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TECHNICAL MEMORANDUM #5 (Exit 210)

Pendleton IAMPs: Exit 210

Detailed Evaluation of Select Concepts

Date:	June 17, 2020	Project #: 24043
To:	Technical Advisory Committee, Citizen Advisory Committee	
From:	Mark Heisinger, Nick Foster, AICP, RSP, and Matt Hughart, AICP	

This memorandum describes and evaluates a select number of interchange and local circulation improvement concepts developed to provide for long-term growth in the vicinity of the Interstate 84 (I-84) Exit 210 interchange. These select concepts were rooted in the preliminary concept development and evaluation process in which two stages of concept evaluation were conducted. First, a set of seven preliminary concepts were developed by the project team based on input from the project's advisory committees. The project team screened these concepts and solicited feedback from the advisory committees and general public. Based on this screening, the Project Management Team selected two concepts to move forward for more detailed evaluation. These select concepts are the focus of this Technical Memorandum.

SUMMARY OF PRELIMINARY CONCEPT EVALUATION

The Exit 210 interchange and local circulation improvement ideas were initially developed by members of the project team, the Technical Advisory Committee (TAC), and the Citizen Advisory Committee (CAC) at the January 29, 2020 TAC/CAC meeting to address known, and anticipated future, geometric and traffic operations and safety conditions. Following this initial work session, the project team distilled the ideas presented at the meeting into seven unique preliminary concepts. These seven concepts were evaluated in *Technical Memorandum #5a,* which included a summary of the concept development process, a qualitative evaluation of the seven preliminary concepts, a summary of public feedback from an on-line feedback tool, and the concepts chosen to be evaluated at a more detailed level. Table 1 summarizes the results of this screening process. *Technical Memorandum #5a is included as Attachment "A"*.

Table 1 Exit 210 Preliminary Concept Screening Results

Concept Description	Included for Further Evaluation?	Justification
Concept #1 - This concept converts the existing interchange to a split diamond interchange in which the westbound off-ramp and the eastbound on-ramp would be further to the east (where Old Dump Road is)	Yes	Third highest score. Supported by survey respondents.
Concept #2 - This concept converts the existing interchange to a split diamond interchange in which the westbound off-ramp and the eastbound on-ramp would be further to the east (where Goad Road is)	No	Interchange spacing and length of frontage roads are not likely to be approved by FHWA
Concept #3 - This concept creates a five-legged roundabout at the westbound ramp terminal	No	Roundabout constructability challenges and south side roads are not feasible from a grade/topography standpoint. Low score.
Concept #4 - This concept modifies the Kirk Avenue/OR-11 intersection so that it is only a right-in/right-out access	No	Right-in/right-out access only to Kirk Avenue is not an ideal long-term solution.
Concept #5 - This concept realigns the intersection of Kirk Avenue/OR-11 to the north to improve spacing between it and the I-84 Westbound ramp terminal	Yes	Highest scoring concept. Provides intuitive access to north side.
Concept #6 - This concept relocates the eastbound ramps, which would eliminate the existing close spacing between Nye Avenue and eastbound ramps	No	Interchange relocation impacts to private property and may transfer access challenges to a new location.
Concept #7 - This option creates roundabouts at the I-84 ramp terminals and at Nye Avenue	No	Roundabouts at the EB and WB ramp terminals are likely not feasible due to significant downslope of OR 11.

Through the survey responses and discussions with the City and ODOT, two additional concepts that are slight modifications to Concept #1 and Concept #5 were also moved forward for traffic operations evaluations:

- **Concept #5B –** Concept 5 with a right-in access from OR 11 at the existing Kirk Avenue alignment.
- **Concept #1 with Concept #5B –** Concept #1 and Concept #5B improvements. In this scenario, Concept #5B would be used as an interim solution before Concept #1 is implemented.

DETAILED EVALUATION OF SELECT CONCEPTS

Concepts #1 and #5 were analyzed with respect to future traffic operations, future safety affects, and planning-level cost estimates. Refined concept drawings were also prepared that consider the area's topography and the expected lane configurations and traffic control at the study intersections. Traffic operations were also analyzed for Concept #5B and the combination of Concepts #1 and #5B.

Conceptual drawings of Concept #1 and Concept #5 are shown in Figure 1 and Figure 2, respectively.

Concept #1 Conceptual Drawing
Pendleton, OR

Figure
1

Concept #5 Conceptual Drawing
Pendleton, OR

Figure
2

Future Traffic Operations

The project team analyzed year 2040 AM and PM peak hour transportation operations at the project study intersections, as well as proposed new ramp terminal intersections, for all concepts. The traffic operations analysis was performed in accordance with the same methodologies used for the existing conditions operations analysis, presented in the *Methodology Memorandum* (Reference 1). The initial traffic operations analysis was performed assuming that existing stop-control remained at all study intersections. Where this did not result in intersections meeting their mobility targets and planning-level signal warrants were met, the project team modified the concept design to include traffic signals and turn lanes. The mobility targets for the study intersections are shown in Table 2. The following sections describe the traffic operations analysis results for each concept. *The complete operations reports and signal warrant analysis worksheets are included in Attachment "B".*

Table 2 – Study Intersection Performance Targets

Intersection	OHP Mobility Target
OR 11/SE Isaac Avenue	0.80 OR 11 approach / 0.90 Isaac Avenue approach
OR 11/SE Kirk Avenue	0.80 OR 11 approach / 0.90 Kirk Avenue approach
I-84 Westbound Ramp Terminal/OR 11	0.85[1]
I-84 Eastbound Ramp Terminal/OR 11	0.85[1]
SE 3rd Avenue/SE Nye Avenue[2]	-

[1] The I-84 westbound and eastbound ramp terminals were evaluated with a more conservative v/c of 0.85 per Action 1F.1 of the Oregon Highway Plan.
[2] The City of Pendleton does not have intersection or roadway performance targets – target v/c of 0.90 assumed.

Concept #1

Concept #1 creates a split diamond interchange by adding frontage roads connecting the existing ramp terminal intersections to new ramp terminal intersections to the east. The new ramp terminal intersections are at a new alignment of Old Dump Road, with a new underpass of I-84. The Kirk Avenue/ OR 11 intersection is removed, so access to development northeast of the Exit 210 interchange is provided through the new alignment and extension of Old Dump Road, Isaac Avenue, and other roadways northeast of the study area.

Lane configurations and traffic control for Concept #1 study intersections are shown in Figure 3. The estimated year 2040 traffic volumes and operations for Concept #1 are shown in Figure 4 and Figure 5 for the AM and PM peak hours, respectively. Given these lane configurations and traffic control, all study intersections in Concept #1 meet their mobility targets and operate at LOS 'C' or better in the AM and PM peak hours.

Concept #1 requires traffic signals at the SE Isaac Avenue/OR 11 and I-84 EB Off-Ramp/OR 11 intersections for those intersections to meet their mobility targets. Planning-level signal warrants are forecast to be met at each location. An eastbound left-turn lane is also recommended at the I-84 EB Off-Ramp/OR 11 intersection to mitigate queue spillback. A roundabout is recommended at the Nye Avenue/3rd Drive intersection to provide for long-term operations as the intersection will be close to exceeding its mobility target as a stop-controlled intersection in 2040.

Concept #5

Concept #5 re-locates the Kirk Avenue/OR 11 intersection to the north to improve spacing between Kirk Avenue and the Exit 210 ramp terminals. The Nye Avenue / 3rd Drive intersection is re-located to the south to provide more space between the intersection and the Exit 210 ramp terminals. It is also reconstructed as a roundabout. All access to development to the northeast of Exit 210 is provided through Kirk Avenue, Isaac Avenue, and other roadways northeast of the study area.

Lane configurations and traffic control for Concept #5 study intersections are shown in Figure 6. The estimated year 2040 traffic volumes and operations for Concept #5 are shown in Figure 7 and Figure 8 for the AM and PM peak hours, respectively. Given these lane configurations and traffic control, all study intersections in Concept #5 meet their mobility targets and operate at LOS 'B' or better in the AM and PM peak hours.

Concept #5 requires traffic signals at most study intersections to meet their mobility targets. Planning-level signal warrants are forecast to be met at each location. A roundabout is recommended at the Nye Avenue/3rd Drive intersection to provide for long-term operations as the intersection will be close to exceeding its mobility target as a stop-controlled intersection in 2040.

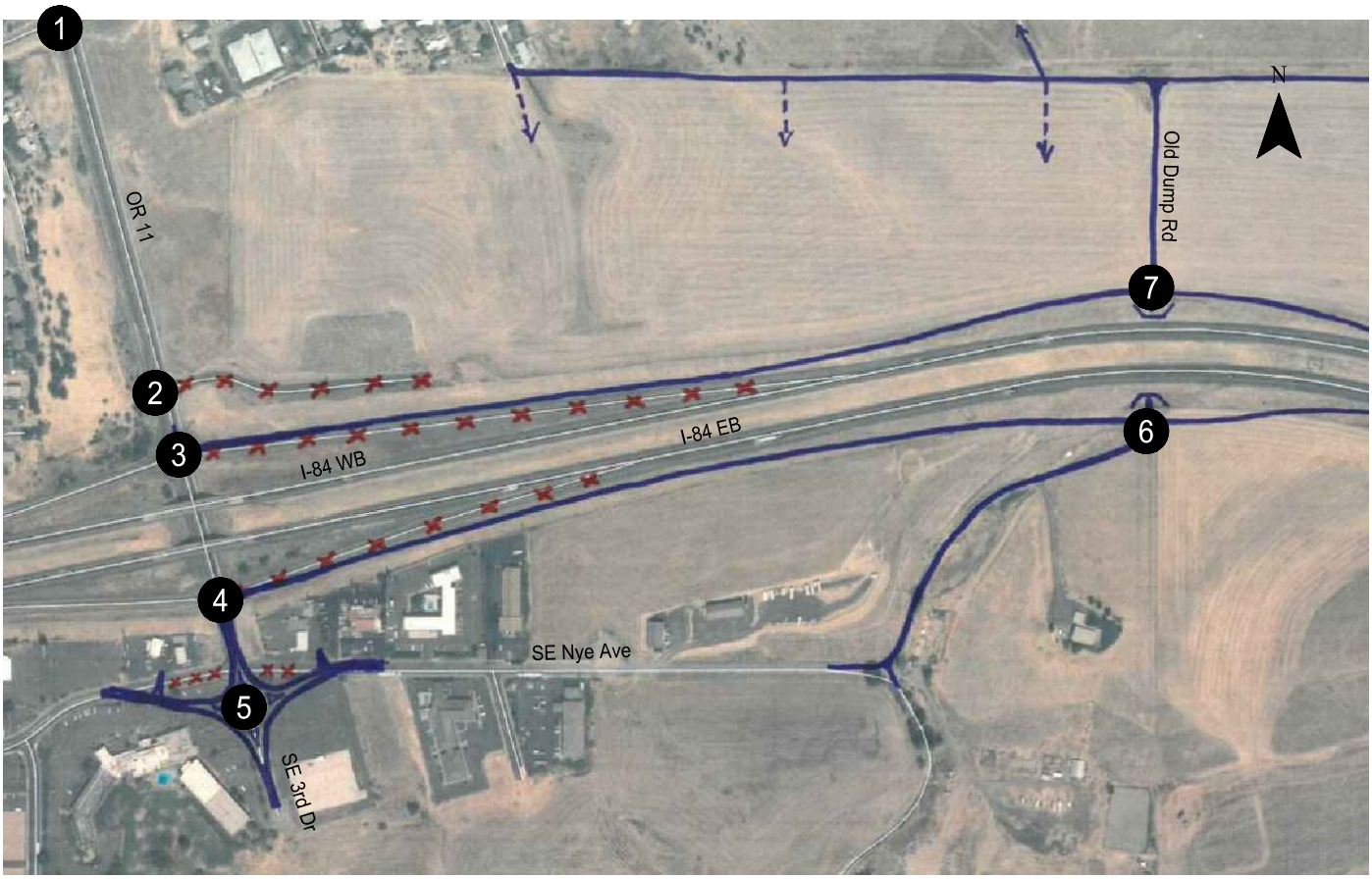
Concept #5B

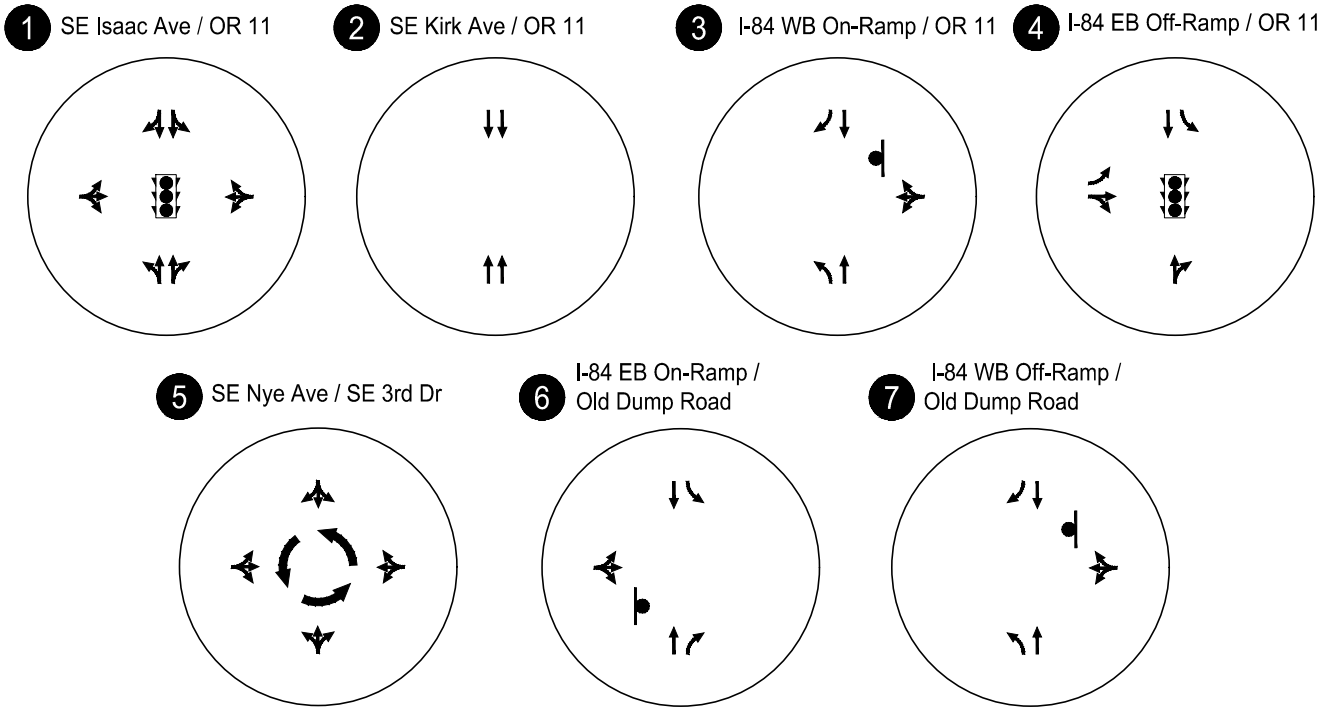
Concept #5B has the same modifications as Concept #5, but also allows northbound vehicles to take a right-in at the existing Kirk Avenue alignment. This concept provides an additional access to development northeast of Exit 210 and its primary benefit is reducing out-of-direction travel, especially for delivery vehicles, which would otherwise have to travel further downgrade on OR 11 before climbing back up to the top of the existing Kirk Avenue. It provides limited operational benefits at the Kirk Avenue intersection (an approximately 5% increase in capacity for the westbound vehicle movements).

Concept #1 with Concept #5B

Concept #1 with Concept 5B implements the Concept #1 split diamond interchange, assuming that Concept #5B has already been constructed as a first phase. By allowing full access at the new Kirk Avenue alignment and the new ramp terminal intersections at Old Dump Road (Extended), this concept would provide the highest amount of access options to development northeast of Exit 210.

Concept #1 with Concept #5B does not provide significant operational benefits over Concept #1 or Concept #5. Traffic signals are required at the SE Isaac Avenue / OR 11 and I-84 EB Off-Ramp / OR 11 intersections for those intersections to meet their mobility targets. An eastbound left-turn lane is required at the I-84 EB Off-Ramp / OR 11 intersection to mitigate queue spillback to the Nye Avenue / 3rd Drive intersection.





LEGEND

- # - Study Intersections
- - Stop Sign
- - Lane Movement
- - Roundabout
- - Traffic Signal

Lane Configurations
Concept 1, Exit 210
Pendleton, OR

Figure 3

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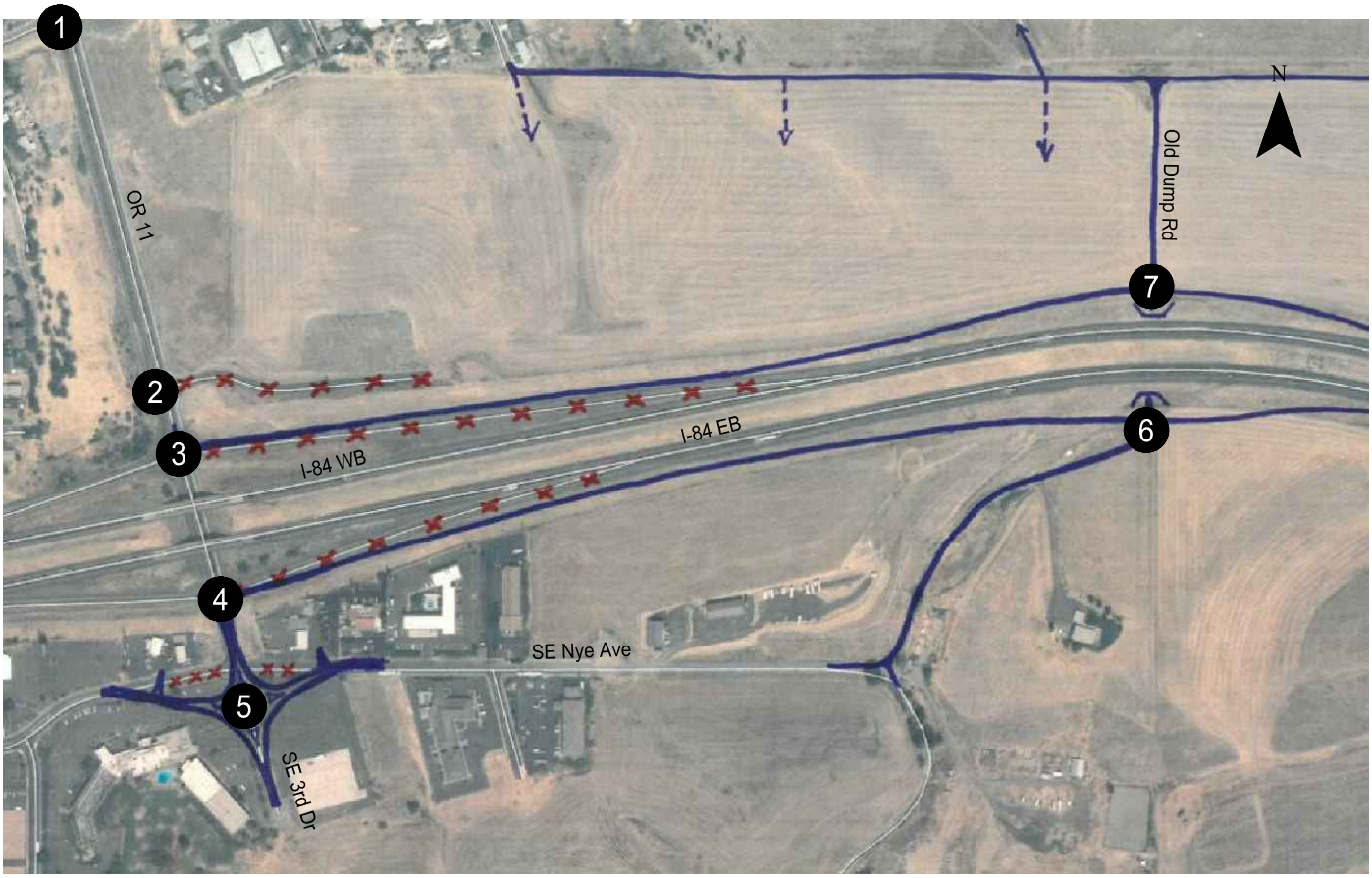

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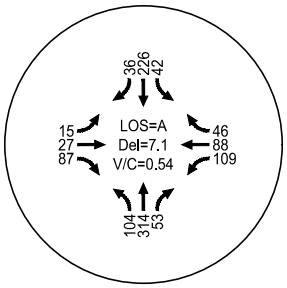
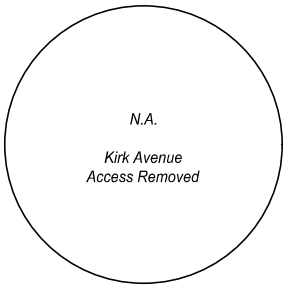


2 SE Kirk Ave / OR 11



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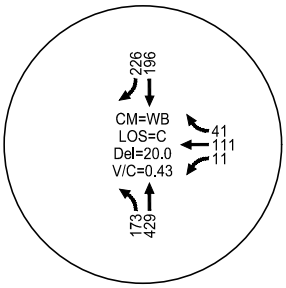
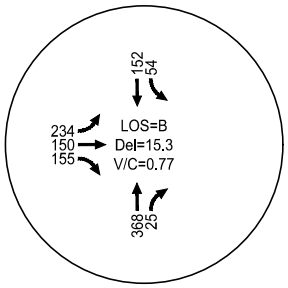


4 I-84 EB Off-Ramp / OR 11



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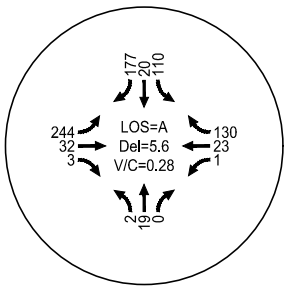
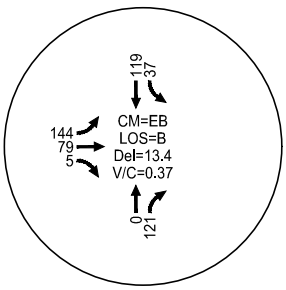
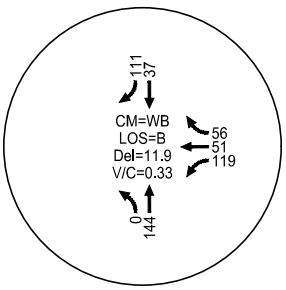


6 I-84 EB On-Ramp / Old Dump Road



7 I-84 WB Off-Ramp / Old Dump Road

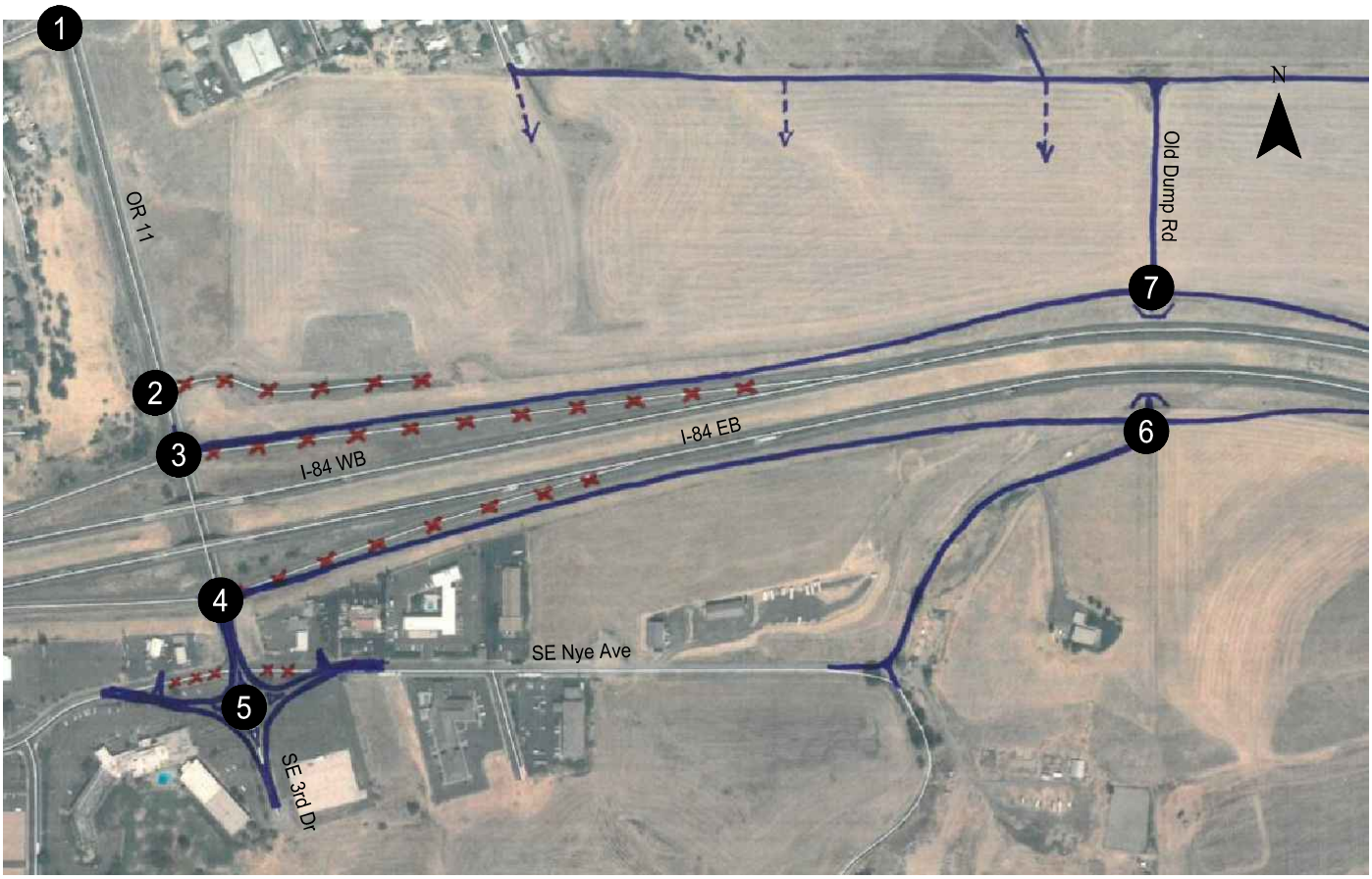


LEGEND

- # - Study Intersections
- CM - Critical Movement
- LOS - Level of Service
- Del - Vehicle Delay (s)
- V/C - Volume-To-Capacity Ratio

Future AM - Traffic Volumes and Operations
Concept 1, Exit 210
Pendleton, OR

Figure 4



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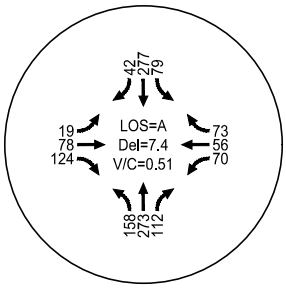

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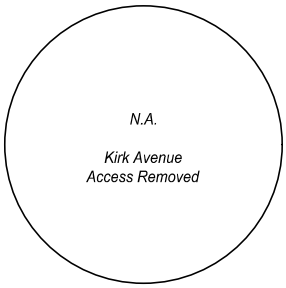
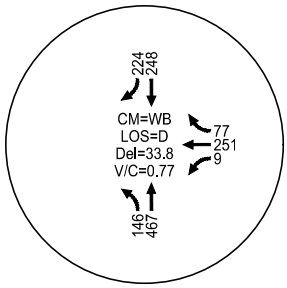
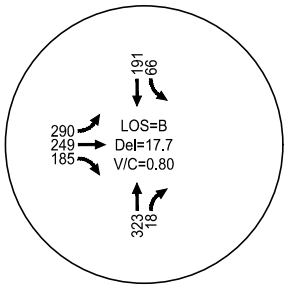


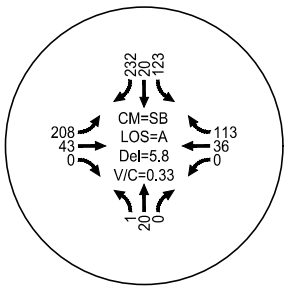
3 I-84 WB On-Ramp / OR 11



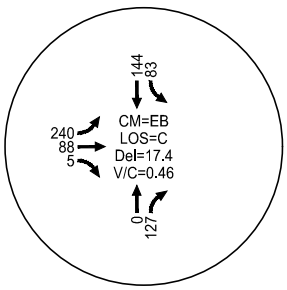
4 I-84 EB Off-Ramp / OR 11



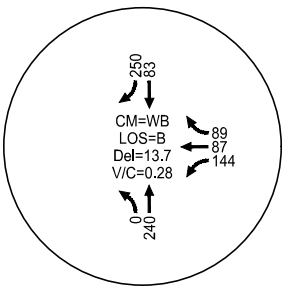
5 SE Nye Ave / SE 3rd Dr



6 I-84 EB On-Ramp / Goad Road



7 I-84 WB Off-Ramp / Goad Road



LEGEND

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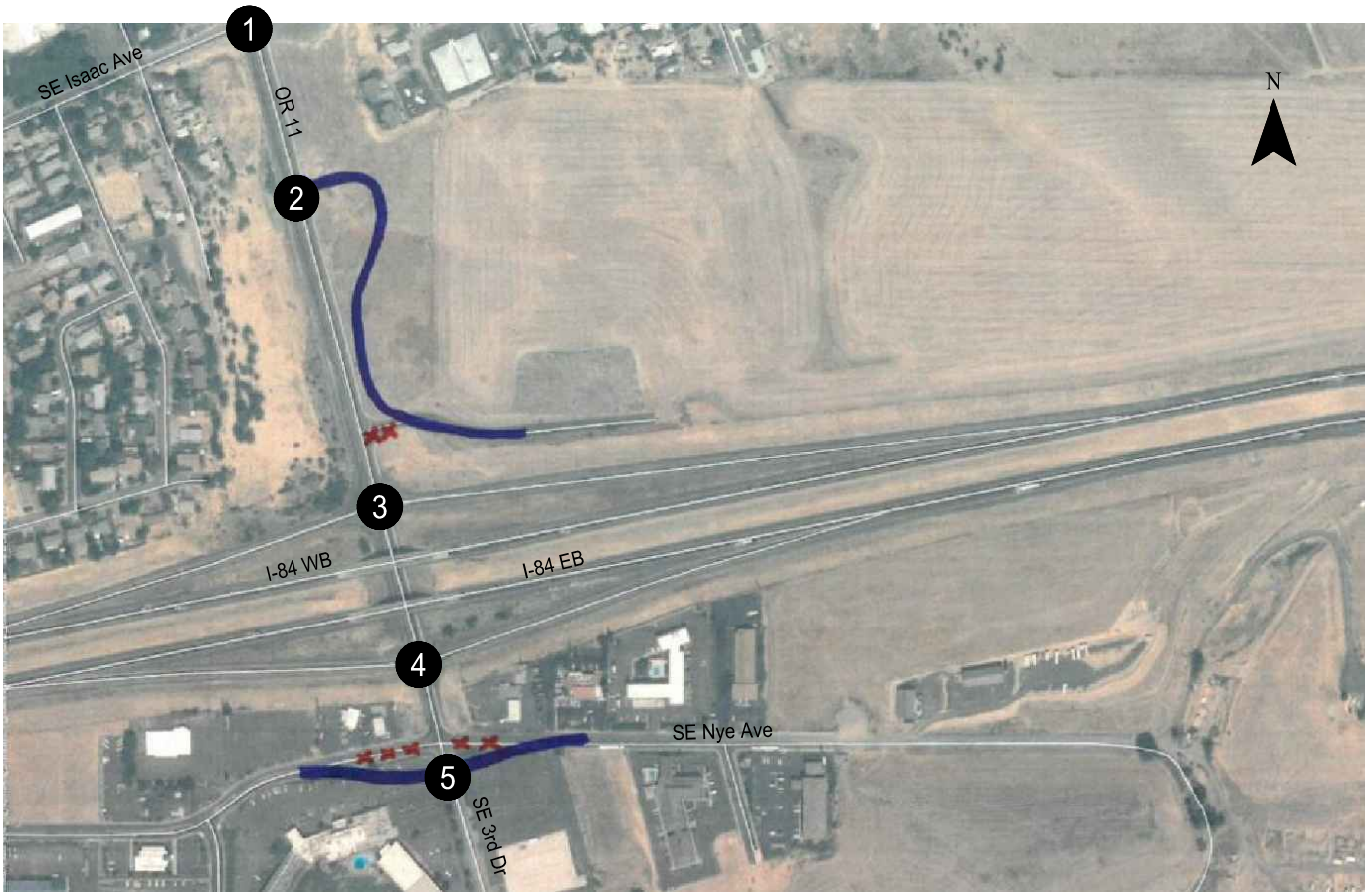
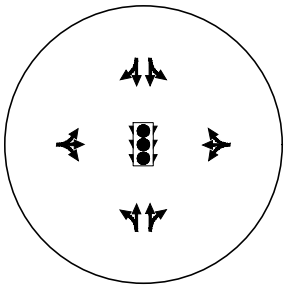
Future PM - Traffic Volumes and Operations
Concept 1, Exit 210
Pendleton, OR

Figure 5



1 SE Isaac Ave / OR 11



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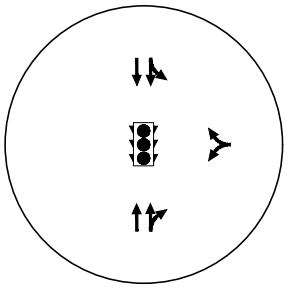
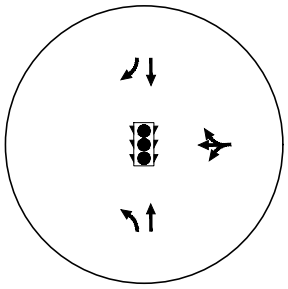
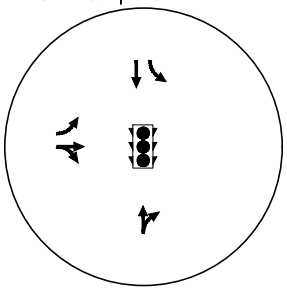


3 I-84 WB On-Ramp/ I-84 WB Off-Ramp / OR 11



4 I-84 EB Off-Ramp / I-84 EB On-Ramp / OR 11



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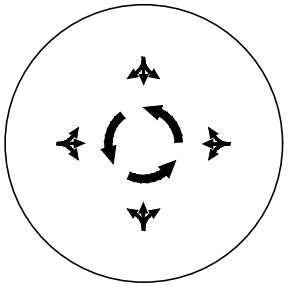
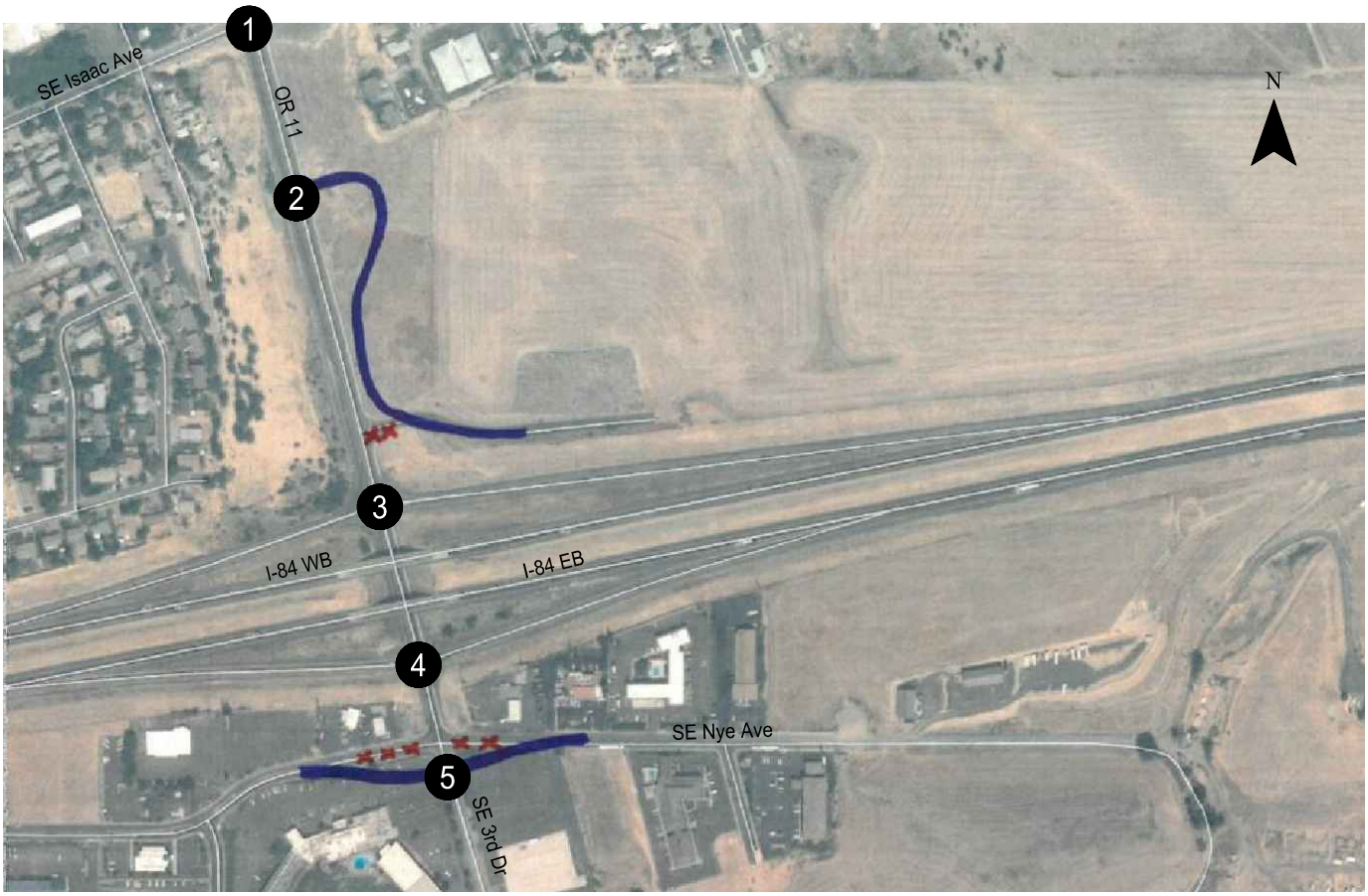


LEGEND

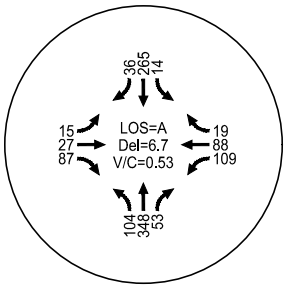
- # - Study Intersections
- - Stop Sign
- - Lane Movement
- - Roundabout
- - Traffic Signal

Lane Configurations
Concept 5, Exit 210
Pendleton, OR

Figure
6



1 SE Isaac Ave / OR 11



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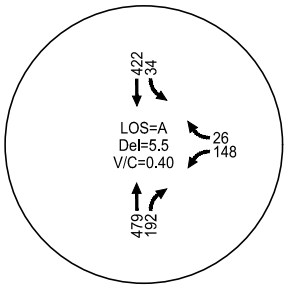
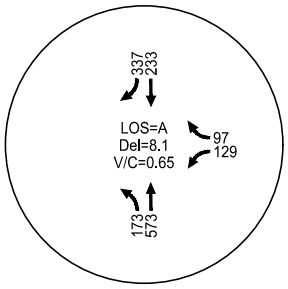
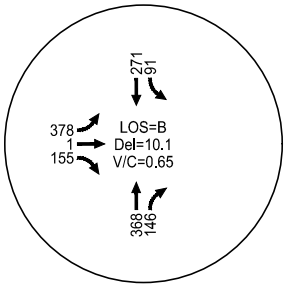


3 I-84 WB Ramp Terminal / OR 11



4 I-84 EB Ramp Terminal / OR 11



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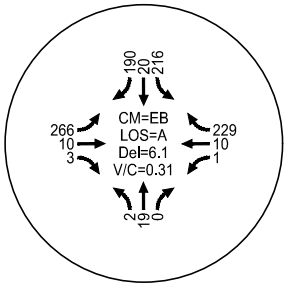
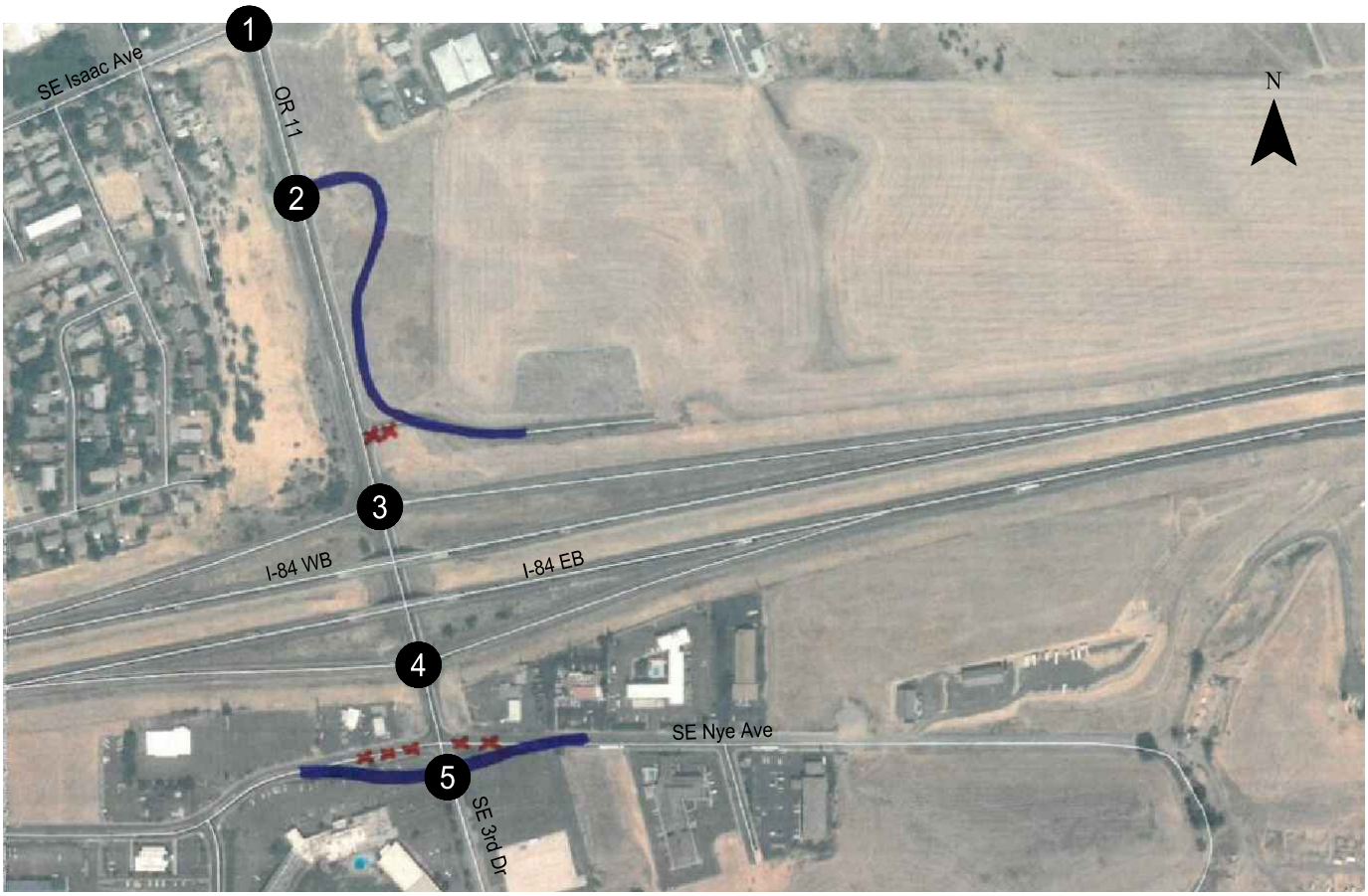


LEGEND

- # - Study Intersections
- CM - Critical Movement
- LOS - Level of Service
- Del - Vehicle Delay (s)
- V/C - Volume-To-Capacity Ratio

Future AM - Traffic Volumes and Operations
Concept 5 - Exit 210
Pendleton, OR

Figure 7



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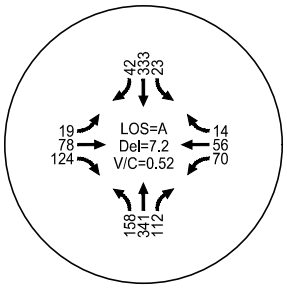

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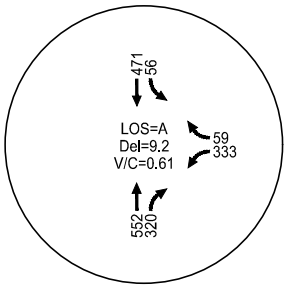

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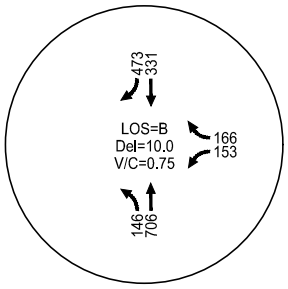
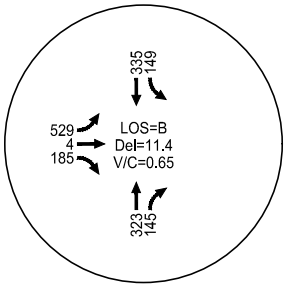
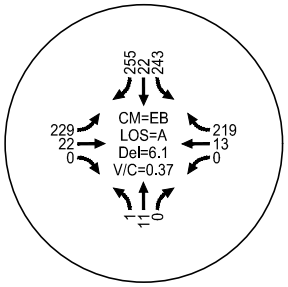


4 I-84 EB Ramp Terminal / OR 11



5 SE Nye Ave / SE 3rd Dr



LEGEND

- # - Study Intersections
- CM - Critical Movement
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- V/C - Volume-To-Capacity Ratio

Future PM - Traffic Volumes and Operations
Concept 5, Exit 210
Pendleton, OR

Figure
8

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Potential Reallocation of Right-of-Way on OR 11

There has also been an expressed desire from the project advisory committees to explore reallocating roadway space on OR 11 between the I-84 WB ramp terminal and the north side of the bridge over the railroad where the existing bike lanes begin/end. This would involve removing one motor vehicle travel lane in each direction and replacing them with left-turn lanes at each intersection (and a median in between intersections), bike lanes, and sidewalks (where these are not already present) on both sides of the road. This reallocation could occur within any of the concepts presented above. The project team analyzed the potential effects of this lane reallocation on traffic operations at the OR 11 Kirk Avenue and Isaac Avenue intersection. Figure 9 shows the resulting lane configurations and traffic control devices for each intersection for each concept. Table 3 shows that the intersections are still forecast to meet their mobility targets after the reallocation.

Table 3 Traffic Operations with OR 11 Roadway Space Reallocation

Intersection	Concept 1 – AM (PM)		Concept 5 – AM (PM)	
	V/C	LOS	V/C	LOS
Kirk Avenue/OR 11	N.A.	N.A.	0.62 (0.68)	A (A)
Isaac Avenue/OR 11	0.58 (0.54)	A (A)	0.58 (0.54)	A (A)

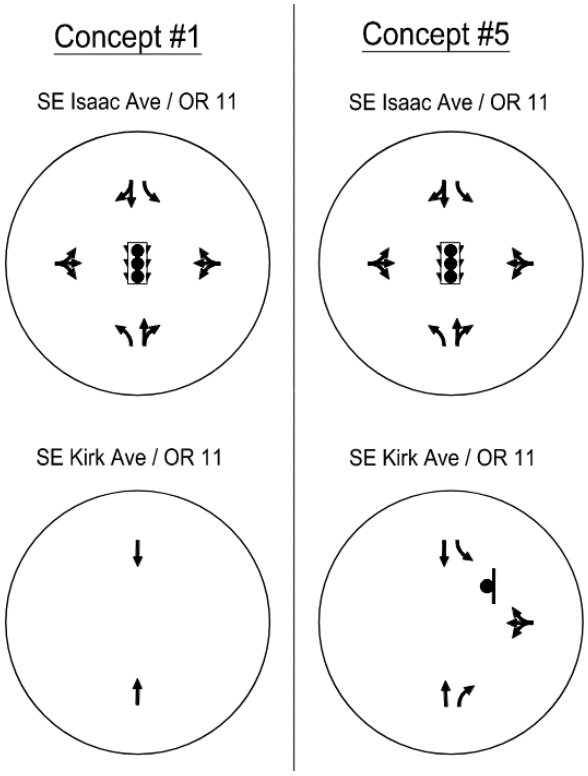

Figure 9 Intersection Lane Configuration with OR 11 Roadway Space Reallocation

Interim Crossing Improvements at Isaac Avenue/OR 11

There is a marked and signed crosswalk across OR 11 on the south side of its intersection with Isaac Avenue. This crossing links the neighborhoods on either side of OR 11 and provides a connection to downtown Pendleton and school bus stops for residents east of OR 11. It is identified for an enhanced crossing in the City's Transportation System Plan (TSP, Reference 2). Both concepts recommend signalizing the Isaac Avenue intersection when signal warrants are met. In the interim, before signal warrants are met, this crossing could be upgraded with a rectangular rapid flashing beacon (RRFB) or a pedestrian hybrid beacon (PHB). The potential reallocation of space along OR 11 discussed previously would further improve this crossing by reducing the number of lanes of traffic needing to be crossed.

Future Safety Effects

The crash histories at the study intersections and along the study area roadways were reviewed in the *Existing Conditions: Transportation System Operations* memorandum (Reference 4). This section identifies crash reduction factors (CRFs) for the roadway and intersection treatments proposed in Concept #1 and Concept #5. The CRFs are used to estimate the potential reduction in crashes that could occur with the implementation of the proposed concepts.

There are not CRFs for each treatment proposed in the concepts (e.g., there is no CRF for converting a standard diamond interchange into a split diamond interchange). Therefore, not all treatments are analyzed. Table 4 shows the treatments for which CRFs are readily available.

Table 4 Crash Reduction Factors

Scenario	Countermeasures Considered	CRF[1]	Appropriate Intersections/Segments
Concept #1	Convert intersection with minor-road stop control to traffic signal	67% (Angle-Related Crashes) - 143% (Rear-End Crashes)	• SE Isaac Ave / OR 11 • I-84 EB Ramp Terminal / OR 11
	Convert intersection with minor-road stop control to modern roundabout	82% (Injury/Fatal Crashes)	• SE Nye Ave / 3rd Drive
	Convert 4-Lane Roadway to 3-Lane Roadway with Center Turn Lane (Road Diet)	29% (All Crashes)	• OR 11 (I-84 WB Ramp Terminal to SE Isaac Ave)
Concept #5	Convert intersection with minor-road stop control to traffic signal	67% (Angle-Related Crashes) - 143% (Rear-End Crashes)	• SE Isaac Ave / OR 11 • SE Kirk Ave / OR 11 • I-84 WB Ramp Terminal / OR 11 • I-84 EB Ramp Terminal / OR 11
	Convert intersection with minor-road stop control to modern roundabout	82% (Injury/Fatal Crashes)	• SE Nye Ave / 3rd Drive
	Convert 4-Lane Roadway to 3-Lane Roadway with Center Turn Lane (Road Diet)	29% (All Crashes)	• OR 11 (I-84 WB Ramp Terminal to SE Isaac Ave)

[1]ODOT Crash Reduction Factor List

Table 5 shows the adjusted crash rates at the study intersections and roadway segments, based on the application of the CRFs presented in Table 4. Both concepts are expected to reduce the study intersection and roadway segment crash frequencies in the study area by similar amounts when these CRFs are applied to the reported crashes for the most recent five year period for which data is available.

Table 5: Crash Rate[1] Assessment

Study Intersection or Segment	Observed Crashes/Year[1]	Adjusted Crashes/Year Concept #1	Adjusted Crashes/Year Under Concept #5
SE Isaac Avenue / OR 11	1.00	0.75	0.75
SE Kirk Avenue / OR 11	0	0[2]	0[2]
I-84 WB Ramp Terminal / OR 11	0.40	0.40	0.27
I-84 EB Ramp Terminal / OR 11	0.80	0.68	0.68
SE Nye Avenue / SE 3rd Drive	0	0[2]	0[2]
OR 11 (I-84 WB Ramp Terminal to SE Isaac Ave)	1.2	0.85	0.85
Total	**3.40**	**2.68**	**2.55**

[1]Observed crashes per year from 2013 to 2017.
[2] The number of crashes per year in the long-term is likely more than 0; however, no crashes were reported at this intersection from 2013 to 2017.

Cost Estimates

Planning level cost estimates were developed for Concept #1 and Concept #5. The total estimated project cost is $11,700,000 to $12,900,000 for Concept #1 and $7,300,000 to $8,100,000 for Concept #5. The project cost estimate for Concept #1 is approximately 60% higher than the project cost estimate for Concept #5. *Detailed breakdowns of the estimated project costs are shown in Attachment C*.

EVALUATION RESULTS

Table 6 summarizes the results of evaluating Concepts #1 and #5 against the evaluation criteria set forth in the *IAMP Definition and Background Memorandum* (Reference 4). These concepts were previously evaluated against these criteria at a high level as part of the screening evaluation summarized in Technical Memorandum #5a. This evaluation takes that screening one step further by refining the criteria and conducting a comparative analysis. Green shading indicates which concept performs best under that evaluation criteria. Orange shading indicates which concept performs worst under that evaluation criteria.

Based on the evaluation shown in Table 6 , Concept #5B scores better than Concept #1. It meets the project objectives, outperforms Concept #1 against the project evaluation criteria, and costs less. Concept #1 could be constructed after Concept #5B as a second phase if additional access to property east of the interchange is desired. However, the additional traffic operations benefit expected from this concept is expected to be relatively small compared to its cost.

We recommend that the preferred alternative be moved forward with the reallocation of space on OR 11 to reduce the number of travel lanes and provide additional sidewalks and bike lanes, as previously described.

Table 6 Refined Concept Evaluation Results

Category	Evaluation Criteria	Concept Performance		Best Performing Concept
		Concept 1	Concept 5/5B	
Transportation	Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	Kirk Avenue access to OR 11 is removed.	Kirk Avenue access to OR 11 is re-located approximately 500 feet from its existing alignment.	Concept #1
	Addresses the limited intersection spacing between the EB ramp terminal and Nye Avenue.	Nye Avenue is re-located approximately 125 feet south of its existing alignment	Nye Avenue is re-located approximately 125 feet south of its existing alignment	*Both Concepts Perform the Same*
Safety	Reduces crash potential	Total expected crash reduction of 0.71 crashes per year	Total expected crash reduction of 0.85 crashes per year	Concept #5/5B
Mobility	Improves mobility for people walking and biking	Provides signalized crossings at two intersections. OR 11 reallocation can provide further benefits.	Provides signalized crossings at four intersections. OR 11 reallocation can provide further benefits.	Concept #5/5B
Land Use/ Economic Development	Accommodates future growth and minimizes right-of-way impacts	Provides access to development northeast of Exit 210 via an extension of Old Dump Road. Higher level of right-of-way impact due to frontage roads, new ramp terminal intersection, and Nye Avenue re-location. Access to the northeast area would also require out-of-direction travel for some traffic.	Provides access to development northeast of Exit 210 via Kirk Avenue. Moderate level of right-of-way impact with Nye Avenue and Kirk Avenue re-locations, but less than in Concept 1. Allowing a right-in to remain at the existing Kirk Avenue further enhances access to the northeast area.	Concept #5/5B
Accessibility	Moves in the direction of ODOT access spacing requirements	Kirk Avenue access removed and Nye Avenue re-located (still within ¼ mile of EB ramp terminal)	Kirk Avenue and Nye Avenue re-located (both still within ¼ mile of EB or WB ramp terminals)	Concept #1
Cost	Planning level cost estimates	$11,700,000 to $12,900,000	$7,300,000 to $8,100,000	Concept #5/5B
Implementation	Constructability	While the majority of the split diamond interchange could be constructed while maintaining existing traffic, the scale of the project is comparatively large with many unknown complexities. The location of the new interchange may not meet FHWA spacing standards.	Kirk Avenue re-alignment would require significant regrading and large retaining walls against the steep hillside, but it could be completed without affecting the operation of the interchange.	Concept #5/5B

PRELIMINARY ACCESS MANAGEMENT PLAN

In addition to the preliminary concept recommendations described above, the project team has developed preliminary access management plans for the Operations and Access Study Area (OASA). The plan aims to move access locations in the OASA towards ODOT's access spacing standards through consolidation of driveways and relocation of public streets. Implementation of access management is anticipated to occur through the development and redevelopment of properties over time.

As Table 7 shows, there are 50 accesses within the OASA. Table 7 also summarizes the proposed access management plan for the Exit 210 OASA for accesses located within ODOT's ¼-mile spacing standard. Accesses shaded grey are located within ¼ mile of the interchange ramp terminals. *A map showing the locations of each access is shown in Attachment D.*

Table 7 Exit 210 IMSA Access Inventory

Access Number	Roadway	Approach Type	Side of Roadway	What Does the Access Serve?	Proposed Access Management Plan Action Under Concept Alternatives
1	OR 11	Public	West	Isaac Ave	No changes are proposed to accesses located outside of ODOT's ¼-mile spacing standard.
2	OR 11	Public	East	SE 5th St	
3	OR 11	Public	East	Kirk Ave	Concept 5/5B would re-locate Kirk Avenue approximately 500 feet north. Access would still be within ¼-mile of I-84 WB ramp terminal intersection. Concept 1 would remove Kirk Avenue access to OR 11.
4	3rd Dr	Public	Both	Nye Ave	All concepts would re-locate 3rd Drive / Nye Avenue intersection approximately 200 feet south. Access would still be within ¼ mile of I-84 WB ramp terminal intersection.
5	3rd Dr	Private	West	Red Lion Hotel	Revisit access location and configuration when property redevelops
6	3rd Dr	Private	East	Vacant Commercial Lot	Revisit access location and configuration when property redevelops
7	Nye Ave	Public	South	SW 3rd Pl	No changes are proposed to accesses located outside of ODOT's ¼-mile spacing standard.
8	Nye Ave	Private	North	Residential Driveway	
9	Nye Ave	Private	North	Residential Driveway	
10	Nye Ave	Private	North	Residential Driveway	
11	Nye Ave	Private	North	Residential Driveway	
12	Nye Ave	Private	North	Residential Driveway	
13	Nye Ave	Public	South	SW 2nd St	
14	Nye Ave	Private	North	Residential Driveway (undeveloped lot)	
15	Nye Ave	Private	North	Residential Driveway (undeveloped lot)	
16	Nye Ave	Private	North	Residential Driveway (undeveloped lot)	
17	Nye Ave	Private	North	Residential Driveway	
18	Nye Ave	Private	South	Office Building	
19	Nye Ave	Private	North	Hampton Inn	
20	Nye Ave	Private	South	Utility/Maintenance Yard	
21	Nye Ave	Private	South	Residential Apartments	
22	Nye Ave	Private	North	Hampton Inn	
23	Nye Ave	Private	South	Utility/Maintenance Yard	
24	Nye Ave	Private	North	Office Building	
25	Nye Ave	Private	North	Office Building	

Access Number	Roadway	Approach Type	Side of Roadway	What Does the Access Serve?	Proposed Access Management Plan Action Under Concept Alternatives
26	Nye Ave	Private	South	Office Building	
27	Nye Ave	Private	South	Office Building	
28	Nye Ave	Private	North	Office Building	
29	Nye Ave	Private	North	Office Building	
30	Nye Ave	Public	South	SE 3rd St	
31	Nye Ave	Private	South	Red Lion Hotel	
32	Nye Ave	Private	North	Office Building	
33	Nye Ave	Private	North	Parking Lot	
34	Nye Ave	Private	North	Chevron	
35	Nye Ave	Private	North	Chevron	
36	Nye Ave	Private	North	Chevron	
37	Nye Ave	Private	South	Red Lion Hotel	
38	Nye Ave	Private	South	Vacant Commercial Lot	
39	Nye Ave	Private	South	Vacant Commercial Lot	
40	Nye Ave	Private	North	Sinclair	
41	Nye Ave	Private	North	Sinclair	
42	Nye Ave	Private	North	Shari's	
43	Nye Ave	Private	North	Shari's	
44	Nye Ave	Private	South	Best Western	
45	Nye Ave	Private	South	Best Western	
46	Nye Ave	Private	North	Motel 6	
47	Nye Ave	Private	South	SE 6th St	
48	Nye Ave	Private	North	Super 8	
49	Nye Ave	Private	South	Holiday Inn	
50	Nye Ave	Private	North	Residential Driveway	

NEXT STEPS

Based on the TAC/CAC meeting conducted on June 11, the preferred concept will incorporate elements of Concept #5b and Concept #1. The different elements will be implemented via a phased approach starting with elements of Concept #5b and followed by elements of Concept #1. The preferred alternative will be refined based on comments from the TAC/CAC meeting and from the public virtual open houses and will be presented in Technical Memorandum #6.

REFERENCES

1. Kittelson and Associates, Inc. *Pendleton IAMPs: Methodology Memorandum.* 2019.
2. City of Pendleton. *Transportation System Plan*. 2007
3. Kittelson and Associates, Inc. *Pendleton IAMPs: Exit 210 – Existing Conditions: System Inventory.* 2019.
4. Kittelson and Associates, Inc. *Pendleton IAMPs: Exit 210 – Existing Conditions: System Inventory.* 2019.

ATTACHMENTS

A. Technical Memorandum #5A – Concepts Evaluation and Screening
B. Intersection Operations Worksheets and Signal Warrants
C. Planning Level Cost Estimates
D. Access Locations

Attachment A
Technical Memorandum #5A – Concepts Evaluation and Screening

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TECHNICAL MEMORANDUM #5a

Pendleton IAMPs: Exit 207 & Exit 210

Concepts Evaluation and Screening

Date:	April 27, 2020	Project #: 24043
To:	Technical Advisory Committee, Citizen Advisory Committee	
From:	Nick Foster, AICP, and Matt Hughart, AICP; Kittelson & Associates, Inc.	

This memorandum documents the development and evaluation of interchange, access, and local circulation concepts for the I-84 Exits 207 and 210 Interchange Area Management Plans (IAMPs). It includes a summary of the concept development process, qualitative evaluations of each concept, a summary of public feedback from an on-line feedback tool, and a consultant team recommendation for which concepts will be evaluated at a more detailed level.

DRAFT CONCEPTS

Concept Development Process

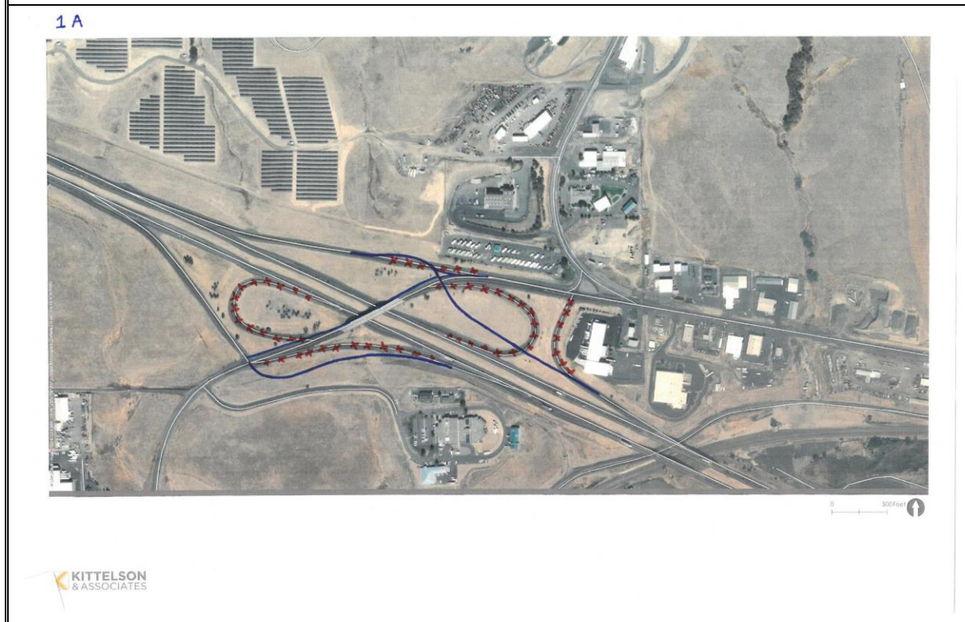
The concepts considered in this memorandum were initially developed by members of the project team, the TAC Committee, and CAC Committee at the January 29, 2020 project meeting to address known geometric and anticipated future traffic conditions. Following this initial work session, the project consultant team took the various circulation improvement ideas and distilled them into a set of unique/representative concepts. For each concept, the subsequent tables provide the following:

- A graphical illustration that conveys the basic components of the concept in a quick single-line sketch overlaid on an aerial photograph.
- A short narrative summarizing the main components of the concept.
- A high-level screening evaluation using the project evaluation criteria.
- A summary of committee and public comments received as part of the two-week virtual open house.
- Based on all the information listed above and following discussions with the City and ODOT, whether or not the concept will move forward in the more detailed alternatives evaluation.

Section 1 Exit 207 Concepts

Table 1 – Concept 1A

Exit 207 – Concept 1A	Evaluation Information				Evaluation Results	
Concept Description and Illustration	**Category**	**Evaluation Criteria**	**Scoring Key**		**Score**	**Comments**
This concept converts the existing interchange to a diamond interchange and widens the existing overpass structure to add-in a left-turn lane. This redesign would provide a simpler interchange form. Realigning the I-84 Westbound off-ramp will reduce the potential for slide-offs during the winter and improve access spacing to Airport Road and private accesses along US 30, thereby reducing conflicts in the interchange area. Removing the free-right-turns will also reduce conflicts for people walking through the area.	Transportation	Addresses the identified operational and safety concerns at the interchange: 1) Location of Airport Road across from I-84 WB off-ramp 2) Slide-offs along the I-84 WB off-ramp"	+1	Addresses both identified concerns	**+1**	**The existing WB off ramp is relocated further to the west. This addresses the existing geometric slide-off deficiencies and eliminates the connection across from Airport Road.**
			0	Addresses only one identified concern		
			-1	Does not address concerns and/or introduces new concerns		
		Improves walking and biking access	+1	Improves walking and biking in the study area for both ramps	**+1**	**This concept eliminates the free-flowing right-turn movements at the ramp terminals, improving pedestrian comfort and visibility. A widened overpass would allow for the construction of new sidewalks.**
			0	Improves walking and biking in the study area for one ramp		
			-1	Does not improve walking or biking in the study area		
	Land Use/ Economic Development	Accommodates future growth and minimizes right-of-way impacts	+1	Alternative provides for long-term growth in the study area with minimal ROW impacts	**+1**	**The diamond interchange and associated widening of the overpass structure can accommodate long-term growth. The right-of-way impacts to private property are expected to be minimal.**
			-1	Alternative precludes long-term growth or has significant ROW impacts		
	Accessibility	Moves in the direction of ODOT access spacing requirements	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**This alternative moves the WB ramp terminal further to the west, thereby increasing the spacing distance to Airport Road and other private accesses along Highway 30.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
	Cost	Cost relative to other concepts	+1	Low construction costs		
			0	Moderate construction costs		
			-1	Substantial construction costs	**-1**	**The costs associated with widening the overpass and modifying the ramp terminals would be substantial.**
	Implementation	Constructability	+1	Project can be constructed with relative ease and/or can maintain existing traffic during construction.		
			-1	Construction of improvements will be a physical challenge and/or will require major detours during construction.	**-1**	**The existing overpass likely cannot be widened based on its current form. A separate parallel structure would need to be constructed in order to accommodate the extra width for a center turn lane.**
					2	

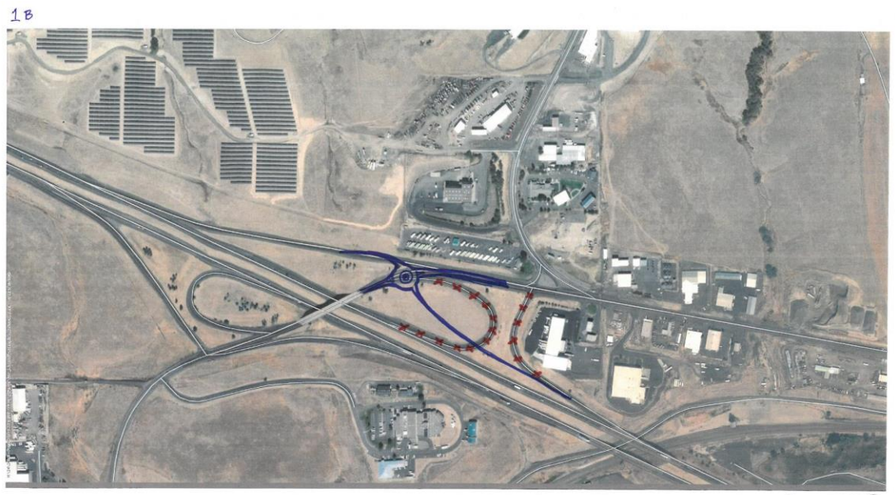


On-line Public Feedback & Miscellaneous Evaluation Comments
General support for the diamond reconfiguration for its simplicity and addressing identified safety concerns
Some concern about cost of structure modifications and whether all of this is necessary
Need to verify adequate acceleration/deceleration is provided on the ramps
Why modify the EB ramp configurations? They are adequately addressing existing interchange volumes

Next Steps	Justification
Do not move forward for further evaluation.	While this concept scored well on the whole, it is a major reconstruction of the entire interchange. There is not enough evidence that the EB ramp terminals need to be completely modified.

Table 2 – Concept 1B

Exit 207 – Concept 1B	Evaluation Information				Evaluation Results	
Concept Description and Illustration	**Category**	**Evaluation Criteria**	**Scoring Key**		**Score**	**Comments**
This concept converts the westbound ramps to a diamond interchange with a roundabout. Realigning the I-84 Westbound off-ramp will reduce the potential for slide-offs during the winter and improve access spacing to Airport Road and private accesses along US 30, thereby reducing conflicts in the interchange area. Removing the free-right-turns will also reduce conflicts for people walking through the area.	Transportation	Addresses the identified operational and safety concerns at the interchange: 1) Location of Airport Road across from I-84 WB off-ramp 2) Slide-offs along the I-84 WB off-ramp"	+1	Addresses both identified concerns	**+1**	**The existing WB off ramp is relocated further to the west. This addresses the existing geometric slide-off deficiencies and eliminates the connection across from Airport Road.**
			0	Addresses only one identified concern		
			-1	Does not address concerns and/or introduces new concerns		
		Improves walking and biking access	+1	Improves walking and biking in the study area for both ramps		
			0	Improves walking and biking in the study area for one ramp	**0**	**A roundabout at the WB ramp terminal could provide modern pedestrian and bicycle accommodations. No modifications are proposed for the EB ramp terminal where free flowing right-turns would still exist.**
			-1	Does not improve walking or biking in the study area		
	Land Use/ Economic Development	Accommodates future growth and minimizes right-of-way impacts	+1	Alternative provides for long-term growth in the study area with minimal ROW impacts	**+1**	**It is anticipated that the roundabout could be constructed with minimal impacts to privately-owned right-of-way.**
			-1	Alternative precludes long-term growth or has significant ROW impacts		
	Accessibility	Moves in the direction of ODOT access spacing requirements	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**This alternative moves the WB ramp terminal further to the west, thereby increasing the spacing distance to Airport Road and other private accesses along Highway 30.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
	Cost	Cost relative to other concepts	+1	Low construction costs		
			0	Moderate construction costs	**0**	**As this option maintains the current overpass and does not modify the EB portion of the interchange. The costs of a roundabout at the WB ramp terminal would be significant. Compared to Concept 1A, the overall cost would be lower.**
			-1	Substantial construction costs		
	Implementation	Constructability	+1	Project can be constructed with relative ease and/or can maintain existing traffic during construction.		
			-1	Construction of improvements will be a physical challenge and/or will require major detours during construction.	**-1**	**Construction of a roundabout at the WB ramp terminal would be difficult to implement while maintaining existing traffic flow.**
					2	

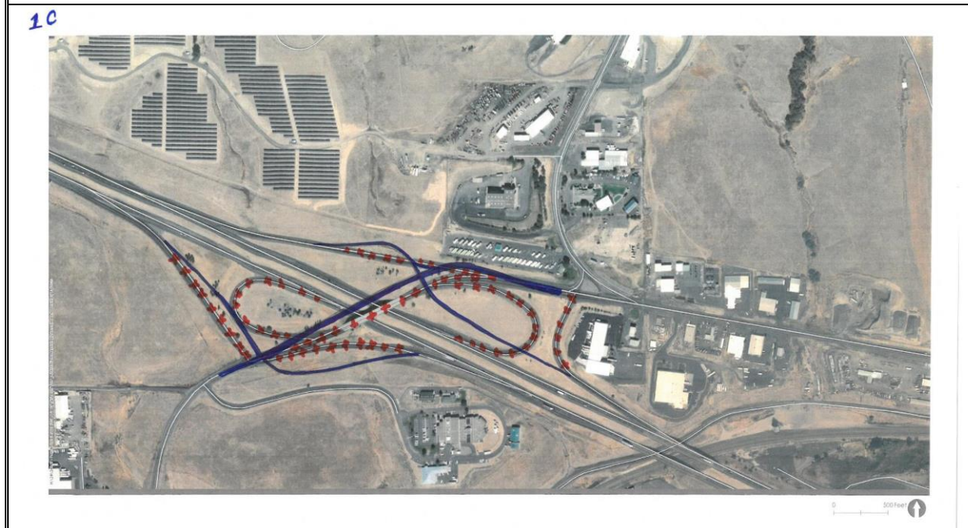


On-line Public Feedback & Miscellaneous Evaluation Comments
Some people opposed to roundabouts (in general, not just at this location)
How does the interchange maintain traffic volumes during roundabout construction?
Can the roundabout be replaced with a more traditional intersection?

Next Steps	Justification
Move forward for further evaluation	Concept scored well. Generally supported by survey respondents. Concept better addresses known geometric issues and does not involve an unnecessary rebuild of the entire interchange.

Table 3 – Concept 1C

Exit 207 – Concept 1C	Evaluation Information				Evaluation Results	
Concept Description and Illustration	**Category**	**Evaluation Criteria**	**Scoring Key**		**Score**	**Comments**
This concept constructs a new diamond interchange and a new overpass structure. This redesign would provide a simpler interchange form. Realigning the I-84 Westbound off-ramp will reduce the potential for slide-offs during the winter and improve access spacing to Airport Road and private accesses along US 30, thereby reducing conflicts in the interchange area. Removing the free-right-turns will also reduce conflicts for people walking through the area.	Transportation	Addresses the identified operational and safety concerns at the interchange: 1) Location of Airport Road across from I-84 WB off-ramp 2) Slide-offs along the I-84 WB off-ramp"	+1	Addresses both identified concerns	**+1**	**The existing WB off ramp is relocated further to the west. This addresses the existing geometric slide-off deficiencies and eliminates the connection across from Airport Road.**
			0	Addresses only one identified concern		
			-1	Does not address concerns and/or introduces new concerns		
		Improves walking and biking access	+1	Improves walking and biking in the study area for both ramps	**+1**	**Like Concept #1A, this design eliminates the free-flowing right-turn movements at the ramp terminals, improving pedestrian comfort and visibility.**
			0	Improves walking and biking in the study area for one ramp		
			-1	Does not improve walking or biking in the study area		
	Land Use/ Economic Development	Accommodates future growth and minimizes right-of-way impacts	+1	Alternative provides for long-term growth in the study area with minimal ROW impacts	**+1**	**The diamond interchange and new overpass can accommodate long-term growth. The right-of-way impacts to private property are expected to be minimal.**
			-1	Alternative precludes long-term growth or has significant ROW impacts		
	Accessibility	Moves in the direction of ODOT access spacing requirements	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**This alternative moves the WB ramp terminal further to the west, thereby increasing the spacing distance to Airport Road and other private accesses along Highway 30.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
	Cost	Cost relative to other concepts	+1	Low construction costs		
			0	Moderate construction costs		
			-1	Substantial construction costs	**-1**	**This option and the new parallel overpass is expected to have substantial construction costs.**
	Implementation	Constructability	+1	Project can be constructed with relative ease and/or can maintain existing traffic during construction.		
			-1	Construction of improvements will be a physical challenge and/or will require major detours during construction.	**-1**	**A new interchange overpass and new diamond ramps would be extremely difficult to construct while maintaining existing traffic flow through the interchange.**
					2	



On-line Public Feedback & Miscellaneous Evaluation Comments	
Similar comments as at 1A	
Next Steps	**Justification**
Do not move forward for further evaluation.	Similar to 1A. Involves a complete rebuild of a functioning interchange.

Table 4 – Concept 2

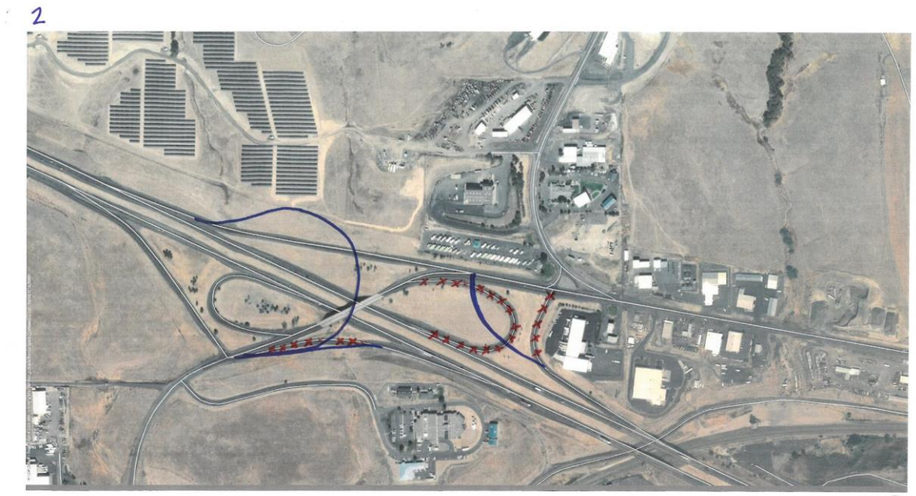
Exit 207 – Concept 2	Evaluation Information				Evaluation Results	
Concept Description and Illustration	**Category**	**Evaluation Criteria**	**Scoring Key**		**Score**	**Comments**
This concept constructs a flyover ramp and modifies the westbound ramps. Realigning the I-84 Westbound off-ramp will reduce the potential for slide-offs during the winter and improve access spacing to Airport Road and private accesses along US 30, thereby reducing conflicts in the interchange area. Removing the free-right-turns will also reduce conflicts for people walking through the area.	Transportation	Addresses the identified operational and safety concerns at the interchange: 1) Location of Airport Road across from I-84 WB off-ramp 2) Slide-offs along the I-84 WB off-ramp"	+1	Addresses both identified concerns	**+1**	**The existing WB off ramp is relocated further to the west. This addresses the existing geometric slide-off deficiencies and eliminates the connection across from Airport Road.**
			0	Addresses only one identified concern		
			-1	Does not address concerns and/or introduces new concerns		
		Improves walking and biking access	+1	Improves walking and biking in the study area for both ramps		
			0	Improves walking and biking in the study area for one ramp		
			-1	Does not improve walking or biking in the study area	**-1**	**There are minimal improvements to the walking or biking environment.**
	Land Use/ Economic Development	Accommodates future growth and minimizes right-of-way impacts	+1	Alternative provides for long-term growth in the study area with minimal ROW impacts	**+1**	**The fly-over is anticipated to provide for long-term growth in the study area. The right-of-way impacts to private property are expected to be minimal.**
			-1	Alternative precludes long-term growth or has significant ROW impacts		
	Accessibility	Moves in the direction of ODOT access spacing requirements	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**This alternative moves the WB ramp terminal further to the west, thereby increasing the spacing distance to Airport Road and other private accesses along Highway 30. Compared to the other evaluated concepts, this improved access spacing is not as significant.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
	Cost	Cost relative to other concepts	+1	Low construction costs		
			0	Moderate construction costs		
			-1	Substantial construction costs	**-1**	**The construction of a fly-over ramp is anticipated to have substantial construction costs. Further, the eastbound left-turn volumes do not warrant such a massive and costly structure.**
	Implementation	Constructability	+1	Project can be constructed with relative ease and/or can maintain existing traffic during construction.		
			-1	Construction of improvements will be a physical challenge and/or will require major detours during construction.	**-1**	**The construction of a fly-over ramp will be an engineering challenge while maintaining existing traffic flow.**
					0	
On-line Public Feedback & Miscellaneous Evaluation Comments						
Like the relocation of the WB off-ramp.						
Concern about the cost of the concept, especially relative to others and whether the flyover may result in wintertime slide issues.						
Next Steps	**Justification**					
Do not move forward for further evaluation.	Flyover ramp is not necessary nor proportionate to the interchange volumes.					

Table 5 – Concept 3

Exit 207 – Concept 3	Evaluation Information				Evaluation Results	
Concept Description and Illustration	**Category**	**Evaluation Criteria**	**Scoring Key**		**Score**	**Comments**
This concept provides minimal changes to the interchange. It realigns the I-84 Westbound off-ramp to reduce the potential for slide-offs during the winter and improve access spacing to Airport Road and private accesses along US 30, thereby reducing conflicts in the interchange area. It also realigns Airport Road to provide more spacing between Airport Road and the I-84 Westbound off-ramp. It creates a new access road behind businesses along the northside of US 30 (Westgate) so that they can take access from that road instead of US 30; thereby reducing the number of accesses within ¼-mile of the I-84 interchange.	Transportation	Addresses the identified operational and safety concerns at the interchange: 1) Location of Airport Road across from I-84 WB off-ramp 2) Slide-offs along the I-84 WB off-ramp"	+1	Addresses both identified concerns	**+1**	**The existing WB off ramp is relocated slightly to the west and the Airport Road intersection is relocated slightly to the east. This addresses the existing geometric slide-off deficiencies and eliminates the connection across from Airport Road.**
			0	Addresses only one identified concern		
			-1	Does not address concerns and/or introduces new concerns		
		Improves walking and biking access	+1	Improves walking and biking in the study area for both ramps		
			0	Improves walking and biking in the study area for one ramp		
			-1	Does not improve walking or biking in the study area	**-1**	**Compared to Concepts #1A-#1C, this concept does not improve walking or biking conditions in the vicinity of the existing interchange ramps.**
	Land Use/ Economic Development	Accommodates future growth and minimizes right-of-way impacts	+1	Alternative provides for long-term growth in the study area with minimal ROW impacts		
			-1	Alternative precludes long-term growth or has significant ROW impacts	**-1**	**The backage road paralleling the north side of Highway 30 will require right-of-way acquisition. The Airport Road realignment may impact the OSP crime lab and/or the parking area.**
	Accessibility	Moves in the direction of ODOT access spacing requirements	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**This alternative moves the WB ramp terminal slightly to the west, thereby increasing the spacing distance to Airport Road and other private accesses along Highway 30. The backage road along the north side of Highway 30 would further improve access management.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
	Cost	Cost relative to other concepts	+1	Low construction costs	**+1**	**In comparison to other concepts, this option is less expensive.**
			0	Moderate construction costs		
			-1	Substantial construction costs		
	Implementation	Constructability	+1	Project can be constructed with relative ease and/or can maintain existing traffic during construction.	**+1**	**The entire project could be constructed while maintaining existing traffic flow between I-84 and Airport Road.**
			-1	Construction of improvements will be a physical challenge and/or will require major detours during construction.		
					2	

On-line Public Feedback & Miscellaneous Evaluation Comments
Like the simplicity and that this may be the lowest cost option.
New WB off-ramp should be designed to alleviate slide-off/winter start-up issues.
Sight distance will need to be re-evaluated from the new WB off-ramp with respect to the curve to the west on US 30.
Eliminates a local street across from the WB off-ramp, but creates one additional intersection in closer proximity to WB on ramp.

Next Steps	Justification
Move forward for further evaluation	Potentially the least costly option while addressing the primary issues at the interchange.

Table 6 – Concept Accessory Elements

Exit 207 – Concept Accessory #1	Evaluation Results	
Concept Description and Illustration		**Comments**
This accessory creates new access roads on the north and south sides of US 30 (Westgate) so that businesses can take access from these roads instead of US 30; thereby reducing the number of accesses within ¼-mile of the I-84 interchange. This accessory can be paired with concepts 1A, 1B, 1C, and 2. The frontage road elements can be paired with Concept 3.	Positives:	This accessory moves the Airport Road intersection away from the I-84 WB off-ramp. The new frontage and backage roads on Highway 30 will significantly improve access management within the vicinity of the WB off-ramp.
	Negatives:	This option requires a fairly significant amount of right of way acquisition. It would increase the travel distance between Airport Road and I-84. This may be an important concern for the Pendleton Police Department and OSP offices. New backage road would need to cross a fairly sizable ravine.
		
On-line Public Feedback & Miscellaneous Evaluation Comments		
Like that it provides access to businesses away from the interchange relocates the Airport Road access.		
Concern about business access, cost, and ability to construct given the topography and land-use.		
Next Steps		
Do not move forward for further evaluation.	Cost and implementation challenges.	

Table 7 – Concept Accessory Elements

Exit 207 – Concept Accessory #2	Evaluation Results	
Concept Description and Illustration		**Comments**
This accessory creates a roundabout intersection with four legs: Airport Road, US 30 (Westgate), and a new access road behind the businesses on the north side of US 30. This accessory can be paired with concepts 1A, 1B, 1C, and 2. It improves access spacing by moving access to the northern businesses to the new access road.	Positives:	A new roundabout at Airport Road would result in a fully complete and modernized pedestrian and bicycle network. The roundabout could be constructed with minimal impacts to private right-of-way. The backage road along the north side of Highway 30 improves access management.
	Negatives:	The backage road requires right of way acquisition. Construction of a roundabout would require significant grading. A roundabout would be difficult to construct while maintaining existing traffic flow along Airport Road.
		
On-line Public Feedback & Miscellaneous Evaluation Comments		
Like that it relocates access and moves the Airport Road intersection. Roundabout may be in public ROW already.		
Concern about business access, cost, and ability to construct given the topography and land-use.		
Some opposed to roundabouts (in general, not just at this location)		
Next Steps		
Move forward for further evaluation, as an accessory to Concept 1B.	Improves access spacing	

Section 2 Exit 210 Concepts

Table 8 – Concept 1

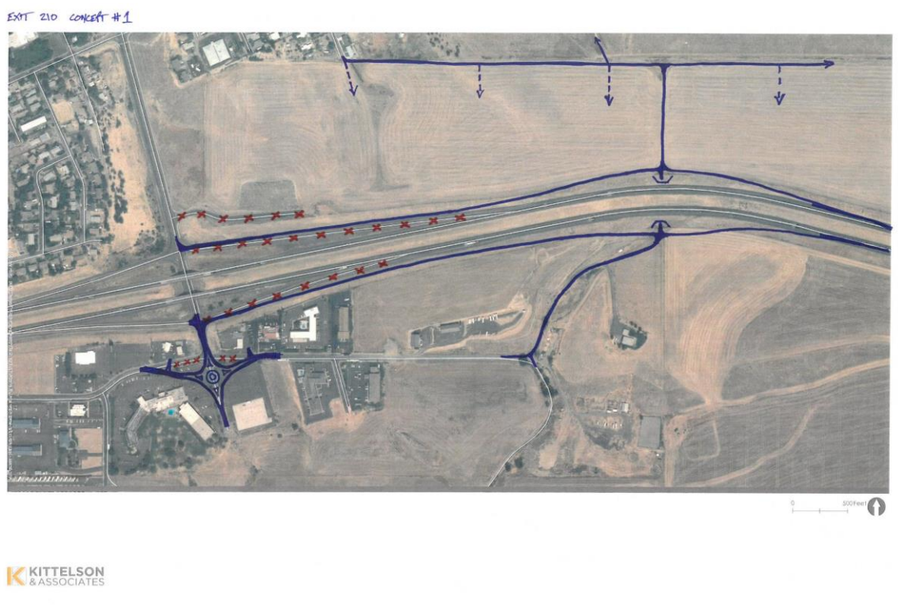
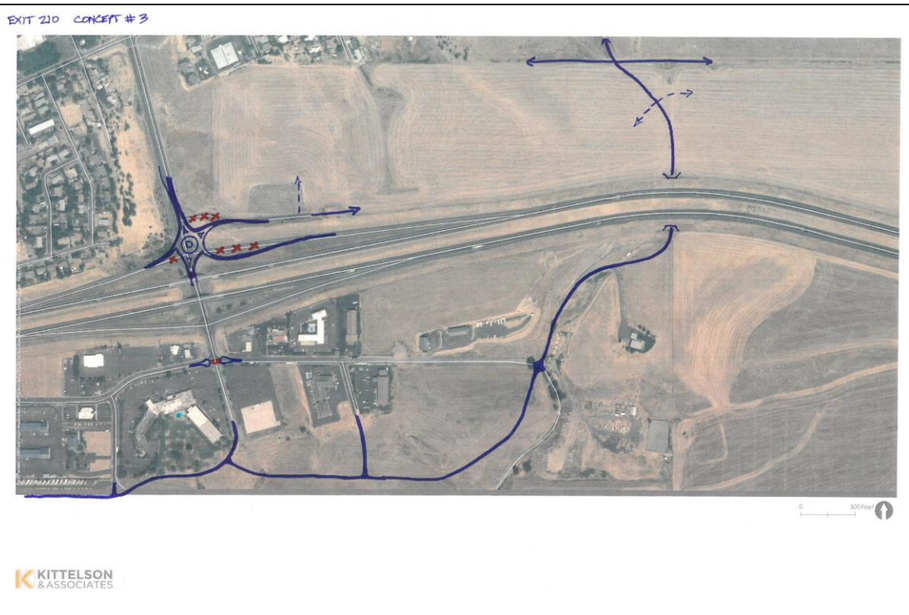
Exit 210 – Concept 1	Evaluation Information				Evaluation Results	
Concept Description and Illustration	**Category**	**Evaluation Criteria**	**Scoring Key**		**Score**	**Comments**
This concept converts the existing interchange to a split diamond interchange in which the westbound off-ramp and the eastbound on-ramp would be further to the east (where Old Dump Road is). This would allow development and existing neighborhoods north of I-84 to take access from a new road connecting to the new on/off ramps. It also closes off Kirk Avenue, eliminating the close spacing from the westbound ramp terminal. This concept relocates Nye Avenue further away from the eastbound ramp terminal and uses a roundabout to improve circulation. These adjustments improve access spacing thereby reducing potential conflicts and improving the capacity of the roadways.	Transportation	Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**This concept closes off Kirk Avenue, eliminating the close spacing from the WB ramp terminal.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
		Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**This concept relocates Nye Avenue further away from the EB ramp terminal and utilizes a roundabout intersection form to improve circulation efficiency**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
	Land Use/ Economic Development	Accommodates future growth and minimizes right-of-way impacts	+1	Alternative provides for long-term growth in the study area with minimal ROW impacts		
			-1	Alternative precludes long-term growth or has significant ROW impacts	**-1**	**There would be ROW impacts associated with a new interchange at Old Dump Road. The new circulation network serving the northeast quadrant would require ROW, but most of these impacts would affect currently undeveloped property. Some infrastructure would be located outside the current Pendleton UGB.**
	Accessibility	Moves in the direction of ODOT access spacing requirements	+1	Provides direct and efficient access to properties in the northeast quadrant of the interchange.	**+1**	**The new split diamond interchange at Old Dump Road would provide direct access to the northeast quadrant of the interchange.**
			-1	Provides indirect or inefficient access to properties in the northeast quadrant of the interchange.		
	Cost	Cost relative to other concepts	+1	Low construction costs		
			0	Moderate construction costs		
			-1	Substantial construction costs	**-1**	**A new interchange underpass at Old Dump Road and the associated frontage roads would have substantial construction costs.**
	Implementation	Constructability	+1	Project can be constructed with relative ease and/or can maintain existing traffic during construction.		
			-1	Construction of improvements will be a physical challenge and/or will require major detours during construction.	**-1**	**While the majority of the split diamond interchange could be constructed while maintaining existing traffic, the scale of the project is comparatively large with many unknown complexities.**
					0	
On-line Public Feedback & Miscellaneous Evaluation Comments						
Like that it opens up access to property north of the interchange and provides a different access to the properties on the south side.						
Concern about roundabouts (in general, not just here) and about closing Kirk Avenue.						
Concern that access to north side from the north would be confusing/out-of-direction for potential customers.						
Next Steps	**Justification**					
Move forward for further evaluation.	Third highest score. Supported by survey respondents.					

Table 9 – Concept 2

Exit 210 – Concept 2	Evaluation Information				Evaluation Results	
Concept Description and Illustration	**Category**	**Evaluation Criteria**	**Scoring Key**		**Score**	**Comments**
This concept converts the existing interchange to a split diamond interchange in which the westbound off-ramp and the eastbound on-ramp would be further to the east (where Goad Road is). This would allow development and existing neighborhoods north of I-84 to take access from a new road connecting to the new on/off ramps. It closes off Kirk Avenue, eliminating the close spacing from the westbound ramp terminal. It also relocates Nye Avenue further away from the eastbound ramp terminal and uses a roundabout to improve circulation. These adjustments improve access spacing thereby reducing potential conflicts and improving the capacity of the roadways.	Transportation	Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**This concept closes off Kirk Avenue, eliminating the close spacing from the WB ramp terminal.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
		Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**This concept relocates Nye Avenue further away from the EB ramp terminal and utilizes a roundabout intersection form to improve circulation efficiency**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
	Land Use/ Economic Development	Accommodates future growth and minimizes right-of-way impacts	+1	Alternative provides for long-term growth in the study area with minimal ROW impacts		
			-1	Alternative precludes long-term growth or has significant ROW impacts	**-1**	**There would be ROW impacts associated with a new interchange at Goad Road. All of this infrastructure would be located outside of the Pendleton UGB. The new circulation network serving the northeast quadrant would require ROW, but most of these impacts would affect currently undeveloped property.**
	Accessibility	Moves in the direction of ODOT access spacing requirements	+1	Provides direct and efficient access to properties in the northeast quadrant of the interchange.	**+1**	**The new split diamond interchange at Goad Road would provide direct access to the northeast quadrant of the interchange.**
			-1	Provides indirect or inefficient access to properties in the northeast quadrant of the interchange.		
	Cost	Cost relative to other concepts	+1	Low construction costs		
			0	Moderate construction costs		
			-1	Substantial construction costs	**-1**	**A new interchange at Goad Road and the associated frontage roads would have substantial construction costs.**
	Implementation	Constructability	+1	Project can be constructed with relative ease and/or can maintain existing traffic during construction.		
			-1	Construction of improvements will be a physical challenge and/or will require major detours during construction.	**-1**	**While the majority of the split diamond interchange could be constructed while maintaining existing traffic, the scale of the project is comparatively large with many unknown complexities.**
					0	
On-line Public Feedback & Miscellaneous Evaluation Comments						
Similar comments as to #1.						
FHWA not likely to approve due to proximity of Exit 211.						
Next Steps	**Justification**					
Do not move forward for further evaluation.	Interchange spacing and length of frontage roads are not likely to be approved by FHWA					

Table 10 – Concept 3

Exit 210 – Concept 3	Evaluation Information				Evaluation Results	
Concept Description and Illustration	**Category**	**Evaluation Criteria**	**Scoring Key**		**Score**	**Comments**
This concept creates a five-legged roundabout at the westbound ramp terminal. The roundabout would provide direct access to the northeast quadrant of the interchange via Kirk Avenue. The concept also creates a new south side access road, which allows for removing the intersection of 3rd Drive & Nye Avenue. This reduces conflicts in the study area. It also adds an underpass of I-84 via an extension of Old Dump Road to provide more connections to existing neighborhoods and future development and more evenly distribute traffic.	Transportation	Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines		
			-1	Does not move in the direction of ODOT's access spacing guidelines	**-1**	**The incorporation of Kirk Ave into the WB ramp terminal is questionable from FHWA policy on interchange ramp design with local streets.**
		Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines	**1**	**This concept closes off Nye Avenue and incorporates a new southside backage road.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
	Land Use/ Economic Development	Accommodates future growth and minimizes right-of-way impacts	+1	Alternative provides for long-term growth in the study area with minimal ROW impacts		
			-1	Alternative precludes long-term growth or has significant ROW impacts	**-1**	**A southside backage road would have significant ROW impacts. A new Old Dump Road underpass and associated access roads would also have significant ROW impacts, but would improve north-south connectivity.**
	Accessibility	Moves in the direction of ODOT access spacing requirements	+1	Provides direct and efficient access to properties in the northeast quadrant of the interchange.	**1**	**A five legged roundabout would provide direct access to the northeast quadrant of the interchange.**
			-1	Provides indirect or inefficient access to properties in the northeast quadrant of the interchange.		
	Cost	Cost relative to other concepts	+1	Low construction costs		
			0	Moderate construction costs		
			-1	Substantial construction costs	**-1**	**A roundabout at the WB ramp terminal and the southside backage road would have significant construction costs.**
	Implementation	Constructability	+1	Project can be constructed with relative ease and/or can maintain existing traffic during construction.		
			-1	Construction of improvements will be a physical challenge and/or will require major detours during construction.	**-1**	**There a significant grade challenges associated with a southside backage road. Grades are likely to steep at the WB ramp terminal for a roundabout.**
					-2	



On-line Public Feedback & Miscellaneous Evaluation Comments	
Like the access to the north side properties and the simplicity of the north side solution.	
South side roads may not be feasible. Opposition to closing Nye.	
Next Steps	**Justification**
Do not move forward for further evaluation.	Roundabout constructability challenges and south side roads are not feasible from a grade/topography standpoint. Low score.

Table 11 – Concept 4

Exit 210 – Concept 4	Evaluation Information				Evaluation Results	
Concept Description and Illustration	**Category**	**Evaluation Criteria**	**Scoring Key**		**Score**	**Comments**
This concept modifies the Kirk Avenue/OR-11 intersection so that it is only a right-in/right-out access. This minimizes the operational issues created by the close spacing to the I-84 Westbound off-ramp. The concept also relocates Nye Avenue further away from the eastbound ramp terminal and uses a roundabout to improve circulation. It also adds an underpass of I-84 via an extension of Old Dump Road to provide more connections to existing neighborhoods and future development and more evenly distribute traffic.	Transportation	Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**A Kirk Avenue right-in/right-out access off OR 11 would minimize the operational issues associated with the WB ramp terminal.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
		Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**This concept relocates Nye Avenue further away from the EB ramp terminal and utilizes a roundabout intersection form to improve circulation efficiency.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
	Land Use/ Economic Development	Accommodates future growth and minimizes right-of-way impacts	+1	Alternative provides for long-term growth in the study area with minimal ROW impacts		
			-1	Alternative precludes long-term growth or has significant ROW impacts	**-1**	**The Nye Avenue roundabout would require right-of-way from the Red Lion Hotel. The Old Dump Road access would have right-of-way impacts.**
	Accessibility	Moves in the direction of ODOT access spacing requirements	+1	Provides direct and efficient access to properties in the northeast quadrant of the interchange.		
			-1	Provides indirect or inefficient access to properties in the northeast quadrant of the interchange.	**-1**	**A right-in/right-out access at Kirk Avenue would limit return access to I-84 and other regional destinations.**
	Cost	Cost relative to other concepts	+1	Low construction costs		
			0	Moderate construction costs	**0**	**Compared to other concepts, costs would be more moderate.**
			-1	Substantial construction costs		
	Implementation	Constructability	+1	Project can be constructed with relative ease and/or can maintain existing traffic during construction.	**+1**	**All improvements could be constructed while maintaining existing traffic flow.**
			-1	Construction of improvements will be a physical challenge and/or will require major detours during construction.		
					+1	
On-line Public Feedback & Miscellaneous Evaluation Comments						
Like the simplicity and the use of Kirk Avenue.						
Concern about Kirk being restricted to Right-in/right-out. General roundabout concerns.						
Concerns about property impacts of relocating Nye/3rd intersection.						
Next Steps	**Justification**					
Do not move forward for further evaluation.	Right-in/right-out access only to Kirk Avenue is not an ideal long-term solution.					

Table 12 – Concept 5

Exit 210 – Concept 5	Evaluation Information				Evaluation Results	
Concept Description and Illustration	**Category**	**Evaluation Criteria**	**Scoring Key**		**Score**	**Comments**
This concept realigns the intersection of Kirk Avenue/OR-11 to the north to improve spacing between it and the I-84 Westbound ramp terminal. The concept also relocates the intersection of Nye Avenue/3rd Avenue further from the eastbound ramp terminal. These adjustments improve access spacing thereby reducing potential conflicts and improving the capacity of the roadways.	Transportation	Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**A realigned Kirk Avenue 700 feet to the north along OR 11 would eliminate the operational issues associated with the WB ramp terminal.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
		Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**This concept relocates Nye Avenue further away from the EB ramp terminal.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
	Land Use/ Economic Development	Accommodates future growth and minimizes right-of-way impacts	+1	Alternative provides for long-term growth in the study area with minimal ROW impacts	**+1**	**Realignment of Nye Avenue would have adjacent right-of-way impacts, but significantly less compared to other concepts.**
			-1	Alternative precludes long-term growth or has significant ROW impacts		
	Accessibility	Moves in the direction of ODOT access spacing requirements	+1	Provides direct and efficient access to properties in the northeast quadrant of the interchange.	**+1**	**While slightly relocated to the north, Kirk Avenue would be a full access intersection with OR 11 and provide efficient access back to the I-84 corridor.**
			-1	Provides indirect or inefficient access to properties in the northeast quadrant of the interchange.		
	Cost	Cost relative to other concepts	+1	Low construction costs	**+1**	**Kirk Avenue realignment would be costly, but the overall costs are low compared to other concepts.**
			0	Moderate construction costs		
			-1	Substantial construction costs		
	Implementation	Constructability	+1	Project can be constructed with relative ease and/or can maintain existing traffic during construction.		
			-1	Construction of improvements will be a physical challenge and/or will require major detours during construction.	**-1**	**The Kirk Avenue realignment would require significant regrading and large retaining walls against the adjacent steep hillside.**
					+4	
On-line Public Feedback & Miscellaneous Evaluation Comments						
Like the simplicity and that Kirk Avenue provides full access.						
Questions about whether extending Kirk in this way is really feasible given topography and basalt layers.						
Concerns about property impacts of relocating Nye/3rd intersection.						
Next Steps	**Justification**					
Move forward for further evaluation (including with one version that keeps the current Kirk Avenue as a right-in access, too).	Highest scoring concept. Provides intuitive access to north side.					

Table 13 – Concept 6

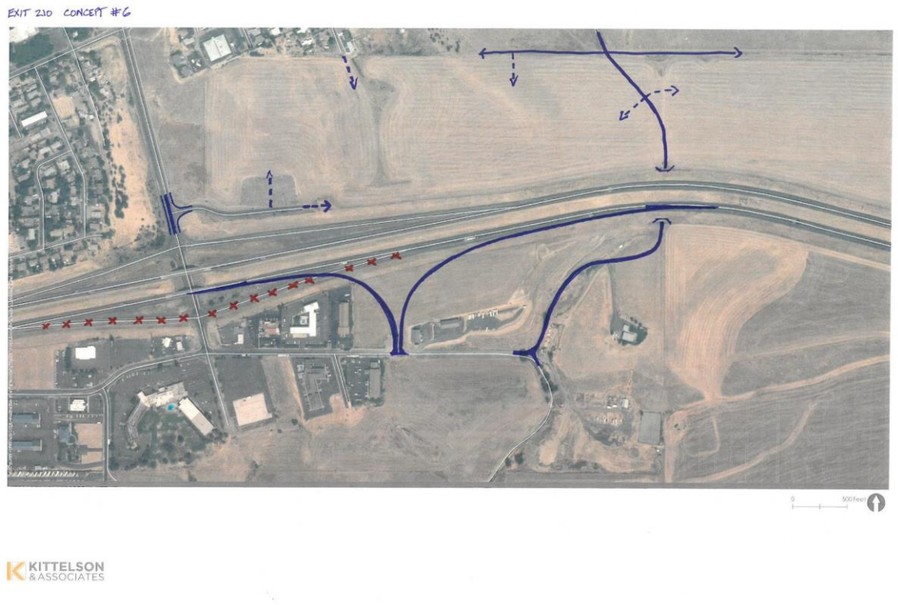
Exit 210 – Concept 6	Evaluation Information				Evaluation Results	
Concept Description and Illustration	**Category**	**Evaluation Criteria**	**Scoring Key**		**Score**	**Comments**
This concept relocates the eastbound ramps, which would eliminate the existing close spacing between Nye Avenue and eastbound ramps. It also modifies the Kirk Avenue/OR-11 access to only permit right-in and right-out access. These adjustments reduce potential vehicle conflicts. It also adds an underpass of I-84 via an extension of Old Dump Road to provide more connections to existing neighborhoods and future development and more evenly distribute traffic.	Transportation	Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**A Kirk Avenue right-in/right-out access off OR 11 would minimize the operational issues associated with the WB ramp terminal.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
		Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**The new buttonhook ramp design at Nye Avenue would eliminate the existing close spacing between Nye Avenue and EB ramp terminal.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
	Land Use/ Economic Development	Accommodates future growth and minimizes right-of-way impacts	+1	Alternative provides for long-term growth in the study area with minimal ROW impacts		
			-1	Alternative precludes long-term growth or has significant ROW impacts	**-1**	**The new buttonhook ramp design and Old Dump Road underpass would have significant ROW impacts.**
	Accessibility	Moves in the direction of ODOT access spacing requirements	+1	Provides direct and efficient access to properties in the northeast quadrant of the interchange.		
			-1	Provides indirect or inefficient access to properties in the northeast quadrant of the interchange.	**-1**	**Access to the northeast quadrant is indirect and inefficient.**
	Cost	Cost relative to other concepts	+1	Low construction costs		
			0	Moderate construction costs		
			-1	Substantial construction costs	**-1**	**Buttonhook ramps and Old Dump Road underpass would have significant construction costs.**
	Implementation	Constructability	+1	Project can be constructed with relative ease and/or can maintain existing traffic during construction.		
			-1	Construction of improvements will be a physical challenge and/or will require major detours during construction.	**-1**	**Button hook ramp design would likely require widening of the I-5 bridge structure over OR 11. The buttonhook design would introduce a significant speed curve on the offramp which would be a challenge to incorporate a design that is adequate for inclement weather conditions.**
					-2	
On-line Public Feedback & Miscellaneous Evaluation Comments						
Like the relocation of the eastbound interchange. Concern that this could create new access challenges, though.						
Relocated interchange uses up developable land.						
Similar feedback as before about Kirk Avenue being used, but as a right-in/right-out access.						
Preliminary Consultant Team Recommendation	**Justification**					
Do not move forward for further evaluation.	Interchange relocation impacts to private property and may transfer access challenges to a new location.					

Table 14 – Concept 7

Exit 210 – Concept 7	Evaluation Information				Evaluation Results	
Concept Description and Illustration	**Category**	**Evaluation Criteria**	**Scoring Key**		**Score**	**Comments**
This option creates roundabouts at the I-84 ramp terminals and at Nye Avenue. This would help reduce some of the concerns about having intersections closely spaced to the I-84 ramps by reducing potential conflicts and improving the capacity of the roadways.	Transportation	Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines		
			-1	Does not move in the direction of ODOT's access spacing guidelines	**-1**	**The incorporation of Kirk Ave into the WB ramp terminal is questionable from FHWA policy on interchange ramp design with local streets.**
		Addresses the limited intersection spacing between the WB ramp terminal and Kirk Avenue.	+1	Moves in the direction of ODOT's access spacing guidelines	**+1**	**Roundabouts at the EB ramp terminal and Nye Avenue would introduce a constant flowing interchange minimizing the concerns associated with closely spaced ramps/intersections.**
			-1	Does not move in the direction of ODOT's access spacing guidelines		
	Land Use/ Economic Development	Accommodates future growth and minimizes right-of-way impacts	+1	Alternative provides for long-term growth in the study area with minimal ROW impacts	**+1**	**Realignment of Nye Avenue would have adjacent right-of-way impacts, but significantly less compared to other concepts. ROW impacts at the other roundabouts would not impact high-value portions of private property.**
			-1	Alternative precludes long-term growth or has significant ROW impacts		
	Accessibility	Moves in the direction of ODOT access spacing requirements	+1	Provides direct and efficient access to properties in the northeast quadrant of the interchange.	**+1**	**A five-legged roundabout would provide direct access to the northeast quadrant of the interchange.**
			-1	Provides indirect or inefficient access to properties in the northeast quadrant of the interchange.		
	Cost	Cost relative to other concepts	+1	Low construction costs		
			0	Moderate construction costs		
			-1	Substantial construction costs	**-1**	**All three roundabouts would have significant construction costs.**
	Implementation	Constructability	+1	Project can be constructed with relative ease and/or can maintain existing traffic during construction.		
			-1	Construction of improvements will be a physical challenge and/or will require major detours during construction.	**-1**	**Grades are likely to steep at the EB and WB ramp terminals for a roundabout. It would be difficult to maintain existing traffic flow on OR 11 and the interchange during construction.**
					0	

On-line Public Feedback & Miscellaneous Evaluation Comments
Like the simplicity and potential cost, relative to other concepts.
Topography may make this unrealistic.
General roundabout concerns.

Preliminary Consultant Team Recommendation	Justification
Do not move forward for further evaluation.	Roundabouts at the EB and WB ramp terminals are likely not feasible due to significant downslope of OR 11

NEXT STEPS

The project team will perform more detailed analyses of the following concepts:

Exit 207

- Concept 1B, w/ Accessory #2
- Concept 3

Exit 210

- Concept 1
- Concept 5 (as shown)
- Concept 5B (with right-in access at Kirk)

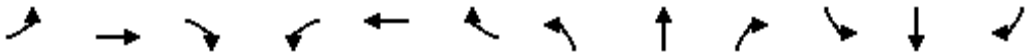
The results of this evaluation will be presented to the project advisory committees and the general public at upcoming virtual meetings and used to select the preferred alternative at each location.

Attachment B
Intersection Operations
Worksheets and Signal Warrants

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	27	87	109	88	46	104	314	53	42	226	36
Future Volume (vph)	15	27	87	109	88	46	104	314	53	42	226	36
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		5%			-4%			4%			-4%	
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.91			0.97			0.98			0.98	
Flt Protected		0.99			0.98			0.99			0.99	
Satd. Flow (prot)		1511			1568			2958			2601	
Flt Permitted		0.95			0.80			0.80			0.85	
Satd. Flow (perm)		1442			1275			2398			2225	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	17	30	97	121	98	51	116	349	59	47	251	40
RTOR Reduction (vph)	0	62	0	0	12	0	0	14	0	0	14	0
Lane Group Flow (vph)	0	82	0	0	258	0	0	510	0	0	324	0
Heavy Vehicles (%)	0%	0%	3%	0%	13%	20%	5%	9%	0%	100%	15%	18%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.7			13.7			15.5			15.5	
Effective Green, g (s)		13.7			13.7			15.5			15.5	
Actuated g/C Ratio		0.36			0.36			0.41			0.41	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		517			457			973			902	
v/s Ratio Prot												
v/s Ratio Perm		0.06			c0.20			c0.21			0.15	
v/c Ratio		0.16			0.57			0.52			0.36	
Uniform Delay, d1		8.3			9.9			8.6			7.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			1.6			0.5			0.2	
Delay (s)		8.5			11.5			9.1			8.1	
Level of Service		A			B			A			A	
Approach Delay (s)		8.5			11.5			9.1			8.1	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	38.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	56.4%	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)	15	27	87	109	88	46	104	314	53	42	226	36
Future Volume (veh/h)	15	27	87	109	88	46	104	314	53	42	226	36
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	1614	1614	1614	1715	1715	1715	1540	1540	1540	1688	1688	1688
Adj Flow Rate, veh/h	17	30	97	121	98	51	116	349	59	47	251	40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	13	13	13	9	9	9	15	15	15
Cap, veh/h	176	108	269	351	191	80	337	728	122	249	906	139
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	78	384	953	537	679	283	382	1952	327	202	2427	373
Grp Volume(v), veh/h	144	0	0	270	0	0	281	0	243	180	0	158
Grp Sat Flow(s),veh/h/ln	1415	0	0	1499	0	0	1318	0	1343	1533	0	1469
Q Serve(g_s), s	0.0	0.0	0.0	1.9	0.0	0.0	1.6	0.0	3.6	0.0	0.0	2.0
Cycle Q Clear(g_c), s	2.1	0.0	0.0	3.9	0.0	0.0	4.0	0.0	3.6	2.0	0.0	2.0
Prop In Lane	0.12		0.67	0.45		0.19	0.41		0.24	0.26		0.25
Lane Grp Cap(c), veh/h	553	0	0	622	0	0	687	0	501	746	0	548
V/C Ratio(X)	0.26	0.00	0.00	0.43	0.00	0.00	0.41	0.00	0.48	0.24	0.00	0.29
Avail Cap(c_a), veh/h	1992	0	0	2113	0	0	1960	0	1878	2190	0	2054
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.5	0.0	0.0	8.1	0.0	0.0	6.3	0.0	6.3	5.7	0.0	5.7
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.5	0.0	0.0	0.4	0.0	0.7	0.2	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	0.4	0.0	0.0	0.8	0.0	0.0	0.6	0.0	0.6	0.4	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.7	0.0	0.0	8.6	0.0	0.0	6.7	0.0	7.0	5.9	0.0	6.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		144			270			524			338	
Approach Delay, s/veh		7.7			8.6			6.8			6.0	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.2		11.9		14.2		11.9				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		36.5		34.5		36.5		34.5				
Max Q Clear Time (g_c+I1), s		6.0		4.1		4.0		5.9				
Green Ext Time (p_c), s		3.7		0.9		2.3		1.8				

Intersection Summary												
HCM 6th Ctrl Delay			7.1									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	10	111	41	173	429	0	0	196	226
Future Vol, veh/h	0	0	0	10	111	41	173	429	0	0	196	226
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Yield	Yield	Yield	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	-2	-	-	4	-	-	-4	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	10	10	10	8	0	0	10	10
Mvmt Flow	0	0	0	11	123	46	192	477	0	0	218	251

Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	1205	1330	477	469	0	-	-	-	0	
Stage 1	861	861	-	-	-	-	-	-	-	
Stage 2	344	469	-	-	-	-	-	-	-	
Critical Hdwy	6	6.2	6.1	4.2	-	-	-	-	-	
Critical Hdwy Stg 1	5	5.2	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5	5.2	-	-	-	-	-	-	-	
Follow-up Hdwy	3.5	4.09	3.39	2.29	-	-	-	-	-	
Pot Cap-1 Maneuver	234	173	587	1052	-	0	0	-	-	
Stage 1	459	398	-	-	-	0	0	-	-	
Stage 2	750	577	-	-	-	0	0	-	-	
Platoon blocked, %					-			-	-	
Mov Cap-1 Maneuver	191	0	587	1052	-	-	-	-	-	
Mov Cap-2 Maneuver	191	0	-	-	-	-	-	-	-	
Stage 1	375	0	-	-	-	-	-	-	-	
Stage 2	750	0	-	-	-	-	-	-	-	

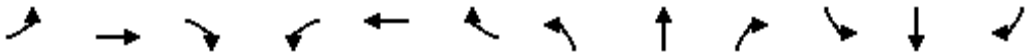
Approach	WB	NB	SB
HCM Control Delay, s	20	2.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1052	-	417	-	-
HCM Lane V/C Ratio	0.183	-	0.432	-	-
HCM Control Delay (s)	9.2	-	20	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.7	-	2.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	234	150	155	0	0	0	0	368	25	54	152	0
Future Volume (vph)	234	150	155	0	0	0	0	368	25	54	152	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-2%			-2%			-4%			4%	
Total Lost time (s)		4.5						4.5		4.5	4.5	
Lane Util. Factor		1.00						1.00		1.00	1.00	
Frt		0.96						0.99		1.00	1.00	
Flt Protected		0.98						1.00		0.95	1.00	
Satd. Flow (prot)		1512						1622		1481	1573	
Flt Permitted		0.98						1.00		0.33	1.00	
Satd. Flow (perm)		1512						1622		515	1573	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	260	167	172	0	0	0	0	409	28	60	169	0
RTOR Reduction (vph)	0	19	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	580	0	0	0	0	0	434	0	60	169	0
Heavy Vehicles (%)	10%	10%	10%	0%	0%	0%	0%	9%	10%	10%	9%	0%
Parking (#/hr)									0			
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		28.7						21.6		21.6	21.6	
Effective Green, g (s)		28.7						21.6		21.6	21.6	
Actuated g/C Ratio		0.48						0.36		0.36	0.36	
Clearance Time (s)		4.5						4.5		4.5	4.5	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		731						590		187	572	
v/s Ratio Prot								c0.27			0.11	
v/s Ratio Perm		0.38								0.12		
v/c Ratio		0.79						0.74		0.32	0.30	
Uniform Delay, d1		12.8						16.4		13.6	13.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		5.9						4.7		1.0	0.3	
Delay (s)		18.7						21.1		14.6	13.7	
Level of Service		B						C		B	B	
Approach Delay (s)		18.7			0.0			21.1			13.9	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	59.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

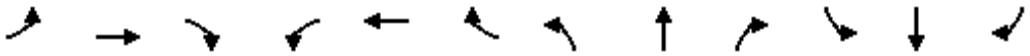
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	234	150	155	0	0	0	0	368	25	54	152	0
Future Volume (veh/h)	234	150	155	0	0	0	0	368	25	54	152	0
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	0.90	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1822	1684	1822				0	1770	1770	1527	1540	0
Adj Flow Rate, veh/h	260	167	172				0	409	28	60	169	0
Peak Hour Factor	0.90	0.90	0.90				0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	10	0				0	9	9	10	9	0
Cap, veh/h	312	200	206				0	542	37	245	566	0
Arrive On Green	0.46	0.46	0.46				0.00	0.37	0.37	0.37	0.37	0.00
Sat Flow, veh/h	681	437	451				0	1474	101	843	1540	0
Grp Volume(v), veh/h	599	0	0				0	0	437	60	169	0
Grp Sat Flow(s),veh/h/ln	1569	0	0				0	0	1575	843	1540	0
Q Serve(g_s), s	17.3	0.0	0.0				0.0	0.0	12.5	3.5	4.0	0.0
Cycle Q Clear(g_c), s	17.3	0.0	0.0				0.0	0.0	12.5	16.0	4.0	0.0
Prop In Lane	0.43		0.29				0.00		0.06	1.00		0.00
Lane Grp Cap(c), veh/h	719	0	0				0	0	579	245	566	0
V/C Ratio(X)	0.83	0.00	0.00				0.00	0.00	0.75	0.25	0.30	0.00
Avail Cap(c_a), veh/h	1232	0	0				0	0	931	433	911	0
HCM Platoon Ratio	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				0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.3	0.0	0.0				0.0	0.0	14.3	21.3	11.6	0.0
Incr Delay (d2), s/veh	2.6	0.0	0.0				0.0	0.0	2.0	0.5	0.3	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
%ile BackOfQ(50%),veh/ln	5.2	0.0	0.0				0.0	0.0	4.1	0.7	1.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.9	0.0	0.0				0.0	0.0	16.3	21.8	11.9	0.0
LnGrp LOS	B	A	A				A	A	B	C	B	A
Approach Vol, veh/h		599						437			229	
Approach Delay, s/veh		14.9						16.3			14.5	
Approach LOS		B						B			B	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		23.5		28.1		23.5						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		30.5		40.5		30.5						
Max Q Clear Time (g_c+I1), s		14.5		19.3		18.0						
Green Ext Time (p_c), s		2.5		4.4		1.0						

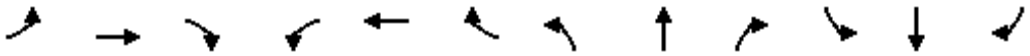
Intersection Summary												
HCM 6th Ctrl Delay			15.3									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	32	3	1	23	130	2	19	0	110	20	177
Future Volume (vph)	244	32	3	1	23	130	2	19	0	110	20	177
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			0%			4%	
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.89			1.00			0.92	
Flt Protected		0.96			1.00			1.00			0.98	
Satd. Flow (prot)		1540			1502			1196			1445	
Flt Permitted		0.68			1.00			0.97			0.88	
Satd. Flow (perm)		1094			1501			1168			1291	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	271	36	3	1	26	144	2	21	0	122	22	197
RTOR Reduction (vph)	0	1	0	0	80	0	0	0	0	0	67	0
Lane Group Flow (vph)	0	309	0	0	91	0	0	23	0	0	274	0
Heavy Vehicles (%)	10%	0%	0%	0%	10%	2%	0%	50%	0%	0%	0%	13%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		19.8			19.8			15.9			15.9	
Effective Green, g (s)		19.8			19.8			15.9			15.9	
Actuated g/C Ratio		0.44			0.44			0.36			0.36	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		484			664			415			459	
v/s Ratio Prot												
v/s Ratio Perm		c0.28			0.06			0.02			c0.21	
v/c Ratio		0.64			0.14			0.06			0.60	
Uniform Delay, d1		9.7			7.4			9.5			11.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.8			0.1			0.1			2.1	
Delay (s)		12.4			7.5			9.5			13.9	
Level of Service		B			A			A			B	
Approach Delay (s)		12.4			7.5			9.5			13.9	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	44.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	64.2%	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)	244	32	3	1	23	130	2	19	0	110	20	177
Future Volume (veh/h)	244	32	3	1	23	130	2	19	0	110	20	177
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	1750	1750	1750	1614	1614	1614	1068	1068	1068	1663	1663	1663
Adj Flow Rate, veh/h	271	36	3	1	26	144	2	21	0	122	22	197
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	10	10	10	50	50	50	0	0	0
Cap, veh/h	621	68	4	131	71	380	149	366	0	311	77	291
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.35	0.35	0.00	0.35	0.35	0.35
Sat Flow, veh/h	1174	210	14	2	219	1179	23	1033	0	383	218	822
Grp Volume(v), veh/h	310	0	0	171	0	0	23	0	0	341	0	0
Grp Sat Flow(s),veh/h/ln	1398	0	0	1401	0	0	1056	0	0	1424	0	0
Q Serve(g_s), s	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0
Cycle Q Clear(g_c), s	4.9	0.0	0.0	2.6	0.0	0.0	0.4	0.0	0.0	5.6	0.0	0.0
Prop In Lane	0.87		0.01	0.01		0.84	0.09		0.00	0.36		0.58
Lane Grp Cap(c), veh/h	694	0	0	582	0	0	514	0	0	680	0	0
V/C Ratio(X)	0.45	0.00	0.00	0.29	0.00	0.00	0.04	0.00	0.00	0.50	0.00	0.00
Avail Cap(c_a), veh/h	2052	0	0	2067	0	0	1349	0	0	1818	0	0
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	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.9	0.0	0.0	7.3	0.0	0.0	5.9	0.0	0.0	7.6	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.6	0.0	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	1.0	0.0	0.0	0.5	0.0	0.0	0.1	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.4	0.0	0.0	7.5	0.0	0.0	6.0	0.0	0.0	8.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		310			171			23			341	
Approach Delay, s/veh		8.4			7.5			6.0			8.1	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.3		13.5		14.3		13.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.5		38.5		32.5		38.5				
Max Q Clear Time (g_c+I1), s		2.4		6.9		7.6		4.6				
Green Ext Time (p_c), s		0.1		2.3		2.3		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			8.0									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	144	79	5	0	0	0	0	0	121	37	119	0
Future Vol, veh/h	144	79	5	0	0	0	0	0	121	37	119	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	150	150	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-2	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	2
Mvmt Flow	160	88	6	0	0	0	0	0	134	41	132	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	281	348	132	-	0	0	134	0	0
Stage 1	214	214	-	-	-	-	-	-	-
Stage 2	67	134	-	-	-	-	-	-	-
Critical Hdwy	6.5	6.6	6.3	-	-	-	4.2	-	-
Critical Hdwy Stg 1	5.5	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.5	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	-	-	-	2.29	-	-
Pot Cap-1 Maneuver	692	563	896	0	-	-	1403	-	0
Stage 1	803	711	-	0	-	-	-	-	0
Stage 2	936	770	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	672	0	896	-	-	-	1403	-	-
Mov Cap-2 Maneuver	672	0	-	-	-	-	-	-	-
Stage 1	803	0	-	-	-	-	-	-	-
Stage 2	909	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0	1.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	678	1403	-
HCM Lane V/C Ratio	-	-	0.374	0.029	-
HCM Control Delay (s)	-	-	13.4	7.6	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	1.7	0.1	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	119	51	56	0	144	0	0	37	111
Future Vol, veh/h	0	0	0	119	51	56	0	144	0	0	37	111
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-2	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	92	90	90	90	90	90
Heavy Vehicles, %	2	2	2	10	10	10	10	10	10	10	10	10
Mvmt Flow	0	0	0	132	57	62	0	160	0	0	41	123

Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	263	324	160	164	0	-	-	-	0	
Stage 1	160	160	-	-	-	-	-	-	-	
Stage 2	103	164	-	-	-	-	-	-	-	
Critical Hdwy	6.1	6.2	6.1	4.2	-	-	-	-	-	
Critical Hdwy Stg 1	5.1	5.2	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.1	5.2	-	-	-	-	-	-	-	
Follow-up Hdwy	3.59	4.09	3.39	2.29	-	-	-	-	-	
Pot Cap-1 Maneuver	730	602	872	1367	-	0	0	-	-	
Stage 1	865	764	-	-	-	0	0	-	-	
Stage 2	912	761	-	-	-	0	0	-	-	
Platoon blocked, %					-			-	-	
Mov Cap-1 Maneuver	730	0	872	1367	-	-	-	-	-	
Mov Cap-2 Maneuver	730	0	-	-	-	-	-	-	-	
Stage 1	865	0	-	-	-	-	-	-	-	
Stage 2	912	0	-	-	-	-	-	-	-	

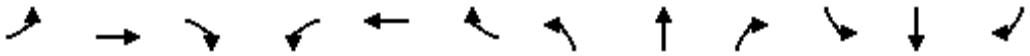
Approach	WB	NB	SB
HCM Control Delay, s	11.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1367	-	770	-	-
HCM Lane V/C Ratio	-	-	0.326	-	-
HCM Control Delay (s)	0	-	11.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	1.4	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	27	87	109	88	19	104	340	27	8	260	36
Future Volume (vph)	15	27	87	109	88	19	104	340	27	8	260	36
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		5%			-4%			4%			-4%	
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.91			0.99			0.99			0.98	
Flt Protected		0.99			0.98			0.99			1.00	
Satd. Flow (prot)		1522			1660			2980			3109	
Flt Permitted		0.95			0.77			0.81			0.94	
Satd. Flow (perm)		1455			1314			2440			2925	
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)	16	29	93	116	94	20	111	362	29	9	277	38
RTOR Reduction (vph)	0	62	0	0	5	0	0	6	0	0	14	0
Lane Group Flow (vph)	0	76	0	0	225	0	0	496	0	0	310	0
Heavy Vehicles (%)	0%	0%	2%	0%	9%	0%	2%	9%	5%	25%	7%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		11.9			11.9			15.2			15.2	
Effective Green, g (s)		11.9			11.9			15.2			15.2	
Actuated g/C Ratio		0.33			0.33			0.42			0.42	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		479			433			1027			1231	
v/s Ratio Prot												
v/s Ratio Perm		0.05			c0.17			c0.20			0.11	
v/c Ratio		0.16			0.52			0.48			0.25	
Uniform Delay, d1		8.6			9.8			7.6			6.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			1.1			0.4			0.1	
Delay (s)		8.7			10.9			8.0			6.9	
Level of Service		A			B			A			A	
Approach Delay (s)		8.7			10.9			8.0			6.9	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	36.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.5%	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)	15	27	87	109	88	19	104	340	27	8	260	36
Future Volume (veh/h)	15	27	87	109	88	19	104	340	27	8	260	36
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	1614	1614	1614	1770	1770	1770	1540	1540	1540	1798	1798	1798
Adj Flow Rate, veh/h	16	29	93	116	94	20	111	362	29	9	277	38
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, %	0	0	0	9	9	9	9	9	9	7	7	7
Cap, veh/h	190	92	234	391	186	33	353	807	64	171	1099	147
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	87	376	957	666	761	136	370	2143	171	30	2920	392
Grp Volume(v), veh/h	138	0	0	230	0	0	269	0	233	172	0	152
Grp Sat Flow(s),veh/h/ln	1421	0	0	1563	0	0	1312	0	1371	1776	0	1566
Q Serve(g_s), s	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	3.0	0.0	0.0	1.6
Cycle Q Clear(g_c), s	1.9	0.0	0.0	2.9	0.0	0.0	3.4	0.0	3.0	1.6	0.0	1.6
Prop In Lane	0.12		0.67	0.50		0.09	0.41		0.12	0.05		0.25
Lane Grp Cap(c), veh/h	517	0	0	611	0	0	708	0	516	828	0	589
V/C Ratio(X)	0.27	0.00	0.00	0.38	0.00	0.00	0.38	0.00	0.45	0.21	0.00	0.26
Avail Cap(c_a), veh/h	2079	0	0	2274	0	0	2235	0	2222	2983	0	2538
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.5	0.0	0.0	7.8	0.0	0.0	5.6	0.0	5.6	5.1	0.0	5.1
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.4	0.0	0.0	0.3	0.0	0.6	0.1	0.0	0.2
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	0.4	0.0	0.0	0.6	0.0	0.0	0.5	0.0	0.4	0.3	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.8	0.0	0.0	8.2	0.0	0.0	5.9	0.0	6.2	5.2	0.0	5.3
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		138			230			502			324	
Approach Delay, s/veh		7.8			8.2			6.1			5.3	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		13.4		10.3		13.4		10.3				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		38.5		32.5		38.5		32.5				
Max Q Clear Time (g_c+I1), s		5.4		3.9		3.6		4.9				
Green Ext Time (p_c), s		3.6		0.8		2.1		1.5				

Intersection Summary												
HCM 6th Ctrl Delay			6.5									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	10	66	57	173	475	0	0	196	270
Future Vol, veh/h	0	0	0	10	66	57	173	475	0	0	196	270
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Yield	Yield	Yield	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	-2	-	-	4	-	-	-4	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	10	10	10	10	6	0	0	4	10
Mvmt Flow	0	0	0	11	71	61	186	511	0	0	211	290

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1239	1384	511	501	0	-	-	-	0
Stage 1	883	883	-	-	-	-	-	-	-
Stage 2	356	501	-	-	-	-	-	-	-
Critical Hdwy	6.1	6.2	6.1	4.2	-	-	-	-	-
Critical Hdwy Stg 1	5.1	5.2	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.1	5.2	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	2.29	-	-	-	-	-
Pot Cap-1 Maneuver	214	161	563	1023	-	0	0	-	-
Stage 1	432	389	-	-	-	0	0	-	-
Stage 2	719	560	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	175	0	563	1023	-	-	-	-	-
Mov Cap-2 Maneuver	175	0	-	-	-	-	-	-	-
Stage 1	353	0	-	-	-	-	-	-	-
Stage 2	719	0	-	-	-	-	-	-	-

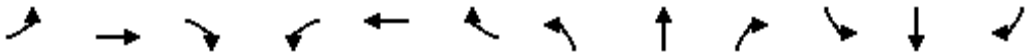
Approach	WB	NB	SB
HCM Control Delay, s	17.8	2.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1023	-	423	-	-
HCM Lane V/C Ratio	0.182	-	0.338	-	-
HCM Control Delay (s)	9.3	-	17.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.7	-	1.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	280	99	155	0	0	0	0	368	25	54	152	0
Future Volume (vph)	280	99	155	0	0	0	0	368	25	54	152	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-2%			-2%			-4%			4%	
Total Lost time (s)		4.5						4.5		4.5	4.5	
Lane Util. Factor		1.00						1.00		1.00	1.00	
Frt		0.96						0.99		1.00	1.00	
Flt Protected		0.97						1.00		0.95	1.00	
Satd. Flow (prot)		1504						1680		1481	1633	
Flt Permitted		0.97						1.00		0.38	1.00	
Satd. Flow (perm)		1504						1680		587	1633	
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)	289	102	160	0	0	0	0	379	26	56	157	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	531	0	0	0	0	0	402	0	56	157	0
Heavy Vehicles (%)	10%	10%	10%	0%	0%	0%	0%	5%	10%	10%	5%	0%
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		25.0						19.1		19.1	19.1	
Effective Green, g (s)		25.0						19.1		19.1	19.1	
Actuated g/C Ratio		0.47						0.36		0.36	0.36	
Clearance Time (s)		4.5						4.5		4.5	4.5	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		708						604		211	587	
v/s Ratio Prot								c0.24			0.10	
v/s Ratio Perm		0.35								0.10		
v/c Ratio		0.75						0.67		0.27	0.27	
Uniform Delay, d1		11.5						14.3		12.0	12.0	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		4.5						2.8		0.7	0.2	
Delay (s)		16.0						17.1		12.7	12.3	
Level of Service		B						B		B	B	
Approach Delay (s)		16.0			0.0			17.1			12.4	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	53.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	70.9%	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)	280	99	155	0	0	0	0	368	25	54	152	0
Future Volume (veh/h)	280	99	155	0	0	0	0	368	25	54	152	0
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1822	1684	1822				0	1826	1826	1527	1595	0
Adj Flow Rate, veh/h	289	102	160				0	379	26	56	157	0
Peak Hour Factor	0.97	0.97	0.97				0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	10	0				0	5	5	10	5	0
Cap, veh/h	369	130	204				0	555	38	294	524	0
Arrive On Green	0.45	0.45	0.45				0.00	0.33	0.33	0.33	0.33	0.00
Sat Flow, veh/h	819	289	453				0	1689	116	869	1595	0
Grp Volume(v), veh/h	551	0	0				0	0	405	56	157	0
Grp Sat Flow(s),veh/h/ln	1562	0	0				0	0	1805	869	1595	0
Q Serve(g_s), s	12.2	0.0	0.0				0.0	0.0	7.9	2.4	3.0	0.0
Cycle Q Clear(g_c), s	12.2	0.0	0.0				0.0	0.0	7.9	10.3	3.0	0.0
Prop In Lane	0.52		0.29				0.00		0.06	1.00		0.00
Lane Grp Cap(c), veh/h	703	0	0				0	0	593	294	524	0
V/C Ratio(X)	0.78	0.00	0.00				0.00	0.00	0.68	0.19	0.30	0.00
Avail Cap(c_a), veh/h	1552	0	0				0	0	1350	658	1193	0
HCM Platoon Ratio	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				0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.5	0.0	0.0				0.0	0.0	11.8	16.3	10.2	0.0
Incr Delay (d2), s/veh	2.0	0.0	0.0				0.0	0.0	1.4	0.3	0.3	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
%ile BackOfQ(50%),veh/ln	3.2	0.0	0.0				0.0	0.0	2.7	0.4	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.5	0.0	0.0				0.0	0.0	13.2	16.6	10.5	0.0
LnGrp LOS	B	A	A				A	A	B	B	B	A
Approach Vol, veh/h		551						405			213	
Approach Delay, s/veh		11.5						13.2			12.1	
Approach LOS		B						B			B	

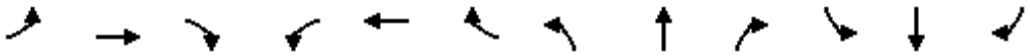
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		17.9		22.9		17.9						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		30.5		40.5		30.5						
Max Q Clear Time (g_c+I1), s		9.9		14.2		12.3						
Green Ext Time (p_c), s		2.5		4.2		1.1						

Intersection Summary												
HCM 6th Ctrl Delay			12.2									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	32	3	1	33	130	2	19	0	110	20	177
Future Volume (vph)	244	32	3	1	33	130	2	19	0	110	20	177
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			0%			4%	
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.89			1.00			0.92	
Flt Protected		0.96			1.00			1.00			0.98	
Satd. Flow (prot)		1612			1526			1742			1510	
Flt Permitted		0.69			1.00			0.97			0.88	
Satd. Flow (perm)		1156			1524			1699			1347	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	274	36	3	1	37	146	2	21	0	124	22	199
RTOR Reduction (vph)	0	1	0	0	82	0	0	0	0	0	67	0
Lane Group Flow (vph)	0	312	0	0	102	0	0	23	0	0	278	0
Heavy Vehicles (%)	3%	11%	0%	0%	0%	3%	0%	0%	0%	0%	0%	5%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		19.2			19.2			15.4			15.4	
Effective Green, g (s)		19.2			19.2			15.4			15.4	
Actuated g/C Ratio		0.44			0.44			0.35			0.35	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		509			671			600			475	
v/s Ratio Prot												
v/s Ratio Perm		c0.27			0.07			0.01			c0.21	
v/c Ratio		0.61			0.15			0.04			0.59	
Uniform Delay, d1		9.4			7.3			9.2			11.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.2			0.1			0.0			1.8	
Delay (s)		11.6			7.4			9.3			13.3	
Level of Service		B			A			A			B	
Approach Delay (s)		11.6			7.4			9.3			13.3	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	43.6	Sum of lost time (s)	9.0
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)	244	32	3	1	33	130	2	19	0	110	20	177
Future Volume (veh/h)	244	32	3	1	33	130	2	19	0	110	20	177
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	1600	1600	1600	1750	1750	1750	1750	1750	1750	1663	1663	1663
Adj Flow Rate, veh/h	274	36	3	1	37	146	2	21	0	124	22	199
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	11	11	11	0	0	0	0	0	0	0	0	0
Cap, veh/h	594	63	4	124	108	418	146	594	0	302	75	288
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.35	0.35	0.00	0.35	0.35	0.35
Sat Flow, veh/h	1061	184	12	2	314	1215	37	1694	0	389	213	821
Grp Volume(v), veh/h	313	0	0	184	0	0	23	0	0	345	0	0
Grp Sat Flow(s),veh/h/ln	1257	0	0	1531	0	0	1732	0	0	1423	0	0
Q Serve(g_s), s	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0
Cycle Q Clear(g_c), s	6.0	0.0	0.0	2.6	0.0	0.0	0.3	0.0	0.0	6.0	0.0	0.0
Prop In Lane	0.88		0.01	0.01		0.79	0.09		0.00	0.36		0.58
Lane Grp Cap(c), veh/h	661	0	0	649	0	0	740	0	0	665	0	0
V/C Ratio(X)	0.47	0.00	0.00	0.28	0.00	0.00	0.03	0.00	0.00	0.52	0.00	0.00
Avail Cap(c_a), veh/h	1776	0	0	2121	0	0	2003	0	0	1717	0	0
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	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.1	0.0	0.0	7.2	0.0	0.0	6.3	0.0	0.0	8.1	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.6	0.0	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	1.1	0.0	0.0	0.6	0.0	0.0	0.1	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.6	0.0	0.0	7.4	0.0	0.0	6.3	0.0	0.0	8.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		313			184			23			345	
Approach Delay, s/veh		8.6			7.4			6.3			8.8	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.8		14.6		14.8		14.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.5		38.5		32.5		38.5				
Max Q Clear Time (g_c+I1), s		2.3		8.0		8.0		4.6				
Green Ext Time (p_c), s		0.1		2.3		2.3		1.2				

Intersection Summary												
HCM 6th Ctrl Delay			8.4									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	98	79	0	0	0	0	0	0	121	37	119	0
Future Vol, veh/h	98	79	0	0	0	0	0	0	121	37	119	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	-	-	-	-	-	150	150	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-2	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	0	2	2	2	10	10	10	10	2
Mvmt Flow	107	86	0	0	0	0	0	0	132	40	129	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	275	341	129	-	0	0	132	0	0
Stage 1	209	209	-	-	-	-	-	-	-
Stage 2	66	132	-	-	-	-	-	-	-
Critical Hdwy	6.5	6.6	6.3	-	-	-	4.2	-	-
Critical Hdwy Stg 1	5.5	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.5	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	-	-	-	2.29	-	-
Pot Cap-1 Maneuver	698	568	900	0	-	-	1405	-	0
Stage 1	807	714	-	0	-	-	-	-	0
Stage 2	937	772	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	678	0	900	-	-	-	1405	-	-
Mov Cap-2 Maneuver	678	0	-	-	-	-	-	-	-
Stage 1	807	0	-	-	-	-	-	-	-
Stage 2	911	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s		0	1.8
HCM LOS	-		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	EBLn3	SBL	SBT
Capacity (veh/h)	-	-	678	-	-	1405	-
HCM Lane V/C Ratio	-	-	0.157	-	-	0.029	-
HCM Control Delay (s)	-	-	11.3	-	0	7.6	-
HCM Lane LOS	-	-	B	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.6	-	-	0.1	-

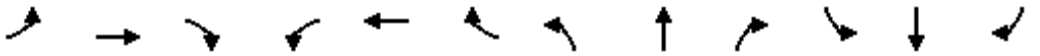
Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	119	67	41	0	98	0	0	37	66
Future Vol, veh/h	0	0	0	119	67	41	0	98	0	0	37	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	150	150	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-2	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	129	73	45	0	107	0	0	40	72

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	183	219	107	112	0	-	-	-	0
Stage 1	107	107	-	-	-	-	-	-	-
Stage 2	76	112	-	-	-	-	-	-	-
Critical Hdwy	6.02	6.12	6.02	4.12	-	-	-	-	-
Critical Hdwy Stg 1	5.02	5.12	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.02	5.12	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	-	-	-
Pot Cap-1 Maneuver	823	696	953	1478	-	0	0	-	-
Stage 1	928	816	-	-	-	0	0	-	-
Stage 2	955	813	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	823	0	953	1478	-	-	-	-	-
Mov Cap-2 Maneuver	823	0	-	-	-	-	-	-	-
Stage 1	928	0	-	-	-	-	-	-	-
Stage 2	955	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s		0	0
HCM LOS	-		

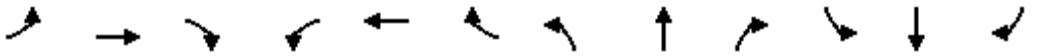
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	WBLn3	SBT	SBR
Capacity (veh/h)	1478	-	823	-	953	-	-
HCM Lane V/C Ratio	-	-	0.157	-	0.047	-	-
HCM Control Delay (s)	0	-	10.2	-	9	-	-
HCM Lane LOS	A	-	B	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	27	87	109	88	46	104	314	53	42	226	36
Future Volume (vph)	15	27	87	109	88	46	104	314	53	42	226	36
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		5%			-4%			4%			-4%	
Total Lost time (s)		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	
Frt		0.91			0.97		1.00	0.98		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1511			1568		1552	1558		848	1515	
Flt Permitted		0.95			0.80		0.58	1.00		0.45	1.00	
Satd. Flow (perm)		1444			1277		945	1558		402	1515	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	17	30	97	121	98	51	116	349	59	47	251	40
RTOR Reduction (vph)	0	63	0	0	12	0	0	8	0	0	7	0
Lane Group Flow (vph)	0	81	0	0	258	0	116	400	0	47	284	0
Heavy Vehicles (%)	0%	0%	3%	0%	13%	20%	5%	9%	0%	100%	15%	18%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		14.9			14.9		18.2	18.2		18.2	18.2	
Effective Green, g (s)		14.9			14.9		18.2	18.2		18.2	18.2	
Actuated g/C Ratio		0.35			0.35		0.43	0.43		0.43	0.43	
Clearance Time (s)		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	
Lane Grp Cap (vph)		511			451		408	673		173	654	
v/s Ratio Prot								c0.26			0.19	
v/s Ratio Perm		0.06			c0.20		0.12			0.12		
v/c Ratio		0.16			0.57		0.28	0.59		0.27	0.43	
Uniform Delay, d1		9.3			11.0		7.7	9.1		7.7	8.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			1.8		0.4	1.4		0.9	0.5	
Delay (s)		9.5			12.8		8.1	10.5		8.5	8.8	
Level of Service		A			B		A	B		A	A	
Approach Delay (s)		9.5			12.8			10.0			8.8	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	42.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

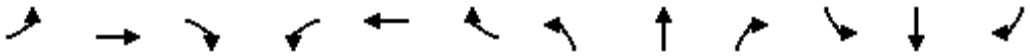
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	27	87	109	88	46	104	314	53	42	226	36
Future Volume (veh/h)	15	27	87	109	88	46	104	314	53	42	226	36
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	1614	1614	1614	1715	1715	1715	1595	1540	1540	512	1688	1688
Adj Flow Rate, veh/h	17	30	97	121	98	51	116	349	59	47	251	40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	13	13	13	5	9	9	100	15	15
Cap, veh/h	137	101	250	295	174	74	579	615	104	292	680	108
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	77	388	961	552	671	285	1007	1284	217	291	1420	226
Grp Volume(v), veh/h	144	0	0	270	0	0	116	0	408	47	0	291
Grp Sat Flow(s),veh/h/ln	1427	0	0	1507	0	0	1007	0	1501	291	0	1647
Q Serve(g_s), s	0.0	0.0	0.0	2.5	0.0	0.0	2.8	0.0	6.7	4.8	0.0	3.9
Cycle Q Clear(g_c), s	2.8	0.0	0.0	5.3	0.0	0.0	6.7	0.0	6.7	11.5	0.0	3.9
Prop In Lane	0.12		0.67	0.45		0.19	1.00		0.14	1.00		0.14
Lane Grp Cap(c), veh/h	488	0	0	543	0	0	579	0	719	292	0	788
V/C Ratio(X)	0.30	0.00	0.00	0.50	0.00	0.00	0.20	0.00	0.57	0.16	0.00	0.37
Avail Cap(c_a), veh/h	1513	0	0	1606	0	0	1164	0	1591	461	0	1745
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.5	0.0	0.0	11.3	0.0	0.0	7.8	0.0	6.4	10.5	0.0	5.7
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.7	0.0	0.0	0.2	0.0	0.7	0.3	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	0.7	0.0	0.0	1.5	0.0	0.0	0.4	0.0	1.3	0.2	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.8	0.0	0.0	12.0	0.0	0.0	8.0	0.0	7.1	10.8	0.0	6.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	B	A	A
Approach Vol, veh/h		144			270			524			338	
Approach Delay, s/veh		10.8			12.0			7.3			6.6	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		21.0		13.5		21.0		13.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		36.5		34.5		36.5		34.5				
Max Q Clear Time (g_c+I1), s		8.7		4.8		13.5		7.3				
Green Ext Time (p_c), s		3.4		0.9		3.0		1.8				

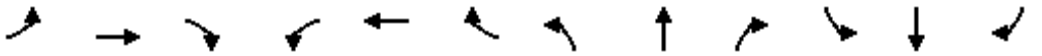
Intersection Summary												
HCM 6th Ctrl Delay			8.5									
HCM 6th LOS			A									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	27	87	109	88	19	104	340	27	8	260	36
Future Volume (vph)	15	27	87	109	88	19	104	340	27	8	260	36
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		5%			-4%			4%			-4%	
Total Lost time (s)		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	
Frt		0.91			0.99		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1522			1660		1597	1560		1357	1645	
Flt Permitted		0.95			0.77		0.57	1.00		0.48	1.00	
Satd. Flow (perm)		1456			1316		951	1560		692	1645	
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)	16	29	93	116	94	20	111	362	29	9	277	38
RTOR Reduction (vph)	0	63	0	0	5	0	0	4	0	0	7	0
Lane Group Flow (vph)	0	75	0	0	225	0	111	387	0	9	308	0
Heavy Vehicles (%)	0%	0%	2%	0%	9%	0%	2%	9%	5%	25%	7%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.7			12.7		17.4	17.4		17.4	17.4	
Effective Green, g (s)		12.7			12.7		17.4	17.4		17.4	17.4	
Actuated g/C Ratio		0.32			0.32		0.45	0.45		0.45	0.45	
Clearance Time (s)		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	
Lane Grp Cap (vph)		472			427		423	694		307	732	
v/s Ratio Prot								c0.25			0.19	
v/s Ratio Perm		0.05			c0.17		0.12			0.01		
v/c Ratio		0.16			0.53		0.26	0.56		0.03	0.42	
Uniform Delay, d1		9.4			10.8		6.8	8.0		6.1	7.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			1.2		0.3	1.0		0.0	0.4	
Delay (s)		9.6			11.9		7.2	9.0		6.1	7.8	
Level of Service		A			B		A	A		A	A	
Approach Delay (s)		9.6			11.9			8.6			7.8	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	39.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

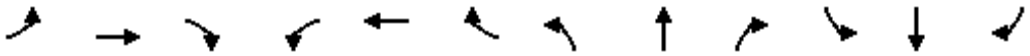
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	27	87	109	88	19	104	340	27	8	260	36
Future Volume (veh/h)	15	27	87	109	88	19	104	340	27	8	260	36
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	1614	1614	1614	1770	1770	1770	1636	1540	1540	1549	1798	1798
Adj Flow Rate, veh/h	16	29	93	116	94	20	111	362	29	9	277	38
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, %	0	0	0	9	9	9	2	9	9	25	7	7
Cap, veh/h	174	90	229	367	182	32	568	585	47	467	644	88
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	85	379	958	666	764	136	1011	1407	113	893	1548	212
Grp Volume(v), veh/h	138	0	0	230	0	0	111	0	391	9	0	315
Grp Sat Flow(s),veh/h/ln	1422	0	0	1566	0	0	1011	0	1520	893	0	1760
Q Serve(g_s), s	0.0	0.0	0.0	1.1	0.0	0.0	2.3	0.0	5.3	0.2	0.0	3.3
Cycle Q Clear(g_c), s	2.1	0.0	0.0	3.2	0.0	0.0	5.6	0.0	5.3	5.5	0.0	3.3
Prop In Lane	0.12		0.67	0.50		0.09	1.00		0.07	1.00		0.12
Lane Grp Cap(c), veh/h	493	0	0	581	0	0	568	0	632	467	0	732
V/C Ratio(X)	0.28	0.00	0.00	0.40	0.00	0.00	0.20	0.00	0.62	0.02	0.00	0.43
Avail Cap(c_a), veh/h	1896	0	0	2076	0	0	1642	0	2247	1416	0	2601
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.4	0.0	0.0	8.7	0.0	0.0	7.4	0.0	6.0	8.1	0.0	5.4
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.4	0.0	0.0	0.2	0.0	1.0	0.0	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	0.4	0.0	0.0	0.8	0.0	0.0	0.3	0.0	0.9	0.0	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.7	0.0	0.0	9.2	0.0	0.0	7.6	0.0	7.0	8.1	0.0	5.8
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		138			230			502			324	
Approach Delay, s/veh		8.7			9.2			7.1			5.9	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		15.3		10.7		15.3		10.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		38.5		32.5		38.5		32.5				
Max Q Clear Time (g_c+I1), s		7.6		4.1		7.5		5.2				
Green Ext Time (p_c), s		3.2		0.8		2.1		1.5				

Intersection Summary												
HCM 6th Ctrl Delay			7.3									
HCM 6th LOS			A									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	27	87	109	88	19	104	348	53	8	260	36
Future Volume (veh/h)	15	27	87	109	88	19	104	348	53	8	260	36
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	1614	1614	1614	1826	1826	1826	1540	1540	1540	1757	1757	1757
Adj Flow Rate, veh/h	17	30	97	121	98	21	116	387	59	9	289	40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	5	5	5	9	9	9	10	10	10
Cap, veh/h	181	92	234	383	192	35	337	802	121	160	1137	154
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	87	376	956	689	783	141	350	2011	302	26	2852	386
Grp Volume(v), veh/h	144	0	0	240	0	0	299	0	263	179	0	159
Grp Sat Flow(s),veh/h/ln	1419	0	0	1613	0	0	1317	0	1347	1735	0	1529
Q Serve(g_s), s	0.0	0.0	0.0	1.0	0.0	0.0	1.3	0.0	3.7	0.0	0.0	1.8
Cycle Q Clear(g_c), s	2.1	0.0	0.0	3.1	0.0	0.0	4.0	0.0	3.7	1.7	0.0	1.8
Prop In Lane	0.12		0.67	0.50		0.09	0.39		0.22	0.05		0.25
Lane Grp Cap(c), veh/h	507	0	0	610	0	0	723	0	537	841	0	610
V/C Ratio(X)	0.28	0.00	0.00	0.39	0.00	0.00	0.41	0.00	0.49	0.21	0.00	0.26
Avail Cap(c_a), veh/h	1897	0	0	2134	0	0	2160	0	2106	2805	0	2390
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.0	0.0	0.0	8.3	0.0	0.0	5.7	0.0	5.7	5.1	0.0	5.1
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0	0.7	0.1	0.0	0.2
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(95%),veh/ln	0.8	0.0	0.0	1.3	0.0	0.0	1.0	0.0	1.0	0.5	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.3	0.0	0.0	8.7	0.0	0.0	6.1	0.0	6.4	5.2	0.0	5.3
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		144			240			562			338	
Approach Delay, s/veh		8.3			8.7			6.2			5.3	
Approach LOS		A			A			A			A	

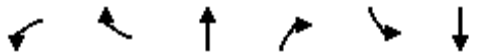
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.6		10.7		14.6		10.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		39.5		31.5		39.5		31.5				
Max Q Clear Time (g_c+I1), s		6.0		4.1		3.8		5.1				
Green Ext Time (p_c), s		4.1		0.9		2.2		1.5				

Intersection Summary												
HCM 6th Ctrl Delay			6.7									
HCM 6th LOS			A									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	27	87	109	88	19	104	348	53	8	260	36
Future Volume (vph)	15	27	87	109	88	19	104	348	53	8	260	36
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		5%			-4%			4%			-4%	
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.91			0.99			0.98			0.98	
Flt Protected		0.99			0.98			0.99			1.00	
Satd. Flow (prot)		1511			1679			2960			2960	
Flt Permitted		0.95			0.77			0.81			0.94	
Satd. Flow (perm)		1442			1322			2428			2784	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	17	30	97	121	98	21	116	387	59	9	289	40
RTOR Reduction (vph)	0	65	0	0	5	0	0	12	0	0	15	0
Lane Group Flow (vph)	0	79	0	0	235	0	0	550	0	0	323	0
Heavy Vehicles (%)	0%	0%	3%	0%	5%	5%	5%	9%	0%	100%	10%	10%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.4			12.4			16.6			16.6	
Effective Green, g (s)		12.4			12.4			16.6			16.6	
Actuated g/C Ratio		0.33			0.33			0.44			0.44	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		470			431			1060			1216	
v/s Ratio Prot												
v/s Ratio Perm		0.05			c0.18			c0.23			0.12	
v/c Ratio		0.17			0.55			0.52			0.27	
Uniform Delay, d1		9.1			10.5			7.8			6.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			1.4			0.4			0.1	
Delay (s)		9.3			11.9			8.2			6.9	
Level of Service		A			B			A			A	
Approach Delay (s)		9.3			11.9			8.2			6.9	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	38.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	148	26	479	192	34	422
Future Volume (vph)	148	26	479	192	34	422
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-4%		4%			-4%
Total Lost time (s)	4.5		4.5			4.5
Lane Util. Factor	1.00		0.95			0.95
Frt	0.98		0.96			1.00
Flt Protected	0.96		1.00			1.00
Satd. Flow (prot)	1821		3386			3668
Flt Permitted	0.96		1.00			0.88
Satd. Flow (perm)	1821		3386			3236
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	164	29	532	213	38	469
RTOR Reduction (vph)	9	0	58	0	0	0
Lane Group Flow (vph)	184	0	687	0	0	507
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	9.3		18.7			18.7
Effective Green, g (s)	9.3		18.7			18.7
Actuated g/C Ratio	0.25		0.51			0.51
Clearance Time (s)	4.5		4.5			4.5
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	457		1711			1635
v/s Ratio Prot	c0.10		c0.20			
v/s Ratio Perm						0.16
v/c Ratio	0.40		0.40			0.31
Uniform Delay, d1	11.5		5.7			5.4
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	0.6		0.2			0.1
Delay (s)	12.1		5.8			5.5
Level of Service	B		A			A
Approach Delay (s)	12.1		5.8			5.5
Approach LOS	B		A			A

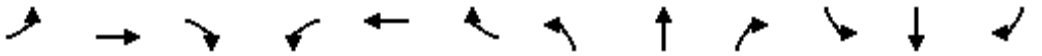
Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	37.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	148	26	479	192	34	422
Future Volume (veh/h)	148	26	479	192	34	422
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	2057	2057	1806	1806	2057	2057
Adj Flow Rate, veh/h	164	29	532	213	38	469
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	247	44	1125	449	225	1676
Arrive On Green	0.15	0.15	0.47	0.47	0.47	0.47
Sat Flow, veh/h	1627	288	2485	955	112	3661
Grp Volume(v), veh/h	194	0	381	364	267	240
Grp Sat Flow(s),veh/h/ln	1924	0	1715	1634	1900	1779
Q Serve(g_s), s	2.3	0.0	3.6	3.6	0.0	2.0
Cycle Q Clear(g_c), s	2.3	0.0	3.6	3.6	1.9	2.0
Prop In Lane	0.85	0.15		0.58	0.14	
Lane Grp Cap(c), veh/h	292	0	806	768	1066	836
V/C Ratio(X)	0.66	0.00	0.47	0.47	0.25	0.29
Avail Cap(c_a), veh/h	2224	0	3136	2987	3394	3252
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.5	0.0	4.3	4.3	3.8	3.9
Incr Delay (d2), s/veh	2.6	0.0	0.4	0.5	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.4	0.0	0.7	0.7	0.4	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.1	0.0	4.7	4.8	4.0	4.1
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	194		745			507
Approach Delay, s/veh	12.1		4.7			4.0
Approach LOS	B		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		15.7			15.7	8.1
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		43.5			43.5	27.5
Max Q Clear Time (g_c+I1), s		5.6			4.0	4.3
Green Ext Time (p_c), s		5.6			3.6	0.5

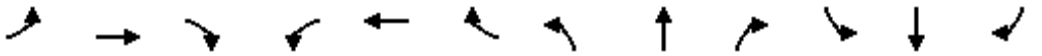
Intersection Summary	
HCM 6th Ctrl Delay	5.5
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	129	0	97	173	573	0	0	233	337
Future Volume (vph)	0	0	0	129	0	97	173	573	0	0	233	337
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-2%			-2%			4%			-4%	
Total Lost time (s)					4.5		4.5	4.5			4.5	4.5
Lane Util. Factor					1.00		1.00	1.00			1.00	1.00
Frt					0.94		1.00	1.00			1.00	0.85
Flt Protected					0.97		0.95	1.00			1.00	1.00
Satd. Flow (prot)					1571		1417	1588			1623	1405
Flt Permitted					0.97		0.60	1.00			1.00	1.00
Satd. Flow (perm)					1571		893	1588			1623	1405
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	143	0	108	192	637	0	0	259	374
RTOR Reduction (vph)	0	0	0	0	35	0	0	0	0	0	0	156
Lane Group Flow (vph)	0	0	0	0	216	0	192	637	0	0	259	218
Heavy Vehicles (%)	0%	0%	0%	0%	0%	7%	15%	8%	0%	0%	10%	8%
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases				8			2					6
Actuated Green, G (s)					12.7		30.4	30.4			30.4	30.4
Effective Green, g (s)					12.7		30.4	30.4			30.4	30.4
Actuated g/C Ratio					0.24		0.58	0.58			0.58	0.58
Clearance Time (s)					4.5		4.5	4.5			4.5	4.5
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					382		521	926			947	819
v/s Ratio Prot								c0.40			0.16	
v/s Ratio Perm					0.14		0.21					0.16
v/c Ratio					0.57		0.37	0.69			0.27	0.27
Uniform Delay, d1					17.3		5.8	7.5			5.4	5.4
Progression Factor					1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2					1.9		0.4	2.1			0.2	0.2
Delay (s)					19.2		6.2	9.7			5.5	5.5
Level of Service					B		A	A			A	A
Approach Delay (s)		0.0			19.2			8.9			5.5	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	52.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

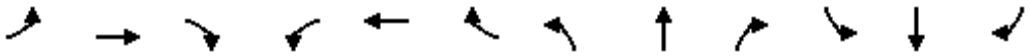
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	129	0	97	173	573	0	0	233	337
Future Volume (veh/h)	0	0	0	129	0	97	173	573	0	0	233	337
Initial Q (Qb), veh				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
Parking Bus, Adj				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	
Adj Sat Flow, veh/h/ln				1822	1822	1822	1458	1554	0	0	1757	1784
Adj Flow Rate, veh/h				143	0	108	192	637	0	0	259	374
Peak Hour Factor				0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %				0	0	0	15	8	0	0	10	8
Cap, veh/h				197	0	149	509	862	0	0	975	839
Arrive On Green				0.21	0.00	0.21	0.55	0.55	0.00	0.00	0.55	0.55
Sat Flow, veh/h				939	0	709	672	1554	0	0	1757	1512
Grp Volume(v), veh/h				251	0	0	192	637	0	0	259	374
Grp Sat Flow(s),veh/h/ln				1648	0	0	672	1554	0	0	1757	1512
Q Serve(g_s), s				5.4	0.0	0.0	8.0	11.8	0.0	0.0	2.9	5.6
Cycle Q Clear(g_c), s				5.4	0.0	0.0	10.9	11.8	0.0	0.0	2.9	5.6
Prop In Lane				0.57		0.43	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				346	0	0	509	862	0	0	975	839
V/C Ratio(X)				0.72	0.00	0.00	0.38	0.74	0.00	0.00	0.27	0.45
Avail Cap(c_a), veh/h				891	0	0	1019	2041	0	0	2307	1986
HCM Platoon Ratio				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	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				14.1	0.0	0.0	7.3	6.4	0.0	0.0	4.4	5.0
Incr Delay (d2), s/veh				2.9	0.0	0.0	0.5	1.3	0.0	0.0	0.1	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
%ile BackOfQ(95%),veh/ln				3.4	0.0	0.0	1.4	4.1	0.0	0.0	1.1	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				17.0	0.0	0.0	7.8	7.7	0.0	0.0	4.6	5.4
LnGrp LOS				B	A	A	A	A	A	A	A	A
Approach Vol, veh/h					251			829			633	
Approach Delay, s/veh					17.0			7.7			5.1	
Approach LOS					B			A			A	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		25.8				25.8		12.5				
Change Period (Y+Rc), s		4.5				4.5		4.5				
Max Green Setting (Gmax), s		50.3				50.3		20.7				
Max Q Clear Time (g_c+I1), s		13.8				7.6		7.4				
Green Ext Time (p_c), s		7.4				3.2		1.2				

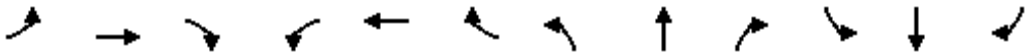
Intersection Summary		
HCM 6th Ctrl Delay	8.1	
HCM 6th LOS	A	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	378	1	155	0	0	0	0	368	146	91	271	0
Future Volume (vph)	378	1	155	0	0	0	0	368	146	91	271	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-2%			-2%			-4%			4%	
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	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1526	884	1252					1638	1405	1567	1573	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.42	1.00	
Satd. Flow (perm)	1526	884	1252					1638	1405	688	1573	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	420	1	172	0	0	0	0	409	162	101	301	0
RTOR Reduction (vph)	0	0	102	0	0	0	0	0	96	0	0	0
Lane Group Flow (vph)	420	1	70	0	0	0	0	409	66	101	301	0
Heavy Vehicles (%)	10%	100%	20%	0%	0%	0%	0%	9%	8%	4%	9%	0%
Turn Type	Perm	NA	Perm					NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)	19.6	19.6	19.6					19.5	19.5	19.5	19.5	
Effective Green, g (s)	19.6	19.6	19.6					19.5	19.5	19.5	19.5	
Actuated g/C Ratio	0.41	0.41	0.41					0.41	0.41	0.41	0.41	
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)	621	360	510					664	569	278	637	
v/s Ratio Prot		0.00						c0.25			0.19	
v/s Ratio Perm	c0.28		0.06						0.05	0.15		
v/c Ratio	0.68	0.00	0.14					0.62	0.12	0.36	0.47	
Uniform Delay, d1	11.7	8.5	8.9					11.3	8.9	10.0	10.5	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.9	0.0	0.1					1.7	0.1	0.8	0.6	
Delay (s)	14.6	8.5	9.1					13.0	9.0	10.8	11.1	
Level of Service	B	A	A					B	A	B	B	
Approach Delay (s)		13.0			0.0			11.9			11.0	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	48.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	79.6%	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)	378	1	155	0	0	0	0	368	146	91	271	0
Future Volume (veh/h)	378	1	155	0	0	0	0	368	146	91	271	0
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1684	440	1546				0	1770	1784	1609	1540	0
Adj Flow Rate, veh/h	420	1	172				0	409	162	101	301	0
Peak Hour Factor	0.90	0.90	0.90				0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	10	100	20				0	9	8	4	9	0
Cap, veh/h	547	150	447				0	734	627	383	638	0
Arrive On Green	0.34	0.34	0.34				0.00	0.41	0.41	0.41	0.41	0.00
Sat Flow, veh/h	1604	440	1310				0	1770	1512	785	1540	0
Grp Volume(v), veh/h	420	1	172				0	409	162	101	301	0
Grp Sat Flow(s),veh/h/ln	1604	440	1310				0	1770	1512	785	1540	0
Q Serve(g_s), s	8.6	0.1	3.7				0.0	6.5	2.6	4.1	5.2	0.0
Cycle Q Clear(g_c), s	8.6	0.1	3.7				0.0	6.5	2.6	10.6	5.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	547	150	447				0	734	627	383	638	0
V/C Ratio(X)	0.77	0.01	0.39				0.00	0.56	0.26	0.26	0.47	0.00
Avail Cap(c_a), veh/h	1374	377	1122				0	1902	1624	901	1654	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.8	8.0	9.2				0.0	8.2	7.1	12.2	7.8	0.0
Incr Delay (d2), s/veh	2.3	0.0	0.5				0.0	0.7	0.2	0.4	0.5	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
%ile BackOfQ(95%),veh/ln	4.6	0.0	1.5				0.0	3.2	1.1	1.1	2.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.1	8.0	9.7				0.0	8.9	7.3	12.6	8.4	0.0
LnGrp LOS	B	A	A				A	A	A	B	A	A
Approach Vol, veh/h		593						571			402	
Approach Delay, s/veh		12.1						8.4			9.4	
Approach LOS		B						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		19.7		17.0		19.7						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		39.5		31.5		39.5						
Max Q Clear Time (g_c+I1), s		8.5		10.6		12.6						
Green Ext Time (p_c), s		3.4		2.0		2.6						

Intersection Summary												
HCM 6th Ctrl Delay			10.1									
HCM 6th LOS			B									

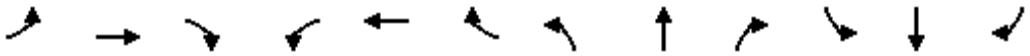
MOVEMENT SUMMARY

Site: 101 [SE Nye Ave & SE 3rd Dr]

Future AM - Concept 5
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SE 3rd Dr											
3	L2	2	0.0	0.044	7.2	LOS A	0.1	4.1	0.53	0.44	33.8
8	T1	21	50.0	0.044	7.2	LOS A	0.1	4.1	0.53	0.44	32.9
18	R2	1	0.0	0.044	7.2	LOS A	0.1	4.1	0.53	0.44	32.8
Approach		24	43.2	0.044	7.2	LOS A	0.1	4.1	0.53	0.44	33.0
East: SE Nye Ave											
1	L2	1	0.0	0.277	6.7	LOS A	1.3	33.8	0.53	0.44	34.4
6	T1	11	10.0	0.277	6.7	LOS A	1.3	33.8	0.53	0.44	34.1
16	R2	249	2.0	0.277	6.7	LOS A	1.3	33.8	0.53	0.44	33.2
Approach		261	2.3	0.277	6.7	LOS A	1.3	33.8	0.53	0.44	33.3
North: RoadName											
7	L2	235	0.0	0.206	4.4	LOS A	1.1	26.9	0.09	0.02	33.2
4	T1	22	0.0	0.206	4.4	LOS A	1.1	26.9	0.09	0.02	33.1
14	R2	21	13.0	0.206	4.4	LOS A	1.1	26.9	0.09	0.02	32.0
Approach		277	1.0	0.206	4.4	LOS A	1.1	26.9	0.09	0.02	33.1
West: RoadName											
5	L2	289	10.0	0.313	7.0	LOS A	1.5	39.8	0.47	0.35	31.6
2	T1	11	0.0	0.313	7.0	LOS A	1.5	39.8	0.47	0.35	31.8
12	R2	3	0.0	0.313	7.0	LOS A	1.5	39.8	0.47	0.35	30.9
Approach		303	9.5	0.313	7.0	LOS A	1.5	39.8	0.47	0.35	31.6
All Vehicles		865	5.5	0.313	6.1	LOS A	1.5	39.8	0.37	0.28	32.6

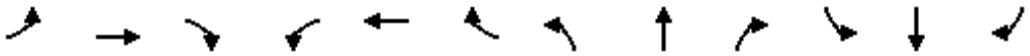
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	78	124	70	56	14	158	341	112	23	333	42
Future Volume (vph)	19	78	124	70	56	14	158	341	112	23	333	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		5%			-4%			4%			-4%	
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.92			0.99			0.97			0.98	
Flt Protected		1.00			0.98			0.99			1.00	
Satd. Flow (prot)		1553			1658			2939			3118	
Flt Permitted		0.96			0.79			0.75			0.91	
Satd. Flow (perm)		1504			1337			2226			2844	
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)	20	83	132	74	60	15	168	363	119	24	354	45
RTOR Reduction (vph)	0	63	0	0	6	0	0	28	0	0	13	0
Lane Group Flow (vph)	0	172	0	0	143	0	0	622	0	0	410	0
Heavy Vehicles (%)	0%	0%	2%	0%	9%	0%	2%	9%	5%	10%	7%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		10.1			10.1			18.4			18.4	
Effective Green, g (s)		10.1			10.1			18.4			18.4	
Actuated g/C Ratio		0.27			0.27			0.49			0.49	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		405			360			1092			1395	
v/s Ratio Prot												
v/s Ratio Perm		c0.11			0.11			c0.28			0.14	
v/c Ratio		0.43			0.40			0.57			0.29	
Uniform Delay, d1		11.3			11.2			6.8			5.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.7			0.7			0.7			0.1	
Delay (s)		12.0			11.9			7.5			5.8	
Level of Service		B			B			A			A	
Approach Delay (s)		12.0			11.9			7.5			5.8	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	37.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		

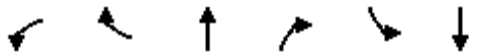
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	78	124	70	56	14	158	341	112	23	333	42
Future Volume (veh/h)	19	78	124	70	56	14	158	341	112	23	333	42
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	1614	1614	1614	1770	1770	1770	1540	1540	1540	1798	1798	1798
Adj Flow Rate, veh/h	20	83	132	74	60	15	168	363	119	24	354	45
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, %	0	0	0	9	9	9	9	9	9	7	7	7
Cap, veh/h	145	141	200	320	212	40	391	683	226	163	1316	162
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	63	572	814	577	862	161	465	1499	495	69	2886	355
Grp Volume(v), veh/h	235	0	0	149	0	0	335	0	315	224	0	199
Grp Sat Flow(s),veh/h/ln	1449	0	0	1600	0	0	1146	0	1313	1737	0	1572
Q Serve(g_s), s	0.8	0.0	0.0	0.0	0.0	0.0	4.1	0.0	5.2	0.0	0.0	2.4
Cycle Q Clear(g_c), s	4.4	0.0	0.0	2.1	0.0	0.0	6.5	0.0	5.2	2.3	0.0	2.4
Prop In Lane	0.09		0.56	0.50		0.10	0.50		0.38	0.11		0.23
Lane Grp Cap(c), veh/h	486	0	0	572	0	0	702	0	598	924	0	717
V/C Ratio(X)	0.48	0.00	0.00	0.26	0.00	0.00	0.48	0.00	0.53	0.24	0.00	0.28
Avail Cap(c_a), veh/h	1392	0	0	1465	0	0	1844	0	1936	2598	0	2320
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.2	0.0	0.0	9.4	0.0	0.0	6.1	0.0	5.9	5.1	0.0	5.1
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.2	0.0	0.0	0.5	0.0	0.7	0.1	0.0	0.2
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(95%),veh/ln	1.9	0.0	0.0	1.1	0.0	0.0	1.5	0.0	1.5	0.8	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.0	0.0	0.0	9.6	0.0	0.0	6.6	0.0	6.6	5.2	0.0	5.3
LnGrp LOS	B	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		235			149			650			423	
Approach Delay, s/veh		11.0			9.6			6.6			5.3	
Approach LOS		B			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		18.3		11.9		18.3		11.9				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		44.5		26.5		44.5		26.5				
Max Q Clear Time (g_c+I1), s		8.5		6.4		4.4		4.1				
Green Ext Time (p_c), s		5.2		1.4		2.9		0.8				

Intersection Summary												
HCM 6th Ctrl Delay			7.2									
HCM 6th LOS			A									



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	333	59	552	320	56	471
Future Volume (vph)	333	59	552	320	56	471
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-4%		4%			-4%
Total Lost time (s)	4.5		4.5			4.5
Lane Util. Factor	1.00		0.95			0.95
Frt	0.98		0.94			1.00
Flt Protected	0.96		1.00			0.99
Satd. Flow (prot)	1821		3343			3663
Flt Permitted	0.96		1.00			0.79
Satd. Flow (perm)	1821		3343			2896
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	370	66	613	356	62	523
RTOR Reduction (vph)	9	0	112	0	0	0
Lane Group Flow (vph)	427	0	857	0	0	585
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	17.1		20.8			20.8
Effective Green, g (s)	17.1		20.8			20.8
Actuated g/C Ratio	0.36		0.44			0.44
Clearance Time (s)	4.5		4.5			4.5
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	663		1482			1284
v/s Ratio Prot	c0.23		c0.26			
v/s Ratio Perm						0.20
v/c Ratio	0.64		0.58			0.46
Uniform Delay, d1	12.4		9.8			9.1
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	2.2		0.6			0.3
Delay (s)	14.5		10.3			9.4
Level of Service	B		B			A
Approach Delay (s)	14.5		10.3			9.4
Approach LOS	B		B			A

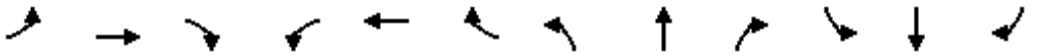
Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	46.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	333	59	552	320	56	471
Future Volume (veh/h)	333	59	552	320	56	471
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	2057	2057	1806	1806	2057	2057
Adj Flow Rate, veh/h	370	66	613	356	62	523
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	479	85	982	570	192	1470
Arrive On Green	0.29	0.29	0.47	0.47	0.47	0.47
Sat Flow, veh/h	1629	291	2180	1213	165	3221
Grp Volume(v), veh/h	437	0	503	466	289	296
Grp Sat Flow(s),veh/h/ln	1924	0	1715	1587	1514	1779
Q Serve(g_s), s	7.9	0.0	8.4	8.4	0.5	4.0
Cycle Q Clear(g_c), s	7.9	0.0	8.4	8.4	8.9	4.0
Prop In Lane	0.85	0.15		0.76	0.21	
Lane Grp Cap(c), veh/h	566	0	806	746	826	836
V/C Ratio(X)	0.77	0.00	0.62	0.62	0.35	0.35
Avail Cap(c_a), veh/h	1639	0	1732	1603	1607	1796
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.3	0.0	7.6	7.6	6.3	6.4
Incr Delay (d2), s/veh	2.3	0.0	0.8	0.9	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.3	0.0	3.8	3.6	1.8	1.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.6	0.0	8.4	8.4	6.5	6.7
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	437		969			585
Approach Delay, s/veh	14.6		8.4			6.6
Approach LOS	B		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		22.4			22.4	15.7
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		38.5			38.5	32.5
Max Q Clear Time (g_c+I1), s		10.4			10.9	9.9
Green Ext Time (p_c), s		7.5			4.4	1.4

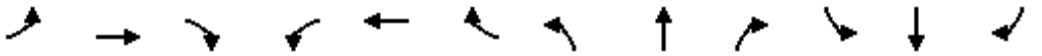
Intersection Summary	
HCM 6th Ctrl Delay	9.2
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	109	1	166	100	706	0	0	331	473
Future Volume (vph)	0	0	0	109	1	166	100	706	0	0	331	473
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-2%			-2%			4%			-4%	
Total Lost time (s)					4.5		4.5	4.5			4.5	4.5
Lane Util. Factor					1.00		1.00	1.00			1.00	1.00
Frt					0.92		1.00	1.00			1.00	0.85
Flt Protected					0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)					1526		1481	1618			1716	1459
Flt Permitted					0.98		0.53	1.00			1.00	1.00
Satd. Flow (perm)					1526		829	1618			1716	1459
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)	0	0	0	117	1	178	108	759	0	0	356	509
RTOR Reduction (vph)	0	0	0	0	67	0	0	0	0	0	0	200
Lane Group Flow (vph)	0	0	0	0	229	0	108	759	0	0	356	309
Heavy Vehicles (%)	0%	0%	0%	8%	0%	2%	10%	6%	0%	0%	4%	4%
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases				8			2					6
Actuated Green, G (s)					13.4		34.6	34.6			34.6	34.6
Effective Green, g (s)					13.4		34.6	34.6			34.6	34.6
Actuated g/C Ratio					0.24		0.61	0.61			0.61	0.61
Clearance Time (s)					4.5		4.5	4.5			4.5	4.5
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					358		503	982			1041	885
v/s Ratio Prot								c0.47			0.21	
v/s Ratio Perm					0.15		0.13					0.21
v/c Ratio					0.64		0.21	0.77			0.34	0.35
Uniform Delay, d1					19.6		5.1	8.3			5.6	5.6
Progression Factor					1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2					3.9		0.2	3.8			0.2	0.2
Delay (s)					23.5		5.3	12.1			5.8	5.8
Level of Service					C		A	B			A	A
Approach Delay (s)		0.0			23.5			11.3			5.8	
Approach LOS		A			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	57.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



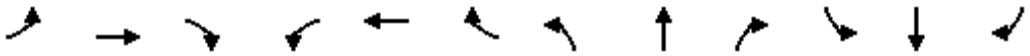
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	109	1	166	100	706	0	0	331	473
Future Volume (veh/h)	0	0	0	109	1	166	100	706	0	0	331	473
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				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	
Adj Sat Flow, veh/h/ln				1822	1822	1822	1527	1581	0	0	1840	1840
Adj Flow Rate, veh/h				117	1	178	108	759	0	0	356	509
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	10	6	0	0	4	4
Cap, veh/h				147	1	223	423	928	0	0	1080	915
Arrive On Green				0.23	0.23	0.23	0.59	0.59	0.00	0.00	0.59	0.59
Sat Flow, veh/h				639	5	972	567	1581	0	0	1840	1559
Grp Volume(v), veh/h				296	0	0	108	759	0	0	356	509
Grp Sat Flow(s),veh/h/ln				1616	0	0	567	1581	0	0	1840	1559
Q Serve(g_s), s				8.5	0.0	0.0	5.9	18.7	0.0	0.0	4.9	9.8
Cycle Q Clear(g_c), s				8.5	0.0	0.0	10.8	18.7	0.0	0.0	4.9	9.8
Prop In Lane				0.40		0.60	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				371	0	0	423	928	0	0	1080	915
V/C Ratio(X)				0.80	0.00	0.00	0.26	0.82	0.00	0.00	0.33	0.56
Avail Cap(c_a), veh/h				576	0	0	708	1723	0	0	2004	1698
HCM Platoon Ratio				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	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				17.8	0.0	0.0	8.0	8.1	0.0	0.0	5.2	6.2
Incr Delay (d2), s/veh				4.3	0.0	0.0	0.3	1.8	0.0	0.0	0.2	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
%ile BackOfQ(95%),veh/ln				5.8	0.0	0.0	1.0	8.0	0.0	0.0	2.3	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				22.2	0.0	0.0	8.3	9.9	0.0	0.0	5.4	6.8
LnGrp LOS				C	A	A	A	A	A	A	A	A
Approach Vol, veh/h					296			867			865	
Approach Delay, s/veh					22.2			9.7			6.2	
Approach LOS					C			A			A	

Timer - Assigned Phs	2		6		8			
Phs Duration (G+Y+Rc), s	33.3		33.3		15.8			
Change Period (Y+Rc), s	4.5		4.5		4.5			
Max Green Setting (Gmax), s	53.5		53.5		17.5			
Max Q Clear Time (g_c+I1), s	20.7		11.8		10.5			
Green Ext Time (p_c), s	8.1		4.7		1.0			

Intersection Summary		
HCM 6th Ctrl Delay	10.0	
HCM 6th LOS	B	

Notes

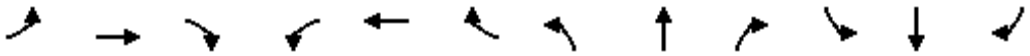
User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	529	4	141	0	0	0	0	277	99	149	291	0
Future Volume (vph)	529	4	141	0	0	0	0	277	99	149	291	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-2%			-2%			-4%			4%	
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	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1555	1329	1295					1700	1343	1597	1633	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.52	1.00	
Satd. Flow (perm)	1555	1329	1295					1700	1343	872	1633	
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)	545	4	145	0	0	0	0	286	102	154	300	0
RTOR Reduction (vph)	0	0	74	0	0	0	0	0	68	0	0	0
Lane Group Flow (vph)	545	4	71	0	0	0	0	286	34	154	300	0
Heavy Vehicles (%)	8%	33%	16%	0%	0%	0%	0%	5%	13%	2%	5%	0%
Turn Type	Perm	NA	Perm					NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)	24.7	24.7	24.7					16.6	16.6	16.6	16.6	
Effective Green, g (s)	24.7	24.7	24.7					16.6	16.6	16.6	16.6	
Actuated g/C Ratio	0.49	0.49	0.49					0.33	0.33	0.33	0.33	
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)	763	652	635					561	443	287	538	
v/s Ratio Prot		0.00						0.17			c0.18	
v/s Ratio Perm	c0.35		0.05						0.03	0.18		
v/c Ratio	0.71	0.01	0.11					0.51	0.08	0.54	0.56	
Uniform Delay, d1	10.0	6.5	6.9					13.6	11.6	13.7	13.8	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.2	0.0	0.1					0.7	0.1	1.9	1.3	
Delay (s)	13.2	6.5	7.0					14.3	11.7	15.6	15.1	
Level of Service	B	A	A					B	B	B	B	
Approach Delay (s)		11.9			0.0			13.6			15.3	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	50.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	529	4	141	0	0	0	0	277	99	149	291	0
Future Volume (veh/h)	529	4	141	0	0	0	0	277	99	149	291	0
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1712	1366	1601				0	1826	1715	1636	1595	0
Adj Flow Rate, veh/h	545	4	145				0	286	102	154	300	0
Peak Hour Factor	0.97	0.97	0.97				0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	8	33	16				0	5	13	2	5	0
Cap, veh/h	665	557	553				0	676	538	417	590	0
Arrive On Green	0.41	0.41	0.41				0.00	0.37	0.37	0.37	0.37	0.00
Sat Flow, veh/h	1630	1366	1357				0	1826	1454	945	1595	0
Grp Volume(v), veh/h	545	4	145				0	286	102	154	300	0
Grp Sat Flow(s),veh/h/ln	1630	1366	1357				0	1826	1454	945	1595	0
Q Serve(g_s), s	12.1	0.1	2.9				0.0	4.7	1.9	5.9	5.9	0.0
Cycle Q Clear(g_c), s	12.1	0.1	2.9				0.0	4.7	1.9	10.6	5.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	665	557	553				0	676	538	417	590	0
V/C Ratio(X)	0.82	0.01	0.26				0.00	0.42	0.19	0.37	0.51	0.00
Avail Cap(c_a), veh/h	1694	1419	1410				0	1302	1037	741	1137	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.7	7.1	8.0				0.0	9.5	8.6	13.5	9.9	0.0
Incr Delay (d2), s/veh	2.6	0.0	0.2				0.0	0.4	0.2	0.5	0.7	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
%ile BackOfQ(95%),veh/ln	6.4	0.0	1.2				0.0	2.7	0.9	1.9	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	7.1	8.2				0.0	10.0	8.8	14.1	10.6	0.0
LnGrp LOS	B	A	A				A	A	A	B	B	A
Approach Vol, veh/h		694						388			454	
Approach Delay, s/veh		12.2						9.7			11.8	
Approach LOS		B						A			B	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		19.5		21.0		19.5						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		28.9		42.1		28.9						
Max Q Clear Time (g_c+I1), s		6.7		14.1		12.6						
Green Ext Time (p_c), s		2.0		2.5		2.4						

Intersection Summary												
HCM 6th Ctrl Delay			11.4									
HCM 6th LOS			B									

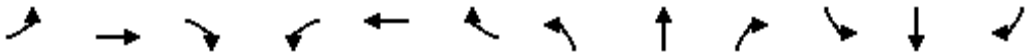
MOVEMENT SUMMARY

Site: 101 [SE Nye Ave & SE 3rd Dr]

Future PM - Concept 5
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SE 3rd Dr											
3	L2	1	0.0	0.024	6.3	LOS A	0.1	2.2	0.49	0.36	34.3
8	T1	12	50.0	0.024	6.3	LOS A	0.1	2.2	0.49	0.36	33.4
18	R2	1	0.0	0.024	6.3	LOS A	0.1	2.2	0.49	0.36	33.2
Approach		14	42.3	0.024	6.3	LOS A	0.1	2.2	0.49	0.36	33.4
East: SE Nye Ave											
1	L2	1	0.0	0.162	5.1	LOS A	0.7	18.4	0.44	0.33	35.2
6	T1	14	10.0	0.162	5.1	LOS A	0.7	18.4	0.44	0.33	34.9
16	R2	147	2.0	0.162	5.1	LOS A	0.7	18.4	0.44	0.33	34.0
Approach		162	2.7	0.162	5.1	LOS A	0.7	18.4	0.44	0.33	34.1
North: RoadName											
7	L2	179	0.0	0.374	6.4	LOS A	2.2	58.5	0.12	0.03	33.4
4	T1	14	0.0	0.374	6.4	LOS A	2.2	58.5	0.12	0.03	33.3
14	R2	277	13.0	0.374	6.4	LOS A	2.2	58.5	0.12	0.03	32.1
Approach		471	7.7	0.374	6.4	LOS A	2.2	58.5	0.12	0.03	32.6
West: RoadName											
5	L2	249	10.0	0.264	6.0	LOS A	1.2	33.0	0.39	0.26	32.1
2	T1	24	0.0	0.264	6.0	LOS A	1.2	33.0	0.39	0.26	32.3
12	R2	1	0.0	0.264	6.0	LOS A	1.2	33.0	0.39	0.26	31.4
Approach		274	9.1	0.264	6.0	LOS A	1.2	33.0	0.39	0.26	32.1
All Vehicles		921	7.7	0.374	6.1	LOS A	2.2	58.5	0.26	0.16	32.7

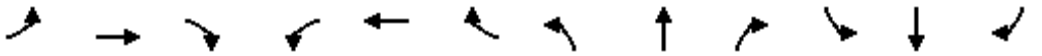
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	27	87	109	88	19	104	348	53	8	260	36
Future Volume (vph)	15	27	87	109	88	19	104	348	53	8	260	36
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		5%			-4%			4%			-4%	
Total Lost time (s)		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	
Frt		0.91			0.99		1.00	0.98		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1511			1679		1552	1559		848	1593	
Flt Permitted		0.95			0.79		0.55	1.00		0.43	1.00	
Satd. Flow (perm)		1444			1354		893	1559		383	1593	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	17	30	97	121	98	21	116	387	59	9	289	40
RTOR Reduction (vph)	0	66	0	0	5	0	0	8	0	0	6	0
Lane Group Flow (vph)	0	78	0	0	235	0	116	439	0	9	323	0
Heavy Vehicles (%)	0%	0%	3%	0%	5%	5%	5%	9%	0%	100%	10%	10%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.5			13.5		19.5	19.5		19.5	19.5	
Effective Green, g (s)		13.5			13.5		19.5	19.5		19.5	19.5	
Actuated g/C Ratio		0.32			0.32		0.46	0.46		0.46	0.46	
Clearance Time (s)		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	
Lane Grp Cap (vph)		464			435		414	723		177	739	
v/s Ratio Prot								c0.28			0.20	
v/s Ratio Perm		0.05			c0.17		0.13			0.02		
v/c Ratio		0.17			0.54		0.28	0.61		0.05	0.44	
Uniform Delay, d1		10.2			11.7		6.9	8.4		6.2	7.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			1.4		0.4	1.4		0.1	0.4	
Delay (s)		10.4			13.1		7.3	9.8		6.3	8.0	
Level of Service		B			B		A	A		A	A	
Approach Delay (s)		10.4			13.1			9.3			7.9	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	42.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.3%	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)	15	27	87	109	88	19	104	348	53	8	260	36
Future Volume (veh/h)	15	27	87	109	88	19	104	348	53	8	260	36
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	1614	1614	1614	1826	1826	1826	1595	1540	1540	512	1757	1757
Adj Flow Rate, veh/h	17	30	97	121	98	21	116	387	59	9	289	40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	5	5	5	5	9	9	100	10	10
Cap, veh/h	164	90	227	357	186	34	558	577	88	314	668	92
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.44	0.44	0.44	0.44	0.44	0.44
Sat Flow, veh/h	85	379	958	692	784	142	973	1305	199	281	1510	209
Grp Volume(v), veh/h	144	0	0	240	0	0	116	0	446	9	0	329
Grp Sat Flow(s),veh/h/ln	1422	0	0	1617	0	0	973	0	1505	281	0	1719
Q Serve(g_s), s	0.0	0.0	0.0	1.1	0.0	0.0	2.6	0.0	6.6	0.7	0.0	3.7
Cycle Q Clear(g_c), s	2.4	0.0	0.0	3.5	0.0	0.0	6.3	0.0	6.6	7.3	0.0	3.7
Prop In Lane	0.12		0.67	0.50		0.09	1.00		0.13	1.00		0.12
Lane Grp Cap(c), veh/h	481	0	0	577	0	0	558	0	665	314	0	760
V/C Ratio(X)	0.30	0.00	0.00	0.42	0.00	0.00	0.21	0.00	0.67	0.03	0.00	0.43
Avail Cap(c_a), veh/h	1708	0	0	1923	0	0	1496	0	2116	585	0	2418
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.1	0.0	0.0	9.5	0.0	0.0	7.6	0.0	6.2	9.1	0.0	5.4
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.5	0.0	0.0	0.2	0.0	1.2	0.0	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(95%),veh/ln	1.0	0.0	0.0	1.7	0.0	0.0	0.6	0.0	2.1	0.1	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.4	0.0	0.0	9.9	0.0	0.0	7.8	0.0	7.4	9.2	0.0	5.8
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		144			240			562			338	
Approach Delay, s/veh		9.4			9.9			7.5			5.9	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		16.9		11.2		16.9		11.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		39.5		31.5		39.5		31.5				
Max Q Clear Time (g_c+I1), s		8.6		4.4		9.3		5.5				
Green Ext Time (p_c), s		3.8		0.9		2.4		1.5				

Intersection Summary												
HCM 6th Ctrl Delay			7.7									
HCM 6th LOS			A									

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	148	26	479	192	34	422
Future Volume (vph)	148	26	479	192	34	422
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-4%		4%			-4%
Total Lost time (s)	4.5		4.5		4.5	4.5
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.98		0.96		1.00	1.00
Flt Protected	0.96		1.00		0.95	1.00
Satd. Flow (prot)	1821		1790		1841	1938
Flt Permitted	0.96		1.00		0.26	1.00
Satd. Flow (perm)	1821		1790		502	1938
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	164	29	532	213	38	469
RTOR Reduction (vph)	9	0	16	0	0	0
Lane Group Flow (vph)	184	0	729	0	38	469
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	11.2		30.3		30.3	30.3
Effective Green, g (s)	11.2		30.3		30.3	30.3
Actuated g/C Ratio	0.22		0.60		0.60	0.60
Clearance Time (s)	4.5		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	403		1074		301	1162
v/s Ratio Prot	c0.10		c0.41			0.24
v/s Ratio Perm					0.08	
v/c Ratio	0.46		0.68		0.13	0.40
Uniform Delay, d1	17.0		6.8		4.4	5.3
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.8		1.7		0.2	0.2
Delay (s)	17.8		8.5		4.6	5.6
Level of Service	B		A		A	A
Approach Delay (s)	17.8		8.5			5.5
Approach LOS	B		A			A

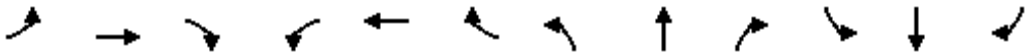
Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	50.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	148	26	479	192	34	422
Future Volume (veh/h)	148	26	479	192	34	422
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	2057	2057	1806	1806	2057	2057
Adj Flow Rate, veh/h	164	29	532	213	38	469
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	234	41	712	285	442	1194
Arrive On Green	0.14	0.14	0.58	0.58	0.58	0.58
Sat Flow, veh/h	1627	288	1226	491	854	2057
Grp Volume(v), veh/h	194	0	0	745	38	469
Grp Sat Flow(s),veh/h/ln	1924	0	0	1717	854	2057
Q Serve(g_s), s	3.1	0.0	0.0	10.5	1.1	4.0
Cycle Q Clear(g_c), s	3.1	0.0	0.0	10.5	11.6	4.0
Prop In Lane	0.85	0.15		0.29	1.00	
Lane Grp Cap(c), veh/h	277	0	0	996	442	1194
V/C Ratio(X)	0.70	0.00	0.00	0.75	0.09	0.39
Avail Cap(c_a), veh/h	1623	0	0	2292	1086	2746
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.3	0.0	0.0	5.1	9.4	3.7
Incr Delay (d2), s/veh	3.2	0.0	0.0	1.1	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.3	0.0	0.0	2.7	0.3	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.5	0.0	0.0	6.2	9.5	3.9
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	194		745			507
Approach Delay, s/veh	16.5		6.2			4.3
Approach LOS	B		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		23.4			23.4	9.2
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		43.5			43.5	27.5
Max Q Clear Time (g_c+I1), s		12.5			13.6	5.1
Green Ext Time (p_c), s		6.4			3.5	0.5

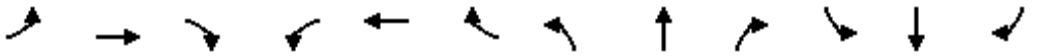
Intersection Summary	
HCM 6th Ctrl Delay	6.9
HCM 6th LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	78	124	70	56	14	158	341	112	23	333	42
Future Volume (vph)	19	78	124	70	56	14	158	341	112	23	333	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		5%			-4%			4%			-4%	
Total Lost time (s)		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	
Frt		0.92			0.99		1.00	0.96		1.00	0.98	
Flt Protected		1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1553			1658		1597	1529		1542	1647	
Flt Permitted		0.96			0.78		0.50	1.00		0.42	1.00	
Satd. Flow (perm)		1504			1329		840	1529		687	1647	
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)	20	83	132	74	60	15	168	363	119	24	354	45
RTOR Reduction (vph)	0	63	0	0	6	0	0	16	0	0	6	0
Lane Group Flow (vph)	0	172	0	0	143	0	168	466	0	24	393	0
Heavy Vehicles (%)	0%	0%	2%	0%	9%	0%	2%	9%	5%	10%	7%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		10.4			10.4		19.6	19.6		19.6	19.6	
Effective Green, g (s)		10.4			10.4		19.6	19.6		19.6	19.6	
Actuated g/C Ratio		0.27			0.27		0.50	0.50		0.50	0.50	
Clearance Time (s)		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	
Lane Grp Cap (vph)		401			354		422	768		345	827	
v/s Ratio Prot								c0.30			0.24	
v/s Ratio Perm		c0.11			0.11		0.20			0.03		
v/c Ratio		0.43			0.40		0.40	0.61		0.07	0.47	
Uniform Delay, d1		11.8			11.8		6.0	6.9		5.0	6.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7			0.8		0.6	1.4		0.1	0.4	
Delay (s)		12.6			12.5		6.7	8.3		5.1	6.8	
Level of Service		B			B		A	A		A	A	
Approach Delay (s)		12.6			12.5			7.9			6.7	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	39.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	68.5%	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)	19	78	124	70	56	14	158	341	112	23	333	42
Future Volume (veh/h)	19	78	124	70	56	14	158	341	112	23	333	42
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	1614	1614	1614	1770	1770	1770	1636	1540	1540	1757	1798	1798
Adj Flow Rate, veh/h	20	83	132	74	60	15	168	363	119	24	354	45
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, %	0	0	0	9	9	9	2	9	9	10	7	7
Cap, veh/h	132	137	195	303	204	39	536	546	179	443	769	98
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.49	0.49	0.49	0.49	0.49	0.49
Sat Flow, veh/h	62	573	814	593	852	162	936	1111	364	931	1564	199
Grp Volume(v), veh/h	235	0	0	149	0	0	168	0	482	24	0	399
Grp Sat Flow(s),veh/h/ln	1449	0	0	1607	0	0	936	0	1475	931	0	1762
Q Serve(g_s), s	0.9	0.0	0.0	0.0	0.0	0.0	4.8	0.0	8.2	0.7	0.0	5.0
Cycle Q Clear(g_c), s	4.9	0.0	0.0	2.4	0.0	0.0	9.8	0.0	8.2	8.9	0.0	5.0
Prop In Lane	0.09		0.56	0.50		0.10	1.00		0.25	1.00		0.11
Lane Grp Cap(c), veh/h	463	0	0	545	0	0	536	0	725	443	0	866
V/C Ratio(X)	0.51	0.00	0.00	0.27	0.00	0.00	0.31	0.00	0.66	0.05	0.00	0.46
Avail Cap(c_a), veh/h	1257	0	0	1327	0	0	1323	0	1964	1226	0	2347
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.5	0.0	0.0	10.6	0.0	0.0	8.8	0.0	6.4	9.8	0.0	5.6
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.3	0.0	0.0	0.3	0.0	1.1	0.1	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(95%),veh/ln	2.3	0.0	0.0	1.3	0.0	0.0	1.3	0.0	2.7	0.2	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.4	0.0	0.0	10.8	0.0	0.0	9.1	0.0	7.5	9.8	0.0	6.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		235			149			650			423	
Approach Delay, s/veh		12.4			10.8			7.9			6.2	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		20.9		12.5		20.9		12.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		44.5		26.5		44.5		26.5				
Max Q Clear Time (g_c+I1), s		11.8		6.9		10.9		4.4				
Green Ext Time (p_c), s		4.6		1.3		2.9		0.8				

Intersection Summary												
HCM 6th Ctrl Delay			8.4									
HCM 6th LOS			A									

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	333	59	552	320	56	471
Future Volume (vph)	333	59	552	320	56	471
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-4%		4%			-4%
Total Lost time (s)	4.5		4.5	4.5	4.5	4.5
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1821		1862	1583	1841	1938
Flt Permitted	0.96		1.00	1.00	0.27	1.00
Satd. Flow (perm)	1821		1862	1583	525	1938
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	370	66	613	356	62	523
RTOR Reduction (vph)	8	0	0	139	0	0
Lane Group Flow (vph)	428	0	613	217	62	523
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	18.7		26.2	26.2	26.2	26.2
Effective Green, g (s)	18.7		26.2	26.2	26.2	26.2
Actuated g/C Ratio	0.35		0.49	0.49	0.49	0.49
Clearance Time (s)	4.5		4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	631		905	769	255	942
v/s Ratio Prot	c0.23		c0.33			0.27
v/s Ratio Perm				0.14	0.12	
v/c Ratio	0.68		0.68	0.28	0.24	0.56
Uniform Delay, d1	15.0		10.6	8.3	8.1	9.7
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9		2.0	0.2	0.5	0.7
Delay (s)	17.9		12.6	8.5	8.6	10.5
Level of Service	B		B	A	A	B
Approach Delay (s)	17.9		11.1			10.3
Approach LOS	B		B			B

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	53.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	333	59	552	320	56	471
Future Volume (veh/h)	333	59	552	320	56	471
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	2057	2057	1806	1806	2057	2057
Adj Flow Rate, veh/h	370	66	613	356	62	523
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	471	84	884	749	334	1007
Arrive On Green	0.29	0.29	0.49	0.49	0.49	0.49
Sat Flow, veh/h	1629	291	1806	1530	693	2057
Grp Volume(v), veh/h	437	0	613	356	62	523
Grp Sat Flow(s),veh/h/ln	1924	0	1806	1530	693	2057
Q Serve(g_s), s	8.5	0.0	10.7	6.3	3.1	7.1
Cycle Q Clear(g_c), s	8.5	0.0	10.7	6.3	13.8	7.1
Prop In Lane	0.85	0.15		1.00	1.00	
Lane Grp Cap(c), veh/h	557	0	884	749	334	1007
V/C Ratio(X)	0.78	0.00	0.69	0.48	0.19	0.52
Avail Cap(c_a), veh/h	1403	0	1831	1552	698	2086
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.3	0.0	8.0	6.9	13.4	7.1
Incr Delay (d2), s/veh	2.5	0.0	1.0	0.5	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.9	0.0	5.2	2.6	0.8	3.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.8	0.0	9.0	7.4	13.6	7.5
LnGrp LOS	B	A	A	A	B	A
Approach Vol, veh/h	437		969			585
Approach Delay, s/veh	15.8		8.4			8.2
Approach LOS	B		A			A

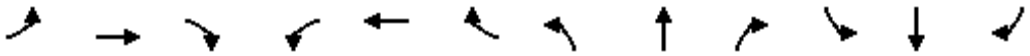
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		24.4			24.4	16.3
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		41.3			41.3	29.7
Max Q Clear Time (g_c+I1), s		12.7			15.8	10.5
Green Ext Time (p_c), s		6.1			4.2	1.4

Intersection Summary	
HCM 6th Ctrl Delay	10.0
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	27	87	109	88	19	104	340	27	8	260	36
Future Volume (vph)	15	27	87	109	88	19	104	340	27	8	260	36
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		5%			-4%			4%			-4%	
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.91			0.99			0.99			0.98	
Flt Protected		0.99			0.98			0.99			1.00	
Satd. Flow (prot)		1511			1607			2969			2829	
Flt Permitted		0.95			0.77			0.80			0.94	
Satd. Flow (perm)		1444			1270			2412			2662	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	17	30	97	121	98	21	116	378	30	9	289	40
RTOR Reduction (vph)	0	64	0	0	5	0	0	6	0	0	15	0
Lane Group Flow (vph)	0	80	0	0	235	0	0	518	0	0	323	0
Heavy Vehicles (%)	0%	0%	3%	0%	13%	20%	5%	9%	0%	100%	15%	18%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.7			12.7			15.7			15.7	
Effective Green, g (s)		12.7			12.7			15.7			15.7	
Actuated g/C Ratio		0.34			0.34			0.42			0.42	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		490			431			1012			1117	
v/s Ratio Prot												
v/s Ratio Perm		0.06			c0.19			c0.21			0.12	
v/c Ratio		0.16			0.55			0.51			0.29	
Uniform Delay, d1		8.6			10.0			8.0			7.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			1.4			0.4			0.1	
Delay (s)		8.8			11.4			8.5			7.3	
Level of Service		A			B			A			A	
Approach Delay (s)		8.8			11.4			8.5			7.3	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	37.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.5%	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)	15	27	87	109	88	19	104	340	27	8	260	36
Future Volume (veh/h)	15	27	87	109	88	19	104	340	27	8	260	36
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	1614	1614	1614	1715	1715	1715	1540	1540	1540	1688	1688	1688
Adj Flow Rate, veh/h	17	30	97	121	98	21	116	378	30	9	289	40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	13	13	13	9	9	9	15	15	15
Cap, veh/h	184	97	245	381	190	34	348	813	64	162	1045	142
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	85	378	957	635	744	132	374	2130	168	26	2739	371
Grp Volume(v), veh/h	144	0	0	240	0	0	279	0	245	180	0	158
Grp Sat Flow(s),veh/h/ln	1421	0	0	1511	0	0	1301	0	1372	1667	0	1469
Q Serve(g_s), s	0.0	0.0	0.0	1.2	0.0	0.0	1.2	0.0	3.3	0.0	0.0	1.9
Cycle Q Clear(g_c), s	2.1	0.0	0.0	3.3	0.0	0.0	3.7	0.0	3.3	1.8	0.0	1.9
Prop In Lane	0.12		0.67	0.50		0.09	0.42		0.12	0.05		0.25
Lane Grp Cap(c), veh/h	526	0	0	605	0	0	702	0	523	789	0	561
V/C Ratio(X)	0.27	0.00	0.00	0.40	0.00	0.00	0.40	0.00	0.47	0.23	0.00	0.28
Avail Cap(c_a), veh/h	1988	0	0	2112	0	0	2125	0	2127	2689	0	2278
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.6	0.0	0.0	8.0	0.0	0.0	5.8	0.0	5.8	5.3	0.0	5.3
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.4	0.0	0.0	0.4	0.0	0.7	0.1	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	0.4	0.0	0.0	0.7	0.0	0.0	0.5	0.0	0.5	0.3	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.9	0.0	0.0	8.5	0.0	0.0	6.2	0.0	6.4	5.5	0.0	5.6
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		144			240			524			338	
Approach Delay, s/veh		7.9			8.5			6.3			5.5	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.0		10.9		14.0		10.9				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		38.5		32.5		38.5		32.5				
Max Q Clear Time (g_c+I1), s		5.7		4.1		3.9		5.3				
Green Ext Time (p_c), s		3.8		0.9		2.2		1.5				

Intersection Summary												
HCM 6th Ctrl Delay			6.7									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	44	26	445	0	34	422
Future Vol, veh/h	44	26	445	0	34	422
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	-	4	-	-	-4
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	28	484	0	37	459

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	788	242	0	0	484	0
Stage 1	484	-	-	-	-	-
Stage 2	304	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	328	759	-	-	1075	-
Stage 1	585	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	313	759	-	-	1075	-
Mov Cap-2 Maneuver	313	-	-	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	689	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	400	1075	-
HCM Lane V/C Ratio	-	-	0.19	0.034	-
HCM Control Delay (s)	-	-	16.1	8.5	0.2
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	10	66	57	173	475	0	0	196	270
Future Vol, veh/h	0	0	0	10	66	57	173	475	0	0	196	270
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Yield	Yield	Yield	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	-2	-	-	4	-	-	-4	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	10	10	10	8	0	0	10	10
Mvmt Flow	0	0	0	11	73	63	192	528	0	0	218	300

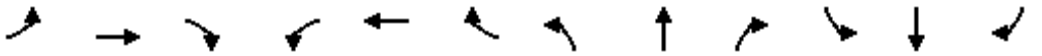
Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	1280	1430	528	518	0	-	-	-	0	
Stage 1	912	912	-	-	-	-	-	-	-	
Stage 2	368	518	-	-	-	-	-	-	-	
Critical Hdwy	6	6.2	6.1	4.2	-	-	-	-	-	
Critical Hdwy Stg 1	5	5.2	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5	5.2	-	-	-	-	-	-	-	
Follow-up Hdwy	3.5	4.09	3.39	2.29	-	-	-	-	-	
Pot Cap-1 Maneuver	213	152	551	1008	-	0	0	-	-	
Stage 1	437	379	-	-	-	0	0	-	-	
Stage 2	734	551	-	-	-	0	0	-	-	
Platoon blocked, %					-			-	-	
Mov Cap-1 Maneuver	173	0	551	1008	-	-	-	-	-	
Mov Cap-2 Maneuver	173	0	-	-	-	-	-	-	-	
Stage 1	354	0	-	-	-	-	-	-	-	
Stage 2	734	0	-	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	18.4	2.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1008	-	415	-	-
HCM Lane V/C Ratio	0.191	-	0.356	-	-
HCM Control Delay (s)	9.4	-	18.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.7	-	1.6	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	280	99	155	0	0	0	0	368	25	54	152	0
Future Volume (vph)	280	99	155	0	0	0	0	368	25	54	152	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-2%			-2%			-4%			4%	
Total Lost time (s)		4.5						4.5		4.5	4.5	
Lane Util. Factor		1.00						1.00		1.00	1.00	
Frt		0.96						0.99		1.00	1.00	
Flt Protected		0.97						1.00		0.95	1.00	
Satd. Flow (prot)		1504						1622		1481	1573	
Flt Permitted		0.97						1.00		0.33	1.00	
Satd. Flow (perm)		1504						1622		515	1573	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	311	110	172	0	0	0	0	409	28	60	169	0
RTOR Reduction (vph)	0	19	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	574	0	0	0	0	0	434	0	60	169	0
Heavy Vehicles (%)	10%	10%	10%	0%	0%	0%	0%	9%	10%	10%	9%	0%
Parking (#/hr)									0			
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		28.6						21.5		21.5	21.5	
Effective Green, g (s)		28.6						21.5		21.5	21.5	
Actuated g/C Ratio		0.48						0.36		0.36	0.36	
Clearance Time (s)		4.5						4.5		4.5	4.5	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		727						590		187	572	
v/s Ratio Prot								c0.27			0.11	
v/s Ratio Perm		0.38								0.12		
v/c Ratio		0.79						0.74		0.32	0.30	
Uniform Delay, d1		12.7						16.3		13.5	13.4	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		5.7						4.7		1.0	0.3	
Delay (s)		18.4						21.1		14.5	13.7	
Level of Service		B						C		B	B	
Approach Delay (s)		18.4			0.0			21.1			13.9	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	70.9%	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)	280	99	155	0	0	0	0	368	25	54	152	0
Future Volume (veh/h)	280	99	155	0	0	0	0	368	25	54	152	0
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	0.90	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1822	1684	1822				0	1770	1770	1527	1540	0
Adj Flow Rate, veh/h	311	110	172				0	409	28	60	169	0
Peak Hour Factor	0.90	0.90	0.90				0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	10	0				0	9	9	10	9	0
Cap, veh/h	374	132	207				0	542	37	246	567	0
Arrive On Green	0.46	0.46	0.46				0.00	0.37	0.37	0.37	0.37	0.00
Sat Flow, veh/h	819	290	453				0	1474	101	843	1540	0
Grp Volume(v), veh/h	593	0	0				0	0	437	60	169	0
Grp Sat Flow(s),veh/h/ln	1562	0	0				0	0	1575	843	1540	0
Q Serve(g_s), s	17.0	0.0	0.0				0.0	0.0	12.4	3.4	4.0	0.0
Cycle Q Clear(g_c), s	17.0	0.0	0.0				0.0	0.0	12.4	15.9	4.0	0.0
Prop In Lane	0.52		0.29				0.00		0.06	1.00		0.00
Lane Grp Cap(c), veh/h	713	0	0				0	0	580	246	567	0
V/C Ratio(X)	0.83	0.00	0.00				0.00	0.00	0.75	0.24	0.30	0.00
Avail Cap(c_a), veh/h	1235	0	0				0	0	938	438	917	0
HCM Platoon Ratio	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				0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.2	0.0	0.0				0.0	0.0	14.2	21.1	11.5	0.0
Incr Delay (d2), s/veh	2.6	0.0	0.0				0.0	0.0	2.0	0.5	0.3	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
%ile BackOfQ(50%),veh/ln	5.2	0.0	0.0				0.0	0.0	4.0	0.7	1.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.8	0.0	0.0				0.0	0.0	16.2	21.6	11.8	0.0
LnGrp LOS	B	A	A				A	A	B	C	B	A
Approach Vol, veh/h		593						437			229	
Approach Delay, s/veh		14.8						16.2			14.4	
Approach LOS		B						B			B	

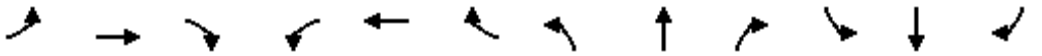
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		23.3		27.9		23.3						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		30.5		40.5		30.5						
Max Q Clear Time (g_c+I1), s		14.4		19.0		17.9						
Green Ext Time (p_c), s		2.5		4.3		1.0						

Intersection Summary												
HCM 6th Ctrl Delay			15.2									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	32	3	1	33	130	2	19	0	110	20	177
Future Volume (vph)	244	32	3	1	33	130	2	19	0	110	20	177
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			0%			4%	
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.89			1.00			0.92	
Flt Protected		0.96			1.00			1.00			0.98	
Satd. Flow (prot)		1540			1508			1196			1445	
Flt Permitted		0.69			1.00			0.97			0.88	
Satd. Flow (perm)		1104			1506			1168			1291	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	271	36	3	1	37	144	2	21	0	122	22	197
RTOR Reduction (vph)	0	1	0	0	80	0	0	0	0	0	66	0
Lane Group Flow (vph)	0	309	0	0	102	0	0	23	0	0	275	0
Heavy Vehicles (%)	10%	0%	0%	0%	10%	2%	0%	50%	0%	0%	0%	13%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.1			20.1			16.0			16.0	
Effective Green, g (s)		20.1			20.1			16.0			16.0	
Actuated g/C Ratio		0.45			0.45			0.35			0.35	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		492			671			414			458	
v/s Ratio Prot												
v/s Ratio Perm		c0.28			0.07			0.02			c0.21	
v/c Ratio		0.63			0.15			0.06			0.60	
Uniform Delay, d1		9.6			7.4			9.6			11.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.5			0.1			0.1			2.1	
Delay (s)		12.1			7.5			9.6			14.0	
Level of Service		B			A			A			B	
Approach Delay (s)		12.1			7.5			9.6			14.0	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	45.1	Sum of lost time (s)	9.0
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)	244	32	3	1	33	130	2	19	0	110	20	177
Future Volume (veh/h)	244	32	3	1	33	130	2	19	0	110	20	177
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	1750	1750	1750	1614	1614	1614	1068	1068	1068	1663	1663	1663
Adj Flow Rate, veh/h	271	36	3	1	37	144	2	21	0	122	22	197
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	10	10	10	50	50	50	0	0	0
Cap, veh/h	621	68	4	131	94	360	149	365	0	311	77	291
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.35	0.35	0.00	0.35	0.35	0.35
Sat Flow, veh/h	1174	210	14	2	293	1117	24	1033	0	384	218	822
Grp Volume(v), veh/h	310	0	0	182	0	0	23	0	0	341	0	0
Grp Sat Flow(s),veh/h/ln	1398	0	0	1412	0	0	1056	0	0	1424	0	0
Q Serve(g_s), s	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0
Cycle Q Clear(g_c), s	4.9	0.0	0.0	2.8	0.0	0.0	0.4	0.0	0.0	5.6	0.0	0.0
Prop In Lane	0.87		0.01	0.01		0.79	0.09		0.00	0.36		0.58
Lane Grp Cap(c), veh/h	694	0	0	586	0	0	514	0	0	679	0	0
V/C Ratio(X)	0.45	0.00	0.00	0.31	0.00	0.00	0.04	0.00	0.00	0.50	0.00	0.00
Avail Cap(c_a), veh/h	2059	0	0	2104	0	0	1334	0	0	1799	0	0
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	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.9	0.0	0.0	7.3	0.0	0.0	5.9	0.0	0.0	7.6	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.6	0.0	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	1.0	0.0	0.0	0.5	0.0	0.0	0.1	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.3	0.0	0.0	7.6	0.0	0.0	6.0	0.0	0.0	8.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		310			182			23			341	
Approach Delay, s/veh		8.3			7.6			6.0			8.1	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.3		13.5		14.3		13.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.1		38.9		32.1		38.9				
Max Q Clear Time (g_c+I1), s		2.4		6.9		7.6		4.8				
Green Ext Time (p_c), s		0.1		2.3		2.3		1.2				

Intersection Summary												
HCM 6th Ctrl Delay			8.0									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	98	79	5	0	0	0	0	0	121	37	119	0
Future Vol, veh/h	98	79	5	0	0	0	0	0	121	37	119	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	150	150	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-2	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	2
Mvmt Flow	109	88	6	0	0	0	0	0	134	41	132	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	281	348	132	-	0	0	134	0	0
Stage 1	214	214	-	-	-	-	-	-	-
Stage 2	67	134	-	-	-	-	-	-	-
Critical Hdwy	6.5	6.6	6.3	-	-	-	4.2	-	-
Critical Hdwy Stg 1	5.5	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.5	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	-	-	-	2.29	-	-
Pot Cap-1 Maneuver	692	563	896	0	-	-	1403	-	0
Stage 1	803	711	-	0	-	-	-	-	0
Stage 2	936	770	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	672	0	896	-	-	-	1403	-	-
Mov Cap-2 Maneuver	672	0	-	-	-	-	-	-	-
Stage 1	803	0	-	-	-	-	-	-	-
Stage 2	909	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	0	1.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	680	1403	-
HCM Lane V/C Ratio	-	-	0.297	0.029	-
HCM Control Delay (s)	-	-	12.5	7.6	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	119	67	41	0	98	0	0	37	66
Future Vol, veh/h	0	0	0	119	67	41	0	98	0	0	37	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-2	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	92	90	90	90	90	90
Heavy Vehicles, %	2	2	2	10	10	10	10	10	10	10	10	10
Mvmt Flow	0	0	0	132	74	46	0	109	0	0	41	73

Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	187	223	109	114	0	-	-	-	0
Stage 1	109	109	-	-	-	-	-	-	-
Stage 2	78	114	-	-	-	-	-	-	-
Critical Hdwy	6.1	6.2	6.1	4.2	-	-	-	-	-
Critical Hdwy Stg 1	5.1	5.2	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.1	5.2	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	2.29	-	-	-	-	-
Pot Cap-1 Maneuver	801	679	929	1427	-	0	0	-	-
Stage 1	907	799	-	-	-	0	0	-	-
Stage 2	933	796	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	801	0	929	1427	-	-	-	-	-
Mov Cap-2 Maneuver	801	0	-	-	-	-	-	-	-
Stage 1	907	0	-	-	-	-	-	-	-
Stage 2	933	0	-	-	-	-	-	-	-

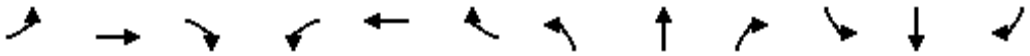
Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1427	-	830	-	-
HCM Lane V/C Ratio	-	-	0.304	-	-
HCM Control Delay (s)	0	-	11.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	1.3	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	78	124	70	56	14	158	332	27	23	333	42
Future Volume (vph)	19	78	124	70	56	14	158	332	27	23	333	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		5%			-4%			4%			-4%	
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.92			0.99			0.99			0.98	
Flt Protected		1.00			0.98			0.98			1.00	
Satd. Flow (prot)		1553			1658			2986			3093	
Flt Permitted		0.96			0.80			0.73			0.91	
Satd. Flow (perm)		1503			1353			2202			2837	
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)	20	83	132	74	60	15	168	353	29	24	354	45
RTOR Reduction (vph)	0	64	0	0	6	0	0	6	0	0	13	0
Lane Group Flow (vph)	0	171	0	0	143	0	0	544	0	0	410	0
Heavy Vehicles (%)	0%	0%	2%	0%	9%	0%	2%	9%	5%	25%	7%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		9.7			9.7			16.2			16.2	
Effective Green, g (s)		9.7			9.7			16.2			16.2	
Actuated g/C Ratio		0.28			0.28			0.46			0.46	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		417			376			1022			1316	
v/s Ratio Prot												
v/s Ratio Perm		c0.11			0.11			c0.25			0.14	
v/c Ratio		0.41			0.38			0.53			0.31	
Uniform Delay, d1		10.3			10.2			6.7			5.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.7			0.6			0.5			0.1	
Delay (s)		10.9			10.8			7.2			6.0	
Level of Service		B			B			A			A	
Approach Delay (s)		10.9			10.8			7.2			6.0	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	34.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	65.2%	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)	19	78	124	70	56	14	158	332	27	23	333	42
Future Volume (veh/h)	19	78	124	70	56	14	158	332	27	23	333	42
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	1614	1614	1614	1770	1770	1770	1540	1540	1540	1798	1798	1798
Adj Flow Rate, veh/h	20	83	132	74	60	15	168	353	29	24	354	45
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, %	0	0	0	9	9	9	9	9	9	7	7	7
Cap, veh/h	151	143	203	329	216	40	428	760	65	169	1267	156
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.44	0.44	0.44	0.44	0.44	0.44
Sat Flow, veh/h	63	572	814	570	866	161	520	1736	148	71	2893	356
Grp Volume(v), veh/h	235	0	0	149	0	0	280	0	270	224	0	199
Grp Sat Flow(s),veh/h/ln	1449	0	0	1596	0	0	1028	0	1375	1747	0	1572
Q Serve(g_s), s	0.7	0.0	0.0	0.0	0.0	0.0	4.0	0.0	4.0	0.0	0.0	2.3
Cycle Q Clear(g_c), s	4.1	0.0	0.0	2.0	0.0	0.0	6.3	0.0	4.0	2.3	0.0	2.3
Prop In Lane	0.09		0.56	0.50		0.10	0.60		0.11	0.11		0.23
Lane Grp Cap(c), veh/h	497	0	0	585	0	0	650	0	602	903	0	688
V/C Ratio(X)	0.47	0.00	0.00	0.25	0.00	0.00	0.43	0.00	0.45	0.25	0.00	0.29
Avail Cap(c_a), veh/h	1509	0	0	1582	0	0	1792	0	2079	2696	0	2377
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.7	0.0	0.0	8.9	0.0	0.0	6.3	0.0	5.7	5.2	0.0	5.2
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.2	0.0	0.0	0.5	0.0	0.5	0.1	0.0	0.2
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	0.0	0.5	0.0	0.0	0.6	0.0	0.6	0.4	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.4	0.0	0.0	9.1	0.0	0.0	6.8	0.0	6.2	5.3	0.0	5.4
LnGrp LOS	B	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		235			149			550			423	
Approach Delay, s/veh		10.4			9.1			6.5			5.4	
Approach LOS		B			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		17.1		11.7		17.1		11.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		43.5		27.5		43.5		27.5				
Max Q Clear Time (g_c+I1), s		8.3		6.1		4.3		4.0				
Green Ext Time (p_c), s		4.3		1.4		2.9		0.9				

Intersection Summary												
HCM 6th Ctrl Delay			7.1									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	100	59	459	0	56	471
Future Vol, veh/h	100	59	459	0	56	471
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	-	4	-	-	-4
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	109	64	499	0	61	512

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	877	250	0	0	499	0
Stage 1	499	-	-	-	-	-
Stage 2	378	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	288	750	-	-	1061	-
Stage 1	575	-	-	-	-	-
Stage 2	663	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	265	750	-	-	1061	-
Mov Cap-2 Maneuver	265	-	-	-	-	-
Stage 1	575	-	-	-	-	-
Stage 2	610	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25	0	1.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	349	1061	-
HCM Lane V/C Ratio	-	-	0.495	0.057	-
HCM Control Delay (s)	-	-	25	8.6	0.3
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	2.6	0.2	-

Intersection	
Int Delay, s/veh	5.4

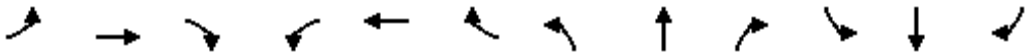
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	9	151	96	146	524	0	0	248	323
Future Vol, veh/h	0	0	0	9	151	96	146	524	0	0	248	323
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Yield	Yield	Yield	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	-2	-	-	4	-	-	-4	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	10	10	10	10	6	0	0	4	10
Mvmt Flow	0	0	0	10	162	103	157	563	0	0	267	347

Major/Minor	Minor1		Major1		Major2				
Conflicting Flow All	1318	1491	563	614	0	-	-	-	0
Stage 1	877	877	-	-	-	-	-	-	-
Stage 2	441	614	-	-	-	-	-	-	-
Critical Hdwy	6.1	6.2	6.1	4.2	-	-	-	-	-
Critical Hdwy Stg 1	5.1	5.2	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.1	5.2	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	2.29	-	-	-	-	-
Pot Cap-1 Maneuver	193	~ 140	527	928	-	0	0	-	-
Stage 1	434	392	-	-	-	0	0	-	-
Stage 2	664	504	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	160	0	527	928	-	-	-	-	-
Mov Cap-2 Maneuver	160	0	-	-	-	-	-	-	-
Stage 1	361	0	-	-	-	-	-	-	-
Stage 2	664	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.9	2.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	928	-	440	-	-
HCM Lane V/C Ratio	0.169	-	0.626	-	-
HCM Control Delay (s)	9.7	-	25.9	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0.6	-	4.2	-	-

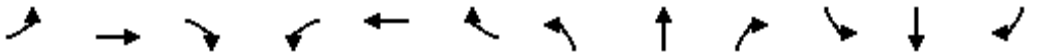
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	347	186	185	0	0	0	0	323	18	66	191	0
Future Volume (vph)	347	186	185	0	0	0	0	323	18	66	191	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-2%			-2%			-4%			4%	
Total Lost time (s)	4.5	4.5						4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.93						0.99		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1526	1487						1683		1481	1633	
Flt Permitted	0.95	1.00						1.00		0.48	1.00	
Satd. Flow (perm)	1526	1487						1683		747	1633	
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)	358	192	191	0	0	0	0	333	19	68	197	0
RTOR Reduction (vph)	0	49	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	358	334	0	0	0	0	0	349	0	68	197	0
Heavy Vehicles (%)	10%	10%	10%	0%	0%	0%	0%	5%	10%	10%	5%	0%
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)	17.5	17.5						15.1		15.1	15.1	
Effective Green, g (s)	17.5	17.5						15.1		15.1	15.1	
Actuated g/C Ratio	0.42	0.42						0.36		0.36	0.36	
Clearance Time (s)	4.5	4.5						4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	641	625						610		271	592	
v/s Ratio Prot		0.22						c0.21			0.12	
v/s Ratio Perm	c0.23									0.09		
v/c Ratio	0.56	0.53						0.57		0.25	0.33	
Uniform Delay, d1	9.1	9.0						10.7		9.3	9.6	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.9						1.3		0.5	0.3	
Delay (s)	10.2	9.9						12.0		9.8	9.9	
Level of Service	B	A						B		A	A	
Approach Delay (s)		10.0			0.0			12.0			9.9	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	41.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	78.0%	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)	347	186	185	0	0	0	0	323	18	66	191	0
Future Volume (veh/h)	347	186	185	0	0	0	0	323	18	66	191	0
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	1684	1684	1684				0	1826	1826	1527	1595	0
Adj Flow Rate, veh/h	358	192	191				0	333	19	68	197	0
Peak Hour Factor	0.97	0.97	0.97				0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	10	10	10				0	5	5	10	5	0
Cap, veh/h	619	299	297				0	573	33	382	535	0
Arrive On Green	0.39	0.39	0.39				0.00	0.34	0.34	0.34	0.34	0.00
Sat Flow, veh/h	1604	775	771				0	1711	98	912	1595	0
Grp Volume(v), veh/h	358	0	383				0	0	352	68	197	0
Grp Sat Flow(s),veh/h/ln	1604	0	1545				0	0	1808	912	1595	0
Q Serve(g_s), s	5.7	0.0	6.5				0.0	0.0	5.2	2.1	3.0	0.0
Cycle Q Clear(g_c), s	5.7	0.0	6.5				0.0	0.0	5.2	7.3	3.0	0.0
Prop In Lane	1.00		0.50				0.00		0.05	1.00		0.00
Lane Grp Cap(c), veh/h	619	0	596				0	0	606	382	535	0
V/C Ratio(X)	0.58	0.00	0.64				0.00	0.00	0.58	0.18	0.37	0.00
Avail Cap(c_a), veh/h	1864	0	1796				0	0	1877	1023	1655	0
HCM Platoon Ratio	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				0.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	7.8	0.0	8.1				0.0	0.0	8.9	11.9	8.1	0.0
Incr Delay (d2), s/veh	0.9	0.0	1.2				0.0	0.0	0.9	0.2	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
%ile BackOfQ(50%),veh/ln	1.4	0.0	1.5				0.0	0.0	1.5	0.4	0.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.7	0.0	9.3				0.0	0.0	9.7	12.1	8.6	0.0
LnGrp LOS	A	A	A				A	A	A	B	A	A
Approach Vol, veh/h		741						352			265	
Approach Delay, s/veh		9.0						9.7			9.5	
Approach LOS		A						A			A	

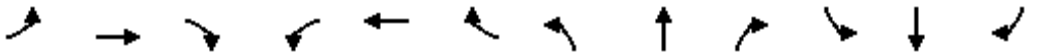
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		15.3		17.0		15.3						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		33.5		37.5		33.5						
Max Q Clear Time (g_c+I1), s		7.2		8.5		9.3						
Green Ext Time (p_c), s		2.2		3.9		1.5						

Intersection Summary												
HCM 6th Ctrl Delay			9.3									
HCM 6th LOS			A									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	208	43	0	0	46	113	1	20	0	123	22	232
Future Volume (vph)	208	43	0	0	46	113	1	20	0	123	22	232
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			0%			4%	
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		1.00			0.90			1.00			0.92	
Flt Protected		0.96			1.00			1.00			0.98	
Satd. Flow (prot)		1610			1549			1746			1501	
Flt Permitted		0.65			1.00			0.99			0.89	
Satd. Flow (perm)		1083			1549			1725			1354	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	234	48	0	0	52	127	1	22	0	138	25	261
RTOR Reduction (vph)	0	0	0	0	75	0	0	0	0	0	79	0
Lane Group Flow (vph)	0	282	0	0	104	0	0	23	0	0	345	0
Heavy Vehicles (%)	3%	11%	0%	0%	0%	3%	0%	0%	0%	0%	0%	5%
Turn Type	Perm	NA			NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.6			18.6			18.2			18.2	
Effective Green, g (s)		18.6			18.6			18.2			18.2	
Actuated g/C Ratio		0.41			0.41			0.40			0.40	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		439			629			685			538	
v/s Ratio Prot					0.07							
v/s Ratio Perm		c0.26						0.01			c0.25	
v/c Ratio		0.64			0.16			0.03			0.64	
Uniform Delay, d1		10.9			8.7			8.4			11.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.2			0.1			0.0			2.6	
Delay (s)		14.1			8.8			8.4			13.8	
Level of Service		B			A			A			B	
Approach Delay (s)		14.1			8.8			8.4			13.8	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	45.8	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.2%	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)	208	43	0	0	46	113	1	20	0	123	22	232
Future Volume (veh/h)	208	43	0	0	46	113	1	20	0	123	22	232
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	1600	1600	1600	1750	1750	1750	1750	1750	1750	1663	1663	1663
Adj Flow Rate, veh/h	234	48	0	0	52	127	1	22	0	138	25	261
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	11	11	11	0	0	0	0	0	0	0	0	0
Cap, veh/h	463	77	0	0	171	418	102	669	0	265	70	338
Arrive On Green	0.38	0.38	0.00	0.00	0.38	0.38	0.39	0.39	0.00	0.39	0.39	0.39
Sat Flow, veh/h	770	203	0	0	451	1101	14	1729	0	365	181	873
Grp Volume(v), veh/h	282	0	0	0	0	179	23	0	0	424	0	0
Grp Sat Flow(s),veh/h/ln	973	0	0	0	0	1552	1742	0	0	1419	0	0
Q Serve(g_s), s	7.8	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	7.0	0.0	0.0
Cycle Q Clear(g_c), s	10.9	0.0	0.0	0.0	0.0	3.1	0.3	0.0	0.0	10.0	0.0	0.0
Prop In Lane	0.83		0.00	0.00		0.71	0.04		0.00	0.33		0.62
Lane Grp Cap(c), veh/h	540	0	0	0	0	589	772	0	0	673	0	0
V/C Ratio(X)	0.52	0.00	0.00	0.00	0.00	0.30	0.03	0.00	0.00	0.63	0.00	0.00
Avail Cap(c_a), veh/h	1164	0	0	0	0	1410	1697	0	0	1431	0	0
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	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.8	0.0	0.0	0.0	0.0	8.4	7.3	0.0	0.0	10.3	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	1.0	0.0	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	1.8	0.0	0.0	0.0	0.0	0.8	0.1	0.0	0.0	2.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.6	0.0	0.0	0.0	0.0	8.7	7.4	0.0	0.0	11.2	0.0	0.0
LnGrp LOS	B	A	A	A	A	A	A	A	A	B	A	A
Approach Vol, veh/h		282			179			23			424	
Approach Delay, s/veh		12.6			8.7			7.4			11.2	
Approach LOS		B			A			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		19.5		19.2		19.5		19.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		35.9		35.1		35.9		35.1				
Max Q Clear Time (g_c+I1), s		2.3		12.9		12.0		5.1				
Green Ext Time (p_c), s		0.1		1.9		3.0		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			11.1									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	182	88	0	0	0	0	0	0	127	83	144	0
Future Vol, veh/h	182	88	0	0	0	0	0	0	127	83	144	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	150	-	-	-	-	-	150	150	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-2	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	0	2	2	2	10	10	10	10	2
Mvmt Flow	198	96	0	0	0	0	0	0	138	90	157	0

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	406	475	157				-	0	0	138	0	0
Stage 1	337	337	-				-	-	-	-	-	-
Stage 2	69	138	-				-	-	-	-	-	-
Critical Hdwy	6.5	6.6	6.3				-	-	-	4.2	-	-
Critical Hdwy Stg 1	5.5	5.6	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.5	5.6	-				-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39				-	-	-	2.29	-	-
Pot Cap-1 Maneuver	586	477	868				0	-	-	1398	-	0
Stage 1	706	627	-				0	-	-	-	-	0
Stage 2	934	767	-				0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	548	0	868				-	-	-	1398	-	-
Mov Cap-2 Maneuver	548	0	-				-	-	-	-	-	-
Stage 1	706	0	-				-	-	-	-	-	-
Stage 2	874	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s		0	2.8
HCM LOS	-		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	EBLn3	SBL	SBT
Capacity (veh/h)	-	-	548	-	-	1398	-
HCM Lane V/C Ratio	-	-	0.361	-	-	0.065	-
HCM Control Delay (s)	-	-	15.2	-	0	7.8	-
HCM Lane LOS	-	-	C	-	A	A	-
HCM 95th %tile Q(veh)	-	-	1.6	-	-	0.2	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	144	106	70	0	182	0	0	83	150
Future Vol, veh/h	0	0	0	144	106	70	0	182	0	0	83	150
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	150	150	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-2	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	10	10	10	10	10	10	10	10	10
Mvmt Flow	0	0	0	157	115	76	0	198	0	0	90	163

Major/Minor	Minor1		Major1			Major2			
Conflicting Flow All	370	451	198	253	0	-	-	-	0
Stage 1	198	198	-	-	-	-	-	-	-
Stage 2	172	253	-	-	-	-	-	-	-
Critical Hdwy	6.1	6.2	6.1	4.2	-	-	-	-	-
Critical Hdwy Stg 1	5.1	5.2	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.1	5.2	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	2.29	-	-	-	-	-
Pot Cap-1 Maneuver	641	517	832	1267	-	0	0	-	-
Stage 1	835	738	-	-	-	0	0	-	-
Stage 2	855	703	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	641	0	832	1267	-	-	-	-	-
Mov Cap-2 Maneuver	641	0	-	-	-	-	-	-	-
Stage 1	835	0	-	-	-	-	-	-	-
Stage 2	855	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s		0	0
HCM LOS	-		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	WBLn3	SBT	SBR
Capacity (veh/h)	1267	-	641	-	832	-	-
HCM Lane V/C Ratio	-	-	0.244	-	0.091	-	-
HCM Control Delay (s)	0	-	12.4	-	9.8	-	-
HCM Lane LOS	A	-	B	-	A	-	-
HCM 95th %tile Q(veh)	0	-	1	-	0.3	-	-

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Project #: 24043
Project Name: Pendleton IAMPs
Analyst: MAH
Date: 6/4/2020
File: H:\24\24043 - Pendleton IAMPs (207 & 210)\Operations Analysis\Signal Warrants\210\[C1_Signal-Warrant-Analysis_EB Ramp Terminal - OR 11.xlsm]Data Input
Intersection: OR 11/I-84 EB Ramp Terminal
Scenario: 2040 Future PM - Concept 1

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
3:15 PM	4:15 PM	613	257	723	0
2nd Highest Hour		573	240	684	0
3rd Highest Hour		565	237	675	0
4th Highest Hour		549	230	646	0
5th Highest Hour		502	210	636	0
6th Highest Hour		494	207	636	0
7th Highest Hour		462	194	607	0
8th Highest Hour		430	180	598	0
9th Highest Hour		430	180	578	0
10th Highest Hour		422	177	540	0
11th Highest Hour		398	167	521	0
12th Highest Hour		374	157	511	0
13th Highest Hour		366	154	492	0
14th Highest Hour		350	147	424	0
15th Highest Hour		279	117	337	0
16th Highest Hour		263	110	318	0
17th Highest Hour		239	100	222	0
18th Highest Hour		207	87	183	0
19th Highest Hour		167	70	96	0
20th Highest Hour		80	33	67	0
21st Highest Hour		72	30	58	0
22nd Highest Hour		48	20	39	0
23rd Highest Hour		40	17	19	0
24th Highest Hour		40	17	19	0

Warrant Summary

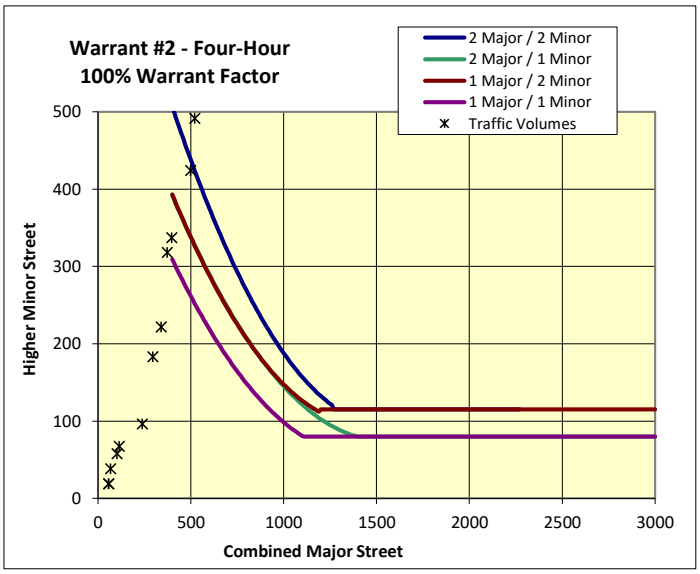
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

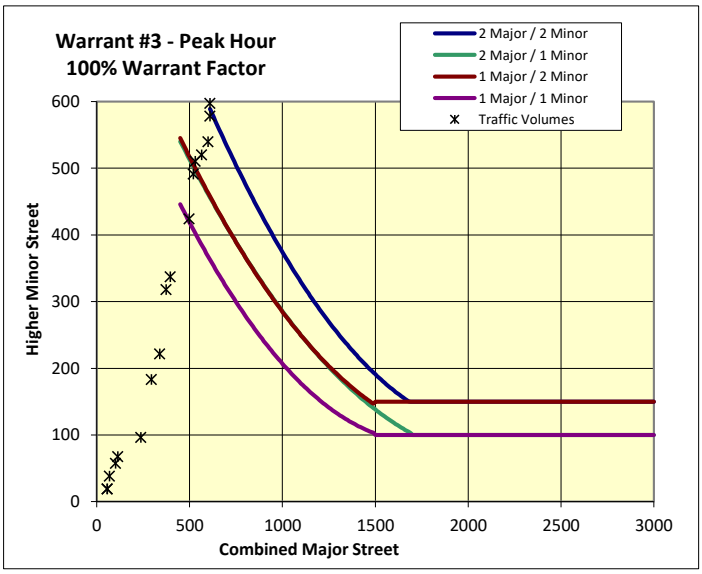
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	90%
Major Street: 8th-Highest Hour / Peak Hour	70%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	9	Yes	**Yes**
	B	900	75	0	No	
80%	A	480	120	14	Yes	**Yes**
	B	720	60	4	No	
70%	A	420	105	14	Yes	**Yes**
	B	630	53	7	No	
56%	A	336	84	17	Yes	**Yes**
	B	504	42	13	Yes	





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Project #: 24043
Project Name: Pendleton IAMPs
Analyst: MAH
Date: 6/4/2020
File: H:\24\24043 - Pendleton IAMPs (207 & 210)\Operations Analysis\Signal Warrants\210\[C1_Signal-Warrant-Analysis_Isaac.xlsm]Data Input
Intersection: OR 11/Isaac Ave
Scenario: 2040 Future PM - Concept 1

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
3:15 PM	4:15 PM	543	471	221	256
2nd Highest Hour		508	440	209	242
3rd Highest Hour		501	434	206	239
4th Highest Hour		487	422	197	229
5th Highest Hour		444	385	194	225
6th Highest Hour		437	379	194	225
7th Highest Hour		409	355	186	215
8th Highest Hour		381	330	183	212
9th Highest Hour		381	330	177	205
10th Highest Hour		374	324	165	191
11th Highest Hour		353	306	159	184
12th Highest Hour		331	287	156	181
13th Highest Hour		324	281	150	174
14th Highest Hour		310	269	130	150
15th Highest Hour		247	214	103	119
16th Highest Hour		233	202	97	113
17th Highest Hour		212	184	68	79
18th Highest Hour		183	159	56	65
19th Highest Hour		148	128	29	34
20th Highest Hour		71	61	21	24
21st Highest Hour		63	55	18	20
22nd Highest Hour		42	37	12	14
23rd Highest Hour		35	31	6	7
24th Highest Hour		35	31	6	7

Warrant Summary

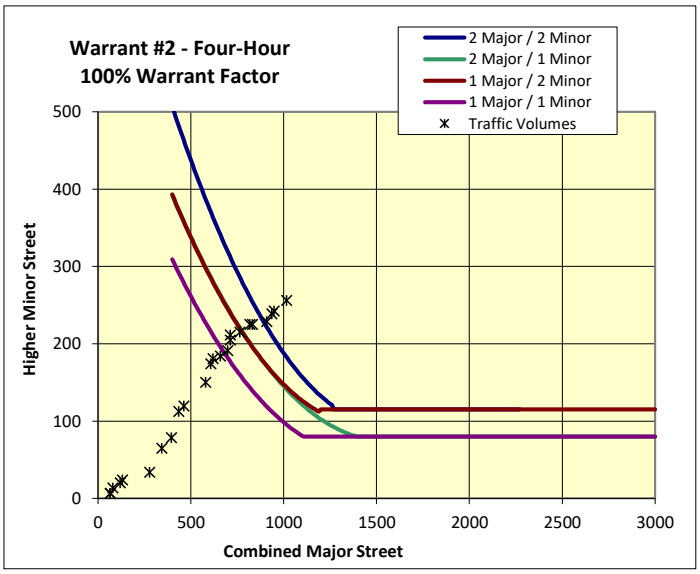
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

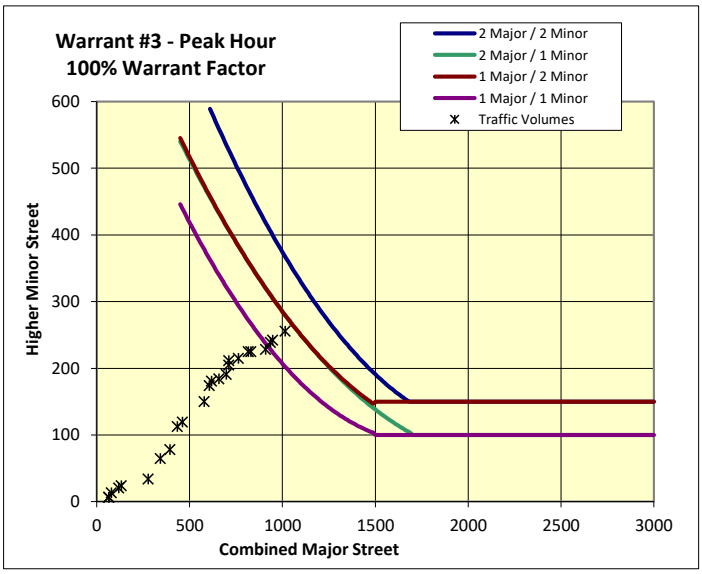
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	90%
Major Street: 8th-Highest Hour / Peak Hour	70%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	13	Yes	**Yes**
	B	900	75	4	No	
80%	A	480	120	14	Yes	**Yes**
	B	720	60	7	No	
70%	A	420	105	16	Yes	**Yes**
	B	630	53	11	Yes	
56%	A	336	84	16	Yes	**Yes**
	B	504	42	14	Yes	





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Project #: 24043
Project Name: Pendleton IAMPs
Analyst: MAH
Date: 6/4/2020
File: H:\24\24043 - Pendleton IAMPs (207 & 210)\Operations Analysis\Signal Warrants\210\[C1_Signal-Warrant-Analysis_Nye Ave-3rd Dr.xlsm]Data Input
Intersection: Nye Ave/3rd Dr
Scenario: 2040 Future PM - Concept 1

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
3:15 PM	4:15 PM	341	376	251	269
2nd Highest Hour		319	352	238	255
3rd Highest Hour		314	347	234	251
4th Highest Hour		306	337	224	240
5th Highest Hour		279	308	221	237
6th Highest Hour		275	303	221	237
7th Highest Hour		257	283	211	226
8th Highest Hour		239	264	207	222
9th Highest Hour		239	264	201	215
10th Highest Hour		235	259	187	201
11th Highest Hour		221	244	181	194
12th Highest Hour		208	230	177	190
13th Highest Hour		204	225	171	183
14th Highest Hour		195	215	147	158
15th Highest Hour		155	171	117	126
16th Highest Hour		146	161	110	118
17th Highest Hour		133	146	77	82
18th Highest Hour		115	127	64	68
19th Highest Hour		93	103	33	36
20th Highest Hour		44	49	23	25
21st Highest Hour		40	44	20	22
22nd Highest Hour		27	29	13	14
23rd Highest Hour		22	24	7	7
24th Highest Hour		22	24	7	7

Warrant Summary

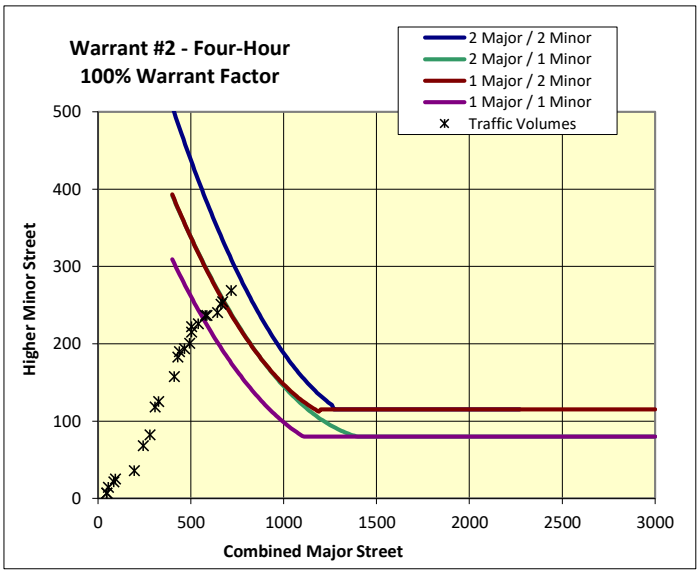
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

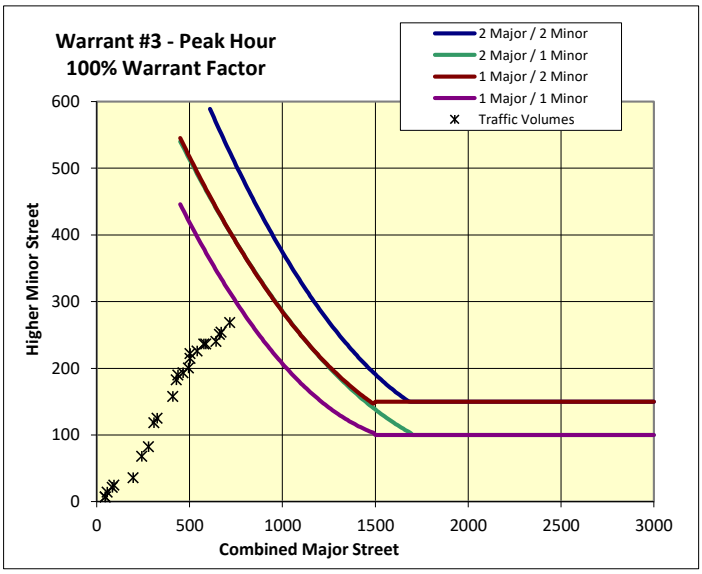
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	90%
Major Street: 8th-Highest Hour / Peak Hour	70%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	500	150	9	Yes	**Yes**
	B	750	75	0	No	
80%	A	400	120	14	Yes	**Yes**
	B	600	60	4	No	
70%	A	350	105	14	Yes	**Yes**
	B	525	53	7	No	
56%	A	280	84	16	Yes	**Yes**
	B	420	42	13	Yes	





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Project #: 24043
Project Name: Pendleton IAMPs
Analyst: MAH
Date: 6/4/2020
File: H:\24\24043 - Pendleton IAMPs (207 & 210)\Operations Analysis\Signal Warrants\210\[C5_Signal-Warrant-Analysis_EBRamps.xlsm]Data Input
Intersection: OR 11/EB Ramps
Scenario: 2040 Future PM - Concept 5

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
3:15 PM	4:15 PM	852	484	718	0
2nd Highest Hour		797	453	680	0
3rd Highest Hour		786	446	670	0
4th Highest Hour		763	434	641	0
5th Highest Hour		697	396	632	0
6th Highest Hour		686	390	632	0
7th Highest Hour		642	365	603	0
8th Highest Hour		598	339	594	0
9th Highest Hour		598	339	574	0
10th Highest Hour		586	333	536	0
11th Highest Hour		553	314	517	0
12th Highest Hour		520	295	507	0
13th Highest Hour		509	289	488	0
14th Highest Hour		487	277	421	0
15th Highest Hour		387	220	335	0
16th Highest Hour		365	207	316	0
17th Highest Hour		332	189	220	0
18th Highest Hour		288	163	182	0
19th Highest Hour		232	132	96	0
20th Highest Hour		111	63	67	0
21st Highest Hour		100	57	57	0
22nd Highest Hour		66	38	38	0
23rd Highest Hour		55	31	19	0
24th Highest Hour		55	31	19	0

Warrant Summary

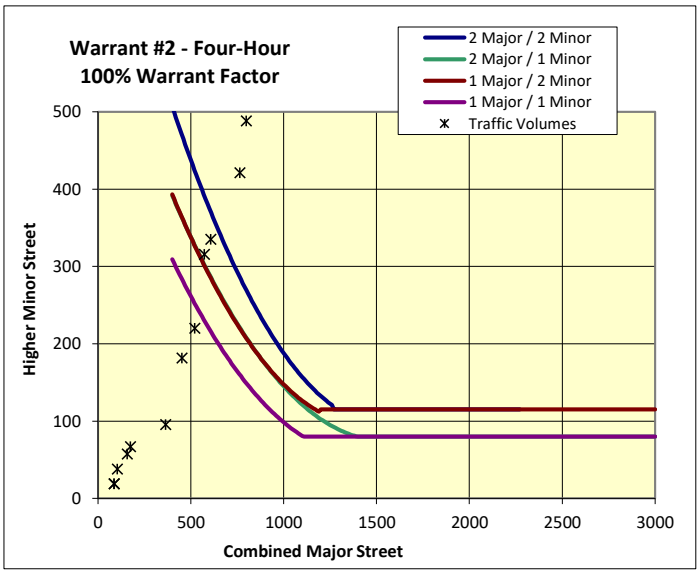
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

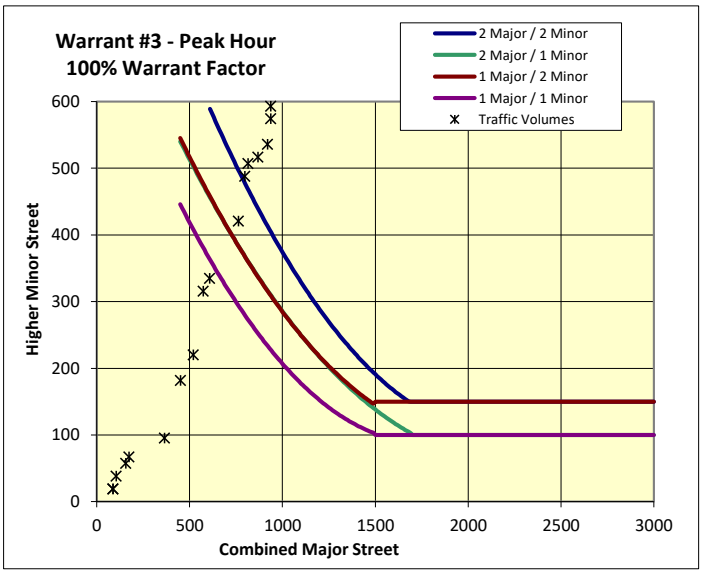
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	90%
Major Street: 8th-Highest Hour / Peak Hour	70%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	500	150	17	Yes	**Yes**
	B	750	75	14	Yes	
80%	A	400	120	18	Yes	**Yes**
	B	600	60	15	Yes	
70%	A	350	105	18	Yes	**Yes**
	B	525	53	16	Yes	
56%	A	280	84	19	Yes	**Yes**
	B	420	42	18	Yes	





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Project #: 24043
Project Name: Pendleton IAMPs
Analyst: MAH
Date: 6/4/2020
File: H:\24\24043 - Pendleton IAMPs (207 & 210)\Operations Analysis\Signal Warrants\210\[C5_Signal-Warrant-Analysis_Isaac.xlsm]Data Input
Intersection: OR 11/Isaac Ave
Scenario: 2040 Future PM - Concept 5

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
3:15 PM	4:15 PM	611	527	221	256
2nd Highest Hour		571	493	209	242
3rd Highest Hour		563	486	206	239
4th Highest Hour		548	472	197	229
5th Highest Hour		500	431	194	225
6th Highest Hour		492	424	194	225
7th Highest Hour		460	397	186	215
8th Highest Hour		428	370	183	212
9th Highest Hour		428	370	177	205
10th Highest Hour		421	363	165	191
11th Highest Hour		397	342	159	184
12th Highest Hour		373	322	156	181
13th Highest Hour		365	315	150	174
14th Highest Hour		349	301	130	150
15th Highest Hour		278	240	103	119
16th Highest Hour		262	226	97	113
17th Highest Hour		238	205	68	79
18th Highest Hour		206	178	56	65
19th Highest Hour		167	144	29	34
20th Highest Hour		79	68	21	24
21st Highest Hour		71	62	18	20
22nd Highest Hour		48	41	12	14
23rd Highest Hour		40	34	6	7
24th Highest Hour		40	34	6	7

Warrant Summary

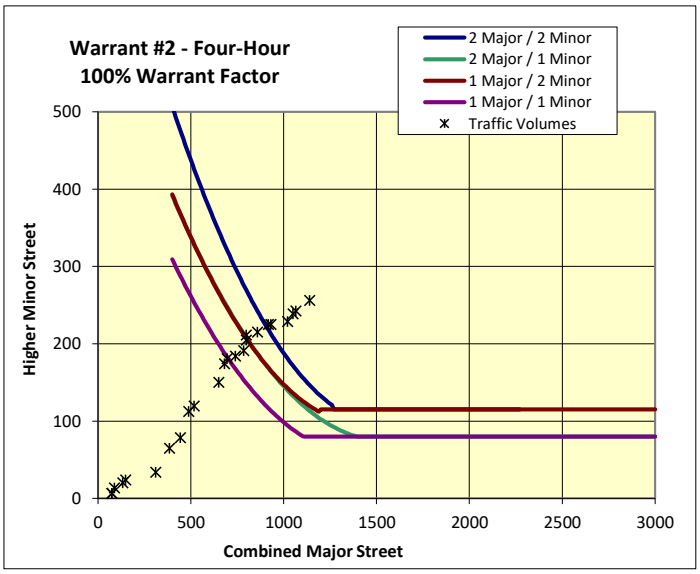
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

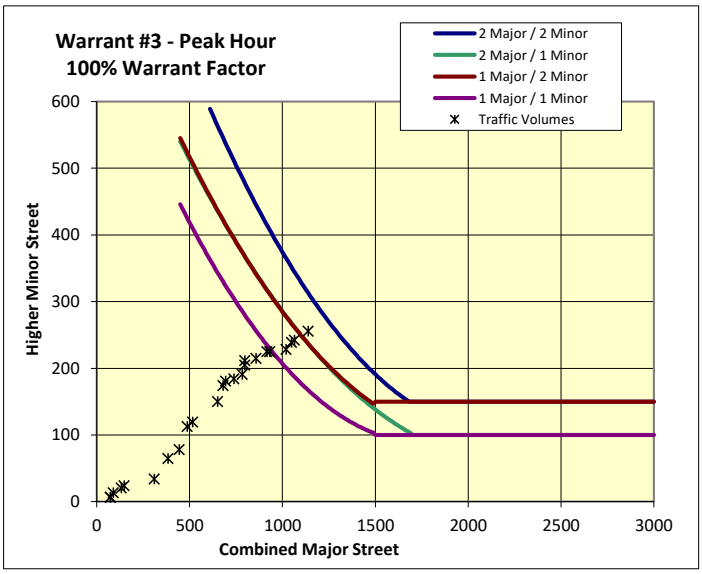
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	90%
Major Street: 8th-Highest Hour / Peak Hour	70%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	14	Yes	**Yes**
	B	900	75	6	No	
80%	A	480	120	15	Yes	**Yes**
	B	720	60	11	Yes	
70%	A	420	105	16	Yes	**Yes**
	B	630	53	14	Yes	
56%	A	336	84	16	Yes	**Yes**
	B	504	42	15	Yes	





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Project #: 24043
Project Name: Pendleton IAMPs
Analyst: MAH
Date: 6/4/2020
File: H:\24\24043 - Pendleton IAMPs (207 & 210)\Operations Analysis\Signal Warrants\210\[C5_Signal-Warrant-Analysis_Kirk.xlsm]Data Input
Intersection: OR 11/Kirk Ave
Scenario: 2040 Future PM - Concept 5

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
3:15 PM	4:15 PM	611	527	376	392
2nd Highest Hour		571	493	356	371
3rd Highest Hour		563	486	351	366
4th Highest Hour		548	472	336	350
5th Highest Hour		500	431	331	345
6th Highest Hour		492	424	331	345
7th Highest Hour		460	397	316	329
8th Highest Hour		428	370	311	324
9th Highest Hour		428	370	301	314
10th Highest Hour		421	363	281	293
11th Highest Hour		397	342	271	282
12th Highest Hour		373	322	266	277
13th Highest Hour		365	315	256	267
14th Highest Hour		349	301	221	230
15th Highest Hour		278	240	175	183
16th Highest Hour		262	226	165	172
17th Highest Hour		238	205	115	120
18th Highest Hour		206	178	95	99
19th Highest Hour		167	144	50	52
20th Highest Hour		79	68	35	37
21st Highest Hour		71	62	30	31
22nd Highest Hour		48	41	20	21
23rd Highest Hour		40	34	10	10
24th Highest Hour		40	34	10	10

Warrant Summary

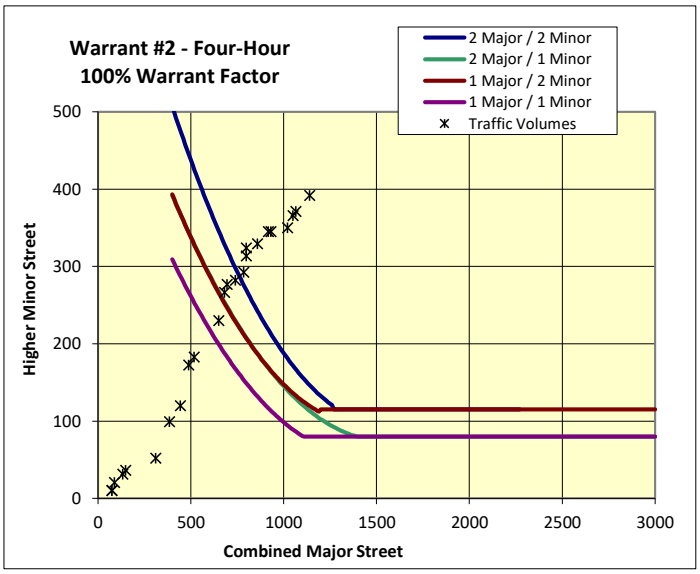
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

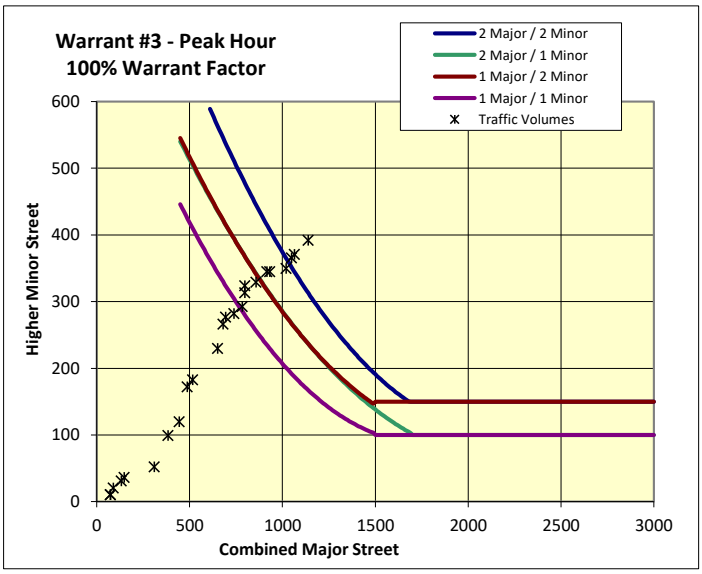
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	90%
Major Street: 8th-Highest Hour / Peak Hour	70%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	14	Yes	**Yes**
	B	900	75	6	No	
80%	A	480	120	16	Yes	**Yes**
	B	720	60	11	Yes	
70%	A	420	105	17	Yes	**Yes**
	B	630	53	14	Yes	
56%	A	336	84	18	Yes	**Yes**
	B	504	42	15	Yes	





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Project #: 24043
Project Name: Pendleton IAMPs
Analyst: MAH
Date: 6/4/2020
File: H:\24\24043 - Pendleton IAMPs (207 & 210)\Operations Analysis\Signal Warrants\210\[C5_Signal-Warrant-Analysis_Nye.xlsm]Data Input
Intersection: Nye Ave/3rd Dr
Scenario: 2040 Future PM - Concept 5

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

Input Parameters

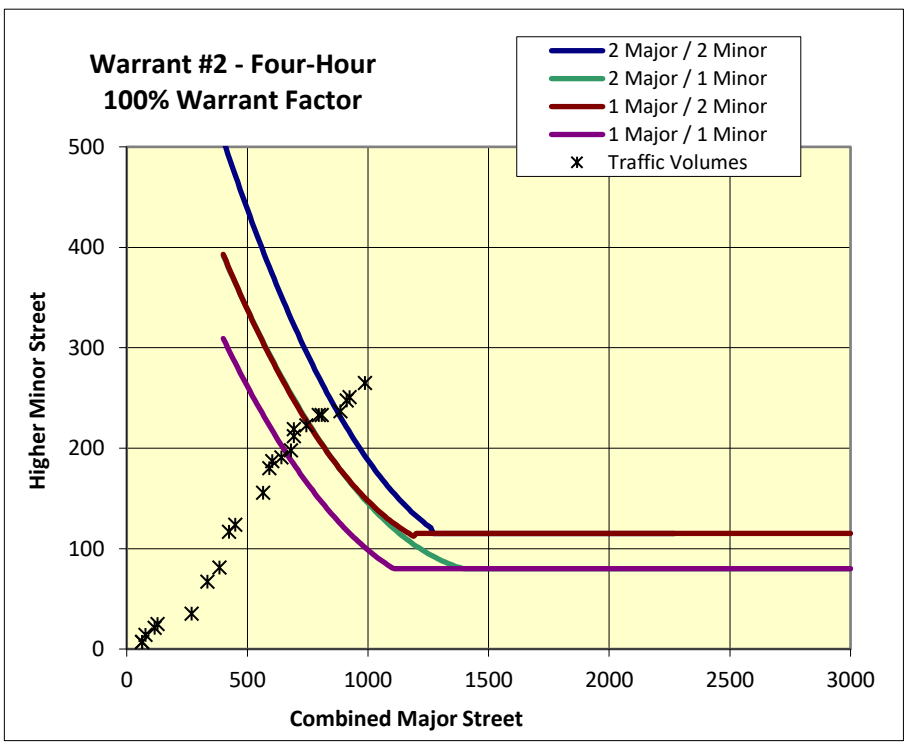
Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	90%
Major Street: 8th-Highest Hour / Peak Hour	70%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

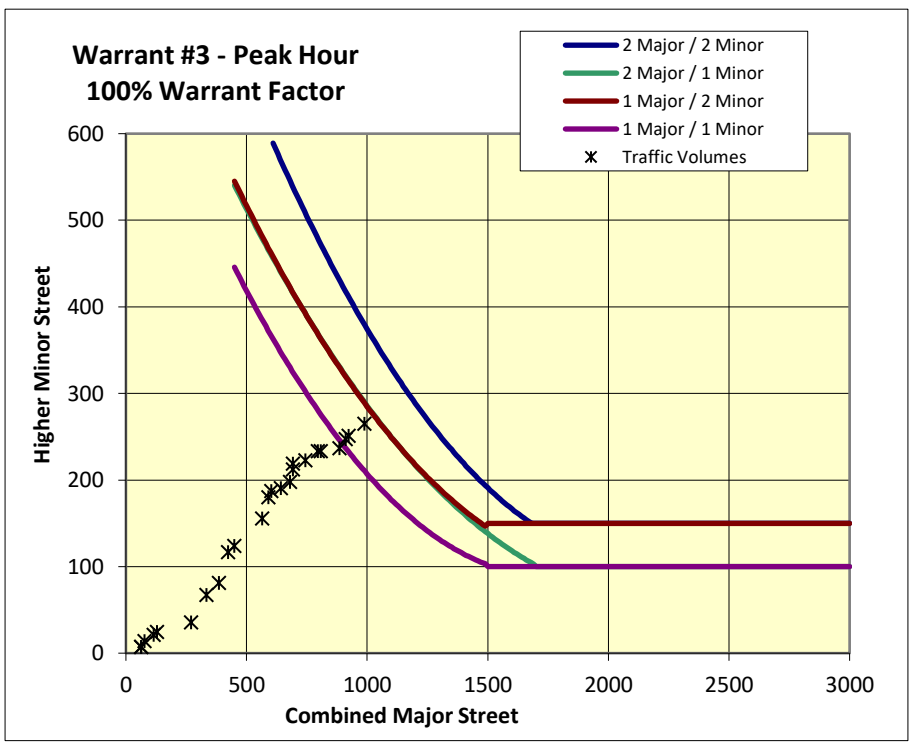
Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
3:15 PM	4:15 PM	468	520	265	232
2nd Highest Hour		438	486	251	220
3rd Highest Hour		432	479	247	217
4th Highest Hour		419	466	237	207
5th Highest Hour		383	425	233	204
6th Highest Hour		377	419	233	204
7th Highest Hour		353	392	223	195
8th Highest Hour		328	365	219	192
9th Highest Hour		328	365	212	186
10th Highest Hour		322	358	198	173
11th Highest Hour		304	338	191	167
12th Highest Hour		286	317	187	164
13th Highest Hour		280	311	180	158
14th Highest Hour		267	297	155	136
15th Highest Hour		213	236	124	108
16th Highest Hour		201	223	117	102
17th Highest Hour		182	203	81	71
18th Highest Hour		158	176	67	59
19th Highest Hour		128	142	35	31
20th Highest Hour		61	68	25	22
21st Highest Hour		55	61	21	19
22nd Highest Hour		36	41	14	12
23rd Highest Hour		30	34	7	6
24th Highest Hour		30	34	7	6

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	500	150	14	Yes	**Yes**
	B	750	75	6	No	
80%	A	400	120	15	Yes	**Yes**
	B	600	60	12	Yes	
70%	A	350	105	16	Yes	**Yes**
	B	525	53	14	Yes	
56%	A	280	84	16	Yes	**Yes**
	B	420	42	16	Yes	





KITTELSON & ASSOCIATES, INC.
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(503) 228-5230

Project #: 24043
Project Name: Pendleton IAMPs
Analyst: MAH
Date: 6/4/2020
File: H:\24\24043 - Pendleton IAMPs (207 & 210)\Operations Analysis\Signal Warrants\210\[C5_Signal-Warrant-Analysis_WBRamps.xlsm]Data Input
Intersection: OR 11/WB Ramps
Scenario: 2040 Future PM - Concept 5

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

Input Parameters

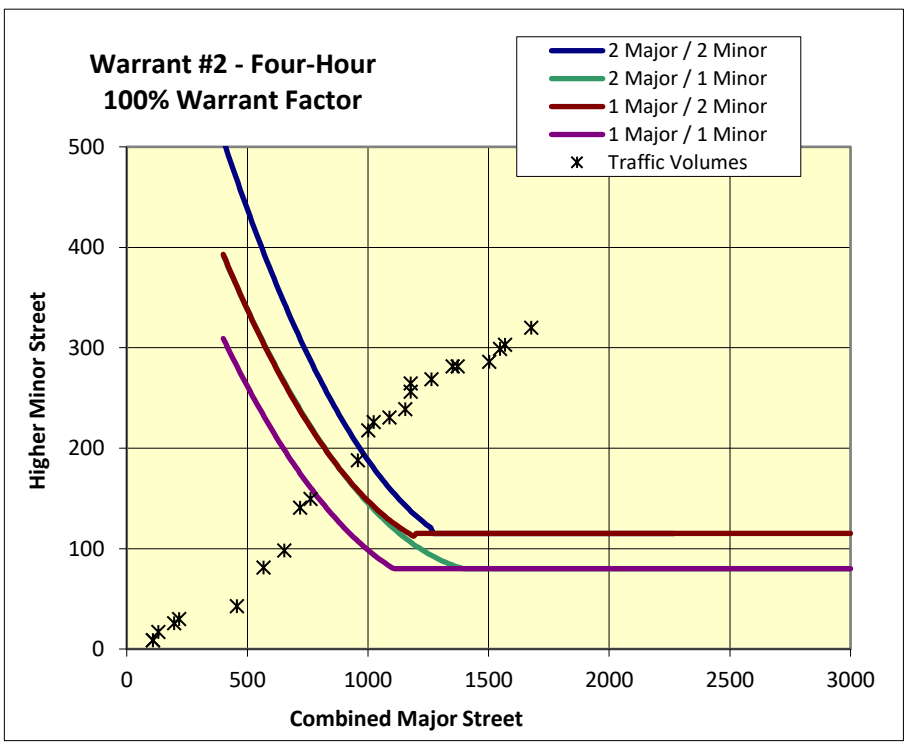
Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	90%
Major Street: 8th-Highest Hour / Peak Hour	70%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

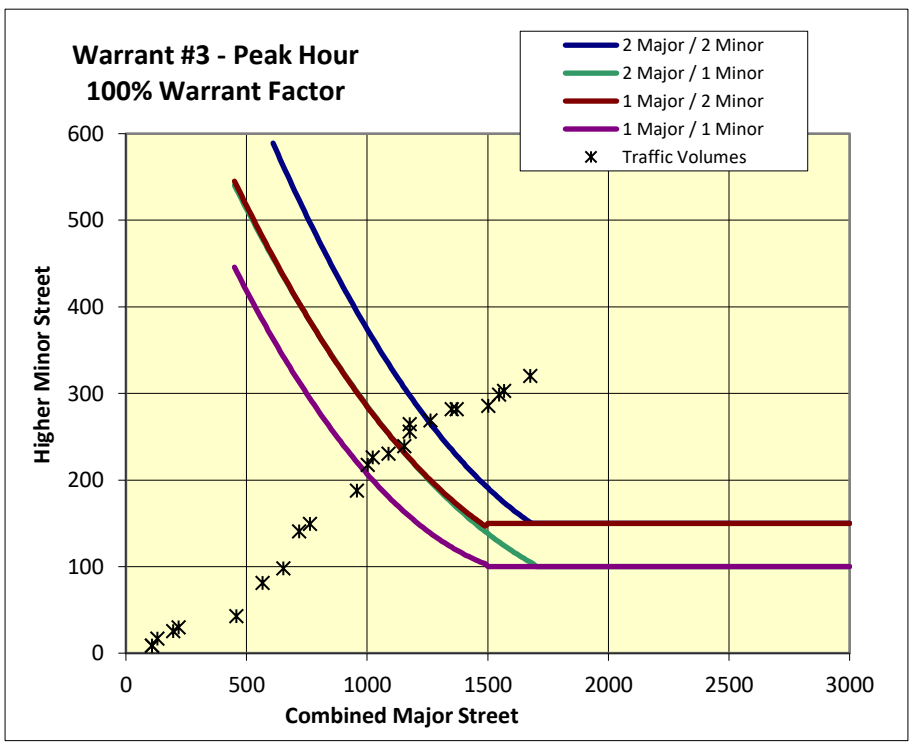
Analysis Traffic Volumes

Hour Begin	Hour End	Major Street NB	Major Street SB	Minor Street EB	Minor Street WB
3:15 PM	4:15 PM	873	804	0	320
2nd Highest Hour		816	752	0	303
3rd Highest Hour		805	741	0	299
4th Highest Hour		782	720	0	286
5th Highest Hour		714	658	0	282
6th Highest Hour		703	647	0	282
7th Highest Hour		658	606	0	269
8th Highest Hour		612	564	0	265
9th Highest Hour		612	564	0	256
10th Highest Hour		601	553	0	239
11th Highest Hour		567	522	0	230
12th Highest Hour		533	491	0	226
13th Highest Hour		522	480	0	218
14th Highest Hour		499	459	0	188
15th Highest Hour		397	365	0	149
16th Highest Hour		374	345	0	141
17th Highest Hour		340	313	0	98
18th Highest Hour		295	271	0	81
19th Highest Hour		238	219	0	43
20th Highest Hour		113	104	0	30
21st Highest Hour		102	94	0	26
22nd Highest Hour		68	63	0	17
23rd Highest Hour		57	52	0	9
24th Highest Hour		57	52	0	9

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	500	150	15	Yes	**Yes**
	B	750	75	15	Yes	
80%	A	400	120	16	Yes	**Yes**
	B	600	60	17	Yes	
70%	A	350	105	16	Yes	**Yes**
	B	525	53	18	Yes	
56%	A	280	84	17	Yes	**Yes**
	B	420	42	19	Yes	





Attachment C
Planning Level Cost Estimates

ODOT- Exit 207 IAMP
PLANNING LEVEL COST ESTIMATE
IAMP
(YEAR 2020 COSTS)
6/2/2020

Prepared By: DR
Reviewed By: ASL
Anderson Perry and Associates, Inc

Exit 210 - Alternative 1

NO.	DESCRIPTION	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL PRICE
1	Mobilization/Demobilization (10%)	LS	$ 287,000	All Req'd	$ 287,000
2	Temporary Protection and Direction of Traffic	LS	$ 42,000	All Req'd	42,000
3	Asphalt Concrete Pavement	TON	100	30,200	3,020,000
4	Aggregate Base	TON	28	95,800	2,682,400
5	Geotextile Fabric	SQYD	2	102,600	153,900
6	Concrete Pavement	SQYD	50	2,500	125,000
7	Earthwork	CY	10	85,000	850,000
8	Permanent Signing and Striping	LS	50,000	All Req'd	50,000
9	Signalized Intersection	EA	300,000	2	600,000
10	Erosion Control	LS	$ 14,000	All Req'd	14,000

Total Estimated Construction Cost	**$ 7,824,300**
Construction Condingency (20%)	$ 1,564,000
Construction Engineering (15%)	$ 1,173,000
Preliminary Engineering (15%)	$ 1,173,000
TOTAL ESTIMATED PROJECT COST (2020)	**$ 11,734,300**

ODOT- Exit 207 IAMP
PLANNING LEVEL COST ESTIMATE
IAMP
(YEAR 2020 COSTS)
6/2/2020

Prepared By: DR
Reviewed By: ASL
Anderson Perry and Associates, Inc

Exit 210 - Alternative 5

NO.	DESCRIPTION	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL PRICE
1	Mobilization/Demobilization (10%)	LS	$ 287,000	All Req'd	$ 287,000
2	Temporary Protection and Direction of Traffic	LS	$ 42,000	All Req'd	42,000
3	Asphalt Concrete Pavement	TON	100	11,600	1,160,000
4	Aggregate Base	TON	28	35,000	980,000
5	Geotextile Fabric	SQYD	2	37,500	56,300
6	Earthwork	CY	10	110,000	1,100,000
7	Permanent Signing and Striping	LS	50,000	All Req'd	50,000
8	Signalized Intersection	EA	300,000	4	1,200,000
9	Erosion Control	LS	$ 14,000	All Req'd	14,000
				Total Estimated Construction Cost	**$ 4,889,300**
				Construction Condingency (20%)	$ 977,000
				Construction Engineering (15%)	$ 733,000
				Preliminary Engineering (15%)	$ 733,000
				TOTAL ESTIMATED PROJECT COST (2020)	**$ 7,332,300**

ODOT- Exit 207 IAMP
PLANNING LEVEL COST ESTIMATE
IAMP
(YEAR 2020 COSTS)
6/2/2020

Prepared By: DR
Reviewed By: ASL
Anderson Perry and Associates, Inc

Exit 210 - Alternative 5B

NO.	DESCRIPTION	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL PRICE
1	Mobilization/Demobilization (10%)	LS	$ 287,000	All Req'd	$ 287,000
2	Temporary Protection and Direction of Traffic	LS	$ 42,000	All Req'd	42,000
3	Asphalt Concrete Pavement	TON	100	11,800	1,180,000
4	Aggregate Base	TON	28	36,000	1,008,000
5	Geotextile Fabric	SQYD	2	38,500	57,800
6	Earthwork	CY	10	111,500	1,115,000
7	Permanent Signing and Striping	LS	50,000	All Req'd	50,000
8	Signalized Intersection	EA	300,000	4	1,200,000
9	Erosion Control	LS	$ 14,000	All Req'd	14,000
				Total Estimated Construction Cost	**$ 4,953,800**
				Construction Condingency (20%)	$ 990,000
				Construction Engineering (15%)	$ 743,000
				Preliminary Engineering (15%)	$ 743,000
				TOTAL ESTIMATED PROJECT COST (2020)	**$ 7,429,800**

Attachment D
Access Locations

Access Location - Driveway or Public Street

Minimum 1320' IAMP Limits

0 380 Feet

Figure 8

OASA Access Inventory
Exit 207
Pendleton, OR

KITTELSON & ASSOCIATES