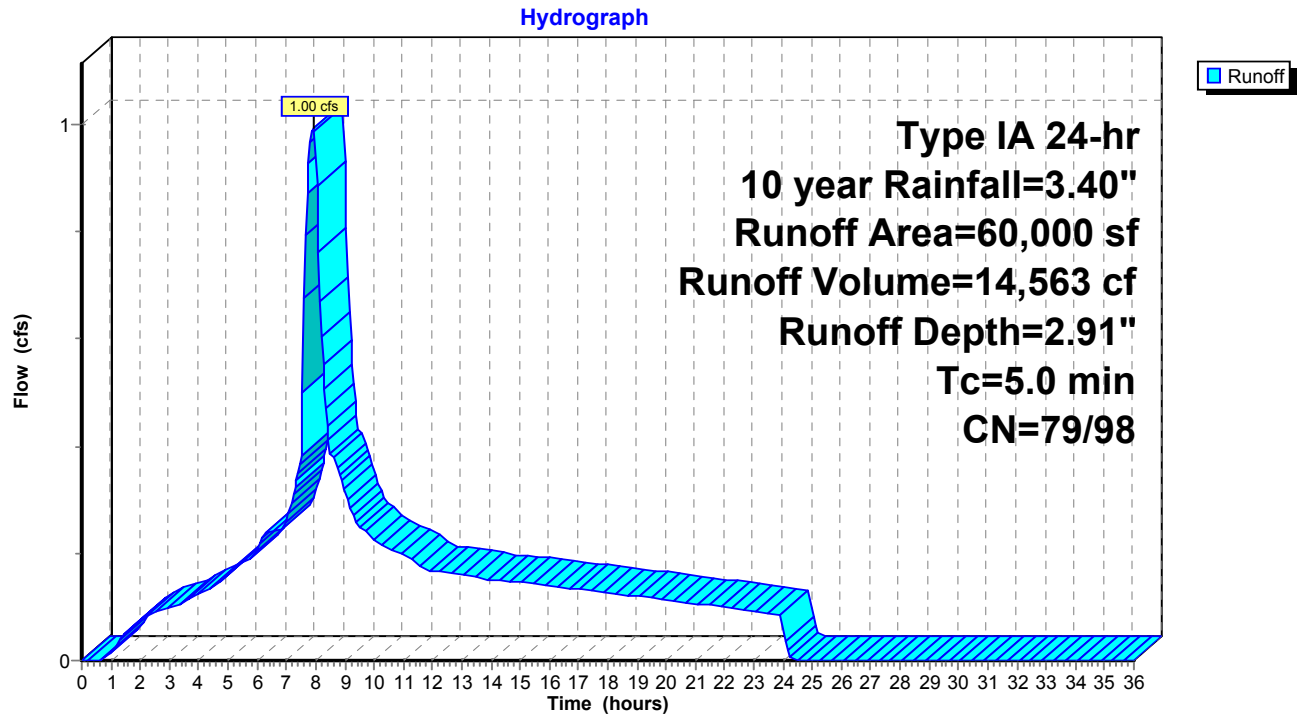
Runoff = 1.00 cfs @ 7.91 hrs, Volume= 14,563 cf, Depth= 2.91"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 year Rainfall=3.40"

	Area (sf)	CN	Description
*	50,912	98	Paved parking & roofs
	9,088	79	50-75% Grass cover, Fair, HSG C
	60,000	95	Weighted Average
	9,088		15.15% Pervious Area
	50,912		84.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2 B Post: Post Developed



Summary for Pond 3 B1: B Det Pipe

Inflow Area = 60,000 sf, 84.85% Impervious, Inflow Depth = 2.91" for 10 year event
Inflow = 1.00 cfs @ 7.91 hrs, Volume= 14,563 cf
Outflow = 0.18 cfs @ 11.47 hrs, Volume= 13,394 cf, Atten= 82%, Lag= 213.7 min
Primary = 0.18 cfs @ 11.47 hrs, Volume= 13,394 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 103.29' @ 11.47 hrs Surf.Area= 1,529 sf Storage= 5,529 cf

Plug-Flow detention time= 474.5 min calculated for 13,394 cf (92% of inflow)
Center-of-Mass det. time= 416.4 min (1,093.4 - 677.0)

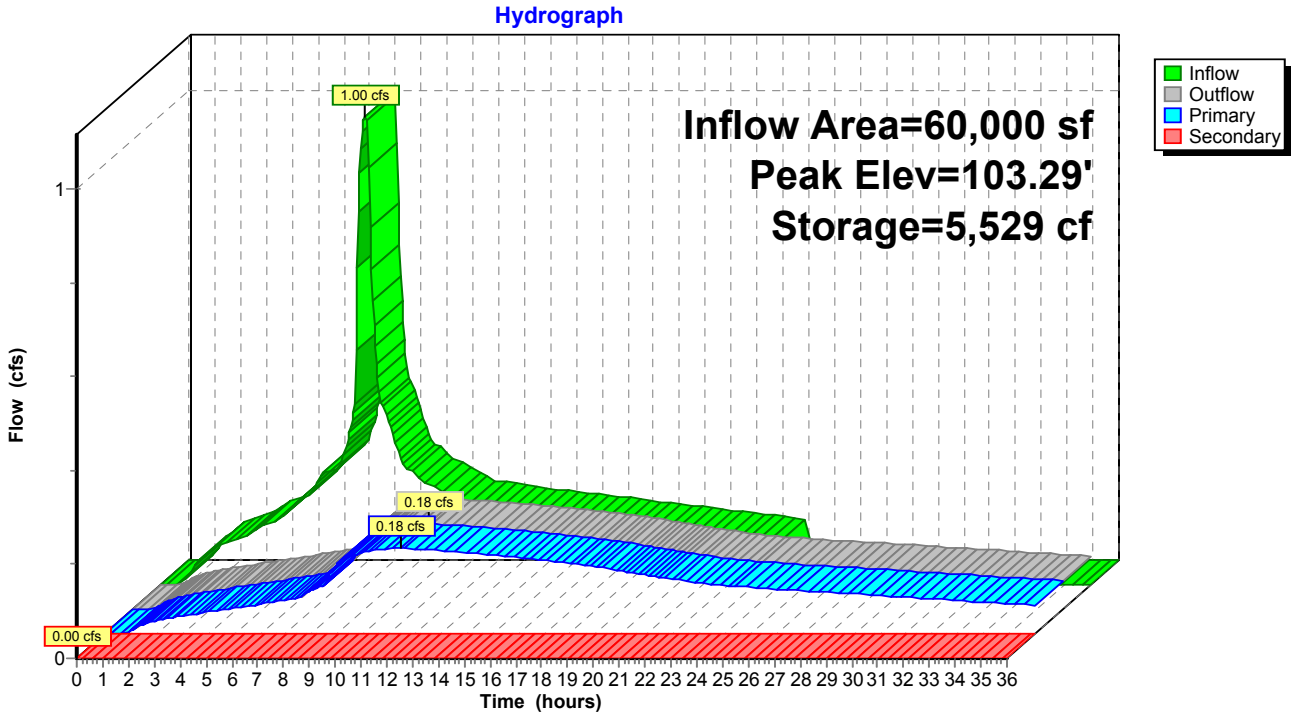
Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	6,283 cf	**48.0" Round CMP_Round 48"** x 5 L= 100.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**1.5" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads
#2	Primary	102.75'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	103.75'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.18 cfs @ 11.47 hrs HW=103.29' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.11 cfs @ 9.02 fps)
└**2=Orifice/Grate** (Orifice Controls 0.07 cfs @ 3.25 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=100.00' (Free Discharge)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3 B1: B Det Pipe



Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1 B Pre: B Predevleloped Runoff Area=60,000 sf 0.00% Impervious Runoff Depth=1.66"
Flow Length=306' Slope=0.0400 '/' Tc=18.8 min CN=76/0 Runoff=0.40 cfs 8,312 cf

Subcatchment2 B Post: Post Developed Runoff Area=60,000 sf 84.85% Impervious Runoff Depth=3.40"
Tc=5.0 min CN=79/98 Runoff=1.16 cfs 16,977 cf

Pond 3 B1: B Det Pipe Peak Elev=103.78' Storage=6,145 cf Inflow=1.16 cfs 16,977 cf
Primary=0.22 cfs 15,544 cf Secondary=0.05 cfs 175 cf Outflow=0.27 cfs 15,719 cf

Total Runoff Area = 120,000 sf Runoff Volume = 25,288 cf Average Runoff Depth = 2.53"
57.57% Pervious = 69,088 sf 42.43% Impervious = 50,912 sf

Summary for Subcatchment 1 B Pre: B Predevleloped

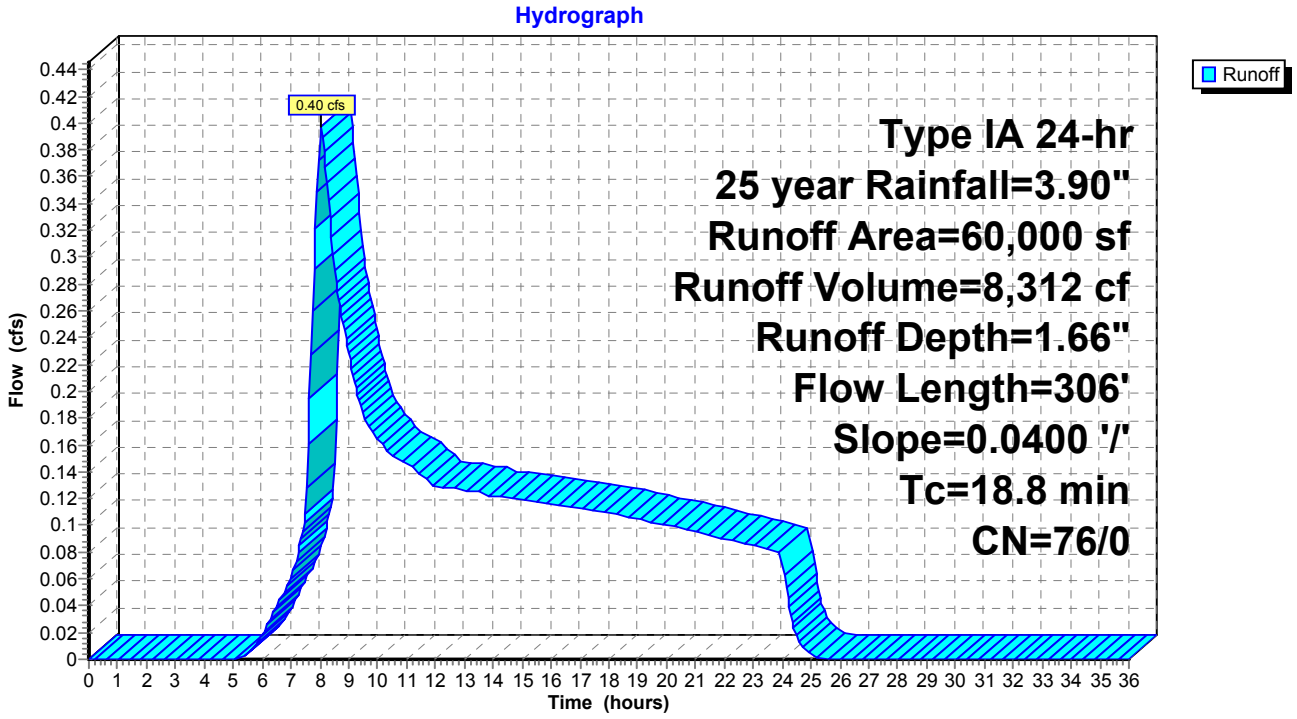
Runoff = 0.40 cfs @ 8.04 hrs, Volume= 8,312 cf, Depth= 1.66"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25 year Rainfall=3.90"

Area (sf)	CN	Description
60,000	76	Woods/grass comb., Fair, HSG C
60,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	75	0.0400	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.40"
3.8	231	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.8	306	Total			

Subcatchment 1 B Pre: B Predevleloped



Summary for Subcatchment 2 B Post: Post Developed

[49] Hint: Tc<2dt may require smaller dt

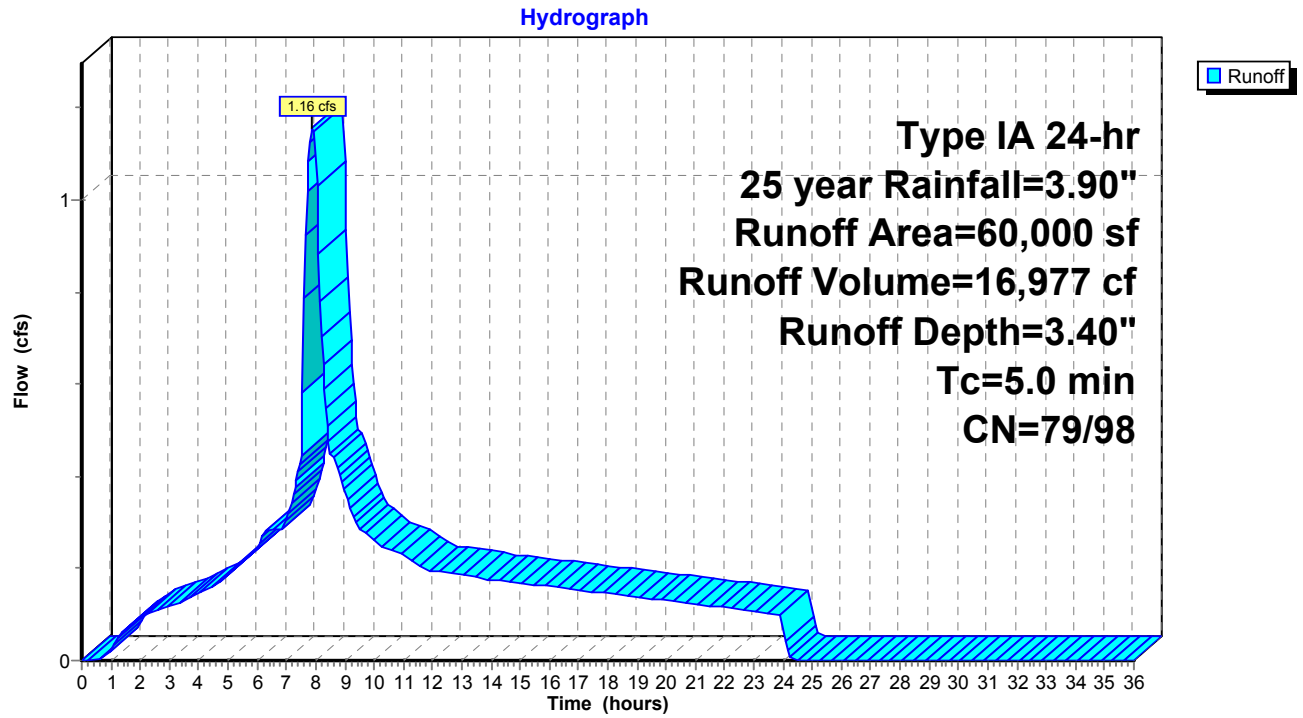
Runoff = 1.16 cfs @ 7.90 hrs, Volume= 16,977 cf, Depth= 3.40"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25 year Rainfall=3.90"

	Area (sf)	CN	Description
*	50,912	98	Paved parking & roofs
	9,088	79	50-75% Grass cover, Fair, HSG C
	60,000	95	Weighted Average
	9,088		15.15% Pervious Area
	50,912		84.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2 B Post: Post Developed



Summary for Pond 3 B1: B Det Pipe

Inflow Area = 60,000 sf, 84.85% Impervious, Inflow Depth = 3.40" for 25 year event
Inflow = 1.16 cfs @ 7.90 hrs, Volume= 16,977 cf
Outflow = 0.27 cfs @ 9.85 hrs, Volume= 15,719 cf, Atten= 76%, Lag= 116.6 min
Primary = 0.22 cfs @ 9.85 hrs, Volume= 15,544 cf
Secondary = 0.05 cfs @ 9.85 hrs, Volume= 175 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 103.78' @ 9.85 hrs Surf.Area= 918 sf Storage= 6,145 cf

Plug-Flow detention time= 441.0 min calculated for 15,719 cf (93% of inflow)
Center-of-Mass det. time= 387.0 min (1,060.6 - 673.6)

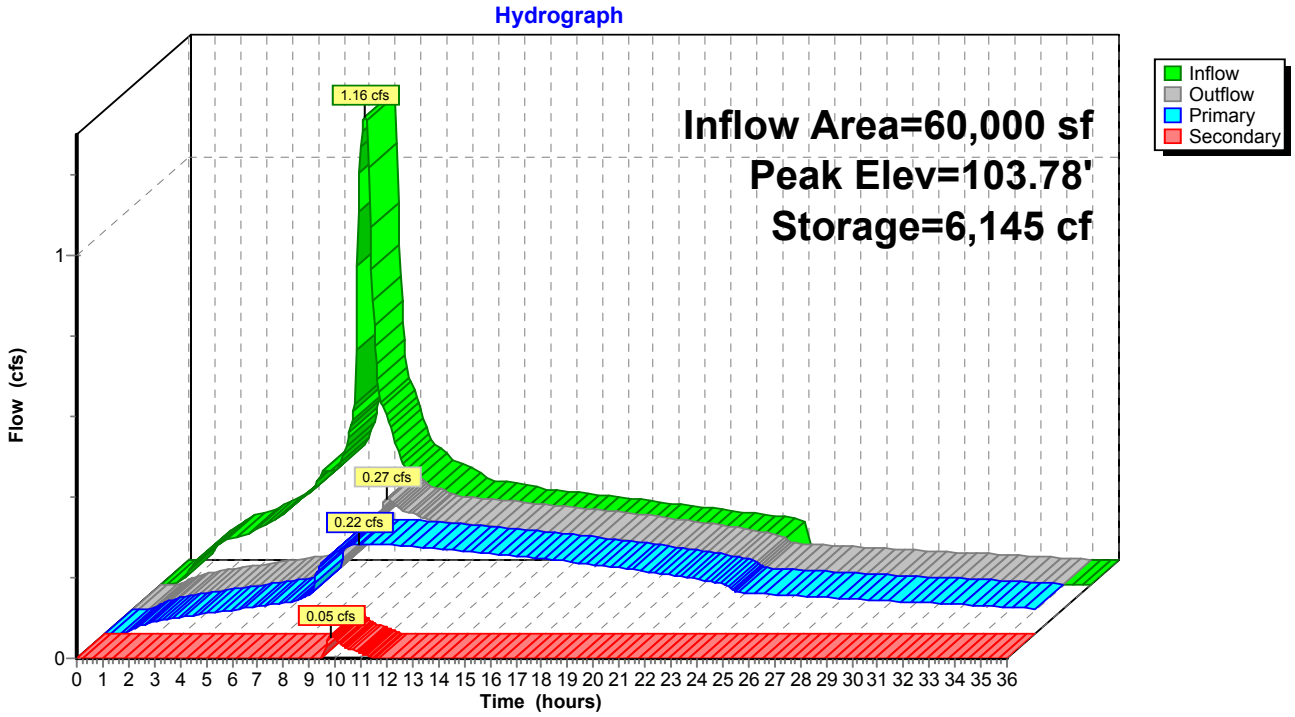
Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	6,283 cf	**48.0" Round CMP_Round 48"** x 5 L= 100.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**1.5" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads
#2	Primary	102.75'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	103.75'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.22 cfs @ 9.85 hrs HW=103.78' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.12 cfs @ 9.67 fps)
└**2=Orifice/Grate** (Orifice Controls 0.10 cfs @ 4.68 fps)

Secondary OutFlow Max=0.04 cfs @ 9.85 hrs HW=103.78' (Free Discharge)
└**3=Orifice/Grate** (Weir Controls 0.04 cfs @ 0.53 fps)

Pond 3 B1: B Det Pipe



Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1 B Pre: B Predevleloped Runoff Area=60,000 sf 0.00% Impervious Runoff Depth=2.05"
Flow Length=306' Slope=0.0400 '/' Tc=18.8 min CN=76/0 Runoff=0.52 cfs 10,251 cf

Subcatchment2 B Post: Post Developed Runoff Area=60,000 sf 84.85% Impervious Runoff Depth=3.88"
Tc=5.0 min CN=79/98 Runoff=1.32 cfs 19,404 cf

Pond 3 B1: B Det Pipe Peak Elev=103.85' Storage=6,206 cf Inflow=1.32 cfs 19,404 cf
Primary=0.23 cfs 16,662 cf Secondary=0.33 cfs 1,389 cf Outflow=0.55 cfs 18,051 cf

Total Runoff Area = 120,000 sf Runoff Volume = 29,655 cf Average Runoff Depth = 2.97"
57.57% Pervious = 69,088 sf 42.43% Impervious = 50,912 sf

Summary for Subcatchment 1 B Pre: B Predevleloped

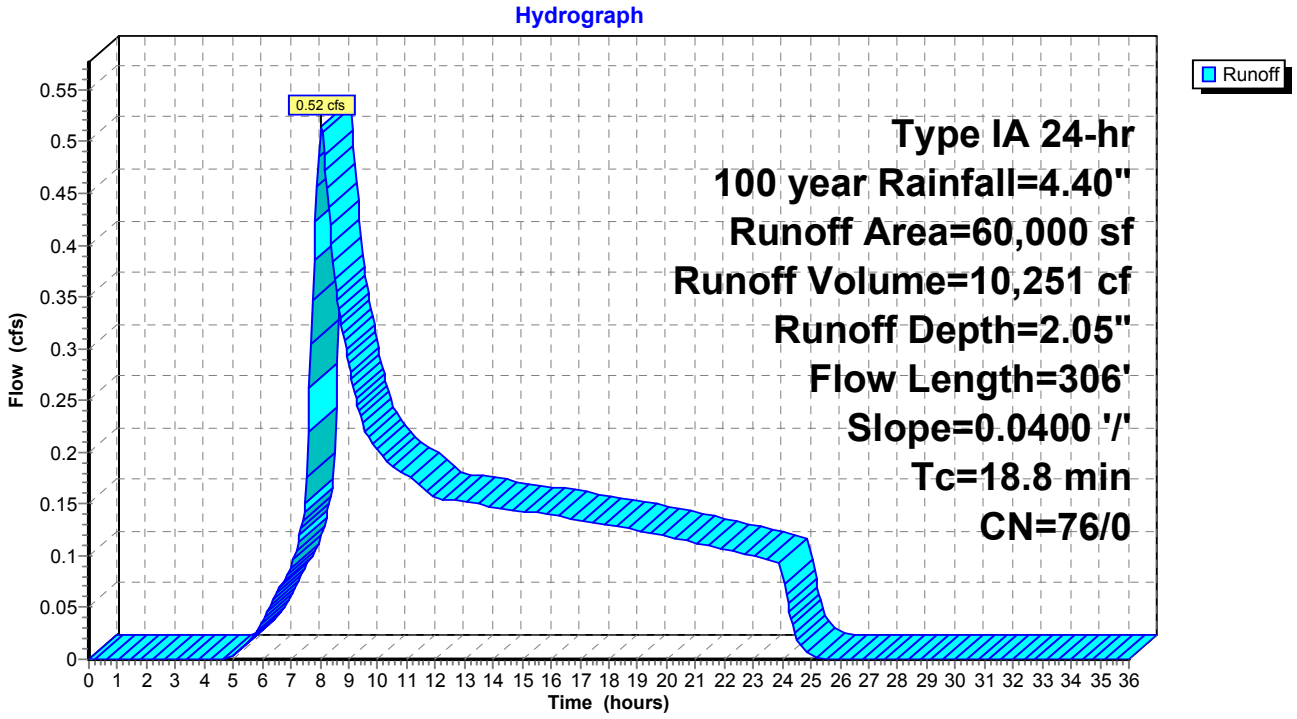
Runoff = 0.52 cfs @ 8.04 hrs, Volume= 10,251 cf, Depth= 2.05"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=4.40"

Area (sf)	CN	Description
60,000	76	Woods/grass comb., Fair, HSG C
60,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	75	0.0400	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.40"
3.8	231	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
18.8	306	Total			

Subcatchment 1 B Pre: B Predevleloped



Summary for Subcatchment 2 B Post: Post Developed

[49] Hint: Tc<2dt may require smaller dt

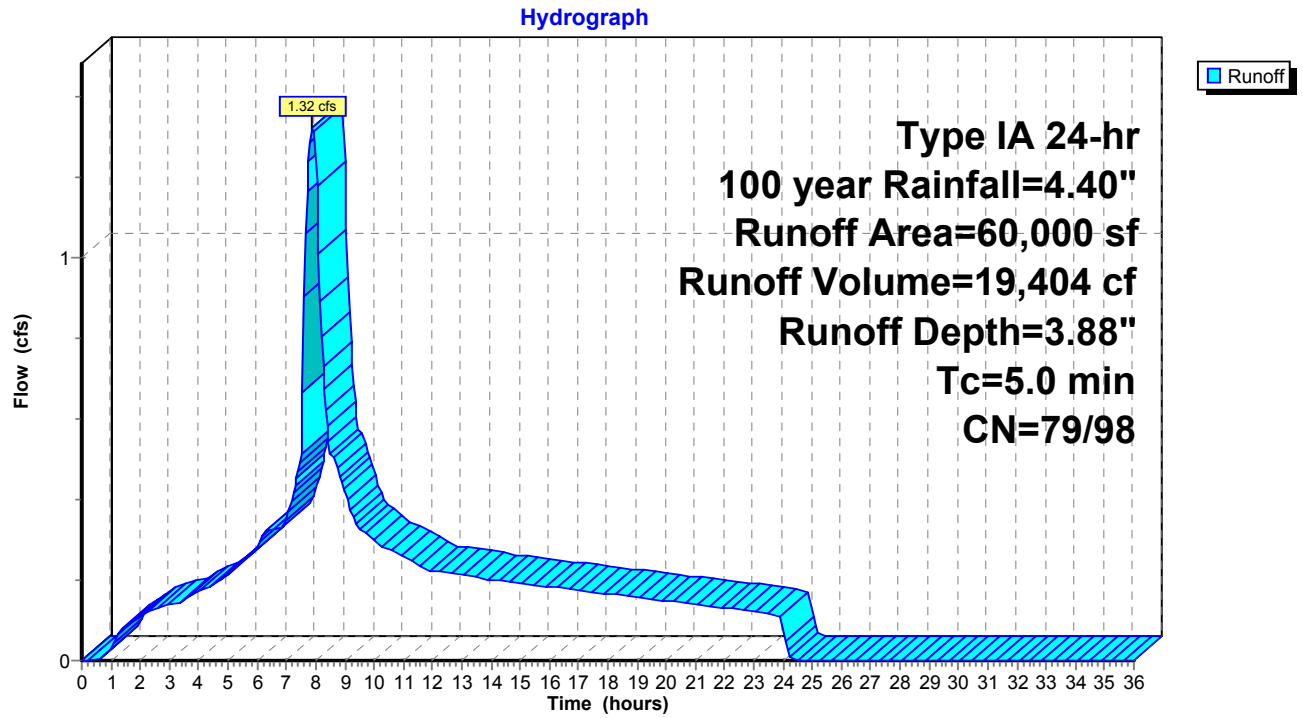
Runoff = 1.32 cfs @ 7.90 hrs, Volume= 19,404 cf, Depth= 3.88"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100 year Rainfall=4.40"

	Area (sf)	CN	Description
*	50,912	98	Paved parking & roofs
	9,088	79	50-75% Grass cover, Fair, HSG C
	60,000	95	Weighted Average
	9,088		15.15% Pervious Area
	50,912		84.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2 B Post: Post Developed



Summary for Pond 3 B1: B Det Pipe

Inflow Area = 60,000 sf, 84.85% Impervious, Inflow Depth = 3.88" for 100 year event
Inflow = 1.32 cfs @ 7.90 hrs, Volume= 19,404 cf
Outflow = 0.55 cfs @ 8.46 hrs, Volume= 18,051 cf, Atten= 58%, Lag= 33.4 min
Primary = 0.23 cfs @ 8.46 hrs, Volume= 16,662 cf
Secondary = 0.33 cfs @ 8.46 hrs, Volume= 1,389 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 103.85' @ 8.46 hrs Surf.Area= 761 sf Storage= 6,206 cf

Plug-Flow detention time= 402.0 min calculated for 18,026 cf (93% of inflow)
Center-of-Mass det. time= 351.6 min (1,022.4 - 670.8)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	6,283 cf	**48.0" Round CMP_Round 48"** x 5 L= 100.0'

Device	Routing	Invert	Outlet Devices
#1	Primary	100.00'	**1.5" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads
#2	Primary	102.75'	**2.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	103.75'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.23 cfs @ 8.46 hrs HW=103.85' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.12 cfs @ 9.76 fps)
└**2=Orifice/Grate** (Orifice Controls 0.11 cfs @ 4.85 fps)

Secondary OutFlow Max=0.32 cfs @ 8.46 hrs HW=103.85' (Free Discharge)
└**3=Orifice/Grate** (Weir Controls 0.32 cfs @ 1.03 fps)

Pond 3 B1: B Det Pipe

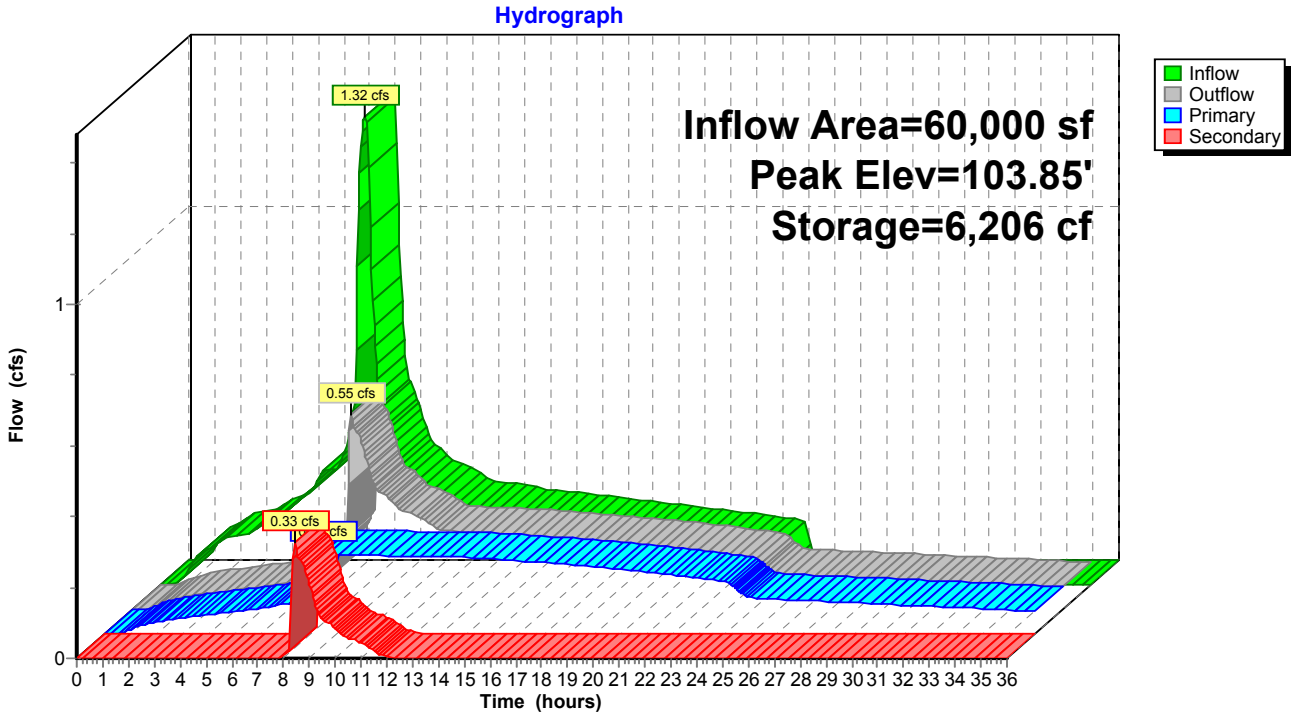


Exhibit H

NOAA Stormwater Requirements

Treat 50% of the 2-year 24 hours storm runoff.

		System Used
2 Year - 24 hour Storm	2.4 in	
18" Contech Treatment Capacity = 0.033 cfs		X
"Low Drop" Contech Treatment Capacity = 0.022 cfs		
12" Kristar Perkfilter Treatment Capacity = .0267 cfs		
18" Kristar Perkfilter Treatment Capacity = 0.040		

Number of Cartridges Used	2

Export from HydroCAD 2 year Storm Event

Time (hours)	*Precip. (inches)*	*Imp.Excess (inches)*	*Runoff (cfs)*	*Treatment Capacity of Filter System (cfs)*	*Volume Treated (cf)*	*Volume Exceeding*
0	0	0	0	0.04	0	0
1	0.05	0	0	0.04	0	0
2	0.13	0.02	0.01	0.04	36	0
3	0.2	0.07	0.01	0.04	36	0
4	0.29	0.14	0.01	0.04	36	0
5	0.39	0.22	0.02	0.04	72	0
6	0.51	0.33	0.02	0.04	72	0
7	0.67	0.48	0.03	0.04	108	0
8	1.06	0.85	0.11	0.04	396	252
9	1.3	1.08	0.04	0.04	144	0
10	1.44	1.22	0.03	0.04	108	0
11	1.56	1.34	0.02	0.04	72	0
12	1.66	1.44	0.02	0.04	72	0
13	1.75	1.53	0.02	0.04	72	0
14	1.84	1.62	0.02	0.04	72	0
15	1.92	1.7	0.02	0.04	72	0
16	2	1.78	0.02	0.04	72	0
17	2.08	1.85	0.01	0.04	36	0
18	2.15	1.92	0.01	0.04	36	0
19	2.22	1.99	0.01	0.04	36	0
20	2.28	2.05	0.01	0.04	36	0
21	2.34	2.11	0.01	0.04	36	0
22	2.4	2.17	0.01	0.04	36	0
23	2.45	2.22	0.01	0.04	36	0
24	2.5	2.27	0.01	0.04	72	0

Total 2 year Volume treated (CF)	**Total 2-year Volume Bypass (CF)**
1764	252

87.50%	**of 2-year 24 hours storm is treated.**

City of Portland **Water Quality Calculations**

Basin	**A**	
WQ Storm (I)	0.19	in
Acres	1.4	AC
Acres/SF Conversion	60984	SF
Coefficient ©	0.9	HR
WQ storm	**0.298018519**	**cfs**

Contech StormFilter® Water Quality

Basin	**A**	
Max WQ Runoff	0.298018519	cfs
Q cartridge	7.5	gpm
gpm/cfs conversion	449	gpm/cfs
Number of Cartridges Required	**18**	**Cartridges**

EXHIBIT "I"

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Clackamas County Area, Oregon

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.


122° 38' 7" W
122° 37' 42" W
45° 27' 4" N
45° 26' 52" N
528530
528580
528630
528680
528730
528780
528830
528880
528930
528980
529030
5033140
5033090
5033040
5032990
5032940
5032890
5032840
5032790
84
53B
91B
Se B St
Se D St
Se C St
Se D Pl
Se Dwyer Dr
Se Meek St
32nd
224
Soil Map may not be valid at this scale.
Map Scale: 1:2,490 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 35 70 140 210
Feet
0 100 200 400 600
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon
Survey Area Data: Version 14, Sep 18, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
53B	Latourell loam, 3 to 8 percent slopes	0.1	0.6%
84	Wapato silty clay loam	0.4	1.8%
91B	Woodburn silt loam, 3 to 8 percent slopes	20.7	97.6%
Totals for Area of Interest		**21.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Clackamas County Area, Oregon

53B—Latourell loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 225k
Elevation: 50 to 400 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Latourell and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Latourell

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified glaciolacustrine deposits

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 48 inches: loam
H3 - 48 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

84—Wapato silty clay loam

Map Unit Setting

National map unit symbol: 227j

Elevation: 100 to 1,500 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Wapato and similar soils: 85 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wapato

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

H1 - 0 to 18 inches: silty clay loam
H2 - 18 to 45 inches: silty clay loam
H3 - 45 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Forage suitability group: Poorly Drained (G002XY006OR)
Hydric soil rating: Yes

Minor Components

Cove

Percent of map unit: 6 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Humaquepts

Percent of map unit: 4 percent
Landform: Flood plains

Hydric soil rating: Yes

91B—Woodburn silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 227z
Elevation: 150 to 400 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Woodburn and similar soils: 90 percent
Minor components: 4 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodburn

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified glaciolacustrine deposits

Typical profile

H1 - 0 to 16 inches: silt loam
H2 - 16 to 38 inches: silty clay loam
H3 - 38 to 60 inches: silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 25 to 32 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Forage suitability group: Moderately Well Drained < 15% Slopes (G002XY004OR)
Hydric soil rating: No

Minor Components

Huberly

Percent of map unit: 2 percent
Landform: Swales on terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Dayton

Percent of map unit: 1 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Aquolls

Percent of map unit: 1 percent
Landform: Flood plains
Hydric soil rating: Yes

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CITY OF MILWAUKIE

January 16, 2020

Debbie Cleek
The Bookin Group
1140 SW 11th Avenue, Suite 500
Portland, OR 97205

Re: Preapplication Report

Dear Debbie:

Enclosed is the Preapplication Report Summary from your meeting with the City on December 12, 2019, concerning your proposal for action on property located at 2889 SE Hillside Ct.

A preapplication conference is required prior to submittal of certain types of land use applications in the City of Milwaukie. Where a preapplication conference is required, please be advised of the following:

- Preapplication conferences are valid for a period of 2 years from the date of the conference. If a land use application or development permit has not been submitted within 2 years of the conference date, the Planning Director may require a new preapplication conference.

- If a development proposal is significantly modified after a preapplication conference occurs, the Planning Director may require a new preapplication conference.

If you have any questions concerning the content of this report, please contact the appropriate City staff.

Sincerely,

Dan Harris
Administrative Specialist II

cc: Ryan McCluckie, Scott Edwards Architecture
Brian Davis, Lancaster Mobely

Bailey Knutson, HACC
Leila Aman, Community Development Director
Denny Egner, Planning Director
Sam Vandagriff, Building Official
Steve Adams, City Engineer
Vera Kolias, Associate Planner
Alex Roller, Engineering Technician II
Alison Wicks, Development Projects Manager
Christina Fadenrecht, Housing and Economic Development Associate
Izak Hamilton, Clackamas Fire District 1
file

CITY OF MILWAUKIE
6101 SE Johnson Creek Blvd
Milwaukie OR 97206
503.786.7600
planning@milwaukieoregon.gov
building@milwaukieoregon.gov
engineering@milwaukieoregon.gov

Preapplication Conference Report

Project ID: 19-018PA

This report is provided as a follow-up to the meeting that was held on 12/12/2019 at 10:00 AM

The Milwaukie Municipal Code is available here: www.qcode.us/codes/milwaukie/

APPLICANT AND PROJECT INFORMATION

Applicant:	Debbie Cleek	Applicant Role: Representative
Applicant Address:	1140 SW 11th Ave Ste 500, Portland, OR 97205	
Company:	The Bookin Group	
Project Name:	Hillside Redevelopment	
Project Address:	2889 SE Hillside Ct	Zone: R3
Project Description:	Master plan for redevelopment of this site with a total of 600 units and some commercial space	
Current Use:	Public housing development	
Applicants Present:	Ryan McCluckie, Scott Edwards Architecture; Brian Davis, Lancaster Mobley; Bayley Knutson, Housing Authority of Clackamas County	
Staff Present:	Leila Aman, Community Development Director; Denny Egner, Planning Director; Steve Adams, City Engineer Vera Kolias, Associate Planner; Alex Roller, Engineering Technician II; Izak Hamilton, Fire Inspector; Alison Wicks, Development Projects Manager; Christina Fadenrecht, Housing and Economic Development Associate	

PLANNING COMMENTS

Zoning Compliance (MMC Title 19)

☒	Use Standards (e.g., residential, commercial, accessory)	The application will include a request for a Planned Development and zone changes.
☒	Dimensional Standards	Per Table 19.302.4, the minimum setbacks for primary structures in the R-3 zone are: 15 ft for front, rear and street side yard and 5 ft for side yards. Given the layout of the structures in the Hillside Park development, staff determined that we would treat each structure as if it fronted on the street; the setbacks vary depending on the location of the street. However, as part of a Planned Development (PD), those yards may be altered as part of the PD review process. The application should specify all setback and dimensional standards that will vary from the required base zone standards. A table or diagram would be appropriate to convey this information.

Land Use Review Process		
☒	Applications Needed	Step 1: Preliminary Planned Development; Transportation Facilities Review (TIS and TPR analysis: OAR 660-012-0060: https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=175311) Step 2: Final Planned Development; Zone Change/Comp Plan Amendment; Subdivision (Preliminary Plat) Step 3 = Final Plat for each phase; Development Review during permitting for each phase/building
☒	Fees	TFR = $1,000 Preliminary PD = $2,000 Final PD = $5,000 Subdivision = $4,400 + $100/lot over 4 lots Zone Change = $5,000 Comp Plan Amendment = $5,000 Final Plat = $200 (for each phase) Development Review = $200 (for each phase) (For concurrent applications, the most expensive application is charged full price and the fees for all other applications are discounted 25%.)
☒	Review Type: Type II Type IV Type III Type V	TFR = Type II Preliminary PD = Type III Final PD = Type IV Subdivision (Preliminary Plat) = Type III Zone Change/Comp Plan Amendment = Type V Final Plat = Type I Development Review = Type I
Overlay Zones (MMC 19.400)		
☐	Willamette Greenway	
☐	Natural Resources	
☐	Historic Preservation	
☐	Flex Space Overlay	
Site Improvements/Site Context		
☒	Landscaping Requirements	All planned unit developments will have at least one-third of the gross area devoted to open space and/or outdoor recreational areas. At least half of the required open space and/or recreational areas will be of the same general character as the area containing dwelling units. Open space and/or recreational areas do not include public or private streets.

☐	Onsite Pedestrian/Bike Improvements (MMC 19.504, 19.606, and 19.609)	
☐	Connectivity to surrounding properties	
☐	Circulation	
☒	Building Design Standards (MMC 19.505)	19.505.3 and 19.505.7 would apply to the proposed development. The PD process allows for a new set of development standards; the submitted application must identify where the PD would modify these standards.
☐	Downtown Design Standards (MMC 19.508)	
Parking Standards (MMC 19.600)		
☐	Residential Off-Street Parking Requirements	
☒	Multi-Family/Commercial Parking Requirements	Off-street parking requirements would be evaluated site-wide, rather than by each individual development parcel. Modifications to the required parking standards would be addressed via a parking modification per 19.605.2 that would be incorporated into the final PD.
Approval Criteria (MMC 19.900)		
☒	Planned Developments (MMC 19.311)	Please review the Development Standards (19.311.3) and the Approval Criteria identified in 19.311.9, which details all of the applicable approval criteria.
☒	Amendments to Maps and Ordinances (MMC 19.902)	19.902.3.B: approval criteria for Comprehensive Plan map amendments 19.902.6.B: approval criteria for Zoning Map amendments
☒	Development Review (MMC 19.906)	Development review will accompany the building permit process for each phase or building to confirm compliance with the code and the PD approval.
☐	Variance (MMC 19.911)	
Land Division (MMC Title 17)		
☒	Design Standards	http://www.qcode.us/codes/milwaukie/view.php?topic=17-17_28&frames=off
☒	Preliminary Plat Requirements	MMC 17.20 Preliminary Plat: http://www.qcode.us/codes/milwaukie/view.php?topic=17-17_20&showAll=1&frames=off Preliminary plat checklist: https://www.milwaukieoregon.gov/sites/default/files/fileattachments/planning/page/38211/preliminaryplatchecklist.pdf MMC 17.12.040 Approval criteria for preliminary plat: http://www.qcode.us/codes/milwaukie/view.php?topic=17-17_12-17_12_040&frames=off
☒	Final Plat Requirements (See Engineering Section of this Report)	MMC 17.24 Final Plat: http://www.qcode.us/codes/milwaukie/view.php?topic=17-17_24&frames=off

		Final plat checklist: https://www.milwaukieoregon.gov/sites/default/files/fileattachments/planning/page/38211/finalplatchecklist.pdf MMC 17.12.050 Approval criteria for final plat: http://www.qcode.us/codes/milwaukie/view.php?topic=17-17_12-17_12_050&frames=off
Sign Code Compliance (MMC Title 14)		
☒	Sign Requirements	Sign Districts Commercial Zones (including GMU): http://www.qcode.us/codes/milwaukie/view.php?topic=14-14_16-14_16_040&frames=off Residential Zones: http://www.qcode.us/codes/milwaukie/view.php?topic=14-14_16-14_16_010&frames=off
Noise (MMC Title 16)		
☐	Noise Mitigation (MMC 16.24)	
Neighborhood District Associations		
☒	Ardenwald-Johnson Creek	https://www.milwaukieoregon.gov/citymanager/ardenwald-johnson-creek-nda https://www.milwaukieoregon.gov/citymanager/historic-milwaukie-nda
	Historic Milwaukie	
	Choose an item.	
Other Permits/Registration		
☐	Business Registration	
☐	Home Occupation Compliance (MMC 19.507)	

Additional Planning Notes

The following questions were asked by the applicant:

Plans. What level of detail will be required for the plans submitted for the Preliminary Development Plan review? Will the conceptual plans that have been used at the previous City meetings be acceptable?

The submitted concept plans are sufficient, but the materials must also include a detailed description of how the proposal differs from the base zone standards. Application materials should also provide tables and/or diagrams that indicate where and how standards vary from the base zone standards and requirements.

Modifications. Will there be an opportunity to modify the plans (if necessary) between the Preliminary Development Plan approval and the Final Development Plan Approval? If so, are there any limits on what can be changed and by how much? Are there any changes that would require the project to go back through Preliminary Plan review?

The Final PD must be substantially consistent with the approved preliminary plan. This would include general block pattern, street locations, range of density, and proposed uses for each block.

Approval Criteria. What are the specific Approval Criteria that need to be addressed for Preliminary Plan approval? The Approval Criteria of 19.311.9 are very specific and seem geared to Final Development Plan approval and the application of the PD zone vs. the Preliminary Plan approval that is more conceptual in nature.

The preliminary plan submittal must include details about how the proposal meets the development standards and approval criteria. Conceptual lotting pattern should also be included.

Procedure. What will the Planning Commission's decision for the Preliminary Plan Review be based on?

The Planning Commission will base its decision on the compliance/consistency of the proposal with the approval criteria and development standards. Conditions of approval would be included, such as the rezoning of the property.

29th Avenue Extension. At what point can we anticipate a final decision to be made in the extension of 29th Avenue to the north (will it be a full street, sharrow or a pedestrian walkway/bikeway)? If 29th is not a through street what will be the fire access requirements for the dead-end street (full turnaround, backing up to Dwyer Street, bollards across 29th as emergency access only, etc.)

More details on this in the Engineering section, but the Planning Commission will decide this issue and make a recommendation to City Council, who will ultimately make the final policy decision on this aspect of the project. The TSP shows this as a street connection as well as a bikeway. If the application will propose to restrict vehicular access to only emergency access, the application must demonstrate that this vehicular connection is not needed. Please review MMC 19.708.1.F for block length perimeter standards.

Open Space. Lot J is intended to remain as an open area for recreational uses. What mechanism will be required to preserve this area, and how will it allow for future flexibility if this area also becomes a stormwater facility for the City?

An easement will be sufficient to address this.

Comprehensive Plan Update. What is the City's schedule for their Comprehensive Plan updates? What Comp Plan designation is anticipated for this site? The Central Milwaukie Plan calls for TC/GMU zoning on the Murphy site to the south - is there any opportunity for this site to be re-designated to TC also through the City's Comp Plan process, rather than individually by HACC?

The comprehensive plan update process will not be able to accommodate this map amendment – the timing will not align with HACC's timeframe.

Zone Change. If the PD Zone will be superimposed on the land at the end of the ZC process is it necessary to designate a specific zone (e.g. GMU or R1) that we plan to change the zoning to? Or is it possible to select a menu of density and development standards that match the program of the master plan?

The PD zone will be an overlay on the base zone(s). It seems that a combination of GMU and R1 zoning could accommodate the development goals of the proposed master plan, with language specific to this PD to limit certain uses, such as commercial areas.

Density. How will density on the site be calculated - per individual lot (Lots A-K) or overall for the site? The open area (Lot J) will have a density of zero, so how will the density of this area be allocated to other lots? Additionally, the GMU zone has no maximum density standard for mixed use buildings, so will the density of Lots A & E be limited in another way, or left open ended?

Density will be calculated on the overall site. The PD allows a blend of density across the site.

Parking. It is anticipated that parking reductions will be necessary on some lots to allow fewer parking spaces than required by the code. How will this request be considered as part of this larger process? Will any additional application requirements be necessary to justify this request?

See discussion above in the parking section and please review MMC 19.605.2.C.1 and 2 to review the approval criteria. This should be incorporated into the PD document as well.

GMU Development Standards. If the GMU zone is applied to the properties adjacent to Meek and 32nd Avenue, is it likely that these properties will be subject to the Residential Edge Treatment standards (e.g. 4th story setback from street) or the Commercial Edge Treatment standards (e.g. maximum setback of 10 feet)?

The submitted application materials should identify how the proposal differs from the multifamily design standards, GMU, and non-residential design standards. The PD can be used to provide for modifications to these base standards and requirements.

Future Commercial Uses. If Lot B is shown on the Master Plan as being entirely residential use, but it gets zoned GMU to account for the anticipated density, could a commercial use be put on this Lot in the future?

Please review MMC 19.909 – Modifications to Existing Approvals. Please note that additional commercial development could impact the TIS and TPR analyses. Future flexibility of uses can be accommodated by proposing the "worst case scenario" now.

Community Center Use. In the GMU zone Community Services Uses are listed as a Conditional Use. Section 19.904 indicates that Community Service Uses include "community meeting buildings" as well as "pools, gyms, indoor sport courts and associated facilities"? Would the Community Center proposed on Lot C, that would mainly serve the surrounding residents need a Conditional Use or other special approval? Are there thresholds or programming specifics that would dictate when this use might trigger a Conditional Use.

The PD approval would establish the use of this community building, so a separate CSU application is not required. The application materials should specify the use and purpose of this building (amenity building for Hillside residents only, or open to the public). This may also factor in to the TIS and TPR analyses.

Other notes:

- Please note the City's goal of 40% tree canopy
- Maintenance of common space/open space – HACC responsibility?
- Will the open areas and/or play fields be open to the public?

ENGINEERING & PUBLIC WORKS COMMENTS

Public Facility Improvements (MMC 19.700)

☒	Applicability (MMC 19.702)	Chapter 19.700 of the Milwaukie Municipal Code (MMC) applies to partitions, subdivisions, new construction and modification and or expansions of existing structures or uses that produce a projected increase in vehicle trips. Transportation Facility Requirements, Code Section 19.708, states that all rights-of-way, streets, sidewalks, necessary public improvements, and other public transportation facilities located in the public right-of-way and abutting the development site shall be adequate at the time of development or shall be made adequate in a timely manner. Prior to each phased plat being signed, required frontage improvements for each phase must either be constructed, or applicant must submit a bond or other approved assurance that is approved by the City Attorney, per MMC 17.24.060.
☒	Transportation Facilities Review (MMC 19.703)	The City Engineer has determined that a Traffic Impact Study (TIS) will be required for this development. The review for the TIS will be completed under a Transportation Facility Review (TFR) land use application. This is a Type II application.
☒	Transportation Impact Study (MMC 19.704)	The TIS will need to reflect the phasing that is planned. This will identify if/when traffic mitigation is required, as it may not be the first phase that triggers any mitigation, but some of the later phases. TIS will also need to show the expected trip distribution difference for 29th Avenue to the north if the street is constructed to allow vehicle traffic or to allow bike/ped only. Also, the City is planning on creating a greenway on 29th avenue. TIS will need to show how the buildout of this greenway will affect vehicular traffic on 29th Ave if no gate is constructed.

		TIS will also need to reflect how the community building on lot C will function (will it be open to the public or not).
☒	Agency Notification (MMC 19.707)	City of Milwaukie will coordinate TIS Agency notification.
☒	Transportation Requirements (MMC 19.708)	Exact cross section for the internal streets were not provided in the application materials. Measuring off of site plan from the application material dated 11/11/19, the majority of the streets appear to match right-of-way width requirements (Table 19.708.1). If they don't exactly match, there is the opportunity to modify components through the planned development process. This is land division, so all conditions of Title 17 apply. 17.32 requires that utilities are undergrounded. This will apply to the 32nd Avenue frontage as well. Also, on street parallel parking will be required, at a minimum, in front of the mixed-use buildings E1 and A2 on lots E and A. If applicant wishes to provide additional parallel parking in front of lot F, that would be permitted as well. The vehicle connection decision for 29th Avenue connection will have an impact on block perimeter requirements. With the 29th avenue vehicle connection the block perimeter of Dwyer/29th/Balfour/32nd is approximately 2250 ft which is still larger than our maximum for a collector, which 32nd Avenue is. Planning commission will need to weigh block perimeter vs connectivity. Without the vehicle connection, a variance to the block perimeter standards of table 19.708.1.
☒	Utility Requirements (MMC 19.709)	Development must conform to MMC 19.709. The sewer system (13.12) section below addresses the required downstream sewer analysis. Analysis must be completed for the water system as well, for both fire and domestic service.
Flood Hazard Area (MMC 18)		
☐	Development Permit (MMC 18.04.100)	
☐	General Standards (MMC 18.04.150)	
☐	Specific Standards (MMC 18.04.160)	
☐	Floodways (MMC 18.04.170)	
Environmental Protection (MMC 16)		
☐	Weak Foundation Soils (MMC 16.16)	
☒	Erosion Control (MMC 16.28)	Development of the site will require an erosion control permit. Direct erosion control questions to Jeremiah Sonne – sonnej@milwaukieoregon.gov
☒	Tree Cutting (MMC 16.32)	Currently our tree code only covers trees in the right-of-way. Preapp materials indicate that applicant is proposing to protect as many large trees as possible. One note for trees that will be located along the rail property to the west: MMC 8.04.110 indicates that adjacent property owners are responsible for maintenance of trees. In the 28th Ave and the Hillside Manor properties the Hillside property developer/owner or their designee will be responsible for maintaining these trees.
Public Services (MMC 13)		

☒	Water System (MMC 13.04)	Applicant will be responsible for constructing adequately sized water lines to provide domestic and fire services to all properties. With the creation of new streets, no public waterlines will be permitted on private properties through easements. Final phasing plan for the water utilities will be developed in coordination with the City. The method for abandonment of water lines will be based on the depth to top of pipe from finished grade. Any pipes 7.5-feet or less from finish grade must be removed. Pipes deeper than 7.5' may be CDF filled.
☒	Sewer System (MMC 13.12)	Applicant will be responsible for constructing adequately sized wastewater lines to provide services to all properties. With the creation of new streets, no public wastewater pipes will be permitted on private properties through easements. Final phasing plan for the wastewater utilities will be developed in coordination with the City. Applicant will be responsible for demonstrating that the downstream system has adequate capacity for the additional units.
☒	Stormwater Management (MMC 13.14)	Submission of a storm water management plan by a qualified professional engineer is required as part of the proposed development. The plan shall conform to Section 2 - Stormwater Design Standards of the City of Milwaukie Pubic Works Standards. The storm water management plan shall demonstrate that the post-development runoff does not exceed the pre-development, including any existing storm water management facilities serving the development property. Also, the plan shall demonstrate compliance with water quality standards. The City of Milwaukie has adopted the City of Portland 2016 Stormwater Management Manual for design of water quality facilities. All new impervious surfaces, including replacement of impervious surface with new impervious surfaces, are subject to the water quality standards. See City of Milwaukie Public Works Standards for design and construction standards and detailed drawings. Storm plan will not require that each new lot treat and detain stormwater on site. The plan will treat the whole planned development as one site, with all stormwater being directed to the storm facility at the northwest corner of the site. Since these pipes will also be capturing public runoff from the streets, they will be maintained by city crews. The creation of an IGA with the City will permit the Hillside development to direct all storm runoff to the large open space in the northwest corner of the site. Each lot will only be responsible for treatment, and not detention. The storm SDC is based on the amount of new impervious surface constructed at the site. One storm SDC unit is the equivalent of 2,706 square feet of impervious surface. The storm SDC is currently $930 per unit. The storm SDC will be assessed and collected at the time the building permits are issued.
☒	System Development Charge (MMC 13.28.040)	System development charges will be applied and collected at the time of building permits.
☒	Fee in Lieu of Construction (MMC 13.32)	For fee in lieu of construction to be applied it must satisfy at least one of the criteria found in 13.32.020. At this point it does not appear to apply to this development.
	Public Places (MMC 12)	
☒	Right of Way Permit (MMC 12.08.020)	Each phase of construction will be completed under a right-of-way permit which will a public improvement project. Cost of permit is 5.5% of the cost of the improvements, performance bond prior to construction, and 12-month maintenance bond.
☒	Access Requirements (MMC 12.16.040)	Site plan currently complies with access requirements.
☒	Clear Vision (MMC 12.24)	Intersections and driveways must comply with clear vision requirements.

Additional Engineering & Public Works Notes

1. Utilities: The method for abandonment of public utilities will be based on the depth to top of pipe from finished grade. Any pipes 7.5-feet or less from finish grade must be removed. Pipes deeper than 7.5' may be CDF filled. Any manhole to be abandoned within future right-of-way must have the cone removed and the manhole filled with 1½"-0 fractured rock up to subgrade. Applicant asked about the process for vacating and creating utility easements during the construction phasing. It may be a cleaner process to have easements match the phasing plan with each one covering each phase of the proposed development and vacating each easement as each improvement vs modifying existing easements throughout the phasing. The City is open to working with whatever method works most efficiently. One requirement that each phase will have complete easements and fully functioning utilities.
2. 29th Avenue Extension: The planning commission will make the final decision on whether vehicle ingress/egress will be permitted from the existing 29th Avenue or if it will be gated. The Traffic Impact Study will need to analyze the expected trip distribution onto and from 29th Avenue as both a gated and non-gated ingress/egress way.

BUILDING COMMENTS

All drawings must be submitted electronically through www.buildingpermits.oregon.gov

New buildings or remodels shall meet all the provisions of the current applicable Oregon Building Codes. All State adopted building codes can be found online at: https://www.oregon.gov/bcd/codes-stand/Pages/adopted-codes.aspx.

All building permit applications are electronic and can be applied for online with a valid CCB license number or engineer/architect license at www.buildingpermits.oregon.gov . Each permit type and subpermit type are separate permits and will need to be applied for individually. Plans need to be uploaded to their specific permits in PDF format as a total plan set (not individual pages) if size allows.

Note: Plumbing and electrical plan reviews (when required) are done off site so two (2) paper copies will be required for those reviews only. Paper copies should be delivered to our office for processing.

Site utilities require a separate plumbing permit. This permit will require plumbing plan review so two (2) paper copies will be required for this review. Paper copies should be delivered to the Building Division office for processing. The grading plan submitted to the Engineering Department does not cover this review.

If you have any building related questions, please email us at building@milwaukieoregon.gov.

Additional Building Notes

Fire sprinklers and alarms as required by OSSC shall be provided throughout.

OTHER FEES

☐	Construction Excise Tax Affordable Housing CET – Applies to any project with a construction value of over 100,000.	Calculation: Valuation *12% (.12)
☐	Metro Excise Tax Metro – Applies to any project with a construction value of over $100,000.	Calculation: Valuation *.12% (.0012)
☐	School Excise Tax School CET – Applies to any new square footage.	Calculation: Commercial = $0.67 a square foot, Residential = $1.35 a square foot (not including garages)

FIRE DISTRICT COMMENTS

Please see the attached memorandum for fire district comments.

COORDINATION WITH OTHER AGENCIES

Applicant must communicate directly with outside agencies. These may include the following:

- Metro
- Trimet
- North Clackamas School District
- North Clackamas Parks and Recreation District (NCPRD)
- Oregon Parks and Recreation
- ODOT/ODOT Rail
- Department of State Lands
- Oregon Marine Board
- Oregon Department of Fish and Wildlife (ODOT)
- State Historic Preservation Office
- Clackamas County Transportation and Development

MISCELLANEOUS

	State or County Approvals Needed	
☐	Boiler Approval (State)	
☐	Elevator Approval (State)	
☐	Health Department Approval (County)	
	Arts Tax	
☐	Neighborhood Office Permit	
	Other Right-of-Way Permits	
☐	Major:	
☐	Minor:	
☐	Painted Intersection Program Permits:	
	☐ artMOB Application	
	☐ Traffic Control Plan (Engineering)	
☐	Parklet:	
	☐ Parklet Application/ Planning Approval	
	☐ Engineering Approval	

	☐ Building Approval	
☐	Sidewalk Café:	
☐	Tree Removal Permit:	

Infrastructure/Utilities

Applicant must communicate directly with utility providers. These may include the following:

- PGE
- NW Natural
- Clackamas River Water (CRW)
- Telecomm (Comcast, Century Link)
- Water Environmental Services (WES)
- Garbage Collection (Waste Management, Hoodview Disposal and Recycling)

Economic Development/Incentives

☐	Enterprise Zone:	
☐	Vertical Housing Tax Credit:	
☐	New Market Tax Credits:	
☐	Housing Resources:	

PLEASE SEE NOTE AND CONTACT INFORMATION ON THE FOLLOWING PAGE

This is only preliminary preapplication conference information based on the applicant's proposal, and does not cover all possible development scenarios. Other requirements may be added after an applicant submits land use applications or building permits. City policies and code requirements are subject to change. If a note in this report contradicts the Milwaukie Municipal Code, the MMC supersedes the note. If you have any questions, please contact the City staff that attended the conference (listed on Page 1). Contact numbers for these staff are City staff listed at the end of the report.

Sincerely,

City of Milwaukie Development Review Team

BUILDING DEPARTMENT		
Samantha Vandagriff	Building Official	503-786-7611
Harmony Drake	Permit Specialist	503-786-7623
Stephanie Marcinkiewicz	Inspector/Plans Examiner	503-786-7636
ENGINEERING DEPARTMENT		
Steve Adams	City Engineer	503-786-7605
Dalton Vodden	Associate Engineer	503-786-7617
Alex Roller	Engineering Tech II	503-786-7695
PLANNING DEPARTMENT		
Dennis Egner	Planning Director	503-786-7654
David Levitan	Senior Planner	503-786-7627
Brett Kelver	Associate Planner	503-786-7657
Vera Kolias	Associate Planner	503-786-7653
Mary Heberling	Assistant Planner	503-786-7658
COMMUNITY DEVELOPMENT DEPARTMENT		
Leila Aman	Community Development Director	503-786-7616
Alison Wicks	Development Programs Manager	503-786-7661
Alicia Martin	Administrative Specialist II	503-786-7600
Tempest Blanchard	Administrative Specialist II	503-786-7600
Dan Harris	Administrative Specialist II	503-786-7600
CLACKAMAS FIRE DISTRICT		
Mike Boumann	Lieutenant Deputy Fire Marshal	503-742-2673
Izak Hamilton	Fire Inspector	503-742-2660

Clackamas County Fire District #1
Fire Prevention Office

E-mail Memorandum

To: City of Milwaukie Planning Department

From: Izak Hamilton, Fire Inspector, Clackamas Fire District #1

Date: 12/18/2019

Re: 19-018PA, 2889 Se Hillside Ct., Milwaukie, OR

This review is based upon the current version of the Oregon Fire Code (OFC), as adopted by the Oregon State Fire Marshal's Office. The scope of review is typically limited to fire apparatus access and water supply, although the applicant must comply with all applicable OFC requirements. When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access and water supply may be modified as approved by the fire code official. The following items should be addressed by the applicant:

A Fire Access and Water Supply plan is required for subdivisions and commercial buildings over 1000 square feet in size <u>or when required by Clackamas Fire District #1</u>. The plan shall show fire apparatus access, fire lanes, fire hydrants, fire lines, available fire flow, FDC location (if applicable), building square footage, and type of construction. The applicant shall provide fire flow tests per NFPA 291, and shall be no older than 12 months. Work to be completed by experienced and responsible persons and coordinated with the local water authority.

Emergency responder radio coverage must be tested or provided due to the following:

1. **Any building 50,000 square feet in size or larger.**

<u>Access:</u>

1. Provide address numbering that is clearly visible from the street.
2. No part of a building may be more than 150 feet from an approved fire department access road.
3. The inside turning radius and outside turning radius for a 20' wide road shall not be less than 28 feet and 48 feet respectively, measured from the same center point
4. Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet (26 feet adjacent to fire hydrants) and an unobstructed vertical clearance of not less than 13 feet 6 inches.

2930 S.E. Oak Grove Blvd. • Milwaukie, OR 97267 • 503-742-2660

5. Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet (26 feet adjacent to fire hydrants) and an unobstructed vertical clearance of not less than 13 feet 6 inches.
6. Fire Department turnarounds shall meet the dimensions found in the fire code applications guide.
7. Buildings exceeding 30 feet in height shall require extra width and proximity provisions for aerial apparatus.
8. Access streets between 26 feet and less than 32 feet in width must have parking restricted to one side of the street. Access streets less than 26 feet in width must have parking restricted on both sides of the street. No parking restrictions for access roads 32 feet wide or more.
9. Developers of private streets less than 32 feet in width must establish a street maintenance agreement that provides for enforcement of parking restrictions.

Water Supply

1. Fire Hydrants Commercial Buildings: Where a portion of the building is more than 400 feet from a hydrant on a fire apparatus access road, as measured in an approved route around the exterior of the building, on-site fire hydrants and mains shall be provided.

Note: This distance may be increased to 600 feet for buildings equipped throughout with an approved automatic sprinkler system.

2. All new buildings shall have a firefighting water supply that meets the fire flow requirements of the Fire Code. Maximum spacing between hydrants on street frontage shall not exceed 500 feet. Additional private on-site fire hydrants may be required for larger buildings. Fire sprinklers may reduce the water supply requirements.
3. Dwellings, their garages, and any accessory structures larger than 3,600 square feet in area must be reviewed for compliance with the water supply requirements of the Fire Code. Residential fire sprinklers may substitute for a water supply.

4. Prior to the start of combustible construction required fire hydrants shall be operational and accessible.
5. The fire department connection (FDC) for any fire sprinkler system shall be placed as near as possible to the street, and within 100 feet of a fire hydrant.

Notes:

1. Comments may not be all inclusive based on information provided.
2. Please visit our website for access to our Fire flow Worksheet, and Fire Code Application Guide.

http://www.clackamasfire.com/fire-prevention/new-construction-resources

Hillside Master Plan for Housing Opportunity

SIGN IN SHEET

Feb 21, 2019 | 6:30 – 8:30 p.m.
Ardenwald Elementary
8950 SE 36th Ave
Milwaukie, OR

10

Name	Affiliation	Email	Phone
Vera Gabor	resident	none	(503) 513-0124
Lyubov Gonchar			(503) 695-0263
Midori Ito	"	"	503-659-8310
Yelena KORDONETS	"	"	503-659-0029
Peter Khoma			503 853 6531
Sonja Souder	HACC	ssouder@clackamas.us	503-650-3134
Tarah DeGeorge	PGE	tarah.degeorge@pgn.com	503-970-7535
Michael PARSONS	resident		503-652-2039
Karen Tillou	Ardenwald neighborhood	kbtillou@gmail.com	
Gene ZAHARIE	MACG	zaharie@comcast	503-786-8218

Health, Housing & Human Services
CLACKAMAS COUNTY

Hillside Master Plan for Housing Opportunity

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Feb 21, 2019 | 6:30 – 8:30 p.m.
Ardenwald Elementary
8950 SE 36th Ave
Milwaukie, OR

3

Name	Affiliation	Email	Phone
Nate Ember	Resident	nate@inkbuiltdesign.com	
Suematranga Watsa		Suemwa@hotmail.com	
Lisa Batey	City Council	—	

Health, Housing & Human Services
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Feb 21, 2019 | 6:30 – 8:30 p.m.
Ardenwald Elementary
8950 SE 36th Ave
Milwaukie, OR

3

7

Name	Affiliation	Email	Phone
Ivan Uzhva			
LUKE STRAIT	MILW. P.D.	STRAITL@MILWAUKIEOREGON.GOV	971.563.2716
Nancy Wogenknecht	Community Member	nancykwag@yahoo.com	
Ann Leenstra	Manor	pdxgramma@gm.	503-878-2614
Kim Travis	Milwaukie Planning Commission	Kim.Travis75@gmail.com	
Angel Falconer	Mwk City Council		
Jemila Hart	HACC	jemilahar@clackamas.us	503-742-5317

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CLACKAMAS COUNTY

Hillside Master Plan for Housing Opportunity

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Feb 21, 2019 | 6:30 – 8:30 p.m.
Ardenwald Elementary
8950 SE 36th Ave
Milwaukie, OR

8

Name	Affiliation	Email	Phone
Margaret Parsons	neighboor (manor)	—	503-652-2039
Brian Henderson	Hillside resident	—	—
MIKE ANDREWS	CONSULTANT		
KATHY HYZY	CITY COUNCIL		—
Becki Hayes	CPAC member	—	—
DJ Heffernan	Murphey Property		
Ben Rousseau	Hillside Resident		
Mark A. Smith		Mark_Smith1972@yahoo.com	(503) 360-8781

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CLACKAMAS COUNTY

Hillside Master Plan for Housing Opportunity

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Ardenwald Elementary
8950 SE 36th Ave
Milwaukie, OR

Name	Affiliation	Email	Phone
Elvis Clark	neighbor	ECLARKMilwOr@Yahoo.com	
Matt Rinker	AJC NDA	MattRinker@hotmail.com	
Chris Riley	Hillside Resident		
Sandra Grzeskowiak	Hillside Steering Committee	sandragrzeskowiak@comcast.net	
Mark Gamba	Mayor	gambam@milwaukieOR.gov	
Rich Malloy	HACC Asset Manager	rmalloy@clackamas.us	
Alma Flores	COM	floresa@milwaukeeoregon.gov	
Till Smith	HACC	tsmith@clackamas.us	

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CLACKAMAS COUNTY

Hillside Master Plan for Housing Opportunity

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Feb 21, 2019 | 6:30 – 8:30 p.m.
Ardenwald Elementary
8950 SE 36th Ave
Milwaukie, OR

10

Name	Affiliation	Email	Phone
SUSAN HOSKINS	RESIDENT	—	503-380-4068
[illegible]	resident	none	(503) 23-45[illegible]
Mary Spooner	Neighbor	mspooner56@gmail.com	503-679-1870
Donna Ryan	Resident	ryan9645@comcast.net	503933-826
MARGE HOCKHART	RESIDENT		503-839-4136
NINA [illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
Allison Coe	Property Manager HACC	acoe@clackamas.us	503-794-8079
BEN BORTOLAZZO	DESIGN PROFESSIONAL	benbortolazzo@otak.com	503 415 2307
Cathy Hearst	Manager #506	∅	503 209 7348

Health, Housing & Human Services
CLACKAMAS COUNTY

Hillside Master Plan for Housing Opportunity

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May 30, 2019 | 6:30 – 8:30 p.m.
Providence Milwaukie Hospital
Mother Gamelin Conference Room
10150 SE 32nd Ave
Milwaukie, OR 97222

Name	Affiliation	Email	Phone
Aris Bz Estupinian	Hillside Manor 304.		503-652-3984
SUSAN HOSKINS	HILLSIDE MANOR 906		
Jane Cortez	10045 SE 32nd Ave		
Sharon Ferguson	2889 S.E. Hillside Ct Apt 812		
Karen Durham	2874 ~~SE~~ Hillside Ct.		
John Kinyston	2889 SE Hillside #803		
Alan Ronfeldt	2889 SE HILLSIDE CT #403		
Brian Henderson	manor #804		
Lizkva Ivan F.	10005 SE Street # Milwaukie		
Vera Gabor	10319 SE B st.		
Larisa, Svetlana	Milwaukie, OR 97222. 10244 SE D St.		
Dottie O'Dell	10144 SE "B" St		
Tatyana Kistol	10047 SE A st.		
NELLIE ALBER	2889 S.E. HILLSIDE CT #603		
ARNOLD RePacker	10103 SE C ST		

Hillside Master Plan for Housing Opportunity

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May 30, 2019 | 6:30 – 8:30 p.m.
Providence Milwaukie Hospital
Mother Gamelin Conference Room
10150 SE 32nd Ave
Milwaukie, OR 97222

Name	Affiliation	Email	Phone
I. Hernandez	Hillside Tenant	irisahernandez2@gmail.com	503.367.7654
Elena Sizmin	HACC		503.655.8202
Nadia Kirilchuk	Hillside tenant		
Peter Khoma	Hillside tenant		
Anfisa Khoma	Hillside resident		
John Russell	Manor		
Elsis Clark	Ardenwald NA	EClarkmilwor@Yahoo.com	
Devin Ellin	HACC		
Pam Stoltz	Hillside Res.		
Becky Dresselhaus	Ardenwald NA	beckyd44@mac.com	503 451-9912
Nina Kaidalina	Helsibe		503.659.78.60
Phidoriya Chornaya	Helside		503.654-83.10
Bradley Bondy		bradleybondy@bradleybondy.com	503-919-5451
RANDY MCTIMMONDS	Hillside Ct.		971-232-0849
Cathy Haase	Hillside Manor	CathyTyrrell57@gmail.com	503-209-7348

Health, Housing & Human Services
CLACKAMAS COUNTY

Hillside Master Plan for Housing Opportunity

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May 30, 2019 | 6:30 – 8:30 p.m.
Providence Milwaukie Hospital
Mother Gamelin Conference Room
10150 SE 32nd Ave
Milwaukie, OR 97222

Name	Affiliation	Email	Phone
Zhanna Mitchell	interpreter		503-916-9237
Erin Maxey	City of Milwaukie	maxeye@milwaukieoregon.gov	706-280-8487
Matt Rinker	AJC NDA	MattRinker@hotmail.com	971 336 8863
Lisa Gannon-Rinker	AJC NDA	astrantialgr@gmail.com	503-754-1655
Emily Gilchrist	none (affected neighbor)	emilygilchrist.jd@gmail.com	503-853-4553
Julie Kenelleck	affected neighbor	strikegirl21@yahoo.com	971-400-7118
Katy Hyzy	City of Milwaukie	NyzyK@milwaukieoregon.gov	
Lisa Batey	City of Milwaukie	BateyL@milwaukieoregon.gov	
Mike Andrews	Structure Development Advisors	mike@structurepdx.com	503-249-5658
James Knight	local Resident	j365K@yahoo.com	
June Ehrlin	NWFS.	jehrlin@nwfs-org.	503 309-2096.
Am Ober	City of Milwaukie	ober@milwaukieoregon.gov	503-753-6608
Isaac Barrow	PGE	isaac.barrow@pgn.com	503 593 2132
Jamie Zentner	Clack Co Public Health	jzentner@clackamas.us	503 742 5939

Health, Housing & Human Services
CLACKAMAS COUNTY

Hillside Master Plan for Housing Opportunity

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May 30, 2019 | 6:30 – 8:30 p.m.
Providence Milwaukie Hospital
Mother Gamelin Conference Room
10150 SE 32nd Ave
Milwaukie, OR 97222

Name	Affiliation	Email	Phone
Enoc Alvarez	Interpreter		
Carrie Bush	Hillside Park		
Cindy Rose	Hillside Park		
Allison Coe	HHCC	acoe@clackamas.us	
Marnie Smith	Hillside Manner		
Jay Davidson			
Rich Malloy	HHCC	rmalloy@clackamas.us	
Szabolcs Tekeli, Erzsebet		szabolcs@gmail.com	
April Bravo	hillside	AprilBravo70@gmail.com	
Beth Byrne	Clackamas County	bbyrne@clackamas.us	
Mark Gamba	Milwaukie	mark@markgamba.com	
Linda Ricketts	Hillside Manor	lmbricketts2017@gmail.com	

Health, Housing & Human Services
CLACKAMAS COUNTY

Hillside Master Plan

S|EA

10/23/2020

BUILDING	USE	Area (SF)	# of Floors	Total units	Parking Provided (On Site)	Parking Ratio	UNIT MIX 1BD	2BD	3BD	4BD	SITE INFO. du/AC	Lot SF	Lot Acres	Bldg. Coverage	Lot Coverage %	FAR	PHASING FAR Bldg. SF Phase I	FAR	Bldg. SF Phase II	FAR
A1					Shared Surface Lot															
	Commercial	0	0		0															
1 BD Walk-ups	Residential	5,280	3	24	30	0.30	24	0	0	0	75	58,421	1.34	17,700	30%	5.5	118,447	2.6	67,640	1.2
	Total	**15,840**	**3**	**24**	**30**	**0.30**														
A2					Shared Surface Lot															
	Commercial	12,420	1																	
1 & 2 BD Apts	Residential	69,183	3	77																
	Total	**81,603**	**4**	**77**			77													
B1					Shared Surface Lot															
	Commercial	0	0		0															
2 BD Apts	Residential	12,687	4	44	38	0.35														
	Total	**50,748**	**4**	**44**	**38**	**0.35**	0	44	0	0	78	60,026	1.38	28,438	47%	4.0				
B2					Shared Surface Lot															
	Commercial	0	0																	
1 & 2 BD Apts	Residential	15,751	4	64																
	Total	**63,004**	**4**	**64**			25	39	0	0										
C1					Shared Surface Lot															
					0															
1 BD Apts	Residential	16,910	4	65	66	1.02														
	Total	**67,640**	**4**	**65**	**66**	**1.02**	65	0	0	0	50	56,407	1.29	24,590	44%	3.7				
D1					Shared Surface Lot															
	Commercial	0	0		0															
2 BD Walk-ups	Residential	7,680	3	20	43	0.80														
	Total	**23,040**	**3**	**20**	**43**	**0.80**	0	20	0	0	39	60,641	1.39	18,240	30%	3.0				
D2					Shared Surface Lot															
	Commercial	0	0																	
1&2 BD Walk-ups	Residential	10,560	3	34																
	Total	**31,680**	**3**	**34**			12	22	0	0										

BUILDING	USE	Area (SF)	# of Floors	Total units	Parking Provided (On Site)	Parking Ratio	Unit Mix 1BD	2BD	3BD	4BD	Site Info. du/AC	Lot SF	Lot Acres	Bldg. Coverage	Lot Coverage %	FAR
E1					**Shared Surface Lot**											
	Commercial	13,816	1													
1 BD Apts	Residential	46,546	3	69	31	0.33										
	Total	**60,362**	**4**	**69**	**31**	**0.33**	**69**	**0**	**0**	**0**	**67**	**60,540**	**1.39**	**19,096**	**32%**	**4.3**
E2					**Shared Surface Lot**											
	Commercial	0	0													
1 BD Walk-ups	Residential	5,280	4	24												
	Total	**21,120**	**4**	**24**			**24**	**0**	**0**	**0**						
F1					**Shared Surface Lot**											
	Commercial	0	0													
2 BD Walk-ups	Residential	7,680	3	24	40	1.00										
	Total	**23,040**	**3**	**24**	**40**	**1.00**	**0**	**24**	**0**	**0**	**40**	**43,154**	**0.99**	**13,180**	**31%**	**3.0**
F2					**Shared Surface Lot**											
	Commercial	0	0													
1&2 BD Walk-ups	Residential	5,500	3	16												
	Total	**16,500**	**3**	**16**			**6**	**10**	**0**	**0**						
G1																
	Commercial	0	0		**Shared Surface Lot**											
Townhouses	Residential	3,072	2	4	18	1.13										
	Total	**6,144**	**2**	**4**	**18**	**1.13**	**0**	**0**	**4**	**0**	**18**	**66,079**	**1.52**	**23,288**	**35%**	**2.5**
G2																
	Commercial	0	0		**Shared Surface Lot**											
Townhouses	Residential	3,072	2	4												
	Total	**6,144**	**2**	**4**			**0**	**0**	**4**	**0**						
G3																
	Commercial	0	0		**Shared Surface Lot**											
Townhouses	Residential	3,072	2	4												
	Total	**6,144**	**2**	**4**			**0**	**0**	**4**	**0**						
G4																
	Commercial	0	0		**Shared Surface Lot**											
Townhouses	Residential	3,072	2	4												
	Total	**6,144**	**2**	**4**			**0**	**0**	**4**	**0**						
G5																
	Commercial	0	0													
Townhouses	Residential	6,000	3	6	6	1.00										
	Total	**18,000**	**3**	**6**	**6**	**1.00**	**0**	**0**	**0**	**6**						
G6																
	Commercial	0	0													
Townhouses	Residential	5,000	3	5	5	1.00										
	Total	**15,000**	**3**	**5**	**5**	**1.00**	**0**	**0**	**0**	**5**						
H1																
Manor (existing)																
	Common Area (1)	8,033	1													
	Residential (2)	8,033	1													
	Residential (3-9)	8,033	7	100	59	0.59										
	Total	**72,297**	**9**	**100**	**59**	**0.59**			**n/a**		**37**	**106,725**	**2.45**			
J																
Open Space (existing)																
	Open Space	84,942	0													
	Total	**84,942**	**0**	-					**n/a**		**0**	**77,979**	**1.79**			

K1																	
	Commercial	0	0		Shared Surface Lot												
Townhouses	Residential	3,072	2	4	16	1.33											
	Total	**6,144**	**2**	**4**	**16**	**1.33**	**0**	**0**	**4**	**0**	**11**	**46,380**	**1.06**	**9,216**	**20%**	**2.7**
K2																	
	Commercial	0	0		Shared Surface Lot												
Townhouses	Residential	3,072	3	4													
	Total	**9,216**	**3**	**4**			**0**	**0**	**4**	**0**							
K3																	
	Commercial	0	0		Shared Surface Lot												
Townhouses	Residential	3,072	3	4													
	Total	**9,216**	**3**	**4**			**0**	**0**	**4**	**0**							

	Total Area (SF)	Total units	Parking Provided (On Site)	On-Site Parking Ratio	On-Street Parking*	Total stalls	Overall Parking Ratio	Total Lot Area (SF)	Lot Acres	Total Bldg. Coverage (SF)	Overall Coverage %	FAR
GRAND TOTAL	**560,846**	**600**	**352**	**0.59**	**137**	**489**	**0.82**	**636,352**	**14.61**	**153,748**	**24%**	**n/a**

*** Does NOT include parking on 32nd Ave.**

EXHIBIT D - HILLSIDE MASTER PLAN PARKING BY BUILDING												
From Master Plan				Floors	Number of Bedrooms*				Est. Unit Count		Parking	
Bld.	Use	Units	Area (SF)		1 BD	2BD	3BD	4BD	<=800 SF	>800 SF	Spaces Provided	Ratio
A1	Multi Mid	24	21,120	4	24				24	0	30	0.30
A2	Multi w/ Com	77	69,183	3	77				77	0		
B1	Multi Mid	44	38,061	3		44			44	0	38	0.35
B2	Multi Mid	64	63,004	4	25	39			64	0		
C1	Multi Mid	65	50,730	3	65				65	0	66	1.02
D1	Multi Mid	20	23,040	3		20			20	0	43	0.80
D2	Multi Mid	34	31,680	3	12	22			34	0		
E1	Multi w/ Com	69	46,546	3	69				69	0	31	0.33
E2	Multi Mid	24	21,120	4	24				24	0		
F1	Multi Mid	24	23,040	3		24			24	0	40	1.00
F2	Multi Mid	16	16,500	3	6	10			16	0		
G1	Multi Low	4	6,144	2			4		0	4	29	1.07
G2	Multi Low	4	6,144	2			4		0	4		
G3	Multi Low	4	6,144	2			4		0	4		
G4	Multi Low	4	6,144	2			4		0	4		
G5	Multi Low	6	18,000	3				6	0	6		
G6	Multi Low	5	15,000	3				5	0	5		
K1	Multi Low	4	6,144	2			4		0	4	16	1.33
K2	Multi Low	4	6,144	2			4		0	4		
K3	Multi Low	4	6,144	2			4		0	4		
New	**Subtotal**	**500**	**480,032**		**302**	**159**	**28**	**11**	**461**	**39**	**293**	**0.59**
H1 (Manor)	Multi Mid	100	72,297	10							59	0.59
Resid.	**Subtotal**	**600**	**552,329**								**352**	**0.59**

*The standards of OHCS Table N13.01 dictate minimum unit size for units qualifying for affordable housing tax credits (1 bedroom = 600 sq. ft. minimum; 2 bedroom = 800 sq. ft. minimum; 3 bedroom = 1000 sq. ft minimum). All units with over 2 bedrooms are assumed to be greater than 800 sq. ft.

EXHIBIT E - HILLSIDE MASTER PLAN PARKING REDUCTIONS

Master Plan Lot	Parking Provided	Code Required Minimum Parking* Res.	Code Required Minimum Parking* Comm.	Comparison to Minimum	Affordable Housing Reduction +		Revised Parking Req.++	Comparison to Minimum
A	30	101	0	-100	0%	0	130	-100
		0	29		n/a	n/a		
B	38	129	0	-91	25%	-32	97	-59
C	66	65	0	1	25%	-16	49	17
D	43	65	0	-22	25%	-16	49	-6
E	31	93	0	-94	0%	0	125	-94
		0	32		n/a	n/a		
F	40	49	0	-9	25%	-12	37	3
G	29	35	0	-6	25%	-9	26	3
H	59	59	0	0			59	0
K	16	15	0	1	25%	-4	11	5
All	**352**	**611**	**61**	**-320**	**-**	**-89**	**583**	**-231**

* Assumed average commercial parking rate of 3 spaces/1000 GSF

+ ITE Parking Manual, 5th Edition shows average parking rate for Affordable Housing (Income Limits) is ~75% of Multifamily Mid-Rise Housing

++ Revised parking requirement with reduction in parking rate for affordable housing

^Assumes that all commercial parking will be shared with residential parking based on combined hourly parking demand rates from the ITE Parking Generation Manual, 5th Editic

^^ Revised parking requirement with shared parking

Applies parking reduction of 20% to dwelling units within 500 feet of a high-frequency transit stop per MMC 19.605.3.B.2.b. Applies parking reduction of 10% to commercial dev

Revised parking requirement with shared parking & transit reduction.

@ On-street parking total excludes new spaces on 32nd Avenue. Total on-street parking is 156 if spaces on 32nd Avenue are included.

Shared Parking^	Revised Parking Req.^^	Comparison to Minimum	Proximity to Transit Reduction#		Revised Parking Req.##	Comparison to Minimum	On-Street Parking @	Comparison to Minimum
			Vehicles	%				
-29	101	-71	-20	-20%	81	-51	51	0
			0	0%				
	97	-59	-19	-20%	78	-40	40	0
	49	17	-10	-20%	39	27	3	30
	49	-6	-10	-20%	39	4		4
-32	93	-62	-19	-20%	74	-43	43	0
			0	0%				
	37	3	-7	-19%	30	10		10
	26	3	0	0%	26	3		3
	59	0			59	0		0
	11	5	0	0%	11	5		5
-61	**522**	**-170**	**-85**	**0%**	**437**	**-85**	**137**	**52**

›n.

velopment within 500 feet of a high-frequency transit stop per MMC 19.605.3.B.2.a.

ITE PARKING GENERATION MANUAL, 5TH EDITION

PARKING DEMAND BY TIME OF DAY

Time of Day	Affordable Housing (223)		Multifamily -Mid (221)		Small Office (712)		Coffee/Donut w/o Drive-Thru (936)		Fast Casual Restaurant (930)		Shopping Center (820)	
	Weekday	Saturday	Weekday	Saturday	Weekday	Saturday	Weekday	Saturday	Weekday	Saturday	Weekday	Saturday
12:00 AM			100%	100%								
5:00 AM			94%	99%								
6:00 AM			83%	97%					2%			
7:00 AM			71%	95%			73%	100%	2%			
8:00 AM			61%	88%	27%		100%	90%	5%	3%	15%	27%
9:00 AM			55%	83%	69%		63%	80%	14%	7%	32%	46%
10:00 AM			54%	75%	88%		57%	65%	17%	7%	54%	67%
11:00 AM			53%	71%	100%		42%	62%	18%	27%	71%	85%
12:00 PM			50%	68%	81%		39%	40%	100%	70%	99%	95%
1:00 PM			49%	66%	81%		27%	32%	75%	80%	100%	100%
2:00 PM			49%	70%	84%				45%	100%	90%	98%
3:00 PM			50%	69%	86%				31%	57%	83%	92%
4:00 PM			58%	72%	92%				23%	43%	81%	86%
5:00 PM			64%	74%	85%				49%	60%	84%	79%
6:00 PM			67%	74%	4%				77%	87%	86%	71%
7:00 PM			70%	73%					69%	53%	80%	69%
8:00 PM			76%	75%					28%	43%	63%	60%
9:00 PM			83%	78%					20%	33%	42%	51%
10:00 PM			90%	82%					11%	20%	15%	38%
11:00 PM			93%	88%								
Supply	1.3 spaces/DU		1.7 spaces/DU		3.9 spaces/KSF		7.1 spaces/KSF		11 spaces/KSF		5.1 spaces/KSF	
Average Demand	per DU (Income Limits)		per DU		per KSF GFA		per DU		per KSF GFA		per KSF GFA	
	0.99	0.79	1.31	1.22	2.56	NA	10.49	14.44	9.92	8.75	1.98	2.91
	76%	65%	Affordable as % of MF M									

LOT A - Estimated Parking Demand Using ITE Rates

Time of Day	Multifamily -Mid (221)		Shopping Center (820)		Combined Demand	
	Weekday	Saturday	Weekday	Saturday	Weekday	Saturday
Demand	132	123	179	263		
12:00 AM	132	123	0	0	132	123
5:00 AM	124	122	0	0	124	122
6:00 AM	110	119	0	0	110	119
7:00 AM	94	117	0	0	94	117
8:00 AM	81	108	27	71	108	179
9:00 AM	73	102	57	121	130	223
10:00 AM	71	92	97	176	168	268
11:00 AM	70	87	127	224	197	311
12:00 PM	66	84	177	250	243	334
1:00 PM	65	81	179	263	244	344
2:00 PM	65	86	161	258	226	344
3:00 PM	66	85	149	242	215	327
4:00 PM	77	89	145	226	222	315
5:00 PM	84	91	150	208	234	299
6:00 PM	88	91	154	187	242	278
7:00 PM	92	90	143	181	235	271
8:00 PM	100	92	113	158	213	250
9:00 PM	110	96	75	134	185	230
10:00 PM	119	101	27	100	146	201
11:00 PM	123	108	0	0	123	108
				MAX	344	

LOT E - Estimated Parking Demand Using ITE Rates

Time of Day	Multifamily -Mid (221)		Shopping Center (820)		Combined Demand	
	Weekday	Saturday	Weekday	Saturday	Weekday	Saturday
Demand	193	179	134	197		
12:00 AM	193	179	0	0	193	179
5:00 AM	181	177	0	0	181	177
6:00 AM	160	174	0	0	160	174
7:00 AM	137	170	0	0	137	170
8:00 AM	118	158	20	53	138	211
9:00 AM	106	149	43	91	149	240
10:00 AM	104	134	72	132	176	266
11:00 AM	102	127	95	167	197	294
12:00 PM	97	122	133	187	230	309
1:00 PM	95	118	134	197	229	315
2:00 PM	95	125	121	193	216	318
3:00 PM	97	124	111	181	208	305
4:00 PM	112	129	109	169	221	298
5:00 PM	124	132	113	156	237	288
6:00 PM	129	132	115	140	244	272
7:00 PM	135	131	107	136	242	267
8:00 PM	147	134	84	118	231	252
9:00 PM	160	140	56	100	216	240
10:00 PM	174	147	20	75	194	222
11:00 PM	179	158	0	0	179	158
				MAX	318	

Conclusion: Combined site use with shared parking does not exceed weekday residential parking demand at night based on ITE demand

OT A - Estimated Parking Demand Using Milwaukie Coc

Time of Day	Multifamily -Mid (221)		Shopping Center (820)		Combined Demand	
	Weekday	Saturday	Weekday	Saturday	Weekday	Saturday
Demand	101	101	29	29		
12:00 AM	101	101	0	0	101	101
5:00 AM	95	100	0	0	95	100
6:00 AM	84	98	0	0	84	98
7:00 AM	72	96	0	0	72	96
8:00 AM	62	89	4	8	66	97
9:00 AM	56	84	9	13	65	97
10:00 AM	55	76	16	19	71	95
11:00 AM	54	72	21	25	75	97
12:00 PM	51	69	29	28	80	97
1:00 PM	49	67	29	29	78	96
2:00 PM	49	71	26	28	75	99
3:00 PM	51	70	24	27	75	97
4:00 PM	59	73	23	25	82	98
5:00 PM	65	75	24	23	89	98
6:00 PM	68	75	25	21	93	96
7:00 PM	71	74	23	20	94	94
8:00 PM	77	76	18	17	95	93
9:00 PM	84	79	12	15	96	94
10:00 PM	91	83	4	11	95	94
11:00 PM	94	89	0	0	94	89
				MAX	101	

OT E - Estimated Parking Demand Using Milwaukie Coc

Time of Day	Multifamily -Mid (221)		Shopping Center (820)		Combined Demand	
	Weekday	Saturday	Weekday	Saturday	Weekday	Saturday
Demand	93	93	32	32		
12:00 AM	93	93	0	0	93	93
5:00 AM	87	92	0	0	87	92
6:00 AM	77	90	0	0	77	90
7:00 AM	66	88	0	0	66	88
8:00 AM	57	82	5	9	62	91
9:00 AM	51	77	10	15	61	92
10:00 AM	50	70	17	21	67	91
11:00 AM	49	66	23	27	72	93
12:00 PM	47	63	32	30	79	93
1:00 PM	46	61	32	32	78	93
2:00 PM	46	65	29	31	75	96
3:00 PM	47	64	27	29	74	93
4:00 PM	54	67	26	28	80	95
5:00 PM	60	69	27	25	87	94
6:00 PM	62	69	28	23	90	92
7:00 PM	65	68	26	22	91	90
8:00 PM	71	70	20	19	91	89
9:00 PM	77	73	13	16	90	89
10:00 PM	84	76	5	12	89	88
11:00 PM	86	82	0	0	86	82
				MAX	96	

Conclusion: Combined site use with shared parking does not exceed weekday residential parking demand at night based on parking requirements in Milwaukie Code but combined Saturday demand on Lot E would exceed residential demand by 3 spaces.

Hillside Master Plan - Water System Loads

SEA011

** Based on City of Milwaukie 2010 Water Master Plan (WMP)

Lot	Units	Average per capita demand (gpcd) WMP Sec. 4.1.4	ADD (gpd)	Max Day Demand (MDD), gpd Peak Factor = 1.9	Peak Hour Demand (PHD), gpd Peak Factor = 2.7	Remarks
A-units	113	116	13108	24905	35392	
A-Commercial (12,420sf)			375	713	1013	Commerical = to 1317 gpd/acre (normalized) per COM 2010 Water MP, Table 4-6
B	100	116	11600	22040	31320	
C	75	116	8700	16530	23490	
D	48	116	5568	10579	15034	
E-units	105	116	12180	23142	32886	
E-Commercial (13,816sf)			418	794	1129	Commerical = to 1317 gpd/acre (normalized) per COM 2010 Water MP, Table 4-6
F	34	116	3944	7494	10649	
G	20	116	2320	4408	6264	
H	100	116	11600	22040	31320	
K	12	116	1392	2645	3758	
Total	607					
		Totals	71205	135290	192254	

Totals by Lot	ADD (gpd)	MDD (gpd)	PHD (gpd)
A	13483	25618	36404
B	11600	22040	31320
C	8700	16530	23490
D	5568	10579	15034
E	12598	23936	34015
F	3944	7494	10649
G	2320	4408	6264
H	11600	22040	31320
K	1392	2645	3758
Totals	71205	135290	192254

Hillside Master Plan -Sanitary System Loads

SEA011

** Based on City of Milwaukie 2010 Sanitary Sewer Master Plan (SMP)

Lot	Units	Average multifamily residence flow per day (gpd/unit)	Average Daily Flow (gpd)	Daily Flow Peaking Factor = 2.5 (gpd)	Remarks
A-units	113	80	9040	22600	
A-Commercial (12,420sf)	8	80	640	1600	Commercial = to 8 residences (2010 Sewer MP, p. 4-3)
B	100	80	8000	20000	
C	75	80	6000	15000	
D	48	80	3840	9600	
E-units	105	80	8400	21000	
E-Commercial (13,816sf)	8	80	640	1600	Commercial = to 8 residences (2010 Sewer MP, p. 4-3)
F	34	80	2720	6800	
G	20	80	1600	4000	
H	100	80	8000	20000	
K	12	80	960	2400	
Total	623				
		Totals	49840	124600	

Totals by Lot	Avg Flow with 2.5 peaking factor (gpd)
A	24200
B	20000
C	15000
D	9600
E	22600
F	6800
G	4000
H	20000
K	2400
	124600

THE BOOKIN GROUP LLC

Land Use & Institutional Planning

Policy Analysis

Project Management

Group Facilitation

Minutes from the Ardenwald/Johnson Creek Neighborhood Association meeting
February 24, 2021
Hillside Park redevelopment

Prepared by Debbie Cleek on February 25, 2021

The meeting began with Jill Smith, the Executive Director of HACC, introducing the project and team. Next Ryan McCluckie with Scott|Edwards Architecture walked through the changes to the project that had occurred since the end of the public engagement process in December 2019. Then Debbie Cleek with the Bookin Group presented information about the Planned Development process and how phasing and dividing the lot would work. Finally, Devin Ellin with HACC described the process for funding affordable housing projects and how HACC would work with their partners to develop and manage the buildings. The presentation included a slide deck that included copies of the plans that were submitted to the City as part of the Preliminary Planned Development application.

Approximately 17 participants attended the meeting. The community members in attendance asked the following questions about the proposal:

- What is the number of on-street parking spaces proposed for each retail space? Are there dedicated spots for the retail businesses?
  Answer: 32nd Ave will be widened to provide on-street parking and HACC has requested that the City consider regulated (timed) parking for these spaced to encourage retail parking during the day. Also, there will be 1 or 2 spaces in the lots behind the businesses for staff and customers.

- As Lots A and E are sold to outside developers how will HACC assure that these private interests operate in a good and neighborly way?? What will be the mechanism for this?
  Answer: HACC will vet all interests that want to operate on the site. There will be management and maintenance agreements overlays across the development.

- Are there any development renderings or sample pictures available?
  Answer: Not at this time, the project is still in the conceptual phase

- How will this development impact the surrounding property values?
  Answer: This development will add neighborhood amenities and improve existing conditions, which should help to increase surrounding property values.

- What GMU retail uses will not be allowed on the site?
  Answer: No warehouses, light (or other) industrial/manufacturing or cannabis related activities or business will be allowed. The commercial uses will also be limited to a total of 20,000 sq. ft. between the two buildings.

- What (if anything) is being put into place to ensure the trees survive over a longer period of time and any that die will be replaced?
  Answer: We are unsure what City regulations govern the long-term health of the trees, but typically in most jurisdictions this is a compliance issue and missing trees need to be accounted for whenever new development is proposed. As a side note, the City of Milwaukie is currently in the process of writing their tree regulations so this might be something that is not currently regulated.

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97205

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bookingroup.com

- Will existing mature trees be preserved?
  Answer: 44 conifers and 35 deciduous trees on are proposed to be preserved on the site, primarily located in the Open Space area in the northwest corner of the site. The new street grid requires a lot of changes to the site, but new trees will be planted in all of the new streets, which the city will ultimately maintain. Additional trees will be planted on all of the lots after construction of each building.

- Are there higher income units on the site?
  Answer: There will be units for people making up to 80% of AMI on the HACC owned parcels, and potentially market rate units on the lots A & E that will be sold for private development. The City Planner has determined that the breakdown of units is 367 units of affordable housing and 233 units of market rate housing, so there will be options for many income levels.

- Will 32nd Avenue need to be expanded to allow for on-street parking?
  Answer: Yes, a significant amount of right-of-way is being dedicated from the west edge site to allow for the widening of 32nd Avenue.

- How wide is the landscape buffer on the north property line? How wide is this buffer adjacent to the parking areas? Is this wide enough to support large trees? Will any existing trees be preserved in this area of the site?
  Answer: The majority of the buffer along the north property line will be 15 feet wide, since all buildings will be setback from this property line at least 15 feet. The parking areas adjacent to the north property line will be 6 feet wide, in compliance with the City's parking lot landscaping standards, which is wide enough to support large trees. Three existing trees are being preserved on the north edge of the property but then are not located adjacent to the parking lot.

- How was usage for 29th determined? Will the traffic control bollards be removed later and the street opened to through traffic?
  Answer: The Traffic Impact Analysis submitted with the application analyzed how much cut-through traffic would be likely if 29th Avenue was a through street. It found that 29th Avenue is not really an attractive entrance/exit for the Hillside site since north of the Hillside the street is in need of improvement and the intersection at 32nd and Balfour is unsafe. Ultimately the decision on if 29th will be required to be a through street will be made by the Milwaukie Planning Commission. HACC would like to see this street continue as a bikeway, and emergency access when needed, but not a through street.

- How do we get information to the Planning Commission?
  Answer: The public notice should be sent out by the City of Milwaukie on March 3rd and will include directions on how to submit comments in writing until the hearing on March 23rd and/or how to attend the hearing in person.

CITY OF MILWAUKIE

March 24, 2021 Land Use File(s): PD-2020-002; TFR-2020-003

NOTICE OF DECISION

This is official notice of action taken by the Milwaukie Planning Commission on March 23, 2021.

Traducciones de este documento e información sobre este proyecto están disponibles en español. Para solicitar información o preguntar en español, favor de email espanol@milwaukieoregon.gov.

Applicant(s):	Jill Smith, Housing Authority of Clackamas County
Appellant (if applicable)	
Location(s):	2889 SE Hillside Ct
Tax Lot(s):	11E25CD 00100 & 00102
Application Type(s):	Preliminary Planned Development; Transportation Facilities Review
Decision:	Approved with Conditions
Review Criteria:	Milwaukie Land Division Ordinance: • MMC Title 17 Land Division (Subdivisions) Milwaukie Municipal Code: • MMC Title 12 Streets, Sidewalks, and Public Places (Access Management) Milwaukie Zoning Ordinance: • MMC Title 12 Streets, Sidewalks, and Public Places • MMC Section 19.1006 Type III Review • MMC Section 19.311 Planned Development Zone (PD) • MMC Section 19.302 Medium and High Density Residential Zones (including R-1) • MMC Section 19.303 Commercial Mixed Use Zones (including GMU) • MMC Title 17 Land Division • MMC Chapter 19.500 Supplementary Development Regulations

- MMC Chapter 19.600 Off-Street Parking and Loading
- MMC Chapter 19.700 Public Facility Improvements
- MMC Section 19.902 Amendments to Maps and Ordinances

Neighborhood(s): Ardenwald-Johnson Creek

This notice is issued in accordance with Milwaukie Municipal Code (MMC) Section 19.1006 Type III Review. The complete case file for this application is available for review. Please contact Vera Kolias, Senior Planner, at 503-786-7653 or koliasv@milwaukieoregon.gov, if you wish to view this case file.

Findings in Support of Approval

The Findings for this application are included as Exhibit 1.

Conditions of Approval

1. Per MMC 129.311.6.B, this approval of a preliminary planned development plan and program requires that the applicant submit within 18 months of the preliminary plan notice of decision, a final development plan and program, which will serve as an application for the PD zone change and comprehensive plan map amendment. The submittal deadline for the final development plan and program is September 24, 2022.
2. Applicant must consult with TriMet and implement best practices on the location and design of the proposed bus stops, bus pullouts, and other TriMet services for the development.

Laura Weigel

Laura Weigel, AICP
Planning Manager

Exhibits

1. Findings in Support of Approval

cc: Jill Smith, Housing Authority of Clackamas County (via email)
Devin Ellin, Housing Authority of Clackamas County (via email)
Debbie Cleek, The Bookin Group (via email)

Planning Commission (via email)
Leila Aman, Community Development Director (via email)
Steve Adams, City Engineer (via email)
Engineering Development Review (via email)
Samantha Vandagriff, Building Official (via email)
Stephanie Marcinkiewicz, Inspector/Plans Examiner (via email)
Harmony Drake, Permit Technician (via email)
Mike Boumann and Alex McGladrey, CFD#1 (via email)
NDA(s): Ardenwald-Johnson Creek (via email)
Interested Persons
Land Use File(s): PD-2020-002

Findings for Approval
File #PD-2020-002, Hillside Preliminary Development Plan

Sections of the Milwaukie Municipal Code not addressed in these findings are found to be inapplicable to the decision on this application.

1. The applicant, Jill Smith, representing the Housing Authority of Clackamas County (HACC), has applied for approval of a preliminary planned development plan and program at the site known as Hillside Park and Hillside Manor at 2889 SE Hillside Ct. This site is in the R-3 Zone. The land use application file number is PD-2020-002.

2. The proposal is for a multi-unit dwelling development. Hillside Manor, the tower, which was partitioned onto a separate lot in early 2020, will remain on site and be refurbished. The remainder of the 16-acre site is proposed to be redeveloped with apartments and mixed-use buildings for a total of 600 units on the property (400 new units, 100 replacement units, and 100 units in the Hillside Manor tower) at the end of all phases of development. The proposed development is being submitted as a Planned Development application to provide more flexibility related to development standards and maximum density. The subject application has been submitted for preliminary development plan review.

3. The proposal is subject to the following provisions of the Milwaukie Municipal Code (MMC):
    - MMC Title 12 Streets, Sidewalks, and Public Places
    - MMC Section 19.1006 Type III Review
    - MMC Section 19.311 Planned Development Zone (PD)
    - MMC Section 19.302 Medium and High Density Residential Zones (including R-1)
    - MMC Section 19.303 Commercial Mixed Use Zones (including GMU)
    - MMC Title 17 Land Division
    - MMC Chapter 19.500 Supplementary Development Regulations
    - MMC Chapter 19.600 Off-Street Parking and Loading
    - MMC Chapter 19.700 Public Facility Improvements
    - MMC Section 19.902 Amendments to Maps and Ordinances

    Only the sections relevant to the decision for denial of the application are addressed below.

4. The application submittal includes a proposed preliminary Planned Development and Transportation Facilities Review. Of the application components, the preliminary Planned Development requires the highest level of review (Type III); as per MMC Subsection 19.1001.6.B, both are being processed with Type III review.

    The application has been processed and public notice provided in accordance with MMC Section 19.1006 Type III Review. As required by MMC Subsection 19.1002.2, a preapplication conference was held on December 12, 2019. Public notice was sent to property owners and current residents within 300 ft of the subject property. As required by law, a public hearing with the Planning Commission was held on March 23, 2021.

5. MMC Title 12 Streets, Sidewalks, and Public Places

   a. MMC Chapter 12.16 Access Management

      MMC Section 12.16.040 establishes standards for access (driveway) requirements, including access spacing, number and location of accessways, and limitations for access onto streets. Spacing criteria are based upon several factors, including stopping sight distance, ability of turning traffic to leave a through lane with minimal disruption to operation, minimizing right turn conflict overlaps, maximizing egress capacity, and reducing compound turning conflicts where queues for turning/decelerating traffic encounter conflicting movements from entering/exiting streets and driveways.

      Through review of the applicant's TIS, the City's traffic consultant found the proposed site access at Meek Street would meet the City's spacing standard of 300 feet for collector streets. The access on Dwyer Street was measured to be 240 feet away from the nearest driveway to the north. However, Dwyer Street is located some 410 feet from the next intersection at Harvey Street, which meets access spacing requirements. Having the second site access street be an extension of Dwyer Street is also an improvement from existing conditions. Also, the development will remove six existing driveways along this section of 32nd Avenue resulting in improved safety. Additionally, a left turn lane will be required for north bound SE 32nd Ave at Meek St as mitigation for expected trip increases. This left-turn pocket must be constructed either prior to, or concurrently with, that phase of development, which creates greater than 325 residential units.

      As conditioned, the development is consistent with the applicable standards of MMC 12.16.

   b. MMC Chapter 12.24 Clear Vision at Intersections

      MMC 12.24 establishes standards for maintenance of clear vision at intersections to protect the safety and welfare of the public in their use of City streets.

      Through review of the applicant's TIS, the City's traffic consultant found both proposed new driveways, at Meek Street and Dwyer Street, were found to meet stopping sight distances but intersection sight distance for turning vehicles was not met for the Meek Street driveway to the south, due to some foliage obstructions, however this has since been remedied through code enforcement. With construction of new roadways and driveways, the applicant must verify required site distance is obtained.

      As conditioned, all driveways, accessways, and intersections associated with the proposed development conform to the applicable standards of MMC 12.24.

   The City Council finds that, as conditioned, the development meets all applicable requirements of MMC Title 12. This standard is met.

6. MMC Title 17 establishes the regulations governing land division.

   a. MMC Chapter 17.12 Application Procedure and Approval Criteria

MMC Section 17.12.040 establishes the approval criteria for a preliminary plat. The proposed plans meets these criteria as described below.

(1) MMC Subsection 17.12.040.A.1 requires that the proposed preliminary plat complies with Title 19 Zoning and other applicable ordinances, regulations, and design standards.

As demonstrated by the applicant's submittal materials and evidenced by these findings, the proposed subdivision complies with the applicable ordinances, regulations, and design standards. As proposed, this criterion is met.

(2) MMC Subsection 17.12.040.A.2 requires that the proposed boundary will allow reasonable development and will not create the need for a variance of any land division or zoning standard.

The proposed boundary will provide sufficient area on each parcel to accommodate future development in accordance with the standards of the underlying R-2 zone. The parcels do not have physical constraints or dimensional limitations that would necessitate the need for variances in the future. As proposed, this criterion is met.

(3) MMC Subsection 17.12.040.A.3 requires that the proposed subdivision plat name is not duplicative and the plat otherwise satisfies the provisions of ORS 92.090(1).

The proposed boundary results in ten parcels in a three-phase development program.

(4) MMC Subsection 17.12.040.A.4 requires that the streets and roads in the proposed subdivision are laid out so as to conform to the plats of subdivisions already approved for adjoining property as to width, general direction, and in all other respects unless the City determines it is in the public interest to modify the street or road pattern.

(5) MMC Subsection 17.12.040.A.4 requires that the application include a detailed narrative description demonstrating how the proposal conforms to all applicable code sections and design standards.

As proposed, this criterion is met.

As proposed, the City Council finds that the proposed boundary meets the applicable criteria.

b. MMC Chapter 17.28 Design Standards

MMC 17.28, particularly MMC Section 17.28.040, establishes standards for lot design for land divisions and boundary changes.

(1) MMC Subsection 17.28.040.A requires that the lot size, width, shape, and orientation shall be appropriate for the location and the type of use contemplated, as well as that minimum lot standards shall conform to Title 19.

The proposed lots are generally rectangular in shape and meet the minimum area requirements for the proposed re-zoning to R1 and GMU zones. All lots conform to the relevant standards of the proposed zones as described in Finding 7 and to other applicable

standards of Title 19 as described elsewhere in these findings. The size and shape of the lots were primarily dictated by a desire to create a street grid that is more rectilinear to improve overall site circulation and safety. Additionally, the need to connect the new streets into the existing street network that surrounds the site skewed the grid pattern. Each lot is an appropriate size to develop with multi-family buildings while also providing open space amenities and adequately meeting the development standards such as parking, pedestrian circulation, and landscaping.

(2) MMC Subsection 17.28.040.B requires that lot shape shall be rectilinear, except where not practicable due to location along a street radius, or existing lot shape. The sidelines of lots, as far as practicable, shall run at right angles to the street upon which the lots face. As far as practicable, the rear lot line shall run parallel to the street.

The proposed lots are generally rectangular in shape and meet the minimum lot standards in Title 19. As described above, the desire to redevelop the streets in a 90-degree grid pattern will result in the majority of the proposed lots being rectilinear. The location of the Manor tower and surrounding parking, which will remain on the site, results in Lots H, C and K being skewed and not having right angles on all corners. Additionally, new 29th Ave will need to connect to the existing right of way in the neighborhood to the north, creating irregular angles in Lots G and K. Except for these variations, the side and rear lot lines will run parallel to the new streets as much as practical.

(3) MMC Subsection 17.28.040.C limits compound lot lines for side or rear lot lines.

The only lot line in the development that includes changes in direction is the rear lot line of Lot K. This lot line backs up the Manor and the open space tract (Lot J) both of which are existing features of the site with boundaries that follow the slope of the existing site topography. Though lot K will feature a compound lot line on the rear, the change in direction will not exceed the 10% requirement and this standard is met. MMC Subsection 17.28.040.D allows lot shape standards to be varied pursuant to MMC 19.911.

No variances to the lot shape standards are requested in this application.

(4) MMC Subsection 17.28.040.E limits double frontage and reversed frontage lots, stating that they should be avoided except in certain situations.

Several of the lots included in the subdivision will comprise full city blocks with frontages on all four sides. Therefore, Lots A, B, C, D, E, and G will all be considered double frontage lots. Through Section 19.311.3, a modification is requested to allow double frontage lots because the proposed subdivision represents a unique situation where full-sized, urban-scale blocks are being created.

(5) MMC Subsection 17.28.040.F requires that, pursuant to the definition and development standards contained in Title 19 for frontage, required frontage

shall be measured along the street upon which the lot takes access. This standard applies when a lot has frontage on more than one street.

As proposed, all of the proposed lots will exceed the minimum frontage requirement of R1 and GMU zones.

As proposed, the Planning Commission finds that the new lots presented in the applicant's preliminary plat meet the applicable design standards established in MMC 17.28.

c. MMC Chapter 17.32 Improvements

MMC 17.32 establishes procedures for public improvements, including a requirement that work shall not begin until plans have been approved by the City.

As discussed in Finding 11, physical improvements are required as a result of the proposed Planned Development.

As conditioned, the Planning Commission finds that the applicable standards of MMC 17.32 are met.

7. MMC Chapter 19.300 Base Zones

As a Planned Development, the proposed subdivision is subject to the requirements for Planned Developments as established in MMC Section 19.311. The Planned Development (PD) zone is a superimposed zone applied in combination with regular existing zones. The subject property is zoned R-3, but the application proposes to re-zone the property to a combination of Residential R-1 and General Mixed Use (GMU). The underlying zone requirements of MMC Section 19.302 and Section 19.303 are relevant and must be addressed as well. These findings will analyze compliance with the proposed new base zones.

a. MMC Section 19.311 Planned Development Zone (PD)

The purpose of a Planned Development (PD) zone is to provide a more desirable environment than is possible through the strict application of Zoning Ordinance requirements, encouraging greater flexibility of design and providing a more desirable use of public and private common open space. PD zones can promote variety in the physical development pattern of the city and encourage a mix of housing types.

(1) MMC Subsection 19.311.2 Use

The City Council approves the final development plan of a PD zone, in consideration of the proposal's conformance to the following standards:

(a) Conformance to the City's Comprehensive Plan

As addressed in more detail in Findings 8 and 12, the proposed Planned Development conforms to the City's Comprehensive Plan and is consistent with the relevant policies and goals.

(b) Formation of a compatible and harmonious group

As proposed, the development is a re-imagined mixed-use and mixed-income community on the site of an existing affordable housing community. The site, which already features multi-family housing, serves as a transition between the higher density commercial uses to the south and the single-family houses to the north. The entire development will create a harmonious micro-neighborhood that will be characterized by green streets, abundant open space amenities, and landscaping that will be consistent throughout the site.

(c) Suitability to the capacity of existing and proposed community utilities and facilities

The existing public utilities and facilities in the vicinity of the subject property are all of sufficient size and capacity to support the proposed development. As required, the new utilities provided within the proposed development itself will be suitable to serve it. As demonstrated in the Transportation Impact Study, the surrounding street network has adequate capacity available to support the increase in density on the site. The existing utilities that currently serve Hillside Park will be updated in the process of relocating them to assure that there is adequate capacity to serve all of the future buildings. Services such as school capacity and fire/police protection is available to serve the proposed uses and densities. Therefore, the site is suited to the proposal and this criterion is met.

(d) Cohesive design and consistency with the protection of public health, safety, and welfare in general

The grid network proposed for the new streets will increase safety in the area by allowing for better visibility at corners and aligning the intersection at 32nd Ave and Dwyer St to the existing street to the east. Public health will be improved by creating an emphasis on walking and outdoor recreation through the improved pedestrian circulation network and open spaces. Finally, public welfare will be addressed by providing more affordable housing units in the City of Milwaukie, where they are critically needed (as indicated by the City of Milwaukie's Housing Needs Analysis). This criterion is met.

(e) Affordance of reasonable protection to the permissible uses of properties surrounding the site

The northern edge of the proposed development will protect the privacy of the single unit dwellings to the north by providing a landscape buffer that will be fully planted to screen the surrounding properties. Additionally, all of the buildings along the north edge will be limited to two stories to be compatible with the houses to the north. The connection of 29th Ave is proposed as a pedestrian route and bikeway with restricted, gated access for emergency vehicles, prohibiting cut-through vehicle traffic in the neighborhood to the north. The addition of commercial uses on the ground floor of the buildings facing 32nd Ave will be an amenity to the residents and surrounding neighborhood, and the limitations proposed to the permitted GMU uses will assure that these small commercial

businesses will be compatible with the development on the site and the surrounding area. This criterion is met.

(2) MMC Subsection 19.311.3 Development Standards

MMC 19.311.3 establishes that the various applicable standards and requirements of MMC Title 19, including those of the underlying zone(s), are applicable in a PD zone, unless the Planning Commission grants a variance from those standards in its approval of the PD or the accompanying subdivision plat. The City Attorney has concurred with the conclusion of City staff that a formal variance request is not required for adjustments related to the flexibility inherent in the stated purpose of the PD zone to encourage greater flexibility of design and provide a more efficient and desirable use of common open space, with an allowance for some increase in density as a reward for outstanding design (e.g., housing type, lot size, lot dimension, setbacks, and similar standards).

(a) Minimum Size of a PD Zone

MMC Subsection 19.311.3.A requires that a PD Zone may be established only on land that is suitable for the proposed development and of sufficient size to be planned and developed in a manner consistent with the purposes of this zone.

The subject property is approximately 16 acres in size and provides an adequate area for development. This includes the provision of a mix of housing types and uses, greater flexibility in the development standards to create a cohesive design concept for the entire site, and to provide for larger swaths of open space that will offer better amenities to the residents of Hillside. The site is located in an area that is well-served by the existing transportation network, utility infrastructure, and services.

(b) Special Improvements

MMC Subsection 19.311.3.B establishes the City's authority to require the developer to provide special or oversize sewer lines, water lines, roads and streets, or other service facilities.

It is not anticipated that special or oversized utility lines or roads will be necessary to develop the Planned Development that is being proposed. All the existing infrastructure currently serving the site will be removed and replaced in phases and will be appropriately sized to serve the development proposed.

(c) Density Increase and Control

MMC Subsection 19.311.3.C allows an increase in density of up to 20% above the maximum allowed in the underlying zone(s), if the City Council determines that the proposed Planned Development is outstanding in planned land use and design and provides exceptional advantages in

living conditions and amenities not found in similar developments constructed under regular zoning.

As discussed elsewhere in these Findings, the portions of the site that will have the Comprehensive Plan designation of High Density Residential will exceed the maximum density of 24 dwelling units permitted in this designation. Lots D, F, G, H, J and K combined will have a density of 24.27 dwelling units per acre, which is well below the 20% increase above the density range permitted by this standard. This modest increase in density will be offset by the abundant open space and other outdoor amenities that will be provided throughout the site for the benefit of the residents.

The development will provide 600 units of housing with a range of affordability from 30% and below of the area median income to 80% and below of area median income.

The Planning Commission finds that the proposed development provides sufficiently outstanding design features to justify minimal density increase.

(d) Peripheral Yards

MMC Subsection 19.311.3.D requires that yards along the periphery of any Planned Development zone be at least as deep as the front yard required in the underlying zone(s). Open space may serve as peripheral yard.

The west side of the site is bounded by the railroad and across the railroad corridor the zoning is NME - North Milwaukie Employment Zone. The development proposal includes a thick landscape buffer along the west property line to assure that the residential buildings in the development will be adequately buffered from the noise of the railroad.

The properties to the south across Meek St and southeast across 32nd Ave are zoned GMU and currently undeveloped. The GMU zone encourages buildings to be close to street lot lines and provide an active frontage with public entrances, façade features and windows, therefore screening and buffering along the south property line of the site would not be appropriate with the GMU zoning.

The properties northeast across 32nd Ave are zoned R3 and are mostly developed as Providence Milwaukie Hospital. Proposed Lot E on the Hillside site will be zoned GMU and will need to meet maximum setback and frontage occupancy standards that would not make buffering and screening from the hospital across 32nd Ave practical. Lot F will be zoned R-1 and will be across 32nd Ave from an existing townhouse development. The buildings proposed on Lot F will be set back with the required front yard minimum of the R-1 zone of 15 ft, which will allow for a large area that will be planted with trees and landscaping to soften and screen the buildings from the townhouses across the street.

The neighborhood to the north is zoned R-7 and developed with single-family houses. The proposed buildings along the northern boundary will be set back from

the property line a minimum of 15 ft (the front yard setback of the R-1 zone). This setback will provide a wide landscape buffer that will be planted with trees and tall shrubs that will help obscure views and absorb sounds to protect the privacy of the neighboring houses. Additionally, all of the buildings that abut the northern property line will be limited to 2 stories in height.

With the proposed setbacks and landscape buffering from the properties to the north and northeast, the peripheral yard standards will be met for the proposed Planned Development.

(e) Open Space

MMC Subsection 19.311.3.E requires that a Planned Development set aside land as open space for scenic, landscaping, or other recreational purposes within the development. A minimum of one-third of the gross area of the site must be provided as open space and/or outdoor recreational areas, with at least half of this area being of the same general character as the area containing dwelling units.

The gross area of the subject property is approximately 19.5 acres, so a minimum of 5.85 acres must be provided as open space. The proposal provides open space and recreational areas dispersed throughout the site that will provide outdoor spaces in an equitable way for all the residents of Hillside. By creating larger swaths of open space (versus small open areas dedicated to each residential unit) more resources can be placed in these open areas in the form of playground equipment, sports equipment, outdoor furnishing, and landscaping, which will collectively provide better overall amenities.

The proposed open space plan includes a total of 7.8 acres of usable open space, which is 40% of the site. This is a combination of 6.8 acres of planted area (including the 1.8-acre large open area in the northwest corner) and approximately 0.9 acres of "paved" open space areas, such as playgrounds and plazas.

(3) MMC Subsection 19.311.6 Planning Commission Review of Preliminary Development Plan and Program

MMC 19.311.6 establishes that the Planning Commission shall review an applicant's preliminary development plan and program for a PD and shall notify the applicant whether the proposal appears to satisfy the provisions of this section or has any deficiencies. Upon the Commission's approval in principle of the preliminary plan and program, the applicant shall file a final development plan and program and an application for zone change.

The applicant has submitted a preliminary development plan and program, which was processed as a Type III application for the purposes of noticing and establishing review by the Planning Commission. After receiving an "approval in principle" of the preliminary development plan from the Planning Commission, the applicant must initiate a Type IV review process by submitting a final development plan along with a

proposed subdivision and any other applicable reviews within 18 months. The Planning Commission would then consider the application package and make a recommendation to the City Council for a final decision.

(4) MMC Subsection 19.311.8 Land Division

MMC 19.311.8 requires that the submittal of a final development plan and program be accompanied by an application for subdivision preliminary plat, where the PD involves the subdivision of land.

The proposal includes a proposed subdivision. The preliminary planned development includes information about the proposed subdivision and a preliminary plat will be submitted as part of the final development plan and program.

(5) MMC Subsection 19.311.9 Approval Criteria

MMC 19.311.9 requires that the approval authority may approve, approve with conditions, or deny the proposed PD zone based on the following criteria:

(a) Substantial consistency with the proposal approved with Subsection 19.311.6

The applicant has submitted a preliminary development plan and program, including a phasing plan.

(b) Compliance with Subsections 19.311.1, 19.311.2, and 19.311.3

As demonstrated by these findings, the proposed development complies with these sections.

(c) The proposed amendment is compatible with the surrounding area based on the following factors:

(i) Site location and character of the area.

(ii) Predominant land use pattern and density of the area.

(iii) Expected changes in the development pattern for the area.

The proposed Planned Development will allow the site to redevelop in a way that is more efficient, practical, and sustainable than the current Hillside Park development. The site will feature a mix of housing types as well as providing both affordable and market rate options. The mixed-use buildings will provide the opportunity to add some small, neighborhood focused commercial uses to the site that will enhance the area. The increase in residential density on the site will be balanced by the abundant recreational amenities and open space opportunities that will include plazas, playgrounds, and open fields. Additionally, the existing streets and infrastructure will be replaced with a safer and better-connected street network that will feature wide, protected sidewalks, bike lanes, and landscape planters with street trees. The flexibility provided by the Planned Development zone allows the proposal to meet the purpose of the zone by providing a variety of

housing choices in a development pattern that will be aesthetically pleasing to both the residents and the neighborhood.

The Preliminary Planned Development includes the proposal to change the Comprehensive Plan designation of the site from Medium Density Residential to a combination of High Density Residential and Town Center. The applicable policies of each of these proposed designations are demonstrated in these Findings. The type of housing proposed on the site, the adjacency of similar uses and development intensities in the area, and the availability and adequacy of the surrounding street system and utility infrastructure make the Hillside site able to conform to the policies of each of these new designations.

The entire development will create a harmonious micro-neighborhood that will be characterized by green streets, abundant open space amenities, and landscaping that will be consistent throughout the site.

As demonstrated in the Traffic Impact Study submitted with the proposal, the surrounding street network has adequate capacity available to support the increase in density on the site. Additionally, the existing utilities that currently serve Hillside Park will be updated in the process of relocating them to assure that there is adequate capacity to serve all of the future buildings. Services such as school capacity and fire/police protection has been found to be available to serve the proposed uses and densities.

The grid network proposed for the new streets will increase safety in the area by allowing for better visibility at corners and aligning the intersection at 32nd Ave and Dwyer St to the existing street to the east. Public health will be improved by creating an emphasis on walking and outdoor recreation through the improved pedestrian circulation network and open spaces. Finally, public welfare will be addressed by providing more affordable housing units in the City of Milwaukie, where they are critically needed (as indicated by the City of Milwaukie's Housing Needs Analysis).

The northern edge of the proposed development will protect the privacy of the single-family houses to the north by providing a lush landscape buffer that will be fully planted to screen the surrounding properties. Additionally, all of the buildings along the northern edge will be limited to two stories to be compatible with the houses to the north. The connection of 29th Ave is proposed as a pedestrian path and bikeway with a locked access gate for use by emergency vehicles, prohibiting cut-through vehicle traffic in the neighborhood to the north. The addition of commercial uses on the ground floor of the buildings facing onto 32nd Ave will be an amenity to the residents and surrounding neighborhood, and the limitations proposed to the permitted GMU uses will assure that these small commercial businesses will be compatible with the development on the site and the surrounding area.

As demonstrated in these Findings, the site meets the minimum lot size requirement for the PD Zone and there are no special improvements that will be required. The proposed residential densities will be blended across the site but in no case will they be greater than 20% of what is allowed in the High Density Residential Comprehensive Plan designation (24 dwelling units per acre). Peripheral yards screening adjacent existing developments will be provided where appropriate, primarily along the northern property line to screen the residential development to the north and on the western property line to abate noise from the railroad. Overall, the site will include an abundance of Open Space exceeding the one-third requirement for planned developments at the end of the third phase.

The major change anticipated for this area would be the future development of the Murphy site located to the south of the subject site and zoned GMU. This 7-acre site is identified in the Central Milwaukie Land Use and Transportation Plan as an "Opportunity Site," since it is a large, vacant site with high visibility and good access to transportation and services. It is envisioned to be developed with a mix of uses that might including 3- to 4-story multi-family residential buildings, commercial uses, and flex space for light industrial. Given the wide range of uses and densities that are permitted for this site, it is hard to predict what the final development plan will be. However, by zoning the lower half of the Hillside site GMU and proposing higher-density mixed use buildings for this part of the site, it will increase the likelihood that the future use on the Murphy site will be compatible with the Hillside site.

(d) The need is demonstrated for uses allowed by the proposed amendment

The most recent study of housing inventory in the City of Milwaukie was done in 2016 and presented as the Milwaukie Housing Needs Analysis (HNA). Key findings of this study include:

- *A comparison of estimated current housing demand with the existing supply identifies a general need for rental units at the lowest price level:*
    - *30% of all needed units are projected to be multi-family in structures of 5+ attached units*
    - *The greatest need for both ownership and rental units is found at lower price points. This reflects the findings that an estimated 37% of Milwaukie households are rent-burdened and currently pay more than 30% of their income towards housing costs.*
- *There is also a current need for more affordable units. In order for all households, both existing and new, to pay 30% or less of their income towards housing in 2036, a total of 1,189 rental units affordable at $900 per month or less are required.*
- *As demand increases, prices rise, and the remaining land within the UGB is developed, denser forms of development and creative reuse of parcels*

through infill and redevelopment will become necessary. As stated in the application materials, the proponents understand the needs of the rental market as they own a large portfolio of apartment communities ranging in affordability. They have found a gap in the availability of the proposed apartment types. Within their community, they have a waiting list for the type of accommodations this project is providing. The City of Milwaukie's Comprehensive Plan recognizes increased housing is a need and the Planning Commission has identified increased housing opportunity and supply as a top goal for the city.

The proposed Planned Development will add 400 new units to the existing Hillside Park site, with a large portion of those units being built as affordable housing. This will directly address the public needs identified in the Housing Needs Analysis. Additionally, because the 100 existing residential houses on the site will be replaced with the proposal, no viable housing stock will be taken out of the current housing inventory.

(e) The subject property and adjacent properties presently have adequate public transportation facilities, public utilities, and services to support the use(s) allowed by the proposed amendment, or such facilities, utilities, and services are proposed or required as a condition of approval for the proposed amendment

As demonstrated elsewhere in these Findings, adequate infrastructure will be available to serve the site. All of the existing streets and utilities serving the site will be removed and rebuilt to support the proposed new development. These changes will result in streets that are safer for all modes of travel and that align better to the existing street network in the area. The new utilities will be built to meet current development standards and adequate capacity in the existing sewer, storm, and water systems to support the proposed uses has been demonstrated with capacity studies submitted with the application. The site is well served by public transit by the #75 bus that operates along 32nd Ave with two bus stops along the site frontage. Fire services are provided to the site from the Clackamas County Fire District #1 and police services from the City of Milwaukie Police Department and both these public services are adequate to serve the site. The local school district has capacity available to serve an increase in student population.

(f) The proposal is consistent with the functional classification, capacity, and level of service of the transportation system. A transportation impact study may be required subject to the provisions of Chapter 19.700.

A transportation impact study has been included as part of application submittal. See Finding 11 for details.

(g) Compliance with all applicable standards in Title 17 Land Division

As detailed in Finding 5, the proposed preliminary development complies with the applicable standards in Title 17. A preliminary plat is required with the final development plan application.

(h) Compliance with all applicable development standards and requirements

As conditioned, and as detailed in these Findings, the proposed development complies with the applicable development standards and requirements.

(i) The proposal demonstrates that it addresses a public purpose and provides public benefits and/or amenities beyond those permitted in the base zone

As demonstrated elsewhere in these Findings, the HNA has identified an immediate need for more multi-family housing and more affordable housing to meet the current and future needs of the population of Milwaukie. By allowing the Hillside site to redevelop, the Planned Development can help address this need by adding 400 new units housing that will be available to a variety of household sizes and incomes. Within the proposed development, these new residential units will be located in a park-like setting that will feature large outdoor recreation areas that will appeal to different populations and age groups. Additionally, all of the new streets and infrastructure will create a safe and well-functioning neighborhood with a strong emphasis on alternate modes of transportation and community gathering. All of these amenities for the future residents will be made possible by allowing the entire site to be designed under a single Planned Development review, allowing for efficient use of the land, a cohesive design across the site, and the modification of standards to better fit the concept for the development and the unique aspects of the site.

As conditioned, the Planning Commission finds that the proposed development meets the approval criteria.

The Planning Commission finds that the applicable standards and requirements of MMC 19.311 are met. A condition of approval has been included requiring a final development plan to be submitted within 18 months as required in MMC 19.311.6.

b. MMC Section 19.302 Medium and High Density Residential Zones (including R-1)

The subject property is zoned Residential R-3. The application includes a proposed rezoning of the site to both R-1 and GMU. As noted in Finding 7-a(2), although the underlying zone standards are primarily applicable, the PD zone allows adjustment to some of those standards. This applies to such underlying zone limitations as housing type, lot size, lot dimension, setbacks, and similar standards that relate to flexibility of design, greater efficiency in the use of common open space, and minor increases in density allowed as a reward for outstanding design.

(1) Permitted Uses

As per MMC Table 19.302.2, multifamily development is an outright permitted use in the R-1 zone.

The proposal includes 600-units of multifamily housing.

(2) Lot and Development Standards

As discussed in Finding 7-a(2), above, adjustments to underlying zone standards that are related to the flexibility of design afforded by the PD process are allowed and do not require a formal variance request. Table 7-b(2) compares the applicable standards for development of the lots in the R-1 zone with the standards proposed as the final development plan and program for this PD zone.

Table 7-b(2)

Standard	R-1 Requirement	Proposed R-1 PD Requirement Lots D, F, G, H (Manor), and K
1. Minimum Lot Size	5,000 sq ft	0.99 ac – 2.45 ac
2. Minimum Lot Width	50 ft	100 ft – 298 ft
3. Minimum Lot Depth	80 ft	100 ft – 328 ft
4. Minimum street frontage	35 ft	97 ft – 298 ft
5. Front Yard	15 ft	10 ft (modification requested)
6. Side Yard	5 ft	5 ft
7. Rear Yard	15 ft	36 ft
8. Street Side yard	15 ft	5 ft – 10 ft (modification requested)
9. Maximum Building Height	3.5 stories or 45 ft (whichever is less; with additional 10% vegetation)	2- 3 stories (10 stories in Manor tower – existing)
10. Maximum lot coverage	45%	20% - 35% (7% for Lot H) (modification requested)
11. Minimum vegetation	15%	15% (38% for Lot H)
12. Minimum density	25 units per acre (232 units)	233 units
13. Maximum density	32 units per acre (297 units)	233 units (modification requested to allow lots D, F, and H to exceed max. density – see table below)

The lots and development standards that will govern development on the subject property are shown in Table 7-b(2) and effectively establish a component of the final development plan and program for this PD zone.

c. MMC Section 19.303 Commercial Mixed Use Zones (including GMU)

The subject property is zoned Residential R-3. The application includes a proposed rezoning of the site to both R-1 and GMU. As noted in Finding 7-a(2), although the underlying zone standards are primarily applicable, the PD zone allows adjustment to some of those standards. This applies to such underlying zone limitations as housing type, lot size, lot dimension, setbacks, and similar standards that relate to flexibility of design, greater efficiency in the use of common open space, and minor increases in density allowed as a reward for outstanding design.

(1) Permitted Uses

As per MMC Table 19.303.2, multifamily and mixed-use development is an outright permitted use in the GMU zone.

The proposal includes 600 units of multifamily housing and mixed use development.

(2) Lot and Development Standards

As discussed in Finding 7-a(2), adjustments to underlying zone standards that are related to the flexibility of design afforded by the PD process are allowed and do not require a formal variance request. Table 7-b(2) compares the applicable standards for development in the R-2 zone with the standards proposed as the final development plan and program for this PD zone.

Table 7-b(2)

Standard	GMU Requirement	Proposed GMU PD Requirement Lots A, B, C, and E
1. Minimum Lot Size	1,500 sq ft	1.3 ac – 1.4 ac
2. Minimum street frontage	25 ft	175 ft – 305 ft
3. Minimum density	25 units per acre (standalone residential; no min. for mixed-use buildings)	Lot A (mixed-use): 75 du/ac Lot B (residential): 78 du/ac Lot C (residential): 50 du/ac Lot E (mixed-use): 67 du/acre
13. Maximum density	50 units per acre (standalone residential; no max. for mixed-use buildings)	Lot A (mixed-use): 75 du/ac Lot B (residential): 78 du/ac Lot C (residential): 50 du/ac Lot E (mixed-use): 67 du/acre

The lots and development standards that will govern development on the subject property are shown in Table 7-b(2) and effectively establish a component of the final development plan and program for this PD zone.

Overall Density				
Lot	Approx. Area	Number of Units	Zoning	Density
Lot A	1.3 acres	101	GMU	75 du/acre
Lot B	1.4 acres	108	GMU	78 du/acre
Lot C	1.3 acres	65	GMU	50 du/acre
Lot D	1.4 acres	54	R-1	39 du/acre
Lot E	1.4 acres	93	GMU	67 du/acre
Lot F	1 acre	40	R-1	40 du/acre
Lot G	1.5 acres	27	R-1	18 du/acre
Lot H (Manor)	2.5 acres	100	R-1	37 du/acre
Lot J (Open Space)	1.8 acres	0	R-1	0
Lot K	1.1 acres	12	R-1	11 du/acre
Total	14.6 acres	600		41 du/acre

The maximum density permitted in the R1 zone is 32 units per acre. In the GMU zone there is no maximum density for mixed-use buildings but a limit of 50 units per acre for stand-alone residential buildings. MMC 19.311.3.C allows the density to be blended across the site. As shown in the table above, several of the proposed R-1 zoned lots will exceed the maximum density of the R-1 zone because some of the density of the GMU zone will be transferred to these lots. The overall density of the entire development will be 41 dwelling units per acre, which falls between the maximums allowed in R-1 and GMU zones.

The Planning Commission finds that, as conditioned, the proposal meets the applicable development standards.

8. MMC Chapter 19.500 Supplementary Development Regulations

   a. MMC Subsection 19.505.3 Multifamily Housing

      MMC 19.505.3 establishes design standards for multifamily housing to facilitate the development of attractive housing that encourages multimodal transportation and good site and building design. The requirements of this subsection are intended to

achieve the principles of livability, compatibility, safety and functionality, and sustainability. The design elements established in MMC Subsection 19.505.3.D are applicable to all new multifamily housing developments with 3 or more units.

(1) MMC Subsection 19.505.3.B states that all new multifamily and congregate housing developments with 3 or more dwelling units on a single lot are subject to the design elements in Table 19.505.3.D.

The proposed development will have 600 dwelling units on 10 lots and is considered multifamily. The proposed development meets the applicability standards of MMC 19.505.3.B.

(2) MMC Subsection 19.505.3.D contain standards for Multifamily Design Guidelines.

The proposed multi-unit residential development is following the Design Guidelines for the Discretionary Process. Each building will be required to meet the standards at the time of development.

The application as proposed meets the standards of this section as described in Table 2 below.

Table 19.505.3.D
Design Guidelines—Multifamily Housing

Design Element	Guideline	Findings
1. Private Open Space	The development should provide private open space for each dwelling unit, with direct access from the dwelling unit and visually and/or physically separate from common areas. The development may provide common open space in lieu of private open space if the common open space is well designed, adequately sized, and functionally similar to private open space.	*The proposed Planned Development will not preclude any of the future buildings from meeting the private open space requirements. The townhouse and walk-up apartments will likely provide the private open space in the form of small private yards adjacent to the units. The larger apartment buildings will either provide small balconies or common open space areas that may include some of the open space amenities already being planned into the larger planned development.* *The application proposes that the open space areas developed on individual lots (for example the playground on Lot E) will be credited towards meeting this open space standard for the development on Lot E. This will assure that there is a variety of different types of open space throughout the site meeting the recreational needs of a diverse population of residents.*

Table 19.505.3.D Design Guidelines—Multifamily Housing		
Design Element	Guideline	Findings
2. Public Open Space	The development should provide sufficient open space for the purpose of outdoor recreation, scenic amenity, or shared outdoor space for people to gather.	*The Planned Development will include a variety of public open space opportunities that will include playgrounds, sport courts, plazas with outdoor furnishings, pocket parks, and the larger open space area in the northwest corner of the site. It is proposed that these open space areas will be used in-part to meet the public open space standard for the individual buildings at the time of development.*
3. Pedestrian Circulation	Site design should promote safe, direct, and usable pedestrian facilities and connections throughout the development. Ground-floor units should provide a clear transition from the public realm to the private dwellings.	*As designed, the proposed development will have continuous connections with adequate lighting and street crossings to site elements as required.*
4. Vehicle and Bicycle Parking	Vehicle parking should be integrated into the site in a manner that does not detract from the design of the building, the street frontage, or the site. Bicycle parking should be secure, sheltered, and conveniently located.	*352 off-street parking spaces and 137 on-street parking spaces are proposed for a total of 489 spaces for the development.* *Bicycle parking spaces will be provided in bike rooms inside of the buildings as well as in clusters around the site.* *A total of 375 bicycle parking spaces are proposed, at least 50% of which will be covered.*
5. Building Orientation and Entrances	Buildings should be located with the principal façade oriented to the street or a street-facing open space such as a courtyard. Building entrances should be well-defined and protect people from the elements.	*The majority of the lots in the development will be surrounded by streets on at least three sides. Therefore, orientating the building entrances to an adjacent street should not be an issue for any of the future buildings. Though none of the buildings have been designed at this time, there is nothing in the design of the Planned Development that would preclude the buildings from including well-defined and protective entrances.*

Table 19.505.3.D Design Guidelines—Multifamily Housing		
Design Element	Guideline	Findings
6. Building Façade Design	Changes in wall planes, layering, horizontal & vertical datums, building materials, color, and/or fenestration should be incorporated to create simple and visually interesting buildings Windows and doors should be designed to create depth and shadows and to emphasize wall thickness and give expression to residential buildings. Windows should be used to provide articulation to the façade and visibility into the street. Building facades should be compatible with adjacent building facades. Garage doors shall be integrated into the design of the larger façade in terms of color, scale, materials, and building style.	*The design of the Planned Development would not prevent any of the future buildings from being able to meet the façade design standards. During the development of each lot careful consideration of building façade design will be done to assure that all of the buildings will meet these standards.*
7. Building Materials	Buildings should be constructed with architectural materials that provide a sense of permanence and high quality, incorporating a hierarchy of building materials that are durable. Street-facing facades should consist predominantly of a simple palette of long-lasting materials such as brick, stone, stucco, wood siding, and wood shingles. Split-faced block and gypsum reinforced fiber concrete (for trim elements) should only be used in limited quantities. Fencing should be durable, maintainable, and attractive.	*The vision for the redevelopment of Hillside is to construct buildings that feature durable, high-quality materials while still providing affordable housing options. As such, each of the future buildings will be designed in accordance with these standards.*
8. Landscaping	Landscaping should be used to provide a canopy for open spaces and courtyards, and to buffer the development from adjacent properties. Existing, healthy trees should be preserved whenever possible. Landscape strategies that conserve water should be included. Hardscapes should be shaded where possible, as a means of reducing energy costs (heat island effect) and improving stormwater management.	*Nearly 7 acres of the site is proposed to be landscaped. The Planned Development plan includes landscaping, open space recreation areas, and substantial buffers throughout the site. Throughout these areas existing healthy trees will be preserved where practical and new trees will be planted. Hardscaped areas such as parking lots and vehicle circulation areas will be shared when possible to minimize the overall impervious area on the site. Native and drought-tolerant plantings will be selected when appropriate and the irrigation systems installed throughout the site will be low-volume to conserve water.*

Table 19.505.3.D Design Guidelines—Multifamily Housing		
Design Element	Guideline	Findings
9. Screening	Mechanical equipment, garbage collection areas, and other site equipment and utilities should be screened so they are not visible from the street and public or private open spaces. Screening should be visually compatible with other architectural elements in the development.	*The design of the Planned Development would not prevent any of the future mechanical equipment, garbage areas or other site utilities from being screened in to meet these standards.*
10. Recycling Areas	Recycling areas should be appropriately sized to accommodate the amount of recyclable materials generated by residents. Areas should be located such that they provide convenient access for residents and for waste/recycling haulers. Recycling areas located outdoors should be appropriately screened or located so they are not prominent features viewed from the street.	*The design of the Planned Development would not prevent any of the future recycling areas from meeting these requirements.*
11. Sustainability	Development should optimize energy efficiency by designing for building orientation for passive heat gain, shading, day-lighting, and natural ventilation. Sustainable materials, particularly those with recycled content, should be used whenever possible. Sustainable architectural elements should be incorporated to increase occupant health and maximize a building's positive impact on the environment. When appropriate to the context, buildings should be placed on the site giving consideration to optimum solar orientation. Methods for providing summer shading for south-facing walls, and the implementation of photovoltaic systems on the south-facing area of the roof, are to be considered.	*Most of the buildings on the site will be multi-family affordable housing development that are publicly financed and must adhere to a green building program. It is anticipated that these buildings will be certified through Earth Advantage or a similar program, assuring that they will be energy efficient, constructed of sustainable and durable materials, and healthy for the occupants.* *Additionally, throughout the development there will be a major emphasis on alternative modes of transportation by providing green streets with wide sidewalk corridors and planter strips, and integration of the transit stops on 32nd Ave with ample bike parking. Planting zones will be maximized to provide landscaping and tree species with large canopies that support the City of Milwaukie's Urban Forestry 40% canopy coverage goal. Green roofs on buildings are encouraged and will contribute to reducing the stormwater released into the treatment system. Stormwater from new impervious surfaces will be directed to new water quality facilities before being released from the site.*

Table 19.505.3.D Design Guidelines—Multifamily Housing		
Design Element	Guideline	Findings
12. Privacy Considerations	Development should consider the privacy of, and sight lines to, adjacent residential properties, and should be oriented and/or screened to maximize the privacy of surrounding residences.	*Adjacent residential properties zoned low-density residential are located to the north of the site. The buildings on the north side of the site have been setback at least 15 feet from the north property line in order to provide a wide landscape buffer from the houses to the north. This area has mature existing trees and will be further planted with trees and tall shrubs that will help obscure views and absorb sounds to protect the privacy of these neighboring homes. Additionally, all of the buildings that abut the north property line will be limited to two stories in height. Building F2 will be located on a sloped lot, so it is proposed as two stories on the north side and three stories on the south to account for the topography of the lot.*
13. Safety	Development should be designed to maximize visual surveillance, create defensible spaces, and define access to and from the site. Lighting should be provided that is adequate for safety and surveillance, while not imposing lighting impacts to nearby properties. The site should be generally consistent with the principles of Crime Prevention Through Environmental Design (CPTED): • Natural Surveillance • Natural Access Control • Territorial Reinforcement	*As proposed, all safety design considerations will be met in the final permit plans.* *The future landscaping and site lighting will be designed with safety in mind. Additionally, the layout of the Planned Development, which will replace the angled streets and dead-end cul-de-sacs with a more open and easily surveilled circulation plan will help to bolster these safety measures.*

The Planning Commission finds that, as conditioned, the discretionary multifamily design guidelines have been met.

b. MMC Section 19.505.7 Nonresidential Development

MMC 19.505.7 establishes design standards for nonresidential and mixed-use development. The design standards apply to the street-facing façades.

The proposed development includes two mixed use buildings (A2 and E1) in the proposed GMU zone, which are subject to these standards.

(1) Weather Protection

All ground-floor building entries must be protected by canopies or a recess at least 3 ft behind the façade.

All first-floor entries in buildings A2 and E1 are proposed to meet this standard.

(2) Exterior Building Materials

This section details specific materials to be used as primary, secondary, and accent materials, as well as a list of prohibited materials.

Buildings A2 and E1 will be constructed of durable, high-quality materials selected from Table 19.505.7.C.3. To maintain the overall affordability of these buildings, however, it is proposed that this standard be modified to allow both "finished metal panels" and "fiber-reinforced cement siding and panels" (i.e., Hardie plank) to be used as primary building materials required to cover at least 60% of the applicable building façades instead of secondary materials limited to only 40% of the building façade. The quality and durability of these materials has increased in recent years as demonstrated on a number of projects throughout the region.

(3) Windows and Doors

(a) For nonresidential and mixed-use buildings, 30% of the ground-floor street wall area must consist of openings, i.e., windows or glazed doors. The ground-floor street wall area is defined as the area up to the finished ceiling height of the space fronting the street or 15 ft above finished grade, whichever is less.

Buildings A2 and E1 will be able to meet all of the applicable window standards by providing both ground-floor windows and doors that meet the standards of this section. The proposed Planned Development will not preclude the buildings from meeting these standards.

(b) For all buildings, the following applies:

(i) Nonresidential ground-floor windows must have a visible transmittance (VT) of 0.6 or higher.

The application materials state that this standard will be met.

(ii) Doors and/or primary entrances must be located on the street-facing block faces and must be unlocked when the business located on the premises is open. Doors/entrances to second-floor residential units may be locked.

The application materials state that all commercial entries will remain unlocked during business hours and that residential entries will be kept secure.

(iii) Clear glazing is required for ground-floor windows. Nontransparent, reflective, or opaque glazings are not permitted.

The application materials state that ground-floor glazing will comply with this standard.

(iv) The bottom edges of windows along pedestrian ways shall be constructed no more than 36 in above grade.

The application materials state that the ground floor windows will meet this standard.

(v) Ground-floor windows for nonresidential uses shall allow views into storefronts, working areas, or lobbies. Signs are limited to a maximum coverage of 50% of the required window area.

The application materials state that ground-floor window signs will comply with this standard.

(vi) Windows shall be designed to provide shadowing. This can be accomplished by recessing windows 4 in into the façade and/or incorporating trim of a contrasting material or color.

The application materials state that the windows will meet this standard.

(c) For all building windows facing streets, courtyards, and/or public squares, the following window elements are prohibited:

(i) Reflective, tinted, or opaque glazing.

(ii) Simulated divisions (internal or applied synthetic materials).

(iii) Exposed, unpainted metal frame windows.

The application materials state that none of the prohibited elements are proposed.

(4) Roofs

Enliven the pedestrian experience and create visual interest through roof form.

The proposed Planned Development will not prevent Buildings A2 and E1 from complying with the roofing standards.

(5) Rooftop Equipment and Screening

Integrate mechanical equipment into the overall building design.

All mechanical equipment placed on the roofs of Buildings A2 and E1 will be screened from public view.

(6) Ground-Level Screening

Mechanical and communication equipment, outdoor storage, and outdoor garbage and recycling areas shall be screened so they are not visible from streets, other ground-level private open space, or common open spaces.

The design of the Planned Development would not prevent any of the future mechanical equipment, garbage areas, or other site utilities from being screened to meet these standards.

(7) Rooftop Structures

Rooftop structures related to shared outdoor space—such as arbors, trellises, or porticos related to roof decks or gardens—shall not be included in the building's maximum height calculation, as long as they do not exceed 10 ft in height.

No rooftop structures are anticipated on Buildings A2 or E1 at this time.

(8) Building Orientation to Transit

New mixed-use buildings shall have their primary orientation toward a transit street or, if not adjacent to a transit street, a public right-of-way which leads to a transit street. The primary building entrance shall be visible from the street and shall be directly accessible from a sidewalk connected to the public right-of-way. A building may have more than 1 entrance.

Both Buildings A2 and E1 are located directly adjacent to 32nd Ave (a transit street) and will be able to orient the main building entrances to this street.

As proposed, the Planning Commission finds that the standards of MMC 19.500 are met.

9. MMC Chapter 19.600 Off-Street Parking and Loading

MMC 19.600 regulates off-street parking and loading areas on private property outside the public right-of-way. The purpose of these requirements includes providing adequate space for off-street parking, minimizing parking impacts to adjacent properties, and minimizing environmental impacts of parking areas.

a. MMC Section 19.602 Applicability

MMC 19.602 establishes the applicability of the provisions of MMC 19.600, and MMC Subsection 19.602.3 establishes thresholds for full compliance with the standards of MMC 19.600. Development of a vacant site is required to provide off-street parking and loading areas that conform fully to the requirements of MMC 19.600.

The proposed development consists of 600 dwelling units, including 2 mixed use buildings, and is required to conform fully to the requirements of MMC 19.600.

The Planning Commission finds that the provisions of MMC 19.600 are applicable to the proposed development.

b. MMC Section 19.605 Vehicle Parking Quantity Requirements

MMC 19.605 establishes standards to ensure that development provides adequate vehicle parking (off-street) based on estimated parking demand.

The proposed multi-unit residential development includes 600 apartments and up to 20,000 sq ft of commercial space. As described in the application materials, 461 units will be less than 800 sq ft and 39 units will be more than 800 sq ft. The existing Hillside Manor tower, with 100 units, has 59 parking spaces that were approved in 1969 via land use file #VR-69-7.

As per MMC Table 19.605.1, the minimum number of required off-street parking spaces for multifamily housing is 1 space per unit for units less than 800 sq ft and 1.25 spaces per unit

for units more than 800 sq ft. The minimum number of spaces for general commercial space is 3 spaces per 1,000 sq ft. The maximum number of spaces is 2 spaces per dwelling unit, regardless of size. According to MMC Table 19.605.1, the proposed development should provide a minimum of 629 spaces and would have a maximum of 1200 spaces allowed. As proposed, the development would provide 489 parking spaces in a mixture of off- and on-street spaces, a parking ratio of 0.82 per unit when including the off-street spaces, which is below that range. This includes the existing 59 parking spaces at Hillside Manor. Another 19 new parallel parking spaces will be developed along the west side of 32nd Ave that will also be available to serve the site but are not included in the overall parking ratio since they will also be available to the larger neighborhood. A parking modification has been requested to permit the proposed parking plan.

Subject to approval of the requested parking modification, the Planning Commission finds that this standard is met.

c. MMC Subsection 19.605.2 Quantity Modifications and Required Parking Determinations

(1) MMC Subsection 19.605.2 A. allows for the modification of minimum and maximum parking ratio standards as calculated per Table 19.605.1.

The applicant has requested a modification to the minimum required parking for the development and proposes to provide a total of 352 off-street spaces and 137 on-street spaces for the development rather than the minimum required 629.

(2) MMC Subsection 19.605.2 C.1. contains the approval criteria for granting a parking modification, including a demonstration that the proposed parking quantities are reasonable based on (1) existing parking demand for similar uses in other locations, (2) quantity requirements from other jurisdictions, and (3) professional literature. In addition to this criterion, a request for modifications to decrease the amount of minimum required parking must meet the following criteria:

(a) The use of transit, parking demand management (TDM) programs, and/or special characteristics of the site users will reduce expected vehicle use and parking space demand for the proposed use or development, as compared with the standards in Table 19.605.1.

(b) The reduction of off-street parking will not adversely affect available on-street parking.

(c) The requested reduction is the smallest reduction needed based on the specific circumstances of the use and/or site.

The applicant has proposed providing 352 off-street parking spaces and 137 on-street parking spaces for the site. The existing Hillside Manor tower is already below the minimum required with 59 spaces for 100 units. The requested reduction is due to the nature of the development as an affordable housing community.

The ITE Parking Manual, 5th Edition shows an average parking rate for Affordable Housing (ITE category 223) of 1.3 spaces/unit compared to a parking rate of 1.7 spaces per unit for typical market rate Multifamily Mid-Rise Housing (ITE category 221). This equates to affordable housing requiring approximately 25%fewer parking spaces than market rate housing.

This reduced need for parking is consistent with what HACC has found with the properties it owns and manages. The low-income populations that HACC serves have very limited access to personal vehicles due to the high cost of ownership and maintenance of a vehicle. Additionally, many lower income residents are seniors or people living with physical ailments who have difficulty driving their own car. A recent survey of the Hillside Manor residents, conducted pre-pandemic, found that only 36% of the residents reported driving in the past week. This same surveyed population was found to be very dependent on other modes of transportation such as Tri-Met (37%), carpooling (40%), and taxi or ride-share (11%). Therefore, it is reasonable that a 25% parking reduction should be applied to all of the proposed affordable housing, which include all the buildings on Lots B, C, D, F, G and K. This would result in a reduction of 67 spaces from the base minimum requirement of 503 for a total of 436 spaces.

The small commercial businesses proposed for Buildings A2 and E1 will have peak parking demands that will not coincide with the peak parking demands of the multi-family units. The majority of commercial businesses experience their peak demand during the daytime, typically between the hours of 9 am and 5 pm. Multi-family residential housing experiences its peak parking demand in the evening and nighttime hours, typically from 10 pm to 7 am according to the ITE. Therefore, the case can be made that the two uses can share parking spaces since the peak parking demands are near opposites. A credit for shared parking, as proposed by the applicant, results in 61 fewer spaces, bringing the new total required on the site to 375 parking spaces.

Additionally, the type of commercial uses proposed for the development are specifically selected to be uses that would attract residents of Hillside and the surrounding neighborhood as customers. Therefore, it is likely that a large percentage of the customers that patronize these businesses will walk or bike to them, further reducing the need for the additional 60 parking spaces dedicated to the commercial businesses.

A total of 137 on-street parking spaces will be developed within the new street network that includes Dwyer St, Hillside Ct, Meek St, 28th Ave, 29th Ave, and 31st Ave. The MMC does not allow on-street parking to count toward minimum or maximum parking requirements, but in this case these parking spaces are interior to the site and will not be convenient for anyone other than the residents and guests of Hillside. The modification request cites other jurisdictions in the region including Hillsboro, Gladstone, Clackamas County, the Villebois development in Wilsonville, and Lake Oswego who allow on-street parking to count toward on-site parking requirements establishing a precedent for recognizing the functional use of the spaces. The 19 on-street parking spaces on 32nd Ave adjacent to the mixed-use buildings have not been included in the 137 total on-street spaces available to serve the residential units. These spaces will be allocated

toward the commercial uses during the day but will still be available for resident parking during the night.

The narrative includes details of TDM measures for the project, designed to encourage walking, biking, and transit use, including the following:

- *Bicycle Facilities: Provide an on-site bicycle repair station. 29th Ave is anticipated to be a sharrow street and part of the Central Milwaukie Bikeway Concept.*
- *Bicycle Maintenance Services: Bring in mobile maintenance service several times annually.*
- *Wayfinding Station: Provide on-site kiosk or information center with multi-modal wayfinding information and transit information.*
- *TDM Coordination: Designate an on-site TDM Coordinator (can be property manager) offering multi-modal and wayfinding information, rideshare matching, walking/biking group coordination.*
- *TDM Communication: Distribute transit, wayfinding, and other TDM informational materials to new residents as they move in and annually to all residents.*
- *Bicycle Share Program: Provide private or public bicycle share memberships to on-site residents and establish a bike-share station on-site.*
- *E-Scooter Share Program: Create a designated space on site for shared scooters.*
- *Dedicated Ride-Share Spaces: Designate some on-site parking spaces for the use by programs like Uber and Lyft.*
- *Transit: There is currently a transit shelter at the intersection of 32nd Ave and Hillside Ct which will be moved toward the west to accommodate the new bus pull-out lane on 32nd Ave. A new transit shelter will be installed at the intersection of 32nd Ave and Meek St.*

Accounting for a proposed modification of the minimum required parking for affordable housing and shared parking, the new minimum required would be 375 off-street spaces. The proposed plans include 352 off-street spaces and 137 on-street spaces for a total of 489 parking spaces for the development, which includes a comprehensive TDM program to further decrease the number of vehicles on the site.

The Planning Commission finds that the applicant has adequately addressed the criteria for a parking modification to allow a reduced number of parking spaces on the site.

d. MMC 19.605.3 Exemptions and By-Right Reductions to Quantity Requirements

MMC 19.605.3.B establishes standards for reductions to minimum parking requirements. Multifamily development within 500 ft of a transit stop with peak hour service frequency is afforded a 20% reduction to required parking.

The proposed development is a multifamily development with two mixed-use buildings within 500 ft of the Trimet #75 bus route resulting in a base requirement of 503 parking spaces. The proposal is entitled to a 20% reduction in the minimum required parking for a total reduction of 125 spaces. The minimum required number of spaces, with reductions, is 503 spaces. 489 parking spaces in a combination of off-street and on-street spaces are proposed, subject to a request for a parking modification as discussed in Finding 9.c.

e. MMC Section 19.606 Parking Area Design and Landscaping

MMC 19.606 establishes standards for parking area design and landscaping, to ensure that off-street parking areas are safe, environmentally sound, and aesthetically pleasing, and that they have efficient circulation.

(1) MMC Subsection 19.606.1 Parking Space and Aisle Dimension

MMC 19.606.1 establishes dimensional standards for required off-street parking spaces and drive aisles. For 90°-angle spaces, the minimum width is 9 ft and minimum depth is 18 ft, with a 9-ft minimum curb length and 22-ft drive aisles. Parallel spaces require with 22-ft lengths and a width of 8.5 ft.

The parking areas shown on the Planned Development plan have been laid out conceptually based on the standards of Table 19.606.1 using a 9-ft wide and 18-ft long parking space. Full compliance with these standards will be shown at the time of development.

(2) MMC Subsection 19.606.2 Landscaping

MMC 19.606.2 establishes standards for parking lot landscaping, including for perimeter and interior areas. The purpose of these landscaping standards is to provide buffering between parking areas and adjacent properties, break up large expanses of paved area, help delineate between parking spaces and drive aisles, and provide environmental benefits such as stormwater management, carbon dioxide absorption, and a reduction of the urban heat island effect.

(a) MMC Subsection 19.606.2.C Perimeter Landscaping

In all but the downtown zones, perimeter landscaping areas must be at least 6 ft wide where abutting other properties and at least 8 ft wide where abutting the public right-of-way. At least 1 tree must be planted for every 30 lineal ft of landscaped buffer area, with the remainder of the buffer planted with grass, shrubs, ground cover, mulch, or other landscaped treatment. Parking areas adjacent to residential uses must provide a continuous visual screen from 1 to 4 ft above the ground to adequately screen vehicle lights.

The perimeter parking lot landscaping adjacent to the right-of-way in the GMU zone have been designed at 4-ft wide, consistent with Table 19.606.2.C.1 for Downtown Zones. In the R-1 zone the perimeter parking lot landscaping buffers adjacent to the right-of-way have been designed at 8 ft. The parking lots on Lots K

and F, which are the only parking areas abutting another property have been designed with a 6-ft buffer.

The buffer along the northern edge of the site, adjacent to the R-7 zone is proposed at 15-ft wide and will be planted with trees and tall shrubs that will help obscure views and absorb sounds to protect the privacy of the neighboring houses. This landscape buffer will also serve to meet this parking lot planting standard.

This standard is met.

(b) MMC Subsection 19.606.2.D Interior Landscaping

At least 25 sq ft of interior landscaped area are required for each parking space. Planting areas must be at least 120 sq ft in area, at least 6 ft in width, and dispersed throughout the parking area. For landscape islands, at least 1 tree shall be planted per island, with the remainder of the buffer planted with grass, shrubs, ground cover, mulch, or other landscaped treatment.

Interior parking lot islands in compliance with these standards have been shown in all of the parking lots proposed in the Planned Development, as illustrated on the submitted concept plans. Full compliance with these standards will be show at the time of development.

This standard is met through the approval of the Planned Development.

As conditioned, the Planning Commission finds that the applicable standards of MMC 19.606.2 are met.

(3) MMC Subsection 19.606.3 Additional Design Standards

MMC 19.606.3 establishes various design standards, including requirements related to paving and striping, wheel stops, pedestrian access, internal circulation, and lighting.

(a) MMC Subsection 19.606.3.A Paving and Striping

Paving and striping are required for all required maneuvering and standing areas, with a durable and dust-free hard surface and striping to delineate spaces and directional markings for driveways and accessways.

The plans submitted indicate that all parking areas will be paved and striped.

This standard is met.

(b) MMC Subsection 19.606.3.B Wheel Stops

Parking bumpers or wheel stops are required to prevent vehicles from encroaching onto public rights-of-way, adjacent landscaped areas, or pedestrian walkways. Curbing may substitute for wheel stops if vehicles will not encroach into the minimum required width for landscape or pedestrian areas.

The plans submitted indicate that all parking areas will meet this standard.

This standard is met.

(c) MMC Subsection 19.606.3.C Site Access and Drive Aisles

Accessways to parking areas shall be the minimum number necessary to provide access without inhibiting safe circulation on the street. Drive aisles shall meet the dimensional requirements of MMC 19.606.1, including a 22-ft minimum width for drive aisles serving 90°-angle stalls and a 16-ft minimum width for drive aisles not abutting a parking space. Along collector and arterial streets, no parking space shall be located such that its maneuvering area is in an ingress or egress aisle within 20 ft of the back of the sidewalk. Driveways and on-site circulation shall be designed so that vehicles enter the right-of-way in a forward motion.

The plans submitted indicate that all parking areas will meet this standard.

This standard is met.

(d) MMC Subsection 19.606.3.D Pedestrian Access and Circulation

Pedestrian access shall be provided so that no off-street parking space is farther than 100 ft away, measured along vehicle drive aisles, from a building entrance or a walkway that is continuous, leads to a building entrance, and meets the design standards of MMC Subsection 19.504.9.E.

A pedestrian access and circulation plan was submitted with the preliminary plan application materials. The plans submitted indicate that all parking areas will be meet this standard.

This standard is met.

(e) MMC Subsection 19.606.3.E Internal Circulation

The City Council has the authority to review the pedestrian, bicycle, and vehicular circulation of the site and impose conditions to ensure safe and efficient on-site circulation. Such conditions may include, but are not limited to, on-site signage, pavement markings, addition or modification of curbs, and modification of drive aisle dimensions.

The Planning Commission has reviewed the proposed circulation plan and concluded that it provides safe and efficient on-site circulation.

This standard is met.

(f) MMC Subsection 19.606.3.F Lighting

Lighting is required for parking areas with more than 10 spaces and must have a cutoff angle of 90° or greater to ensure that lighting is directed toward the parking surface. Lighting shall not cause a light trespass of more than 0.5 footcandles measured vertically at the boundaries of the site and shall provide a minimum illumination of 0.5 footcandles for pedestrian walkways in off-street parking areas.

The plans submitted indicate that the site will meet these standards.

A condition requiring a photometric plan showing compliance to be submitted during permit review has been included.

As conditioned, this standard is met.

As conditioned, the Planning Commission finds that the applicable standards of MMC 19.606.3 are met.

As conditioned, the Planning Commission finds that the applicable design and landscaping standards of MMC 19.606 are met.

f. MMC Section 19.608 Loading

MMC 19.608 establishes standards for off-street loading areas and empowers the Planning Director to determine whether loading spaces are required. The purpose of off-street loading areas is to contain loading activity of goods on-site and avoid conflicts with travel in the public right-of-way; provide for safe and efficient traffic circulation on the site; and minimize the impacts of loading areas to surrounding properties. For residential development with fewer than 50 dwelling units on a site that abuts a local street, no loading space is required; otherwise, 1 space is required.

The standards required to calculate required loading spaces is based on the individual lots and building. Proposed Buildings B2 and C1 will be entirely residential use and will contain more than 50 dwelling units, so each of these buildings will require one loading space. Proposed Buildings A2 and E1 will be mixed-use buildings with a floor area of more than 50,000 sq. ft. for each building, so each of these buildings will also require two loading spaces. The combined total is six loading spaces between these four buildings. However, because all of these lots and buildings will be developed in compliance with the Planned Development, a modification using Section 19.311.3 is requested to allow the loading space requirement to be applied site-wide allowing some of these buildings to share loading spaces. Additionally, as described by the applicant, some of the required loading spaces are proposed to be provided in the street instead of on individual lots so that they can better serve more than one building.

The submitted vehicle circulation plan shows where the proposed loading spaces will be located. A dedicated loading area will be provided in front of buildings C and H (the Manor). An on-street loading space will be provided on 31st Ave adjacent to the northwest corner of Lot E, which can serve the buildings on Lot D, E, and F. A second on-street loading space is provided on 31st Ave adjacent to the southeast corner of Lot D which can serve the buildings on Lots A, B, D, and E. No impacts to the public right of way or surrounding properties are anticipated by loading activity on the site.

All of the proposed loading spaces will meet the loading space standards. A modification is included as part of the Planned Development to allow these spaces to be located in the street instead of on individual lots to allow them to serve more buildings.

Subject to approval of the final development plan and program, and the requested modification to these standards, the Planning Commission finds that this standard is met.

g. MMC Section 19.609 Bicycle Parking

MMC 19.609 establishes standards for bicycle parking for new development of various uses. Multifamily residential development with 4 or more units shall provide 1 space per unit. When at least 10 bicycle spaces are required, a minimum of 50% of the spaces shall be covered and/or enclosed. MMC Subsection 19.609.3.A provides that each bicycle parking space shall have minimum dimensions of 2 ft by 6 ft, with 5-ft-wide aisles for maneuvering. MMC Subsection 19.609.4 requires bike racks to be located within 50 ft of a main building entrance.

For each of the residential buildings proposed on the site the minimum number of bicycle parking spaces required will be the same as the number of units. For the commercial uses proposed on the ground floor of buildings A2 and E1 the number of bike parking spaces will be determined by the uses in each building, but in no case will there be less than two spaces for each use. Based on these minimum requirements, over 510 bicycle parking spaces would be required on the site, which, according to the application materials, exceeds the amount that is likely to be used.

Based on the resident populations in HACC's other properties (including the Hillside Manor) many residents of affordable housing are elderly or disabled and not likely to use bicycles for transportation. Additionally, the existing bicycle network surrounding the site is currently not well developed, making travel by bicycle a less attractive option. However, the future Central Milwaukie Bikeway Concept (CMBC) will connect the Hillside development and the vacant site to the south to both the Springwater Corridor and the Monroe Street Greenway. The CMBC will also cater to pedestrians and ADA accessibility, not just bicyclists, but will be several years before it is constructed. As part of the TDM measures, the proposal includes exploration of a bikeshare program, so individual bike spaces could be reduced. Therefore, a modification through the Planned Development review is requested to reduce the minimum number of required bicycle parking spaces on the site to 0.75 spaces per unit which would bring the total number of spaces down to 375 spaces required to serve the residential units plus the additional spaces to serve the commercial uses.

Bicycle parking spaces will be provided in bike rooms inside of the buildings as well as in clusters around the site. The submitted circulation plan shows where concentrations of bike racks will be provided, with several racks located around the exterior of buildings A2 and E1 to serve the future commercial uses in these buildings. Bicycle parking for the new multi-family buildings will be partially provided in combined bike storage rooms inside the buildings assuring that at least 50% of the bike parking spaces will be covered. The concentrations of bicycle parking locations will be dispersed throughout the site to be convenient to all of on-site amenities and gathering spots. Additionally, bike parking will be provided within 50 ft of the entrances all of proposed buildings.

Subject to approval of the final development plan and program, and the requested modification to these standards, the Planning Commission finds that this standard is met.

h. MMC Section 19.610 Carpool and Vanpool Parking

MMC 19.610 establishes carpool parking standards for new industrial, institutional, and commercial development. The number of carpool/vanpool parking spaces shall be at least 10% of the minimum amount of required parking spaces. Carpool/vanpool spaces shall be located closer to the main entrances of the building than other employee or student parking, except ADA spaces and shall be clearly designated with signs or pavement markings for use only by carpools/vanpools.

The proposed development is a predominantly multi-unit residential development.

This standard does not apply.

As conditioned, the Planning Commission finds that the proposed development meets all applicable standards of MMC 19.600.

10. MMC Chapter 19.700 Public Facility Improvements

MMC 19.700 is intended to ensure that development, including redevelopment, provides public facilities that are safe, convenient, and adequate in rough proportion to their public facility impacts.

a. MMC Section 19.702 Applicability

MMC 19.702 establishes the applicability of the provisions of MMC 19.700, including new construction.

The applicant proposes to develop new construction of 400 multifamily residential units as an expansion to an existing multifamily development. The proposed new construction and additional dwelling units fulfill the applicability criteria of MMC 19.700.

b. MMC Section 19.703 Review Process

MMC 19.703 establishes the review process for development that is subject to MMC 19.700, including requiring a preapplication conference, establishing the type of application required, and providing approval criteria.

The applicant had a preapplication conference with City staff on May 14, 2020, prior to application submittal. The applicant's proposal includes a Transportation Facilities Review and a transportation impact study, meeting requirements of this section.

c. MMC Section 19.704 Transportation Impact Evaluation

MMC 19.704 establishes the process and requirements for evaluating development impacts on the surrounding transportation system, including determining when a formal Transportation Impact Study (TIS) is necessary and what mitigation measures will be required.

The proposed development completed a formal TIS according to scoping developed by the City Engineer and the City's on-call traffic consultant (DKS), who provided the applicant with a scope of work for the TIS. Warrants for a left turn pocket for north bound SE 32nd Ave were found to be met and are proposed to be included with this development. This left-turn pocket

must be constructed either prior to, or concurrently with, that phase of development which creates greater than 325 residential units.

As submitted with additional submittal received regarding a left turn lane for north bound SE 32nd Ave, the applicant's TIS is sufficient to meet the requirements of MMC 19.704.

d. MMC Section 19.705 Rough Proportionality

MMC 19.705 requires that transportation impacts of the proposed development be mitigated in proportion to its potential impacts.

Improvements submitted by the applicant were in rough proportion to potential impacts. Final design will be approved by City Engineering prior to construction, including final design mitigations for any deficiency in intersection-sight distance. The minimum AASHTO sight distance requirements shall be met at the proposed street intersection and driveways and final acceptance shall be made by the City Engineer prior to final site plan approval

e. MMC Section 19.707 Agency Notification and Coordinated Review

MMC 19.707 establishes provisions for coordinating land use application review with other agencies that may have some interest in a project that is in proximity to facilities they manage.

The application was referred to the Oregon Department of Transportation (ODOT), Clackamas County Department of Transportation and Development (DTD), TriMet, and Metro for comment. Agency comments have been incorporated into these findings and the associated conditions of approval.

f. MMC Section 19.708 Transportation Facility Requirements

MMC 19.708 establishes the City's requirements and standards for improvements to public streets, including pedestrian, bicycle, and transit facilities.

(1) MMC Subsection 19.708.1 General Street Requirements and Standards

MMC 19.708.1 provides general standards for streets, including for access management, clear vision, street layout and connectivity, and intersection design and spacing.

As proposed, the development is consistent with the applicable standards of MMC 19.708.1.

(2) MMC Subsection 19.708.2 Street Design Standards

MMC 19.708.2 provides design standards for streets, including dimensional requirements for the various street elements (e.g., travel lanes, bike lanes, on-street parking, landscape strips, and sidewalks).

The proposed SE 32nd Ave cross section conforms to applicable requirements and are consistent with MMC 19.708.2.

(3) MMC Subsection 19.708.3 Sidewalk Requirements and Standards

MMC 19.708.3 provides standards for public sidewalks, including the requirement for compliance with applicable standards of the Americans with Disabilities Act (ADA).

The proposed development includes ADA compliant ramps, sidewalks, and crossings.

As conditioned under the Final Development Plan to construct all improvements consistent with ADA requirements, the development is consistent with all applicable standards of MMC 19.708.3.

(4) MMC Subsection 19.708.4 Bicycle Facility Requirements and Standards

MMC 19.708.4 provides standards for bicycle facilities, including a reference to the Public Works Standards.

The City's bicycle facilities goals, objectives, and policies are found in Chapter 6 of the Transportation System Plan (TSP). No additional context is identified for the adjacent frontage of development.

As proposed, the development is consistent with all applicable standards of MMC 19.708.4.

(5) MMC Subsection 19.708.5 Pedestrian/Bicycle Path Requirements and Standards

MMC 19.708.5 provides standards for pedestrian and bicycle paths.

The proposed site plan includes pedestrian connections within the development through internal streets with sidewalks and sharrows.

As proposed, the development does not require dedication of a path and is consistent with standards of MMC 19.708.5.

(6) MMC Subsection 19.708.6 Transit Requirements and Standards

MMC 19.708.6 provides standards for transit facilities.

The City's transit facilities goals, objectives, and policies are found in Chapter 7 of the TSP. The applicant is proposing to improve Trimet stop #7342 with a bus loading zone on SE 32nd Ave and to improve stop #7349 with a shelter and ADA compliant passenger loading area.

As proposed, the development is consistent with all applicable standards of MMC 19.708.6.

As conditioned, the Planning Commission finds that the proposed development meets the applicable public facility improvement standards of MMC 19.700.

11. MMC Section 19.902 Amendments to Maps and Ordinances

MMC 19.902 establishes the process for amending the City's Comprehensive Plan and land use regulations, including the zoning map. Specifically, MMC Subsection 19.902.6 establishes the review process and approval criteria for zoning map amendments.

a. MMC Subsection 19.902.6.A Review Process

MMC 19.902.6.A provides that, generally, changes to the zoning map that involve 5 or more properties or encompass more than 2 acres of land are legislative and are therefore subject to Type V review; otherwise, they are quasi-judicial in nature and subject to Type III review. The City Attorney has the authority to determine the appropriate review process for each proposed zoning map amendment.

The proposed zoning map amendments encompass a single property of approximately 19.5 acres and are related to a proposed planned development, which requires Type IV review. The Planning Commission finds that the Type IV review process is appropriate for the proposed zoning map change.

b. MMC Subsection 19.902.6.B Approval Criteria

MMC 19.906.2.B establishes the following approval criteria for zoning map amendments:

(1) The proposed amendment is compatible with the surrounding area based on the following factors:

(a) Site location and character of the area

(b) Predominant land use pattern and density of the area

(c) Expected changes in the development pattern for the area

The location of the site is suitable for the proposed Planned Development and additional residential density because it is located in an area that is well-served by the existing transportation network, utility infrastructure, and services. The site has easy access to Highway 99E (McLoughlin Blvd) and Highway 224 (Milwaukie Expressway) via 32nd Ave that fronts the site. Additionally, the site is approximately one-half mile from downtown Milwaukie to the south, so itis in close proximity to commercial retail, parks, and services that will be needed to serve the new residents. Directly across 32nd Ave is a hospital and clinic that can serve the medical needs of the residents. Local schools are close by and convenient. Finally, the site is located directly located on a frequent service bus line. With the proximity of so many necessary services to serve the new housing units the site location is an ideal for the proposed use.

The site sits at the intersection between the Ardenwald, Historic Milwaukie, McLoughlin Industrial, and Central Milwaukie Planning Area identified in the City's Central Milwaukie Land Use and Transportation Plan. Each of these planning areas represents a different set of planning goals and objectives. As such, the overall character of the area represents a mix of uses with no single use dominating the area. The site, which already features multi-family housing, serves as a transition between the higher density uses to the south and the single-family houses to the north. Likewise, the site abuts the railroad line and manufacturing uses to the west. Across 32nd Ave from the site, there is a variety of commercial and medical uses as well as existing multi-family residential housing. Since the general use of the site will not be changing significantly as

it will still be used predominately for affordable multi-family housing after redevelopment, the proposed Planned Development will continue to be compatible with the character of the area and this criterion is met.

There is no predominant land use pattern in the surrounding area since the neighborhood is a mix of residential, commercial, medical, and industrial uses. Additionally, there is not a specific zoning pattern, since every abutting side of the site has a different zoning designation: Low-Density Residential (R-7) to the north, Medium to High Residential (R-3) to the east, General Mixed Use (GMU) to the south, and North Milwaukie Employment Zone (NME) to the west. Therefore, , changing the zoning of the site from R-3 to R-1 and GMU is appropriate to recognize that the site sits at a crossroads of many different uses and can continue to serve as a transitional area between them.

The density in the residential areas north and east of the site is currently lower than what is proposed through the Planned Development. However, the property to the south (which is currently vacant) is zoned GMU and has the potential to be developed with much higher densities than what is proposed for the subject site. Proposing a transition of the zoning on the site, with GMU on the south and R-1 on the north will help provide a stepped-down density pattern across the site, with the lowest density lots located on the north of the site. Finally, the 9-story, 100-unit Hillside Manor has been located on the site since the 1960s and though this existing building is far taller and denser that what is proposed with the other lots in the Planned Development, it does represent an existing land use pattern that is part of the historical character of the area and should be taken into consideration when considering the compatibility of the proposal. As proposed, the Planned Development will be compatible with the land use pattern and density of the area.

The major change anticipated for this area would be the future development of the Murphy site located to the south of the subject site and zoned GMU. This 7-acre site is identified in the Central Milwaukie Land Use and Transportation Plan as an "Opportunity Site," since it is a large, vacant/under-utilized site with high visibility and good access to transportation and services. It is envisioned to be developed with a mix of uses that might include 3- to 4-story multi-family residential buildings, commercial uses, and flex space for light industrial. Given the wide range of uses and densities that are permitted for this site, it is difficult to predict what the final development plan will be. However, by zoning the lower half of the Hillside site GMU and proposing higher-density mixed use buildings for this part of the site, it will increase the likelihood that the future use on the Murphy site will be compatible with the Hillside site.

The proposed zoning amendment is compatible with the surrounding area based on the factors listed above.

(2) The need is demonstrated for uses allowed by the proposed amendment.

The 2020 Milwaukie Comprehensive Plan notes a particular need for affordable housing and rental housing opportunities. The Housing Needs Analysis specifically identifies a need for affordable housing.

The most recent study of housing inventory in the City of Milwaukie was done in 2016 and presented as the Milwaukie Housing Needs Analysis (HNA). Key findings of this study include:

- *A comparison of estimated current housing demand with the existing supply identifies a general need for rental units at the lowest price level:*
    - *30% of all needed units are projected to be multi-family in structures of 5+ attached units.*
    - *The greatest need for both ownership and rental units is found at lower price points. This reflects the findings that an estimated 37% of Milwaukie households are rent-burdened and currently pay more than 30% of their income towards housing costs.*
- *There is also a current need for more affordable units. In order for all households, both existing and new, to pay 30% or less of their income towards housing in 2036, a total of 1,189 rental units affordable at $900 or less are required.*
- *As demand increases, prices rise, and the remaining land within the UGB is developed, denser forms of development and creative reuse of parcels through infill and redevelopment will become necessary.*

The HNA findings match similar and more current work done around the region including, Clackamas County Regional Housing Needs Analysis (issued in September of 2019), ECONorthwest's report "Potential Sources and Uses of Revenue to Address the Region's Homeless Crisis" (issued in February 2020 to support Metro's successful Housing Bond measure) and the State of Oregon's 2016-2020 Consolidated Plan Amendment (issued in 2016, representing the State's five-year housing and community development planning process required by the United States Department of Housing and Urban Development). All of these studies have found a growing gap between the number of Oregonians who need affordable housing and the availability of affordable homes. This trend has led to destabilizing rent increases, an alarming number of evictions of low- and fixed-income people, increasing homelessness, and serious housing instability throughout Oregon.

The proposed Planned Development will add 400 new units to the existing Hillside Park site, with a large portion of those units being built as affordable housing. This will directly address the public needs identified in the Housing Needs Analysis. Additionally, because the 100 existing residential houses on the site will be replaced with the proposal, no viable housing stock will be taken out of the current housing inventory. Furthermore, portions of the site were identified as "unlikely to redevelop" in the

Housing Needs Analysis, meaning that adding more density to the site represents an unidentified opportunity to help Milwaukie meet its housing needs without removing any available land that was already earmarked for future housing in the study.

(3) The availability is shown of suitable alternative areas with the same or similar zoning designation.

Functionally, the PD designation is a form of overlay zone designation that can be applied to sufficiently sized properties for greater flexibility in development.. This criterion is more applicable to standard base zone designations and is intended to ensure that a suitable number of other properties with the same base zone designation will remain available for development.

This criterion is not applicable to a proposal to add the PD designation to a base zone.

(4) The subject property and adjacent properties presently have adequate public transportation facilities, public utilities, and services to support the use(s) allowed by the proposed amendment, or such facilities, utilities, and services are proposed or required as a condition of approval for the proposed amendment.

The applicant's submittal materials include a traffic impact study, utility plans, and preliminary stormwater drainage report to demonstrate that public facilities are or will be made adequate to serve the proposed development.

Existing water and sanitary sewer services to the Hillside development are provided by the City and Clackamas County's Water and Environment Services (WES) respectively and are adequate to serve the proposed new units.

The new utilities will be built to meet current development standards and adequate capacity in the existing sewer, storm, and water systems to support the proposed uses has been demonstrated with capacity studies submitted with the application. Existing, on-site underground utilities must be removed or abandoned at the appropriate phases of development.

All internal streets must be constructed in conformance with the city's Public Works Standards.

As streets are constructed, the development design engineer must confirm that all street intersections and driveways meet the minimum AASHTO sight distance requirements; final acceptance shall be made by the City Engineer prior to acceptance.

All work done within existing or proposed public ROW must be in conformance with the city's Public Works Standards.

The subject property and adjacent properties presently have adequate public transportation facilities, public utilities, and services to support the proposed development.

(5) The proposed amendment is consistent with the functional classification, capacity, and level of service of the transportation system. A transportation impact study may be required subject to the provisions of Chapter 19.700.

The applicant prepared a transportation impact study (TIS) to evaluate the proposed development's anticipated impacts on the transportation system. The TIS estimated a net increase in daily motor vehicle trips of 1,426 trips. All study intersections were found to operate at an acceptable level of service through the 2026 AM and PM peak hours with full buildout of the proposed development, expect for the intersection of Harrison St and 42nd Ave, which with background conditions would exceed mobility standards even without the development. Therefore, mitigation is not triggered by the development at any of the study street intersections. At the southern accessway of the site, a left turn pocket is required to mitigate impacts for vehicles access the site from northbound SE 32nd Ave. The additional ridership generated by the site will require improving adjacent bust stops as addressed above.

As conditioned, the proposed is consistent with the functional classification, capacity, and level of service of the transportation system.

(6) The proposed amendment is consistent with the goals and policies of the Comprehensive Plan, including the Land Use Map.

As proposed, the entire site will be rezoned from R-3 (Medium Density Residential) to R-1 (High Density Residential) on the northern half and GMU (General Mixed Use) on the south. The Comprehensive Plan Designation of the site will be changed to match these new zones, with High Density Residential on the north and Town Center on the south. The current Comprehensive Plan designation of the site is Medium Density Residential.

The purpose of the High Density Residential zone in Chapter 19.302 of the MMC states that it is "intended to create and maintain higher density residential neighborhoods that blend a range of housing types with a limited mix of neighborhood-scale commercial, office, and institutional uses." The northern side of Hillside Park will be consistent with the purpose by providing a variety of housing types including 2-story townhomes, 2- and 3-story walk-up style apartments, and the Manor Tower, which will all be supported by the small commercial and office uses on the southern side of the site.

Chapter 19.303 of the MMC states that the purpose of the General Mixed Use zone is to "promote a mix of uses that will support a lively and economically robust district. It is also intended to ensure high-quality urban development that is pedestrian-friendly and complementary to the surrounding area." The Hillside Park redevelopment will represent high-quality urban design and the new street network and open space amenities are designed to make the site bicycle- and pedestrian-friendly while minimizing the prominence of vehicles on the site. Adding small commercial uses on the site will help to create a lively and robust center that will benefit residents and draw in neighbors from the larger community. As shown, the proposed development will be consistent with the purpose of the GMU zoning.

The southern half of Hillside Park will be developed with a mix of high density housing and small commercial and office uses. The site is well served by transit and will feature an enhanced bicycle and pedestrian network. Off-street parking will be not be a prominent feature and parking ratios will be purposefully low to encourage other modes of transportation. Finally, the development will represent a mix of both affordable housing serving HACC's community and market-rate housing that will provide a range of housing options. The preliminary development plan meets the policies of the Town Center designation and is appropriate for the site.

As described above, the GMU zoning that will be applied to the site will be modified to encourage neighborhood-scale commercial uses and not larger employment uses drawing visitors or workers from the region. Additionally, uses that are not compatible with residential development will not be permitted outright. These specific modifications to the GMU zoning that will limit the commercial uses to those that are neighborhood-scale will be included in the PD overlay that will accompany the zoning designation on the site.

These rezoning requests will be submitted, as required with sufficient detail regarding compliance with all of the applicable comprehensive plan policies (such as Engagement, Housing, and Transportation), with the Final Planned Development application.

As conditioned with the submittal and approval of the final development plan and program, the proposed amendment is consistent with the goals and policies of the Comprehensive Plan, including the Land Use Map.

(7) The proposed amendment is consistent with the Metro Urban Growth Management Functional Plan and relevant regional policies.

The Metro Urban Growth Management Functional Plan includes a number of titles that address various aspects of the region's goals and policies for urban development.

(a) Title 1 Housing Capacity

The proposed development will provide 600 needed housing units in a compact urban form.

(b) Title 7 Housing Choice

The proposed development will provide needed affordable multi-unit rental housing and will support Metro's policies for expanding housing choice with a needed housing type in Milwaukie.

The proposed amendment is consistent with the Metro Urban Growth Management Functional Plan and relevant regional policies.

(8) The proposed amendment is consistent with relevant State statutes and administrative rules, including the Statewide Planning Goals and Transportation Planning Rule.

Several of the Statewide Planning Goals are relevant to the proposed amendment:

(a) Goal 2 Citizen Involvement

Prior to submitting the application, the applicant conducted a series of open houses and public events to discuss and present the project (October 24, 2018, February 21, 2019, May 30, 2019, and December 4, 2019), including a presentation at Planning Commission and City Council meetings on August 13, 2019, and August 20, 2019, respectively.

The Type III review process utilized for consideration of a preliminary Planned Development plan and program provides for public hearings by the Planning Commission where citizens have the opportunity to present testimony and participate in the decision-making process. A public hearing on the proposed preliminary plan and program was held by the Planning Commission on March 23, 2021. The Commission considered testimony from citizens en route to reaching the decision reflected in these findings.

(b) Goal 10 Housing

As addressed in Finding 7-b(6) and elsewhere in these findings, the proposed development would provide 600 units of much-needed rental housing, much of it affordable, to the city.

Per the City's 2016 Housing Needs Analysis (HNA), Milwaukie currently has a range of housing types, including single-family detached and attached homes, duplexes, multi-family, and mixed-use developments, and has sufficient capacity to provide for needed housing during the next 20 years. The HNA includes the city's buildable lands inventory (BLI) for housing within the UGB, showing that the city has sufficient zoned capacity to meet the projected housing needs over the next 20 years. Relevant findings from the HNA include:

(i) The projected growth in the number of non-group households over 20 years (2016-2036) is roughly 1,070 households, with accompanying population growth of 2,150 new residents. The supply of buildable land includes properties zoned to accommodate a variety of housing types.

(ii) Over the next 20 years, 30% of all needed units are projected to be multi-family in structures of 5+ attached units.

(iii) The analysis identifies a general need for rental units at the lowest price level. The findings demonstrate that there are fewer housing opportunities at lower price points than might be considered "affordable" to many local households, particularly for renter households.

(c) Goal 12 Transportation and Transportation Planning

As addressed in Finding 14 and elsewhere in these findings, the applicant's TIS analyzed the potential impact of the proposed Planned Development on the surrounding transportation system. This study found that the proposed

development is projected to generate a net additional 110 trips during the morning peak hour, a net additional 105 trips during the evening peak hour. With this additional traffic, all study intersections were found to operate at an acceptable level of service through the 2026 AM and PM peak hours with full buildout of the proposed development, except for Harrison St/42nd Ave. This intersection also exceeds mobility standards under the 2026 background conditions scenario. Therefore, mitigation is not triggered by the development. The proposed project is estimated to add 5 AM peak hour trips and 5 PM peak hour trips through this intersection. Installation of a traffic signal at Harrison St/42nd Ave is identified in the Milwaukie TSP, and has also been identified as a need with the Monroe Street Greenway project, and will be planned and funded. The intersection did not meet signal warrants for the 2026 AM and PM peak hours full buildout scenario.

A warrant analysis was conducted for traffic signals and left turn pockets at the site accesses. The analysis found that traffic signal warrants would not be met. Left turn lane warrants are projected to be met for the northbound approach of Meek Street/32nd Avenue during PM peak hour 2026 buildout conditions. A left turn lane is proposed as mitigation by this development. This left-turn pocket must be constructed either prior to, or concurrently with, the phase of development that creates greater than 325 residential units.

A Transportation Planning Rule (TPR) analysis was conducted to address the proposed rezone. A reasonable worst-case trip generation was performed for the existing R-3 designation and the proposed R-l and GMU designation. The proposed rezone estimated a net increase in motor vehicle trip generation: 54 weekday AM peak hour trips, 27 weekday PM peak hour trips, and 796 daily trips. The 2040 analysis assumed three improvement projects as identified in the Milwaukie TSP. Operations analysis with the proposed zone change showed no deficiencies. The proposed zone change will not further degrade the performance of the planned transportation facility beyond what is allowed in the current zone.

As conditioned, the proposed amendment is consistent with relevant State statutes and administrative rules, including the Statewide Planning Goals and Transportation Planning Rule.

The proposed amendment, as conditioned, is consistent with the applicable criteria for zoning map and comprehensive plan land use map amendments.

As conditioned, the Planning Commission finds that the proposed amendment to the City's Zoning Map and Comprehensive Plan land use map are approvable.

12. The application was referred to the following departments and agencies on January 15, 2021:
    - Milwaukie Building Division
    - Milwaukie Engineering Department
    - Milwaukie Public Works Department

- Clackamas County Fire District #1
- Ardenwald and Historic Milwaukie Neighborhood District Association Chairperson and Land Use Committee
- Metro
- Oregon Department of Transportation
- Clackamas County

In addition, notice of the public hearing was mailed to owners and residents of properties within 300 ft of the subject property on January 27, 2021.

Agency and NDA comments received are summarized as follows:

- **Kate Hawkins, Development Review Planner and Avi Tayar, P.E., Oregon Department of Transportation:** comments regarding the TIS's estimated trip generation and compliance with the Transportation Planning Rule.

From: Ryan McCluckie
To: Wyffels, Michelle
Cc: Debbie Cleek; Devin Ellin (dellin@clackamas.us)
Subject: RE: Hillside Master Plan: Trimet review of master plan transit
Date: Thursday, May 13, 2021 2:29:00 PM

Thanks Michelle!

-Ryan

Ryan McCluckie
Architect, NCARB

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From: Wyffels, Michelle <WyffelsM@trimet.org>
Sent: Thursday, May 13, 2021 2:16 PM
To: Ryan McCluckie <rmccluckie@seallp.com>
Cc: Debbie Cleek <cleek@bookingroup.com>; Devin Ellin (dellin@clackamas.us) <dellin@clackamas.us>
Subject: RE: Hillside Master Plan: Trimet review of master plan transit

Makes perfect sense to me. I'd plan on the standard 4'x8' shelter. It wouldn't hurt to leave space for a 12' long shelter in case ridership really surprises us. We aren't going to get much ridership from the consolidation, but we might from new residents. You should also leave space for a future trashcan if conditions warrant it.

Attached are the drawings for the 4'x8' shelter (Typbe B) and the 4'x12' shelter (BX).

Michelle

From: Ryan McCluckie <rmccluckie@seallp.com>
Sent: Thursday, May 13, 2021 1:54 PM
To: Wyffels, Michelle <WyffelsM@trimet.org>
Cc: Debbie Cleek <cleek@bookingroup.com>; Devin Ellin (dellin@clackamas.us) <dellin@clackamas.us>
Subject: RE: Hillside Master Plan: Trimet review of master plan transit

Michelle,

I think the Housing Authority will not have a problem with the standard Trimet shelter and I don't believe they will desire to incur the cost of building/maintain their own. Do you have a station dimensions/layout guide that you could direct me to? I'd be interested to know if there is a size of shelter I should be looking at since we are now combining stops.

Thanks,
-Ryan

Ryan McCluckie
Architect, NCARB

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From: Wyffels, Michelle <WyffelsM@trimet.org>
Sent: Monday, May 10, 2021 7:38 AM
To: Ryan McCluckie <rmccluckie@seallp.com>
Subject: RE: Hillside Master Plan: Trimet review of master plan transit

A thought for you that I didn't want to drag the City into- shelters.

Given the location of the stop (the hospital, low income housing), TriMet will place one of our standard box shelters at the stop.

However, if you want, you could design and place your own shelter that fits with the look of the development. Be aware that TriMet is only able to clean and maintain TriMet owned/ placed shelters. So, tradeoffs.

From: Ryan McCluckie <rmccluckie@seallp.com>
Sent: Friday, May 7, 2021 4:01 PM

To: Wyffels, Michelle <WyffelsM@trimet.org>; 'Tessie Prentice' <PrenticeT@milwaukieoregon.gov>
Cc: Debbie Cleek <cleek@bookingroup.com>; Devin Ellin (dellin@clackamas.us) <dellin@clackamas.us>; Lisa McClellan <Lisa@seallp.com>
Subject: Hillside Master Plan: Trimet review of master plan transit

Michelle and Tessie,

Thanks so much for our meeting yesterday and for working through the Hillside Master Plan transit review along 32nd Ave with me. I appreciated our collaborative approach to addressing the City of Milwaukie's Planning Commission condition of approval regarding the review of existing transit stops adjacent to the property.

I tracked the changes (attached) that you both recommended and I will be modifying the Master Plan in kind for the project's upcoming Final Master Plan Approval submittal/hearing. During the final master plan approval, there will be a review by City of Milwaukie Public works that will likely attach specific conditions of approval that really get into the finer details (some of which we talked about today) regarding left turn lanes, and specific pavement markings, etc.

I understand you'd like to be kept involved in the project especially during the public works construction drawings package documentation process and have copied the Housing Authority's Director of Housing Devin Ellin on this email so we can relay that desire throughout the development of the individual phases.

-Ryan

Ryan McCluckie
Architect, NCARB

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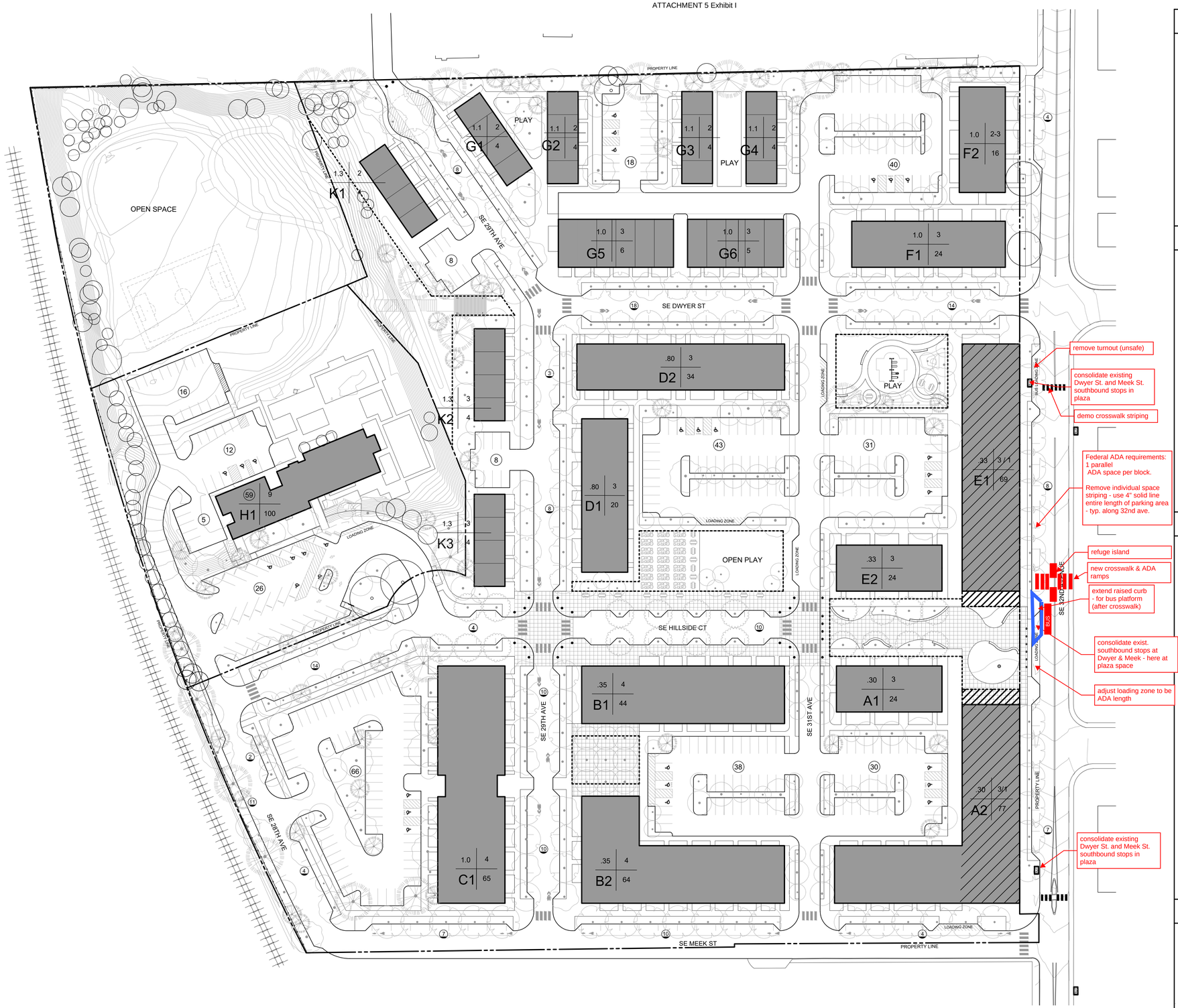
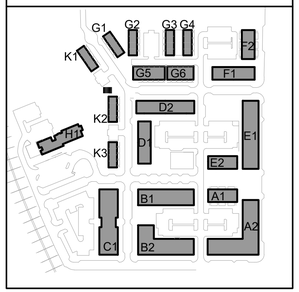


GENERAL SHEET NOTES

LEGEND

KEYNOTES

KEY PLAN



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HILLSIDE MASTER PLAN

32ND AND MEEK ST.
MILWAUKIE, OR 97222

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SCOTT|EDWARDS ARCHITECTURE LLP
05/06/21

Zoom presentation with Trimet & City of Milwaukie

Ryan McCluckie, Scott Edwards Architecture
Michelle Wyffels, Trimet
Tessie Prentice, City of Milwaukie

Drawing:

MASTER PLAN

Job No:	20064
Date:	10/23/2020
Drawn By:	-
Checked By:	-

Sheet No:

MP 1.3

Oregon
Kate Brown, Governor

Department of Transportation
Region 1 Headquarters
123 NW Flanders Street
Portland, Oregon 97209
(503) 731.8200
FAX (503) 731.8259

September 16, 2021 ODOT #10442

ODOT Response

Project Name: Hillside Master Plan Development	**Applicant:** Jill Smith, HACC
Jurisdiction: City of Milwaukie	**Jurisdiction Case #:** PD-2021-001
Site Address: 2889 SE Hillside Court Milwaukie, OR	**Legal Description:** 01S 01E 25CD **Tax Lot(s):** 00100
State Highway: OR 224	**ODOT Crossing:** C-764.30, USDOT 759756B

The site of this proposed land use action is adjacent to the Union Pacific Railroad. The site is also in the vicinity of ODOT Crossing No C-764.30, USDOT 759756B at SE Harrison Street, which is regulated by the ODOT Rail and Public Transit Division (ODOT RPTD). ODOT has permitting authority for this facility and an interest in ensuring that this proposed land use is compatible with its safe and efficient operation.

COMMENTS/FINDINGS

ODOT has reviewed the submitted materials for the proposed Hillside Master Plan development. The proposal includes redeveloping Hillside Park with higher density apartment and mixed-use buildings totaling 600 units. A new community center, open space area, playground, sports court, and potential commercial or office space are also included.

In order to ensure safe operation of trains and prevent pedestrians from crossing the tracks, ODOT recommends the installation of continuous fencing along the property line fronting the tracks (see attached railroad fencing drawing). The fencing should not have any gaps or gates to access the railroad right of way for the safety of the public as it is a quiet zone and typically the trains do not sound their horn. Fencing needs to be installed on the developer's property and not on the railroad right of way.

The submitted site plans show SE Meek Street and SE Hillside Court extending to the rail line. ODOT recommends fencing and tall landscaping or a type III barricade to visually block drivers from driving onto the tracks.

The Harrison Street rail crossing is within a "Quiet Zone", as defined in 49 CFR Part 222 "Train Horn Rule". Material alterations to the crossings may impact the status of the "Quiet Zone". Special design consideration should be provided given the "Quiet Zone" designation and the residential nature of this development directly adjacent to the tracks. Please consider noise when building next to the railroad line. Even though this is a quiet zone, trains can still sound their horn if there are hazards or other reasons. If problems or incidents occur it could impact the quiet zone standing of the crossing(s).

It is our understanding there are other proposed developments in the vicinity that could impact the intersection at Harrison at 32nd and Harrison at OR224. The traffic study did not state additional queue to the intersection which could cause vehicles to block the tracks. Please note that if improvements or alterations are needed, a rail crossing application and new rail Order would be required. Any alterations to the crossings require authorization through the State of Oregon crossing Order process prior to construction. This process requires agreement of said alterations between the parties involved (the railroad, the road authority, and ODOT RPTD). The railroad

normally requires a PE agreement be signed by the road authority before they meet with the parties. This process can take 3-6 months for a simple Order and 6-12 months or longer for a complex and/or contested Order. Union Pacific Railroad would require a PE agreement be signed prior to a diagnostic meeting taking place. The rail crossing application can be found here: https://www.oregon.gov/ODOT/Forms/2ODOT/9202.pdf

Alterations include, but may not be limited to, the following: "any change to the roadway or tracks at a crossing that materially affects use of the crossing by railroad equipment, vehicles, or pedestrians. Alterations include, but are not limited to adding or removing tracks; changing the width of the roadway; installing or removing protective devices; creating an additional travel lane; changing the direction of traffic flow; installing curbs, sidewalks, or bicycle facilities; or changing grade, including super elevation, if sufficient to necessitate a change of the grade of the railroad or highway being crossed." If signal work is needed, a new rail crossing Order will likely be needed.

Finally, ODOT strongly recommends contacting the railroad company (Union Pacific Railroad) early and throughout the development process since development will occur near the tracks. A diagnostic meeting may also be necessary for this development if additional queues could block the rail crossing. Please contact the ODOT Rail contact listed below for further information.

ODOT RECOMMENDED LOCAL CONDITIONS OF APPROVAL

Property Location Adjacent to Rail Tracks

☒ The applicant shall install continuous fencing (no gates) along the property line fronting the rail tracks to ensure the safe operation of trains by preventing illegal trespassing of pedestrians across the tracks (see attached Rail Fence Detail).

ADVISORY INFORMATION

Noise

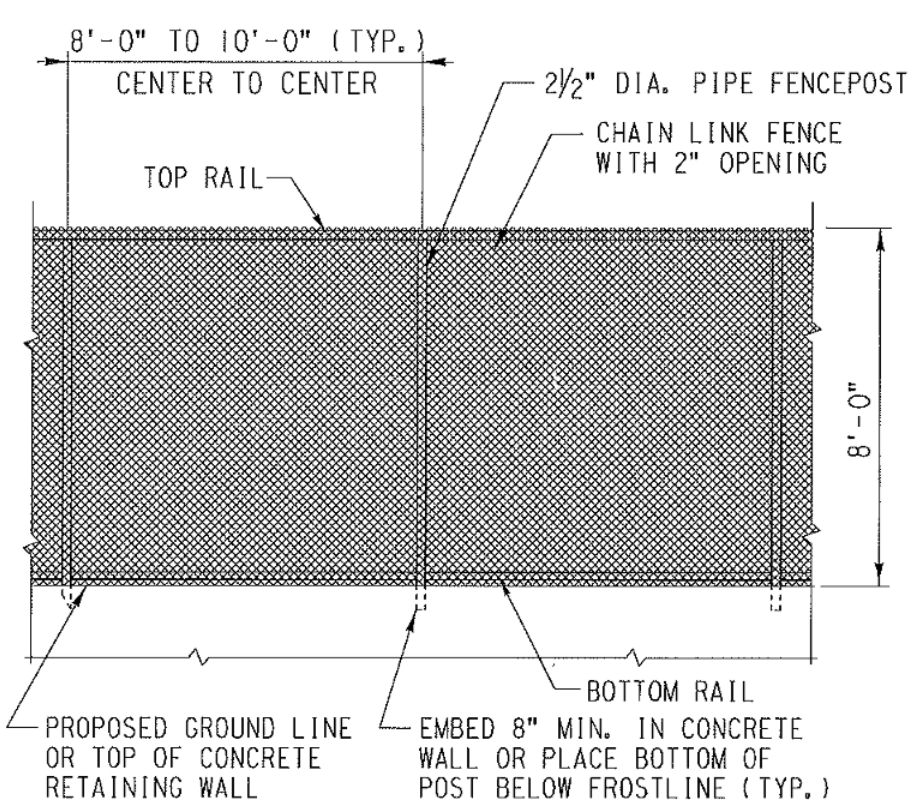
☒ The applicant is advised that a residential development on the proposed site may be exposed to noise from heavy rail freight trains, passenger trains or transit vehicles. It is generally not the State's responsibility to provide mitigation for receptors that are built after the noise source is in place. Builders should take appropriate measures to mitigate the noise impacts.

Please send a copy of the Staff Report and/or Notice of Decision including conditions of approval to:

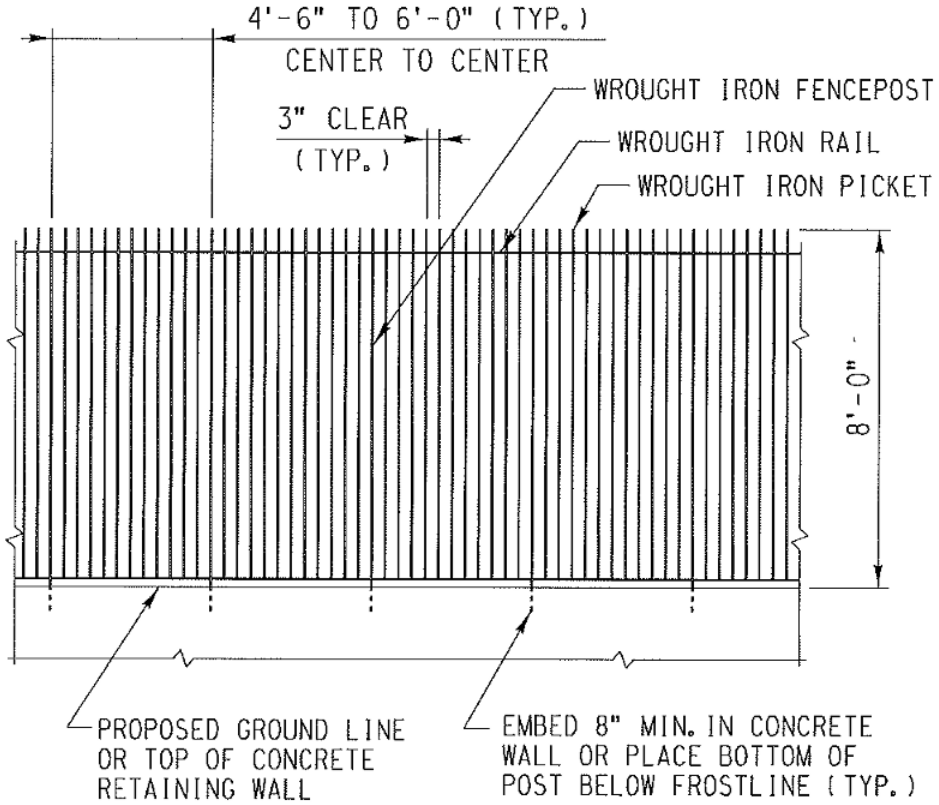
ODOT Region 1 Planning
Development Review
123 NW Flanders St
Portland, OR 97209

ODOT_R1_DevRev@odot.state.or.us

Development Review Planner: Kate Hawkins	503.731.3049; kate.w.hawkins@odot.state.or.us
Traffic Contact: Avi Tayar, P.E.	503.731.8221; abraham.tayar@odot.state.or.us
ODOT Rail Contact: Carrie Martin	503-986-6801; carrie.a.martin@odot.state.or.us



CHAIN LINK FENCE



WROUGHT IRON PICKET FENCE

FENCE ELEVATION

SCALE: 3/16" = 1'-0"

REVISIONS		
DATE	LTR.	DESCRIPTION
/		
/		
/		
/		
/		
/		

DESIGN BY: RAF | DRAWN BY: FJS | CHECKED BY: KHJ

APPROVED:

K.H. Jennison

BNSF - ASSISTANT DIRECTOR STRUCTURES DESIGN

George J. Meyn

UPRR - MGR SPECIAL PROJECTS STRUCTURES DESIGN

BNSF RAILWAY | UNION PACIFIC

BRIDGE STANDARDS

RIGHT-OF-WAY FENCING

FENCE DETAILS

FILE OWNER: UPRR	DATE: 1/24/07
PLAN NO.: 711000	SHEET: 1

PLOTTED: 3/30/2007 2:53:20 PM

FILE NAME: P:\ustation\dgn\std\pp_guidelines.dgn

From:	Milwaukie Planning
To:	Vera Kolias
Subject:	FW: Redevelopment of Hillside Court
Date:	Monday, September 27, 2021 9:11:17

From: Sharon Johnson <sharonjo1411@yahoo.com>
Sent: Sunday, September 26, 2021 2:26 PM
To: Milwaukie Planning <Planning@milwaukieoregon.gov>
Subject: Redevelopment of Hillside Court

This Message originated outside your organization.

Dear Planning Commission Members,

I am a resident of the Historic Milwaukie Neighborhood, and this afternoon I reviewed the website materials for the public hearing in October. I will not be at that public hearing, but wanted to extend my support for the thoughtfulness that has been extended to this project to add needed middle housing and low-income housing to Milwaukie. I appreciate that the plan provides for higher density, open space, parking, and access to public transit.

I believe I first heard about this project two years ago, and am glad to see the project come to fruition. At that time, I also heard some negative word-of-mouth by neighbors who were not aware of all the provisions of the development. Since that time, I have served on two planning subcommittees and am aware that staff and citizen volunteers take much input and many factors into consideration. Thank you.

Sharon A. Johnson
http://www.common-sage.com