PD application submitted on 11/16/20; Fee paid on 11/17/20.

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

Application for Land Use Action

Master File #: PD-2020-002; TFR-2020-003

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 Co

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

Phone(s):   Email: JSmith@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 Co

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: 16.16 acres

PROPOSAL (describe briefly):

A Preliminary Planned Development review for the redevelopment of Hillside Park to allow 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   Date: 11/16/2020

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-2020-002	$ 2,000			
Concurrent application files	TFR-2020-003	$ $750 + $2,500	25% off	$1,000 PAID on	9/9/2020; receipt #19554
		$			
		$			
		$			
Deposit (NR only)				☐ Deposit Authorization Form received	
TOTAL AMOUNT RECEIVED: $			RECEIPT #:		RCD BY:

Associated application file #s (appeals, modifications, previous approvals, etc.):

Neighborhood District Association(s): Ardenwald

Notes:

THE
BOOKIN
GROUP
LLC

Land Use &
Institutional
Planning

Policy Analysis

Project
Management

Group
Facilitation

1140 SW 11th Ave.
Suite 500
Portland, Oregon
97205

503.241.2423

bookingroup.com

MEMORANDUM

DATE: January 7, 2021

TO: Vera Kolias, Senior Planner, City of Milwaukie

FROM: Debbie Cleek, Senior Planner

SUBJECT: Response to Incompleteness Letter (PD-2020-002 – 2889 SE Hillside Ct)

This memorandum is in response to the request for additional information per your December 15, 2020 Incompleteness Letter related to the Planned Development application for Hillside Park. With the acceptance of this information, please deem the application complete.

Completeness Items
The following items were found to be incomplete or missing:

1. *MMC 19.704 Transportation Impact Evaluation – The Transportation Impact Study (TIS) is incomplete.*

   Response: A revised TIS has been submitted with this letter addressing the issues raised in the incompleteness letter. Additionally, after meeting with Steve Adams on December 16th,it was agreed that a new left-turn lane providing queuing for vehicles traveling north on SE 32nd Avenue and turning left onto SE Meek Street will need to be constructed as part of the development. Sketches showing where this turn lane will be located and how it will be configured have been provided with this letter. Additionally, a note has been added on sheet MP 1.6 (Vehicular Circulation Plan) that indicated that this turn lane will be provided, however, because the entire improvement will be located off-site it has not been shown on the master plan itself.

2. *MCC 19.708.6 – Transit Facility Requirements: Include in the narrative reasons for not enhancing the transit stop benches and shelters on 32nd Avenue.*

   Response: A revised narrative has been provided with this letter that has addressed the proposed transit improvements along SE 32nd Avenue. After consulting with Michelle Wyffels with TriMet it has been determined that improvements to the transit stop near SE Meek Street are warranted based on the increase in ridership anticipated (see attached email). The response to this development standard now describes the improvements that are anticipated at both of the transit stops, which now includes adding a shelter at Meek. It should be noted that the bus stop at Hillside Court already includes a shelter, so this enhancement is not necessary.

Informational Items
The following are informational items, not completeness items.

1. *Transportation improvements and impact mitigations can be phased if clearly identified within the TIS as to which phase of development warrants are met.*

Response: The amended TIS study now proposes construction of a left-turn lane from northbound SE 32nd Avenue onto SE Meek Street. The warrant is not met with Phase 1 of the project, which includes 209 dwelling units but is expected to be met when 325 to 350 units are constructed on the site. A storage length of approximately 50 feet should be provided and the pedestrian crossing on the north side of the street should be moved southward to align with new ramps on the northwest corner of the intersection.

2. *Throughout phased development, no public utility lines shall exist on private property. Abandonment of public lines must occur at appropriate phases to meet this requirement.*

   Response: The phasing of the development has been carefully coordinated to assure that each phase will include the construction of new utility lines and the abandonment of the existing lines while still providing necessary services to the buildings that will remain on the site, so meeting this requirement should not be an issue.

3. *Any stormwater pipes conveying public discharge mixed with private discharge will require City maintenance through an Inter-Governmental Agreement.*

   Response: At this point it is not anticipated that public and private stormwater discharge will be mixed, but if this does turn out to be a design solution under consideration, we will work with the City to obtain the proper agreements.

4. *MMC 17.32.020 Utility Undergrounding – All utility lines shall be placed underground. Surface-mounted transformers, surface-mounted connection boxes and meter cabinets, temporary utility service facilities during construction, high-capacity electric and communication feeder lines, and utility transmission lines operating at 50,000 volts or above may be placed above ground.*

   Response: No utility lines are anticipated to be located above ground at this point, but we will take this information under advisement if this situation changes as the plans are further developed.

Attachments

1. Revised Transportation Impact Study (electronic)
2. Revised Narrative (electronic)
3. Left-hand turn lane studies (electronic)
4. Revised sheet 1.6 (electronic)
5. Copy of email from TriMet

From: **Wyffels, Michelle** WyffelsM@trimet.org
Subject: RE: New project on 32nd ave and Meek St. Milwaukie, OR and Trimet transit stops
Date: December 17, 2020 at 11:12 AM
To: Ryan McCluckie rmccluckie@seallp.com
Cc: Debbie Cleek cleek@bookingroup.com, Tessie Prentice PrenticeT@milwaukieoregon.gov

MW

Ryan (and Debbie),

Here is the promised analysis. I'm coping Tessie Prentice from the City of Milwaukie as she is managing the SAFE program and we have discussed this corridor.

The addition of 400 units to this development and 489 parking stalls to 600 units indicates to me that we ought to improve the stops adjacent to your development with the thought of significantly more ridership.

Given the extent of this project, I think this would be a good opportunity to consider consolidating the stops at Meek. In order to do this we will need a stop with additional space behind the sidewalk for a shelter, waiting area, and ample depth for an ADA compliant boarding area. It would be ideal to see the sidewalk situation better match the situation on the east side of SE 32nd south of Meek with a wider area for pedestrians and buffering from the roadway. This would make it more comfortable for residents and people accessing the hospital to walk along SE 32nd.

If you want to chat, I can be reached on my work cell at 503-969-1014 or I can set up a WebEx meetings so that we can share images.

Michelle Wyffels
Planner II
TriMet

From: Ryan McCluckie <rmccluckie@seallp.com>
Sent: Wednesday, December 16, 2020 4:00 PM
To: Wyffels, Michelle <WyffelsM@trimet.org>
Cc: Debbie Cleek <cleek@bookingroup.com>
Subject: New project on 32nd ave and Meek St. Milwaukie, OR and Trimet transit stops
Importance: High

Hello Michelle,

My name is Ryan McCluckie and I am an architect with Scott Edwards Architecture in Portland. The Housing Authority of Clackamas County hired SEA to design a masterplan for their Hillside Park property in Milwaukie, OR. It is located on 32nd Ave. between just north of Dwyer St. and south to Meek St. in Milwaukie, OR.

During the review of our masterplan and official comment from the City of Milwaukie asked us whether we intended to comply with their transit infrastructure Code Section (below). The project is willing to comply with the code, but we figured that Trimet would have a say in all this and so that's my reason for reaching out to you today.

Currently there are two existing bus stops that affect our property. One has a shelter, one has only a bench. This development is adding 400 units to the existing 200 currently there for a total of 600 dwelling units. Would you be able to have a quick chat with me to determine the following:

1. What kind of transit facilities will Trimet require on the property? (i.e. will they essentially be the same, but "enhanced" by say, two new shelters, benches, etc.? Or, will they need to be larger and have more amenities, requiring a larger easement, etc.)
2. I'm responding in text to the City's letter, so we can keep this at a high-level discussion as we're not going to provide drawings to address this.

Thank you for your help – I appreciate your time. Feel free to call to discuss if you prefer.

-Ryan

2. MMC 19.708.6 – Transit Facility Requirements: Include within the narrative specific reasons for not enhancing transit stop benches and shelters on 32nd Ave near Meek St and Hillside Ct or propose enhancements. The highest density on the site is proposed nearest the 32nd Ave transit stop adjacent to Meek St, which does not have a shelter.

Ryan McCluckie
Architect, NCARB

S|EA

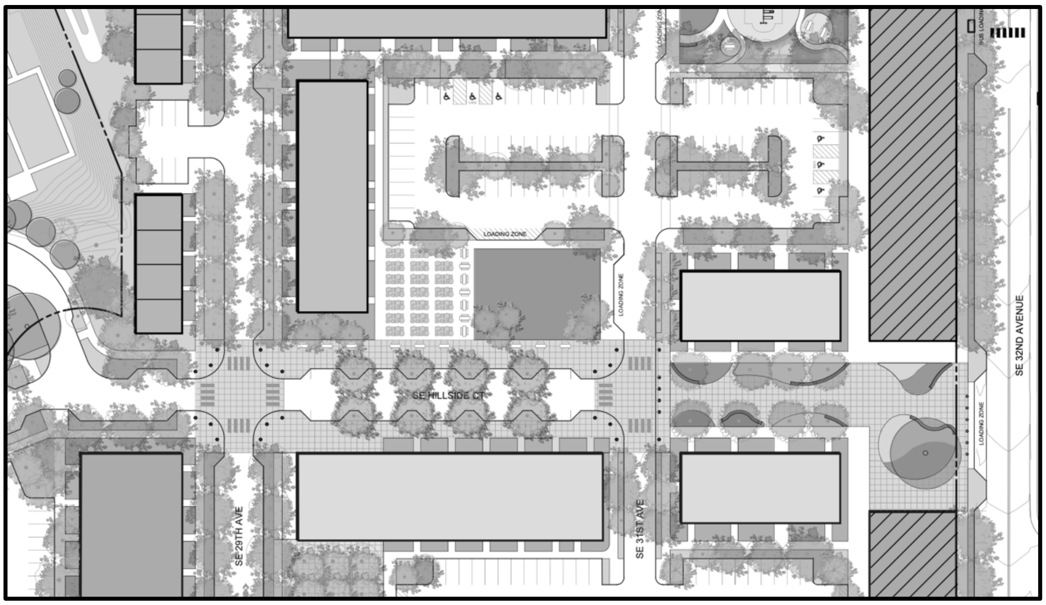
SCOTT | EDWARDS ARCHITECTURE LLP

S|EA IS WORKING FROM HOME
Please contact us via email or phone

Mailing: 2709 SE Ankeny St. Portland, OR 97214
Delivery: 2709 SE Ankeny St. Portland, OR 97214
O: 503.226.3617 | D: 503.896.5358 | www.seallp.com

HILLSIDE MASTER PLAN

APPLICATION FOR A PRELIMINARY PLANNED DEVELOPMENT



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

November 2020

TABLE OF CONTENTS

MP 3.50 Water System Plan
MP 3.60 Private Utility Plan

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 Preliminary Planned Development 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.
117 SE Taylor St #001
Portland, OR 97214
dave.humber@hdgpdx.com

Land Use Planner:
Debbie Cleek, Principal
The Bookin Group
1140 SW 4th Avenue, Suite 500
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

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.

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).

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.

- **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 PRELIMINARY 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 Preliminary 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.

It is anticipated that 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.

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. *The predominant housing types will be multifamily units.*
b. *High Density Residential areas shall be located either adjacent to or within close proximity to the downtown or district shopping centers, employment concentrations and/or major transit centers or transfer areas.*
c. *Access to High Density areas should be primarily by major or minor arterials.*

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 (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 Preliminary Development Plan can largely comply with these Comprehensive Plan policies and so the High Density 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. *Within the Town Center areas designated on Map 8, mixed-use development combining residential high density housing with retail, 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. *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.*
d. *A variety of higher density housing is desired in a designated Town Center Area, and the City shall work cooperatively with the private sector to provide a diverse range of affordable housing.*

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. The off-street parking provided 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 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 10 lots, as illustrated on Figure MP 1.4 – Land Division Plan. 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 D	60,641 sq. ft.	226 ft.	267 ft.	267 ft.
Lot F	43,514 sq. ft.	198 ft.	215 ft.	212 ft.
Lot G	66,079 sq. ft.	240 ft.	214 ft.	240 ft.
Lot H (Manor)	106,725 sq. ft.	288 ft.	328 ft.	97 ft.
Lot J (Open Space)	77,979 sq. ft.	216 ft.	288 ft.	n/a
Lot K	46,380 sq. ft.	298 ft.	100+ ft.	298 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 A	58,421 sq. ft.	295 ft.
Lot B	60,026 sq. ft.	226 ft.
Lot C	56,407 sq. ft.	175 ft.
Lot E	60,540 sq. ft.	305 ft.

Phasing.

Redevelopment of the park will be done in several 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 and B (shown on Figure MP 1.9), followed by two subsequent phases.

The location of the first phase (Lots A and B) 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 34 residential buildings, and the removal of the southern half of A, B, and C Streets. The existing public and private utility lines south of Hillside Court (in the Phase 1 area) 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. 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 corner of the site first is to set the expectations and character for the rest of the project. This high-visibility 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 C, 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

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.

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 either with the subdivision or with development of individual lots 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.

<u>Standards for Non-Residential Development (19.505.7):</u>
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.

<u>Parking and Loading.</u>

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[1], Gladstone[2], Clackamas County[3] and Lake Oswego[4] 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.

- **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.

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[1] 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."

[2] 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."

[3] 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."

[4] 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."

- 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 is currently not well developed, making travel by bicycle a less attractive option. 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 a 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 will apply to the 10-lot subdivision that will be included in the Final Planned Development application. Though the subdivision is not included with the Preliminary Planned Development this section demonstrates how the proposed lot pattern can comply 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 Figure MP 1.4. 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 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. 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. 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.

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 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 do apply to the proposal at this time including:

- ***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 Preliminary 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.

<u>19.708 Transportation Facility Requirements</u>

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. A new 5-ft wide dedicated bike lane will also be added to the west side of the street. 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). Both of these stops will remain in place but will be enhanced as part of the development.

Stop #7342 already has a transit shelter, so the anticipated improvements to this stop will involve functionality, by constructing a bus loading zone south of the intersection with future SE Dwyer Street, allowing the bus to pull out of the traffic lane to pick up and drop off riders. A dedication along the site's SE 32nd Avenue site frontage will allow the existing sidewalk to be moved to the west to accommodate the bus loading lane and still allow for adequate waiting area near the shelter, and ample depth for an ADA compliant boarding area.

Stop #7349 currently only has a bench for passengers waiting for the bus. TriMet has evaluated the development proposal and determined that there will be enough new ridership generated by the Planned Development a full development to warrant a new transit shelter at this stop. To accommodate the shelter additional space will be provided behind the sidewalk to create a waiting area and provide the necessary depth for an ADA compliant boarding area. This wider area will provide more comfort for pedestrians by providing additional buffering from the roadway.

<u>19.709 Public Utility Requirements</u>

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 terminate at the north end of SE 29th Avenue, allowing a future connection to the water system if development occurs on the properties to the north. 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 greenstreet 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 PRELIMINARY DEVELOPMENT PLAN

The approval criteria for a Preliminary Development Plan is found in Section 19.311.9 of the Milwaukie Municipal Code. The approval authorities may approve, approve with conditions, or deny the Preliminary 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.

Response: The proposed application is for a Preliminary Development Plan to be considered by the Planning Commission, therefore, this approval criteria 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.

Response: The proposed application is for a Preliminary Development Plan, so this approval criteria will not apply until the Final Development Plan is submitted.

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.

Response: 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.

<u>19.311.2 Use.</u> 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;

Response: 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 addressed in Section III of this report. In short, 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;

Response: 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;

Response: As demonstrated in the Traffic Impact Study submitting 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;

Response: 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.

Response: 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.

<u>19.311.3 Development Standards.</u> 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.

Response: 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. 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.

Response: 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 as will still be used predominately for affordable multi-family housing after redevelopment it can be concluded that 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.

Response: 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 the 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 considering 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.

Response: 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;

Response: The most recent study of housing inventory in the City of Milwaukie was done in 2016 and presented as the Milwaukie Housing Needs Analysis. Keep 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 (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 facilities, utilities, and services are proposed or required as a condition of approval for the proposed amendment;

Response: 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

[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.

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;***

Response: 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;***

Response: The applicable standards of Title 17 that would apply to the proposed 10-lot subdivision were addressed in Section III of this report. These findings show that the conceptual Land Division Plan (Figure MP 1.4) complies with the minimum lot standards of the R1 and GMU zones and that the proposed lots are as regular and rectilinear as possible, taking into account existing development on the site that will remain. This criterion is met.

H. ***Compliance with all applicable development standards and requirements; and***

Response: 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 conceptual 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.***

Response: As shown in the response 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 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.

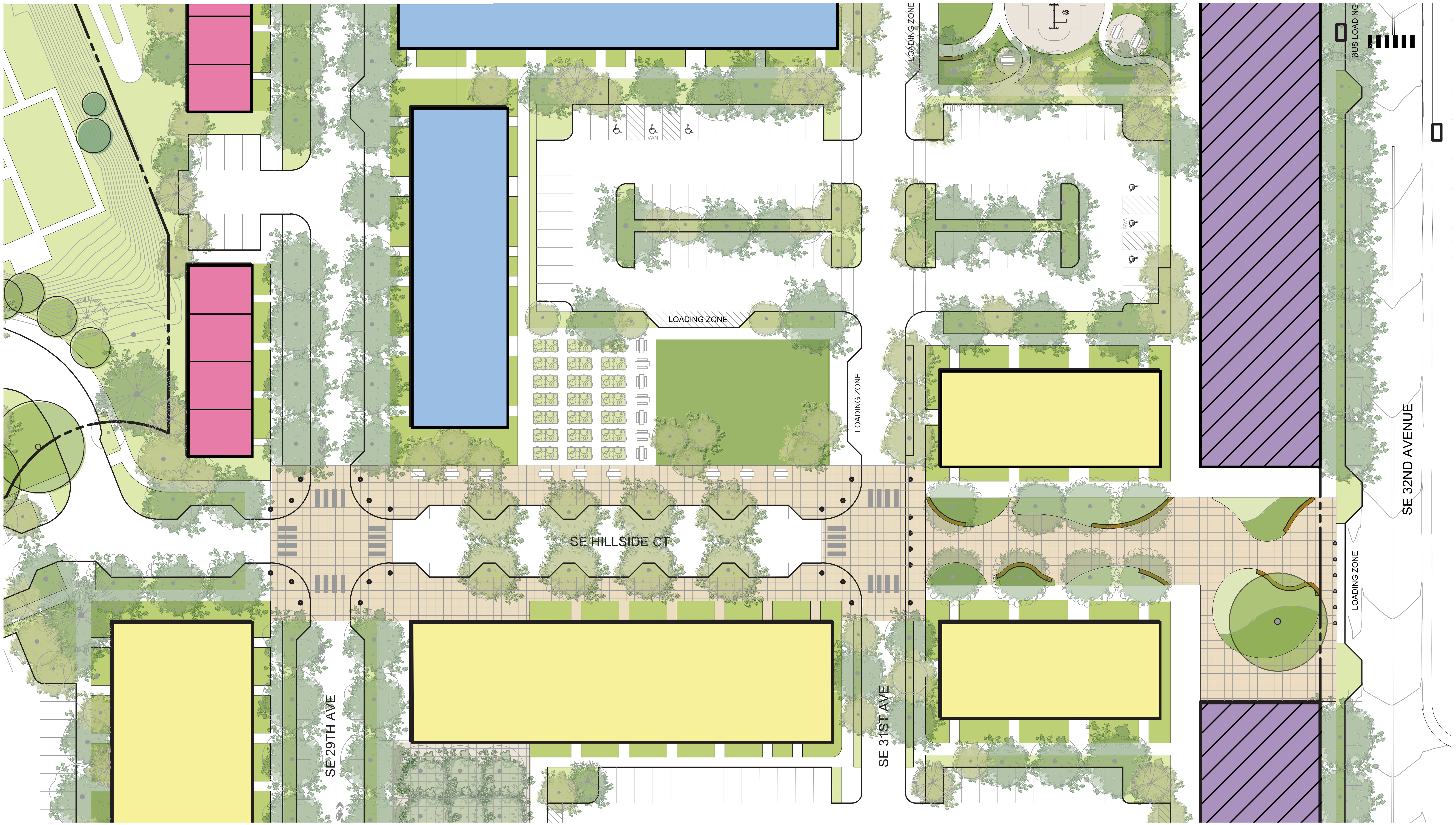
CONCLUSION

As shown in this report, the proposed Preliminary Planned Development which would allow the redevelopment of Hillside Park with higher density apartment and mixed-use buildings can met all of the approval criteria related to Preliminary Development Plans found in Section 19.311.9. 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

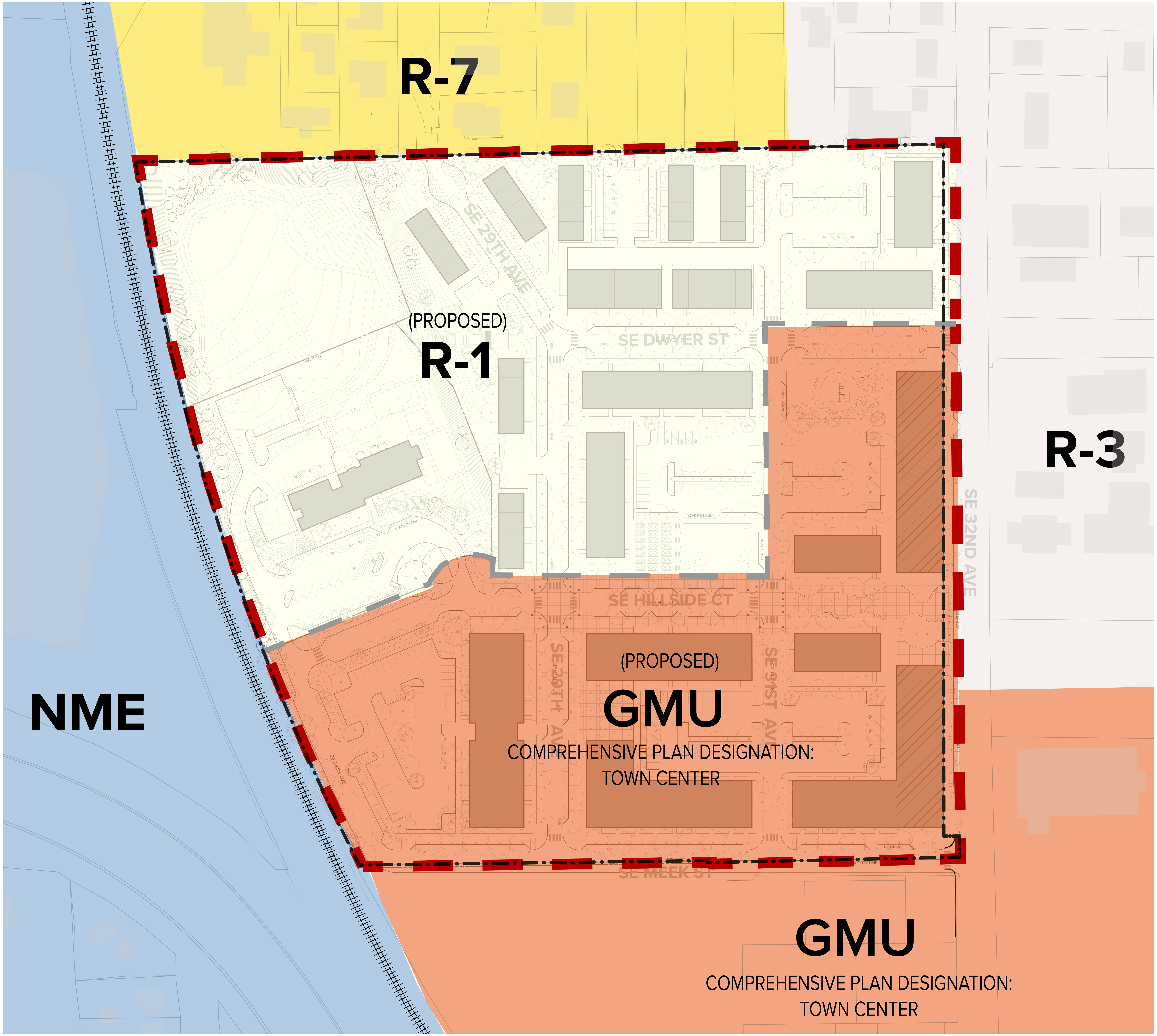
MILWAUKIE, OREGON

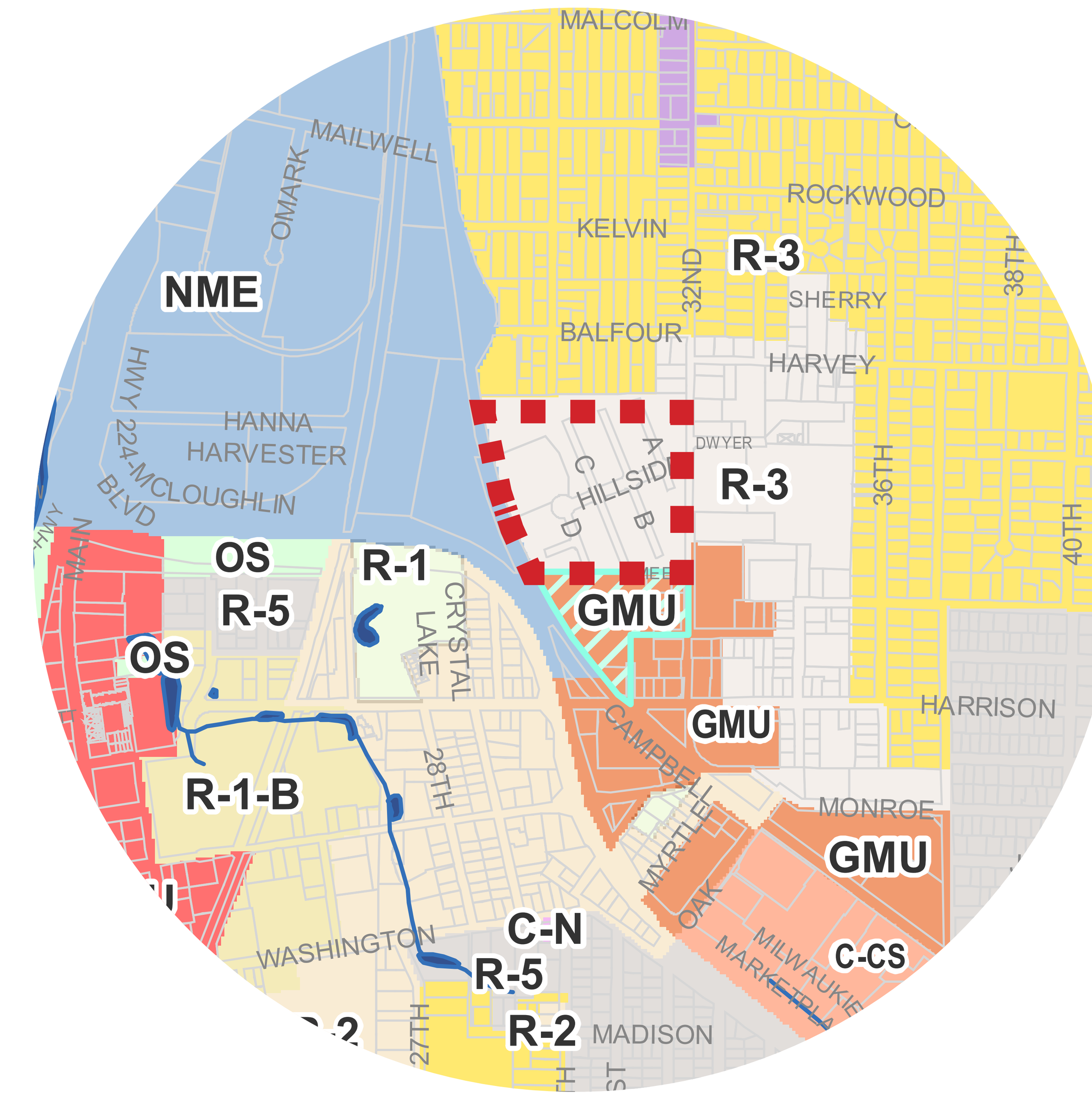
03.01.2021



Health, Housing & Human Services CLACKAMAS COUNTY · S|E A SCOTT|EDWARDS ARCHITECTURE · The Bookin Group, LLC · Humber Design Group, Inc. · WALKER|MACY · lancaster mobley


ARDENWALD NEIGHBORHOOD
1 & 2 STORY, LOW-DENSITY RESIDENTIAL
SE 29TH AVE
EXISTING SINGLE-FAMILY RESIDENCES & DUPLEXES
OPEN SPACE
STEEP GRADE
STEEP GRADE
EXISTING HILLSIDE MANOR BLDG
SE C ST
SE B ST
SE A ST
SE HILLSIDE CT
SE D ST
SE MEEK ST
SE 32ND AVE
SE DWYER DR
MULTI-FAMILY APARTMENT BUILDINGS (2 STORIES)
MEDICAL OFFICE BUILDINGS (2-STORIES)
PROVIDENCE MILWAUKIE HOSPITAL (3 STORIES)
MEDICAL OFFICE BUILDING (3 STORIES)
INDUSTRIAL BUILDING (PRECISION CAST PARTS)
TRAIN NOISE
INDUSTRIAL AREA
MILWAUKIE EXPRESSWAY
MURPHY SITE
UNDEVELOPED
MCLOUGHLIN INDUSTRIAL
ARDENWALD
HILLSIDE MASTER PLAN
LEWELLING
HISTORIC MILWAUKIE
HECTOR CAMPBELL
ISLAND STATION
LAKE ROAD
MILWAUKIE BUSINESS INDUSTRIAL
Milwaukie, OR
VICINITY MAP
MP 1.1
Health, Housing & Human Services
SEA
SCOTT EDWARDS ARCHITECTURE





CURRENT ZONING

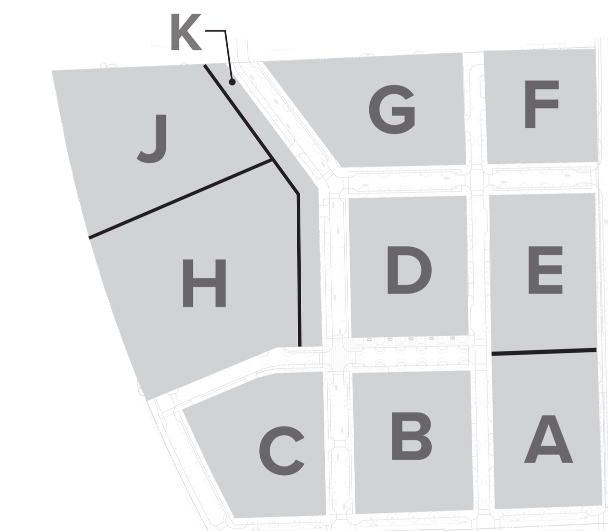
PROPOSED
ZONING

MP 1.2

Health, Housing & Human Services Clackamas County

S|E A
SCOTT EDWARDS ARCHITECTURE

KEY PLAN



LEGEND

.5 | 3/1 — # of stories (res.) / over commerical

E1 | 50 — # of units

parking ratio

Building

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	= 137 stalls
Total	= **489 stalls**

0 50' 100' 200'

NORTH

MASTER PLAN

MP 1.3

Health, Housing & Human Services CLACKAMAS COUNTY

S|E A SCOTT EDWARDS ARCHITECTURE

XX' = BUILDING SETBACKS REQUESTING MODIFICATION FROM ZONING STANDARDS

LAND DIVISION PLAN

MP 1.4

Health, Housing & Human Services — Clackamas County

SEA — SCOTT EDWARDS ARCHITECTURE

LOW
DENSITY

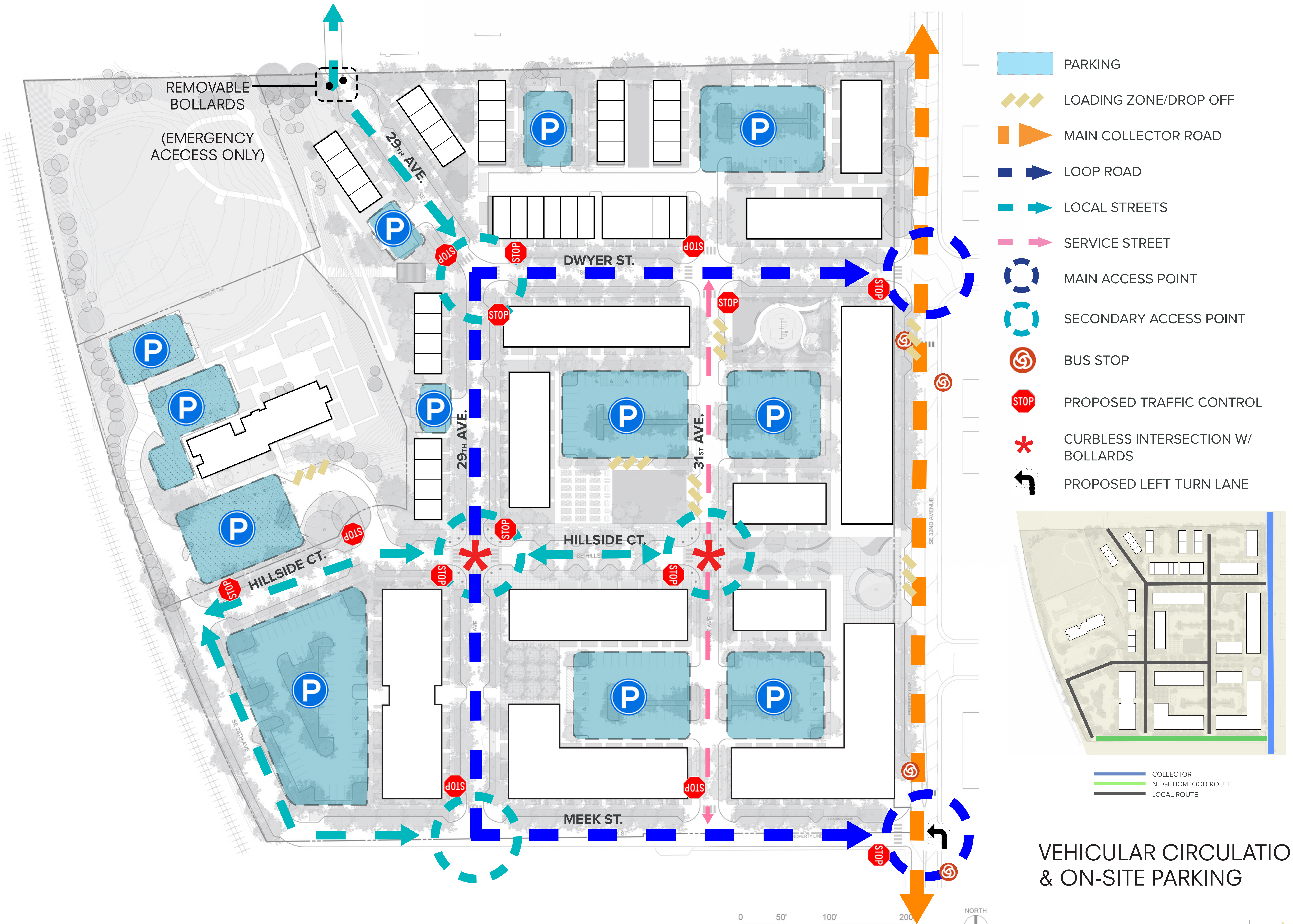
HIGH
DENSITY

DENSITY ALLOCATION

MP 1.5

Health, Housing & Human Services
CLACKAMAS COUNTY

S|E A
SCOTT | EDWARDS ARCHITECTURE

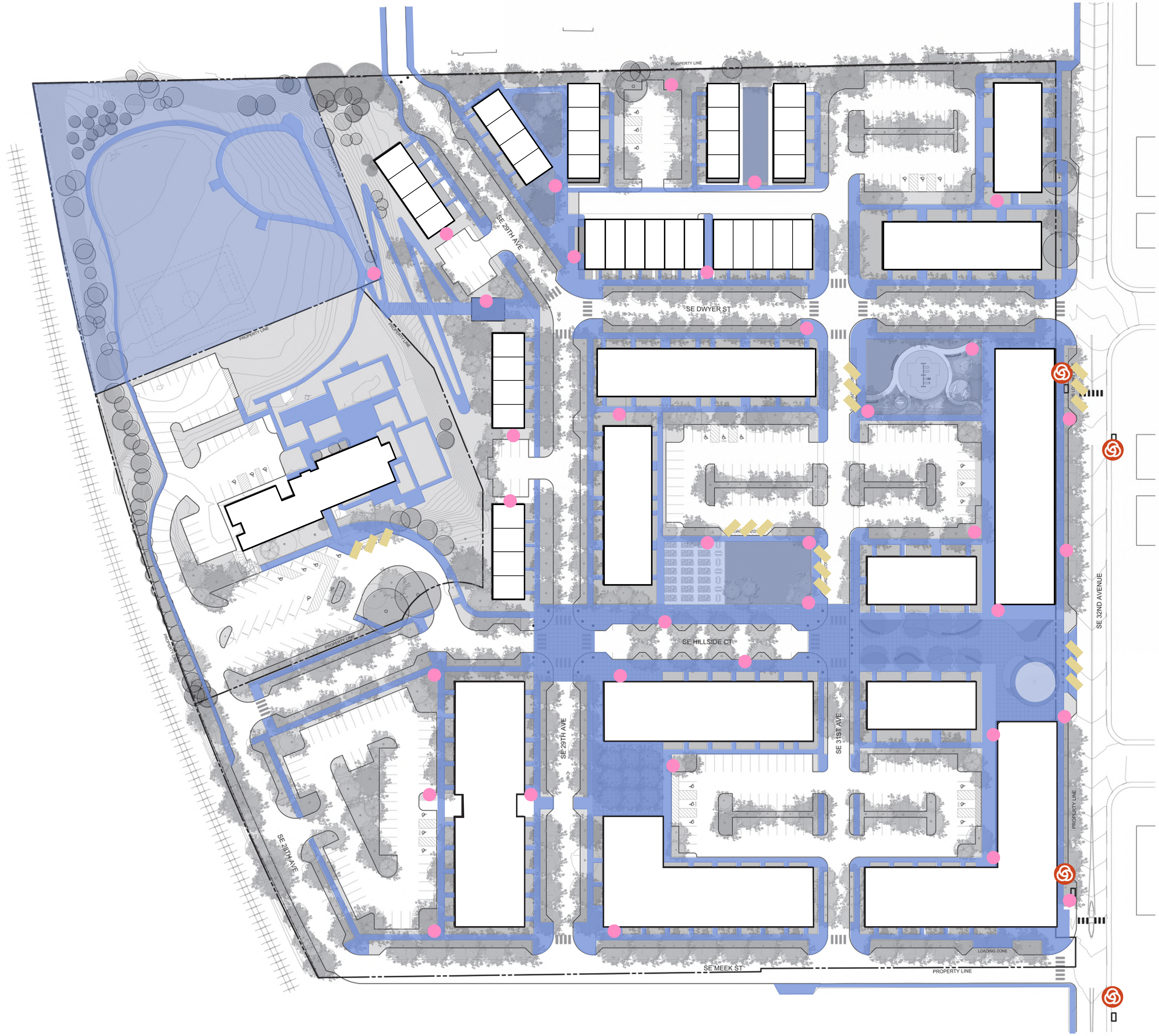


VEHICULAR CIRCULATION & ON-SITE PARKING

MP 1.6

Health, Housing & Human Services

SEA SCOTT EDWARDS ARCHITECTURE



- PEDESTRIAN CIRCULATION
- OPEN SPACE (PUBLIC)
- OPEN SPACE (PRIVATE)
- CONCENTRATION OF BIKE PARKING
- EXISTING BUS STOP
- DROP-OFF AREA

0 50' 100' 200'

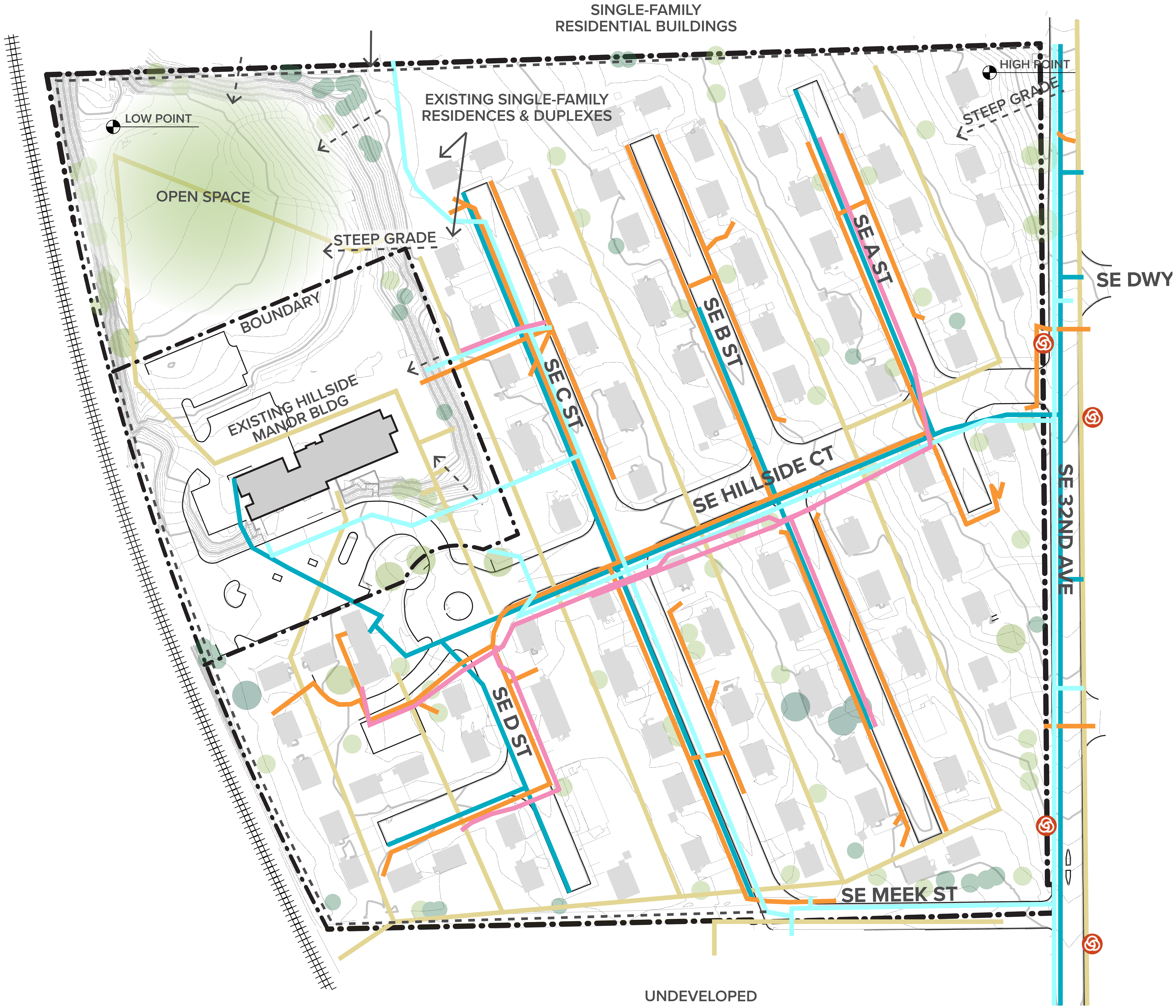
NORTH

PEDESTRIAN CIRCULATION

MP 1.7

Health, Housing & Human Services CLACKAMAS COUNTY

S|E|A SCOTT EDWARDS ARCHITECTURE



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

0 50' 100' 200'

NORTH

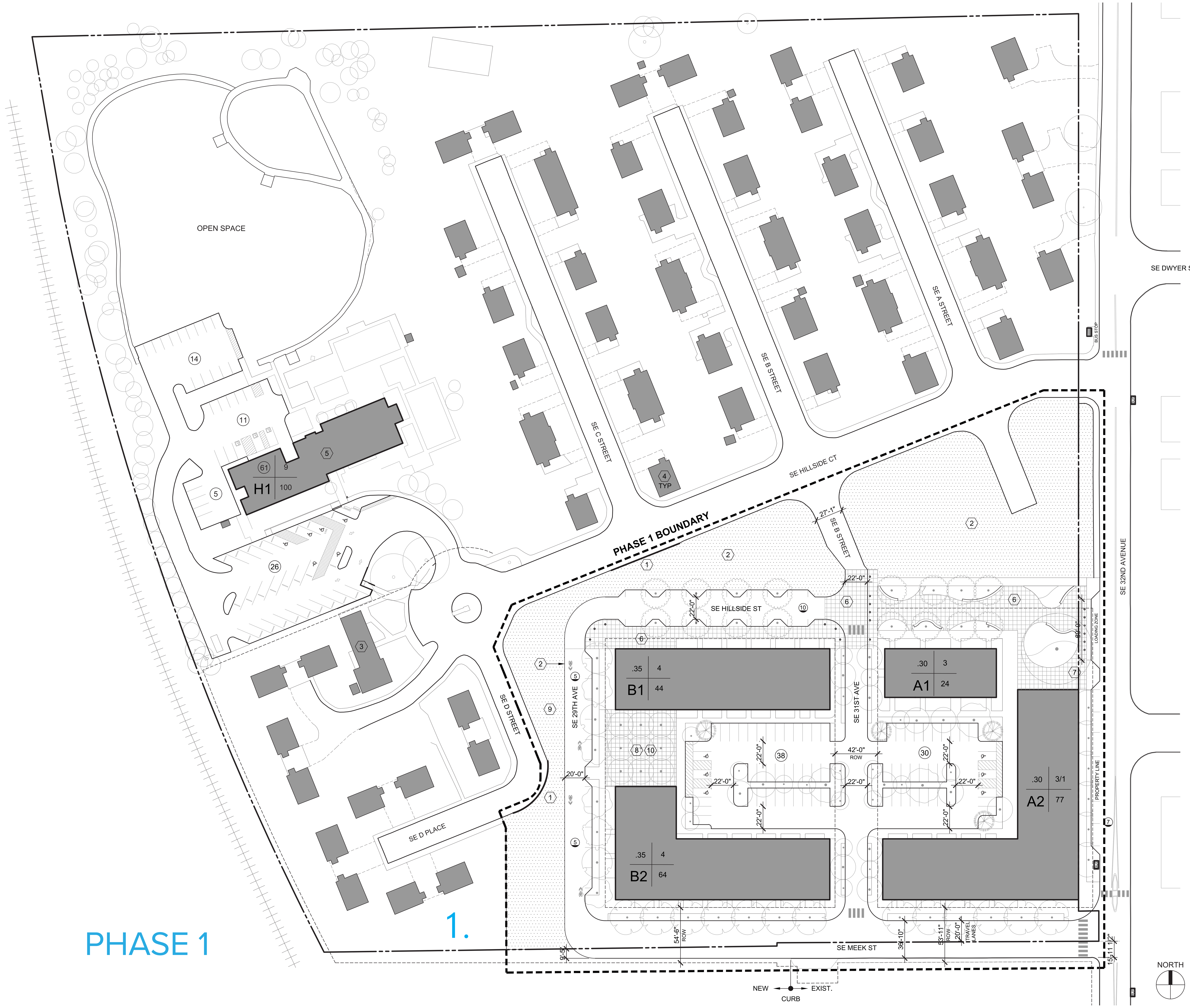
MP 1.8

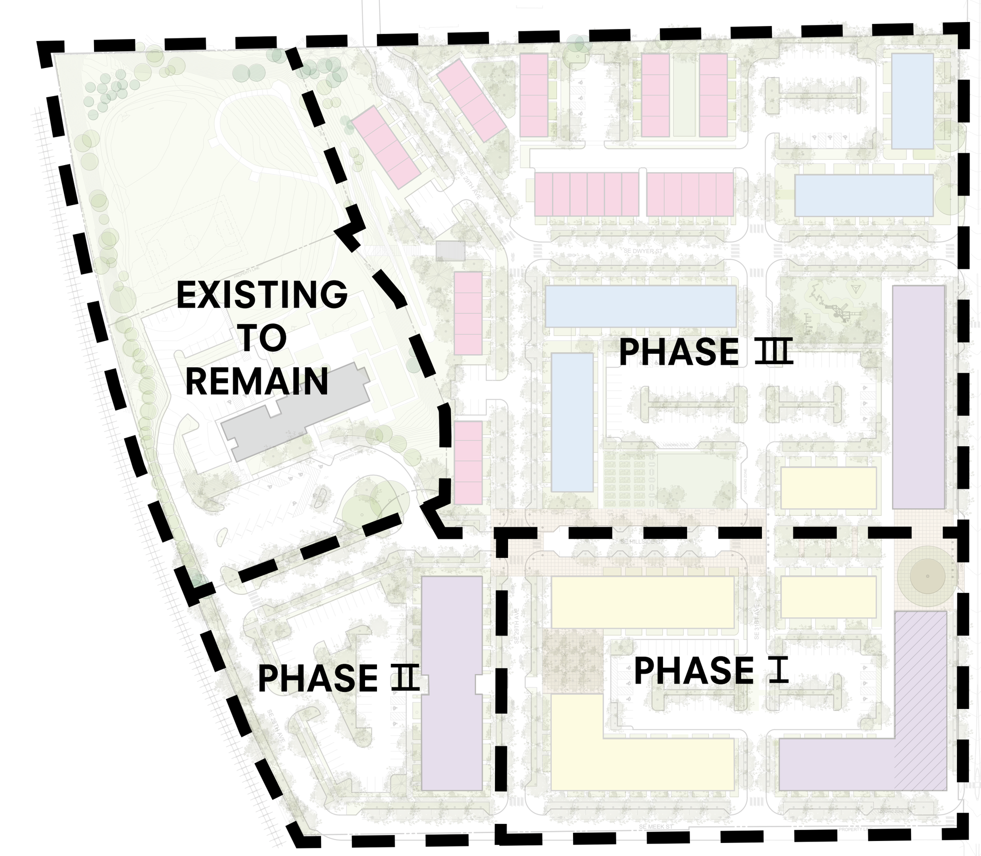
Health, Housing & Human Services

SEA
SCOTT EDWARDS ARCHITECTURE

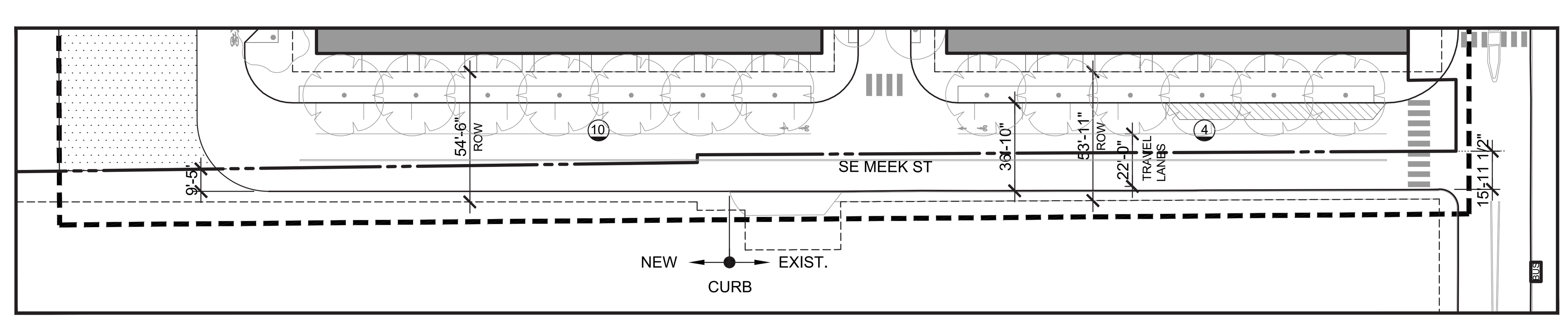
1. PHASE I - BEFORE MEEK ST. ACCESS AGREEMENT (DELAY STRIPING OF 14 PARKING SPACES

2. PHASE I - AFTER MEEK ST. ACCESS AGREEMENT (STRIPE 14 PARKING SPACES, BIKE LANE, SHIFT TRAVEL LANES SOUTH)





2.



PHASED DEVELOPMENT PLAN

MP 1.9

Health, Housing & Human Services CLACKAMAS COUNTY

S|E A SCOTT EDWARDS ARCHITECTURE

lancaster mobley

Hillside Master Plan

Transportation Impact Study

Milwaukie, Oregon

Revision Date:
January 4, 2021

Prepared for:
Devin Ellin & Stephen McMurtrey
Housing Authority of Clackamas County (HACC)

Prepared by:
Jennifer Danziger, PE

REGISTERED PROFESSIONAL
ENGINEER
OREGON
SEPT. 15, 1992
JENNIFER ELISE DANZIGER

RENEWS: 12.31.21

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 potential conflict points along this section of SE 32nd Avenue will be reduced by six driveways 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. The warrant is not met with Phase 1 of the project, which includes 209 dwelling units but is expected to be met when 325 to 350 units on the site are constructed. A storage length of approximately 50 feet should be provided and the pedestrian crossing on the north side of the street should be moved southward to align with new ramps on the northwest corner of the intersection.
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 can support 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	Collector	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

Note: Functional Classification based on the City of Milwaukie Transportation System Plan

Study Intersections

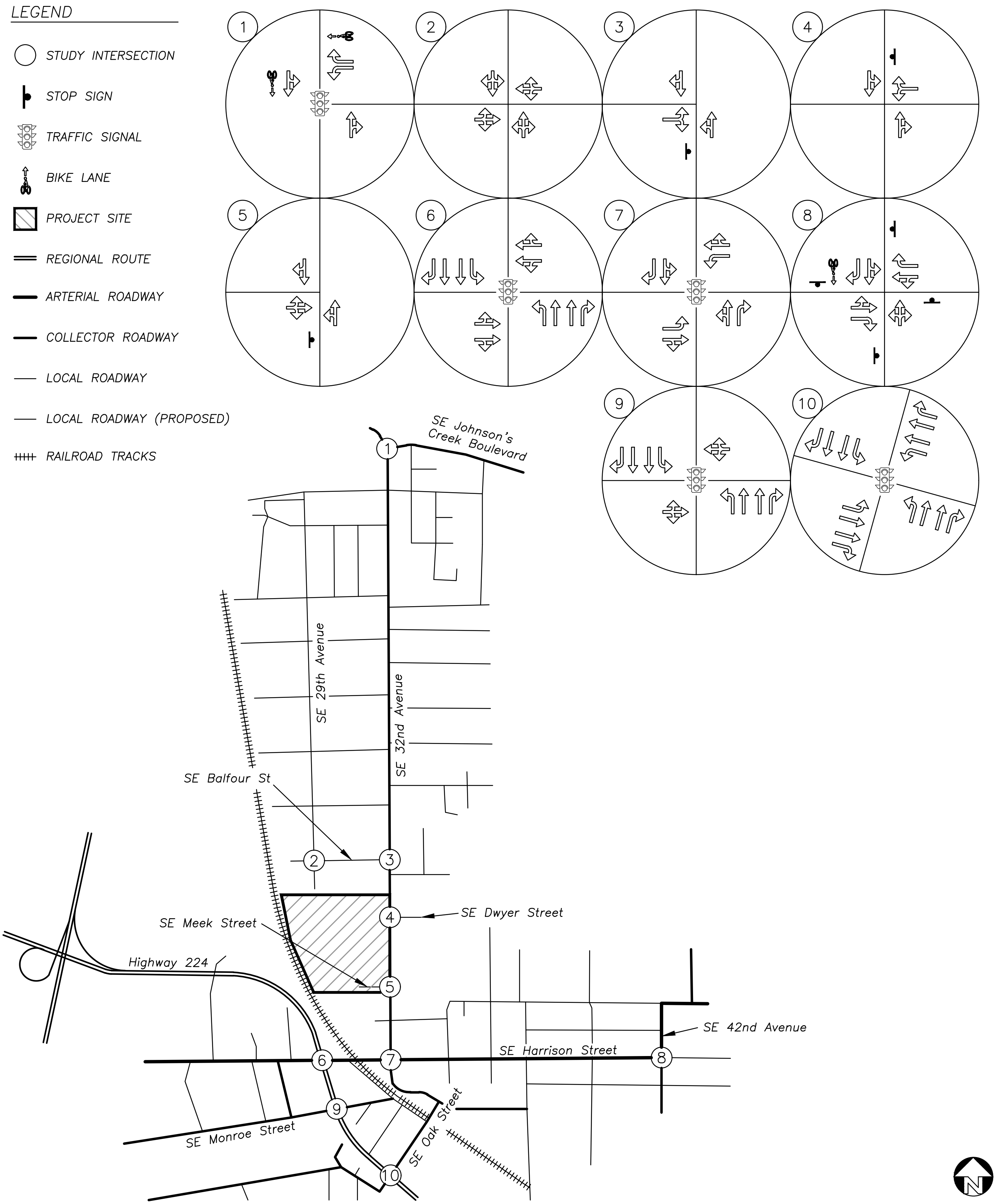
The proposed development is expected to impact ten vicinity intersections of significance. Table 2 provides a summarized description of the study intersections.

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	Proposed Four-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.



Plotted 8/24/2020

lancaster mobley

VICINITY MAP

Figure 1

Hillside Master Plan

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. Rates for all land uses are based on the General Urban/Suburban setting/location.

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

Land Use	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	1,488
Modal Split Reduction (10%)			*3*	*8*	*11*	*9*	*5*	*14*	*148*
Net External Trips			25	74	99	80	49	129	1,340
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	2,258
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	3,074
Modal Split Reduction (10%)			*6*	*18*	*24*	*16*	*10*	*26*	*308*
Net External Trips			51	158	209	144	90	234	2,766
Net Increase in External Trips			**26**	**84**	**110**	**64**	**41**	**105**	**1,426**

Note: All trip rates are based on the General Urban/Suburban setting/location.

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

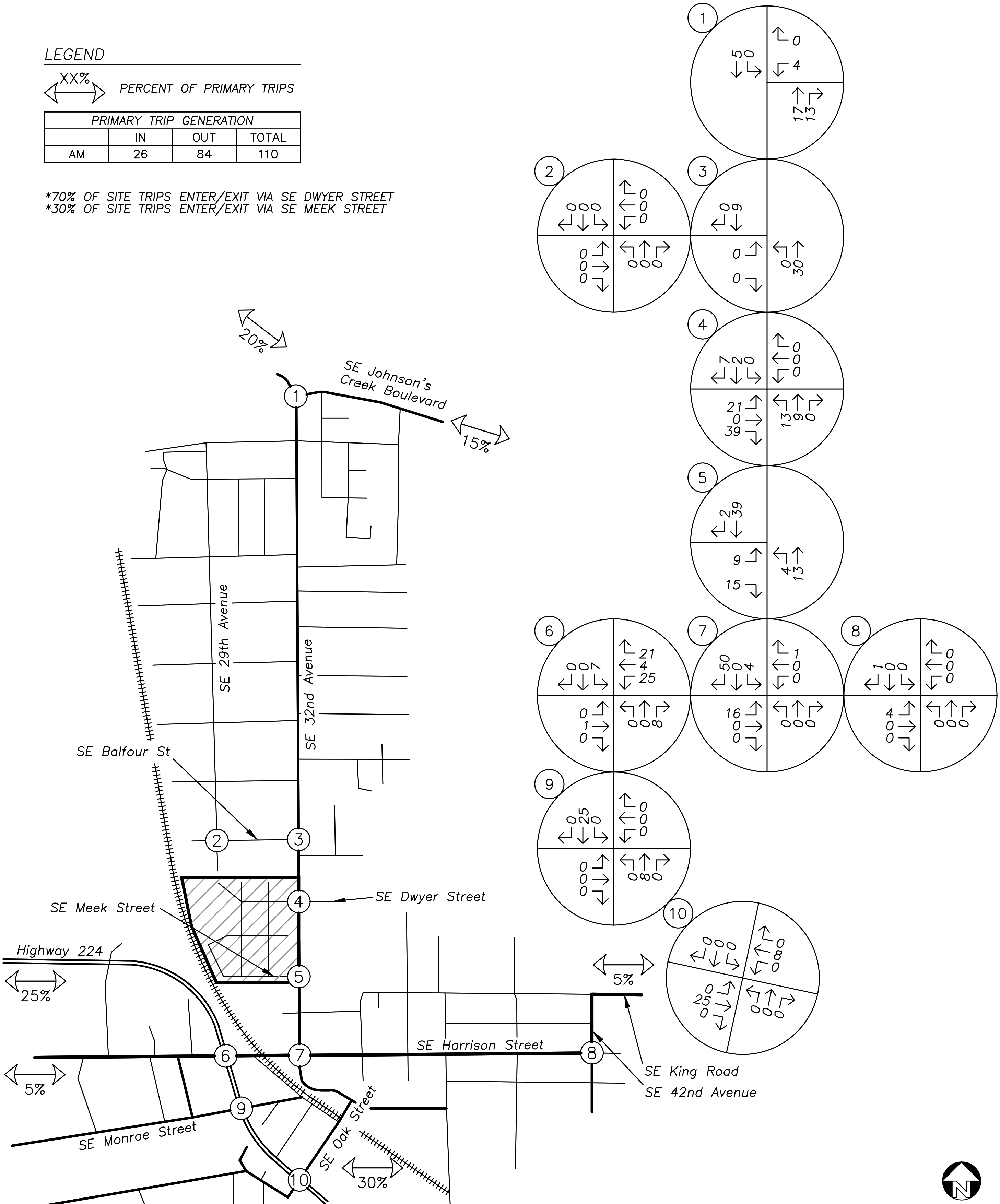
The trip distribution and assignment for the site trips generated by the proposed development during the morning and evening peak hours is shown in Figure 2 and Figure 3 respectively.

LEGEND

XX% PERCENT OF PRIMARY TRIPS

PRIMARY TRIP GENERATION			
	IN	OUT	TOTAL
AM	26	84	110

*70% OF SITE TRIPS ENTER/EXIT VIA SE DWYER STREET
*30% OF SITE TRIPS ENTER/EXIT VIA SE MEEK STREET



Plotted 8/24/2020

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SITE TRIP DISTRIBUTION & ASSIGNMENT
Proposed Development Plan - Site Trips
AM Peak Hour

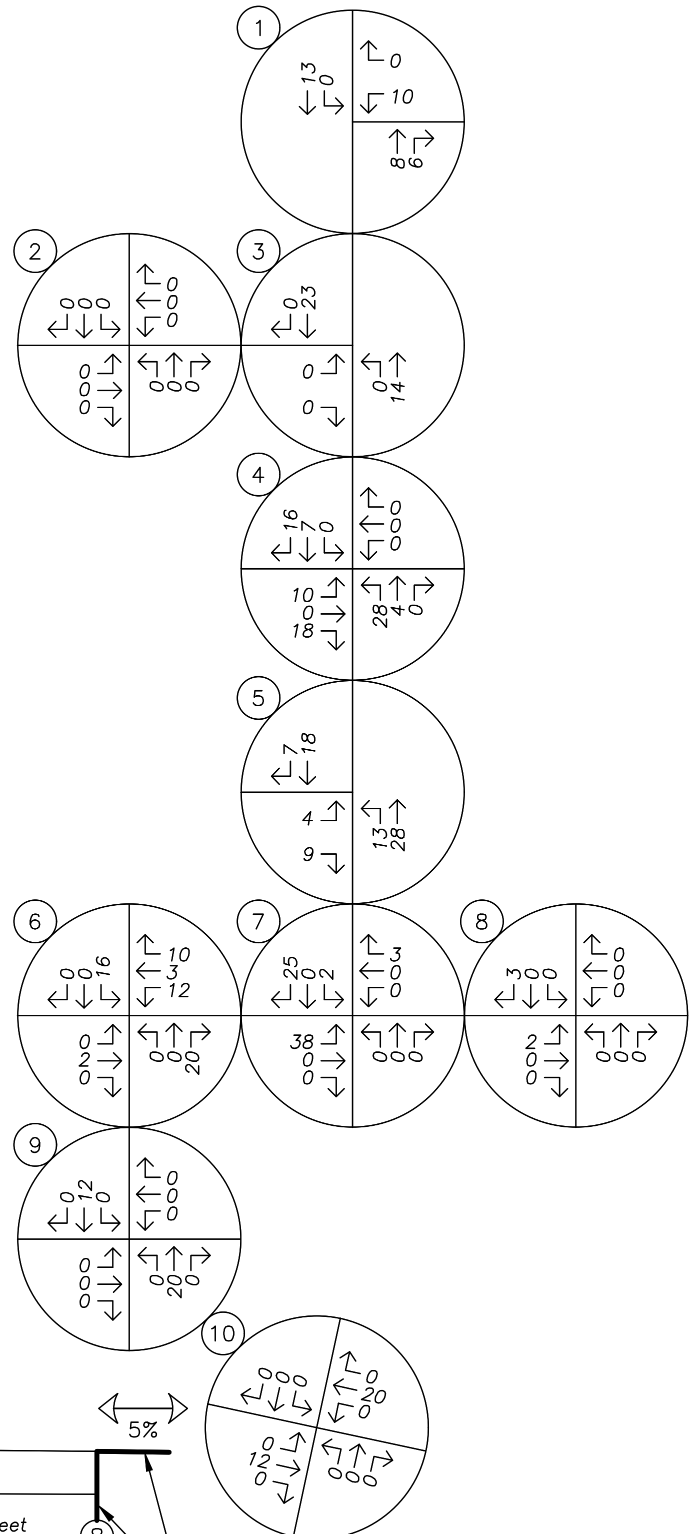
Figure 2
Hillside Master Plan

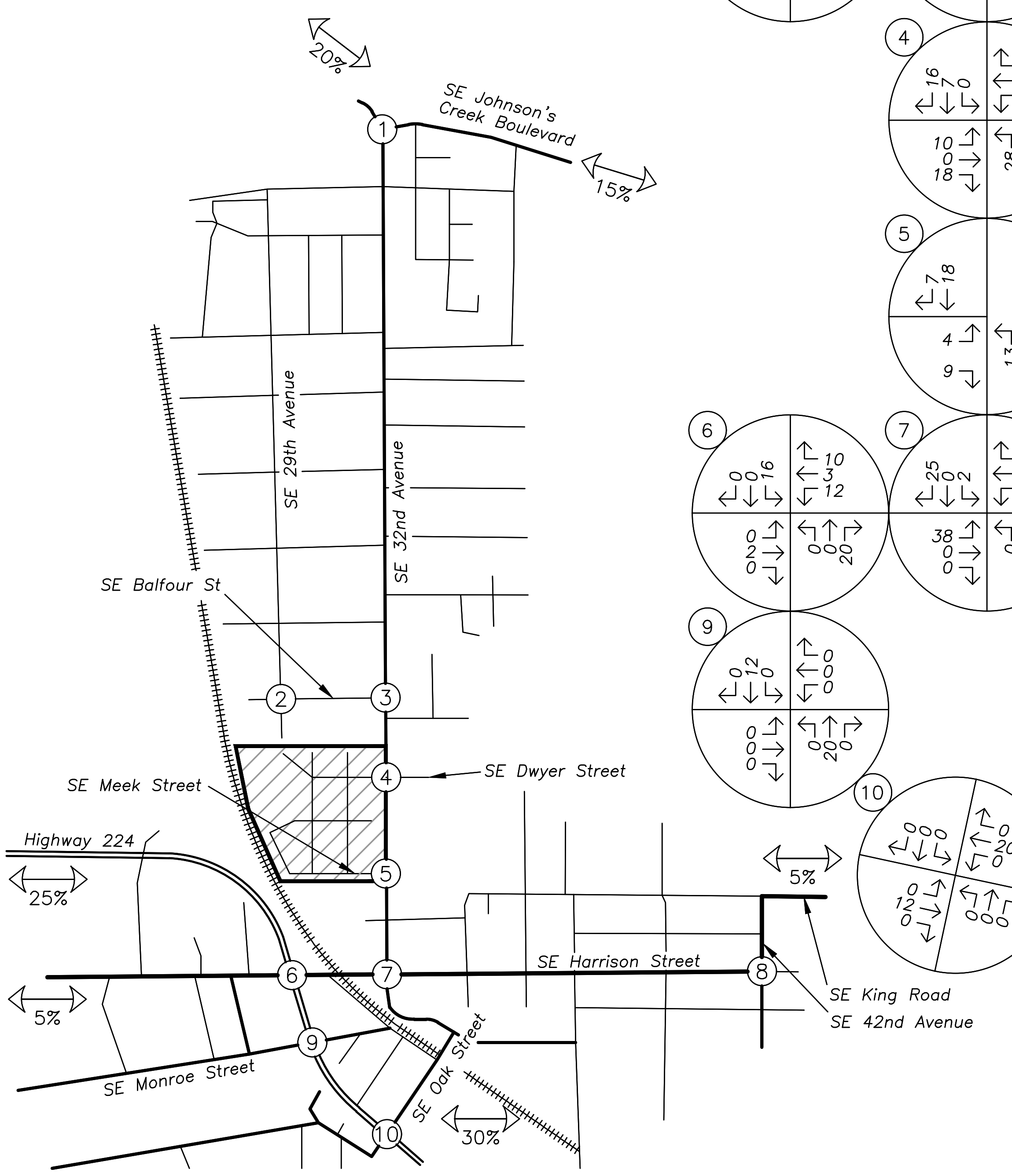
LEGEND

XX% — PERCENT OF PRIMARY TRIPS

PRIMARY TRIP GENERATION			
	IN	OUT	TOTAL
PM	64	41	105

*70% OF SITE TRIPS ENTER/EXIT VIA SE DWYER STREET
*30% OF SITE TRIPS ENTER/EXIT VIA SE MEEK STREET





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SITE TRIP DISTRIBUTION & ASSIGNMENT
Proposed Development Plan - Site Trips
PM Peak Hour

Figure 3
Hillside Master Plan

Traffic Volumes

Existing Conditions

Historic traffic data from two transportation impact studies, *Hillside Development Preliminary Master Plan* (dated December 21, 2018) and *Monroe Apartments Transportation Impact Study* (dated July 16, 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 AM to 9:00 AM and 4:00 PM to 6:00 PM 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 AM to 9:00 AM and 4:00 PM to 6:00 PM.

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 7, 2019 from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM 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 14, 2020 from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM 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 after, 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.

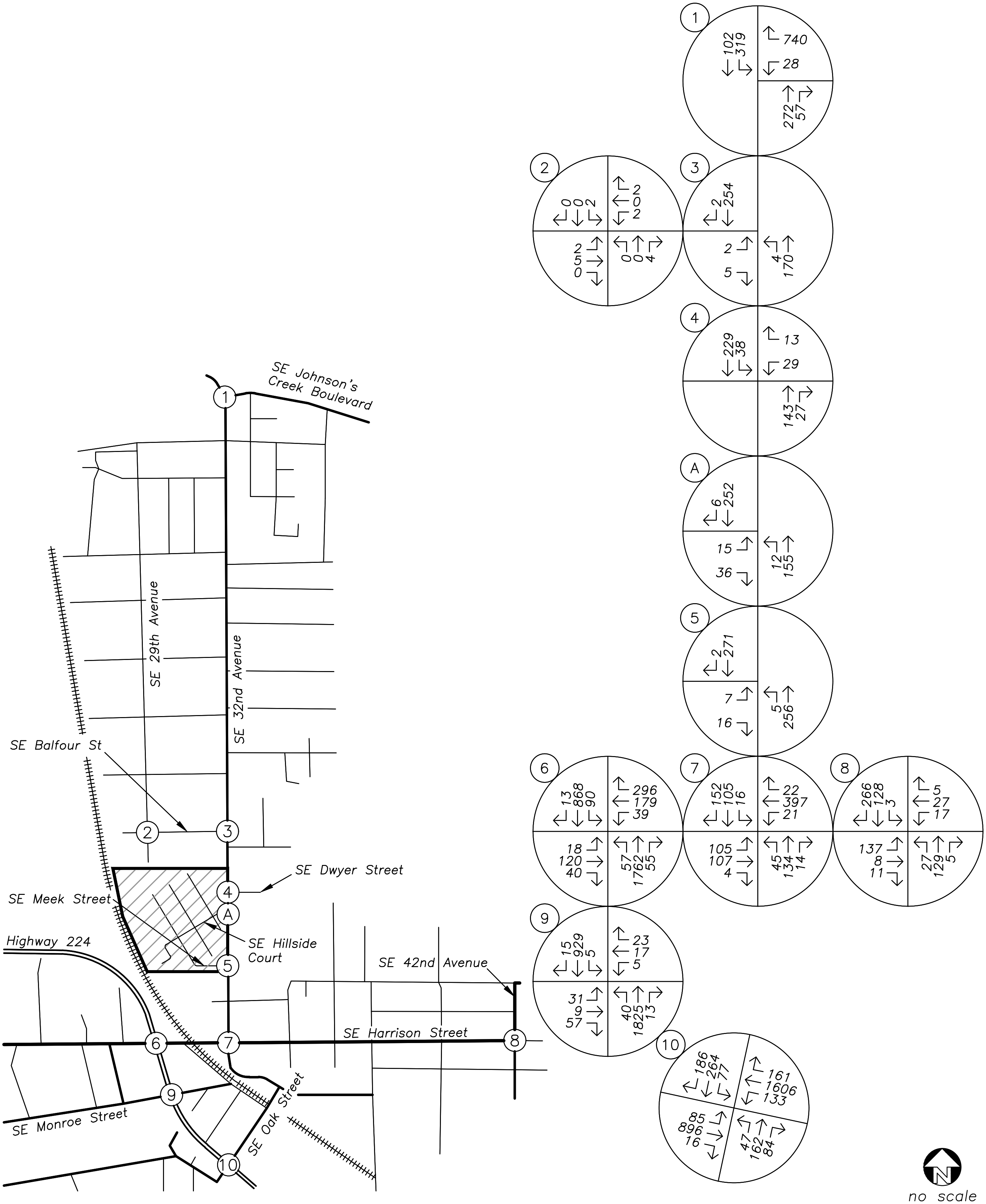
SE Hillside Court and SE Meek Street

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'.



Plotted 8/24/2020

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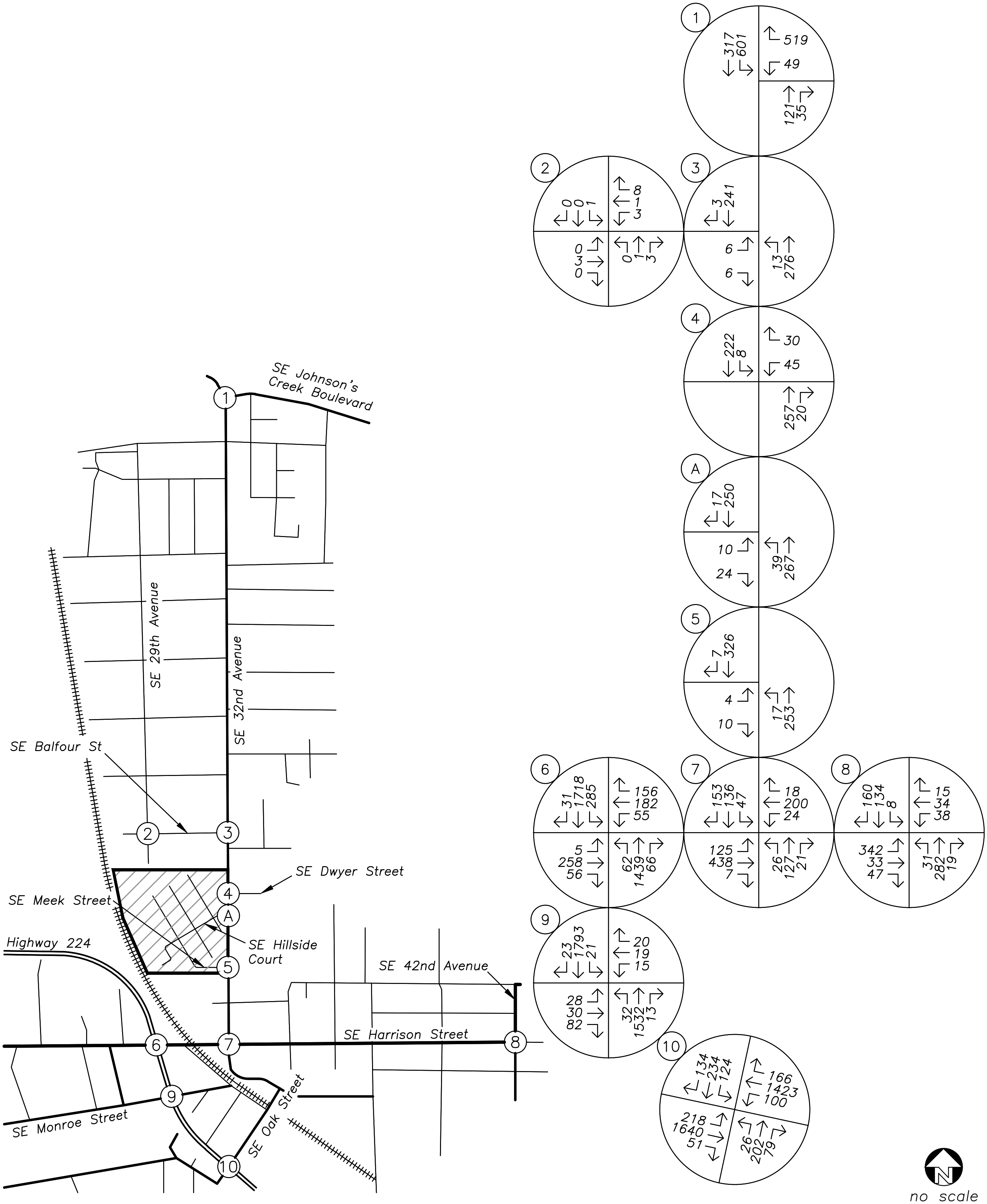
TRAFFIC VOLUMES
2020 Existing Conditions
AM Peak Hour

Figure 4

Hillside Master Plan



Plotted 8/24/2020

TRAFFIC VOLUMES
2020 Existing Conditions
PM Peak Hour

Figure 5

Hillside Master Plan

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

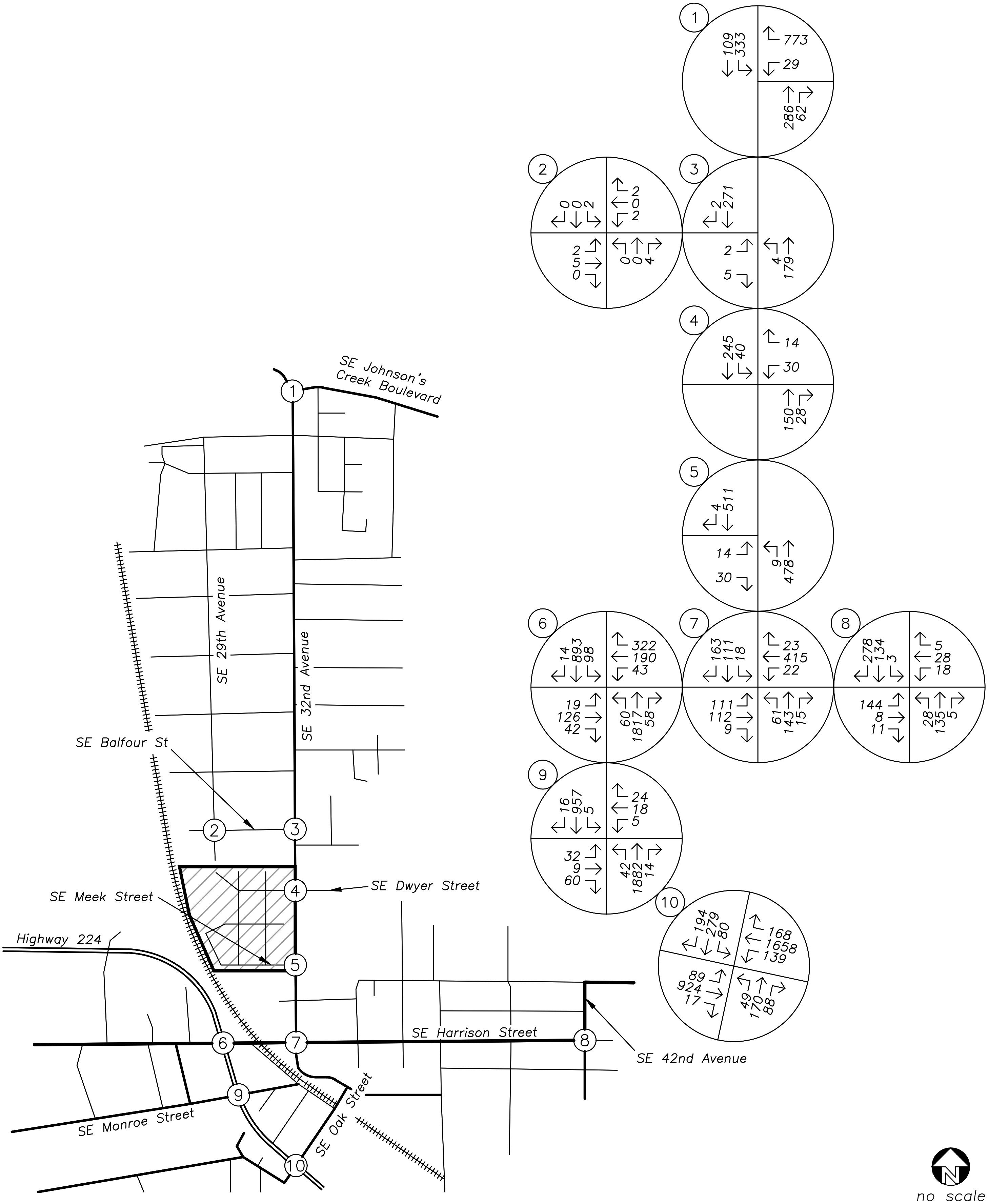
The Transportation Impact Study of each development was used to obtain trip generation and trip assigment data corresponding to their respective developments. The trip assignments assumed in these reports was used to quantify the total volume of site trips travelling through the study intersections related 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



Plotted 8/24/2020

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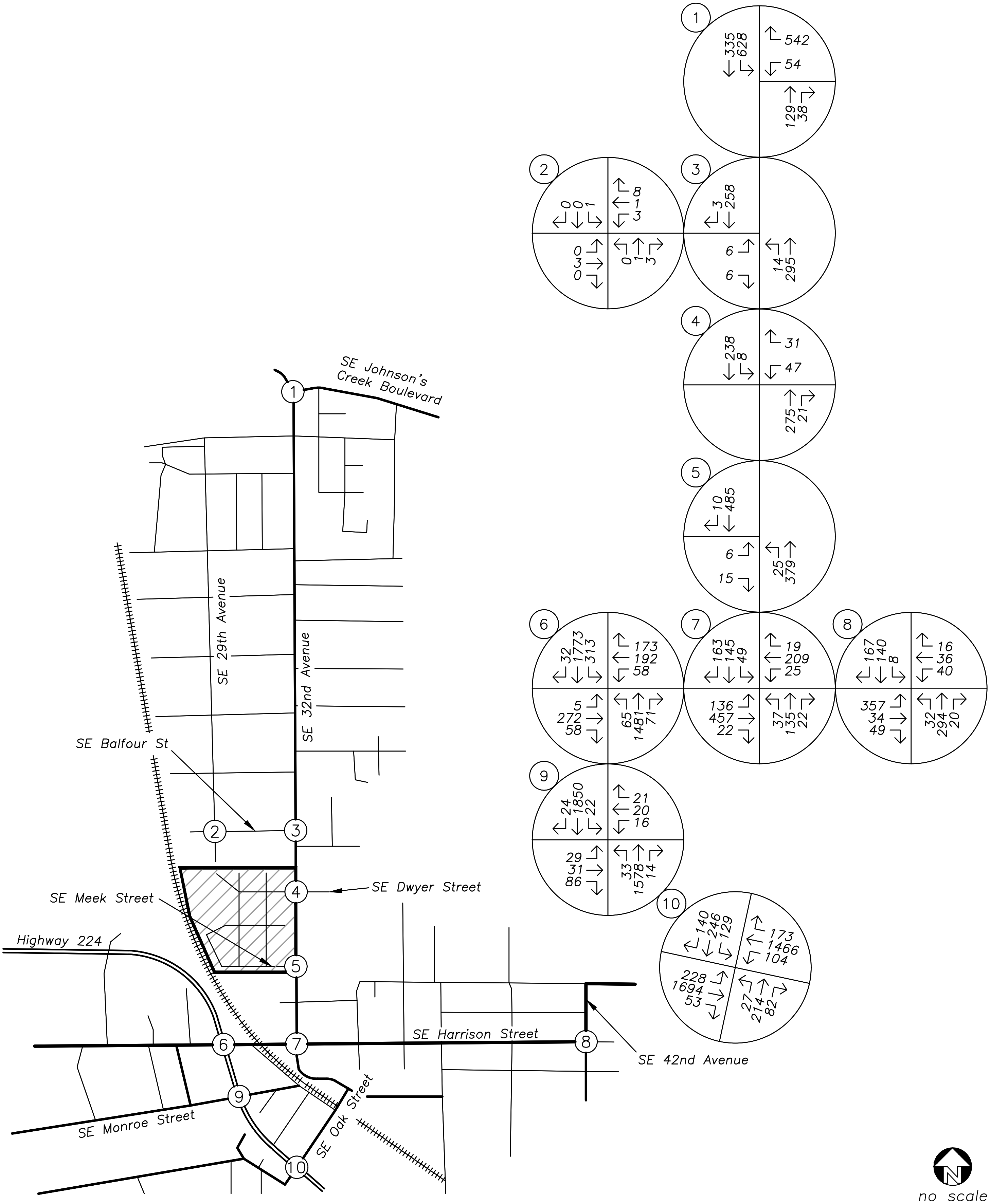
TRAFFIC VOLUMES
2026 Background Conditions
AM Peak Hour

Figure 6

Hillside Master Plan



Plotted 8/24/2020

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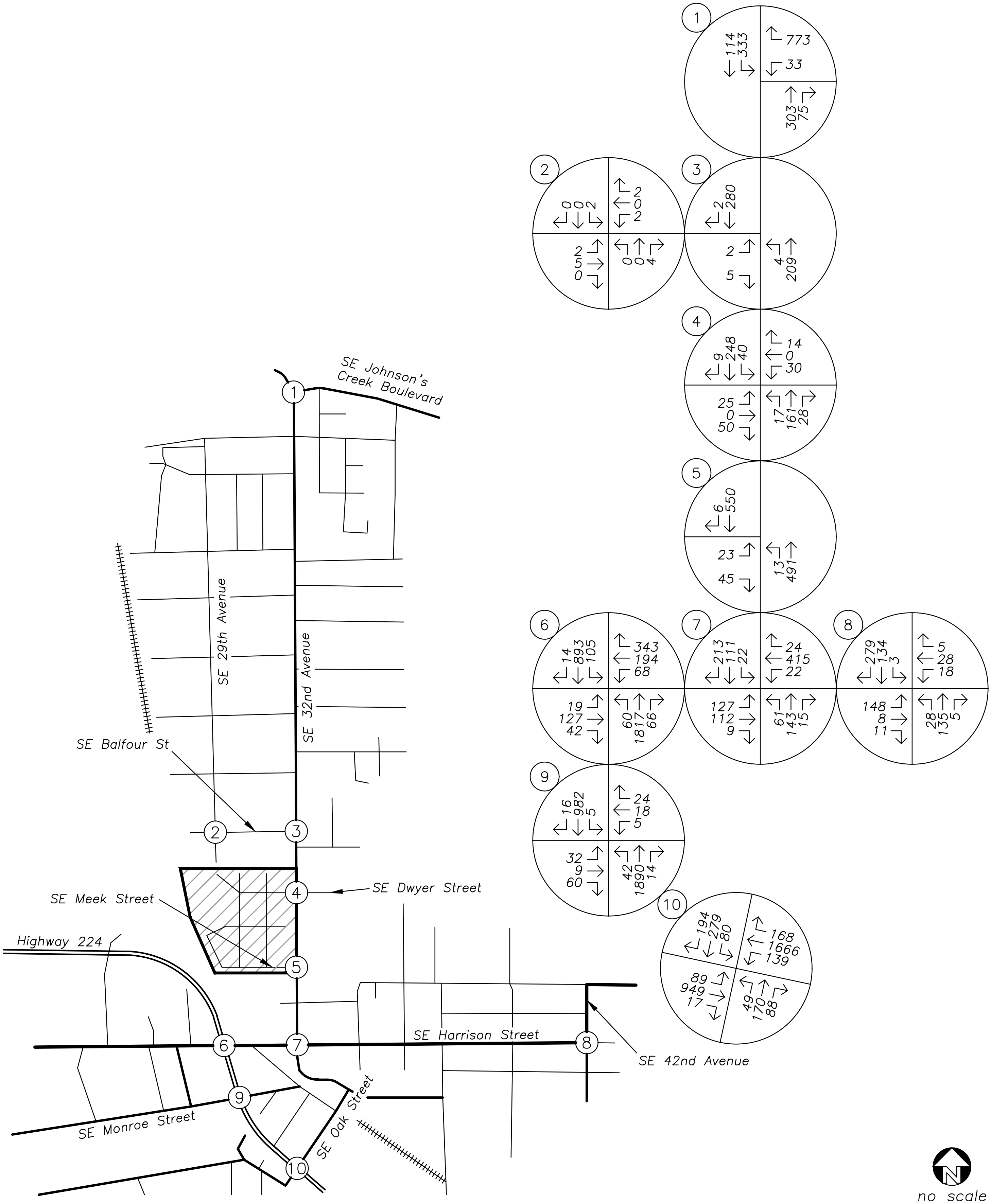
TRAFFIC VOLUMES
2026 Background Conditions
PM Peak Hour

Figure 7

Hillside Master Plan

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.



Plotted 8/24/2020

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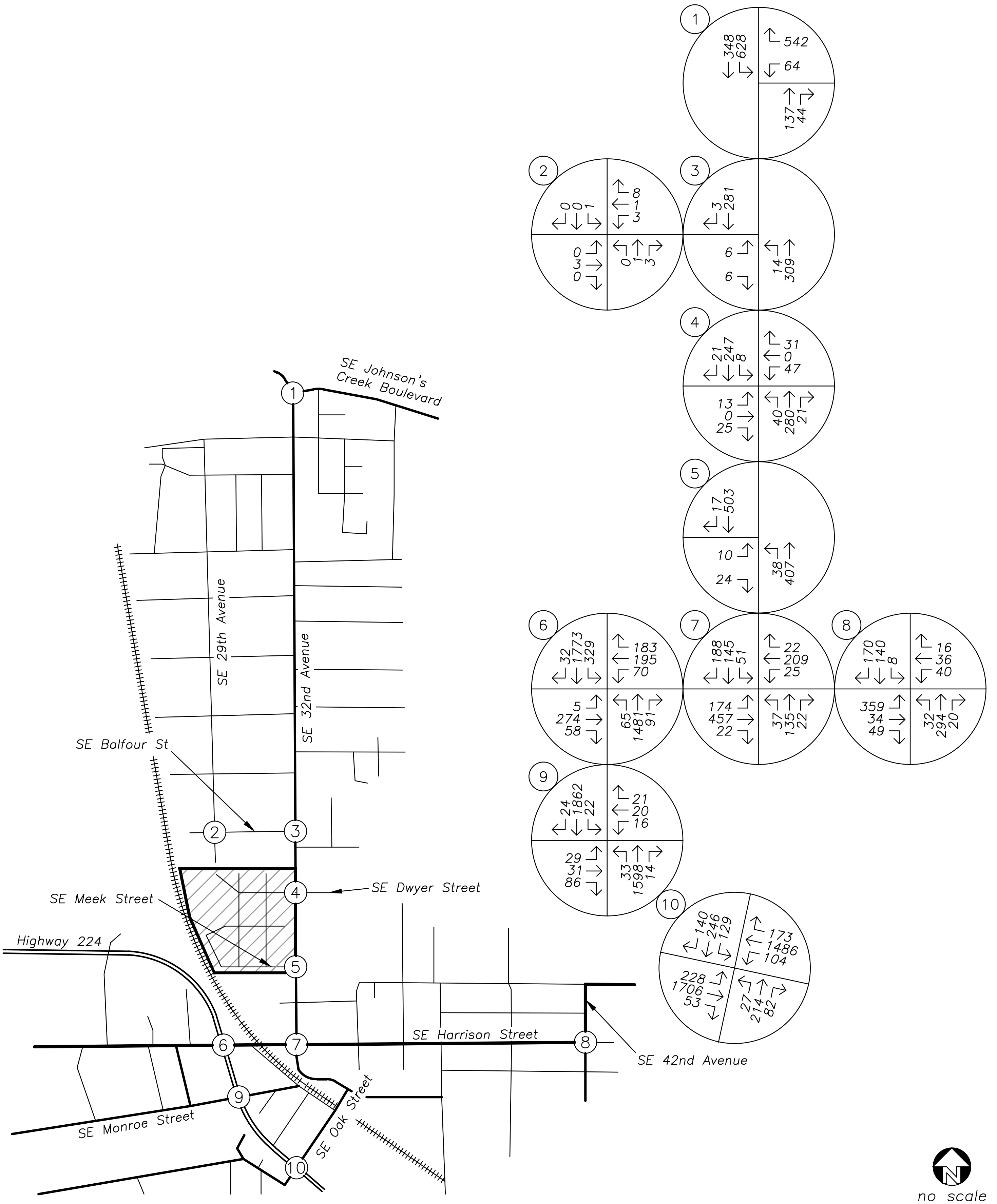
TRAFFIC VOLUMES
2026 Buildout Conditions
AM Peak Hour

Figure 8

Hillside Master Plan



Plotted 8/24/2020

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TRAFFIC VOLUMES
2026 Buildout Conditions
PM Peak Hour

Figure 9

Hillside Master Plan

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 exceeding 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 exceeding 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

With the proposed development, a new eastbound leg opposite SE Dwyer Drive will be created and the access at SE Hillside Court will be closed. Sight lines for the new intersection approach were measured using the site plan, which includes on-street parking along SE 32nd Avenue. Available sight distance was measured to be 280 looking to the north before parked cars on SE 32nd Avenue could begin to affect the line of sight. Available sight distance was measured to be 300 feet looking to the south before parked cars along SE 32nd Avenue could begin to affect the line of sight.

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 exceeding 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.

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[4] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 6th Edition, 2011.

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 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 exceeding 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. The warrant is not met with Phase 1 of the project, which includes 209 dwelling units. The warrant is estimated to be met when 325 to 350 units on the site are constructed.

Preliminary analysis using traffic simulations indicates that the left-turn lane should have a storage length of approximately 50 feet to accommodate the 95th percentile queue. A conceptual illustration of the left-turn lane is included in the appendix. With the addition of the left-lane and the improvements along the site frontage, the pedestrian crossing on the north side of the street should be moved southward to align with new ramps on the northwest corner of the intersection.

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 are 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

lancaster mobley

SAFE ROUTES TO SCHOOL
Wilbur Rowe Middle School

Figure 11

Hillside Master Plan

lancaster mobley

SAFE ROUTES TO SCHOOL
Milwaukie High School

Figure 12

Hillside Master Plan

Operational Analysis

An operational 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.

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[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 (Three Legs)	B	14	0.11	B	14	0.17
2026 Background Conditions (Three Legs)	B	14	0.12	B	14	0.19
2026 Buildout Conditions (Four Legs)	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 29^{th} Avenue Connection

The Hillside Master Plan has the potential to connect its internal street system to SE 29^{th} Avenue on the north side of the site. This connection would extend SE 29^{th} Avenue to connect with SE Dwyer Drive within the property and has the option to either accommodate vehicular traffic or provide connection to SE 29^{th} 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 29^{th} Avenue.

To understand the potential impacts that a vehicular connection with SE 29^{th} 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 29^{th} Avenue: 1) how much traffic from the proposed development enter the neighborhood to the north using by SE 29^{th} Avenue instead of SE 32^{nd} Avenue and 2) how much traffic from the neighborhood would travel through the Hillside development instead of using SE 32^{nd} 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 29^{th} 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 32^{nd} Avenue. Further, delays from the site accesses (SE Dwyer Drive and SE Meek Street) onto SE 32^{nd} 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 29^{th} 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 29^{th} Avenue to SE Meek Street at SE 32^{nd} 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 29^{th} 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 29^{th} 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 29^{th} 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 can support 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) reasonably represent 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

Land Use	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**

Note: All trip rates are based on the General Urban/Suburban setting/location.

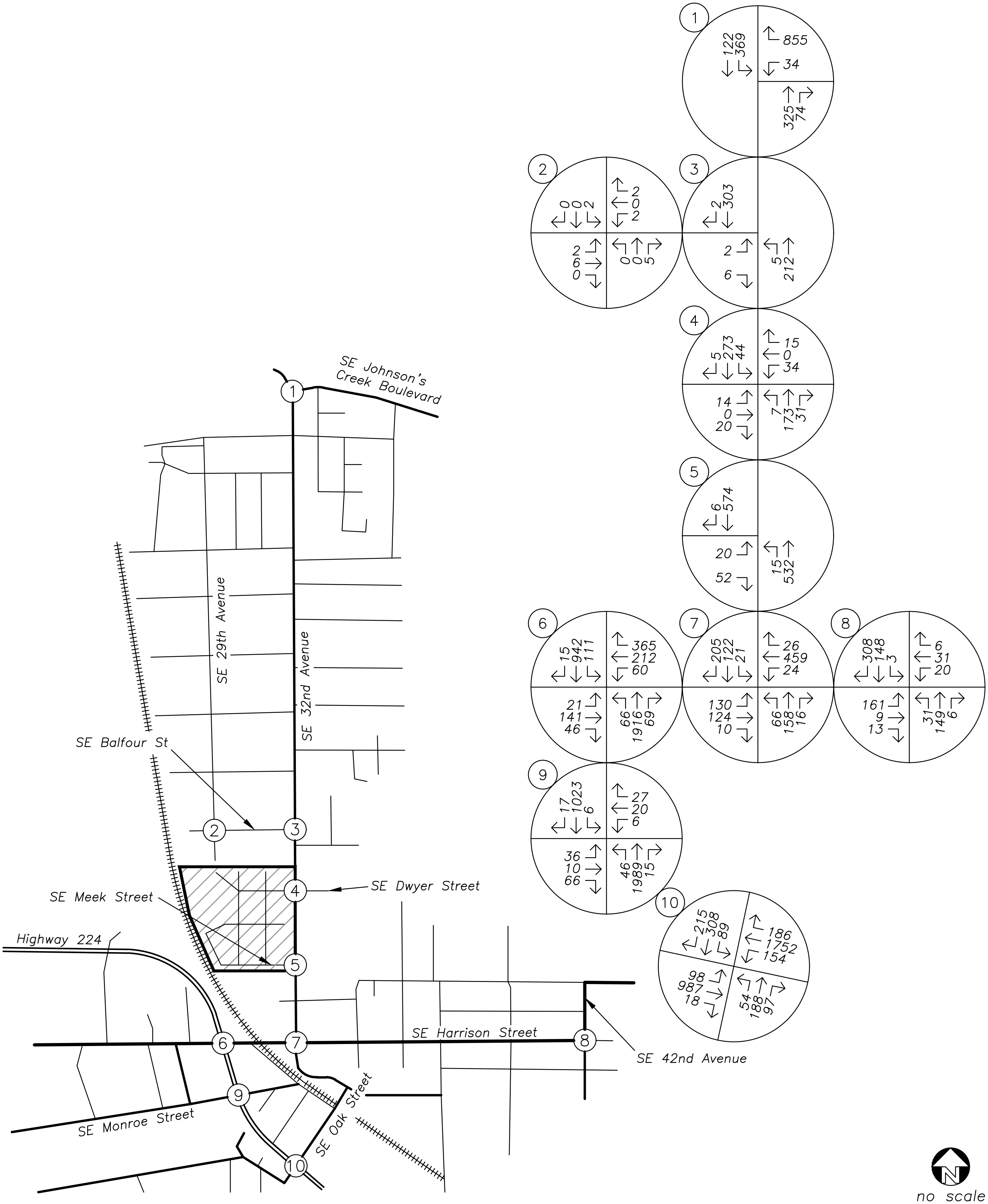
As required by the City of Milwaukie, an analysis of the study intersections in the 20-year planning horizon was done to determine the potential impacts the proposed zone change could have on the transportation system. A compounded growth rate of 0.725 percent per year for an assumed buildout condition 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.



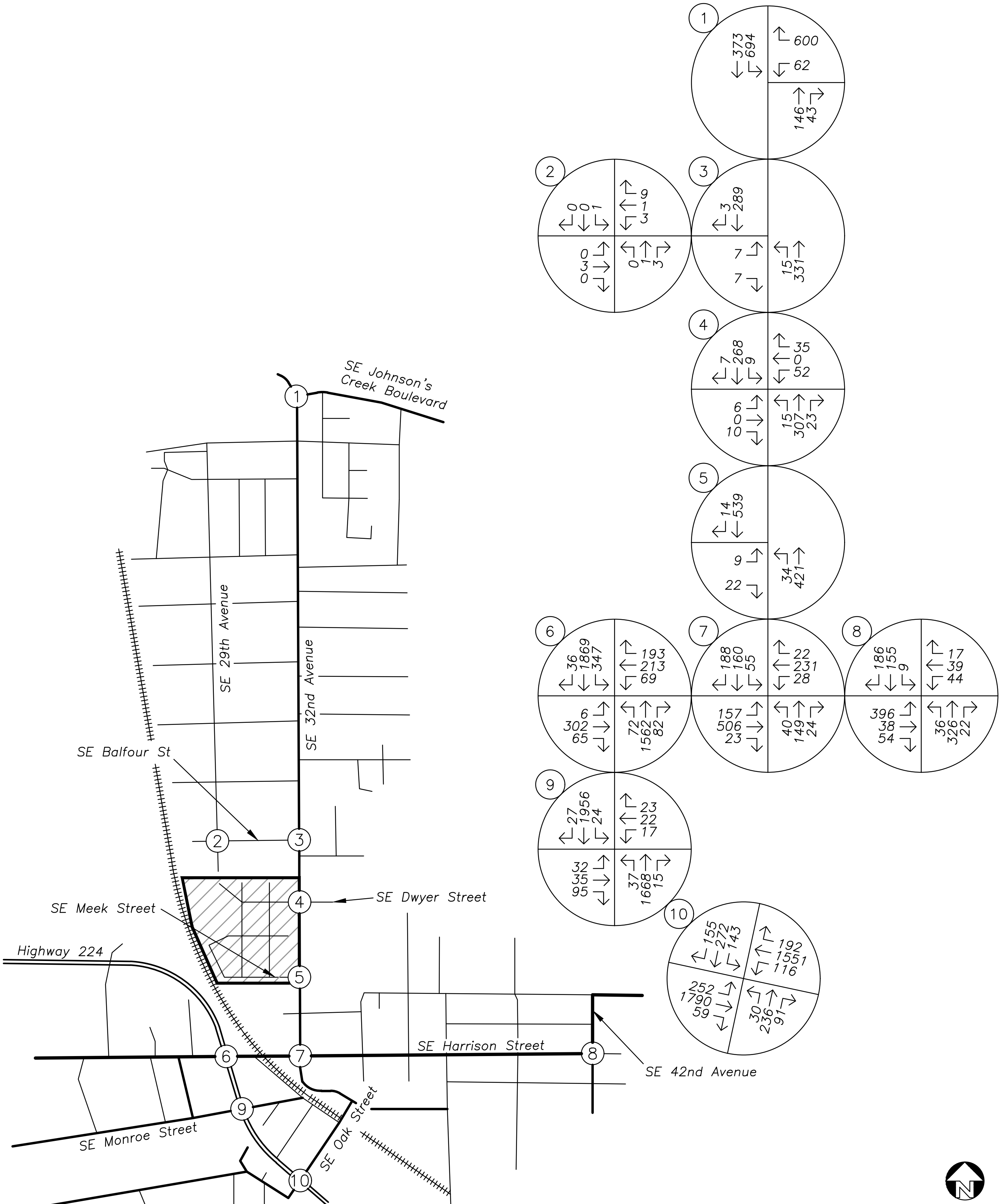
Plotted 8/24/2020

lancaster mobley

TRAFFIC VOLUMES
2040 Planning Horizon
AM Peak Hour

Figure 13

Hillside Master Plan



Plotted 8/24/2020

lancaster mobley

TRAFFIC VOLUMES
2040 Planning Horizon
PM Peak Hour

Figure 14

Hillside Master Plan

Operational Analysis

An operational 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:

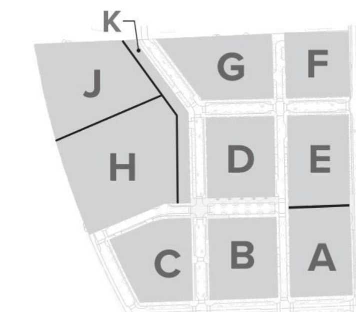
- No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
- Adequate sight distance is available at the site access to ensure safe and efficient operation 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. The warrant is not met with Phase 1 of the project, which includes 209 dwelling units but is expected to be met when 325 to 350 units on the site are constructed. A storage length of approximately 50 feet should be provided and the pedestrian crossing on the north side of the street should be moved southward to align with new ramps on the northwest corner of the intersection.
- 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 can support 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

- Site Plan
- Trip Generation
- Traffic Count Data
- In-Process Traffic
- Historical Crash Reports
- Left-Turn Warrants
    - Warrants
    - Queuing Analysis
    - Conceptual Illustration of Northbound Left-Turn Lane on SE 32nd Avenue
- Traffic Signal Warrants
- Operational Analysis
    - 2020 Existing Conditions
    - 2026 Background Conditions
    - 2026 Buildout Conditions
    - 2026 Buildout Conditions with SE 29th Avenue Connection
    - 2040 Planning Horizon

KEY PLAN



LEGEND

- parking ratio
- # of stories (res.) / over commerical
- # of units
- Building

.5 | 3/1
E1 | 50

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**

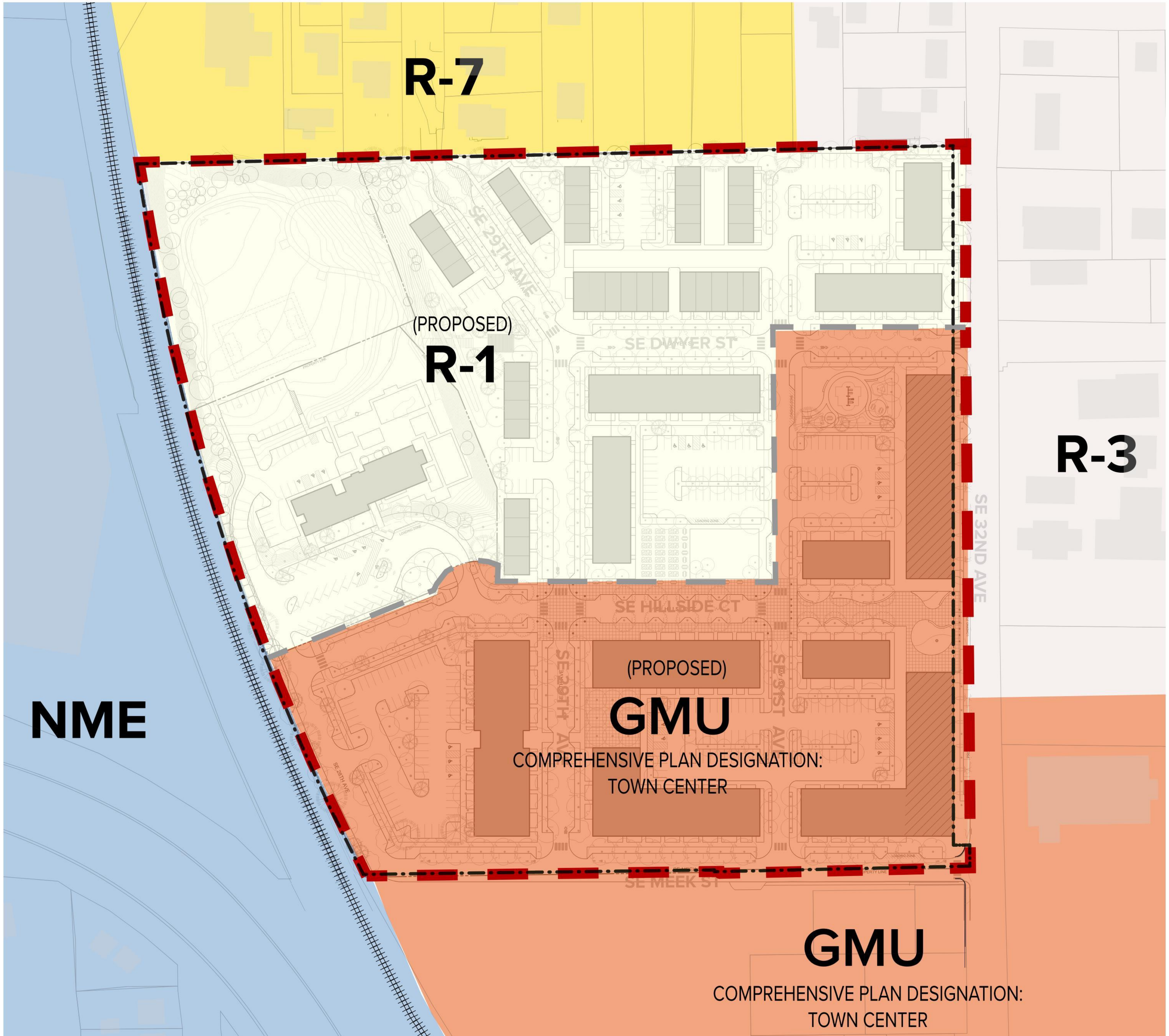
Off-street parking*	= 352 stalls
On-street parking	= 137 stalls
Total	= **489 stalls**

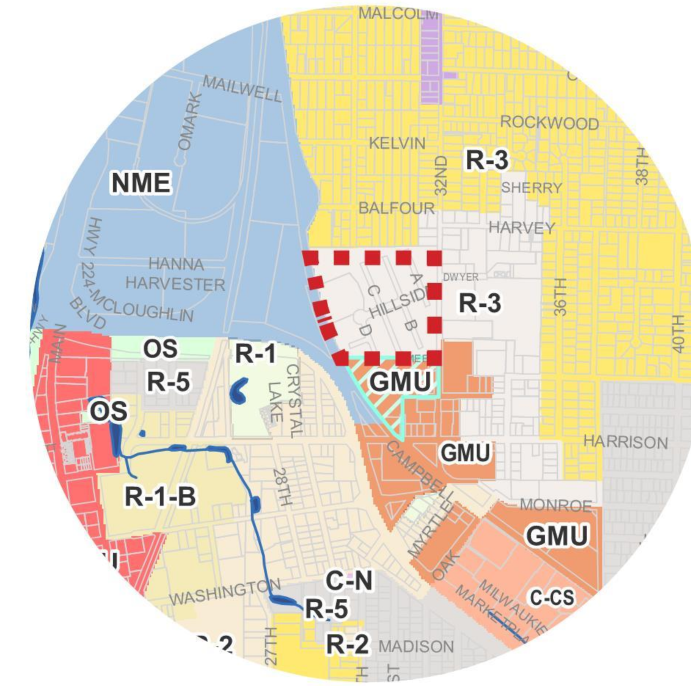
MASTER PLAN

MP 1.3

Health, Housing & Human Services CLACKAMAS COUNTY

S|E|A SCOTT|EDWARDS ARCHITECTURE





CURRENT ZONING

PROPOSED ZONING

MP 1.2

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

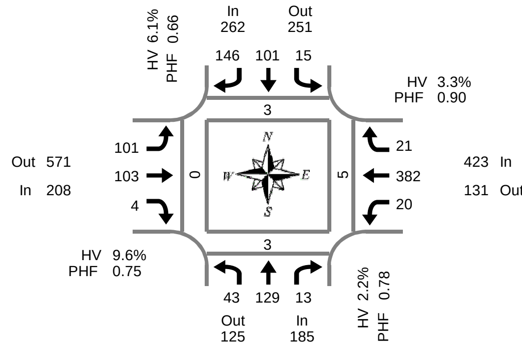
	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**265**	**264**	**529**

Source: TRIP GENERATION, Tenth Edition

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
7:15 AM to 8:15 AM

SE 32nd Ave & SE Harrison St

Tuesday, September 18, 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 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	1	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				

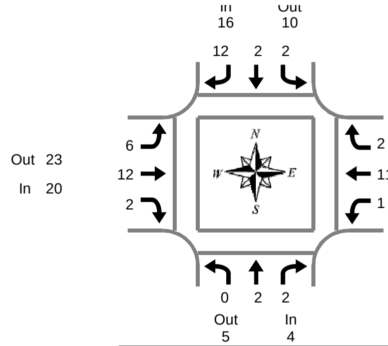
By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	43	129	13	185	15	101	146	262	101	103	4	208	20	382	21	423	1,078
%HV	0.0%	1.6%	15.4%	2.2%	13.3%	2.0%	8.2%	6.1%	5.9%	11.7%	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

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:15 AM to 8:15 AM

SE 32nd Ave & SE Harrison St

Tuesday, September 18, 2018
7:00 AM to 9:00 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 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

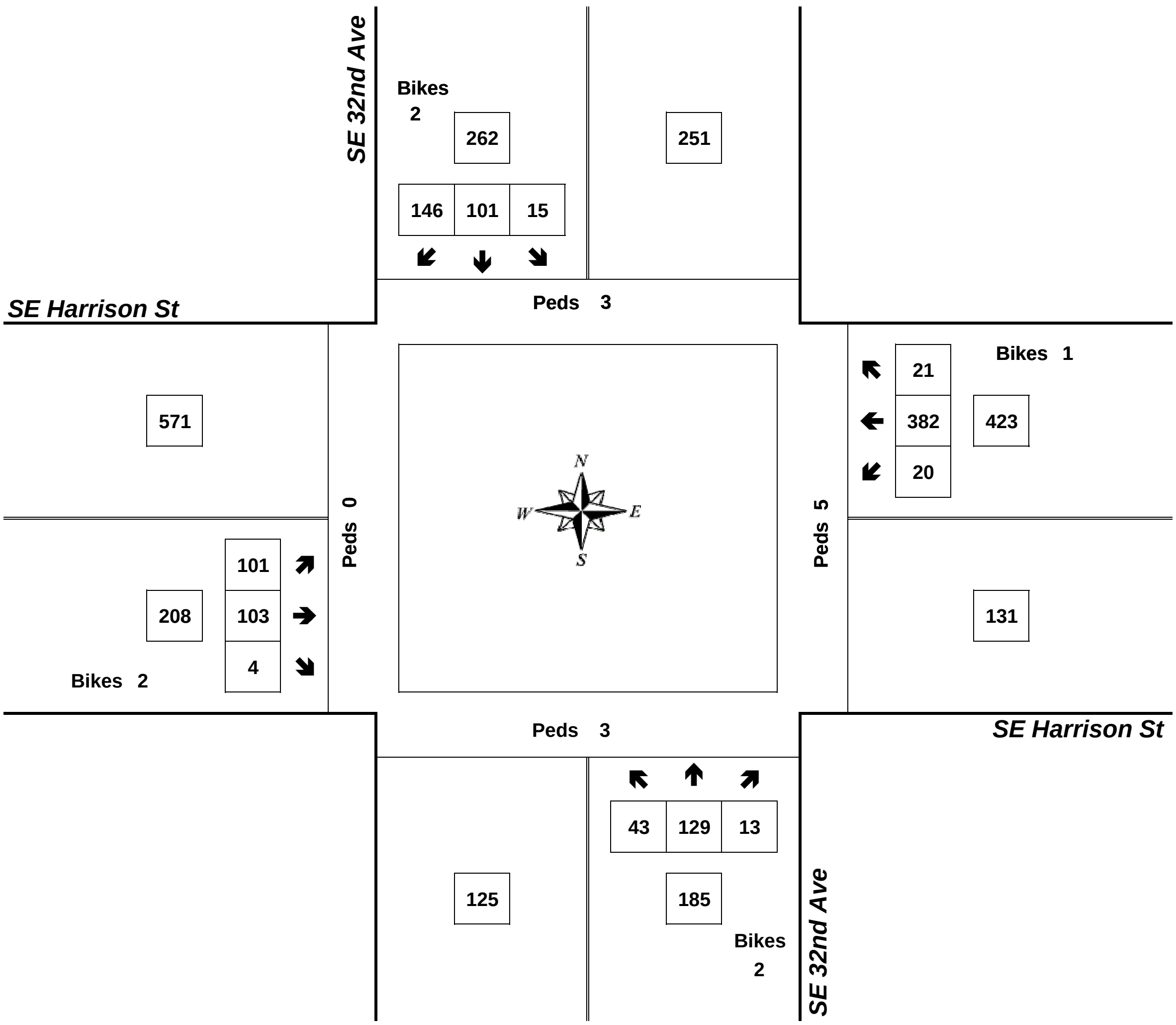
Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	1	1	2	1	1	7	9	7	15	1	23	1	11	2	14	48
7:15 AM	0	2	2	4	2	2	12	16	6	12	2	20	1	11	2	14	54
7:30 AM	0	2	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



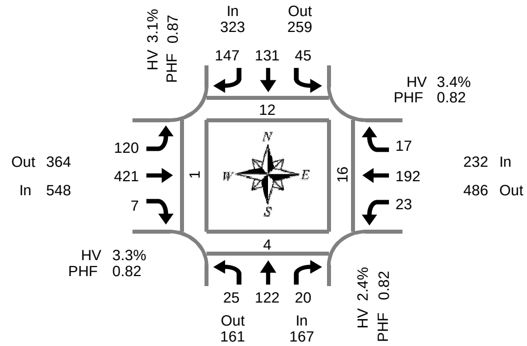
Approach	PHF	HV%	Volume
EB	0.75	9.6%	208
WB	0.90	3.3%	423
NB	0.78	2.2%	185
SB	0.66	6.1%	262
Intersection	0.96	5.0%	1,078

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
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	
4:00 PM	1	10	1	0	4	10	12	0	8	34	0	0	2	17	0	0	99
4:05 PM	1	11	6	1	1	13	10	0	10	37	0	0	2	17	0	0	108
4:10 PM	4	7	3	0	7	11	6	0	10	38	2	2	4	12	0	0	104
4:15 PM	1	10	4	0	6	12	9	0	7	30	0	0	2	20	1	0	102
4:20 PM	2	11	2	2	6	9	9	0	6	26	2	0	0	18	3	0	94
4:25 PM	3	3	1	0	8	10	9	0	6	17	0	0	5	15	3	0	80
4:30 PM	4	7	3	1	3	10	13	0	13	34	1	0	3	14	0	0	105
4:35 PM	3	11	3	0	3	8	15	0	10	44	0	0	1	19	4	0	121
4:40 PM	2	12	0	0	6	5	14	0	19	41	0	0	2	18	2	0	121
4:45 PM	1	15	4	0	4	12	15	0	7	32	2	0	1	22	2	0	117
4:50 PM	2	10	1	0	4	15	15	0	4	23	1	1	4	20	0	0	99
4:55 PM	4	10	0	0	2	12	14	0	10	38	0	0	2	18	1	0	111
5:00 PM	1	6	1	0	1	18	11	0	6	27	0	0	1	12	2	0	86
5:05 PM	1	7	0	0	4	14	14	1	5	20	0	1	1	12	2	0	80
5:10 PM	2	15	3	0	5	9	11	0	11	52	1	0	3	18	2	0	132
5:15 PM	3	10	2	1	5	13	9	0	9	36	1	0	1	14	2	0	105
5:20 PM	1	11	2	0	4	7	7	1	16	41	0	0	0	12	0	0	101
5:25 PM	1	8	1	0	4	8	9	1	10	33	1	1	4	13	0	1	92
5:30 PM	1	15	1	0	3	8	7	0	12	33	0	0	2	16	0	0	98
5:35 PM	5	8	1	0	6	11	10	0	5	24	1	1	2	14	1	0	88
5:40 PM	0	8	1	0	3	17	11	0	7	23	3	0	1	24	1	0	99
5:45 PM	0	5	0	0	1	5	13	0	5	26	0	0	1	15	1	0	72
5:50 PM	4	6	2	0	2	11	5	1	12	32	0	1	3	18	0	0	95
5:55 PM	4	5	0	1	2	13	10	0	8	30	1	0	1	18	2	0	94
Total Survey	51	221	42	6	94	261	258	4	216	771	16	7	48	396	29	1	2,403

Interval Start Time	Pedestrians Crosswalk			
	North	South	East	West
4:00 PM	0	0	0	0
4:05 PM	2	0	3	0
4:10 PM	1	0	0	0
4:15 PM	0	0	2	1
4:20 PM	1	0	1	0
4:25 PM	0	0	3	0
4:30 PM	1	0	2	0
4:35 PM	6	0	4	0
4:40 PM	1	0	1	0
4:45 PM	2	1	2	0
4:50 PM	1	3	1	0
4:55 PM	0	0	2	0
5:00 PM	0	0	1	0
5:05 PM	0	0	0	0
5:10 PM	1	0	0	1
5:15 PM	0	0	3	0
5:20 PM	0	0	0	0
5:25 PM	0	0	0	0
5:30 PM	0	0	0	0
5:35 PM	0	0	0	0
5:40 PM	0	0	0	0
5:45 PM	2	1	4	1
5:50 PM	0	0	1	0
5:55 PM	3	0	1	0
Total Survey	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
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	
4:00 PM	6	28	10	1	12	34	28	0	28	109	2	2	8	46	0	0	311
4:15 PM	6	24	7	2	20	31	27	0	19	73	2	0	7	53	7	0	276
4:30 PM	9	30	6	1	12	23	42	0	42	119	1	0	6	51	6	0	347
4:45 PM	7	35	5	0	10	39	44	0	21	93	3	1	7	60	3	0	327
5:00 PM	4	28	4	0	10	41	36	1	22	99	1	1	5	42	6	0	298
5:15 PM	5	29	5	1	13	28	25	2	35	110	2	1	5	39	2	1	298
5:30 PM	6	31	3	0	12	36	28	0	24	80	4	1	5	54	2	0	285
5:45 PM	8	16	2	1	5	29	28	1	25	88	1	1	5	51	3	0	261
Total Survey	51	221	42	6	94	261	258	4	216	771	16	7	48	396	29	1	2,403

Interval Start Time	Pedestrians Crosswalk			
	North	South	East	West
4:00 PM	3	0	3	0
4:15 PM	1	0	6	1
4:30 PM	8	0	7	0
4:45 PM	3	4	5	0
5:00 PM	1	0	1	1
5:15 PM	0	0	3	0
5:30 PM	0	0	0	0
5:45 PM	5	1	6	1
Total Survey	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

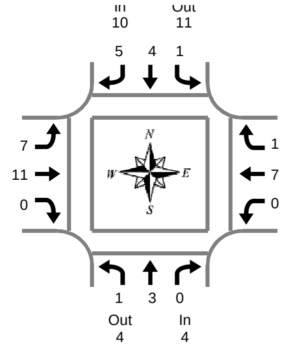
Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	
4:00 PM	28	117	28	4	54	127	141	0	110	394	8	3	28	210	16	0	1,261
4:15 PM	26	117	22	3	52	134	149	1	104	384	7	2	25	206	22	0	1,248
4:30 PM	25	122	20	2	45	131	147	3	120	421	7	3	23	192	17	1	1,270
4:45 PM	22	123	17	1	45	144	133	3	102	382	10	4	22	195	13	1	1,208
5:00 PM	23	104	14	2	40	134	117	4	106	377	8	4	20	186	13	1	1,142

Interval Start Time	Pedestrians Crosswalk			
	North	South	East	West
4:00 PM	15	4	21	1
4:15 PM	13	4	19	2
4:30 PM	12	4	16	1
4:45 PM	4	4	9	1
5:00 PM	6	1	10	2

Heavy Vehicle Summary

Clay Carney
(503) 833-2740

Out 13
In 18



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

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

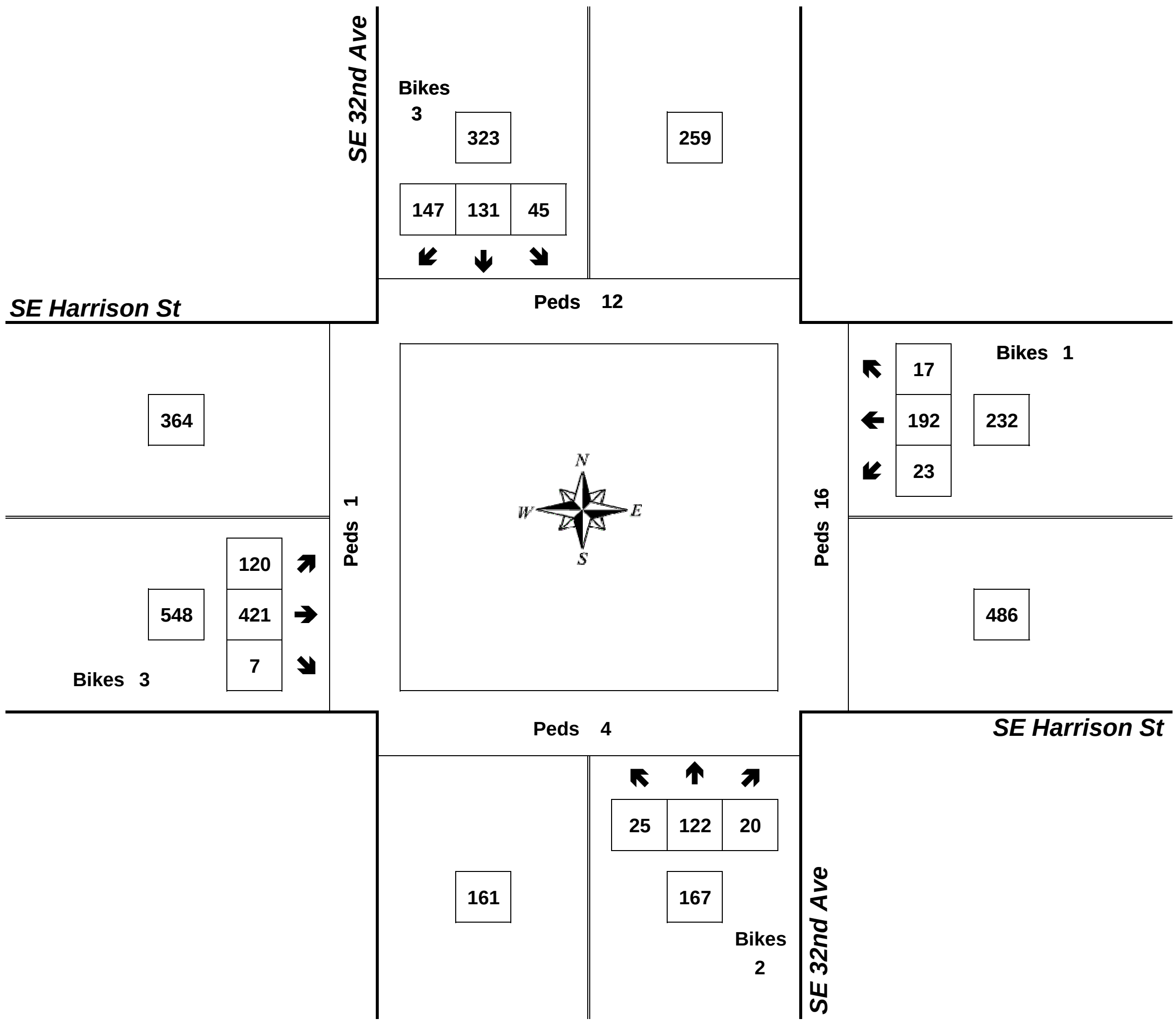
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

SE 32nd Ave & SE Harrison St

4:30 PM to 5:30 PM
Tuesday, September 18, 2018



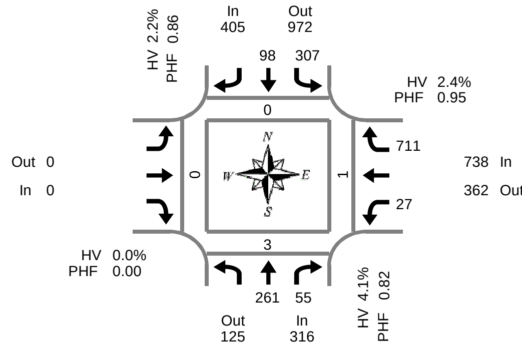
Approach	PHF	HV%	Volume
EB	0.82	3.3%	548
WB	0.82	3.4%	232
NB	0.82	2.4%	167
SB	0.87	3.1%	323
Intersection	0.88	3.1%	1,270

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
7:00 AM to 8:00 AM

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
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	316	125	441	16	405	972	1,377	6	0	0	0	0	738	362	1,100	20	1,459
%HV	4.1%				2.2%				0.0%				2.4%				2.7%
PHF	0.82				0.86				0.00				0.95				0.93

Pedestrians Crosswalk			
North	South	East	West
0	3	1	0

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

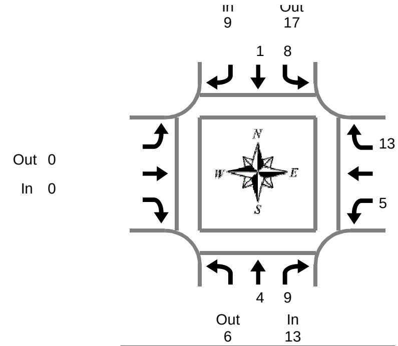
Rolling Hour Summary
7:00 AM to 9:00 AM

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

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
7:00 AM to 8:00 AM

SE 32nd Ave & SE Johnson Creek Blvd

Tuesday, September 25, 2018
7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 32nd Ave T	R	Total	Southbound SE 32nd Ave L	T	Total	Eastbound SE Johnson Creek Blvd Total	Westbound SE Johnson Creek Blvd L	R	Total	Interval 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 T	R	Total	Southbound SE 32nd Ave L	T	Total	Eastbound SE Johnson Creek Blvd Total	Westbound SE Johnson Creek Blvd L	R	Total	Interval 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 In	Out	Total	Southbound SE 32nd Ave In	Out	Total	Eastbound SE Johnson Creek Blvd In	Out	Total	Westbound SE Johnson Creek Blvd In	Out	Total	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 T	R	Total	Southbound SE 32nd Ave L	T	Total	Eastbound SE Johnson Creek Blvd Total	Westbound SE Johnson Creek Blvd L	R	Total	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

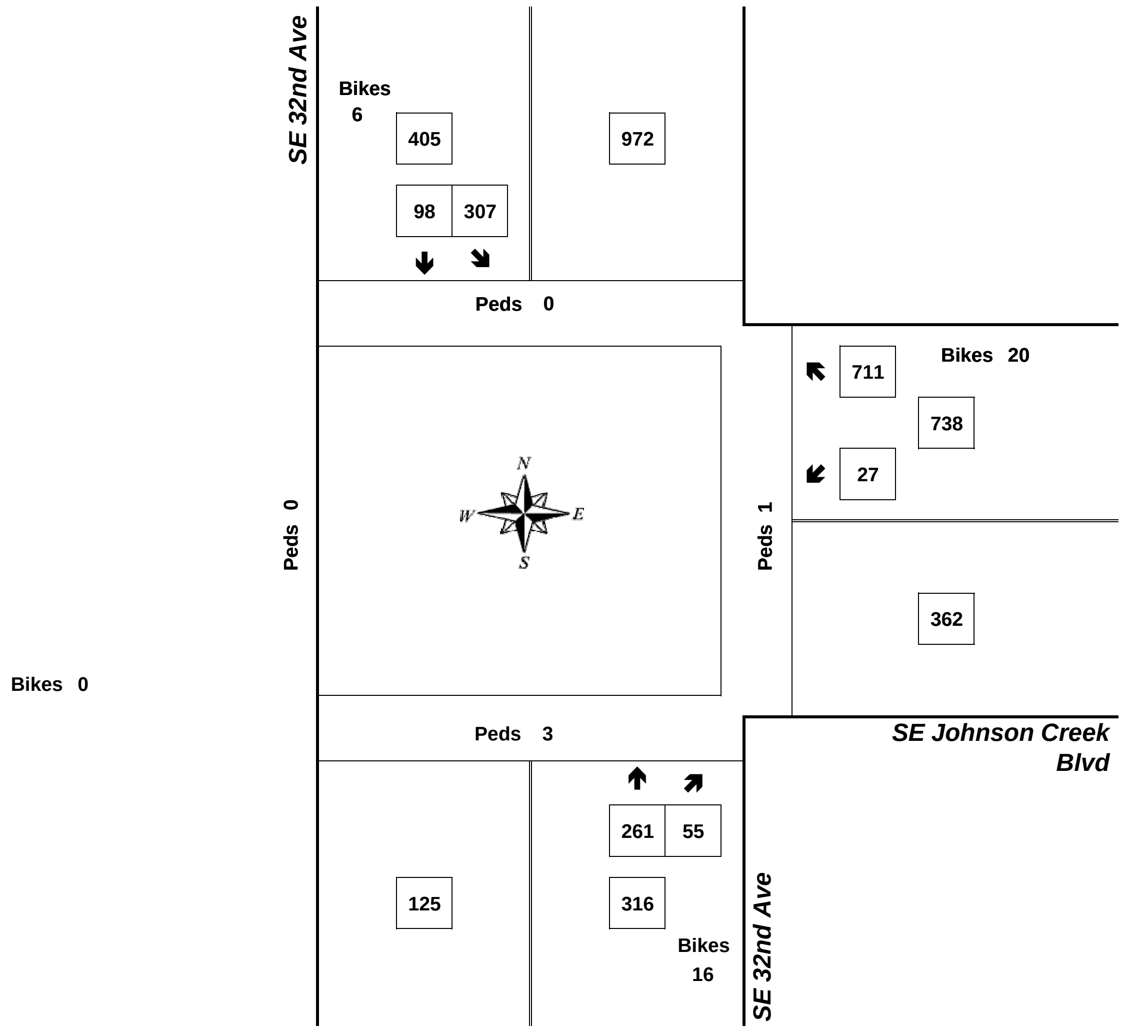
Interval Start Time	Northbound SE 32nd Ave T	R	Total	Southbound SE 32nd Ave L	T	Total	Eastbound SE Johnson Creek Blvd Total	Westbound SE Johnson Creek Blvd L	R	Total	Interval Total
7:00 AM	4	9	13	8	1	9	0	5	13	18	40
7:15 AM	5	7	12	10	0	10	0	6	16	22	44
7:30 AM	4	6	10	14	0	14	0	6	15	21	45
7:45 AM	5	6	11	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

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SE 32nd Ave & SE Johnson Creek Blvd

7:00 AM to 8:00 AM
Tuesday, September 25, 2018

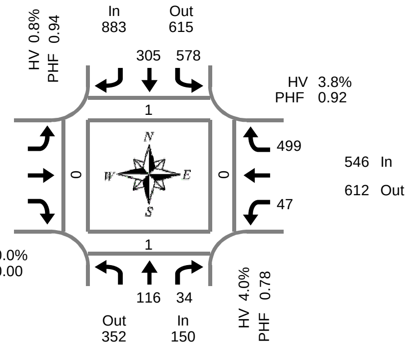


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.95	2.4%	738
NB	0.82	4.1%	316
SB	0.86	2.2%	405
Intersection	0.93	2.7%	1,459

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

SE 32nd Ave & SE Johnson Creek Blvd

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 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				

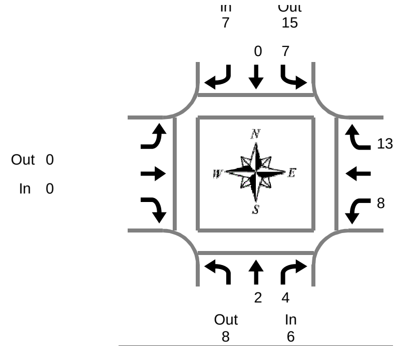
By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Total
		T	R	Total	L	T		Total				Total	L		R	Total	
Volume		116	34	150	578	305		883				0	47		499	546	1,579
%HV	NA	1.7%	11.8%	4.0%	1.2%	0.0%	NA	0.8%	NA	NA	NA	0.0%	17.0%	NA	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

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

SE 32nd Ave & SE Johnson Creek Blvd

Tuesday, September 25, 2018
4:00 PM to 6:00 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

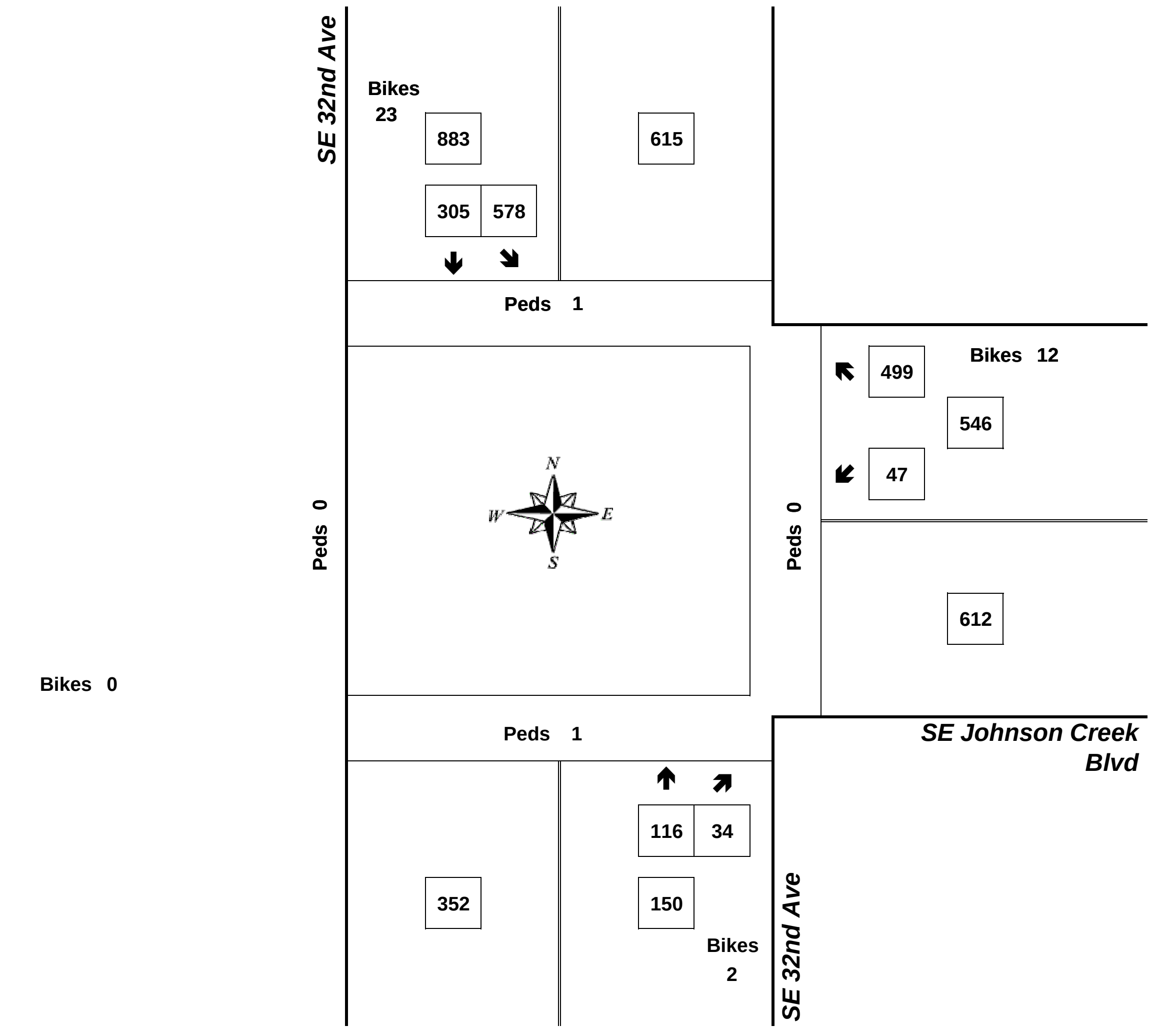
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

SE 32nd Ave & SE Johnson Creek Blvd

4:30 PM to 5:30 PM
Tuesday, September 25, 2018

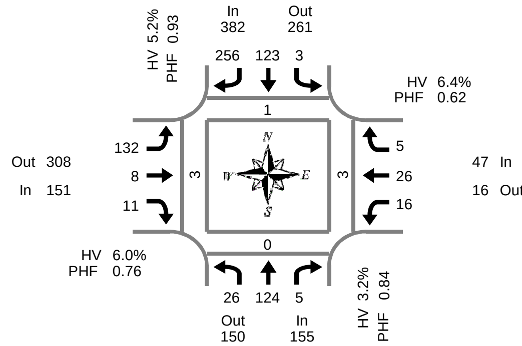


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.92	3.8%	546
NB	0.78	4.0%	150
SB	0.94	0.8%	883
Intersection	0.95	2.2%	1,579

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

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				

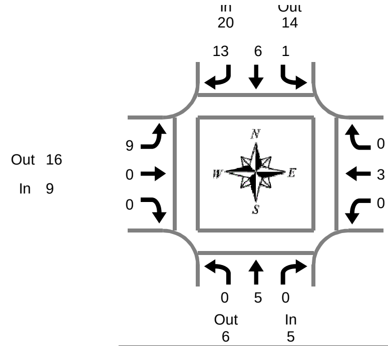
By Movement	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	26	124	5	155	3	123	256	382	132	8	11	151	16	26	5	47	735
%HV	0.0%	4.0%	0.0%	3.2%	33.3%	4.9%	5.1%	5.2%	6.8%	0.0%	0.0%	6.0%	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



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

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

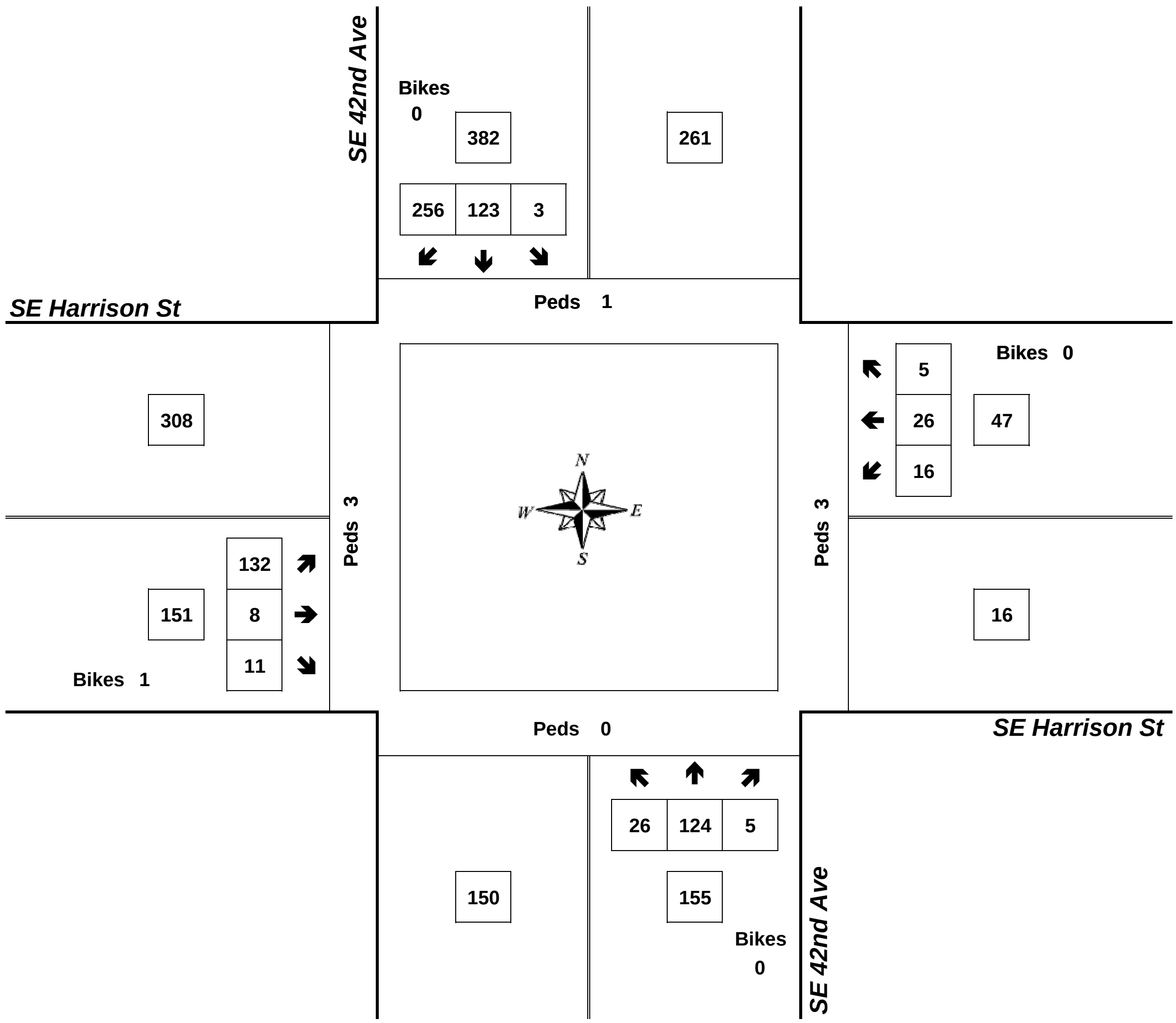
Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	3	1	4	1	3	15	19	7	0	0	7	0	2	0	2	32
7:15 AM	0	5	1	6	1	4	12	17	9	0	0	9	0	2	0	2	34
7:30 AM	0	6	0	6	1	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

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SE 42nd Ave & SE Harrison St

7:25 AM to 8:25 AM
Tuesday, September 25, 2018

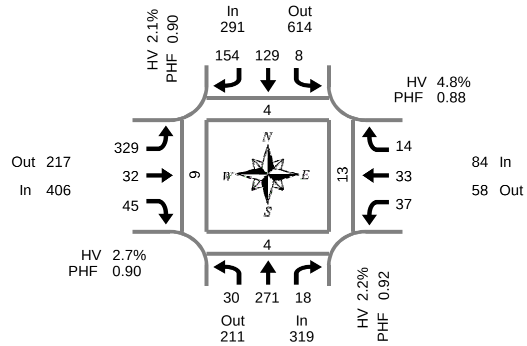


Approach	PHF	HV%	Volume
EB	0.76	6.0%	151
WB	0.62	6.4%	47
NB	0.84	3.2%	155
SB	0.93	5.2%	382
Intersection	0.93	5.0%	735

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 L	T	R	Bikes	Southbound SE 42nd Ave L	T	R	Bikes	Eastbound SE Harrison St L	T	R	Bikes	Westbound SE Harrison St L	T	R	Bikes	Interval Total	Pedestrians Crosswalk 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 L	T	R	Bikes	Southbound SE 42nd Ave L	T	R	Bikes	Eastbound SE Harrison St L	T	R	Bikes	Westbound SE Harrison St L	T	R	Bikes	Interval Total	Pedestrians Crosswalk 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 In	Out	Total	Bikes	Southbound SE 42nd Ave In	Out	Total	Bikes	Eastbound SE Harrison St In	Out	Total	Bikes	Westbound SE Harrison St In	Out	Total	Bikes	Total
Volume	319	211	530	0	291	614	905	1	406	217	623	1	84	58	142	0	1,100
%HV	2.2%				2.1%				2.7%				4.8%				2.5%
PHF	0.92				0.90				0.90				0.88				0.96

Pedestrians Crosswalk North	South	East	West
4	4	13	9

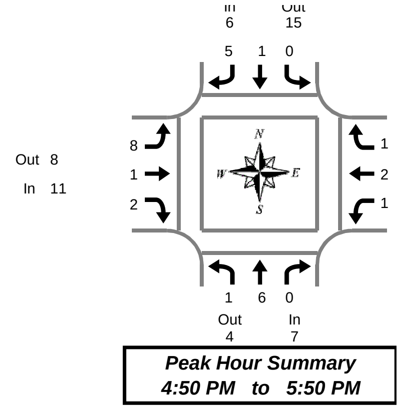
By Movement	Northbound SE 42nd Ave L	T	R	Total	Southbound SE 42nd Ave L	T	R	Total	Eastbound SE Harrison St L	T	R	Total	Westbound SE Harrison St L	T	R	Total	Total
Volume	30	271	18	319	8	129	154	291	329	32	45	406	37	33	14	84	1,100
%HV	3.3%	2.2%	0.0%	2.2%	0.0%	0.8%	3.2%	2.1%	2.4%	3.1%	4.4%	2.7%	2.7%	6.1%	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 L	T	R	Bikes	Southbound SE 42nd Ave L	T	R	Bikes	Eastbound SE Harrison St L	T	R	Bikes	Westbound SE Harrison St L	T	R	Bikes	Interval Total	Pedestrians Crosswalk 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

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

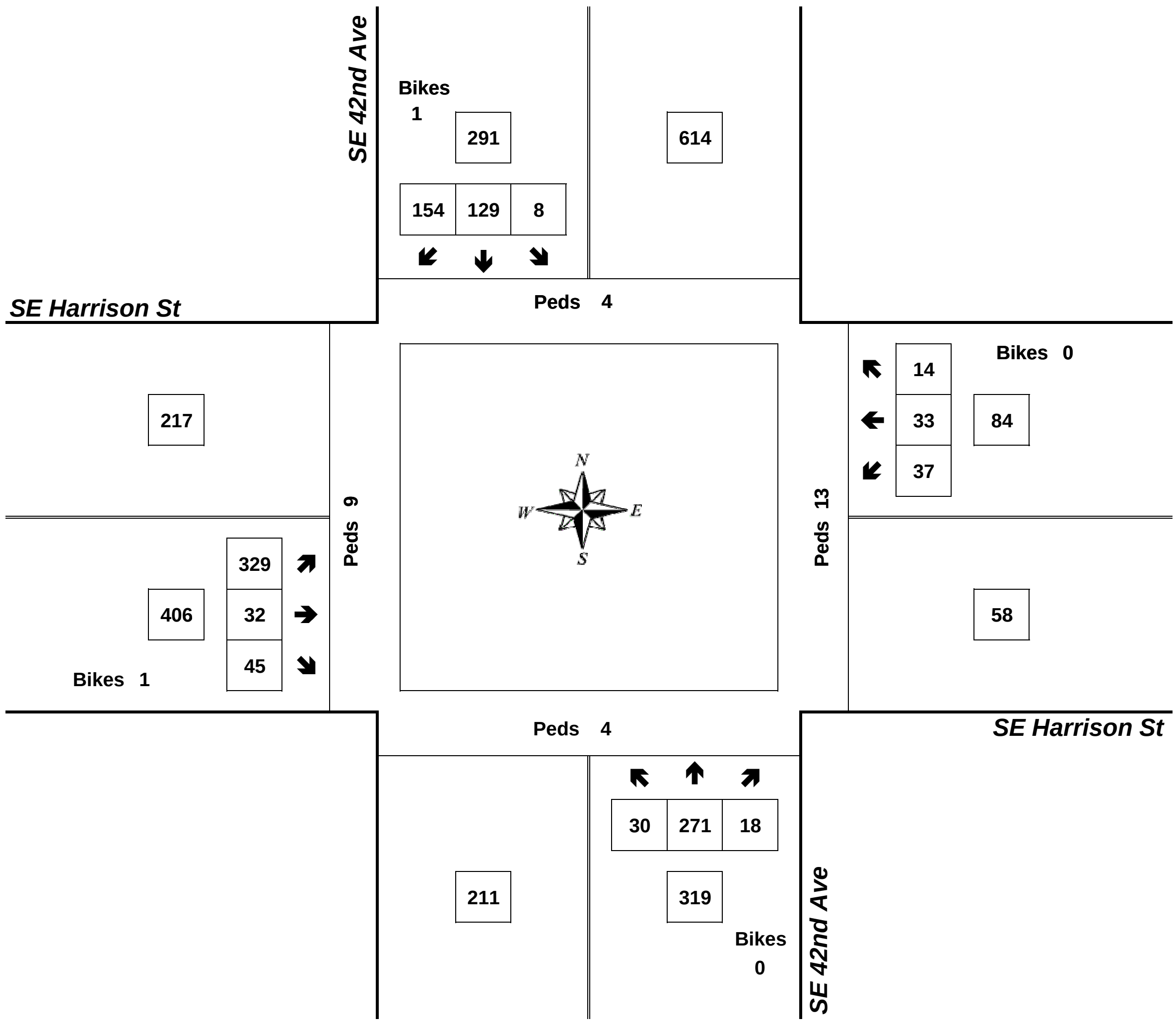
Interval Start Time	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	5	0	5	0	0	9	9	6	1	0	7	0	2	0	2	23
4:15 PM	0	7	0	7	0	1	9	10	6	1	1	8	1	2	1	4	29
4:30 PM	0	5	0	5	0	1	6	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

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SE 42nd Ave & SE Harrison St

4:50 PM to 5:50 PM
Tuesday, September 25, 2018



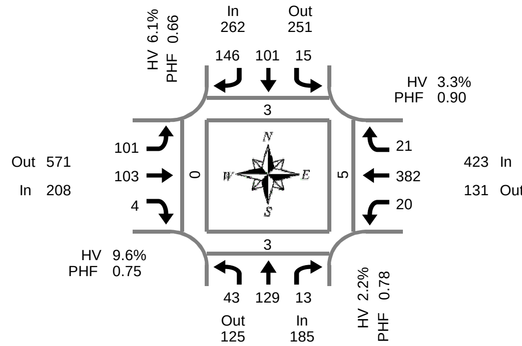
Approach	PHF	HV%	Volume
EB	0.90	2.7%	406
WB	0.88	4.8%	84
NB	0.92	2.2%	319
SB	0.90	2.1%	291
Intersection	0.96	2.5%	1,100

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				

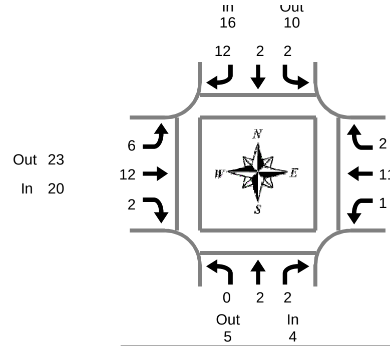
By Movement	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	43	129	13	185	15	101	146	262	101	103	4	208	20	382	21	423	1,078
%HV	0.0%	1.6%	15.4%	2.2%	13.3%	2.0%	8.2%	6.1%	5.9%	11.7%	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

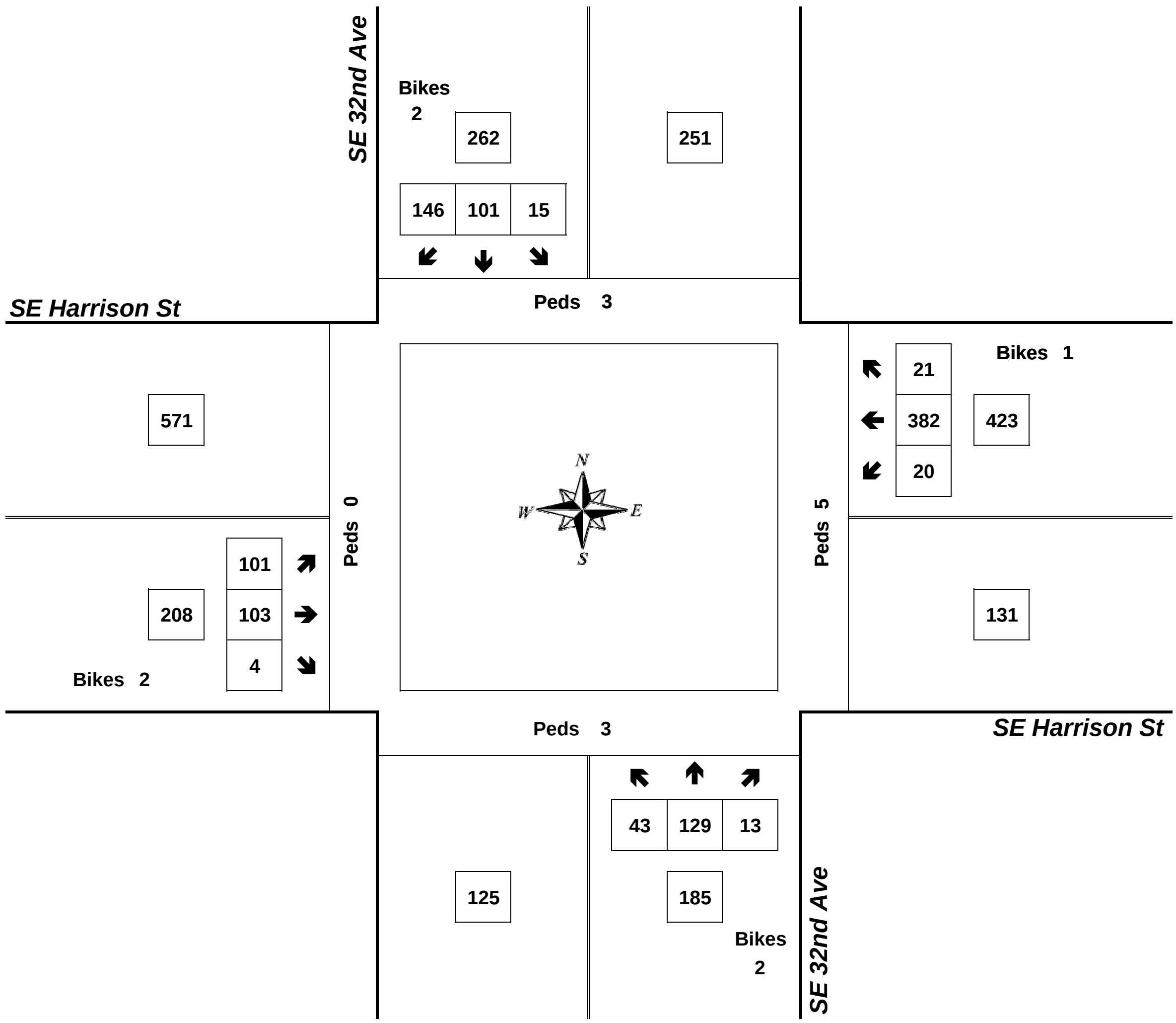
Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	1	1	2	1	1	7	9	7	15	1	23	1	11	2	14	48
7:15 AM	0	2	2	4	2	2	12	16	6	12	2	20	1	11	2	14	54
7:30 AM	0	2	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

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SE 32nd Ave & SE Harrison St

7:15 AM to 8:15 AM
Tuesday, September 18, 2018



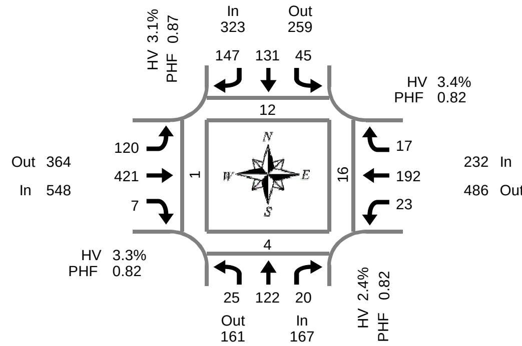
Approach	PHF	HV%	Volume
EB	0.75	9.6%	208
WB	0.90	3.3%	423
NB	0.78	2.2%	185
SB	0.66	6.1%	262
Intersection	0.96	5.0%	1,078

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	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	167	161	328	2	323	259	582	3	548	364	912	3	232	486	718	1	1,270	12	4	16	1
%HV	2.4%				3.1%				3.3%				3.4%				3.1%				
PHF	0.82				0.87				0.82				0.82				0.88				

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

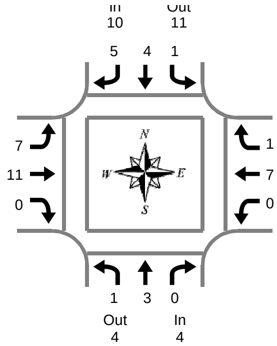
Rolling Hour Summary
4:00 PM to 6:00 PM

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



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

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

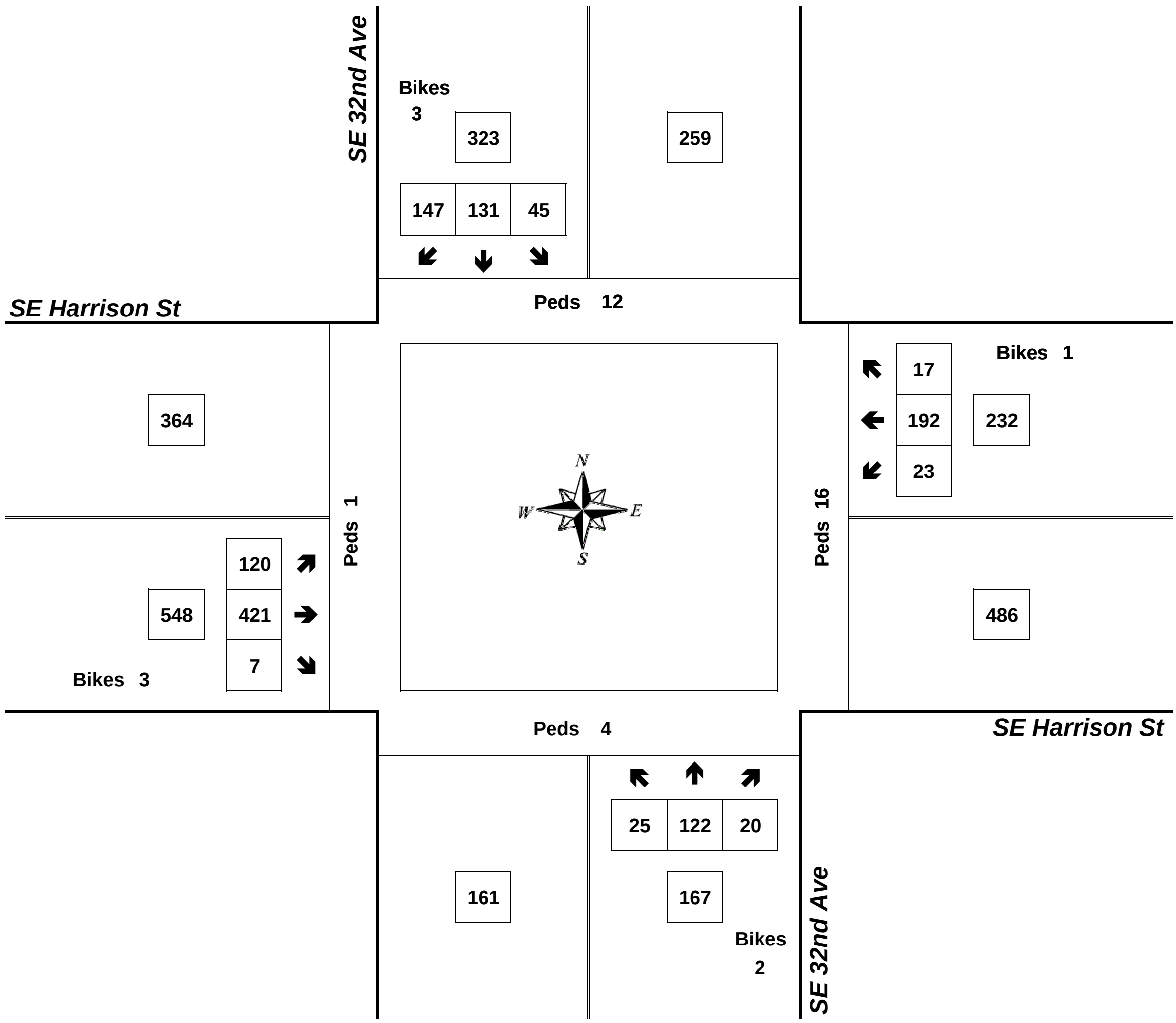
Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	1	3	0	4	0	4	6	10	4	16	0	20	0	8	1	9	43
4:15 PM	1	3	0	4	1	4	4	9	4	12	0	16	0	8	1	9	38
4:30 PM	1	3	0	4	1	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

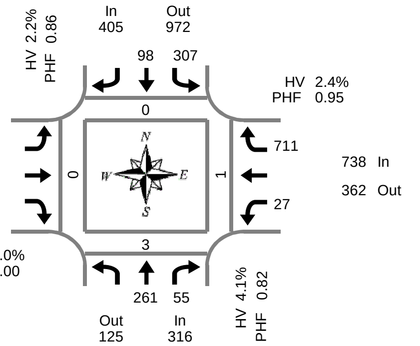


Approach	PHF	HV%	Volume
EB	0.82	3.3%	548
WB	0.82	3.4%	232
NB	0.82	2.4%	167
SB	0.87	3.1%	323
Intersection	0.88	3.1%	1,270

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
7:00 AM to 8:00 AM

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	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval	Pedestrians Crosswalk			
Time		T	R	Bikes	L	T		Bikes				Bikes	L		R	Bikes	Total	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	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval	Pedestrians Crosswalk			
Time		T	R	Bikes	L	T		Bikes				Bikes	L		R	Bikes	Total	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

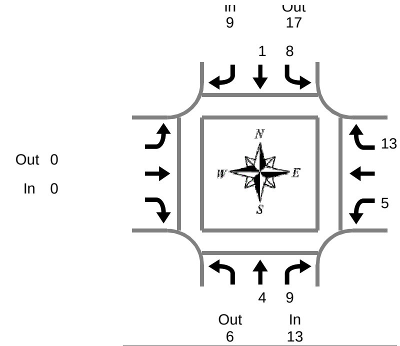
Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval	Pedestrians Crosswalk			
Time		T	R	Bikes	L	T		Bikes				Bikes	L		R	Bikes	Total	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

All Traffic Data
Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
7:00 AM to 8:00 AM

SE 32nd Ave & SE Johnson Creek Blvd

Tuesday, September 25, 2018
7:00 AM to 9:00 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

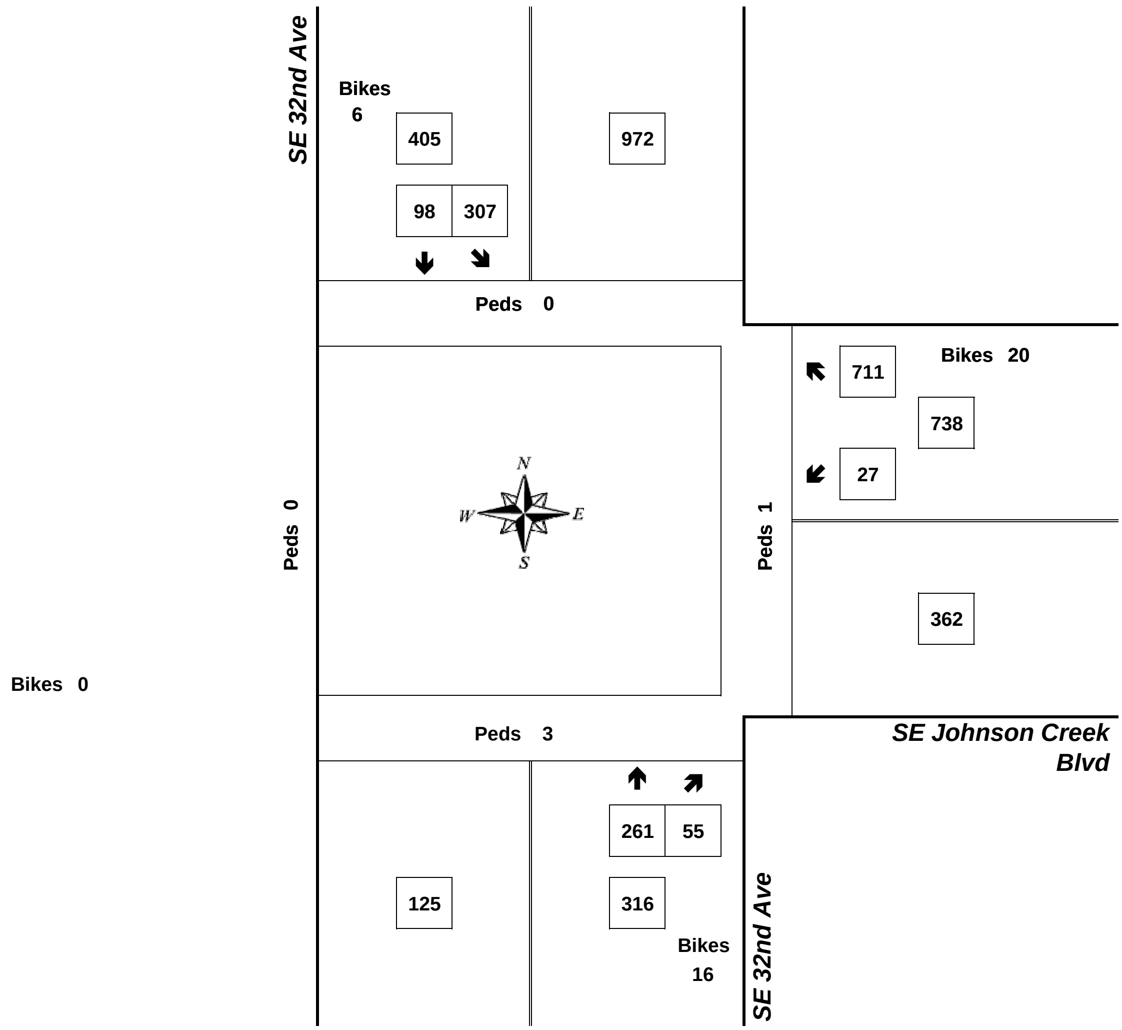
Interval Start Time	Northbound SE 32nd Ave				Southbound SE 32nd Ave				Eastbound SE Johnson Creek Blvd				Westbound SE Johnson Creek Blvd				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
7:00 AM		4	9	13	8	1		9				0	5		13	18	40
7:15 AM		5	7	12	10	0		10				0	6		16	22	44
7:30 AM		4	6	10	14	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

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SE 32nd Ave & SE Johnson Creek Blvd

7:00 AM to 8:00 AM
Tuesday, September 25, 2018



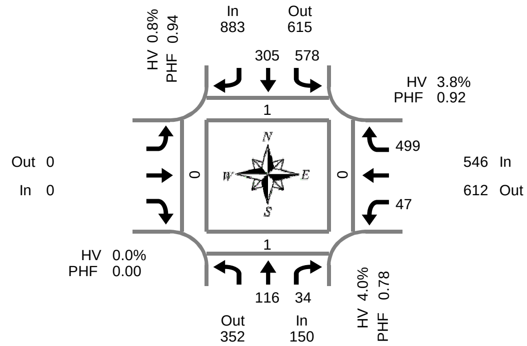
Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.95	2.4%	738
NB	0.82	4.1%	316
SB	0.86	2.2%	405
Intersection	0.93	2.7%	1,459

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

SE 32nd Ave & SE Johnson Creek Blvd

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 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
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	150	352	502	2	883	615	1,498	23	0	0	0	0	546	612	1,158	12	1,579
%HV	4.0%				0.8%				0.0%				3.8%				2.2%
PHF	0.78				0.94				0.00				0.92				0.95

Pedestrians Crosswalk			
North	South	East	West
1	1	0	0

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

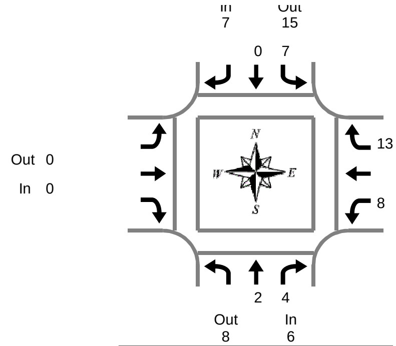
Rolling Hour Summary
4:00 PM to 6:00 PM

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

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

SE 32nd Ave & SE Johnson Creek Blvd

Tuesday, September 25, 2018
4:00 PM to 6:00 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

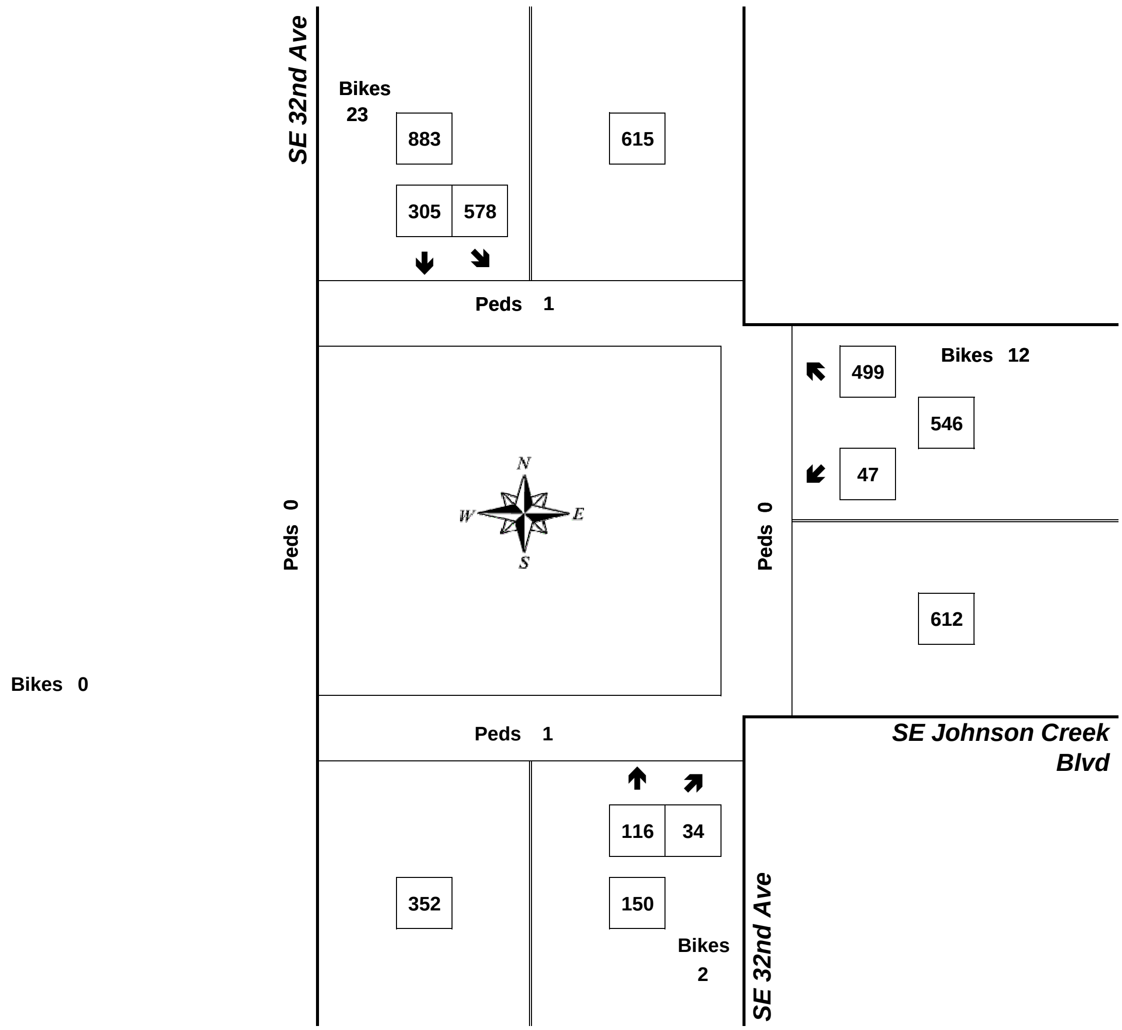
Peak Hour Summary

All Traffic Data
Services Inc.

Clay Carney
(503) 833-2740

SE 32nd Ave & SE Johnson Creek Blvd

4:30 PM to 5:30 PM
Tuesday, September 25, 2018



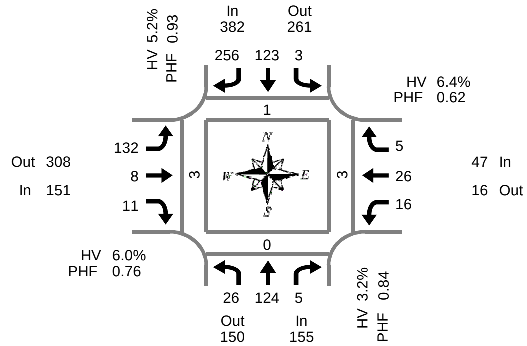
Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.92	3.8%	546
NB	0.78	4.0%	150
SB	0.94	0.8%	883
Intersection	0.95	2.2%	1,579

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 L	T	R	Bikes	Southbound SE 42nd Ave L	T	R	Bikes	Eastbound SE Harrison St L	T	R	Bikes	Westbound SE Harrison St L	T	R	Bikes	Interval Total	Pedestrians Crosswalk 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 L	T	R	Bikes	Southbound SE 42nd Ave L	T	R	Bikes	Eastbound SE Harrison St L	T	R	Bikes	Westbound SE Harrison St L	T	R	Bikes	Interval Total	Pedestrians Crosswalk 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 In	Out	Total	Bikes	Southbound SE 42nd Ave In	Out	Total	Bikes	Eastbound SE Harrison St In	Out	Total	Bikes	Westbound SE Harrison St In	Out	Total	Bikes	Total
Volume	155	150	305	0	382	261	643	0	151	308	459	1	47	16	63	0	735
%HV	3.2%				5.2%				6.0%				6.4%				5.0%
PHF	0.84				0.93				0.76				0.62				0.93

Pedestrians Crosswalk North	South	East	West
1	0	3	3

By Movement	Northbound SE 42nd Ave L	T	R	Total	Southbound SE 42nd Ave L	T	R	Total	Eastbound SE Harrison St L	T	R	Total	Westbound SE Harrison St L	T	R	Total	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

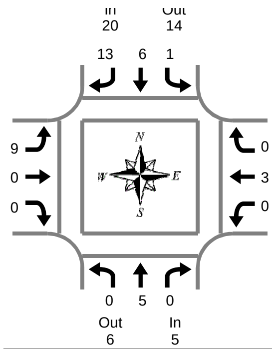
Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE 42nd Ave L	T	R	Bikes	Southbound SE 42nd Ave L	T	R	Bikes	Eastbound SE Harrison St L	T	R	Bikes	Westbound SE Harrison St L	T	R	Bikes	Interval Total	Pedestrians Crosswalk 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



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

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	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	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	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	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	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

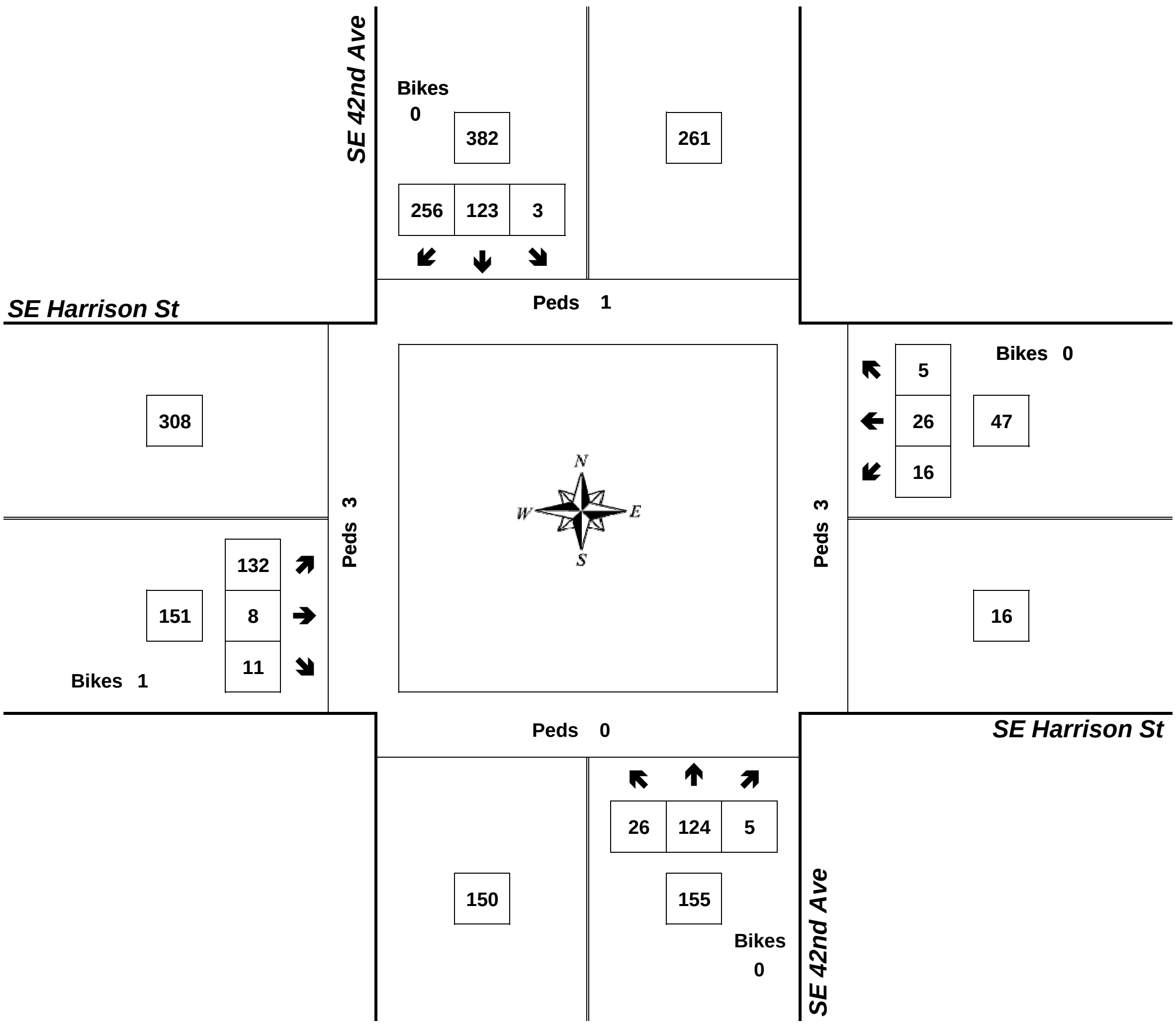
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

SE 42nd Ave & SE Harrison St

7:25 AM to 8:25 AM
Tuesday, September 25, 2018

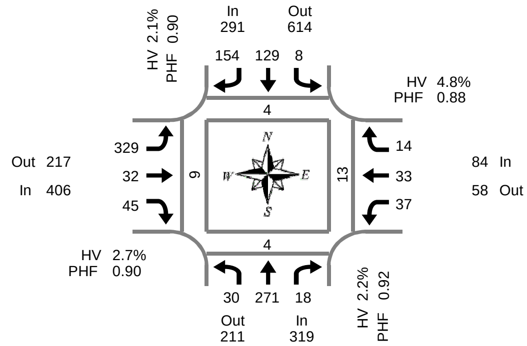


Approach	PHF	HV%	Volume
EB	0.76	6.0%	151
WB	0.62	6.4%	47
NB	0.84	3.2%	155
SB	0.93	5.2%	382
Intersection	0.93	5.0%	735

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 L	T	R	Bikes	Southbound SE 42nd Ave L	T	R	Bikes	Eastbound SE Harrison St L	T	R	Bikes	Westbound SE Harrison St L	T	R	Bikes	Interval Total	Pedestrians Crosswalk 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 L	T	R	Bikes	Southbound SE 42nd Ave L	T	R	Bikes	Eastbound SE Harrison St L	T	R	Bikes	Westbound SE Harrison St L	T	R	Bikes	Interval Total	Pedestrians Crosswalk 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 In	Out	Total	Bikes	Southbound SE 42nd Ave In	Out	Total	Bikes	Eastbound SE Harrison St In	Out	Total	Bikes	Westbound SE Harrison St In	Out	Total	Bikes	Total	Pedestrians Crosswalk 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				

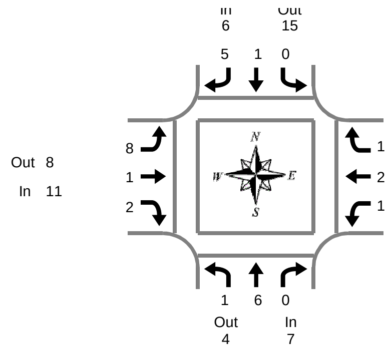
By Movement	Northbound SE 42nd Ave L	T	R	Total	Southbound SE 42nd Ave L	T	R	Total	Eastbound SE Harrison St L	T	R	Total	Westbound SE Harrison St L	T	R	Total	Total
Volume	30	271	18	319	8	129	154	291	329	32	45	406	37	33	14	84	1,100
%HV	3.3%	2.2%	0.0%	2.2%	0.0%	0.8%	3.2%	2.1%	2.4%	3.1%	4.4%	2.7%	2.7%	6.1%	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 L	T	R	Bikes	Southbound SE 42nd Ave L	T	R	Bikes	Eastbound SE Harrison St L	T	R	Bikes	Westbound SE Harrison St L	T	R	Bikes	Interval Total	Pedestrians Crosswalk 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



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

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	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	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	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	Northbound SE 42nd Ave				Southbound SE 42nd Ave				Eastbound SE Harrison St				Westbound SE Harrison St				Interval
Time	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	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

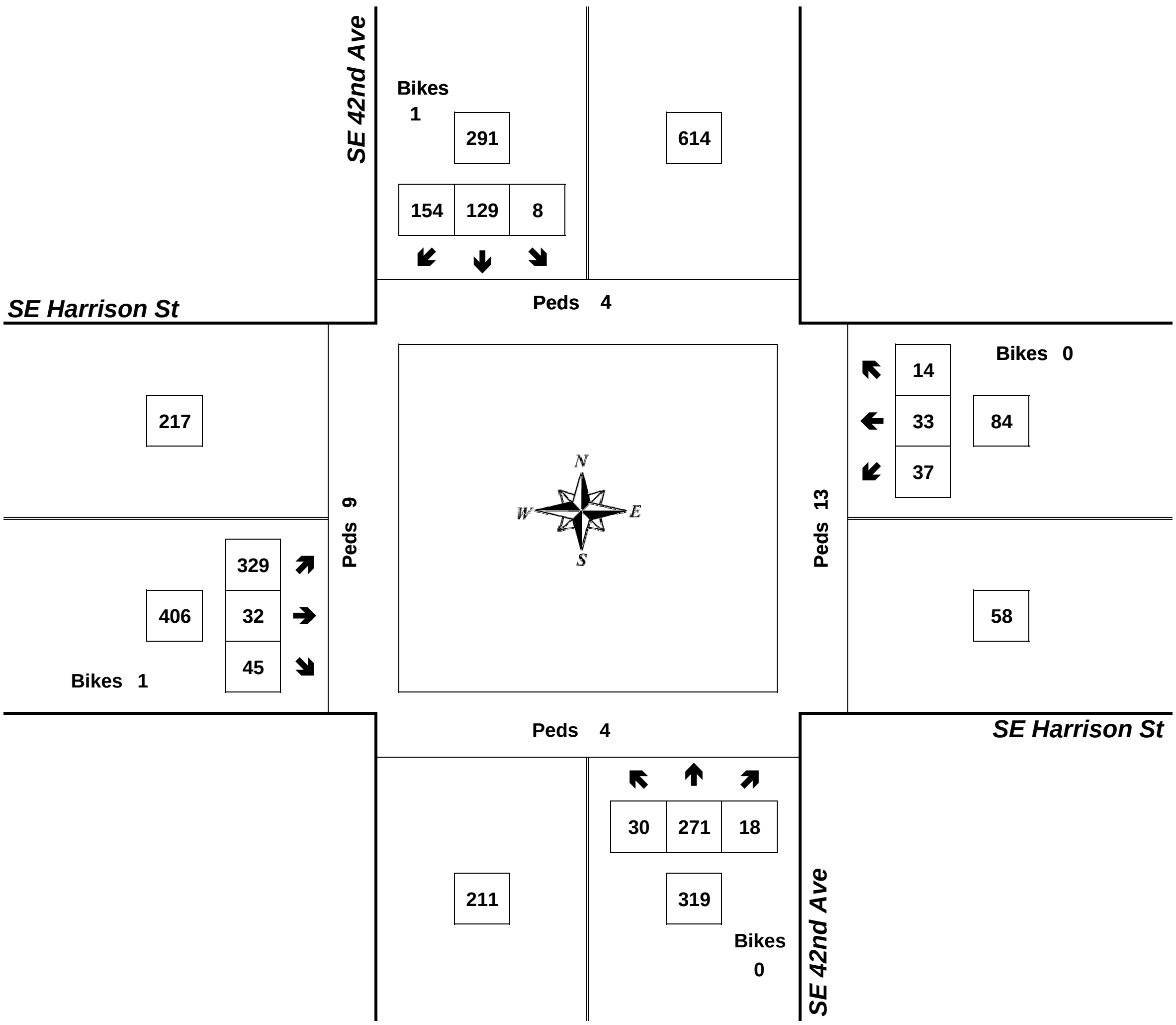
Peak Hour Summary

All Traffic Data Services Inc.

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

(303) 216-2439
www.alltrafficdata.net

Location: SE 29th Ave & SE Balfour St AM

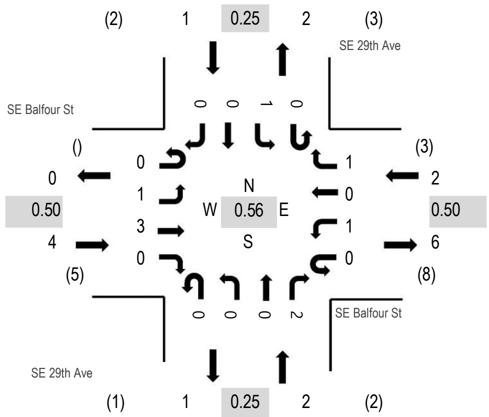
Date: Tuesday, July 14, 2020

Peak Hour: 07:20 AM - 08:20 AM

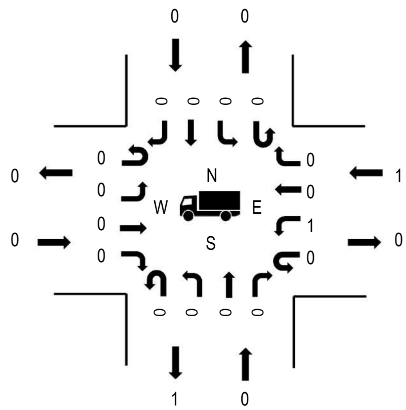
Peak 15-Minutes: 07:25 AM - 07:40 AM

Peak Hour

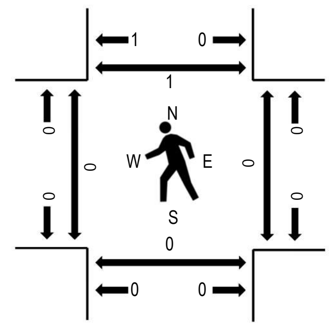
Motorized Vehicles



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 U-Turn	Left	Thru	Right	SE Balfour St Westbound U-Turn	Left	Thru	Right	SE 29th Ave Northbound U-Turn	Left	Thru	Right	SE 29th Ave Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
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

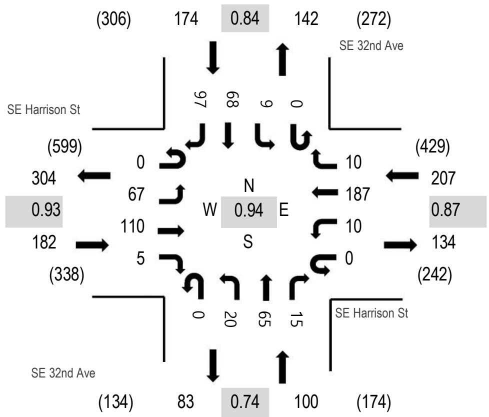
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	1	1	7:05 AM	0	0	0	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
www.alltrafficdata.net

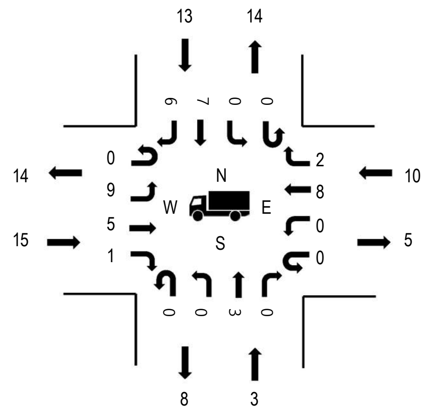
Location: SE 32nd Ave & SE Harrison St AM
Date: Tuesday, July 14, 2020
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour

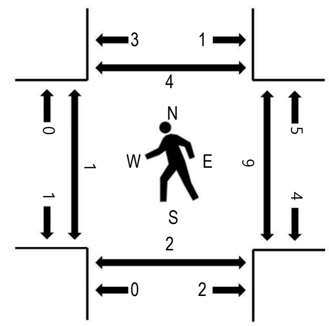
Motorized Vehicles



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 U-Turn	Left	Thru	Right	SE Harrison St Westbound U-Turn	Left	Thru	Right	SE 32nd Ave Northbound U-Turn	Left	Thru	Right	SE 32nd Ave Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
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	Heavy Vehicles					Interval	Bicycles on Roadway					Interval	Pedestrians/Bicycles on Crosswalk				
Start Time	EB	NB	WB	SB	Total	Start Time	EB	NB	WB	SB	Total	Start Time	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

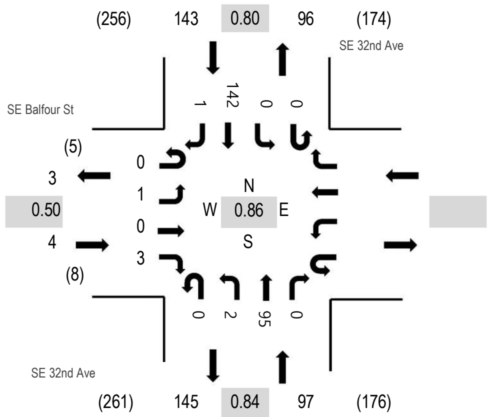
Date: Tuesday, July 14, 2020

Peak Hour: 07:55 AM - 08:55 AM

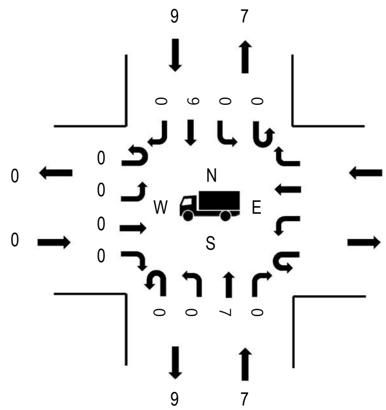
Peak 15-Minutes: 08:40 AM - 08:55 AM

Peak Hour

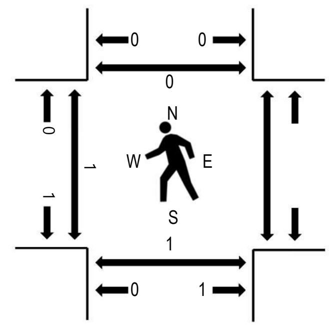
Motorized Vehicles



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 U-Turn	Left	Thru	Right	Westbound U-Turn	Left	Thru	Right	SE 32nd Ave Northbound U-Turn	Left	Thru	Right	SE 32nd Ave Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
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

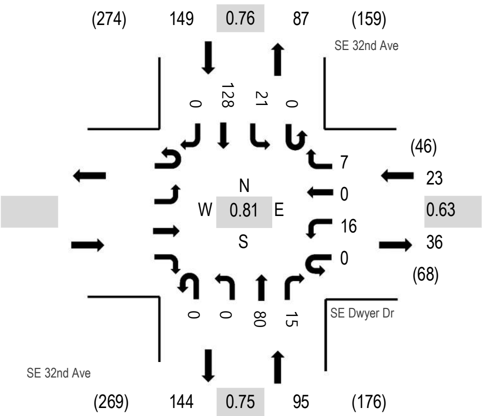
ALL TRAFFIC DATA SERVICES

(303) 216-2439
www.alltrafficdata.net

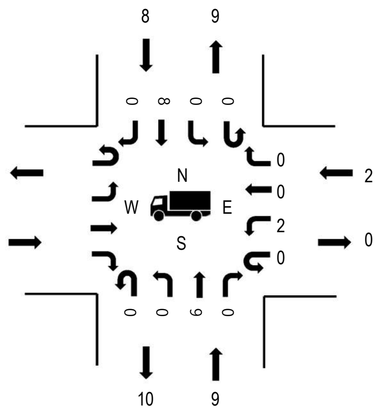
Location: SE 32nd Ave & SE Dwyer Dr AM
Date: Tuesday, July 14, 2020
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour

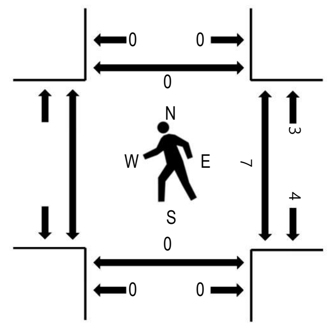
Motorized Vehicles



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 U-Turn	Eastbound Left	Eastbound Thru	Eastbound Right	SE Dwyer Dr Westbound U-Turn	Westbound Left	Westbound Thru	Westbound Right	SE 32nd Ave Northbound U-Turn	Northbound Left	Northbound Thru	Northbound Right	SE 32nd Ave Southbound U-Turn	Southbound Left	Southbound Thru	Southbound Right	Total	Rolling Hour
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	Heavy Vehicles					Interval	Bicycles on Roadway					Interval	Pedestrians/Bicycles on Crosswalk				
Start Time	EB	NB	WB	SB	Total	Start Time	EB	NB	WB	SB	Total	Start Time	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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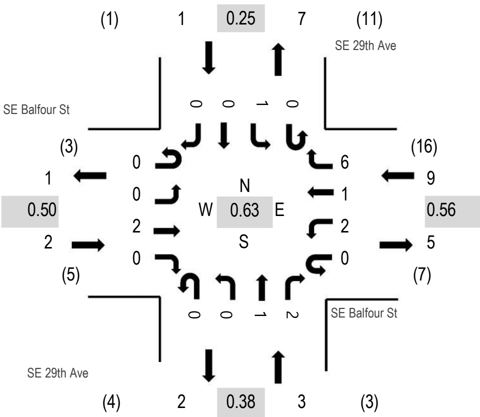
Location: SE 29th Ave & SE Balfour St PM
Date: Tuesday, July 14, 2020
Peak Hour: 05:00 PM - 06:00 PM
Peak 15-Minutes: 05:40 PM - 05:55 PM

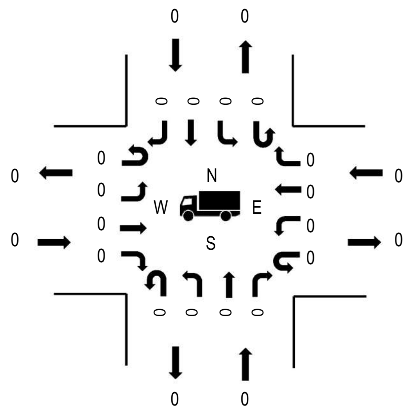
Peak Hour

Motorized Vehicles

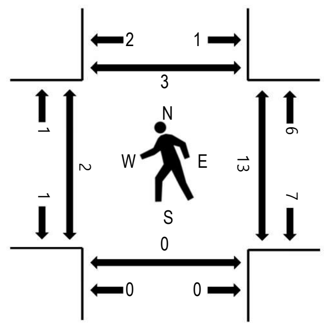


Note: Total study counts contained in parentheses.

Heavy Vehicles



Pedestrians



	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 U-Turn	Left	Thru	Right	SE Balfour St Westbound U-Turn	Left	Thru	Right	SE 29th Ave Northbound U-Turn	Left	Thru	Right	SE 29th Ave Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
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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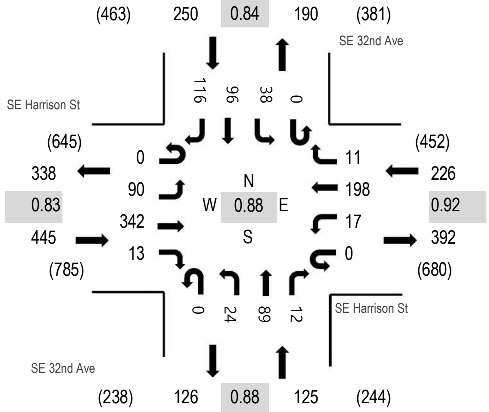
Location: SE 32nd Ave & SE Harrison St PM
Date: Tuesday, July 14, 2020
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:35 PM - 04:50 PM

Peak Hour

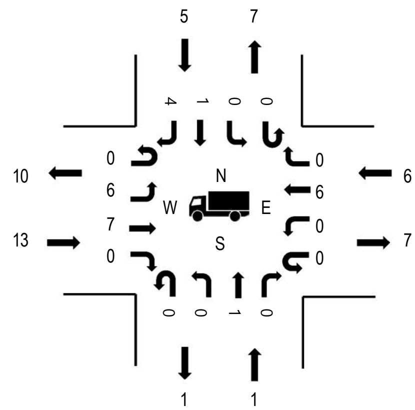
Motorized Vehicles



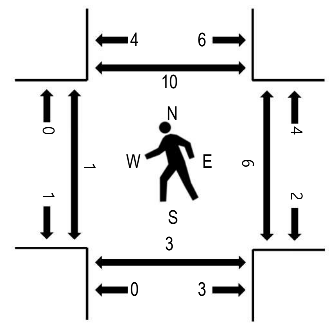
Note: Total study counts contained in parentheses.

	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

Heavy Vehicles



Pedestrians



Traffic Counts - Motorized Vehicles

Interval Start Time	SE Harrison St Eastbound				SE Harrison St Westbound				SE 32nd Ave Northbound				SE 32nd 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	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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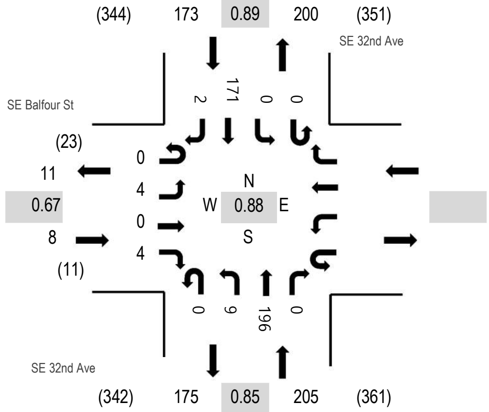
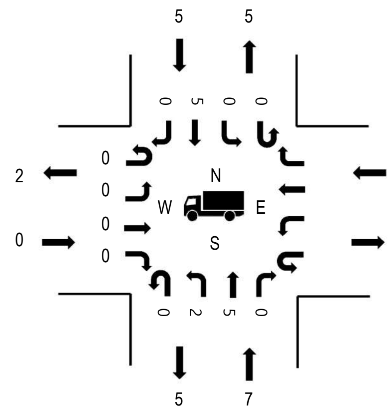
Location: SE 32nd Ave & SE Balfour St PM
Date: Tuesday, July 14, 2020
Peak Hour: 04:40 PM - 05:40 PM
Peak 15-Minutes: 05:25 PM - 05:40 PM

Peak Hour

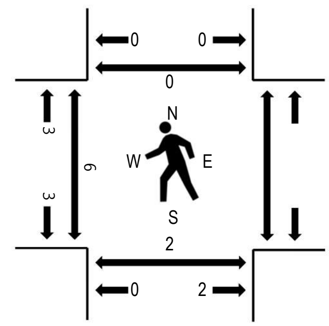
Motorized Vehicles



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 U-Turn	Left	Thru	Right	Westbound U-Turn	Left	Thru	Right	SE 32nd Ave Northbound U-Turn	Left	Thru	Right	SE 32nd Ave Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
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				
	EB	NB	WB	SB	Total
4:00 PM	0	0		0	0
4:05 PM	0	1		0	1
4:10 PM	0	0		1	1
4:15 PM	0	0		0	0
4:20 PM	0	0		0	0
4:25 PM	0	1		1	2
4:30 PM	0	0		0	0
4:35 PM	0	0		0	0
4:40 PM	0	1		0	1
4:45 PM	0	1		1	2
4:50 PM	0	1		0	1
4:55 PM	0	1		1	2
5:00 PM	0	0		0	0
5:05 PM	0	1		1	2
5:10 PM	0	0		1	1
5:15 PM	0	0		0	0
5:20 PM	0	0		0	0
5:25 PM	0	1		1	2
5:30 PM	0	1		0	1
5:35 PM	0	0		0	0
5:40 PM	0	1		1	2
5:45 PM	0	0		0	0
5:50 PM	0	0		0	0
5:55 PM	0	0		0	0
Count Total	0	10		8	18
Peak Hour	0	7		5	12

Interval Start Time	Bicycles on Roadway				
	EB	NB	WB	SB	Total
4:00 PM	0	0		0	0
4:05 PM	0	0		0	0
4:10 PM	0	0		0	0
4:15 PM	0	0		0	0
4:20 PM	0	1		0	1
4:25 PM	0	0		0	0
4:30 PM	0	0		0	0
4:35 PM	0	1		0	1
4:40 PM	0	0		1	1
4:45 PM	0	2		0	2
4:50 PM	1	0		0	1
4:55 PM	0	0		1	1
5:00 PM	0	0		0	0
5:05 PM	0	1		0	1
5:10 PM	0	0		0	0
5:15 PM	0	0		0	0
5:20 PM	0	0		0	0
5:25 PM	0	0		0	0
5:30 PM	0	0		0	0
5:35 PM	0	0		0	0
5:40 PM	0	0		0	0
5:45 PM	0	0		0	0
5:50 PM	0	0		0	0
5:55 PM	0	0		0	0
Count Total	1	5		2	8
Peak Hour	1	3		2	6

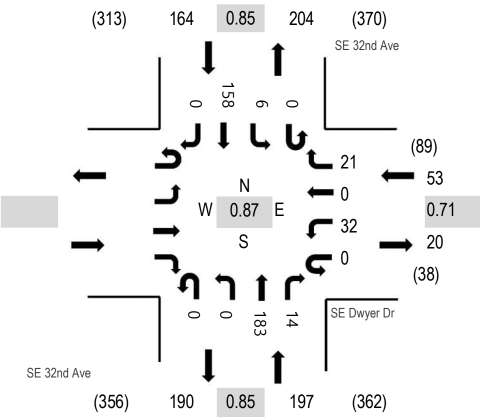
Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total
4:00 PM	0	0		0	0
4:05 PM	0	0		0	0
4:10 PM	0	0		0	0
4:15 PM	0	0		0	0
4:20 PM	0	0		0	0
4:25 PM	1	0		0	1
4:30 PM	0	0		0	0
4:35 PM	0	0		0	0
4:40 PM	2	0		0	2
4:45 PM	0	0		0	0
4:50 PM	0	0		0	0
4:55 PM	0	0		0	0
5:00 PM	1	0		0	1
5:05 PM	0	0		0	0
5:10 PM	2	0		0	2
5:15 PM	0	0		0	0
5:20 PM	0	0		0	0
5:25 PM	1	2		0	3
5:30 PM	0	0		0	0
5:35 PM	0	0		0	0
5:40 PM	0	0		0	0
5:45 PM	2	0		0	2
5:50 PM	0	0		0	0
5:55 PM	0	0		0	0
Count Total	9	2		0	11
Peak Hour	6	2		0	8

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

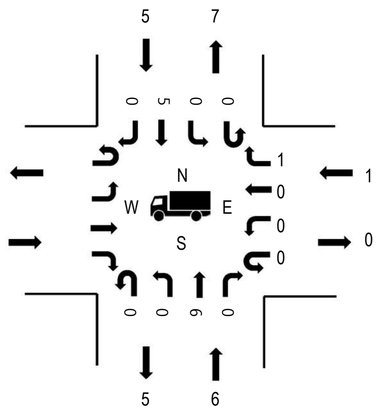
Location: SE 32nd Ave & SE Dwyer Dr PM
Date: Tuesday, July 14, 2020
Peak Hour: 04:35 PM - 05:35 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour

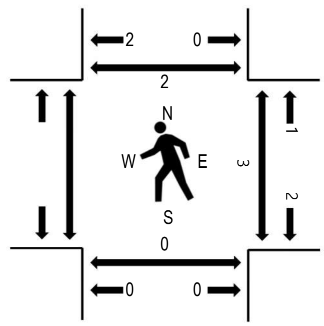
Motorized Vehicles



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

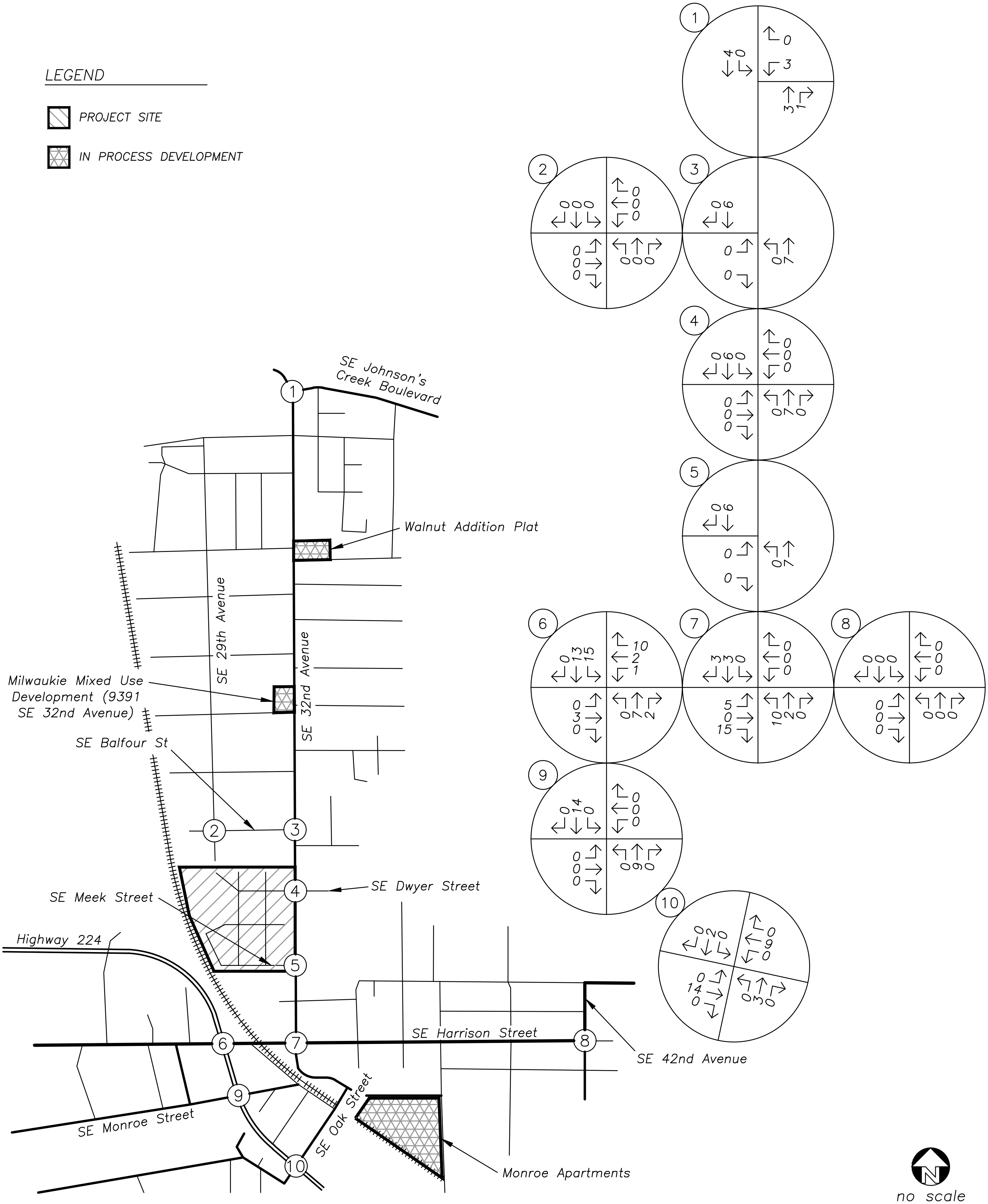
Interval	Eastbound				SE Dwyer Dr Westbound				SE 32nd Ave Northbound				SE 32nd Ave Southbound					Rolling
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	Hour
4:00 PM					0	2	0	1	0	0	15	1	0	2	15	0	36	364
4:05 PM					0	0	0	2	0	0	8	2	0	1	11	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 EB	NB	WB	SB	Total
4:00 PM		0	0	0	0
4:05 PM		0	0	0	0
4:10 PM		1	0	1	2
4:15 PM		0	0	0	0
4:20 PM		0	0	1	1
4:25 PM		1	0	0	1
4:30 PM		0	0	1	1
4:35 PM		0	0	0	0
4:40 PM		1	0	0	1
4:45 PM		0	0	1	1
4:50 PM		1	0	0	1
4:55 PM		1	0	1	2
5:00 PM		0	0	0	0
5:05 PM		0	0	1	1
5:10 PM		1	0	1	2
5:15 PM		0	0	0	0
5:20 PM		0	1	0	1
5:25 PM		0	0	1	1
5:30 PM		2	0	0	2
5:35 PM		0	0	0	0
5:40 PM		1	0	1	2
5:45 PM		0	0	0	0
5:50 PM		0	1	0	1
5:55 PM		0	0	0	0
Count Total		9	2	9	20
Peak Hour		6	1	5	12

Interval Start Time	Bicycles on Roadway EB	NB	WB	SB	Total
4:00 PM		0	0	0	0
4:05 PM		0	0	0	0
4:10 PM		0	0	0	0
4:15 PM		0	0	0	0
4:20 PM		0	0	0	0
4:25 PM		0	0	0	0
4:30 PM		0	0	0	0
4:35 PM		0	0	0	0
4:40 PM		0	0	1	1
4:45 PM		0	0	0	0
4:50 PM		0	1	0	1
4:55 PM		0	0	0	0
5:00 PM		0	0	0	0
5:05 PM		0	0	0	0
5:10 PM		1	0	0	1
5:15 PM		0	0	0	0
5:20 PM		0	0	0	0
5:25 PM		0	0	0	0
5:30 PM		0	0	0	0
5:35 PM		0	0	0	0
5:40 PM		0	0	0	0
5:45 PM		0	0	0	0
5:50 PM		0	0	0	0
5:55 PM		0	0	0	0
Count Total		1	1	1	3
Peak Hour		1	1	1	3

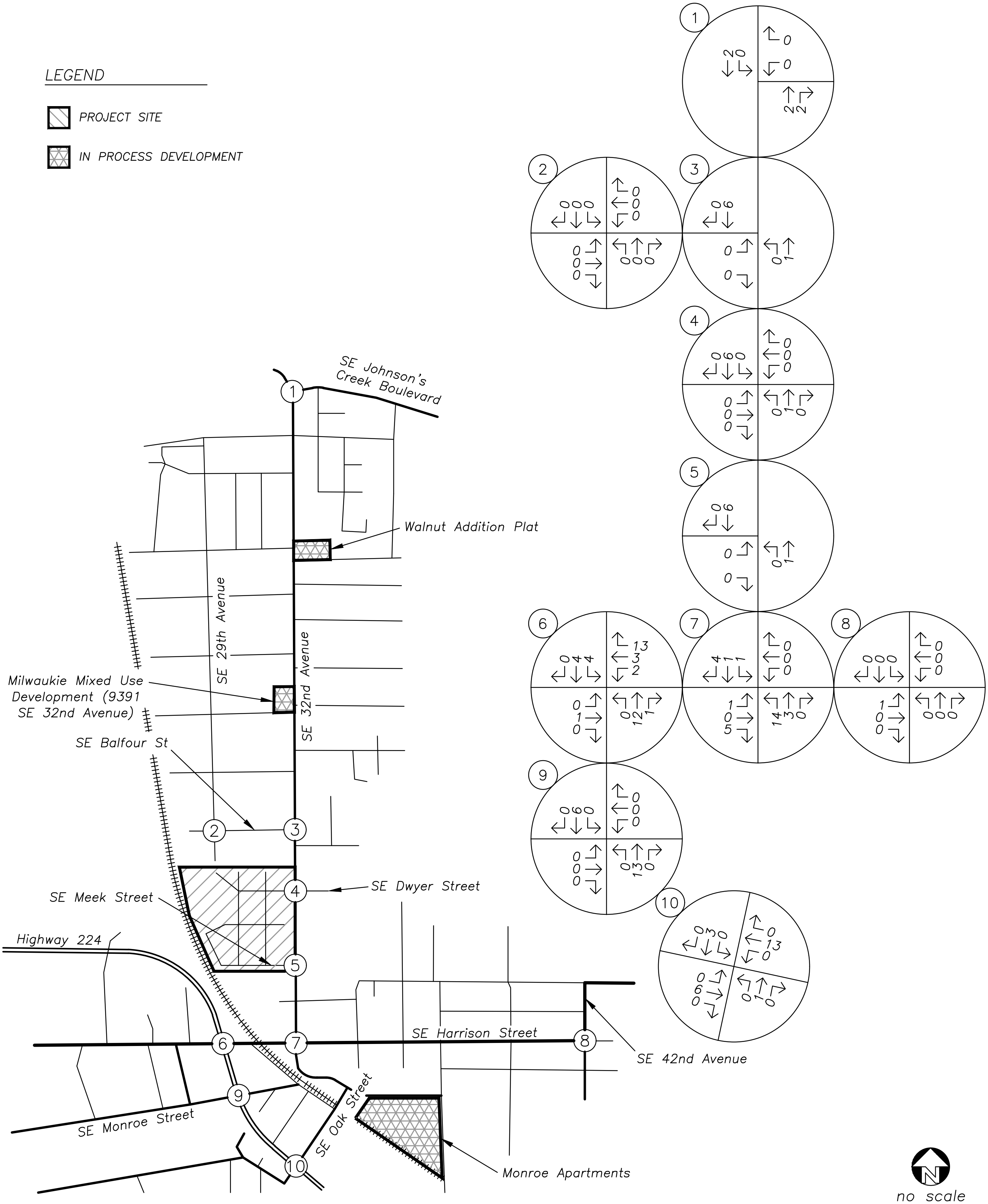
Interval Start Time	Pedestrians/Bicycles on Crosswalk EB	NB	WB	SB	Total
4:00 PM		0	0	0	0
4:05 PM		0	0	0	0
4:10 PM		0	0	0	0
4:15 PM		0	0	0	0
4:20 PM		0	1	0	1
4:25 PM		0	0	0	0
4:30 PM		0	0	0	0
4:35 PM		0	0	0	0
4:40 PM		0	0	2	2
4:45 PM		0	0	0	0
4:50 PM		0	0	0	0
4:55 PM		0	3	0	3
5:00 PM		0	0	0	0
5:05 PM		0	0	0	0
5:10 PM		0	0	0	0
5:15 PM		0	0	0	0
5:20 PM		0	1	0	1
5:25 PM		0	0	0	0
5:30 PM		0	0	0	0
5:35 PM		0	0	0	0
5:40 PM		0	0	0	0
5:45 PM		0	0	0	0
5:50 PM		0	0	0	0
5:55 PM		0	0	0	0
Count Total		0	5	2	7
Peak Hour		0	4	2	6



lancaster mobley

TRAFFIC VOLUMES
In-Process Trips
PM Peak Hour

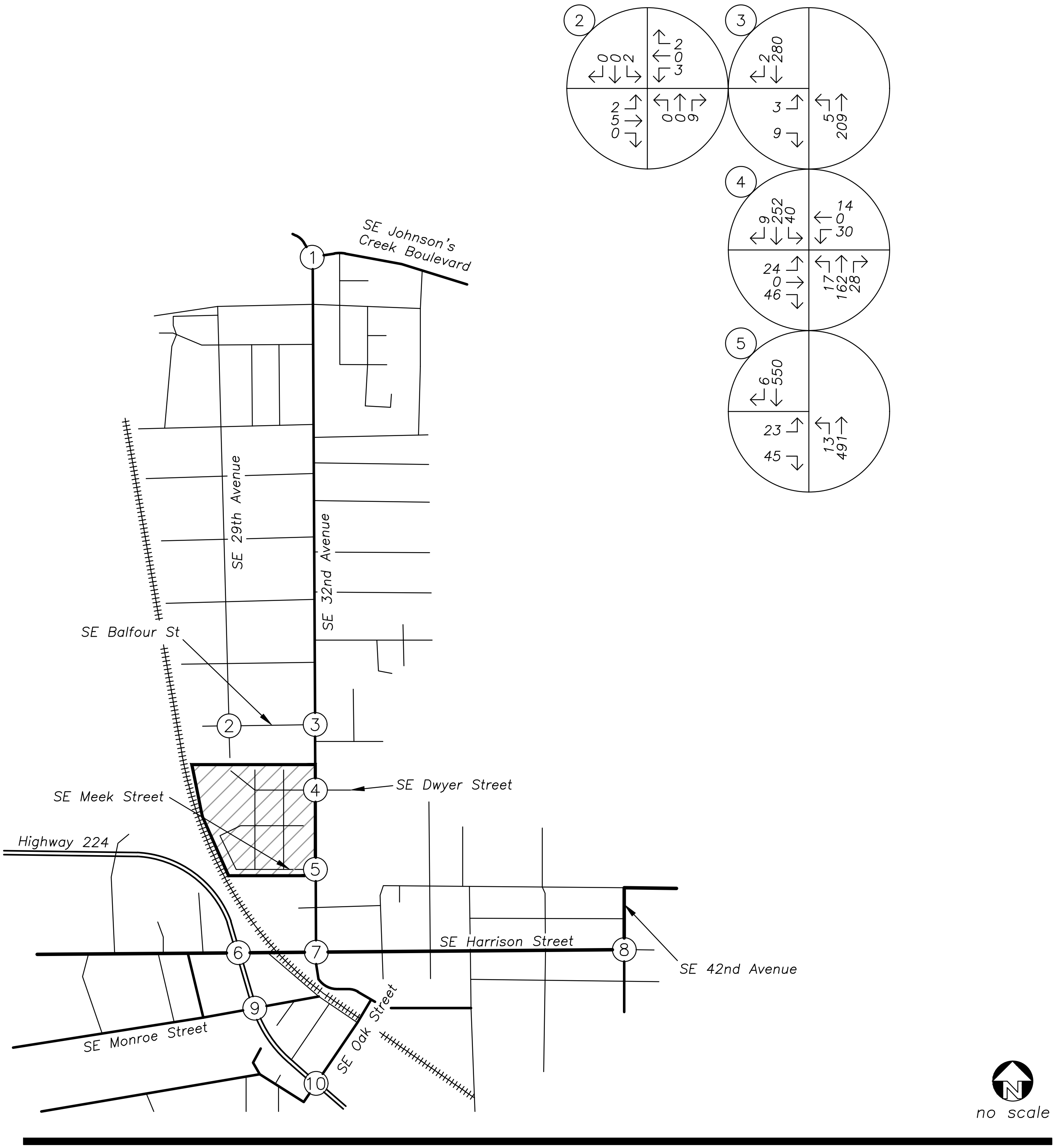
Hillside Master Plan
8/24/2020



lancaster mobley

TRAFFIC VOLUMES
In-Process Trips
AM Peak Hour

Hillside Master Plan
8/24/2020



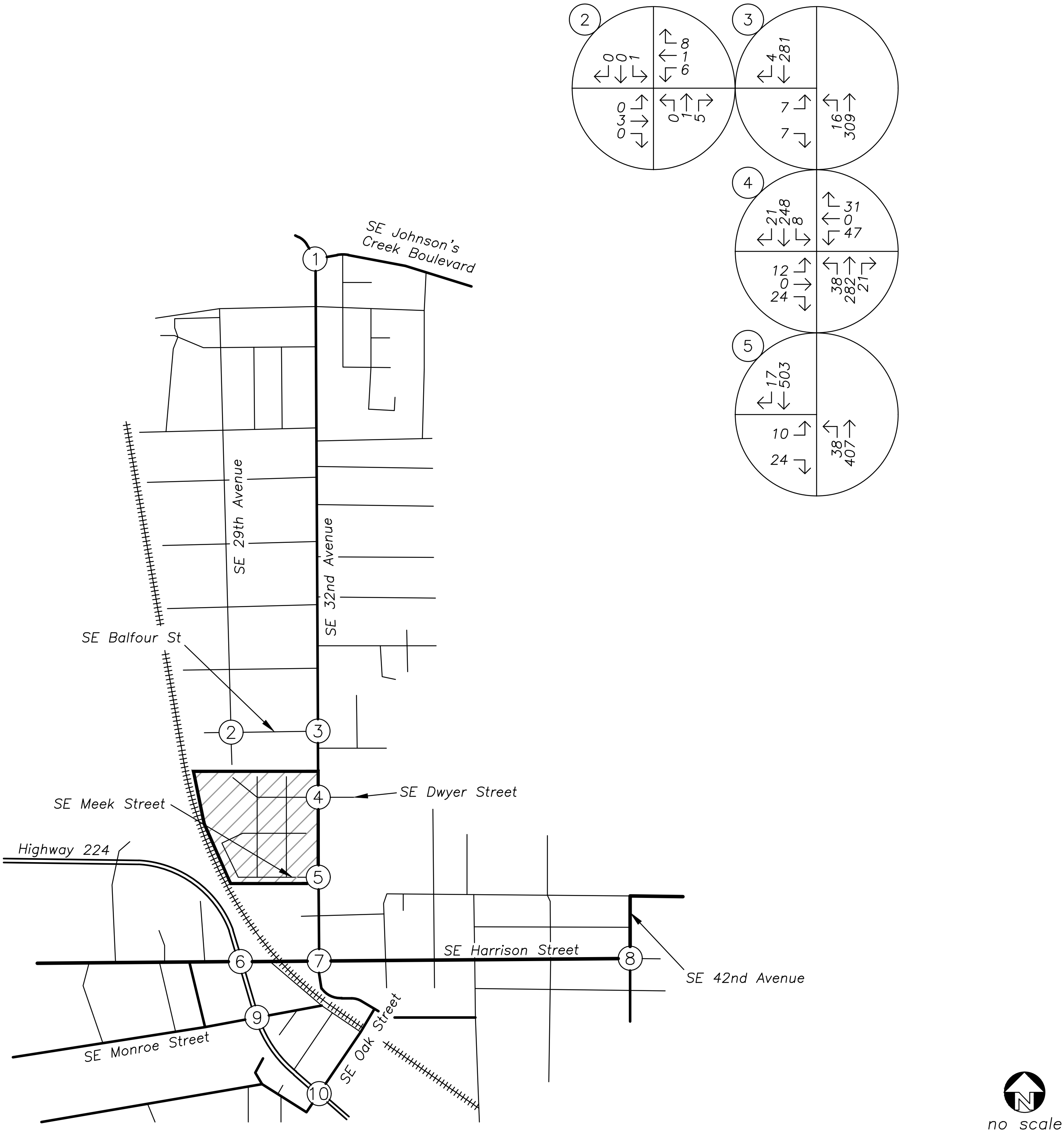
TRAFFIC VOLUMES

2026 Buildout Conditions with SE 29th Avenue Connection

AM Peak Hour

Hillside Master Plan

8/24/2020



TRAFFIC VOLUMES
2026 Buildout Conditions with SE 29th Avenue Connection
PM Peak Hour

Hillside Master Plan
8/24/2020

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 R U G S	M 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
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					

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

5 - 10 of 10 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E E D	A L C	D R U G S	M 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	SPCL USE TRLR QTY OWNER / V# TYPE	MOVE FROM / TO	PRTC P# TYPE	INJ SVRTY	AGE	SEX	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														UNK					
								47.45																			
																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														UNK					
								47.45																			
																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														OR<25					
								47.45																			
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														OR<25					
								47.45																			
																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														OR<25					
								47.45																			
																02 NONE 0	STRGHT										
																PRVTE	S -N								000		00
																PSNGR CAR		01 DRVR	NONE	00	F	OTH-Y		000	000		00
																						OR<25					

URBAN NON-SYSTEM CRASH LISTING

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.

	S		D	M																									
SER#	P		R	J	S	W	DATE	CLASS	CITY STREET		INT-TYPE						SPCL USE												
INVEST	E	A	U	I	C	O	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH		TRLR QTY	MOVE				A	S						
RD DPT	E	L	G	N	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL		OWNER	FROM		PRTC	INJ	G	E	LICNS	PED				
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	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					

URBAN NON-SYSTEM CRASH LISTING

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 D M P R J S W E A U I C O E L G N H R D C S V L 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	SPCL USE TRLR QTY OWNER V# TYPE	MOVE FROM TO	PRTC P# 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	017100100S00													OR<25					
			56.24																			
											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	017100100S00													OR<25					
			56.24																			
											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	017100100S00								E W										
			56.23																			
											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	017100100S00													OR<25					
			56.23																			
												-										
												STRGHT	01 BIKE	INJC	57	M		I XWLK	020	035		04,18,19
												E W										

SER# INVEST RD DPT UNLOC?	S P E E D	A L C	D R U G S	M 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
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	0171AB100S00															OR<25					
								56.24																					
																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	017100100S00															N-RES					
								56.24																					
																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	017100100S00															OR<25					
								56.24																					
																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	017100100S00															OR<25					
								56.24																					
																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 A U I C O / D M R J S W / E L G N H R / D C S V L 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
											03 NONE 0	STOP									
											PRVTE	S -N								011	00
											PSNGR CAR		02 PSNG	NO<5	02	M			000	000	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		7A			06	0		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000	00
N		45 26 47.55	-122 37 56.24	017100100S00													UNK				
											02 NONE 9	STOP									
											N/A	S -N								011	00
											PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000	00
																	UNK				
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		7A			06	0		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	47	M	OR-Y		026	000	29
N		45 26 47.55	-122 37 56.24	0171AB100S00													OR<25				
											02 NONE 0	STOP									
											PRVTE	W -E								011 004	00
											PSNGR CAR		01 DRVR	INJC	26	F	OR-Y		000	000	00
																	OR<25				
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		12A			06	0		N	DLIT	PDO	PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000	00
N		45 26 47.55	-122 37 56.24	017100100S00													UNK				
											02 NONE 9	STOP									
											N/A	W -E								011	00
											PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000	00
																	UNK				
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		1A			06	0		N	DLIT	INJ	PSNGR CAR		01 DRVR	NONE	26	M	OR-Y		026	000	29
N		45 26 47.55	-122 37 56.24	017100100S00													OR<25				
											01 NONE 0	STRGHT									
											PRVTE	W -E								000	00
											PSNGR CAR		02 PSNG	INJC	27	M			000	000	00
											02 NONE 0	STOP									
											PRVTE	W -E								011	00
											TRUCK		01 DRVR	NONE	49	M	OR-Y		000	000	00
																	OR<25				

CLACKAMAS HY at HARRISON ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

SER# / INVEST / RD DPT / UNLOC?	S P E E D / A L C / D R U G S / M J I N V / S 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 / 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 / D R U G S / M 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	AGE	SEX	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	017100100S00															OR<25					
			56.24																					
											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	017100100S00															OR<25					
			56.24																					
											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	017100100S00															OR<25					
			56.24																					
											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	017100100S00															OR<25					
			56.24																					

CLACKAMAS HY at HARRISON ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

21 - 24 of 29 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S D M / P R J S W / E A U I C O / E L G N H R / D C S V L 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
											01	NONE 0	STRGHT											
												PRVTE	W -E									000		00
												PSNGR CAR		02	PSNG	INJC	45	F			000	000		00
											02	NONE 0	TURN-L											
												PRVTE	E -S									000		00
												PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		028,004	000		02
																			OR<25					
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		10A			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N		45 26 47.55	-122 37 56.24	017100100S00															UNK					
											02	NONE 9	STRGHT											
												N/A	W -E									000		00
												PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																			UNK					
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		9P			03	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N		45 26 47.55	-122 37 56.24	017100100S00															UNK					
											02	NONE 9	STRGHT											
												N/A	W -E									000		00
												PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																			UNK					
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		8A			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N		45 26 47.55	-122 37 56.24	017100100S00															UNK					
											02	NONE 9	STRGHT											
												N/A	S -N									000		00
												PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																			UNK					
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		8P			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	21	F	OR-Y		000	000		00
N		45 26 47.55	-122 37 56.24	017100100S00															OR<25					
											01	NONE 0	STRGHT											
												PRVTE	E -W									000		00
												PSNGR CAR		02	PSNG	INJC	21	M			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S D M / P R J S W / E A U I C O / E L G N H R / D C S V L 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
											01	NONE 0	STRGHT										
												PRVTE	E -W									000	00
												PSNGR CAR		03	PSNG	INJC	23	M			000	000	00
											02	NONE 0	STRGHT										
												PRVTE	N -S									000	00
												PSNGR CAR		01	DRVR	NONE	35	M	OR-Y		020	000	04
																			OR<25				
02402	N N N	06/18/2017	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										02
NONE		SU		HARRISON ST	CN		TRF SIGNAL	N	DRY	ANGL		N/A	S -N									000	00
N		8A			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N		45 26 47.55	-122 37	017100100S00															UNK				
			56.24																				
											02	NONE 9	STRGHT										
												N/A	W -E									000	00
												PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																			UNK				
03992	N N N	09/26/2017	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L										02,08
NONE		TU		HARRISON ST	CN		TRF SIGNAL	N	DRY	TURN		N/A	W -N									000	00
N		6A			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N		45 26 47.55	-122 37	017100100S00															UNK				
			56.24																				
											02	NONE 9	STRGHT										
												N/A	E -W									000	00
												PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																			UNK				
03832	N N N N N	10/22/2018	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
CITY		MO		HARRISON ST	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	N -S									000	00
N		10A			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	43	M	OR-Y		020	000	04
N		45 26 47.55	-122 37	017100100S00															OR<25				
			56.24																				
											02	NONE 1	STRGHT										
												PRVTE	W -E									000	00
												PSNGR CAR		01	DRVR	INJC	69	M	OR-Y		000	000	00
																			OR<25				
02869	N N N	08/16/2018	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										04
NONE		TH		HARRISON ST	CN		TRF SIGNAL	N	DRY	ANGL		N/A	E -W									000	00
N		6A			02	0		N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N		45 26 47.58	-122 37	017100100S00															UNK				
			56.25																				
											02	NONE 9	STRGHT										
												N/A	S -N									000	00
												PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																			UNK				

CITY OF MILWAUKIE, CLACKAMAS COUNTY

32ND AVE at HARRISON ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

SER# INVEST RD DPT UNLOC?	S P E E D	A L C	D R U G S	M 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					

URBAN NON-SYSTEM CRASH LISTING

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 E D	A L C	D R U G S	M 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	AGE	SEX	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				

CITY OF MILWAUKIE, CLACKAMAS COUNTY

32ND AVE at HARRISON ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

SER# INVEST RD DPT UNLOC?	S P E E D	 A L C	D R U G S	M 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
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																OR<25					
								46.89																					
																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																OR<25					
								46.89																					
																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																OR<25					
								46.89																					
																02	NONE 0	STRGHT											
																	PRVTE	S -N									000	053	00
																	PSNGR CAR		01	DRVR	INJC	38	F	OR-Y		020	000		04
																								OR<25					

TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

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 E D	 A L C	D R U G S	M 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
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																UNK				
								10.33																				
																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																OR<25				
								10.33																				
																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																OR<25				
								10.33																				
																02	NONE 0	STRGHT										
																	PRVTE	N -S									015	00
																	PSNGR CAR		01	DRVR	INJC	37	F	OR-Y		000	000	00
																								OR<25				

07/22/2020

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION

TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF MILWAUKIE, CLACKAMAS COUNTY

CLACKAMAS HY at MONROE ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

SER# INVEST RD DPT UNLOC?	S D M / P R J S W / E A U I C O / E L G N H R / D C S V L 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	AGE	SEX	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	017100100S00															OR<25				
			54.11																				
											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	017100100S00															OR<25				
			54.11																				
											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	017100100S00															OR<25				
			54.11																				
											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	-122 37	0171AC100S00															OR<25				
		42.6596999	54.1050599																				
											02	NONE 0	STOP										
												PRVTE	E -W									011	00
												PSNGR CAR		01	DRVR	INJC	33	F	OR-Y		000	000	00
																			OR<25				

CLACKAMAS HY at MONROE ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

SER# INVEST RD DPT UNLOC?	S D M P R J S W E A U I C O E L G N H R D C S V L 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	017100100S00															OR<25				
			54.11																				
											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	017100100S00															OR<25				
			54.11																				
											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	017100100S00															OR>25				
			54.12																				
											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	-122 37	017100100S00															OR<25				
		42.6596999	54.1050599																				
											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	017100100S00															OR<25				
			54.11																				

CITY OF MILWAUKIE, CLACKAMAS COUNTY

CLACKAMAS HY at MONROE ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

9 - 11 of 11 Crash records shown.

SER# INVEST RD DPT UNLOC?	S P E E D	A L C	D R U G S	M 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	AGE	SEX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 0	STRGHT											
																	PRVTE	W -E									000		00
																	PSNGR CAR		01	DRVR	NONE	58	F	OR-Y		000	000		00
																								OR<25					
03574	N	N	N				09/01/2015	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NO RPT							TU		MONROE ST	CN		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E									000		00
N							2P			04	0		N	DAY	PDO		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	W -E									011		00
																	PSNGR CAR		01	DRVR	NONE	85	M	OR-Y		000	000		00
																								OR<25					
02887	N	N	N		N	N	06/27/2016	12	CLACKAMAS HY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											27,04
CITY							MO		MONROE ST	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	W -E									000		00
N							6P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		016,020	038		27,04
N							45 26 42.66	-122 37 54.11	017100100S00															OR<25					
																02	NONE 0	STRGHT											
																	PRVTE	S -N									000		00
																	PSNGR CAR		01	DRVR	INJA	38	M	OR-Y		000	000		00
																								OR<25					

URBAN NON-SYSTEM CRASH LISTING

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 E D	A L C	D R U G S	M 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
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	017100100S00															OR<25					
								47.2																					
																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	017100100S00															OR<25					
								47.2																					
																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	017100100S00															UNK					
								47.2																					
																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	017100100S00															OR<25					
								47.2																					
																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					

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 D M / P R J S W / E A U I C O / E L G N H R / D C S V L 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	01	BIKE	INJA	32	M		I XWLK	020	035	19,18,04
													SW NE										
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	01	PED	INJC	45	M		I XWLK	000	035	19
													NE SW										
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 E D	A L C	D R U G S	M 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	SPCL USE TRLR QTY OWNER V# TYPE	MOVE FROM TO	PRTC P# TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
																02 NONE 9	STRGHT									
																N/A	SE-NW								000	00
																PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000	00
																						UNK				
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							3P			06	0		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	57	M	OR-Y		026	000	29
N							45 26 36.14	-122 37 47.2	017100100S00													OR<25				
																02 NONE 0	STOP									
																PRVTE	NW-SE								012	00
																PSNGR CAR		01 DRVR	INJC	77	M	OR-Y		000	000	00
																						OR<25				
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							5P			06	0		N	DLIT	INJ	SEMI TOW		01 DRVR	NONE	50	M	OTH-Y		011	000	10
N							45 26 36.14	-122 37 47.2	017100100S00													N-RES				
																02 NONE 0	STOP									
																PRVTE	NW-SE								011	00
																PSNGR CAR		01 DRVR	INJC	36	F	OR-Y		000	000	00
																						OR<25				
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							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				
																02 NONE 9	STOP									
																N/A	NW-SE								011	00
																PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000	00
																						UNK				
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							4A			06	0		N	DLIT	INJ	PSNGR CAR		01 DRVR	INJB	28	F	OR-Y		026	038	27,29
N							45 26 36.14	-122 37 47.2	017100100S00													OR<25				
																02 NONE 0	STOP									
																PRVTE	NW-SE								012	00
																PSNGR CAR		01 DRVR	NONE	32	M	OR-Y		000	000	00
																						OR<25				
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							4P			04	0		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	00	M	OR-Y		020	000	04
N							45 26 36.1367879	-122 37 47.199576	017100100S00													UNK				

SER# / INVEST / RD DPT / UNLOC?	S D M / P R J S W / E A U I C O / E L G N H R / D C S V L 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	SPCL USE / TRLR QTY / OWNER / V# TYPE	MOVE / FROM / TO	PRTC / P# 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

CLACKAMAS HY at OAK ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

18 - 21 of 25 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E E D	A L C	D R U G S	M 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
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					

CLACKAMAS HY at OAK ST, City of Milwaukie, Clackamas County, 01/01/2014 to 12/31/2018

22 - 25 of 25 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S D M / P R J S W / E A U I C O / E L G N H R / D C S V L 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

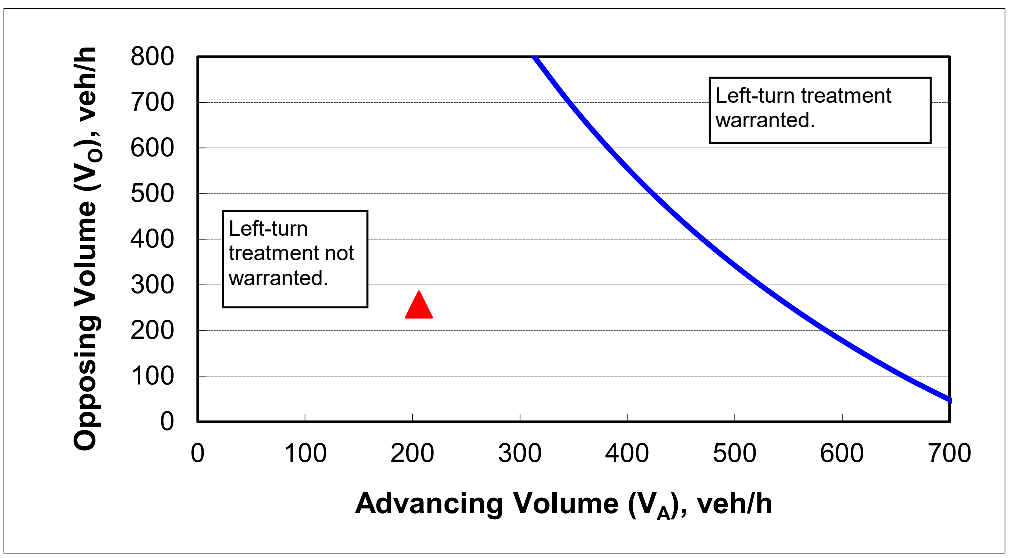
2-lane roadway (English)

INPUT

Variable	Value
85^{th} 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

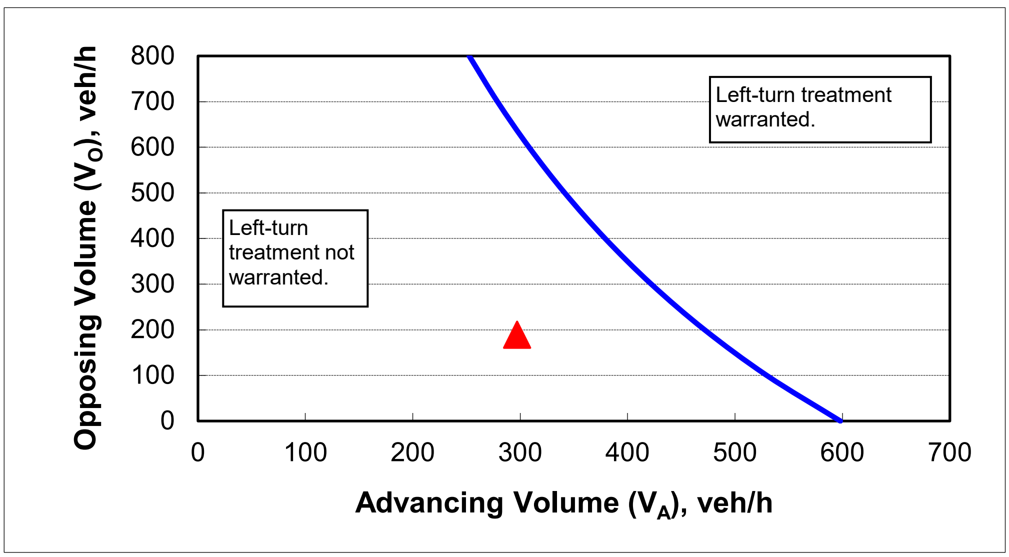
2-lane roadway (English)

INPUT

Variable	Value
85^{th} 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

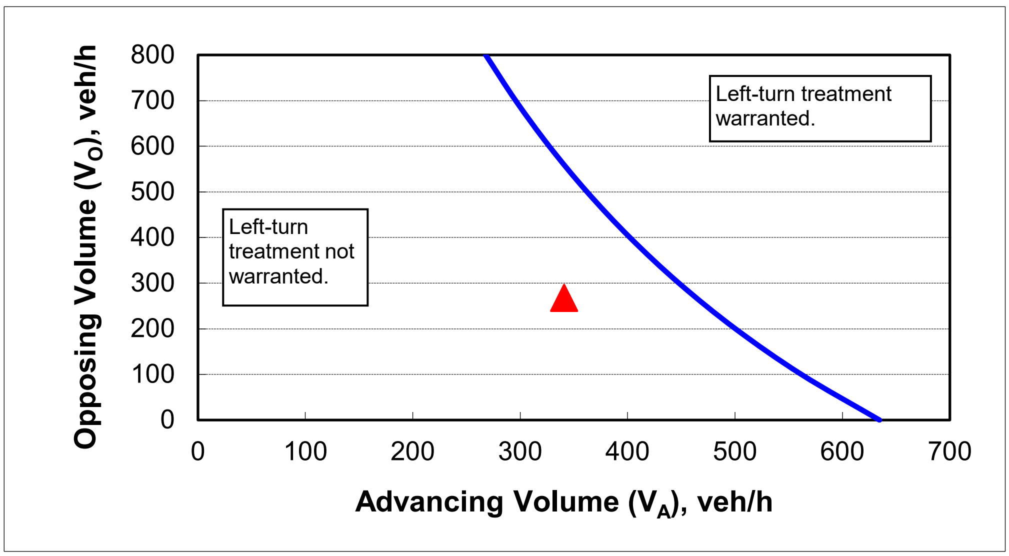
2-lane roadway (English)

INPUT

Variable	Value
85^{th} 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

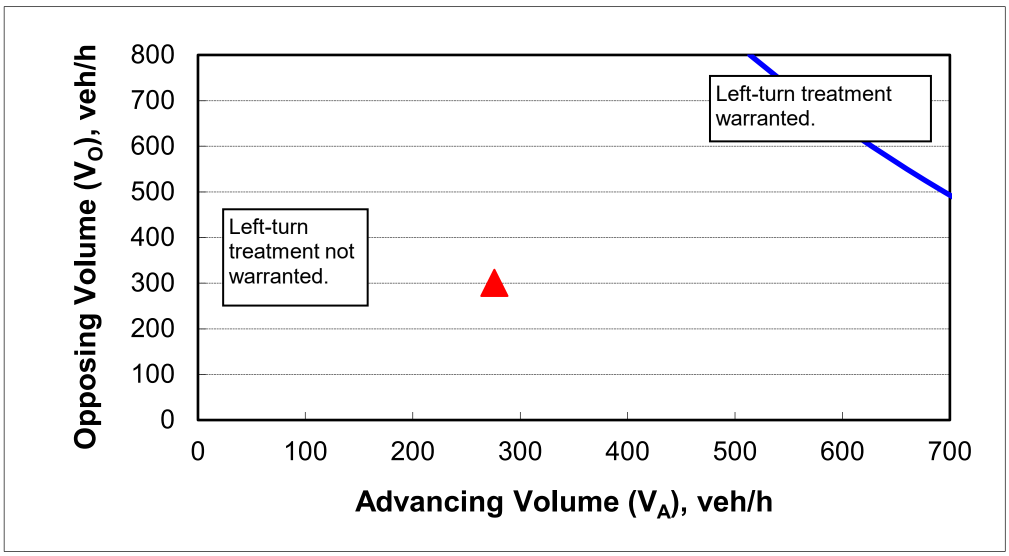
2-lane roadway (English)

INPUT

Variable	Value
85^{th} 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

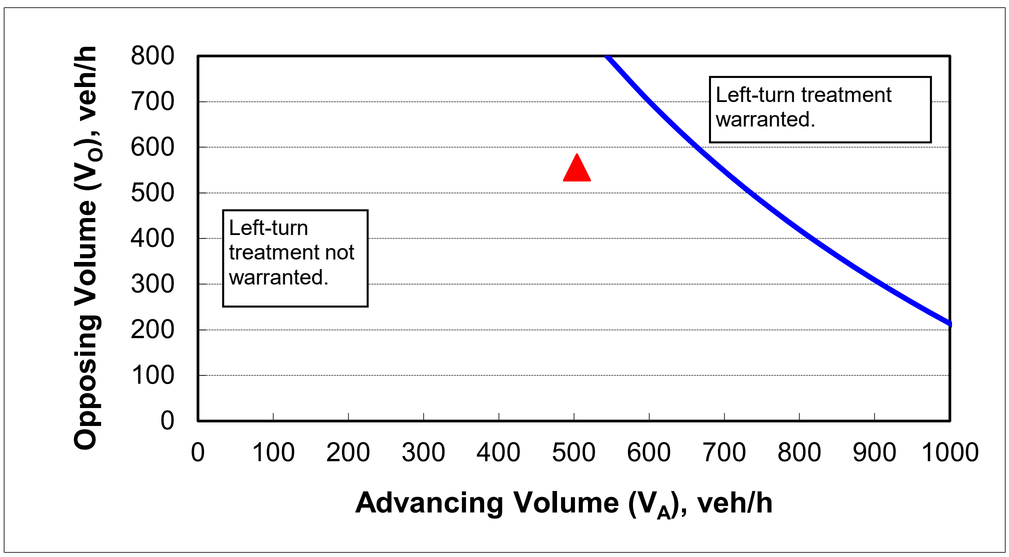
2-lane roadway (English)

INPUT

Variable	Value
85^{th} 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

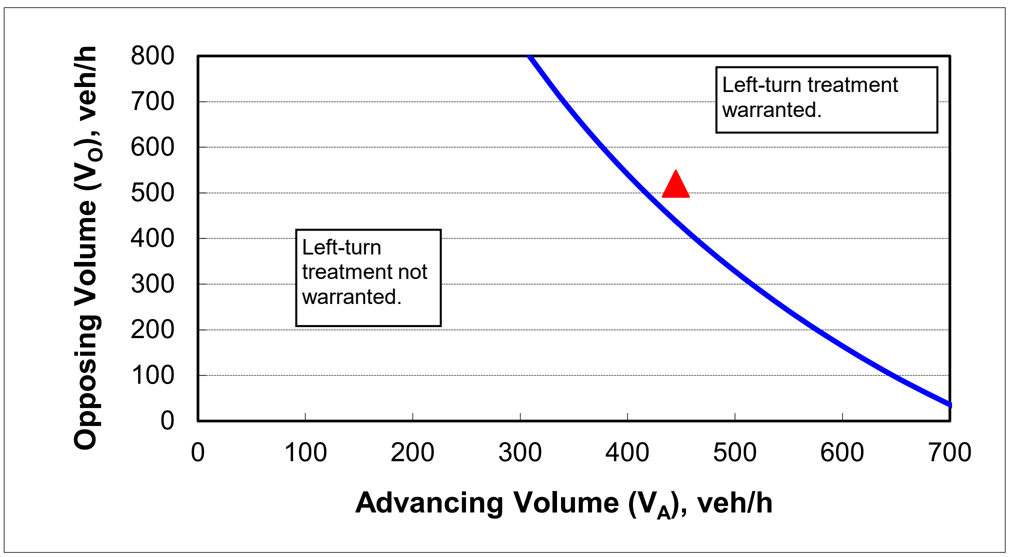
2-lane roadway (English)

INPUT

Variable	Value
85^{th} 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

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	-	82	-	-	-
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	171	453	917	-	-	-
Mov Cap-2 Maneuver	171	-	-	-	-	-
Stage 1	496	-	-	-	-	-
Stage 2	530	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	22.3		0.2		0	
HCM LOS	C					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	917	-	291	-	-
HCM Lane V/C Ratio	0.018	-	0.288	-	-
HCM Control Delay (s)	9	-	22.3	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.2	-	-

Intersection: 5: SE 32nd Avenue & SE Meek Street

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	54	31
Average Queue (ft)	29	8
95th Queue (ft)	60	30
Link Distance (ft)	272	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		82
Storage Blk Time (%)		
Queuing Penalty (veh)		

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	-	85	-	-	-
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	213	513	974	-	-	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	578	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.1	0.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	974	-	363	-	-
HCM Lane V/C Ratio	0.045	-	0.108	-	-
HCM Control Delay (s)	8.9	-	16.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection: 5: SE 32nd Avenue & SE Meek Street

Movement	EB	NB	SB
Directions Served	LR	L	TR
Maximum Queue (ft)	61	53	15
Average Queue (ft)	22	19	1
95th Queue (ft)	51	48	7
Link Distance (ft)	272		624
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		85	
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Proposed Northbound
Left-Turn Lane

Conceptual Illustration

Scale 1"=50'

Scale 1"=50'

Proposed Northbound
Left-Turn Lane

Conceptual Illustration

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
Number of Lanes: 1
PM Peak Hour Volumes: 664

Minor Street: SE Harrison Street
Number of Lanes: 1
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

HCM 6th Signalized Intersection Summary
6: Highway 224 & SE Harrison Street

07/29/2020

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.

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	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	-	-

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.

Proposed Northbound
Left-Turn Lane

Scale 1"=50'

Proposed Northbound
Left-Turn Lane

Scale 1"=50'

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 Barbara 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

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 <u>volume of water</u> 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

A. **Basin Map (Overall)**
B. **Basin Map (Conveyance)**
C. **Conveyance Calculations**
D. **"2020 Facility Sizes" City of Portland BES Memo**
E. **Utility Plan**
F. **HydroCAD Confirming Compliance with HUD for Greenstreets and onsite planters**
G. **HydroCAD Confirming Private Detention Compliance with HUD and City of Milwaukie**
H. **Calculations for Proprietary systems Compliance with HUD and City of Milwaukie**
I. **Soils Information**

Exhibit C

Humber Design Group, Inc.
117 SE Taylor Street
Suite 202
Portland, OR 97214
P: 503-946-6690
F: 503-946-3112
www.hdgpdx.com

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"

Stormwater Management Manual
2020 Facility Sizes—Proposed

Spring 2020

Storm system and location make a difference for engineered facilities.

ENVIRONMENTAL SERVICES
CITY OF PORTLAND

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

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.

EXHIBIT "D"

Infiltration to groundwater to manage stormwater and reduce combined sewer overflows

REQUIREMENT (NO CHANGE):

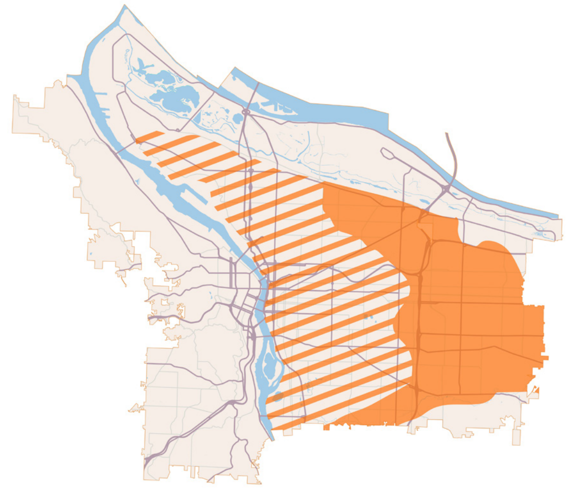
Fully infiltrate the 10-year storm event on sites with infiltration rates greater than 2 inches per hour.

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):

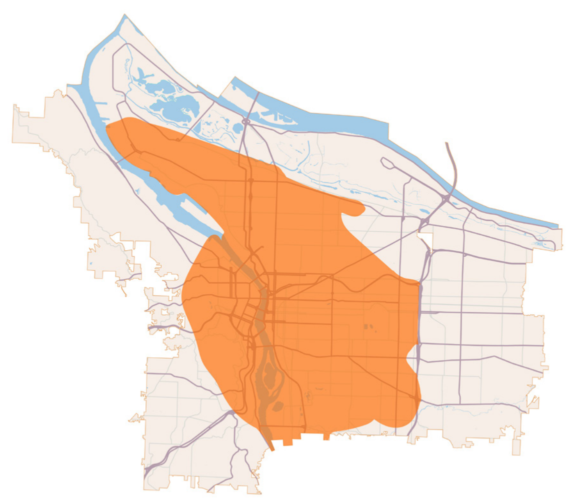
Control the post-development 25-year, 24-hour storm peak flow to the predevelopment 10-year, 24-hour peak flow.

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.

EXHIBIT "D"

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.

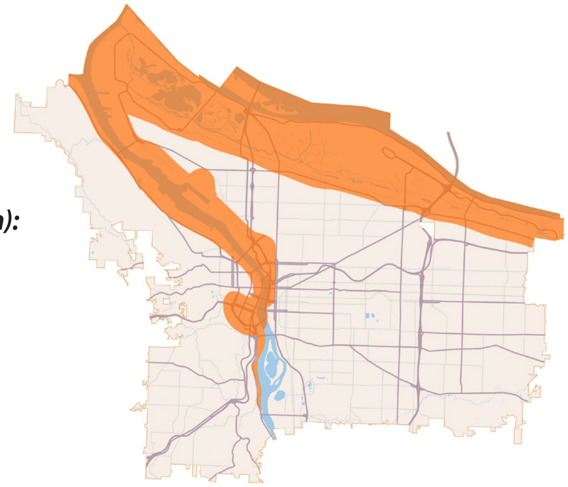
FACILITY DESIGN CHANGES:

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.

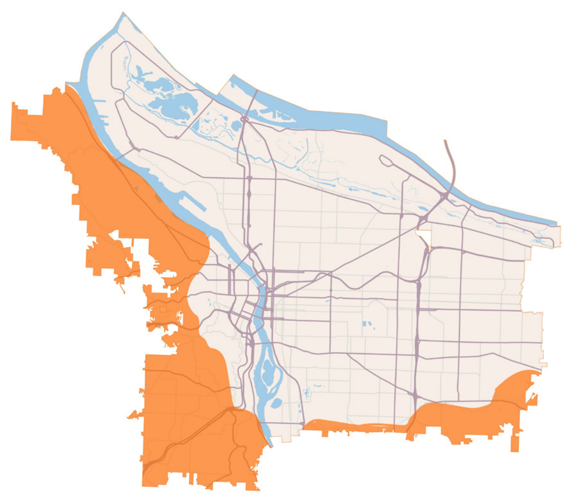
FACILITY DESIGN CHANGES:

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:

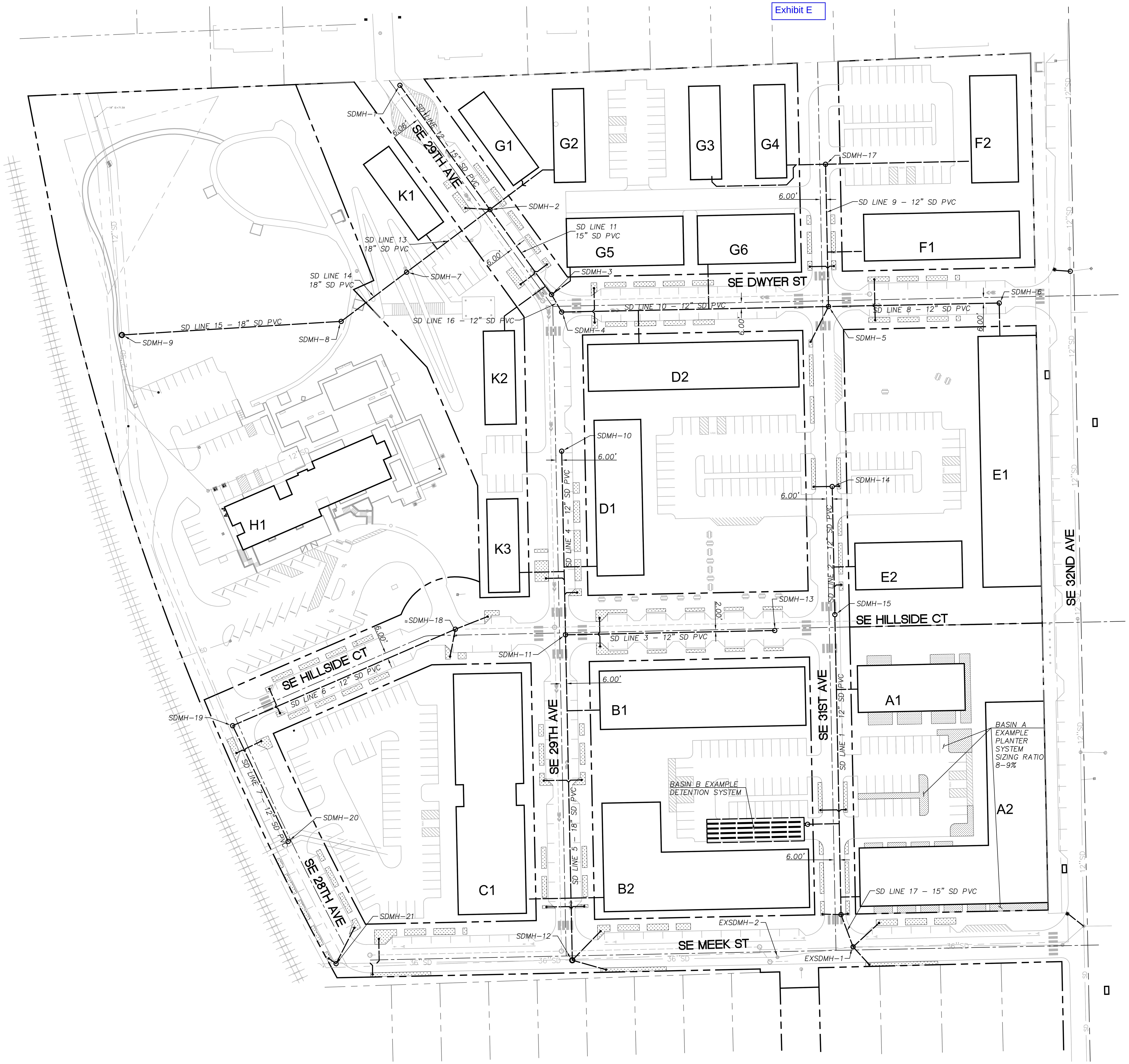
- Configurations with a water-quality facility paired with additional detention can meet water quality and flow control requirements.
- This combination can be used in limited circumstances when approved by Environmental Services.



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'

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%

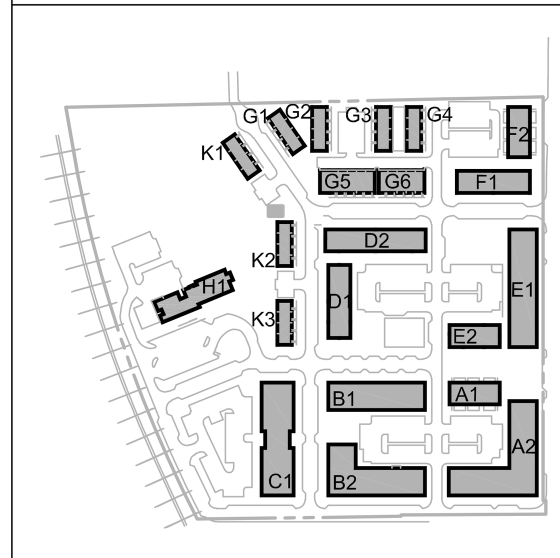
ABBREVIATIONS

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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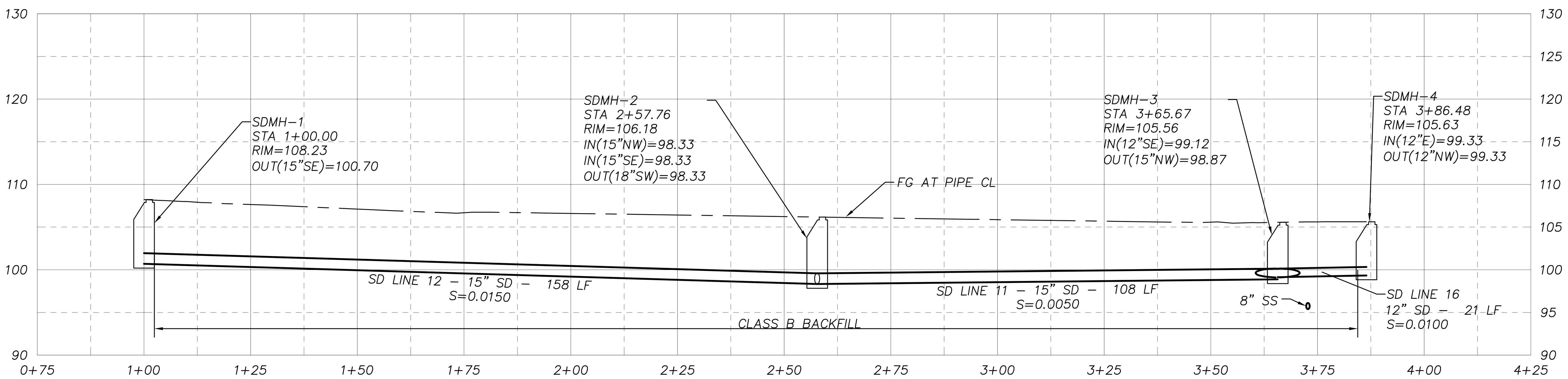
Drawing:

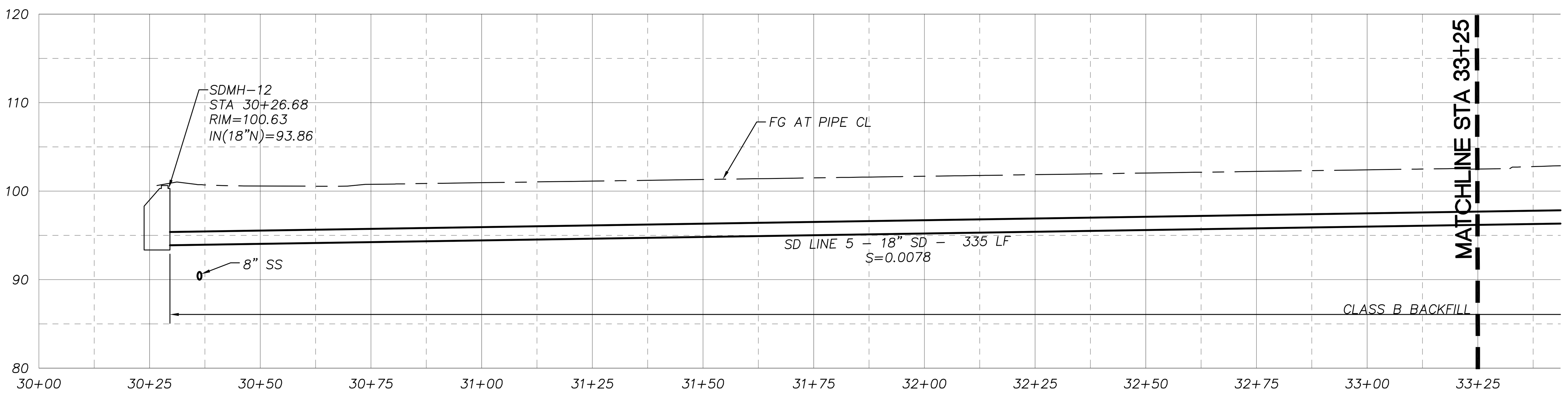
STORM SEWER PLAN

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
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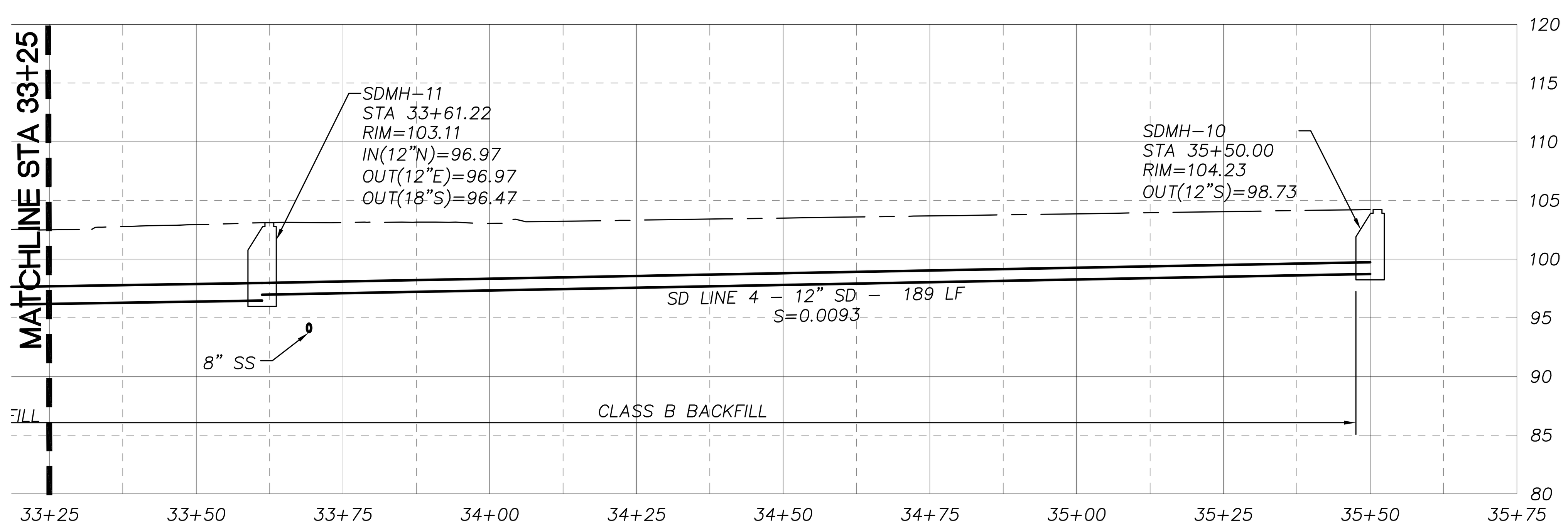

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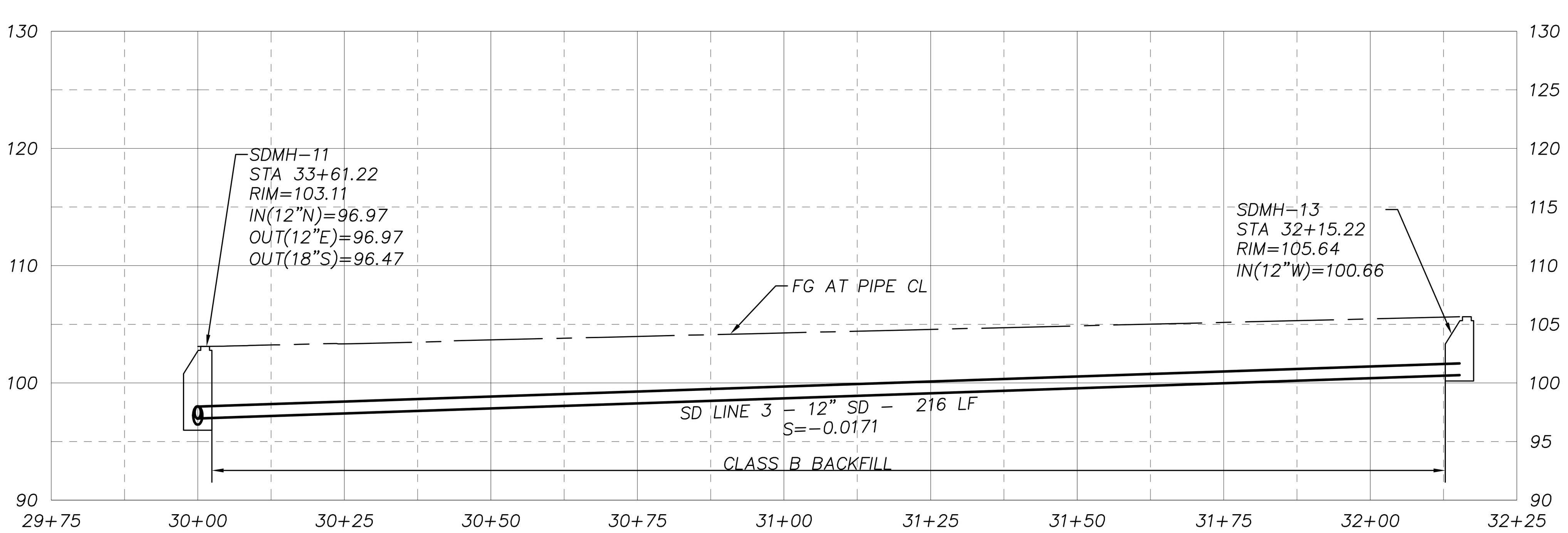

SE HILLSIDE CT STORM SEWER PROFILE
SCALE: H: 1"=20'
V: 1"=10'

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Drawing:

STORM SEWER PROFILE

Job No:	20064
Date:	10/23/2020
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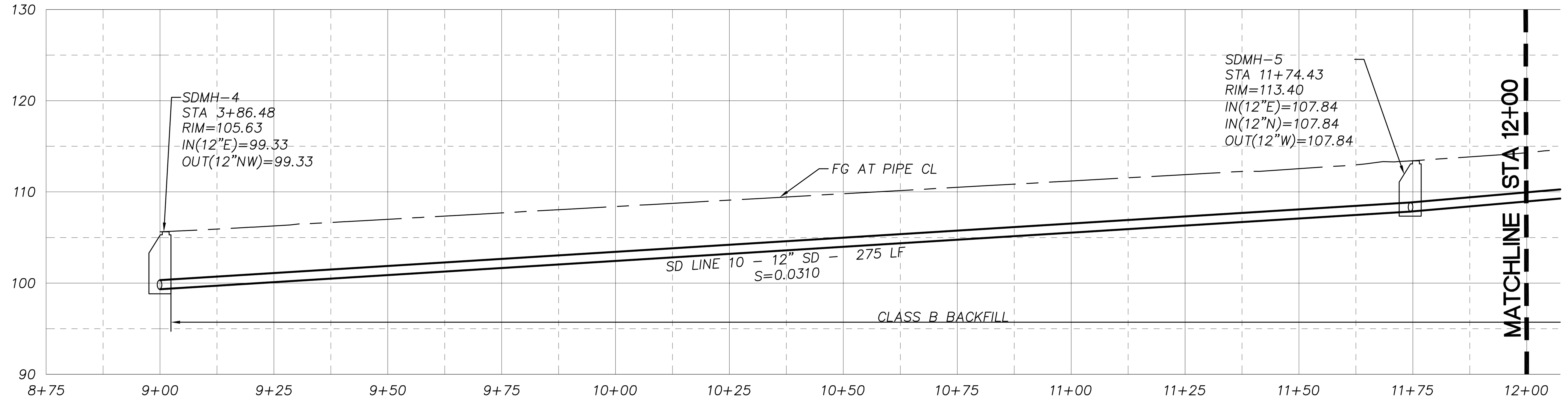
Checked By:	-
Sheet No:	

MP3.31



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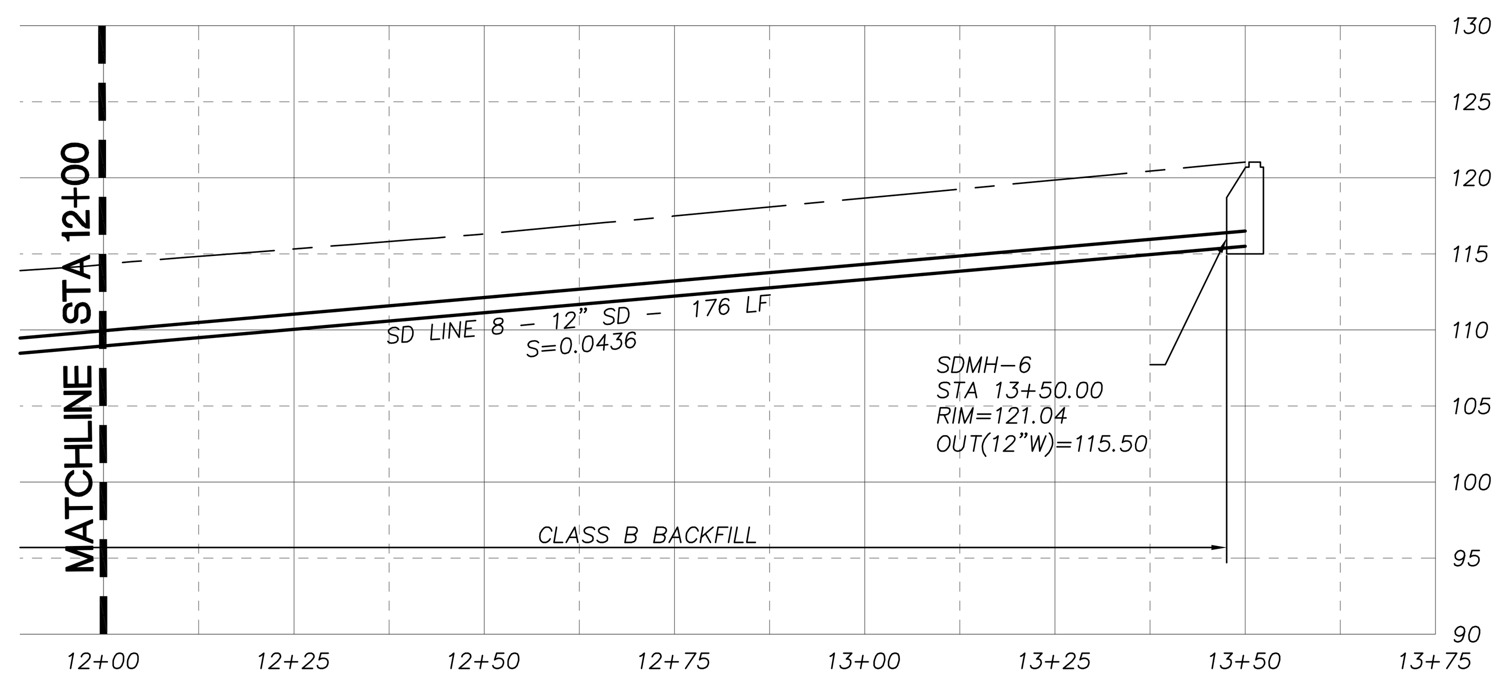

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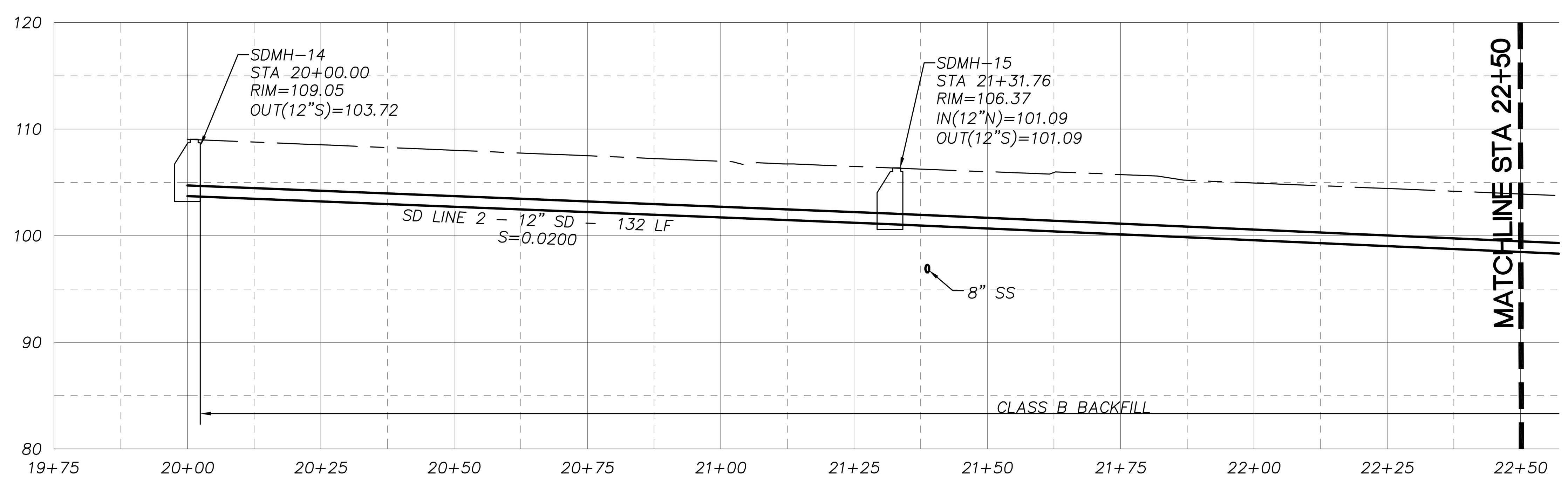

SE 31ST AVE STORM SEWER PROFILE
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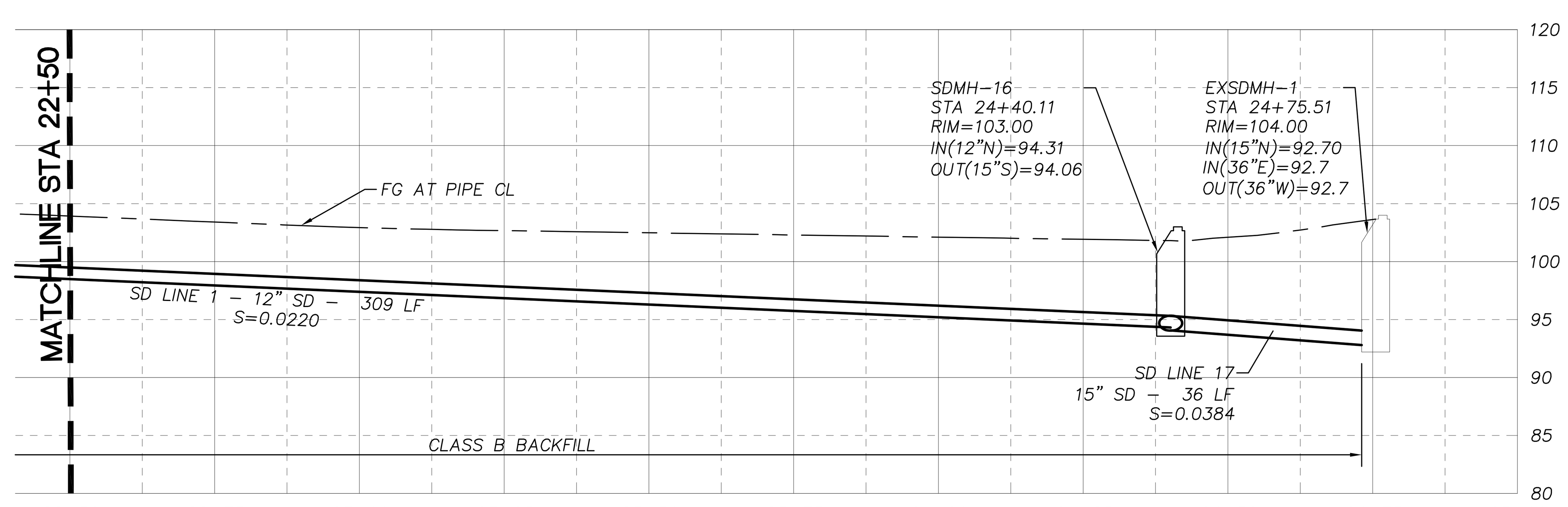
V: 1"=10'



SE 31ST AVE STORM SEWER PROFILE
SCALE: H: 1"=20'
V: 1"=10'

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Drawing:

STORM SEWER PROFILE

Job No:	20064
Date:	10/23/2020
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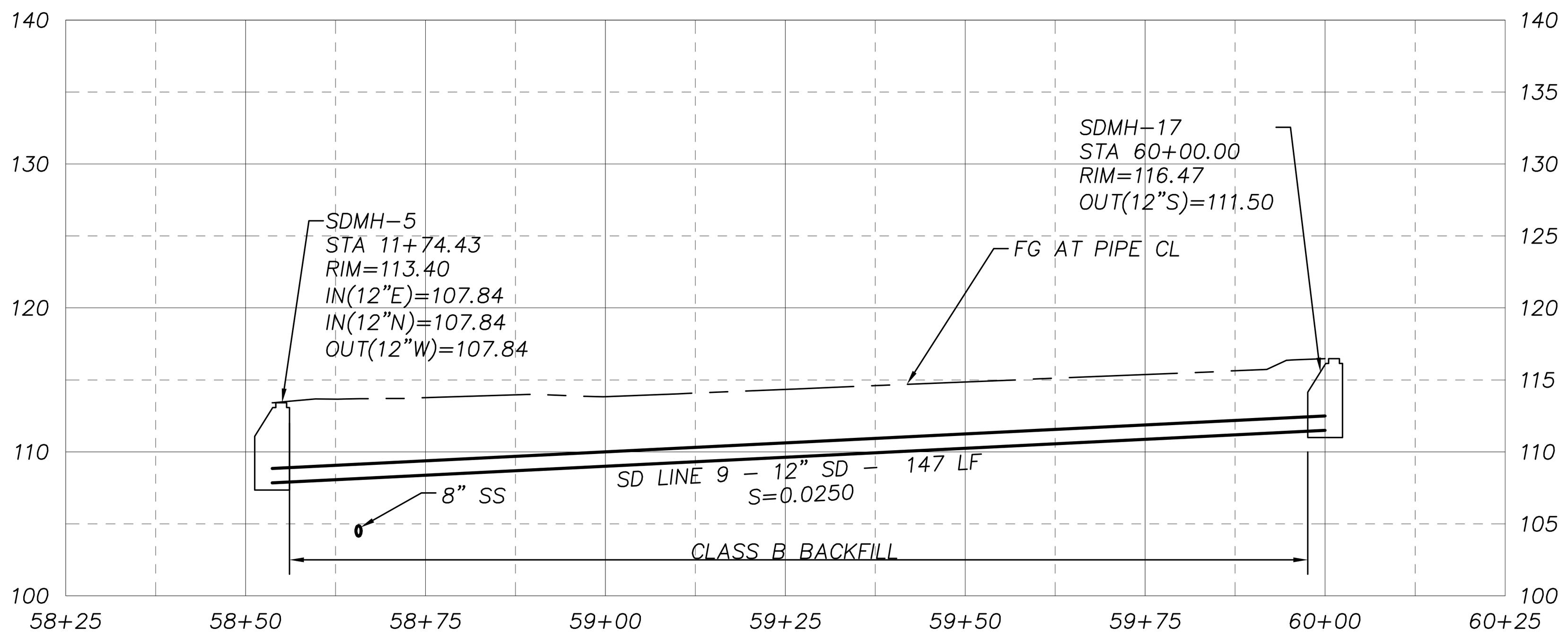
Checked By:	-
Sheet No:	

MP3.32



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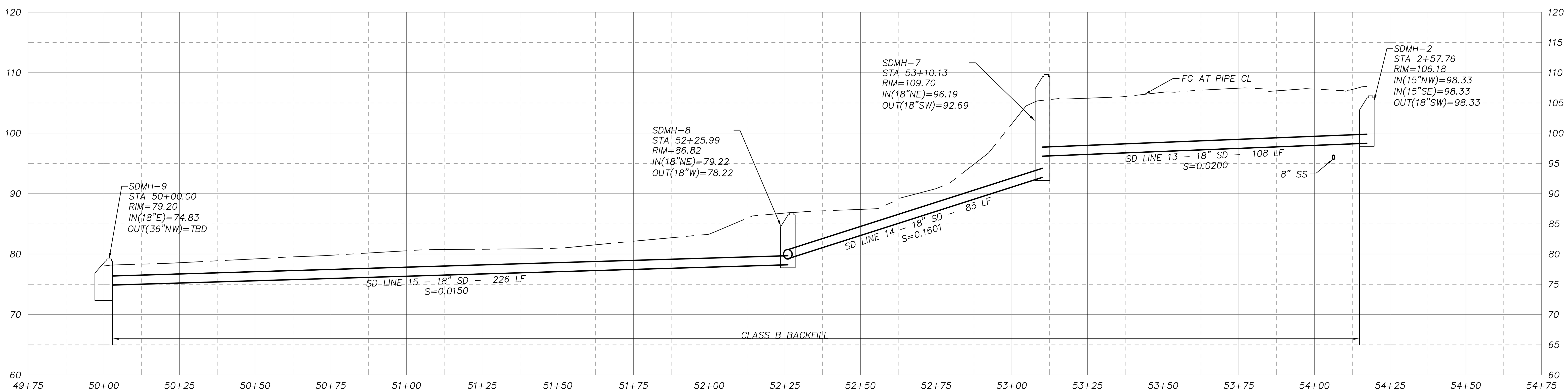
V: 1"=10'



FIELD STORM SEWER PROFILE
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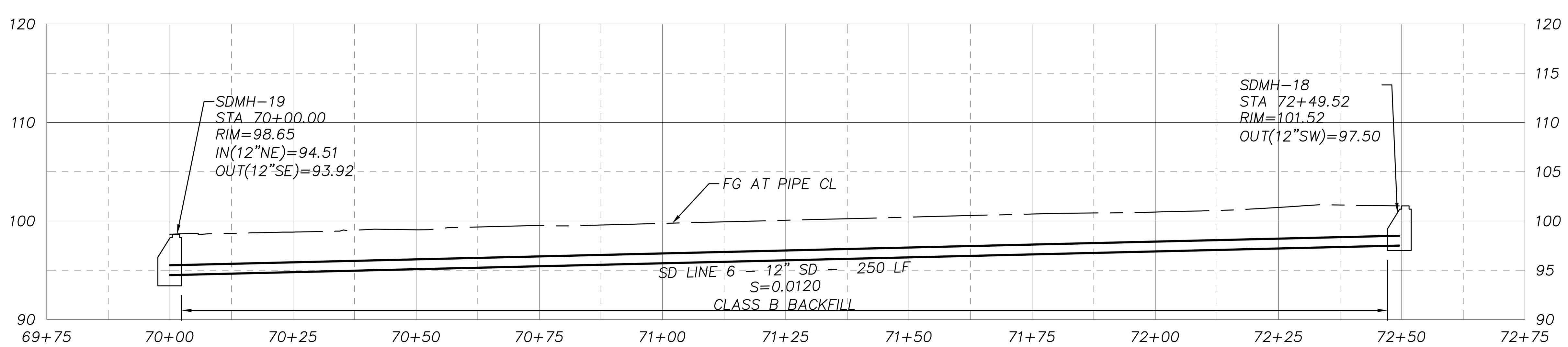

HILLSIDE CT STORM SEWER PROFILE
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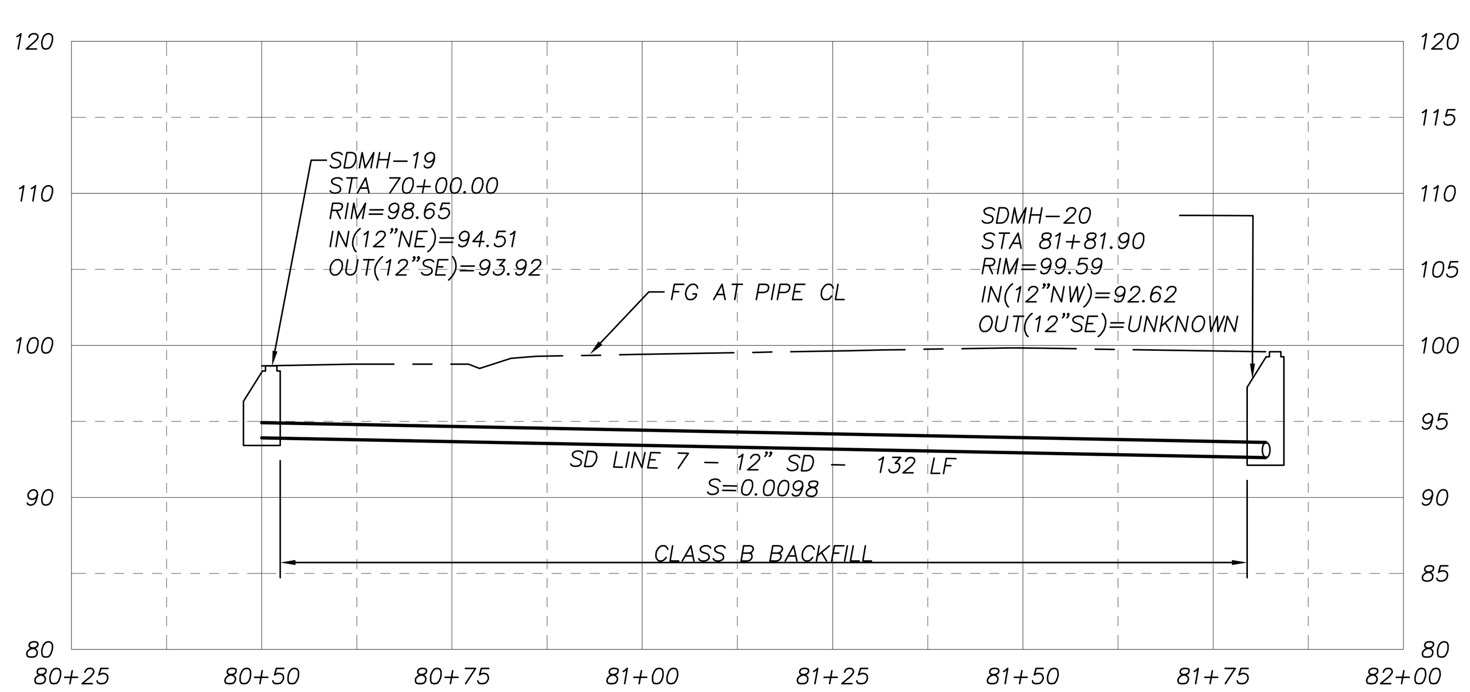
V: 1"=10'



28TH AVE STORM SEWER PROFILE
SCALE: H: 1"=20'
V: 1"=10'

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MILWAUKIE, OR 97222

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Drawing:

STORM SEWER PROFILE

Job No:	20064
Date:	10/23/2020
Drawn By:	-
Checked By:	-
Sheet No:	

MP3.33

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

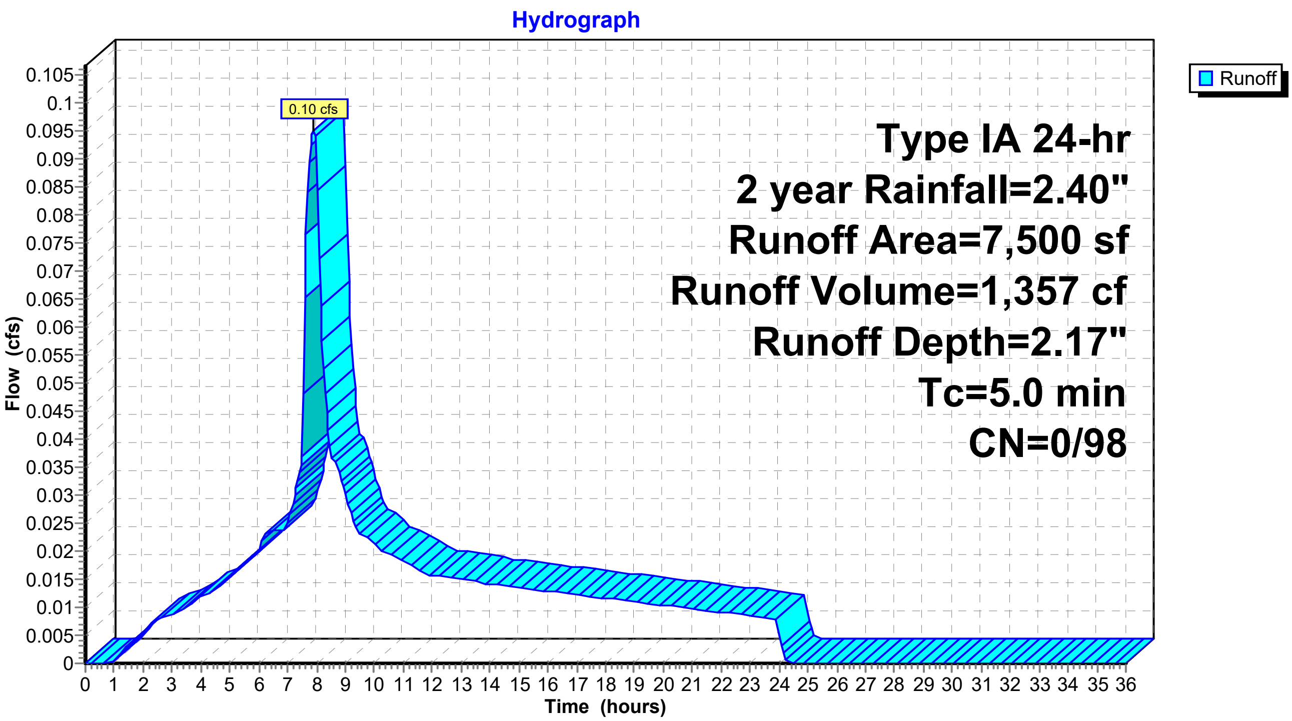


EXHIBIT "F"

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%

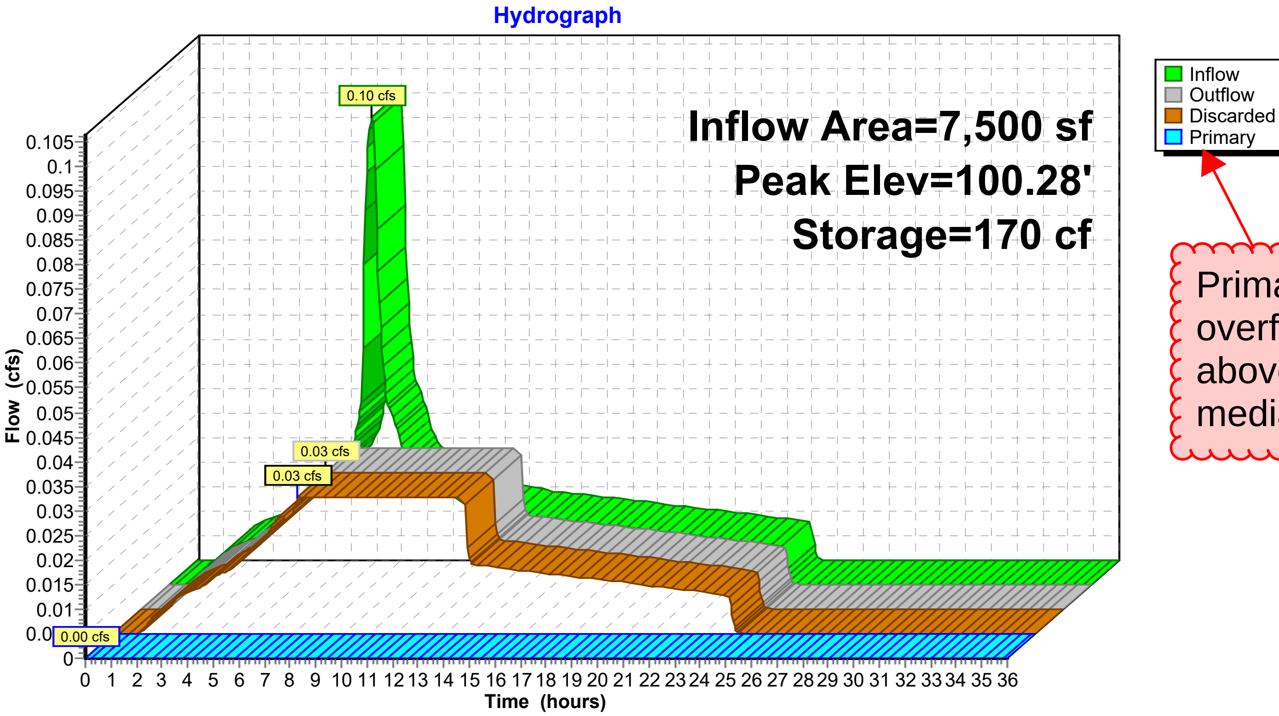
Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	**2.000 in/hr Exfiltration over Surface area**
#2	Primary	100.50'	**12.0" Horiz. Orifice/Grate** C= 0.620 Limited to weir flow at low heads

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

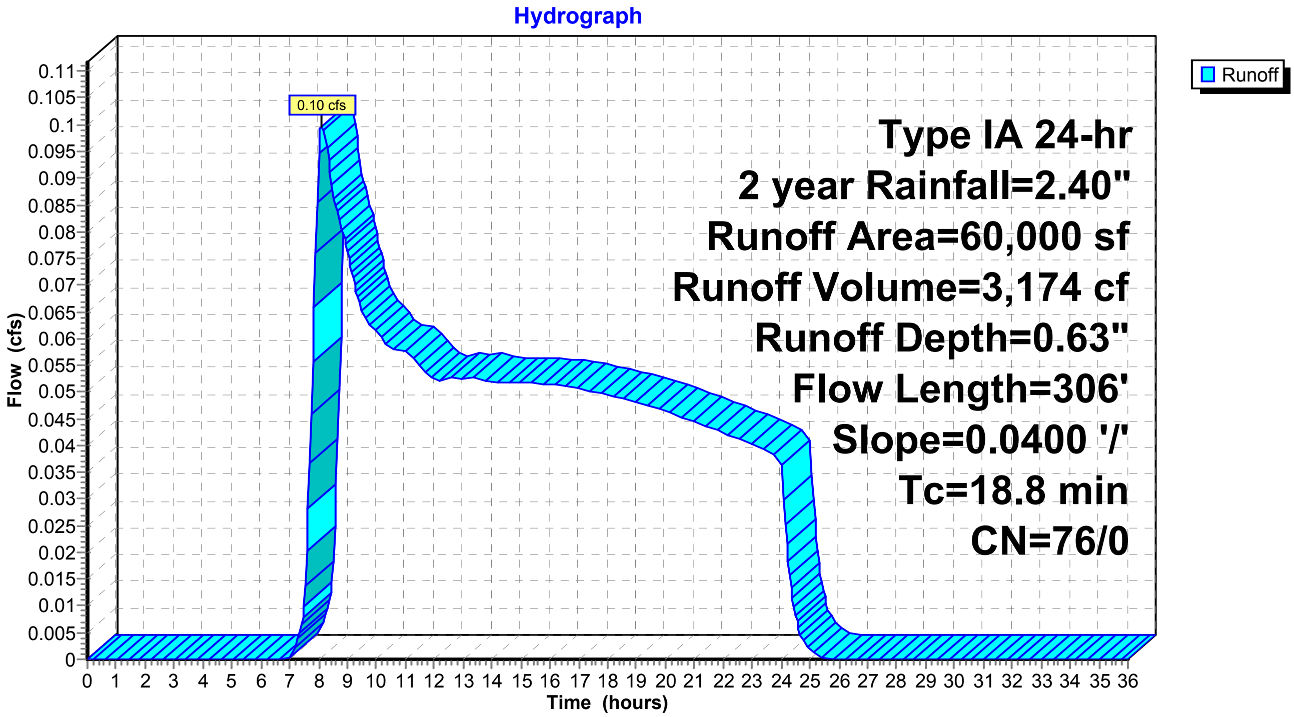
Runoff = 0.10 cfs @ 8.11 hrs, Volume= 3,174 cf, Depth= 0.63"

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

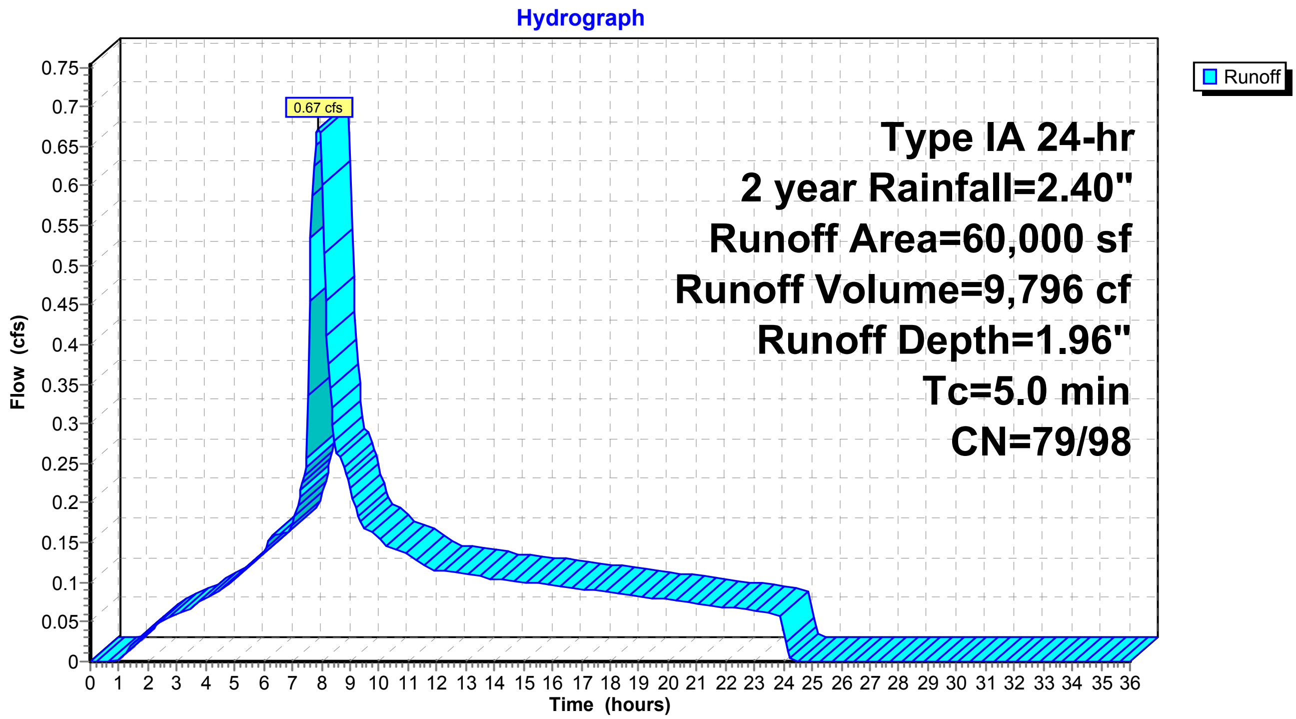
Runoff = 0.67 cfs @ 7.91 hrs, Volume= 9,796 cf, Depth= 1.96"

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)

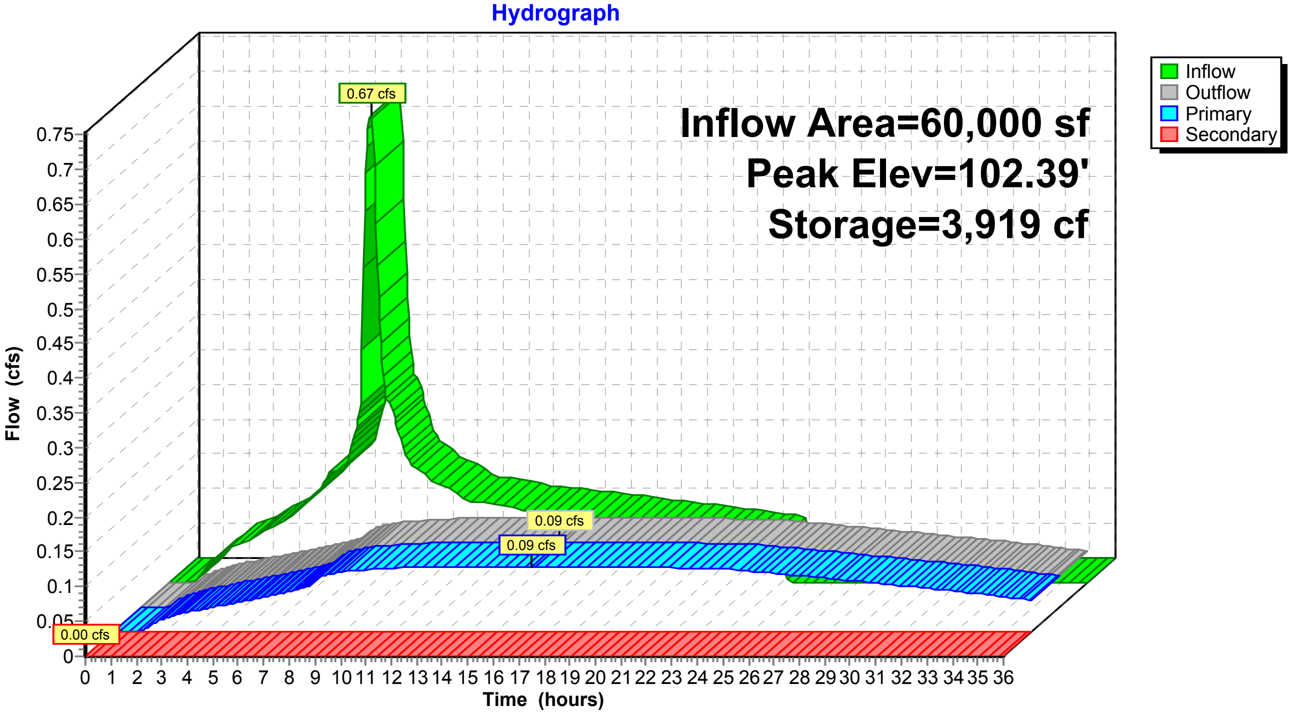
Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	6,283 cf	**48.0" Round CMP_Round 48"** x 5 L= 100.0'

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

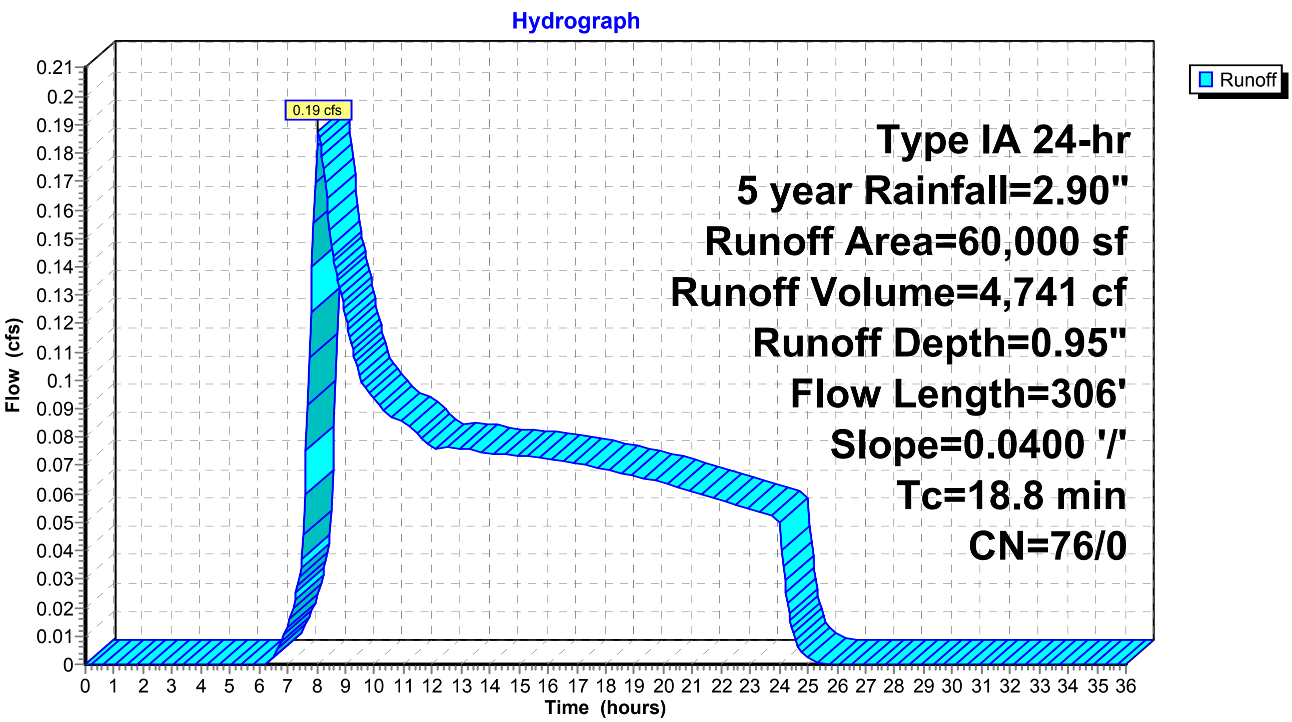
Runoff = 0.19 cfs @ 8.06 hrs, Volume= 4,741 cf, Depth= 0.95"

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

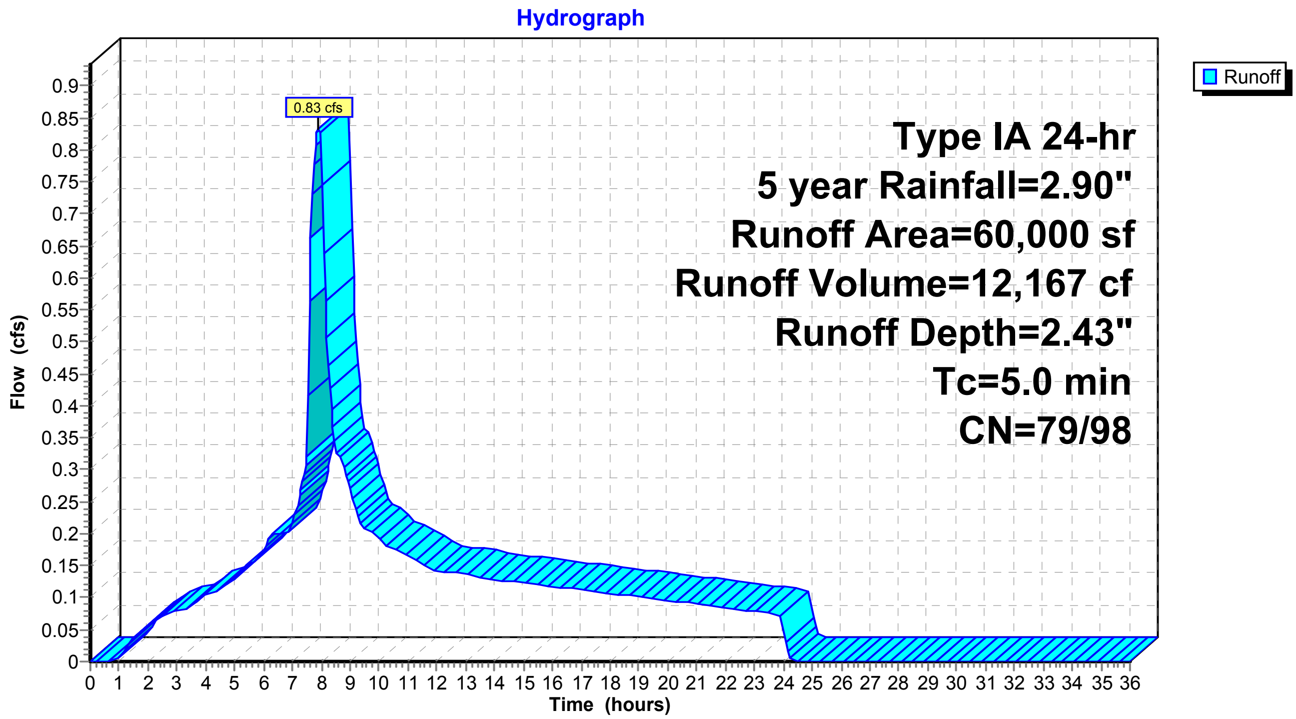
Runoff = 0.83 cfs @ 7.91 hrs, Volume= 12,167 cf, Depth= 2.43"

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)

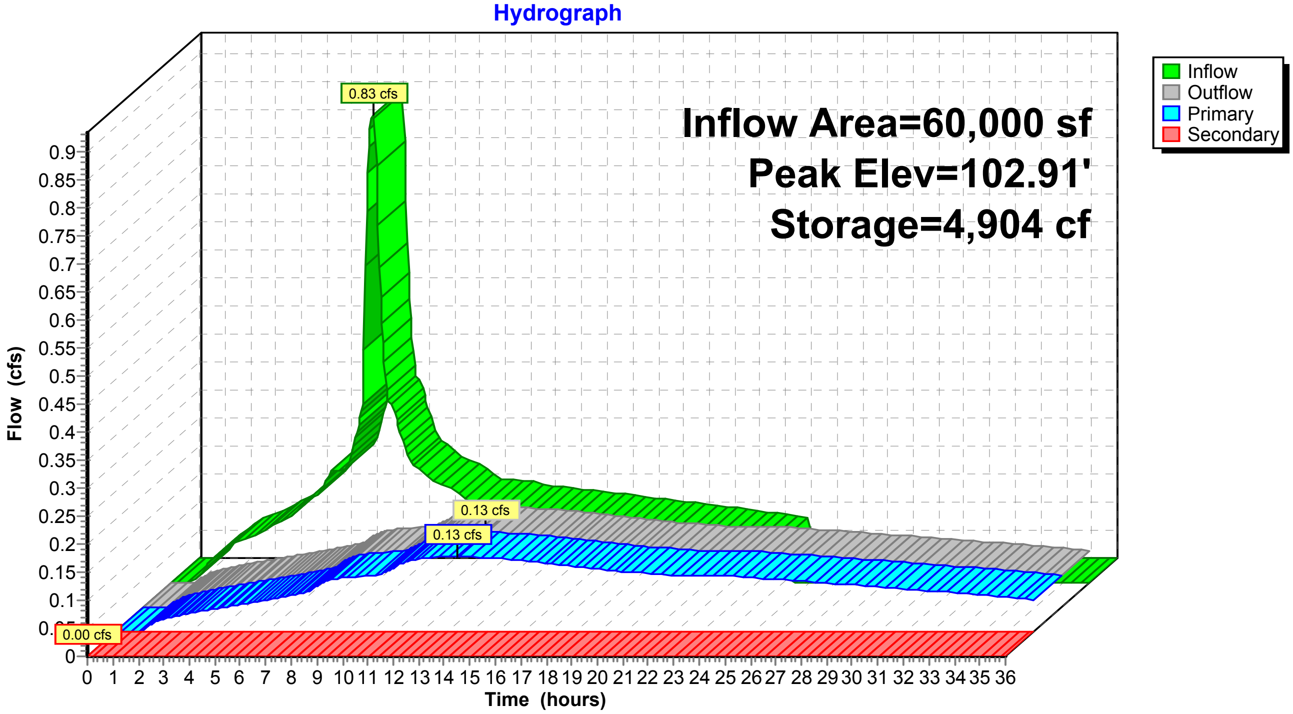
Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	6,283 cf	**48.0" Round CMP_Round 48"** x 5 L= 100.0'

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

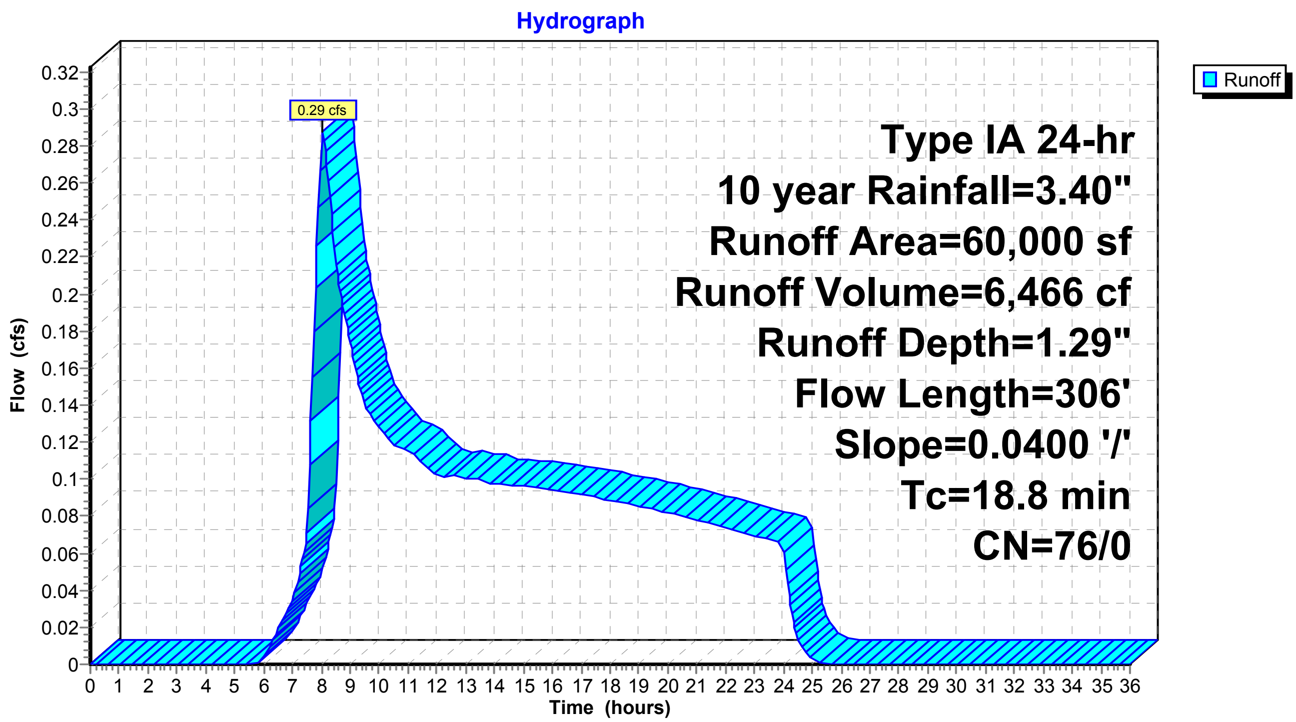
Runoff = 0.29 cfs @ 8.05 hrs, Volume= 6,466 cf, Depth= 1.29"

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

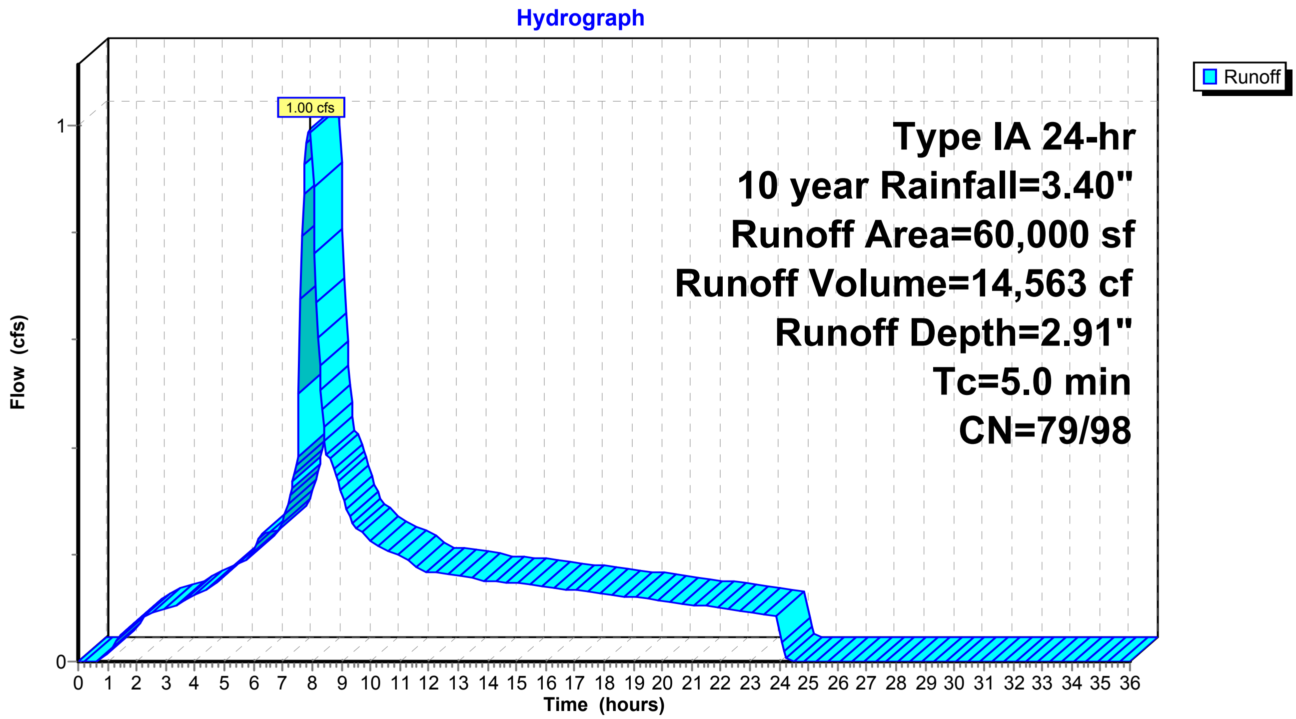
Runoff = 1.00 cfs @ 7.91 hrs, Volume= 14,563 cf, Depth= 2.91"

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)

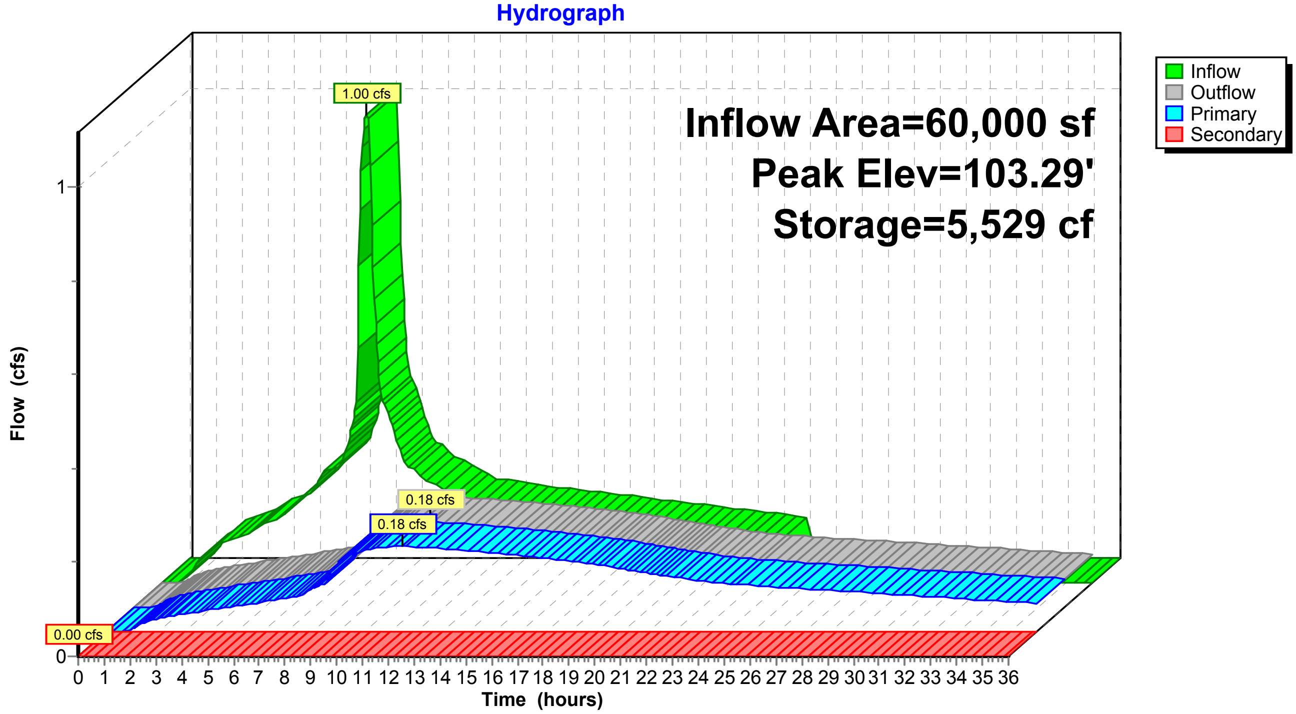
Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	6,283 cf	**48.0" Round CMP_Round 48"** x 5 L= 100.0'

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

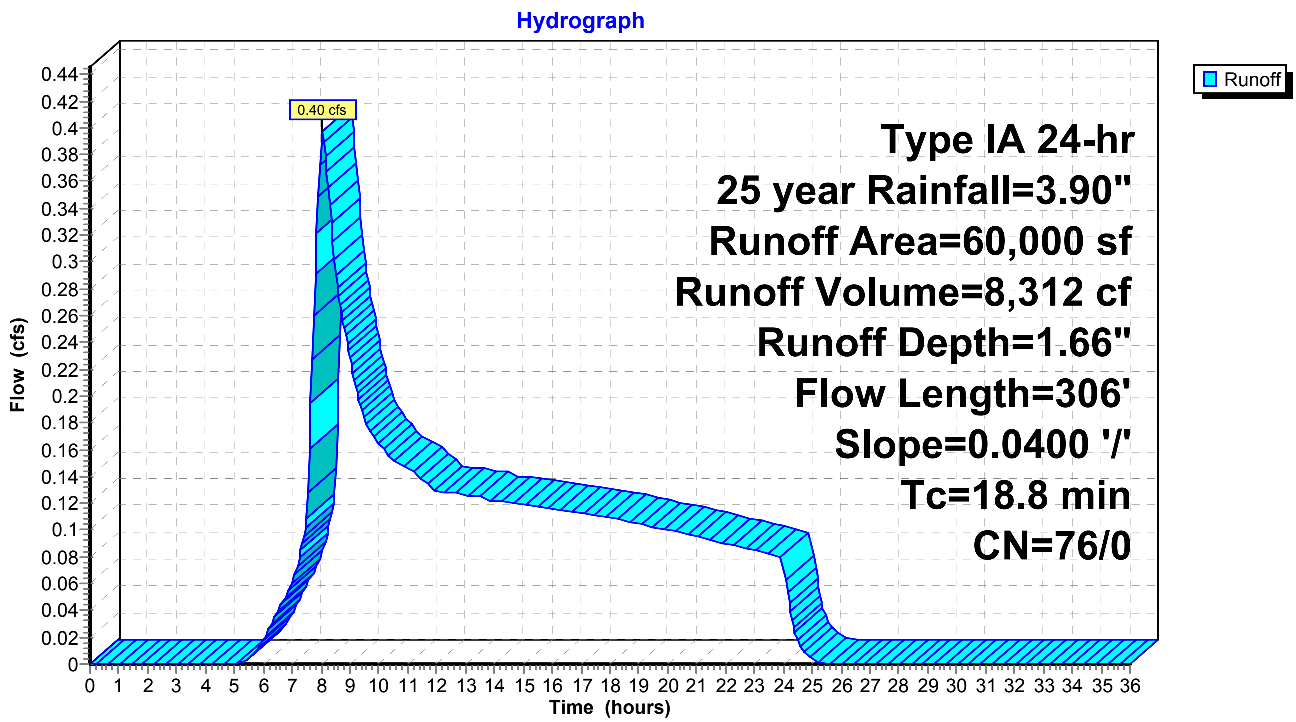
Runoff = 0.40 cfs @ 8.04 hrs, Volume= 8,312 cf, Depth= 1.66"

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

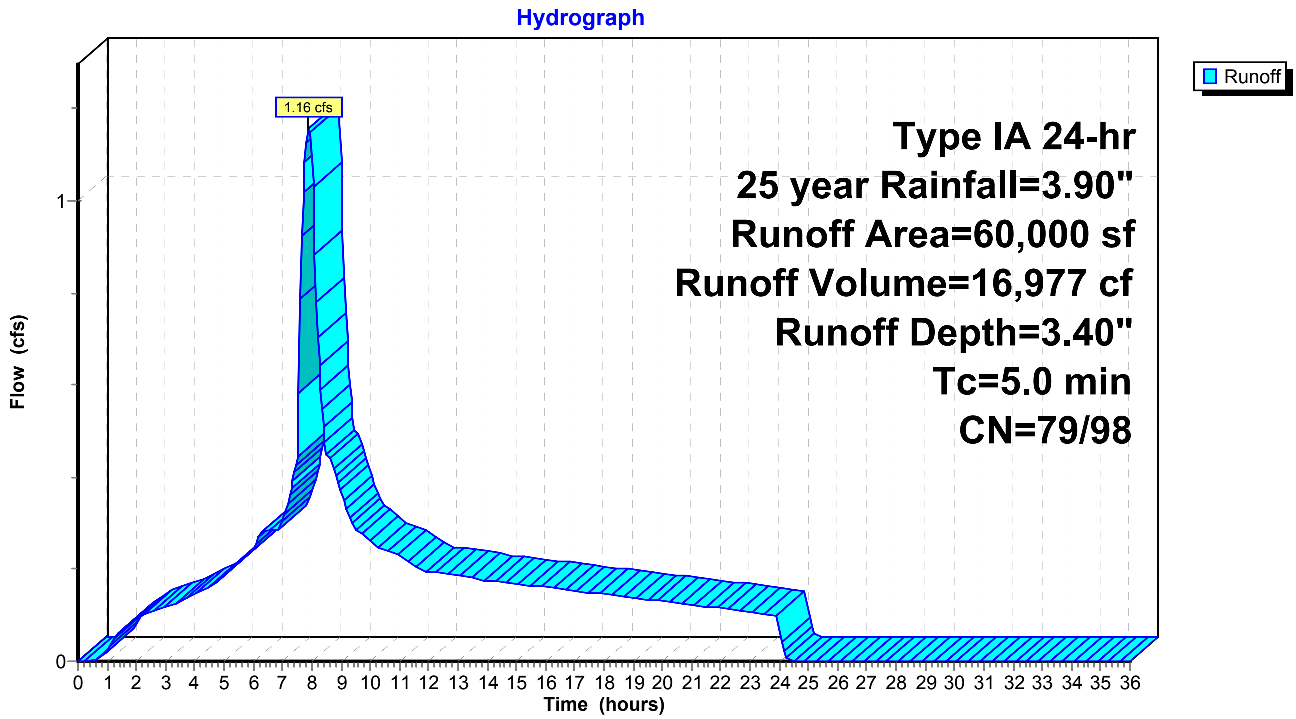
Runoff = 1.16 cfs @ 7.90 hrs, Volume= 16,977 cf, Depth= 3.40"

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)

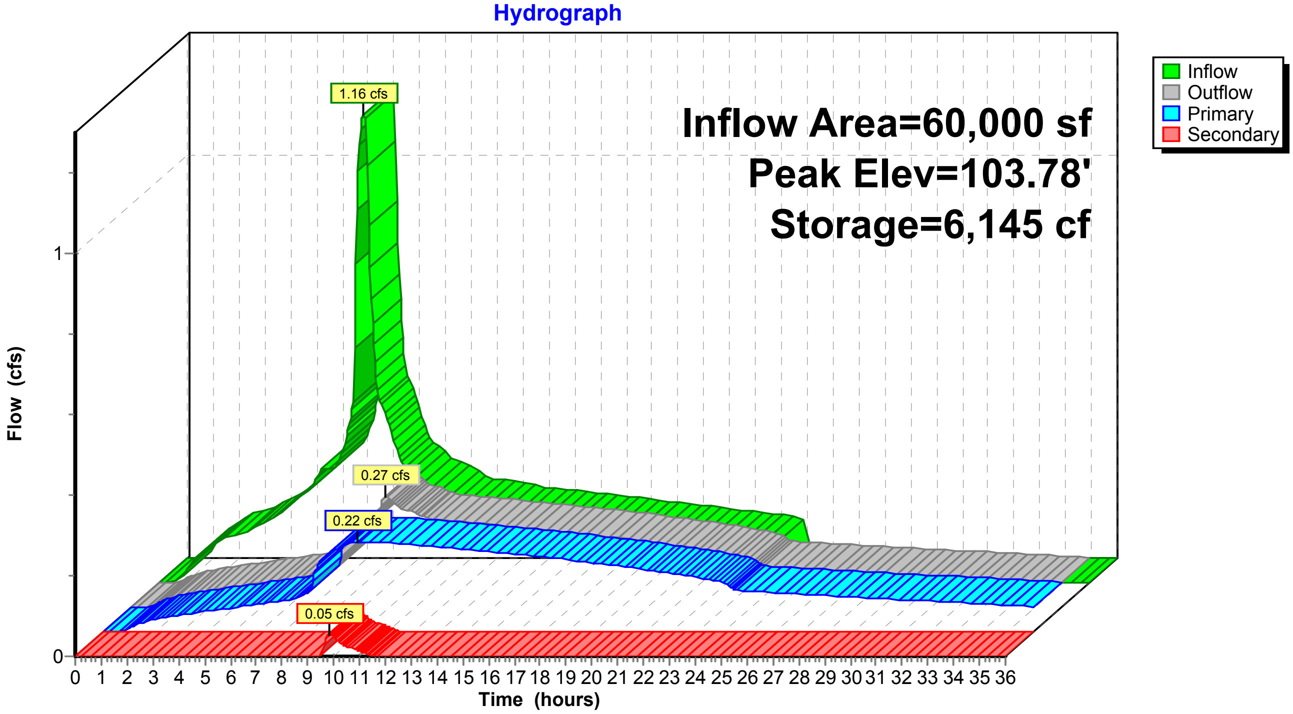
Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	6,283 cf	**48.0" Round CMP_Round 48"** x 5 L= 100.0'

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

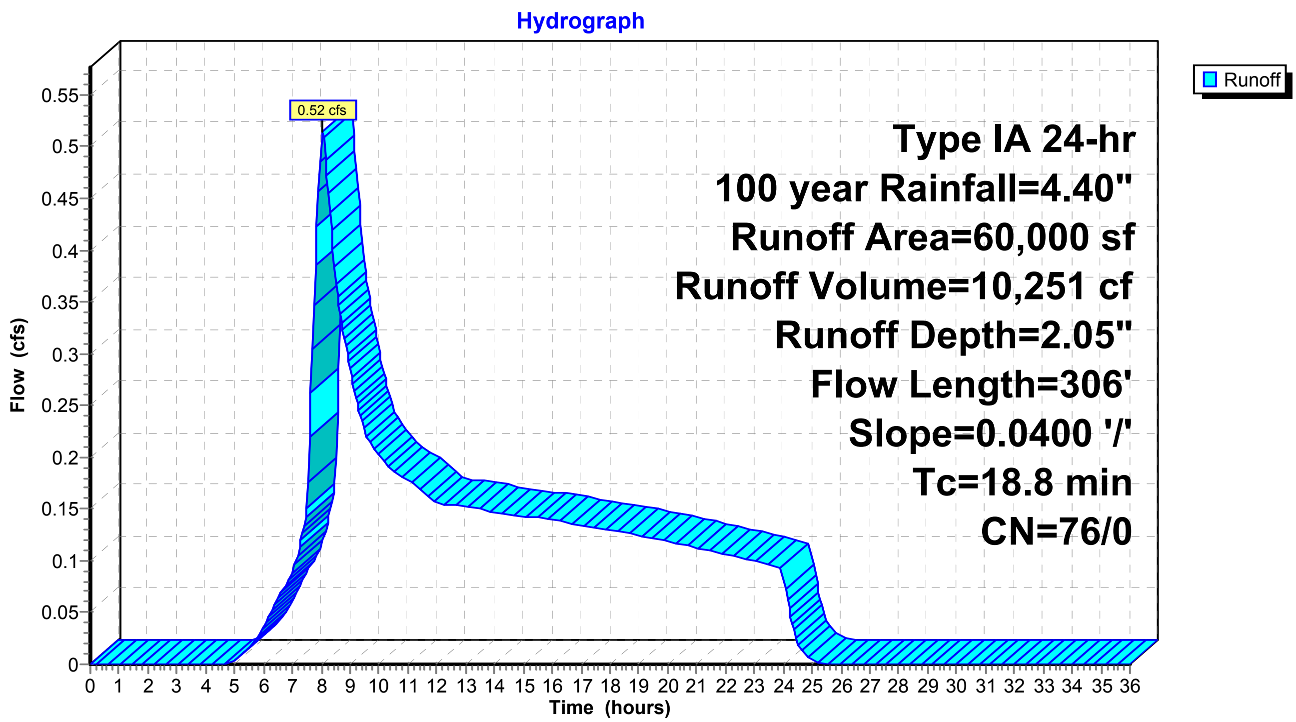
Runoff = 0.52 cfs @ 8.04 hrs, Volume= 10,251 cf, Depth= 2.05"

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

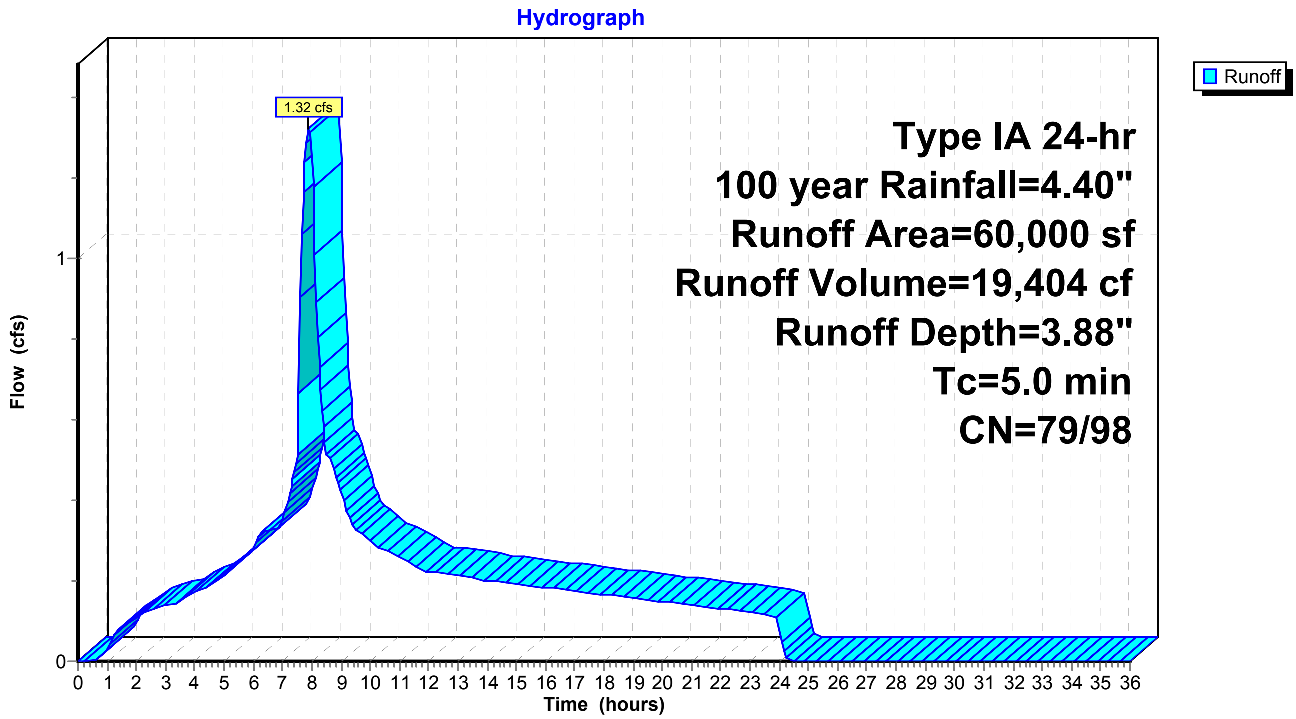
Runoff = 1.32 cfs @ 7.90 hrs, Volume= 19,404 cf, Depth= 3.88"

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

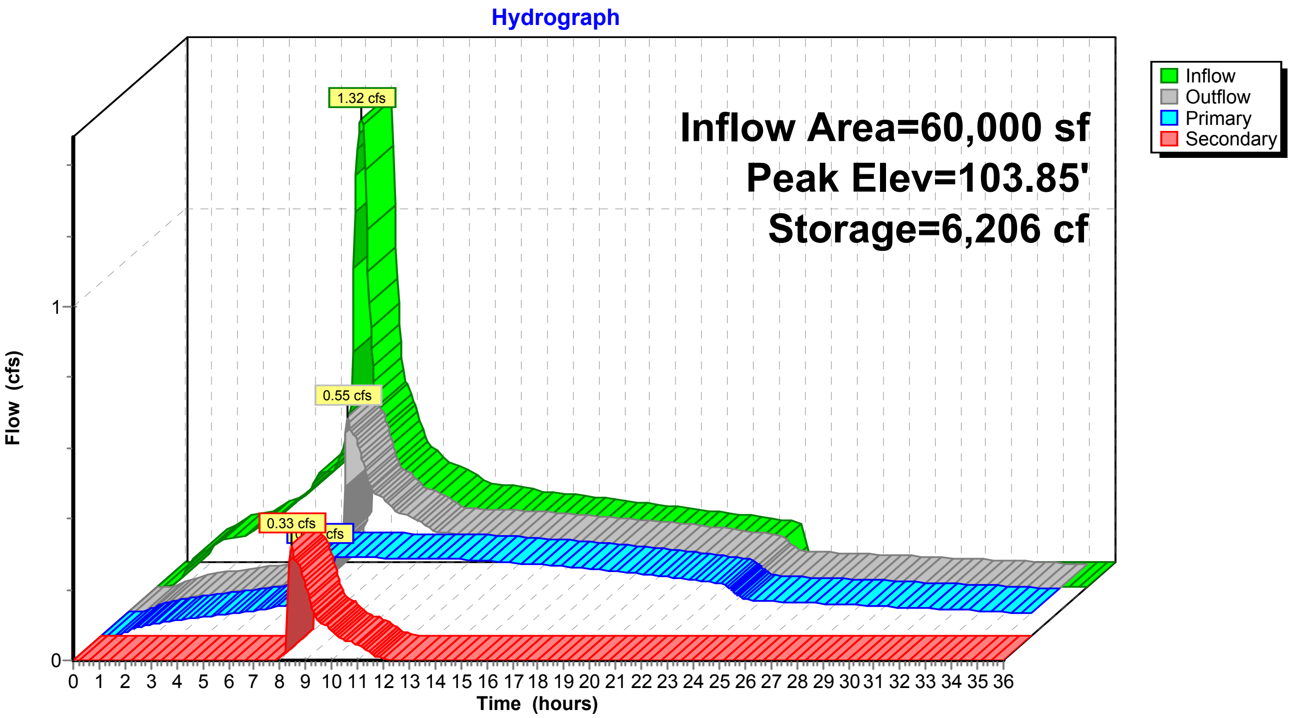


Exhibit H

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

February 13, 2019

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.

Soil Map

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

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

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.

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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