WORK SESSION

AGENDA

WORK SESSION
MILWAUKIE CITY COUNCIL

JUNE 17, 2008

MILWAUKIE CITY HALL
Second Floor Conference Room
10722 SE Main Street

A light dinner will be served.

WORK SESSION – 5:30 p.m.

Discussion Items:

	Time	Topic	Presenter	Page
1.	5:30 p.m.	Harmony Road Transportation Improvement Project Update	Gary Parkin	1
2.	6:00 p.m.	Briefing on the Portland-Milwaukie Light Rail Locally Preferred Alternative (LPA) Process	Kenny Asher	34
3.	6:45 p.m.	Adjourn		

EXECUTIVE SESSION

Executive Session: The Milwaukie City Council may go into Executive Session pursuant to ORS 192.660(2). All discussions are confidential and those present may disclose nothing from the Session. Representatives of the news media are allowed to attend Executive Sessions as provided by ORS 192.660(3) but must not disclose any information discussed. No Executive Session may be held for the purpose of taking any final action or making any final decision. Executive Sessions are closed to the public.

Public Notice

- The Council may vote in work session on non-legislative issues.
- The time listed for each discussion item is approximate. The actual time at which each item is considered may change due to the length of time devoted to the one previous to it.
- For assistance/service per the Americans with Disabilities Act (ADA) please dial TDD (503) 786-7555.
- The Council requests that all pagers and cell phones be either set on silent mode or turned off during the meeting.

CITY OF MILWAUKIE

To: **Mayor and City Council**

Through: **Mike Swanson, City Manager**
Kenneth Asher, Community Development and Public Works Director

From: **Gary Parkin, Director of Engineering**

Subject: **Harmony Road Transportation Improvement Project Update**

Date: **May 27, 2008 for the June 17, 2008 Regular Session**

Action Requested

None. This is an update on the status of the Harmony Road project and is for Information only.

History of Prior Actions and Discussions

January 2, 2008: City Council update, reviewed the Policy Review Committee (PRC) recommendations to not take action on any of the alternatives, instead directing the project team to gather data to allow the PRC to better evaluate new alternatives proposed by the Project Advisory Committee (PAC). Specifically, the team was asked to look at traffic and environmental impacts, business displacements, and whether the new alternatives met the project's purpose and need.

July 17, 2007: City Council updated on the Harmony Road Improvement project status. The project was progressing through its Environmental Impact Study (EIS). The first major step in the EIS was the scoping process. It involved public outreach and agency coordination to provide input on project purpose and need, and determine alternative alignments. The scoping process was completed, and alternatives were presented to the City Council.

Background

Since last meeting to update the City Council on this project, the County's project design team has evaluated the ten alternatives (including no-build) that came out of the

scoping phase and the PAC recommendations from their December 2007 meeting. The ten alternatives are:

#1 No build (it includes the other projects that are anticipated in the region)

#2 Widen 82nd to 7 lanes

#3 Widen 82nd to 7 lanes, omit Sunrise Corridor project, improve the Hwy 224 connection

#4 Widen 82nd to 7 lanes, extend 84th Ave (parallel route to 82nd)

#5 Widen 82nd to 7 lanes, build Harmony road as 3 lane with RR bridge

#6 Build Harmony road with 3 lanes with RR bridge

#7 Build Harmony road with 5 lanes with RR bridge

#8 Build Harmony road with 5 lanes with RR bridge, and Sunnybrook extension from 82nd to Harmony Rd

#9 Build Harmony road with 3 and 5 lanes with RR bridge, and Sunnybrook extension from 82nd to Harmony Rd

#10 Build Harmony road with 3 lanes with RR bridge, and Sunnybrook extension from 82nd to Harmony Rd

The alternatives are described more fully in Attachment 1.

The PRC at their May 14, 2008 meeting gave direction for the project team to continue with six alternatives in the EIS evaluation, alternatives #1,3,4,5,9,and 10. They also directed that the PAC be reconvened to clarify that group's position on the alternatives. That meeting was held June 4, 2008.

Based on input received from the neighborhood, the City's representative on the PRC stated support only for alternatives that did not widen Harmony or add a railroad bridge.

The representative from ODOT stated opposition to any alternative that did not provide non-grade crossing of the rail tracks.

The project is scheduled to complete its EIS by this winter when a locally preferred alternative is identified. Prior to that, the City Council will be asked for concurrence of alternatives to be studied and a draft EIS will be distributed for public and agency stakeholder comment.

Concurrence

This project is incorporated in the Clackamas County Comprehensive Plan. The project is listed as a low priority in the City's recently adopted Transportation System Plan (TSP).

The Linwood NDA supports only looking at options that do not include Harmony Road.

City staff continues to support moving forward with the EIS, looking at the alternatives forwarded from the PAC. There is a traffic problem at the Harmony Road/Linwood intersection (poor level of service, documented in the TSP), which is exacerbated by the proximity of the railroad crossing. The problem is likely to worsen in the future. Further study of possible solutions to the traffic and/or at-grade railroad crossing issues will provide an assessment of the problem and the magnitude of the impacts to solve it.

In addition, the Harmony Road portion of the project would provide for the completion of a Railroad Quiet Zone through the City of Milwaukie, a widely supported community endeavor.

Fiscal Impact

No direct fiscal impacts for City of Milwaukie.

Work Load Impacts

None (no action requested), although the Engineering Director attends regular project management team meetings. The meetings, preparation and miscellaneous project support amount to 15-20 hours per month.

Alternatives

Not applicable at this time as no direction is being sought.

Attachments

1. Material from the PRC meeting- Alternatives Analysis
2. Powerpoint presentation

HARMONY ROAD ALTERNATIVES ANALYSIS

GLOSSARY

LOS
The concept of level-of-service (LOS) has been developed to correlate traffic volume data to subjective descriptions of traffic performance at intersections. Intersections are the controlling bottlenecks of traffic flow, and the ability of a roadway system to carry traffic efficiently is nearly always diminished in their vicinity.

An intersection's LOS is similar to a "report card" rating, based on average vehicle delay. LOS A, B and C indicate conditions where vehicles can move freely. LOS D and E are progressively worse. For signalized intersections, LOS F represents conditions where the average delay for all vehicles through the intersection exceeds 80 seconds per vehicle, generally indicated by long queues and delays. Under this operating condition, delay is highly variable, and it is difficult to estimate average stopped vehicle delay accurately because congestion often extends into adjacent intersection affecting operation.

V/C
The volume to capacity ratio (V/C) is used as a measure of effectiveness for signalized and unsignalized intersection operation. The V/C is calculated by dividing the volume entering the intersection by the total capacity (maximum volume the intersection could serve). The V/C describes the amount of intersection capacity that is utilized by the volume. For example, a 0.85 V/C represents intersection volumes consuming 85% of the available capacity at that intersection. A V/C of 1.0 suggests there is no available capacity at that intersection and not one more vehicle could be accommodated.

Daily Traffic Volumes
The forecasted 2030 daily traffic volumes for the selected roadway sections are based on forecasted 2030 PM peak hour volumes from the Metro travel demand model. Existing PM peak hour traffic volumes were compared to existing daily traffic volumes to estimate the appropriate volume relationship in the study area. Existing traffic count data found the daily traffic volumes were approximately 11 times higher than the PM peak hour. This relationship was assumed to continue in the 2030 forecast year. Therefore, forecasted 2030 PM peak hour volumes were factored by 11 to represent 2030 daily traffic volumes.

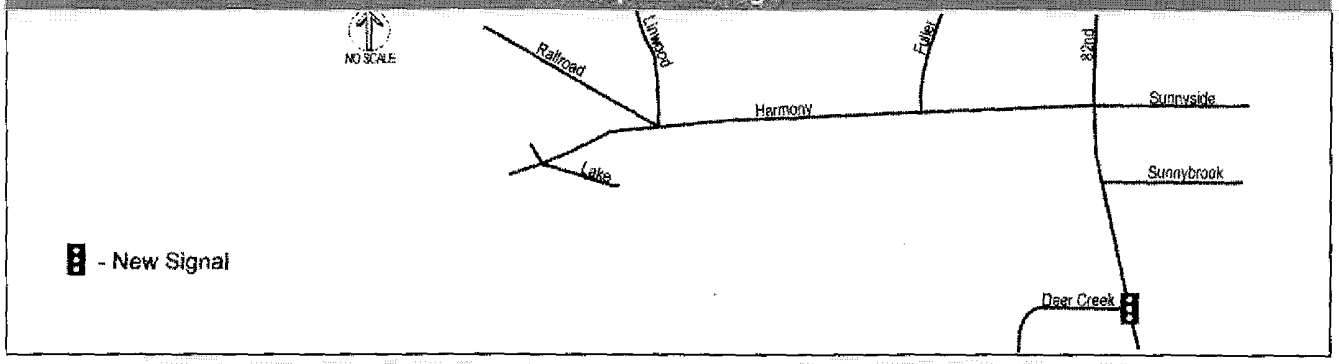
HARMONY ROAD ALTERNATIVES ANALYSIS

ALTERNATIVE 1
2030 No Build

Key Findings

- **The Harmony Road/Linwood Avenue/Railroad Avenue intersection would operate with significant vehicle delay and queues.**
- **The Harmony Road corridor would experience vehicle congestion due to numerous access points and future traffic demands.**
- Mitigation would be required at the Sunnyside Road/82nd Avenue intersection.
- A second northbound left turn lane would be required at the Deer Creek Lane/82nd Avenue intersection.
- Capacity improvements would be needed to accommodate future traffic demands on Highway 224 at Johnson Road.

Conceptual Design



2030 Daily Traffic Volumes (vehicles/day)

Harmony Road west of 82nd Avenue	20,000
Harmony Road west of Fuller Road	23,000
Harmony Road west of Linwood Avenue	18,000
Sunnybrook Blvd west of 82nd Avenue	-
82nd Avenue south of Sunnyside Road	45,000
82nd Avenue south of Sunnybrook Blvd	57,000
Highway 224 west of Johnson Road	44,000

2030 PM Peak Hour Traffic Operations

Intersection	LOS	V/C
Sunnyside Road/82nd Avenue	F E*	1.34 1.00*
Harmony Road/Fuller Road	C	0.90
Sunnybrook Blvd/82nd Avenue	D	1.00
Harmony Road/Linwood Ave	F	1.19
Hwy 224/Johnson Road	F	1.22
Deer Creek Lane/82nd Avenue	E C**	1.20 0.93**

* Add 2nd left turn lane to each approach
** Add 2nd northbound left turn lane

Assumptions

- Assumes all improvement projects identified for the no build scenario.
- The no build scenario includes a seven lane boulevard cross-section on SE 82nd Avenue from Sunnyside to Sunnybrook.
- The no build scenario includes the Sunrise Corridor from I-205 to SE 122nd Avenue. The Sunrise Corridor project includes the Deer Creek Lane extension as a five lane roadway between Hwy 224 and SE 82nd Avenue and a new traffic signal at the Deer Creek Lane/SE 82nd Avenue intersection.

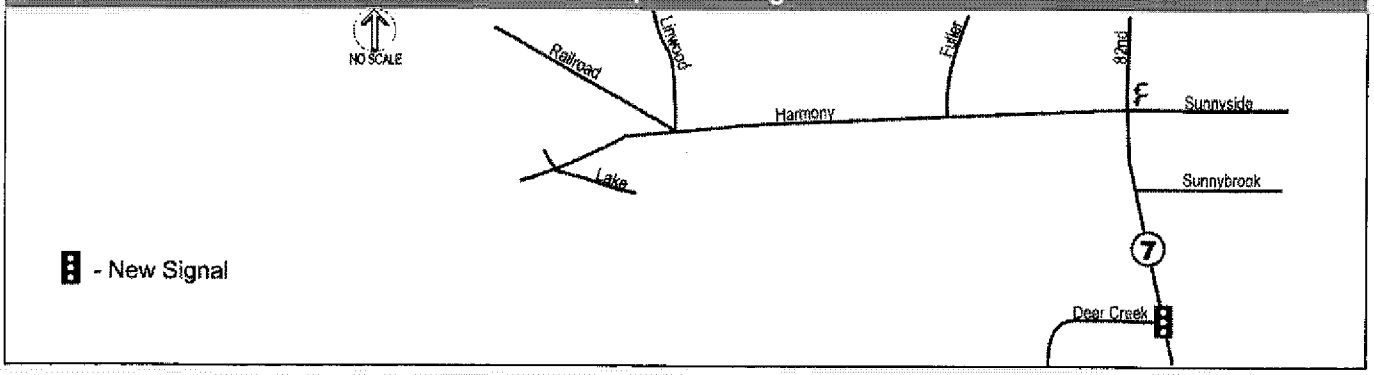
HARMONY ROAD ALTERNATIVES ANALYSIS

ALTERNATIVE 2
2030 No Build + SE 82nd Avenue With 7 Lanes

Key Findings

- **The 7 lane section on 82nd Avenue between Sunnybrook Blvd and Highway 224 and the double westbound left turn lanes at Sunnyside Road/82nd Avenue would not significantly change the travel demand on Harmony Road.**
- The Harmony Road/Linwood Avenue/Railroad Avenue intersection would operate with significant vehicle delay and queues.
- The Harmony Road corridor would experience vehicle congestion due to numerous access points and future traffic demands.
- Additional mitigation would be required at the Sunnyside Road/82nd Avenue intersection.
- Capacity improvements would be needed to accommodate future traffic demands on Highway 224 at Johnson Road.

Conceptual Design



2030 Daily Traffic Volumes (vehicles/day)

Harmony Road west of 82nd Avenue	20,000
Harmony Road west of Fuller Road	23,000
Harmony Road west of Linwood Avenue	18,000
Sunnybrook Blvd west of 82nd Avenue	-
82nd Avenue south of Sunnyside Road	46,000
82nd Avenue south of Sunnybrook Blvd	60,000
Highway 224 west of Johnson Road	44,500

2030 PM Peak Hour Traffic Operations

Intersection	LOS	V/C
Sunnyside Road/82nd Avenue	F E*	1.15 1.04*
Harmony Road/Fuller Road	C	0.88
Sunnybrook Blvd/82nd Avenue	C	0.88
Harmony Road/Linwood Ave	F	1.20
Hwy 224/Johnson Road	E	1.11
Deer Creek Lane/82nd Avenue	D	1.01

* Add 2nd northbound, southbound and eastbound left turn lanes

Assumptions

- Assumes all improvement projects identified for the no build scenario.
- SE 82nd Avenue would be widened to a seven lane cross-section from Sunnybrook to the Highway 224 interchange.
- At the Sunnyside Road/SE 82nd Avenue intersection, the second westbound thru lane would convert to a second westbound left turn lane.

HARMONY ROAD ALTERNATIVES ANALYSIS

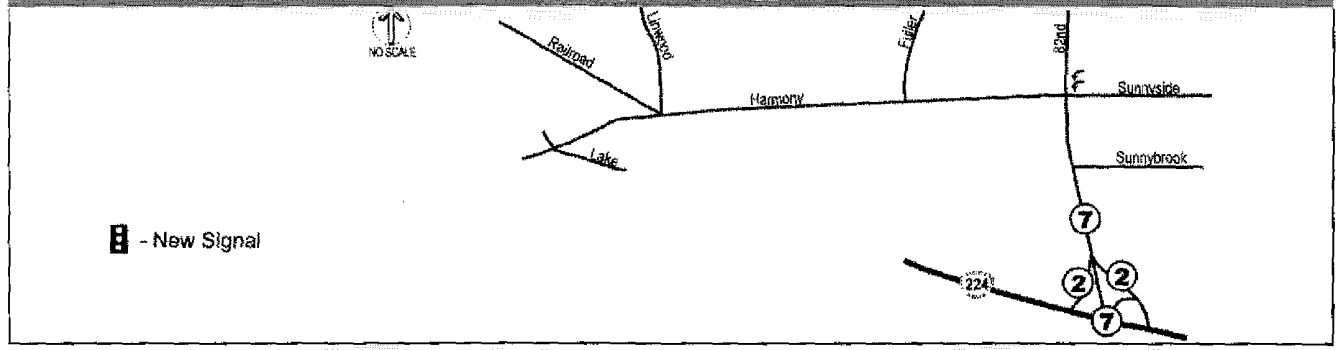
ALTERNATIVE 3

2030 No Build + SE 82nd Avenue With 7 Lanes + Removal of the Sunrise Corridor project+ Improved Connections to Hwy 224

Key Findings

- **The removal of the Sunrise Corridor project would have limited impact on the travel patterns in the study area.**
- **Highway 224 would require a 7 lane section between the between the SE 82nd Avenue ramps.**
- The 7 lane section on 82nd Avenue between Sunnybrook Blvd and Highway 224 and the double westbound left turn lanes at Sunnyside Road/82nd Avenue would not significantly change the travel demand on Harmony Road.
- The Harmony Road/Linwood Avenue/Railroad Avenue intersection would operate with significant vehicle delay and queues.
- The Harmony Road corridor would experience vehicle congestion due to numerous access points and future traffic demands.
- Additional mitigation would be required at the Sunnyside Road/82nd Avenue intersection.
- Capacity improvements would be needed to accommodate future traffic demands on Highway 224 at Johnson Road.

Conceptual Design



2030 Daily Traffic Volumes (vehicles/day)

Harmony Road west of 82nd Avenue	20,000
Harmony Road west of Fuller Road	23,500
Harmony Road west of Linwood Avenue	19,500
Sunnybrook Blvd west of 82nd Avenue	-
82nd Avenue south of Sunnyside Road	43,500
82nd Avenue south of Sunnybrook Blvd	50,000
Highway 224 west of Johnson Road	42,000

2030 PM Peak Hour Traffic Operations

Intersection	LOS	V/C
Sunnyside Road/82nd Avenue	E D*	1.05 0.95*
Harmony Road/Fuller Road	D	0.92
Sunnybrook Blvd/82nd Avenue	C	0.77
Harmony Road/Linwood Ave	F	1.20
Hwy 224/Johnson Road	F	1.27
Hwy 224/82nd Avenue NB Ramp	D	1.02
Hwy 224/82nd Avenue SB Ramp	C	0.98

* Add 2nd northbound, southbound and eastbound left turn lanes.

Assumptions

- Assumes all improvement projects identified for the no build scenario except the Sunrise Corridor project. The Deer Creek Lane extension and the Deer Creek Lane/SE 82nd Avenue traffic signal are not assumed.
- SE 82nd Avenue would be widened to a seven lane cross-section from Sunnybrook to the southbound off-ramp and northbound on-ramp to Highway 224.
- The improved connections to Hwy 224 would widen the SE 82nd Avenue on-ramp and off-ramp to two lanes. SE 82nd Avenue would transition from seven lane north of the ramps to five lanes south of the ramps by dropping the outside southbound lane at the off-ramp and adding the outside northbound lane at the on-ramp.
- At the Sunnyside /SE 82nd intersection, the second westbound thru lane would convert to a second westbound left turn lane.
- Hwy 224 would widen to a seven lane cross-section between the SE 82nd Avenue ramps. The cross-section would include:
  - two left turn lanes and two through lanes in the eastbound direction
  - one left turn lane and two through lanes in the westbound direction
- No sidewalks would be provided on SE 82nd Avenue south of Sunnybrook Boulevard.

HARMONY ROAD ALTERNATIVES ANALYSIS

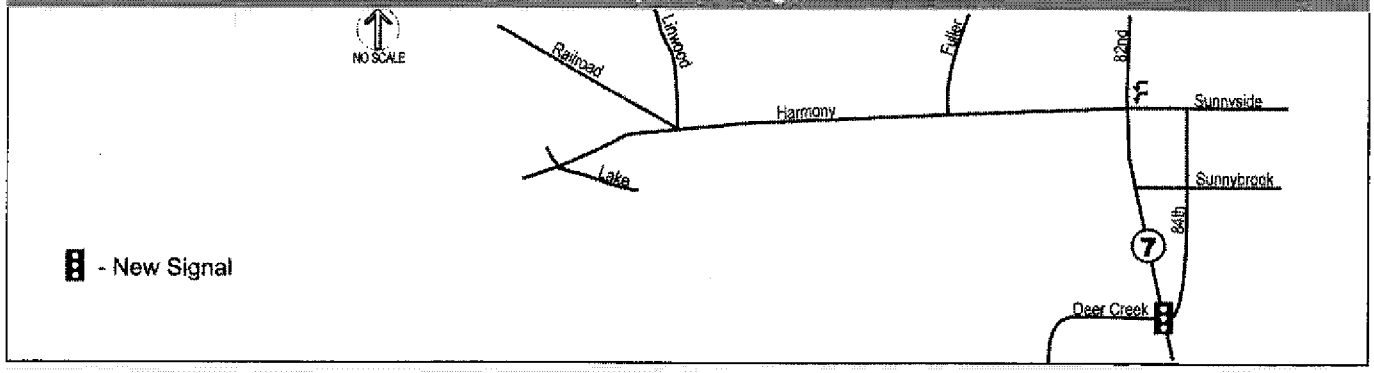
ALTERNATIVE 4

2030 No Build+ SE 82nd Avenue With 7 Lanes + SE 84th Avenue Extension

Key Findings

- **The 84th Avenue extension would not significantly change the travel demand on Harmony Road.**
- **The 84th Avenue extension would have a marginal benefit to traffic operations on 82nd Avenue.**
- The 7 lane section on 82nd Avenue between Sunnybrook Blvd and Highway 224 and the double westbound left turn lanes at Sunnyside Road/82nd Avenue would not significantly change the travel demand on Harmony Road.
- The Harmony Road/Linwood Avenue/Railroad Avenue intersection would operate with significant vehicle delay and queues.
- The Harmony Road corridor would experience vehicle congestion due to numerous access points and future traffic demands.
- Additional mitigation would be required at the Sunnyside Road/82nd Avenue intersection.
- Capacity improvements would be needed to accommodate future traffic demands on Highway 224 at Johnson Road.

Conceptual Design



2030 Daily Traffic Volumes (vehicles/day)

Harmony Road west of 82nd Avenue	20,000
Harmony Road west of Fuller Road	23,000
Harmony Road west of Linwood Avenue	17,500
Sunnybrook Blvd west of 82nd Avenue	-
82nd Avenue south of Sunnyside Road	46,000
82nd Avenue south of Sunnybrook Blvd	52,000
Highway 224 west of Johnson Road	43,000

2030 PM Peak Hour Traffic Operations

Intersection	LOS	V/C
Sunnyside Road/82nd Avenue	F E*	1.17 1.06*
Harmony Road/Fuller Road	C	0.86
Sunnybrook Blvd/82nd Avenue	B	0.72
Harmony Road/Linwood Ave	F	1.19
Hwy 224/Johnson Road	F	1.22
Deer Creek Lane/82nd Avenue	C	0.90

* Add 2nd northbound, southbound and eastbound left turn lanes.

Assumptions

- Assumes all improvement projects identified for the no build scenario.
- SE 82nd Avenue would be widened to a seven lane cross-section from Sunnybrook to the Highway 224 interchange.
- SE 84th Avenue extension would be added. This new roadway would extend from Sunnyside Road to the Deer Creek Lane/SE 82nd Avenue intersection. The SE 84th Avenue extension would be assumed as a three lane collector with a 30 mph speed limit. The alignment of SE 84th Avenue is to be determined.
- Deer Creek Lane would provide a four lane cross-section between SE 82nd Avenue and SE 84th Avenue.
- At the Sunnyside Road/SE 82nd Avenue intersection, the second westbound thru lane would convert to a second westbound left turn lane.

HARMONY ROAD ALTERNATIVES ANALYSIS

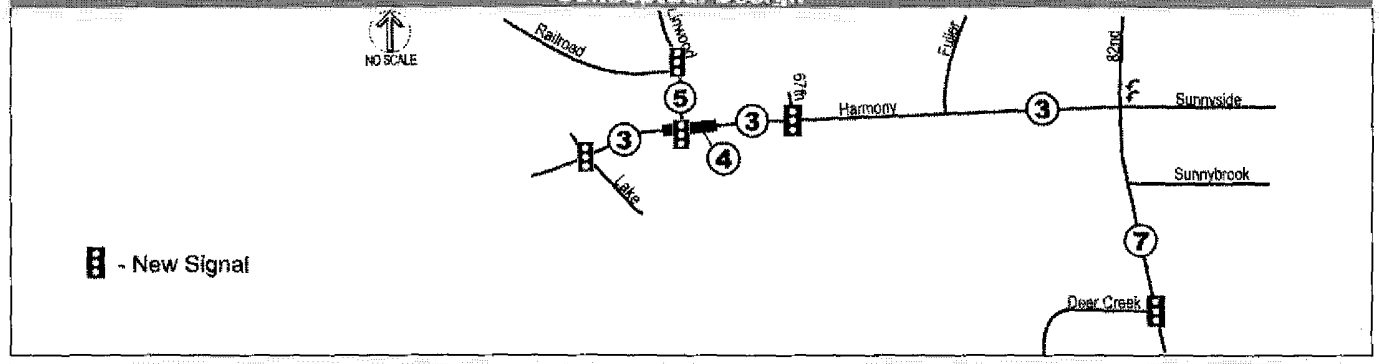
ALTERNATIVE 5

2030 No Build + SE 82nd Avenue With 7 Lanes + Harmony Road With 3 Lanes and Grade-Separated Railroad Crossing

Key Findings

- **Access management measures (such as driveway closure and consolidation) would be necessary on Harmony Road to maintain acceptable traffic flow. Unsignalized access points would experience difficulties due to limited gaps in the traffic stream.**
- The 7 lane section on 82nd Avenue between Sunnybrook Blvd and Highway 224 and the double westbound left turn lanes at Sunnyside Road/82nd Avenue would not significantly change the travel demand on Harmony Road.
- Linwood Avenue would require a 5 lane section between Harmony Road and Railroad Avenue. Harmony Road would require a 4 lane section east of Linwood Avenue.
- Additional mitigation would be required at the Sunnyside Road/82nd Avenue intersection.
- A second northbound left turn lane would be required at the Deer Creek Lane/82nd Avenue intersection.
- Capacity improvements would be needed to accommodate future traffic demands on Highway 224 at Johnson Road.

Conceptual Design



2030 Daily Traffic Volumes (vehicles/day)

Harmony Road west of 82nd Avenue	20,000
Harmony Road west of Fuller Road	23,000
Harmony Road west of Linwood Avenue	20,000
Sunnybrook Blvd west of 82nd Avenue	-
82nd Avenue south of Sunnyside Road	46,000
82nd Avenue south of Sunnybrook Blvd	59,500
Highway 224 west of Johnson Road	43,000

2030 PM Peak Hour Traffic Operations

Intersection	LOS	V/C
Sunnyside Road/82nd Avenue	F E*	1.16 1.05*
Harmony Road/Fuller Road	C	0.89
Sunnybrook Blvd/82nd Avenue	C	0.88
Harmony Road/Linwood Ave	E C**	1.04 0.73**
Hwy 224/SE Johnson Road	F	1.22
Deer Creek Lane/82nd Avenue	C	0.86

* Add 2nd northbound, southbound and eastbound left turn lanes.
** Linwood with five lane section from Harmony to Railroad. Harmony with 4 lane section east of Linwood.

Assumptions

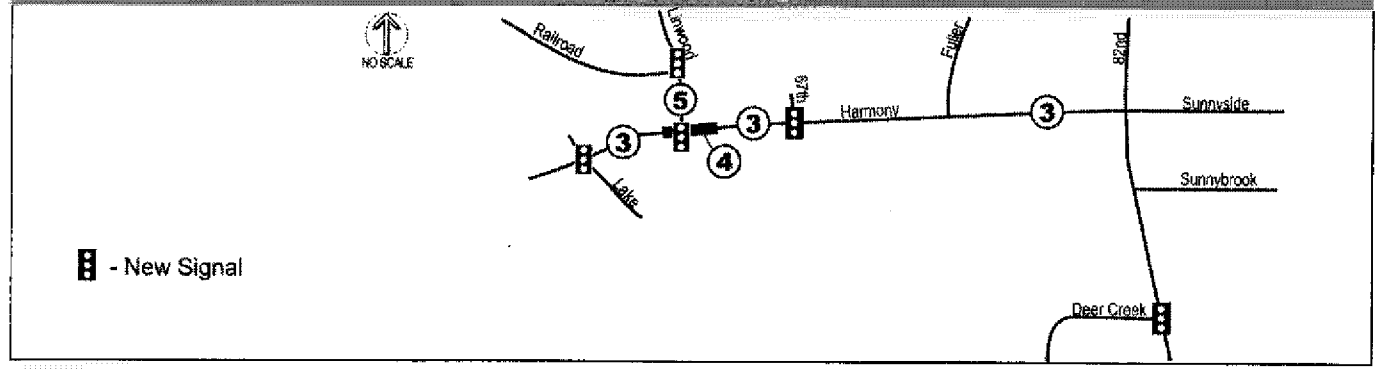
- Assumes all improvement projects identified for the no build scenario.
- SE 82nd Avenue would be widened to a seven lane cross-section from Sunnybrook to the Highway 224 interchange.
- Harmony Road would be widened to a three lane cross-section from Fuller Road to Lake Road/International Way. East of Linwood Avenue, Harmony Road would be four lanes wide to accommodate two southbound left turn lanes from Linwood Avenue.
- At the Sunnyside Road/SE 82nd Avenue intersection, the second westbound thru lane would convert to a second westbound left turn lane.
- A grade-separated railroad crossing would be assumed on Harmony Road at the Linwood Avenue/Railroad Road intersection.
- Linwood Avenue would provide a five lane cross-section between Harmony Road and the realigned Railroad Avenue.
- The Lake Road/International Way/Harmony Road intersection would be relocated to the east to improve access spacing.
- Access to Cedar Crest Drive from Harmony Road would be closed.
- A traffic signal would be provided at the SE 67th Avenue/Harmony Road intersection.

HARMONY ROAD ALTERNATIVES ANALYSIS
ALTERNATIVE 6
2030 No Build + Harmony Road With 3 Lanes and Grade-Separated Railroad Crossing

Key Findings

- **Access management measures (such as driveway closure and consolidation) would be necessary on Harmony Road to maintain acceptable traffic flow. Unsignalized access points would experience difficulties due to limited gaps in the traffic stream.**
- Linwood Avenue would require a 5 lane section between Harmony Road and Railroad Avenue. Harmony Road would require a 4 lane section east of Linwood Avenue.
- Additional mitigation would be required at the Sunnyside Road/82nd Avenue intersection.
- A second northbound left turn lane would be required at the Deer Creek Lane/82nd Avenue intersection.
- Capacity improvements would be needed to accommodate future traffic demands on Highway 224 at Johnson Road.

Conceptual Design



2030 Daily Traffic Volumes (vehicles/day)

Harmony Road west of 82nd Avenue	20,000
Harmony Road west of Fuller Road	24,000
Harmony Road west of Linwood Avenue	20,000
Sunnybrook Blvd west of 82nd Avenue	-
82nd Avenue south of Sunnyside Road	45,000
82nd Avenue south of Sunnybrook Blvd	57,000
Highway 224 west of Johnson Road	43,000

2030 PM Peak Hour Traffic Operations

Intersection	LOS	V/C
Sunnyside Road/82nd Avenue	F D*	1.33 0.95*
Harmony Road/Fuller Road	D	0.93
Sunnybrook Blvd/82nd Avenue	D	0.99
Harmony Road/Linwood Ave	E C***	1.04 0.74***
Hwy 224/SE Johnson Road	F	1.21
Deer Creek Lane/82nd Avenue	D C**	1.05 0.94**

* Add 2nd left turn lane to all approaches.
** Add 2nd northbound left turn lane.
*** Linwood with five lane section from Harmony to Railroad. Harmony with 4 lane section east of Linwood.

Assumptions

- Assumes all improvement projects identified for the no build scenario.
- Harmony Road would be widened to a three lane cross-section from Fuller Road to Lake Road/International Way. East of Linwood Avenue, Harmony Road would be four lanes wide to accommodate two southbound left turn lanes from Linwood Avenue.
- A grade-separated railroad crossing would be assumed on Harmony Road at the Linwood Avenue/Railroad Road intersection.
- Linwood Avenue would provide a five lane cross-section between Harmony Road and the realigned Railroad Avenue.
- The Lake Road/International Way/Harmony Road intersection would be relocated to the east to improve access spacing.
- Access to Cedar Crest Drive from Harmony Road would be closed.
- A traffic signal would be provided at the SE 67th Avenue/Harmony Road intersection.

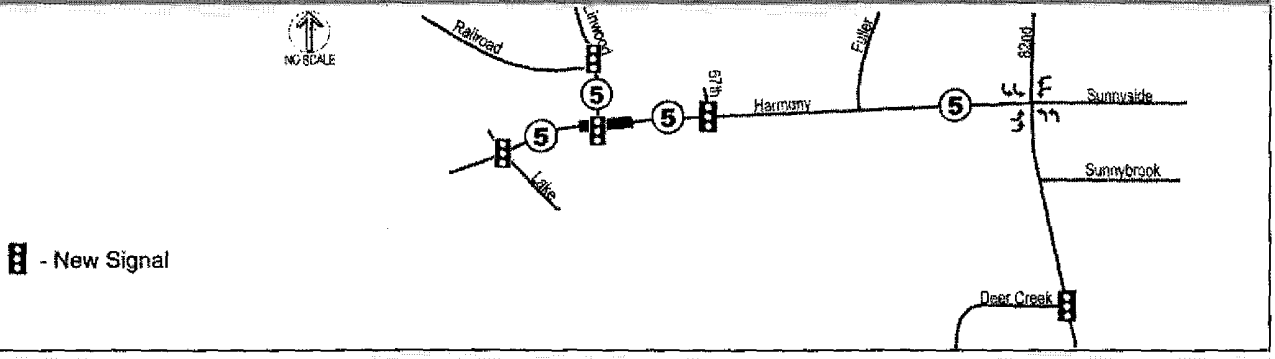
HARMONY ROAD ALTERNATIVES ANALYSIS

ALTERNATIVE 7
2030 No Build + Harmony Road With 5 Lanes and Grade-Separated Railroad Crossing

Key Findings

- **The additional capacity on Harmony Road would increase traffic volumes 2,000 to 3,000 vehicles per day in the year 2030.**
- Linwood Avenue would require a 5 lane section between Harmony Road and Railroad Avenue.
- A second northbound left turn lane would be required at the Deer Creek Lane/82nd Avenue intersection.
- Capacity improvements would be needed to accommodate future traffic demands on Highway 224 at Johnson Road.

Conceptual Design



2030 Daily Traffic Volumes (vehicles/day)

Harmony Road west of 82nd Avenue	22,000
Harmony Road west of Fuller Road	26,000
Harmony Road west of Linwood Avenue	22,500
Sunnybrook Blvd west of 82nd Avenue	-
82nd Avenue south of Sunnyside Road	45,500
82nd Avenue south of Sunnybrook Blvd	56,000
Highway 224 west of Johnson Road	42,000

2030 PM Peak Hour Traffic Operations

Intersection	LOS	V/C
Sunnyside Road/82nd Avenue	E	1.02
Harmony Road/Fuller Road	C	0.71
Sunnybrook Blvd/82nd Avenue	D	0.98
Harmony Road/Linwood Ave	C**	0.67**
Hwy 224/SE Johnson Road	F	1.21
Deer Creek Lane/82nd Avenue	D C*	1.05 0.93*

* Add 2nd northbound left turn lane
** Linwood with five lane section from Harmony to Railroad

Assumptions

- Assumes all improvement projects identified for the no build scenario.
- Harmony Road would be widened to a five lane cross-section with access management measures from SE 82nd Avenue to Lake Road/International Way.
- A grade-separated railroad crossing would be assumed on Harmony Road at the Linwood Avenue/Railroad Road intersection.
- Linwood Avenue would provide a five lane cross-section between Harmony Road and the realigned Railroad Avenue.
- The Lake Road/International Way/Harmony Road intersection would be relocated to the east to improve access spacing.
- Access to Cedar Crest Drive from Harmony Road would be closed.
- At the Sunnyside Road/SE 82nd Avenue intersection, all approaches would have double left turn lanes.
- A traffic signal would be provided at the SE 67th Avenue/Harmony Road intersection.

HARMONY ROAD ALTERNATIVES ANALYSIS

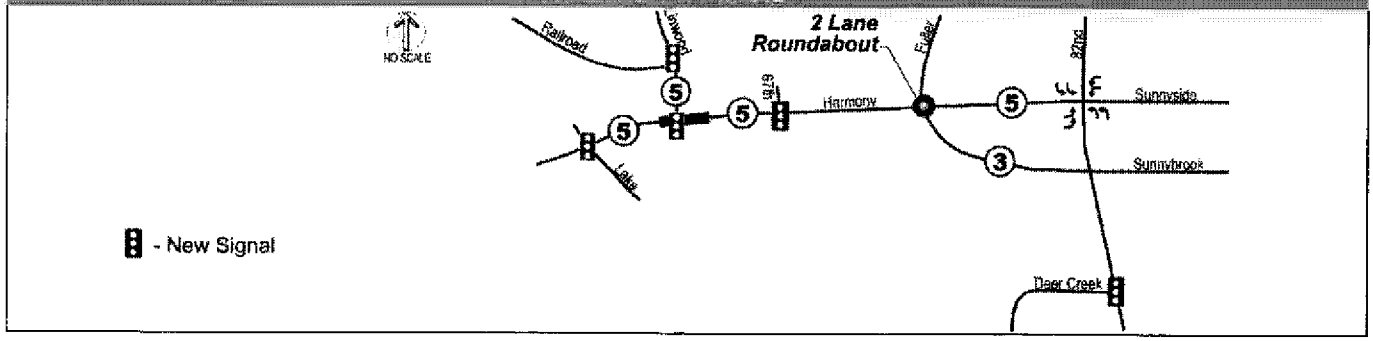
ALTERNATIVE 8

2030 No Build + Harmony Road With 5 Lanes + Sunnybrook Extension With 3 Lanes and Grade-Separated Railroad Crossing

Key Findings

- **Five lane Harmony Road between 82nd Ave and Fuller Rd would not be required with the Sunnybrook extension.**
- The additional capacity on Harmony Road would increase traffic volumes 2,000 to 3,000 vehicles per day in the year 2030.
- Linwood Avenue would require a 5 lane section between Harmony Road and Railroad Avenue.
- Additional analysis or mitigation would be needed at the Sunnybrook Boulevard/82nd Avenue intersection.
- A second northbound left turn lane would be required at the Deer Creek Lane/82nd Avenue intersection.
- Capacity improvements would be needed to accommodate future traffic demands on Highway 224 at Johnson Road.

Conceptual Design



2030 Daily Traffic Volumes (vehicles/day)

Harmony Road west of 82nd Avenue	15,000
Harmony Road west of Fuller Road	29,500
Harmony Road west of Linwood Avenue	24,500
Sunnybrook Blvd west of 82nd Avenue	15,000
82nd Avenue south of Sunnyside Road	41,000
82nd Avenue south of Sunnybrook Blvd	56,500
Highway 224 west of Johnson Road	42,000

2030 PM Peak Hour Traffic Operations

Intersection	LOS	V/C
Sunnyside Road/82nd Avenue	D	0.94
Harmony Road/Fuller Road	C	-
Sunnybrook Blvd/82nd Avenue	F E*	1.55 1.10*
Harmony Road/Linwood Ave	C***	0.74***
Hwy 224/SE Johnson Road	F	1.22
Deer Creek Lane/82nd Avenue	D C**	1.07 0.94**

* Add 2nd eastbound through lane and 2nd westbound left turn lane
** Add 2nd northbound left turn lane
*** Linwood with five lane section from Harmony to Railroad

Assumptions

- Assumes all improvement projects identified for the no build scenario.
- Harmony Road would be widened to a five lane cross-section with access management measures from SE 82nd Avenue to Fuller Road.
- Harmony Road would be widened to a five lane cross-section with access management measures from Fuller Road to Lake Road/International Way.
- A grade-separated railroad crossing would be assumed on Harmony Road at the Linwood Avenue/Railroad Road intersection.
- Linwood Avenue would provide a five lane cross-section between Harmony Road and the realigned Railroad Avenue.
- The Sunnybrook extension would be added from Fuller Road/Harmony Road to Sunnybrook Blvd/SE 82nd Avenue. The Sunnybrook extension would be assumed as a three lane collector with a 35 mph speed limit.
- The Sunnybrook Boulevard/Fuller Road/Harmony Road intersection would be controlled by a two-lane roundabout.
- The Lake Road/International Way/Harmony Road intersection would be relocated to the east to improve access spacing.
- Access to Cedar Crest Drive from Harmony Road would be closed.
- At the Sunnyside Road/SE 82nd Avenue intersection, all approaches would have double left turn lanes.
- A traffic signal would be provided at the SE 67th Avenue/Harmony Road intersection.

HARMONY ROAD ALTERNATIVES ANALYSIS

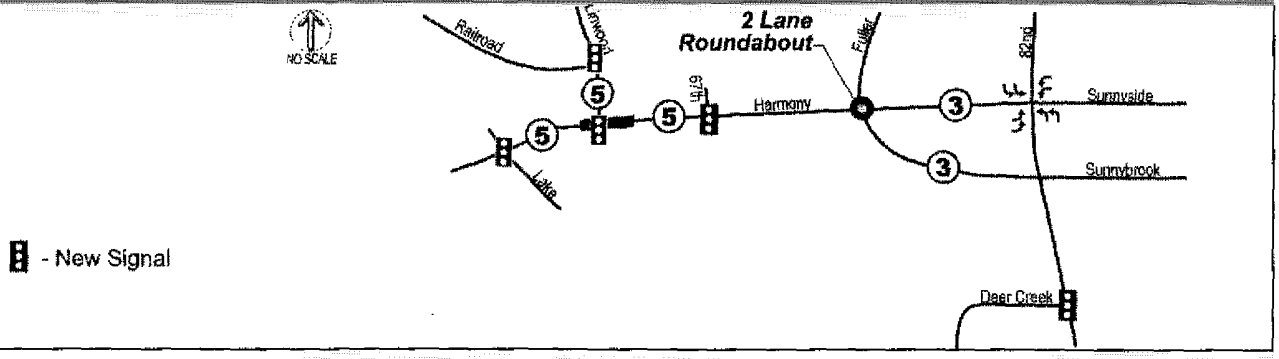
ALTERNATIVE 9

2030 No Build + Harmony Road With 3/5 Lanes + Sunnybrook Extension With 3 Lanes and Grade-Separated Railroad Crossing

Key Findings

- Access management measures (driveway closure/consolidation) would be needed on the Harmony Road 3 lane section to maintain acceptable traffic flow. Unsignalized access points would experience difficulties due to limited gaps in the traffic stream.
- Linwood Avenue would require a 5 lane section between Harmony Road and Railroad Avenue.
- Additional analysis or mitigation would be needed at the Sunnybrook Boulevard/82nd Avenue intersection.
- A second northbound left turn lane would be required at the Deer Creek Lane/82nd Avenue intersection.
- Capacity improvements would be needed to accommodate future traffic demands on Highway 224 at Johnson Road.

Conceptual Design



2030 Daily Traffic Volumes (vehicles/day)

Harmony Road west of 82nd Avenue	13,000
Harmony Road west of Fuller Road	29,000
Harmony Road west of Linwood Avenue	24,000
Sunnybrook Blvd west of 82nd Avenue	16,000
82nd Avenue south of Sunnyside Road	40,000
82nd Avenue south of Sunnybrook Blvd	56,000
Highway 224 west of Johnson Road	42,000

2030 PM Peak Hour Traffic Operations

Intersection	LOS	V/C
Sunnyside Road/82nd Avenue	D	0.94
Harmony Road/Fuller Road	C	-
Sunnybrook Blvd/82nd Avenue	F E*	1.55 1.10*
Harmony Road/Linwood Ave	C***	0.74***
Hwy 224/SE Johnson Road	F	1.22
Deer Creek Lane/82nd Avenue	D C**	1.07 0.94**

* Add 2nd eastbound through lane and second westbound left turn lane
** Add 2nd northbound left turn lane
*** Linwood with five lane section from Harmony to Railroad

Assumptions

- Assumes all improvement projects identified for the no build scenario.
- Harmony Road would be widened to a three lane cross-section from SE 82nd Avenue to Fuller Road.
- Harmony Road would be widened to a five lane cross-section with access management measures from Fuller Road to Lake Road/International Way.
- A grade-separated railroad crossing would be assumed on Harmony Road at the Linwood Avenue/Railroad Road intersection.
- Linwood Avenue would provide a five lane cross-section between Harmony Road and the realigned Railroad Avenue.
- The Sunnybrook extension would be added from Fuller Road/Harmony Road to Sunnybrook Blvd/SE 82nd Avenue. The Sunnybrook extension would be assumed as a three lane collector with a 35 mph speed limit.
- The Sunnybrook Boulevard/Fuller Road/Harmony Road intersection would be controlled by a two-lane roundabout.
- The Lake Road/International Way/Harmony Road intersection would be relocated to the east to improve access spacing.
- Access to Cedar Crest Drive from Harmony Road would be closed.
- At the Sunnyside Road/SE 82nd Avenue intersection, all approaches would have double left turn lanes.
- A traffic signal would be provided at the SE 67th Avenue/Harmony Road intersection.

HARMONY ROAD ALTERNATIVES ANALYSIS

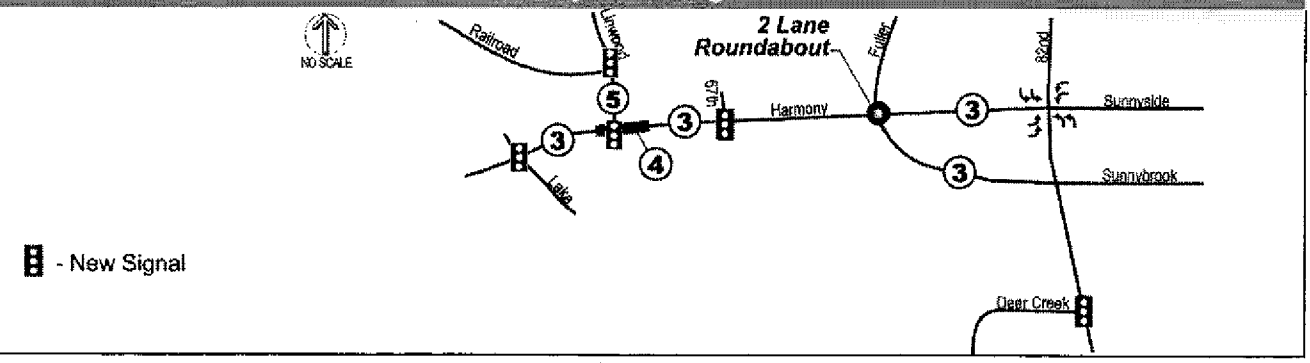
ALTERNATIVE 10

2030 No Build + Harmony Road With 3 Lanes + Sunnybrook Extension With 3 Lanes and Grade-Separated Railroad Crossing

Key Findings

- Access management measures (driveway closure/consolidation) would be necessary on Harmony Road to maintain acceptable traffic flow. Unsignalized access points would experience difficulties due to limited gaps in the traffic stream.
- Linwood Avenue would require a 5 lane section between Harmony Road and Railroad Avenue. Harmony Road would require a 4 lane section east of Linwood Avenue.
- Additional analysis or mitigation would be needed at the Sunnybrook Boulevard/82nd Avenue intersection.
- A second northbound left turn lane would be required at the Deer Creek Lane/82nd Avenue intersection.
- Capacity improvements would be needed to accommodate future traffic demands on Highway 224 at Johnson Road.

Conceptual Design



2030 Daily Traffic Volumes (vehicles/day)

Harmony Road west of 82nd Avenue	14,500
Harmony `Road west of Fuller Road	26,000
Harmony Road west of Linwood Avenue	20,000
Sunnybrook Blvd west of 82nd Avenue	12,500
82nd Avenue south of Sunnyside Road	41,000
82nd Avenue south of Sunnybrook Blvd	57,000
Highway 224 west of Johnson Road	42,000

2030 PM Peak Hour Traffic Operations

Intersection	LOS	V/C
Sunnyside Road/82nd Avenue	D	0.95
Harmony Road/Fuller Road	C	-
Sunnybrook Blvd/82nd Avenue	F E*	1.45 1.04*
Harmony Road/Linwood Ave	E C***	1.12 0.74***
Hwy 224/SE Johnson Road	F	1.21
Deer Creek Lane/82nd Avenue	D C**	1.07 0.95**

* Add 2nd eastbound through lane and second westbound left turn lane
** Add 2nd northbound left turn lane
*** Linwood with five lane section from Harmony to Railroad. Harmony with 4 lane section east of Linwood.

Assumptions

- Assumes all improvement projects identified for the no build scenario.
- Harmony Road would be widened to a three lane cross-section from SE 82nd Avenue to Fuller Road.
- Harmony Road would be widened to a three lane cross-section from Fuller Road to Lake Road/International Way. East of Linwood Avenue, Harmony Road would be four lanes wide to accommodate two southbound left turn lanes from Linwood Ave.
- A grade-separated railroad crossing would be assumed on Harmony Road at the Linwood Avenue/Railroad Road intersection.
- Linwood Avenue would provide a five lane cross-section between Harmony Road and the realigned Railroad Avenue.
- The Sunnybrook extension would be added from Fuller Road/Harmony Road to Sunnybrook Blvd/SE 82nd Avenue. The Sunnybrook extension would be assumed as a three lane collector with a 35 mph speed limit.
- The Sunnybrook Boulevard/Fuller Road/Harmony Road intersection would be controlled by a two-lane roundabout.
- The Lake Road/International Way/Harmony Road intersection would be relocated to the east to improve access spacing.
- Access to Cedar Crest Drive from Harmony Road would be closed.
- At the Sunnyside Road/SE 82nd Avenue intersection, all approaches would have double left turn lanes.
- A traffic signal would be provided at the SE 67th Avenue/Harmony Road intersection.

GLOSSARY

LOS
The concept of level-of-service (LOS) has been developed to correlate traffic volume data to subjective descriptions of traffic performance at intersections. Intersections are the controlling bottlenecks of traffic flow, and the ability of a roadway system to carry traffic efficiently is nearly always diminished in their vicinity.

An intersection's LOS is similar to a "report card" rating, based on average vehicle delay. LOS A, B and C indicate conditions where vehicles can move freely. LOS D and E are progressively worse. For signalized intersections, LOS F represents conditions where the average delay for all vehicles through the intersection exceeds 80 seconds per vehicle, generally indicated by long queues and delays. Under this operating condition, delay is highly variable, and it is difficult to estimate average stopped vehicle delay accurately because congestion often extends into adjacent intersection affecting operation.

V/C
The volume to capacity ratio (V/C) is used as a measure of effectiveness for signalized and unsignalized intersection operation. The V/C is calculated by dividing the volume entering the intersection by the total capacity (maximum volume the intersection could serve). The V/C describes the amount of intersection capacity that is utilized by the volume. For example, a 0.85 V/C represents intersection volumes consuming 85% of the available capacity at that intersection. A V/C of 1.0 suggests there is no available capacity at that intersection and not one more vehicle could be accommodated.

Daily Traffic Volumes
The forecasted 2030 daily traffic volumes for the selected roadway sections are based on forecasted 2030 PM peak hour volumes from the Metro travel demand model. Existing PM peak hour traffic volumes were compared to existing daily traffic volumes to estimate the appropriate volume relationship in the study area. Existing traffic count data found the daily traffic volumes were approximately 11 times higher than the PM peak hour. This relationship was assumed to continue in the 2030 forecast year. Therefore, forecasted 2030 PM peak hour volumes were factored by 11 to represent 2030 daily traffic volumes.

Harmony Road Area Transportation Improvements

City Of Milwaukie City Council Work Session
June 17, 2008
From material presented to the
Project Advisory Committee on
June 4, 2008

U.S. Department of Transportation
Federal Highway Administration

OREGON DEPARTMENT OF TRANSPORTATION

CLACKAMAS COUNTY

Alternative 1

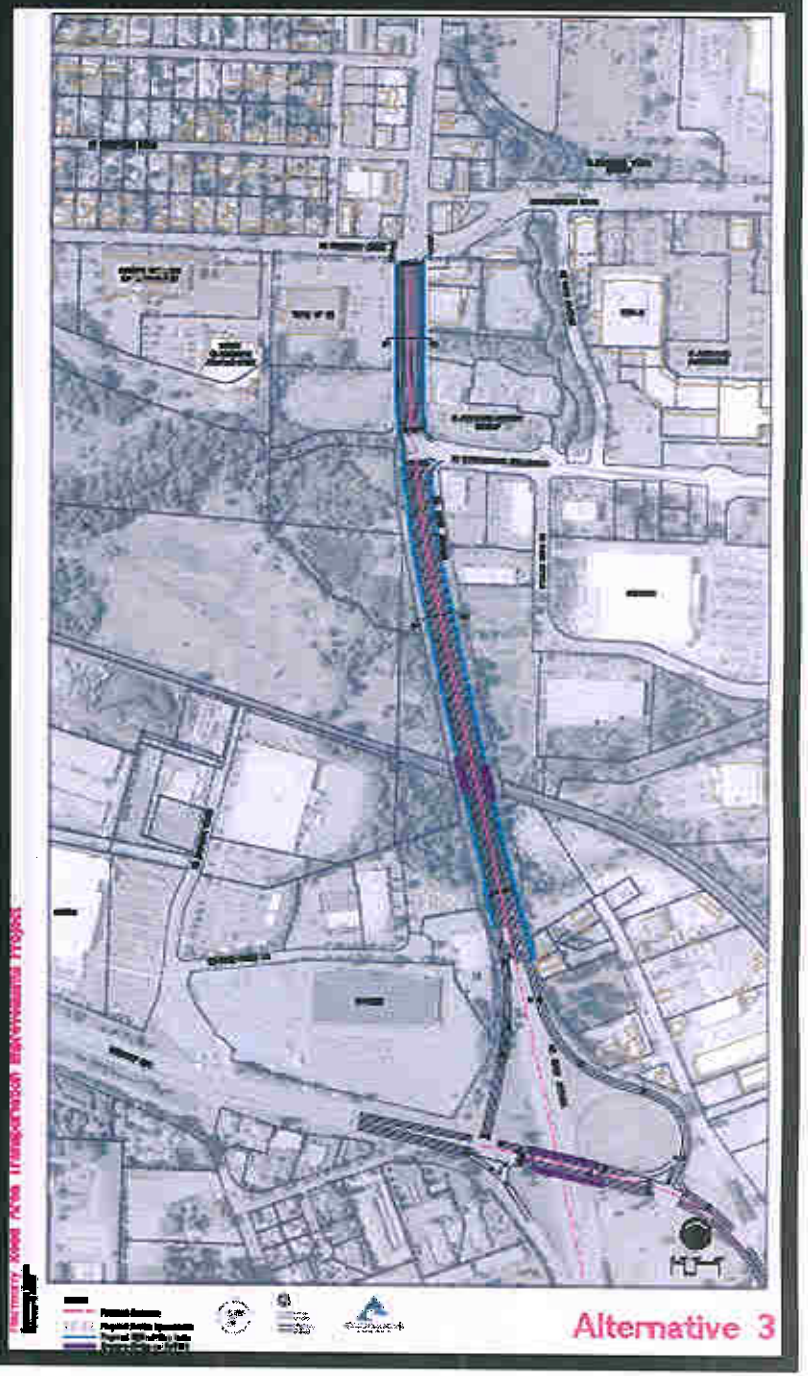
- 2030 No-Build
- Planned financially constrained projects in study area, including:
  - 82nd Ave expansion – Sunnyside to Sunnybrook
  - Sunrise Project
  - Fuller Rd reconstruction
  - Railroad Ave bike/ped improvements
  - Lake Rd improvements
  - Sunnyside Rd bike lanes
  - 82nd Ave boulevard – Causey to Sunnyside
  - 37th Ave bike/ped improvements
  - Webster Rd / Lake Rd intersection

Alternative 1 Findings

- Traffic –
  - Increased congestion (compared with today) with significant vehicle queues and delays
  - 23,000 ADT on Harmony (west of Fuller)
- Environment –
  - Lower impact potential for displacements, natural resources, & hazardous materials

Alternative 3

- Includes: 2030 No-Build + 82nd Ave 7 Lanes + Removal of Sunrise Project + Improved Connection to Hwy 224



Alternative 3 Findings

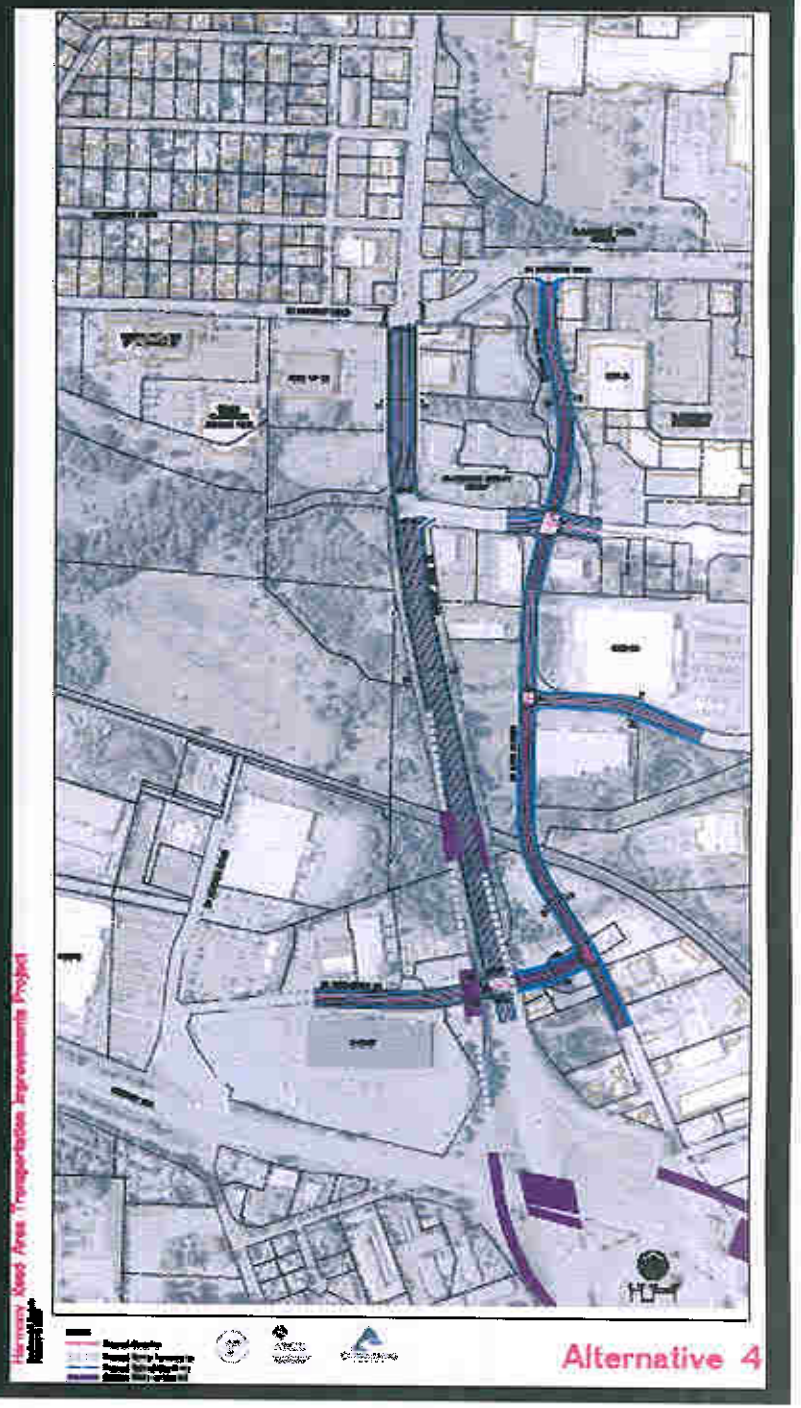
- Traffic –
  - Would not significantly change travel demand on Harmony Rd
  - Harmony Rd would remain congested
  - 23,500 ADT on Harmony (west of Fuller)

Alternative 3 Findings

- Environment –
  - Lower displacement potential
  - Potential wetland and waterway impacts are higher with 82nd Ave expansion
  - Lower impact to trees
  - Hazardous materials concerns
    - Retaining wall and bridge foundations resulting in possible disturbance of contaminated soils and groundwater adjacent to 82nd

Alternative 4

- Includes: 2030 No-Build + 82nd Ave 7 Lanes + 84th Ave Extension



Alternative 4 Findings

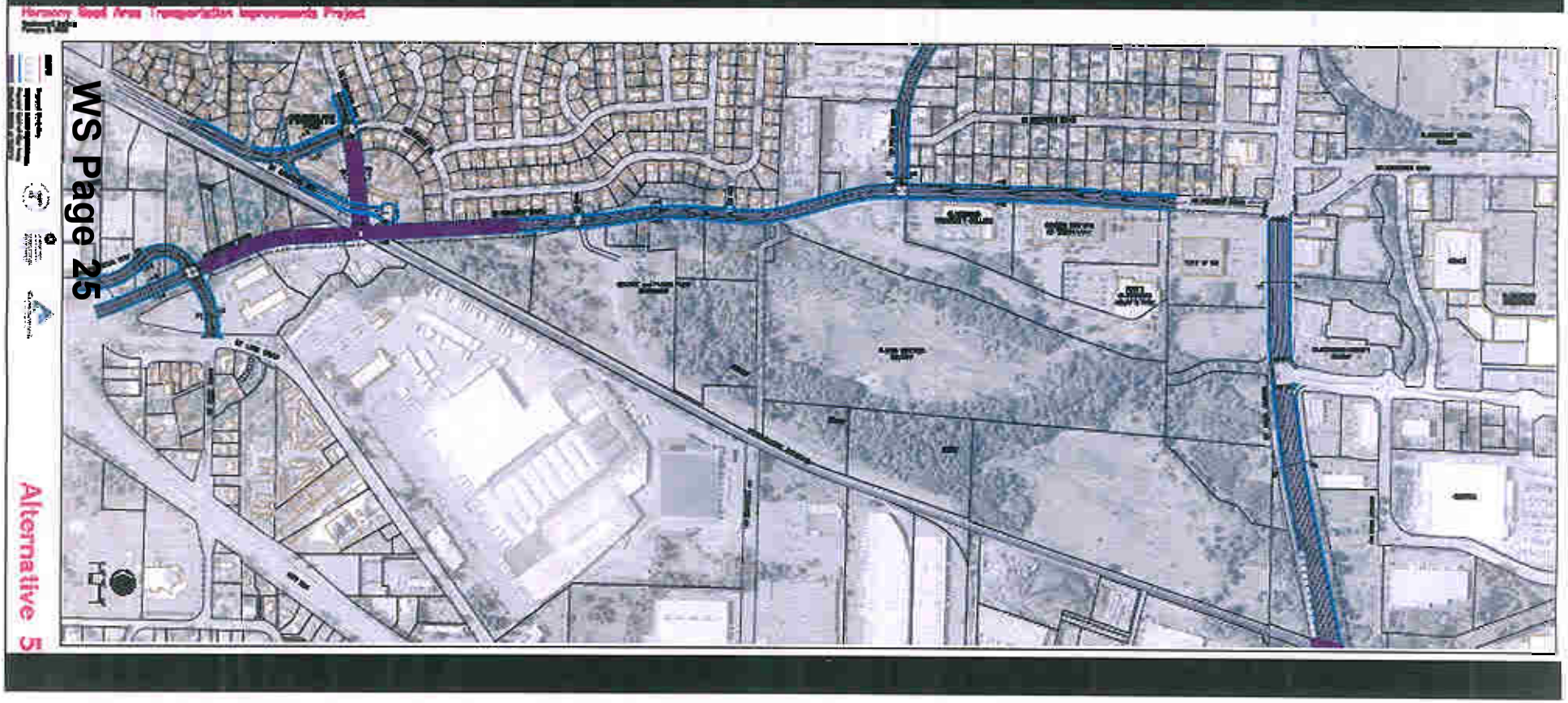
- Traffic –
  - Would not significantly change travel demand on Harmony Rd
  - Harmony Rd would remain congested
  - 84th Ave extension would have marginal benefit to 82nd Ave
  - 23,000 ADT on Harmony (west of Fuller)

Alternative 4 Findings

- Environment –
  - Additional displacement/access impacts compared to Alt 3
  - Potential wetland and waterway impacts are highest
  - Moderate tree impacts
  - Higher hazardous materials concerns
    - Retaining walls and structures with deep foundations could disturb contaminated soil near Clackamas County Sheriff's facility
    - Possible disturbance of contaminated soils and groundwater adjacent to 82nd

Alternative 5

- Includes: 2030 No-Build + 82nd Ave 7 Lanes + Harmony Rd 3 Lanes & Grade-Separated RR Crossing



Alternative 5 Findings

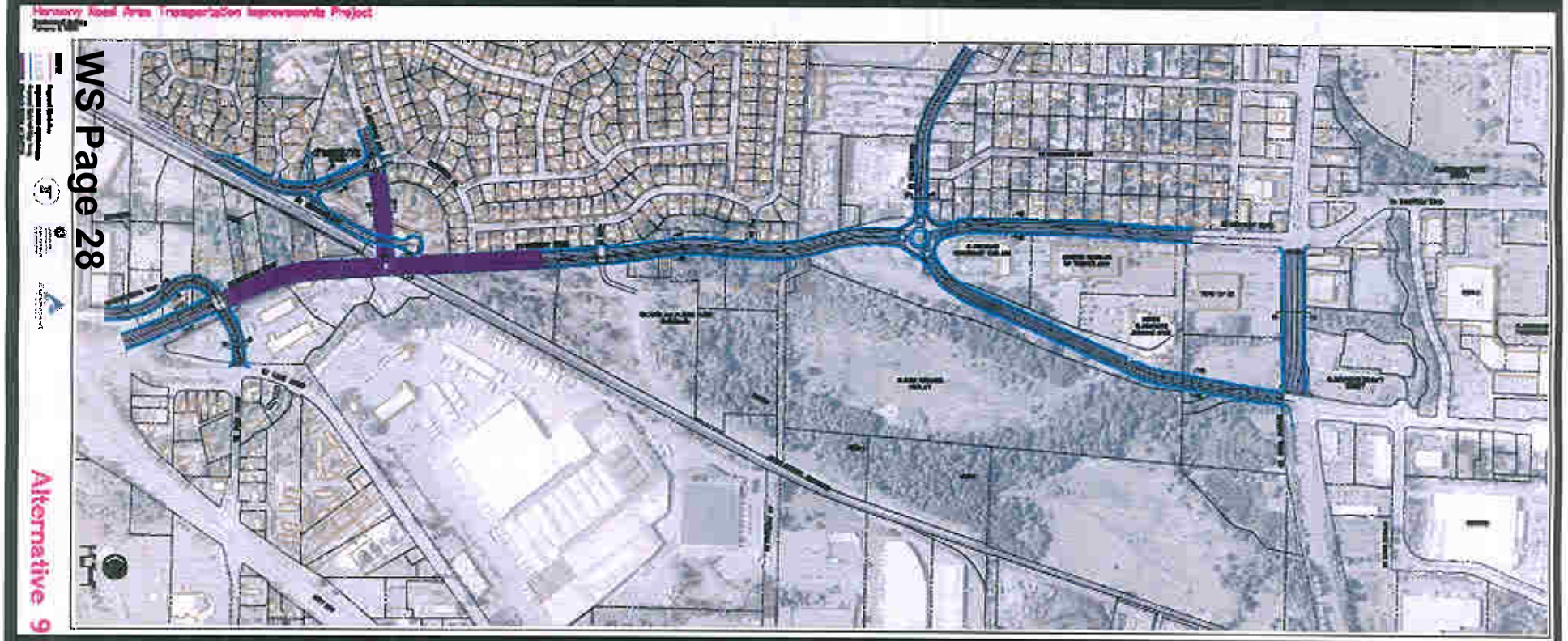
- Traffic –
  - Improved operations at Harmony/Linwood intersection
  - Travel demand on Harmony not significantly changed with 82nd Ave expansion
  - 23,000 ADT on Harmony
  - Harmony Rd east of Linwood needs to be 4 lanes
  - Access management necessary for improved safety/traffic operations

Alternative 5 Findings

- Environment –
  - Higher potential displacements with expansion of Harmony Rd
  - Higher potential wetland and waterway impacts with expansion of 82nd and Harmony Rd
  - Moderate tree impacts
  - Hazardous materials issues
    - Possible disturbance of contaminated soils and groundwater adjacent to 82nd
    - Harmony bridge/deep foundations may encounter contaminated groundwater
    - Soil and groundwater contamination suspected near PGE site adjacent to Lake Rd

Alternative 9

- Includes: 2030 No-Build + Harmony Rd 3/5 Lanes & Grade-Separated RR Crossing + Sunnybrook Extension 3 Lanes



Alternative 9 Findings

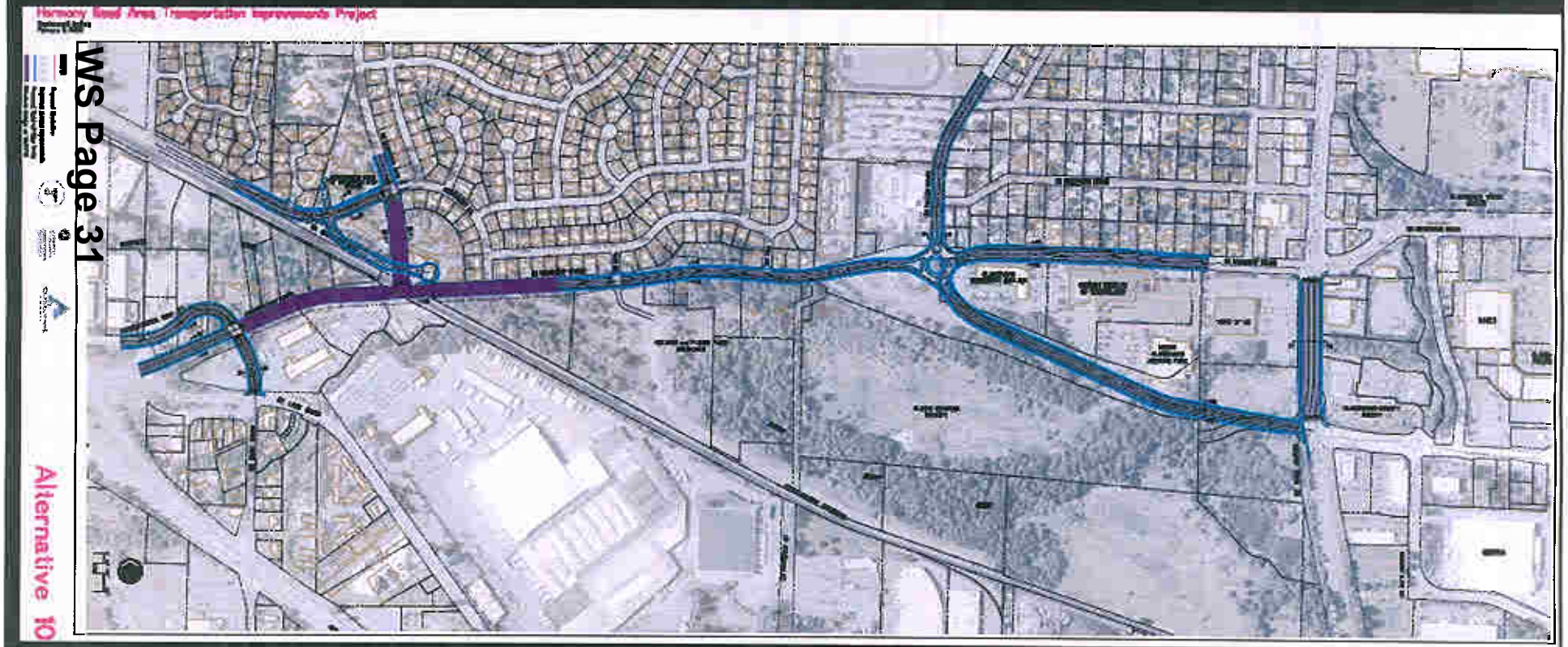
- Traffic –
  - Improved operations at Harmony/Linwood intersection
  - Significant improvement in Harmony Rd traffic operations
  - Significantly improved access to campus area
  - 29,000 ADT on Harmony
  - Access management necessary for improved safety/traffic operations

Alternative 9 Findings

- Environment –
  - Higher potential displacements with expansion of Harmony
  - Higher potential tree impacts with Sunnybrook extension
  - Moderate potential impacts to wetlands & waterways
  - Hazardous materials issues
    - Harmony bridge/deep foundations may encounter contaminated groundwater
    - Vacant land south of Toys R Us contains undocumented fills—potential of encountering contaminated soil with Sunnybrook extension
    - Soil and groundwater contamination suspected near PGE site adjacent to Lake Rd

Alternative 10

- Includes: 2030 No-Build + Harmony Rd 3 Lanes & Grade-Separated RR Crossing + Sunnybrook Extension 3 Lanes



Alternative 10 Findings

- Traffic –
  - Improved operations at Harmony/Linwood intersection
  - Significant improvement in Harmony Rd traffic operations
  - Significantly improved campus access
  - Harmony Rd east of Linwood 4 lanes
  - 26,000 ADT on Harmony
  - Access management necessary for improved safety/traffic operations

Alternative 10 Findings

- Environment –
  - Higher potential displacements with expansion of Harmony
  - Higher potential tree impacts with Sunnybrook extension
  - Moderate potential impacts to wetlands & lower potential impact to waterways
  - Hazardous materials issues
    - Harmony bridge/deep foundations may encounter contaminated groundwater
    - Vacant land south of Toys R Us contains undocumented fills—potential of encountering contaminated soil with Sunnybrook extension
    - Soil and groundwater contamination suspected near PGE site adjacent to Lake Rd

CITY OF MILWAUKIE

To: **Mayor and City Council**

Through: **Mike Swanson, City Manager**

From: **Kenneth Asher, Community Development & Public Works Director**

Subject: **Briefing on the Portland-Milwaukie Light Rail Locally Preferred Alternative Process**

Date: **June 5, 2008 for the June 17 Meeting**

Action Requested

None. This is a briefing to help prepare the Council for its Locally Preferred Alternative (LPA) adoption hearing scheduled for July 14-15, 2008. Staff will update council on the shape of LPA discussions occurring in other groups, so the Council can discuss issues and options prior to the Mayor's vote on the Steering Committee LPA recommendation on June 26.

This is the last scheduled update on the SDEIS or LPA prior to the scheduled public hearing on the LPA at City Council on July 14 and 15. The City Council is scheduled to take action on the Steering Committee LPA recommendation on July 15.

History of Prior Actions and Discussions

June 2008 – Resolution (no. 51-2008) establishing Lake Road as the preferred single light rail station in downtown Milwaukie
May 2008 – Special Report on light rail and schools; work session discussion on umbrella agreement with TriMet regarding light rail
April 2008 – Work session on understanding the SDEIS and its adoption process; work session discussion on downtown Milwaukie station locations.
March 2008 – Project staff update on the SDEIS; Light Rail web strategy
February 2008 – Project staff update on the SDEIS
December 2007 – Project staff updated on the SDEIS
October 2007 – Project staff update on the SDEIS

September 2007 – Special report on the Portland-Milwaukie Light Rail Safety and Security Task Force
April 2007 – Council resolution (no. 30-2007) to help fund the SDEIS

Various actions and discussions related to earlier versions of a South Corridor Project, including:

October 2004 – Resolution 31-2004 adopting the Tillamook Branch Design Option light rail alignment through the North Milwaukie Industrial District in place of the Main Street and crossover alignment within the South Corridor Project.
April 2003 – Resolution 12-2003 adopting the South Corridor Locally Preferred Alternative recommended by the South Corridor Policy Advisory Committee as the City's preferred alternative.

Background

Project staff from Metro and TriMet will be on hand to brief the Council on the LPA process and the LPA discussions that are occurring in the region. Although the LPA won't be formally established until the Public Comment Period ends on June 23rd and the Steering Committee makes its formal recommendation on June 26th, other groups are beginning to form opinions about LPA preferences.

By the time the Council gets this briefing, the Citizens Advisory Committee (CAC) is expected to have determined an LPA recommendation, the Project Management Group is expected to have done the same, and Oregon City will have had a chance to weigh in on the LPA discussion as well. If written recommendations are available from any of these actions, staff will attempt to provide them to Council prior to the work session.

Staff is also prepared to delve into any aspect of the SDEIS that Council would like to hear more about.

This staff report does not summarize the SDEIS, however staff has included summary tables as attachments (Attachments 1 and 2) and has asked Metro to be prepared to explain at the session, as completely as possible, the key differences between the build and no-build scenarios.

As this is the only briefing scheduled prior to the council's LPA hearing, staff would ask that the council review the SDEIS and begin thinking about alignment-related questions such that action can be taken in July. If Council has questions prior to the work session, city staff is available to track down information or provide additional clarification. To the maximum extent possible, staff will try to help Council understand where the LPA decision appears to be heading, recognizing that the public comment

period will not have ended and the Steering Committee will not yet have made a recommendation at the time of the work session.

Of special importance will be any direction that the Council wishes to provide the Mayor, who represents Milwaukie on the Steering Committee.

Concurrence

None, as no action is being requested.

Fiscal Impact

None, as no action is being requested. However a portion of this Project's financing is expected to be provided by the City of Milwaukie, which will have a fiscal impact on the City. The investment in light rail is also expected to have a long-term positive fiscal impact on the City, although no return on investment analysis has been conducted. If the Council would like to discuss fiscal impacts from the Project at this briefing, please contact the Project staff so we can be sure to have the right people and information on hand at the briefing.

Work Load Impacts

None, as no action is being requested.

Alternatives

None, as no action is being requested.

Attachments

1. SDEIS Table S-3 Summary of Environmental Impacts
2. SDEIS Tables 4.2.8 and 4.2.10 Summarizing Travel Effects in the Corridor

S.6 ENVIRONMENTAL CONSEQUENCES

Table S-3 summarizes environmental impacts that would occur with the Light Rail Alternative compared to No-Build, followed by a discussion of major differences in effects by area.

Table S-3
Summary of Environmental Impacts

Measures	No-Build	2003 LPA	2003 LPA w/Bridge Crossing Options (range)	2003 LPA Extension to Park	2003 LPA w/Tillamook Branch Alignment	Maintenance Base
Displacements and Acquisitions						
Full Acquisitions	0	55	60-60	61	62	14
Partial Acquisitions	0	67	64-65	82	77	1
Displaced Residence/Business/Other	0	2/46/15	2-2/49-50/ 15-15	4/53/13	4/55/13	7/6/2
Land Use and Economic						
Compatibility with Local Land Use Plans	Low	High	High	High	High	High
Construction Impact: Potential Temporary Increase in Personal Income (millions)	0	$390-428	$406-438	$487	$437-484	-
Estimated Jobs Displaced	0	675	744-897	699	705	60
Tax Revenue Impact due to Property Acquisition	0	$847,000	$905,000-$912,000	$868,200	$824,300	Not Estimated
Community Impact Assessment						
Neighborhood Benefits	Low	High	High	High	High	Low
Neighborhood Impacts	Low	Low	Low	Low	Low	Low-Medium
Visual Resources Impacts	Low	Medium-High	Medium-High	Medium-High	Medium-High	Low
Historic and Archaeological Resources						
Properties with Identified Historic Resources	0	15	15	17	17	0
Historic Resources with Expected Adverse Effects	0	3	3	4	3	0
(High/Moderate) Probability Areas for Archaeological Resources	0/0	5/1	5/1	8/1	8/1	0
Parks and Recreational Resources						
Number of Existing Parks Impacted	0	6	6	6	6	0
Number of Planned Parks Impacted	0	0	1	2	2	0
Geology and Soils Impacts	None	None	None	None	None	None
Ecosystems						
Wetland Filled / Spanned (acres)	0	0.57	0.57	0.57	0.57	0
Permanent Footprint of Project Area Stream Crossings (ft^2)	0	84,350	86,750-101,950	96,400	96,400	0
Impervious Surface Area (acres)	0	26.1	26.5	29.2	26.6	3.7
Vegetation Impacts Excluding Open Water (acres)	0	6.71	6.71	7.78	7.03	0
Impacts to TES Fish-Bearing Streams (lineal feet)	0	188	188	302	302	0
Water Quality/Hydrology						
Combined Acreage in Floodplain	0	1.9	1.9-2.5	2.0	2.7	1.7

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Measures	No-Build	2003 LPA	2003 LPA w/Bridge Crossing Options (range)	2003 LPA Extension to Park	2003 LPA w/Tillamook Branch Alignment	Maintenance Base
Noise and Vibration						
Noise Impacts without Mitigation	0	23	3	25	25	0
Vibration Impacts without Mitigation	0	33	13	36-38	34-36	0
Regional Air Quality (tons per day)						
Carbon Monoxide	606.3	605.8	Similar to LPA	Similar to LPA	Similar to LPA	Similar to LPA
Nitrogen Oxides	16.2	16.1	Similar to LPA	Similar to LPA	Similar to LPA	Similar to LPA
Volatile Organic Compounds	19.1	19.1	Similar to LPA	Similar to LPA	Similar to LPA	Similar to LPA
Carbon Dioxide	36,328	36,299	Similar to LPA	Similar to LPA	Similar to LPA	Similar to LPA
Energy Consumption						
Regional Daily Vehicle (10^9 BTU)	495.173	494.819	Similar to LPA	494.632	Similar to LPA	Similar to LPA
Hazardous Materials						
All Sites of Concern/Sites of Highest Concern	0	80/35	95/38	84/35	90/42	
Public Services Impacts	None	Minor	Minor	Minor	Minor	None
Utilities Impacts	None	Minor	Minor	Minor	Minor	None

S.6.1 Displacements

The Light Rail Alternative would acquire 55 to 62 full properties, including two to four residences and 46 to 55 businesses. The expansion of the Ruby Junction maintenance base would affect 14 parcels, displacing seven residences and six businesses.

S.6.2 Land Use and Economic Impacts

The Light Rail Alternative would be more supportive of statewide planning goals and regional and local plans and policies than the No-Build Alternative. The Light Rail Alternative serves major regional employment and commercial and residential areas, and it supports Statewide Planning Goals by providing a transportation service that reduces reliance on the automobile.

The Light Rail Alternative supports the regional *2040 Growth Concept,* which directs most new development to mixed-use urban centers and along major transportation corridors. The proposed project also supports local jurisdiction land use plans and policies. For instance, the Light Rail Alternative would serve the South Waterfront area, an area targeted for major development by the City of Portland, and it would support revitalization plans for downtown Milwaukie.

Forty six to 55 businesses with up to 900 jobs could be affected by property acquisition and business displacement and relocation actions. The project's mitigation measures include compensation and relocation for property owners and businesses, which would minimize the effects. If businesses are able to relocate within the area or region, job losses would be lower. Construction of light rail would also provide near term economic benefits by providing employment, with over 10,000 additional person-year jobs and approximately $425 million more in additional personal income, compared to the No-Build Alternative.

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Table 4.2-8
Average Weekday Work and Non-Work Corridor Transit Trips and Transit Mode Share to Portland CBD, Year 2030

Attribute	Existing (2005)	No-Build	2003 LPA		Willamette River Crossing Options				2003 LPA-Park	Tillamook
			No Bus	Bus	Meade-Sherman	Meade-Caruthers	Porter-Sherman	Porter-Caruthers		
Home-Based Work[1]										
Transit	4,780	11,420	12,930	12,970	12,850	12,870	12,850	12,860	14,110	13,950
Total Person	17,090	24,790	24,590	24,640	24,510	24,510	24,510	24,510	24,790	24,890
Mode Split	28%	46%	53%	53%	52%	53%	52%	52%	57%	56%
% change from NB			14%	14%	14%	14%	14%	14%	24%	22%
Non-Work[2]										
Transit	6,310	13,940	15,380	15,540	15,370	15,380	15,370	15,390	15,820	15,800
Total Person	51,940	86,720	86,370	86,830	86,270	86,270	86,270	86,270	87,000	87,050
Mode Split	12%	16%	18%	18%	18%	18%	18%	18%	18%	18%
Total										
Transit	11,100	25,360	28,320	28,510	28,220	28,250	28,220	28,250	29,930	29,750
Total Person	69,040	111,510	110,960	111,470	110,790	110,790	110,790	110,790	111,790	111,940
Mode Split	16%	23%	26%	26%	25%	25%	25%	25%	27%	27%
% change from NB			12%	12%	12%	12%	12%	12%	18%	17%

Source: Metro, 2008

[1] Home-based work trips are defined as trips taken directly between one's home and one's place of work.

[2] Non-work trips are defined as all trips that are not home-based work trips.

Table 4.2-10
Average Weekday Regional Roadway Data, Year 2030

Attribute	No-Build	2003 LPA		Willamette River Crossing Options				2003 LPA-Park	Tillamook
		No Bus	Bus	Meade-Sherman	Meade-Caruthers	Porter-Sherman	Porter-Caruthers		
Average Weekday VMT[1]	58,445,500	58,399,100	58,394,600	58,386,300	58,385,400	58,386,600	58,387,800	58,376,300	58,376,800
Change from No-Build[2]	N/A	-46,400	-50,900	-59,200	-60,100	-58,900	-57,700	-69,200	-68,700
% change from NB		-0.08%	-0.09%	-0.10%	-0.10%	-0.10%	-0.10%	-0.12%	-0.12%
Vehicle Hours of Delay[1]	40,290	39,990	39,970	39,950	39,950	39,960	39,930	39,830	39,840
Change from No-Build[2]	N/A	-300	-320	-340	-340	-330	-360	-460	-450
% change from NB		-0.74%	-0.79%	-0.84%	-0.84%	-0.82%	-0.89%	-1.14%	-1.12%

Source: Metro, 2008

[2] Based on P.M. peak-hour conditions in 2030 on freeways, major and minor arterials and collector streets.

[2] The change in all measures is from the No-Build Alternative.