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TRANSPORTATION ENGINEERING / PLANNING

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June 2, 2015

Project #: 17299

Tony Doran
City of Tualatin
18880 SW Martinazzi Avenue
Tualatin, OR 97062

RE: Sagert Farms Development Transportation Impact Analysis

Dear Tony,

Lennar Homes is proposing a 79-unit single-family home subdivision in southeast Tualatin. This report addresses the development's traffic impacts on the surrounding transportation system and has been prepared to support the formal development application. Transportation improvements recommended in conjunction with site development include:

- SW Sagert Street should be extended to the east through the site in a manner that meets the intent of the City's TSP and accommodates the proposed development.
- The SW Sagert Street/SW 65th Avenue intersection should be signalized and coordinated with the SW Borland Road/SW 65th Avenue intersection.
- Landscaping, signage, and above ground utilities near the internal intersections and site access points should be located and maintained to ensure adequate sight distance.

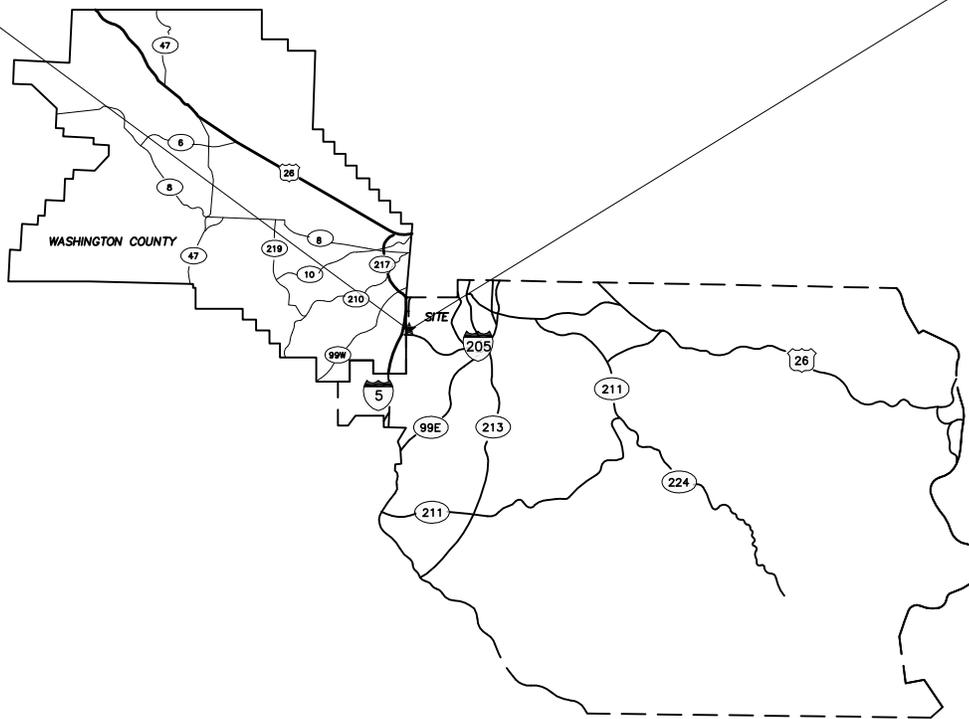
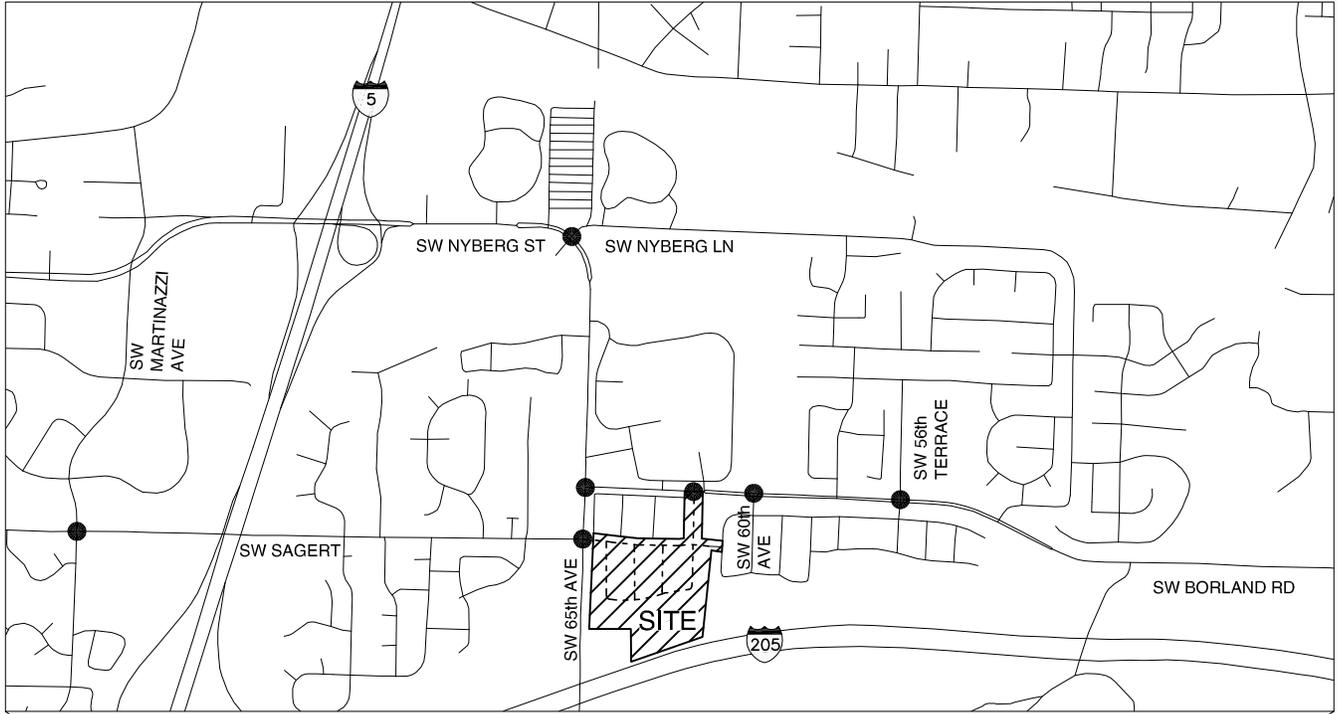
Additional details of the methodology, findings and recommendations are provided herein.

INTRODUCTION

Lennar Homes is proposing to develop a residentially zoned property that has historically been owned/utilized by the Sagert family for farming/agriculture purposes. The development is a 79-unit single-family home subdivision. As identified in the City of Tualatin's Transportation System Plan (TSP), the development will construct an eastward extension of SW Sagert Street from its current terminus at SW 65th Avenue through the site and connect it to an existing local street stub in the adjacent Sequoia Woods neighborhood. Local street connections are proposed off the SW Sagert Street extension to provide access to the proposed neighborhood. In addition, a local street connection to SW Borland Road is proposed to provide a secondary access point to the neighborhood. Figure 1 shows the site vicinity and Figure 2 illustrates the proposed site plan. Full build-out and occupancy of the subdivision is anticipated in year 2018.



(NO SCALE)



LEGEND

- - STUDY INTERSECTION

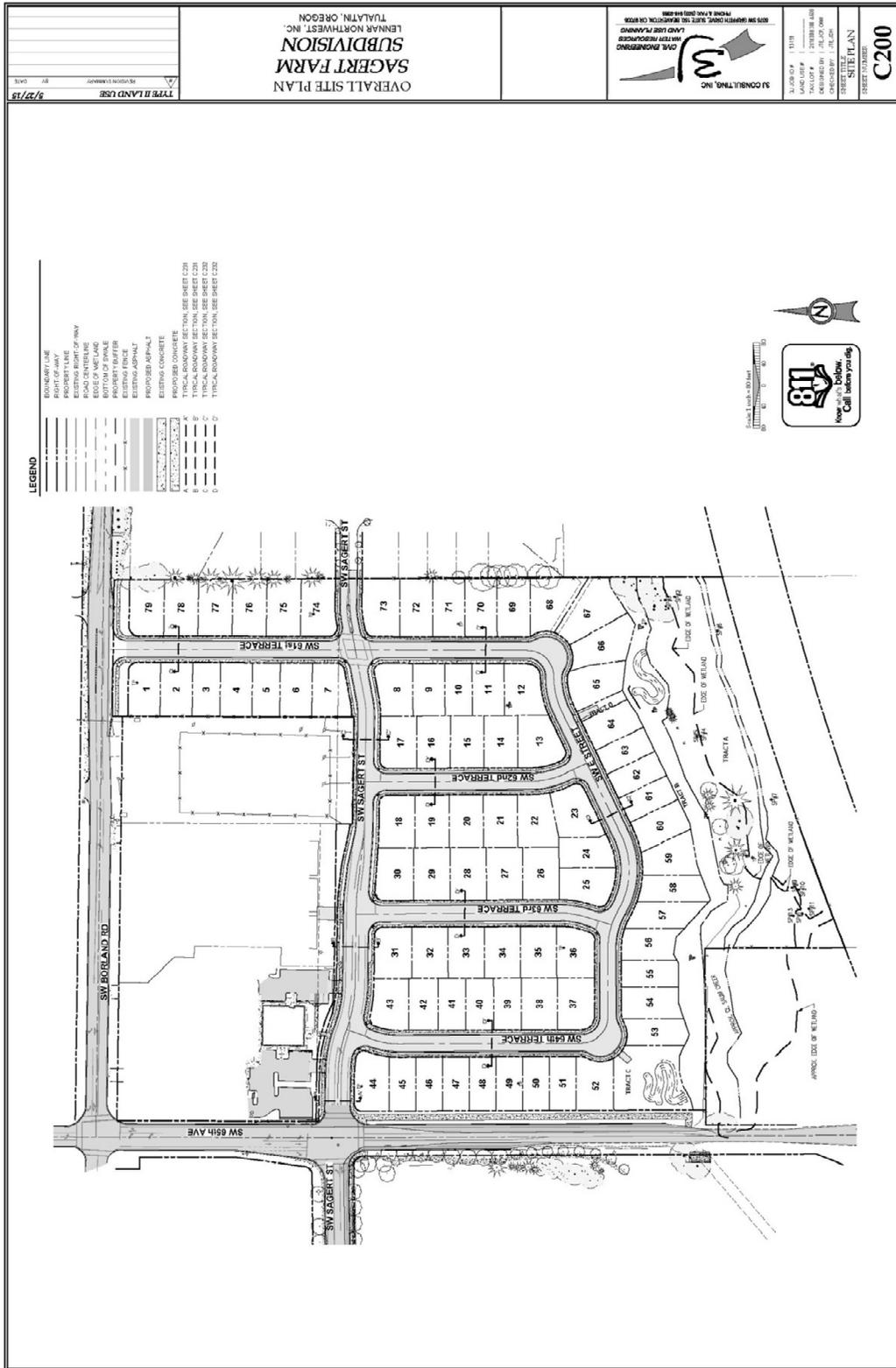
**SITE VICINITY MAP
TUALATIN, OREGON**

FIGURE

1

H:\profile\17299 - Sagert Farms\dwg\figs\17299_figs_4.14.2015.dwg Jun 02, 2015 - 4:48pm - pmarnell Layout Tab: 01

Figure 2 – Proposed Site Layout (Provided by 3J Consulting, Inc. 6/2/15)



SCOPE OF THE REPORT

This report identifies the transportation-related impacts associated with the proposed subdivision and was prepared in accordance with the requirements of the City of Tualatin. The study intersections and scope were selected in consultation with City staff. Accordingly, operational analyses were performed at the following study intersections during the weekday AM and PM peak periods:

- SW 65th Avenue/SW Sagert Street;
- SW 65th Avenue/SW Borland Road;
- SW Nyberg Street/SW 65th Avenue/SW Nyberg Lane;
- SW 60th Avenue/SW Borland Road;
- SW 56th Terrace/SW Borland Road; and
- SW Martinazzi Avenue/SW Sagert Street

This report evaluates the following transportation issues:

- Existing land use and transportation system conditions within the site vicinity during the weekday AM and PM peak periods;
- Forecast year 2018 background traffic conditions during the weekday AM and PM peak periods, considering developments and transportation improvements planned in the study area;
- Trip generation and distribution estimates for the subdivision;
- Forecast year 2018 total traffic conditions during both peak hours of the site assuming full buildout of the subdivision; and
- Recommended improvements/intersection considerations.

Analysis Methodology

All level-of-service analyses described in this report were performed in accordance with the procedures stated in the 2000 Highway Capacity Manual (HCM). A description of level of service and the criteria by which they are determined is presented in Appendix "A". Appendix "A" also indicates how level of service is measured and what is generally considered the acceptable range of level of service. To ensure that this analysis was based on a reasonable worst-case scenario, the peak 15 minute flow rate during the peak hour analysis periods was used in the evaluation of all intersection levels of service. For this reason, the analysis reflects conditions that are only likely to occur for 15 minutes out of each average peak hour. Traffic conditions during other weekday and weekend hours will likely be better than those described in this report.

EXISTING CONDITIONS

This section summarizes the existing characteristics of the transportation system and adjacent land uses in the vicinity of the proposed subdivision, including an inventory of the existing multi-modal transportation facilities and options, an evaluation of existing intersection operations for motor vehicles at the study intersections, and a summary of recent crash history.

Site Conditions and Adjacent Land Uses

The proposed development site is located east of SW 65th Avenue, south of SW Borland Road, and north of Saum Creek and the I-205 corridor. The site has historically been used for farming purposes and currently contains a single residential home and several farming related structures. Access to this home is via a single driveway located off of SW 65th Avenue. The site is bounded to the east by the Sequoia Ridge subdivision. The site's northern boundary is formed by two separate professional medical office buildings, a PGE substation, and SW Borland Road.

Transportation Facilities

Table 1 identifies the characteristics of key roadways located within the vicinity of the development site. Figure 3 identifies the existing lane configurations and traffic control devices at all of the study intersections.

Table 1 – Existing Transportation Facilities

Roadway	Classification (by Jurisdiction)	Motor Vehicle Travel Lanes	Posted Speed (mph)	Sidewalks	Striped Bicycle Lanes	On-Street Parking
SW Nyberg Street	Arterial (east of I-5) - (Washington County) ¹ Major Arterial – (Tualatin)	3-6 lanes	30	Yes	Yes	No
SW 65 th Avenue	Arterial - (Washington County) ² Major Arterial – (Tualatin)	3 lanes	35	Yes	No ⁵	No
SW Sagert Street ³	Minor Arterial – (Tualatin) (east of SW Martinazzi Ave to SW 65 th Ave) Major Collector – (Tualatin) (west of SW Martinazzi Ave)	2-3 lanes	35	Yes	Yes	No
SW Borland Road	Minor Arterial – (Clackamas County) ⁴ Major Arterial – (Tualatin)	2-3 lanes	35	Yes	Yes ⁶	No
SW 60 th Avenue	Local Street – (Tualatin)	2 lanes	25	Yes	No	Yes
SW 56 th Avenue	Local Street – (Tualatin)	2 lanes	25	Yes	No	Yes

Notes:

¹ ODOT has jurisdictional control over SW Nyberg Road within the vicinity of the northbound and southbound I-5 ramp terminals. Washington County has maintenance and ownership responsibility east of this point.

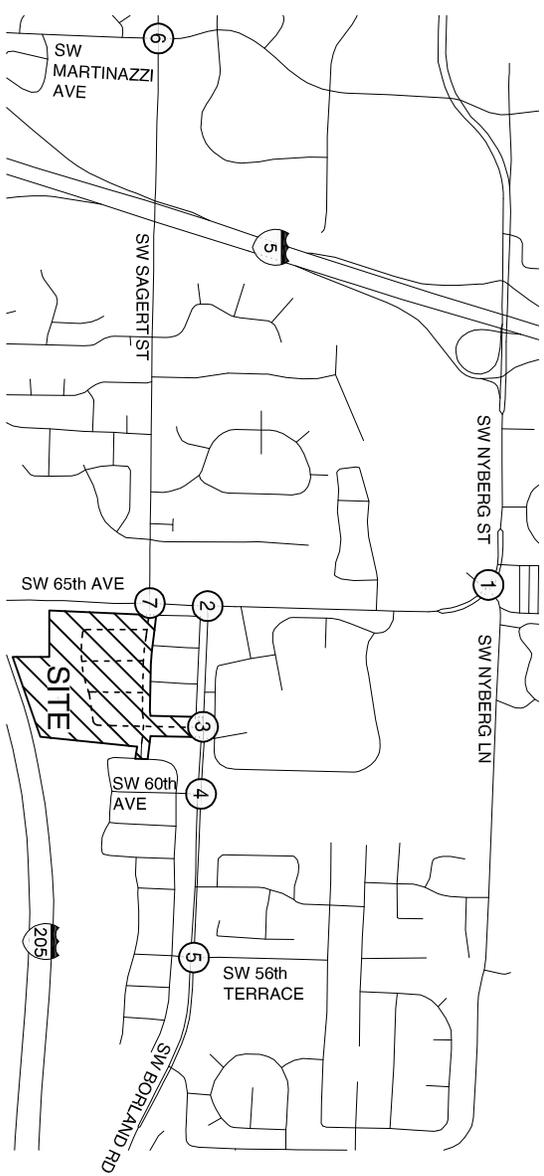
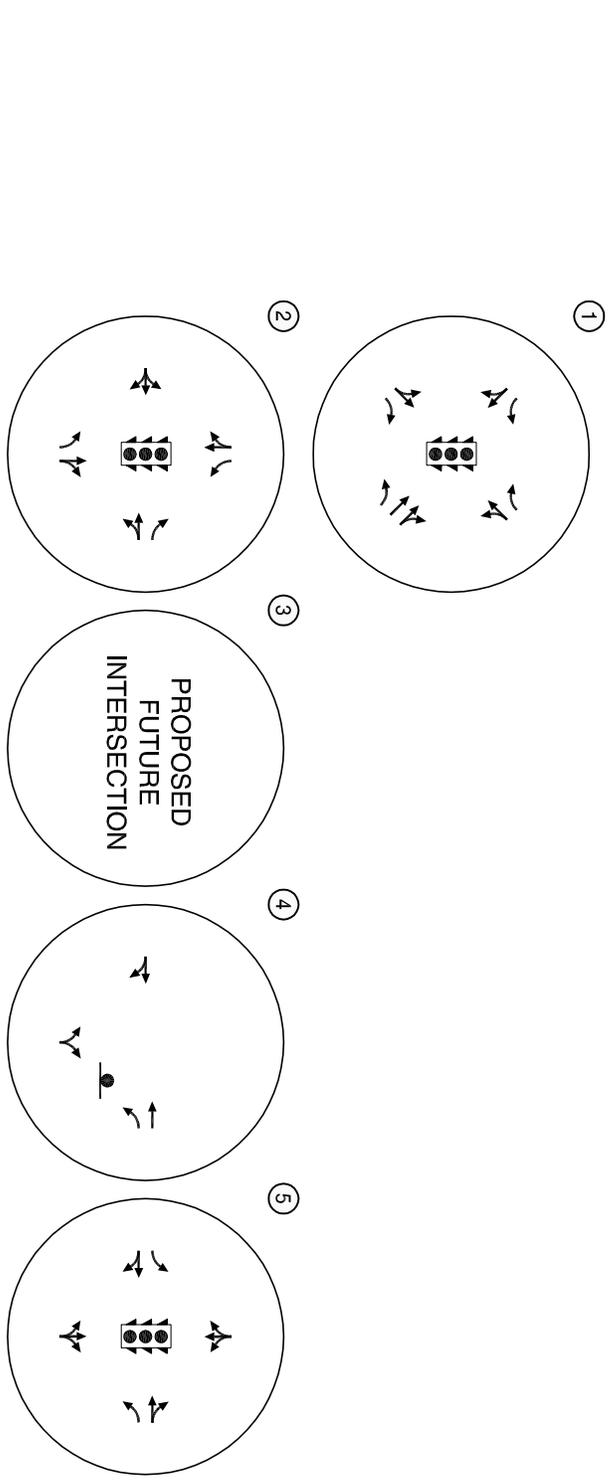
² Washington County has maintenance and ownership responsibility for SW 65th Avenue.

³ The City of Tualatin has maintenance and ownership responsibility for SW Sagert Street.

⁴ Clackamas County has maintenance and ownership responsibility for SW Borland Road.

⁵ Striped bicycle lanes exist on SW 65th Avenue south of SW Borland Road.

⁶ There are no bicycle lanes within the vicinity of the SW 65th Avenue intersection.



LEGEND

-  - STOP SIGN
-  - TRAFFIC SIGNAL

EXISTING LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES TUALATIN, OREGON

Transit Facilities

Regional transit access is provided to the site vicinity via TriMet bus route 76. This route connects the site vicinity to Legacy Meridian Park, Downtown Tualatin, Downtown Tigard, and Downtown Beaverton. Bus stops for this route are located within the Legacy Meridian Park hospital site, along SW 65th Avenue, and along SW Sagert Street. Service is provided seven days a week with a stop frequency of approximately every half hour.

2015 Existing Operations

Manual turning movement counts were collected at the study intersections in January 2015 when local schools were in session. Traffic counts were collected during the morning (7:00 to 9:00 a.m.) and evening (4:00 to 6:00 p.m.) peak time periods. Appendix "B" contains the traffic count worksheets.

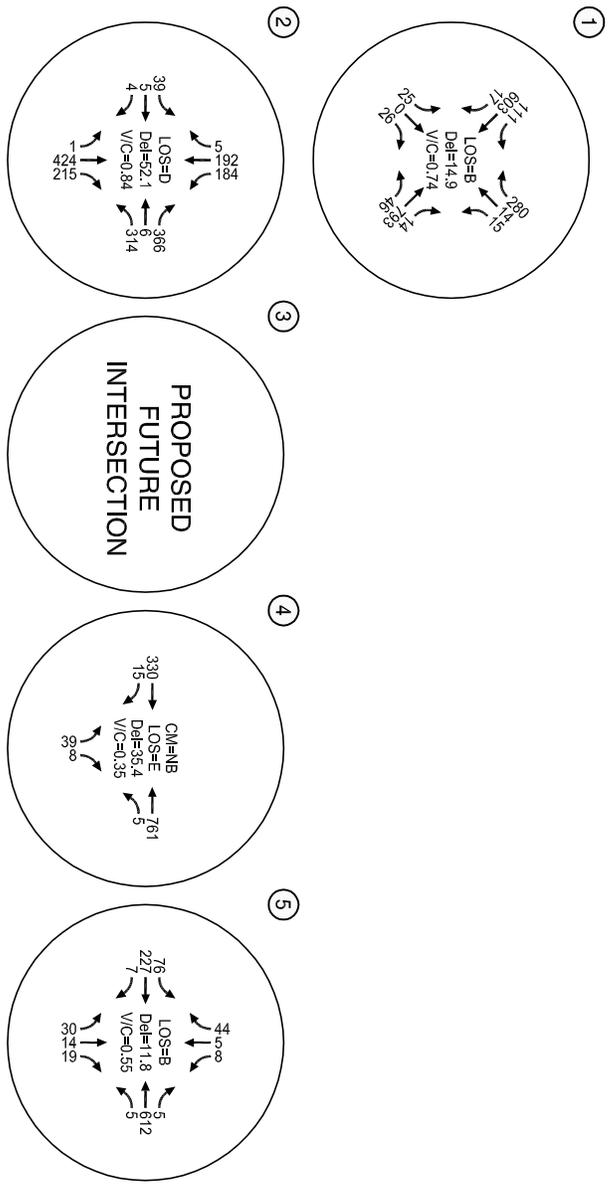
Figures 4, 5, and Table 2 summarize the operational analysis for the study intersections during the weekday AM and PM peak hours. As shown, all intersections operate at acceptable levels of service and volume-to-capacity (v/c) ratios during the peak hours with the exception of the SW Martinazzi Avenue/SW Sagert Street and SW 65th Avenue/SW Sagert Street intersections. *Appendix "C" contains the 2015 existing conditions operational worksheets.*

SW 65th Avenue/SW Sagert Street

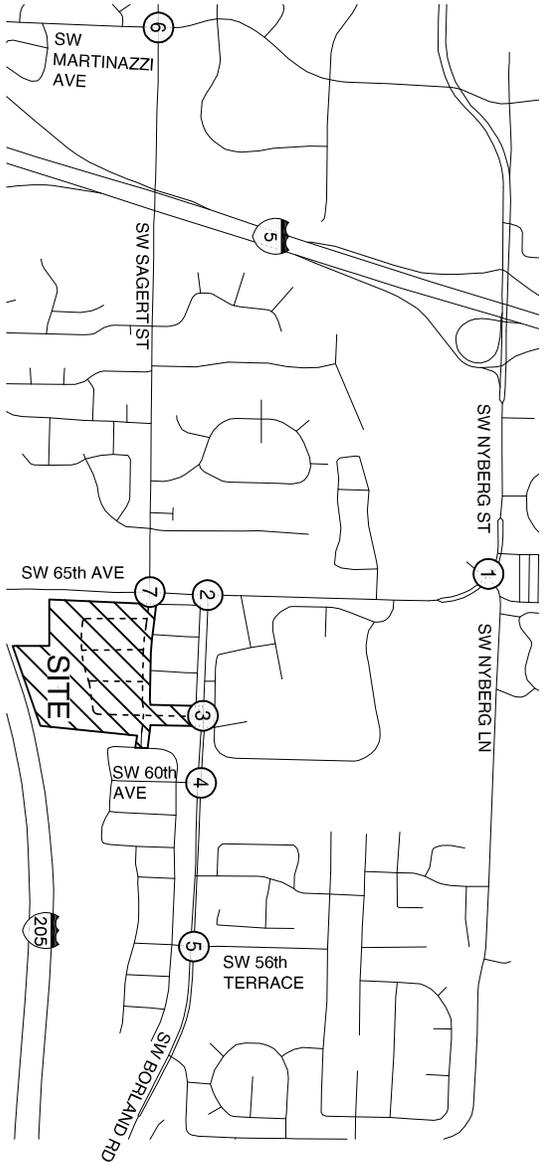
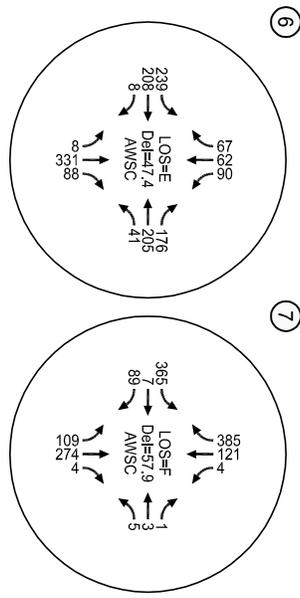
The SW 65th Avenue/SW Sagert Street intersection is an all-way stop-controlled intersection. Based on the existing traffic demand, the intersection currently operates at LOS F during the weekday a.m. and p.m. peak hours. These findings are consistent with field observations which show significant levels of delay and long vehicle queues along the westbound SW Sagert Street approach and along the northbound SW 65th Avenue approach. These findings are also consistent with the analyses performed as part of the recent update to the *Tualatin Transportation System Plan (TSP)*. In recognition of these conditions, the City of Tualatin has included signalization of the SW 65th Avenue/SW Sagert Street intersection in the latest draft of its Capital Improvement Plan (CIP). With inclusion in the CIP, this funded improvement could potentially be constructed sometime within the 5-year CIP window.

SW Martinazzi Avenue/SW Sagert Road

The SW Martinazzi Avenue/SW Sagert Street intersection is an all-way stop-controlled intersection. Based on the existing traffic demand, the intersection currently operates at LOS E during the weekday a.m. peak hour and LOS F during the weekday p.m. peak hour. These findings are also consistent with field observations and the existing conditions analysis prepared as part of the recent update to the Tualatin TSP. This intersection is included in the "unfunded" category of the City's CIP and is noted as needing improvements. The City's TSP calls for future signalization of the intersection.



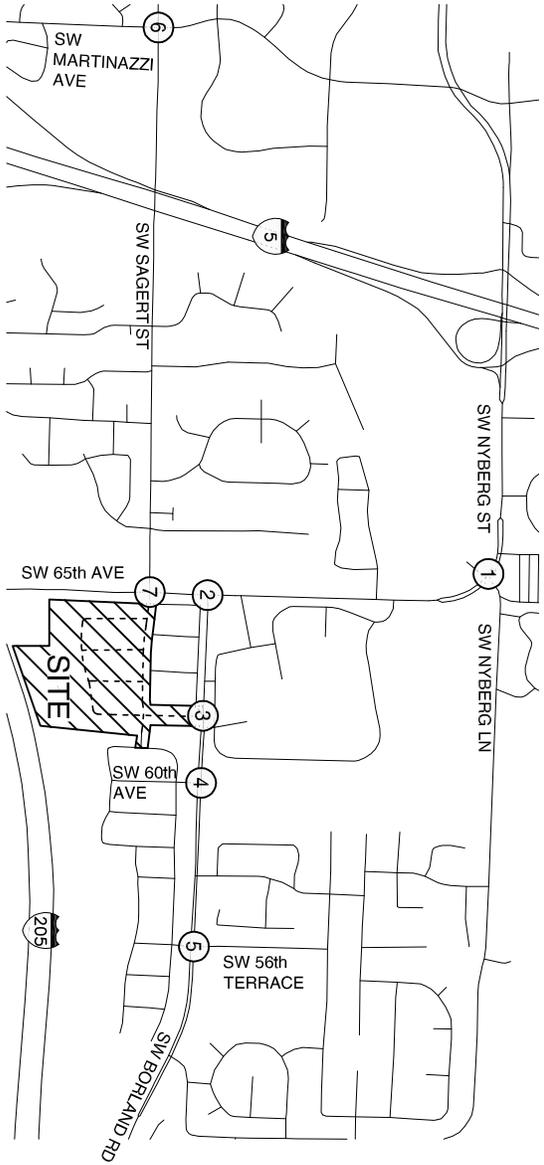
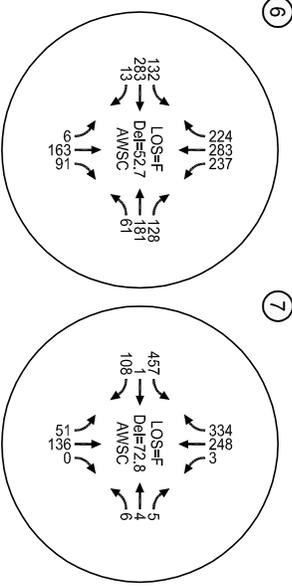
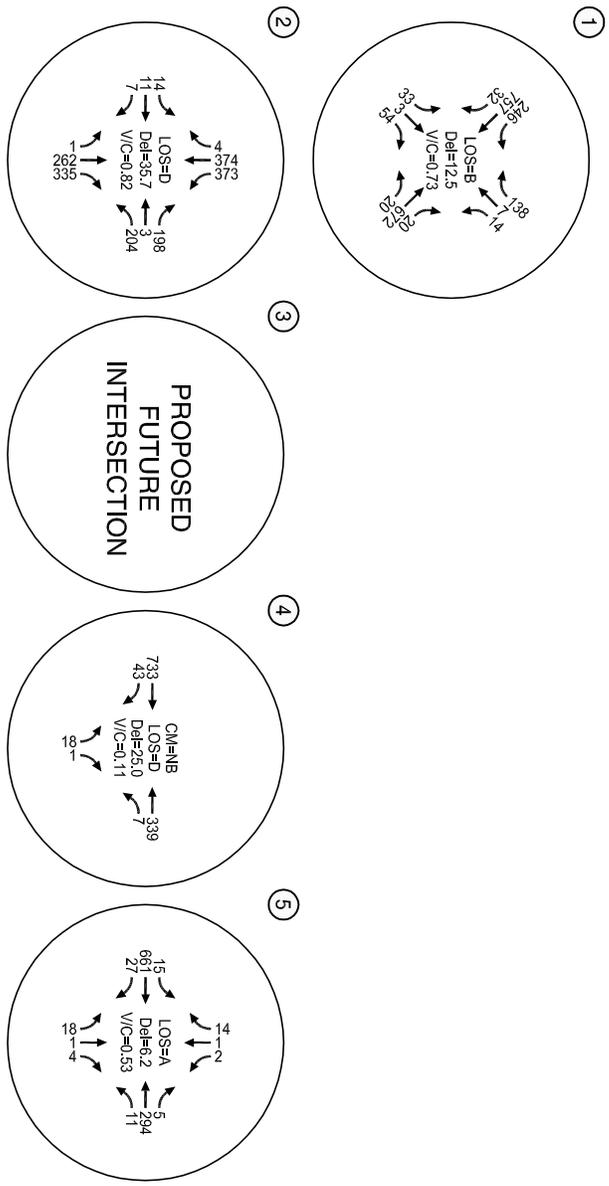
**PROPOSED
FUTURE
INTERSECTION**



LEGEND

- CM = CRITICAL MOVEMENT (TWSC)
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**EXISTING TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR
TUALATIN, OREGON**



LEGEND

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EXISTING TRAFFIC CONDITIONS
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON
FIGURE 5

Table 2 – 2015 Existing Traffic Conditions

Intersection	Maximum Operating Standard	Weekday AM Peak Hour		Weekday PM Peak Hour	
		LOS	V/C	LOS	V/C
Signalized Intersections					
SW 65 th Avenue/SW Borland Road	0.99 ¹	D	0.84	D	0.82
SW Nyberg Street/SW 65 th Avenue/SW Nyberg Lane	0.99 ¹	B	0.74	B	0.73
SW 56 th Terrace/SW Borland Road	0.99 ² / LOS E ³	B	0.55	A	0.53
Unsignalized Intersections⁴					
SW 60 th Avenue/SW Borland Road	0.99 ³ / LOS E ³	E	0.35	D	0.11
All-Way Stop Controlled Intersections					
SW 65 th Avenue/SW Sagert Street	0.99 ¹ / LOS E ³	F	-	F	-
SW Martinazzi Avenue/SW Sagert Street	LOS D ³	E	-	F	-

Notes:

¹ Washington County sets operating standards for both signalized and unsignalized intersections as a volume-to-capacity ratio no greater than 0.99.

² Clackamas County sets operating standards for both signalized and unsignalized intersections as a volume-to-capacity ratio no greater than 0.99.

³ The City of Tualatin considers LOS “D” acceptable at signalized intersections and LOS “E” acceptable at unsignalized intersections.

⁴ LOS and V/C for unsignalized intersections reported for the highest delay or critical movement.

Crash History Analysis

Washington County maintains a Safety Priority Index System (SPIS) list to identify existing hazardous intersections for potential safety improvements. Intersections are included in the SPIS list if they have three or more crashes or if they have one or more severe injury or fatal crashes within three consecutive years. The intersection of Nyberg Lane/Nyberg Street/65th Avenue appears on the most recent Washington County SPIS list (2010-2012) (Reference 1). This intersection of is ranked 185th of 312.

In addition to reviewing the Washington County SPIS list, the crash histories of the each study intersections and driveways were reviewed in an effort to identify potential intersection safety issues. Crash data for the study intersections were obtained from the Oregon Department of Transportation (ODOT) for the five-year period from January 1, 2009 through December 31, 2013. Table 3 illustrates the crashes reported at the study intersections. Appendix “D” contains the ODOT crash data.

Table 3 - Intersection Crash History (January 1, 2009 through December 31, 2013)

Intersection	Collision Type						Total Crashes	Estimated Average Annual Daily Traffic	Crash Rate (crashes per million entering vehicles)
	Angle	Turning	Rear End	Fixed Object	Ped/Bike	Other			
SW 65 th Avenue/ SW Borland Road	1	3	2	-	-	-	6	17,860	0.18
SW Nyberg Street/ SW 65 th Avenue/SW Nyberg Lane	-	2	5	-	1 ^A	1	9	19,960	0.25
SW 60 th Avenue/ SW Borland Road	-	-	-	-	-	-	0	11,410	0
SW 56 th Terrace/ SW Borland Road	-	-	-	-	-	-	0	10,530	0
SW 65 th Avenue/ SW Sagert Street	1	8	2	-	-	-	11	13,530	0.45
SW Martinazzi Avenue/ SW Sagert Street	5	1	-	1	1 ^B	-	8	18,020	0.24

^A The bicycle crash reported at the SW Nyberg Street/SW 65th Avenue/SW Nyberg Lane intersection occurred when a left-turning vehicle entering the driveway on the south side of the intersection failed to yield the right-of-way to eastbound bicyclist. The bicyclist struck the turning vehicle resulting in a "right-hook" crash.

^B The bicycle crash reported at the SW Martinazzi Avenue/SW Sagert Street intersection occurred when a southbound vehicle disregarded a stop sign and struck an eastbound bicyclist.

Eight turning crashes were reported at the SW 65th Avenue/SW Sagert Street intersection. As noted later in this report, it will be recommended that this intersection be signalized.

The historic crash rates were compared to the peak hour total entering volumes to determine whether the crashes per million entering vehicles exceeded 1.0. No intersection had a crash rate per million entering vehicles exceeding 1.0. Given the frequency of crashes at the intersections potentially impacted by the proposed Sagert Farms development, no additional safety-based mitigation measures were identified for the study intersections based on the review of ODOT crash data (assuming signalization of the SW 65th Avenue/SW Sagert Street intersection).

TRAFFIC IMPACT ANALYSIS

The traffic impact analysis identifies how the study area's transportation system will operate upon build out of the proposed residential development. The impact of site-generated weekday a.m. and p.m. peak hour trips was examined as follows:

- Planned developments and transportation improvements in the site vicinity were identified and reviewed;
- Year 2018 background traffic conditions (build-out year of the proposed development without site-generated traffic) were analyzed at the study intersections;
- Future peak hour site-generated trips were estimated for build-out of the site;
- A trip distribution pattern was prepared and the site-generated trips were distributed to the study area intersections;
- Existing traffic patterns were adjusted to account for new roadway infrastructure;
- Forecast year 2018 total traffic conditions were analyzed during the weekday a.m. and p.m., peak hours with build-out of the site; and
- On-site circulation and site-access operations were evaluated.

2018 BACKGROUND CONDITIONS

The year 2018 background traffic analysis identifies how the study area's transportation system will operate without the proposed development but within the same anticipated buildout period. This analysis accounts for traffic attributed to planned developments within the study area and includes general growth in the region, but does not include traffic from the proposed development.

Planned Developments and Transportation Improvements

Per discussions with City and County staff, there are no approved in-process developments in the immediate site vicinity that are anticipated to have a measurable impact at the study intersections. However, it should be noted that at the time the traffic counts were collected for this study, buildout of the last few Nyberg Rivers outparcel pads was still in process. Given the difficulty in itemizing the traffic-related impacts of these remaining pads, this growth as well as continued regional growth was accounted for by applying a 2-percent annual growth rate to the existing traffic volumes. This growth rate is slightly higher than the 1.5 percent annual growth rate that City has recognized on other transportation impact studies in the area and therefore is a reasonably conservative approximation of future traffic conditions.

With regards to planned transportation improvements, it was previously noted that signalization of the SW Sagert Street/SW 65th Avenue intersection has been included in the City's CIP. However, given the likelihood that construction of the traffic signal won't occur within the anticipated 2018 study horizon

year, the 2018 background traffic analysis has been performed assuming continued use of the existing all-way stop control.

2018 Background Operations

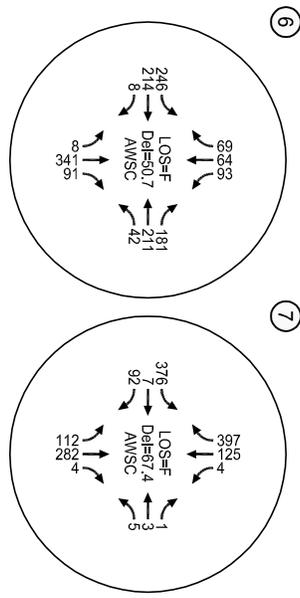
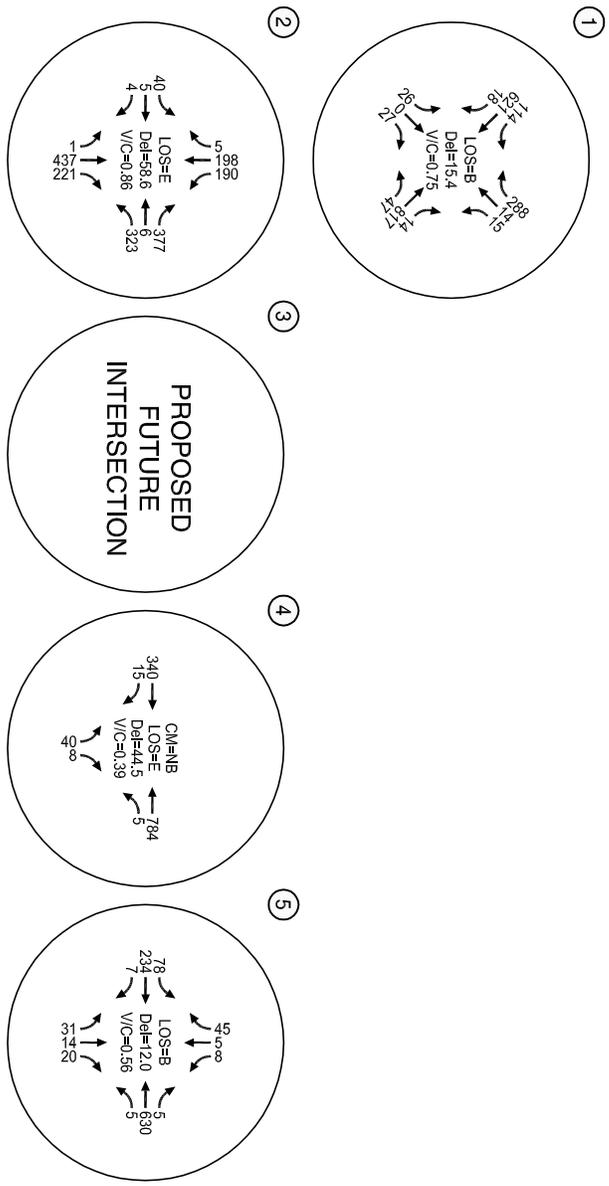
Figures 6, 7, and Table 4 summarize the forecast 2018 background traffic conditions for the study intersections during the weekday a.m. and p.m. peak hours. As shown, all intersections are forecast to operate at acceptable levels of service and v/c ratios during the peak hours with the exception of the SW Martinazzi Avenue/SW Sagert Street and SW 65th Avenue/SW Sagert Street intersections (both of which were documented to operate at LOS F under existing conditions). *Appendix “E” contains the 2018 background conditions operational worksheets.*

Table 4 – 2018 Background Traffic Conditions

Intersection	Maximum Operating Standard	Weekday AM Peak Hour		Weekday PM Peak Hour	
		LOS	V/C	LOS	V/C
Signalized Intersections					
SW 65 th Avenue/SW Borland Road	0.99 ¹	E	0.86	D	0.84
SW Nyberg Street/SW 65 th Avenue/SW Nyberg Lane	0.99 ¹	B	0.75	B	0.74
SW 56 th Terrace/SW Borland Road	0.99 ² / LOS E ³	B	0.56	A	0.55
Unsignalized Intersections⁴					
SW 60 th Avenue/SW Borland Road	0.99 ³ / LOS E ³	E	0.39	D	0.12
All-Way Stop Controlled Intersections					
SW 65 th Avenue/SW Sagert Street	0.99 ¹ / LOS E ³	F	-	F	-
SW Martinazzi Avenue/SW Sagert Street	LOS D ³	F	-	F	-

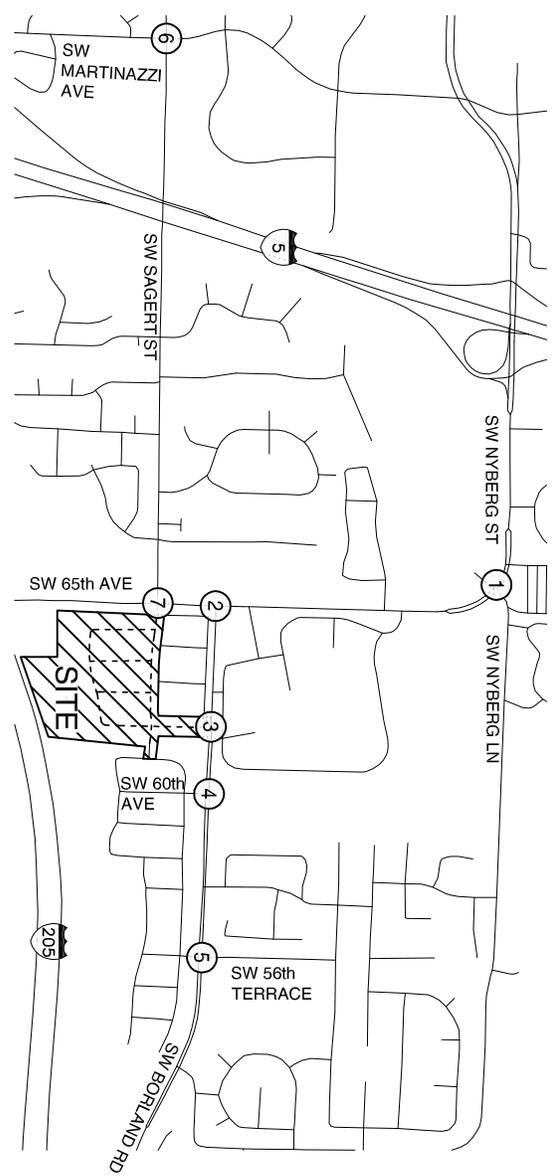
Notes:

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- ³ The City of Tualatin considers LOS “D” acceptable and signalized intersections and LOS “E” at unsignalized intersections.
- ⁴ LOS and V/C for unsignalized intersections reported for the highest delay or critical movement.

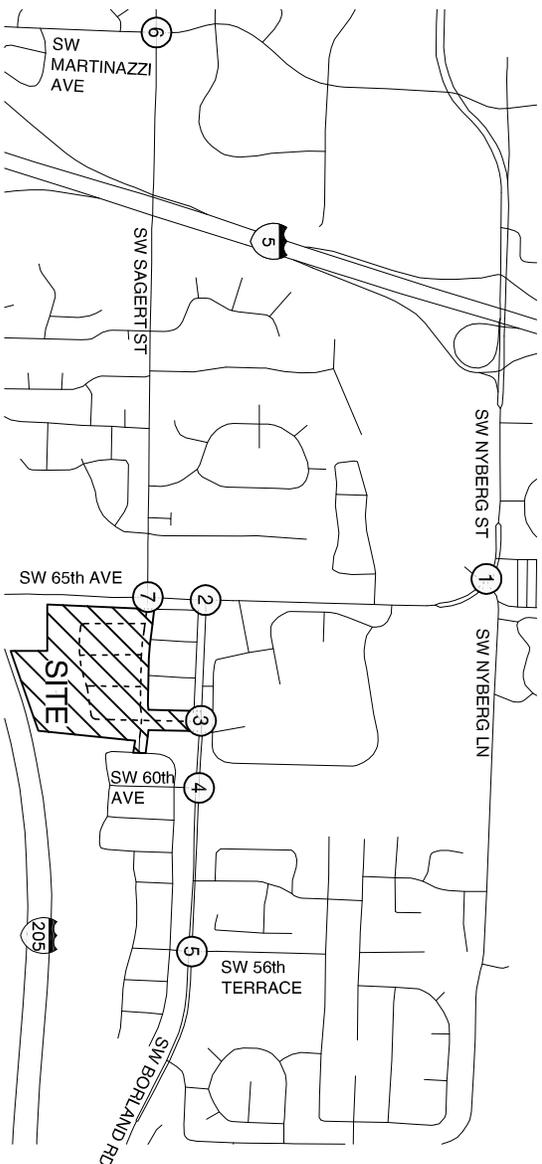
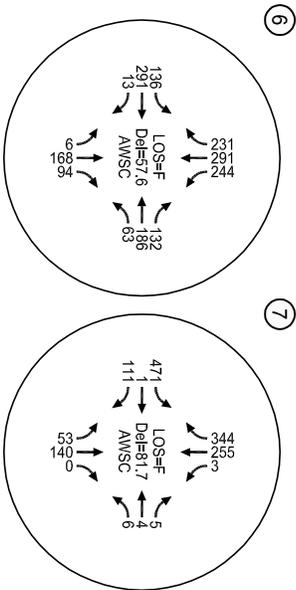
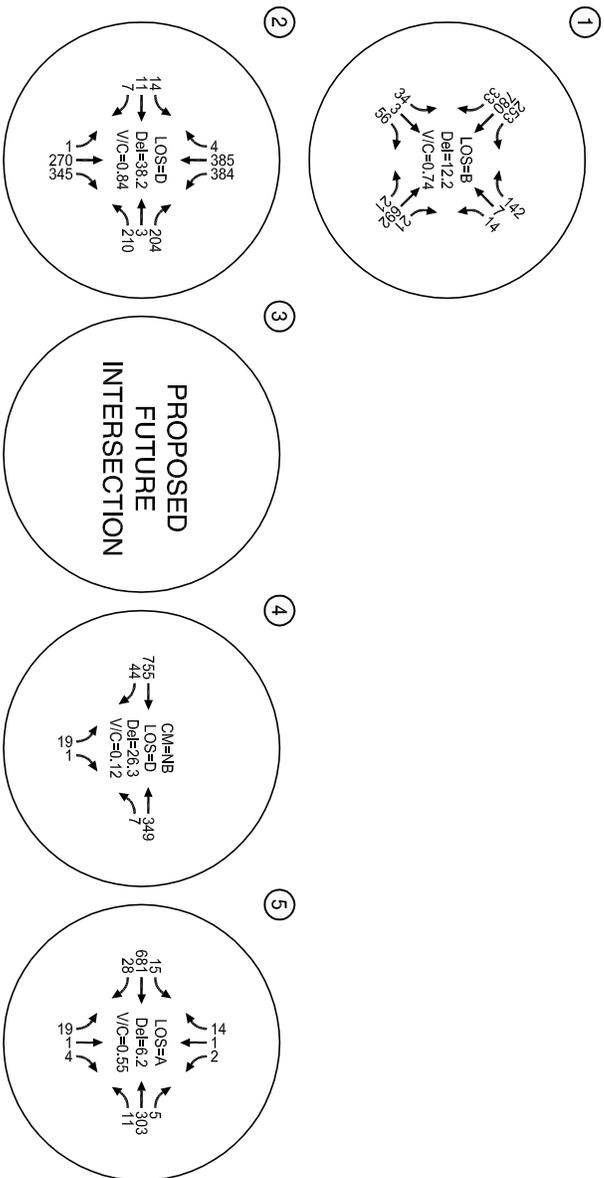


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2018 BACKGROUND TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR
TUALATIN, OREGON
FIGURE 6



LEGEND

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2018 BACKGROUND TRAFFIC CONDITIONS
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

PROPOSED DEVELOPMENT PLAN

As previously described and illustrated in Figure 2, Lennar Homes is proposing to develop a 79-unit single-family home subdivision on the Sagert Property. The development is proposing to construct the following transportation infrastructure:

- An easterly extension of SW Sagert Street beginning at the SW Sagert Street/SW 65th Avenue intersection and connecting to an existing local street stub in the adjacent Sequoia Ridge neighborhood. This proposed alignment and connecting points are consistent with the City of Tualatin TSP. To accommodate the development and meet the intent of the TSP, the configuration of the SW Sagert Street extension is proposed to include:
 - A two-lane roadway designed as a modified version of the City’s Minor Collector roadway standard.
 - The west end of the extension is proposed to be three travel lanes wide (adding a westbound left-turn lane) to better accommodate turning movement volumes at the SW Sagert Street/SW 65th Avenue intersection.
 - The east end of the extension will provide two travel lanes. This configuration will allow the roadway to match the existing local street stub at the Sequoia Ridge neighborhood and provide a natural transition from the three-lane minor arterial configuration west of SW 65th Avenue to the designated local street section (the two-lane configuration should help minimize regional cut-through traffic).
 - The entire roadway extension will include sidewalks and bicycle lanes.
- To serve the 79-home subdivision, a network of local streets will be constructed. All of these local streets are proposed to take access off of the new extension of SW Sagert Street. One of these local streets serving the eastern portion of the site is proposed to connect to SW Borland Road. Due to the configuration of the site and the width of the property that fronts SW Borland Road, it is not feasible to align a local street such that it would connect to SW Borland Road opposite the existing hospital access driveway and still maximize the property for development. As such, a limited access right-in/right-out connection is proposed to mitigate the resulting negatively off-set driveways. A small raised median is proposed along SW Borland Road at this connection point to help enforce the right-in/right-out access and still allow full access to the Meridian Park Hospital emergency driveway. A “pork-chop” island within the local street driveway throat the SW Borland Road may also be considered to reinforce the right-in/right-out access driveway.
- As documented later in this report, the extension of SW Sagert Street is likely to result in some regional cut-through traffic. Although projected to be relatively minor (see Figures 9, 10, and Appendix F figures F5 and F6), some of this regional cut-through traffic will result in increased traffic volumes on the local streets in the adjacent Sequoia Ridge subdivision. In an attempt to help minimize cut-through traffic oriented through Sequoia Ridge, all-way

stop control is proposed at the intersection of SW Sagert Street and the north-south roadway that connects to SW Borland Road. The inclusion of all-way stop control will help transition between the Minor Collector design of the SW Sagert Street extension and the local street stub connecting to the Sequoia Ridge subdivision. In addition to the all-way stop control, additional signage is proposed for eastbound traffic volumes on the SW Sagert Street that will help direct traffic volumes onto the new local street that will connect to SW Borland Road.

- Given the existing operational limitations, the new characteristics brought about as a result of the extension of SW Sagert Street, and the increased traffic volumes from the proposed subdivision, it is recognized that the proposed development will require signalization of the SW Sagert Street/SW 65th Avenue intersection. Additional details of this signalization are included in the following section.

Signalization of the SW Sagert Street/SW 65th Avenue Intersection

For the purposes of this analysis, signalization of the SW Sagert Street/SW 65th Avenue intersection was assumed to include the following characteristics.

- The intersection approaches are configured as described below.
 - The northbound approach will be widened and reconfigured to include a separate left-turn lane and a shared through-right lane;
 - The eastbound approach will be restriped to include a separate left-turn lane and a shared through/right-turn lane. This approach will also be widened to accommodate full width bicycle lanes all the way to the SW 65th Avenue intersection;
 - No changes are proposed to the southbound approach, thereby maintaining the existing right-turn slip lane, a through lane, and a left-turn lane; and
 - The westbound approach will be reconstructed to provide a separate left-turn lane and a shared through-right lane (mirroring the proposed configuration on the eastbound approach).
- The traffic signal has been analyzed and based on the traffic volumes, geometric/land use constraints, and proposed lane configurations, the following design characteristics are needed/proposed:
 - The new signal would need to operate in coordination with the existing traffic signal at the SW Borland Road/SW 65th Avenue intersection. This coordination is needed for vehicle queue management purposes due to the relatively short distance between the SW 65th Avenue/SW Borland Road and SW 65th Avenue/SW Sagert Street intersections.

- The signal should be designed with a 2070 type controller that will allow for coordination with the existing 2070 controller at the SW 65th Avenue/SW Borland Road intersection.
- The proposed signal should be designed to operate with split phasing in the east-west direction (along SW Sagert Street).
- The proposed signal should operate with a 130-second cycle length during the a.m. and a 115-second cycle length during p.m. peak periods to match current adjacent intersection operations (or as amended by the City/County to coordinate with the existing 2070 controller at the SW 65th Avenue/SW Borland Road intersection).
- The northbound and southbound movements at the proposed SW Sagert Street/SW 65th Avenue and the existing SW Borland Road/SW 65th Avenue signalized intersections are assumed to be served twice per cycle to better manage queuing between the signals.
- The traffic signal should include appropriate design features (to be determined during the formal signal design and affiliated signing/stripping plans) to address the grades along SW 65th Avenue's northbound approach. An example feature, among others, may include advanced signal head placements in accordance with the *Manual on Uniform Traffic Control Devices*).

Driveway Access to the SW Sagert Street Extension

In conjunction with the extension of SW Sagert Street, the two previously mentioned medical office building lots that border the north side of the proposed subdivision will have access to SW Sagert Street. The western lot (TPC property) will be provided two driveways to the SW Sagert Street extension that replace their existing driveway access at the SW Sagert Street/SW 65th Avenue intersection. The east driveway will be a full access driveway located approximately 250 feet east of the SW Sagert Street/SW 65th Avenue intersection. Due to the orientation of the site, the west driveway can only be located 100 feet from the SW Sagert Street/SW 65th Avenue intersection. As such, this driveway will be limited to right-in/right-out access via a raised median along the SW Sagert Street extension. Although the right-in/right-out driveway will provide some access limitations, the TPC property will continue to have use of two existing full access driveways off of SW Borland Road.

The other medical office building lot (Mei Medical Building) will be provided a full access driveway along the SW Sagert Street extension opposite one of the proposed local neighborhood streets. For the purposes of this study, it has been assumed that this access will replace the existing full access

driveway off of SW Borland Road per that site's original conditions of approval¹. Additional details of this SW Borland Road driveway closure are provided in the following section.

Figure 8 illustrates the proposed/assumed lane configurations and traffic control devices at all of the study intersections.

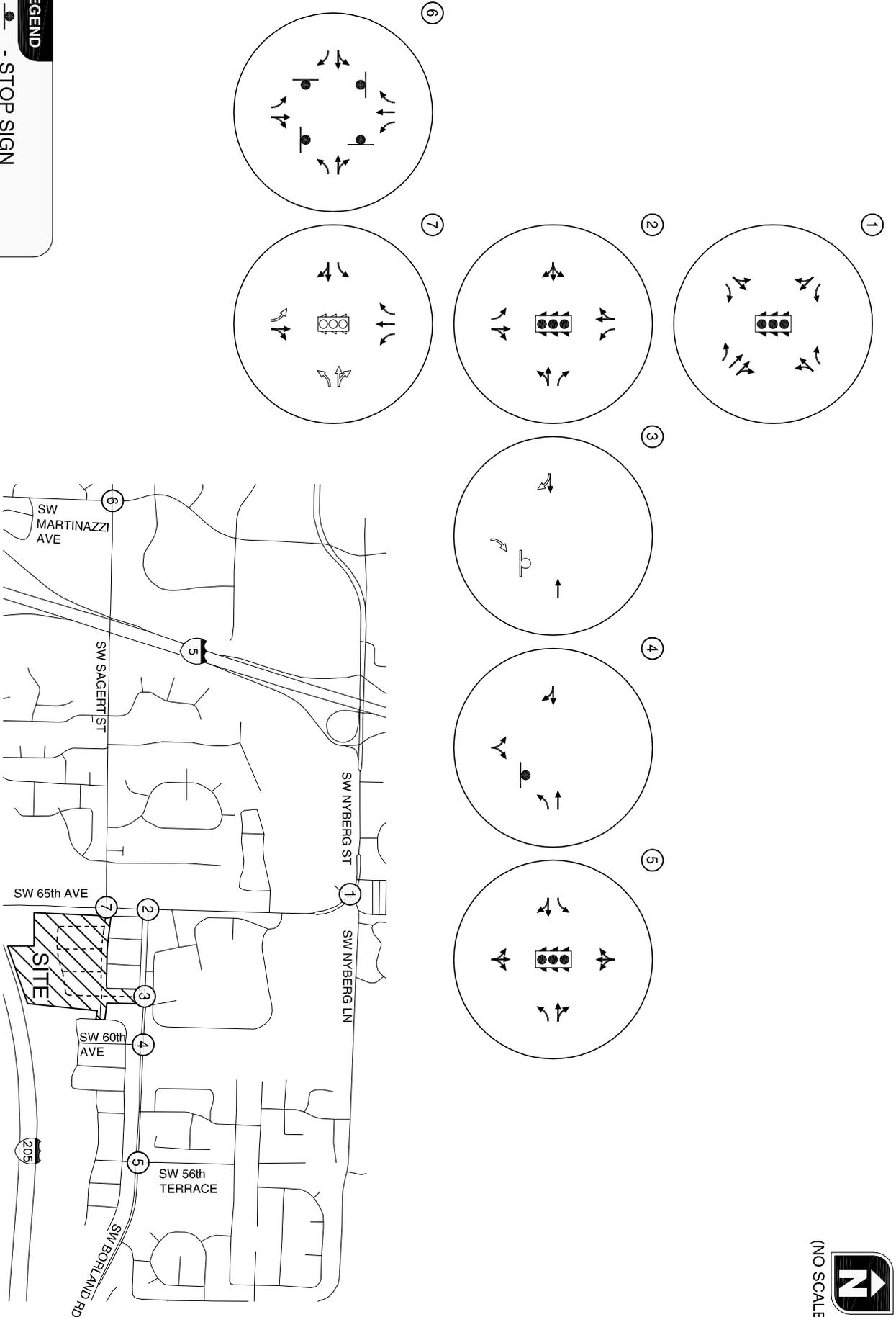
Re-Routing of Existing Volumes

The proposed extension of SW Sagert Street through the project site is expected to result in some changes to study area travel patterns as noted below:

- MEI Medical Building – The assumed closure of the MEI Medical Building driveway off of SW Borland Road will reorient all of the existing site-generated trips to the new extension of SW Sagert Street. Based on weekday a.m. and p.m. traffic counts collected at the site's existing SW Borland Road driveway, a detailed summary of the assumed re-routed trips is shown in Figures F1 and F2 in *Appendix F*.
- TPC Property – While this site will have two driveways on the new extension of SW Sagert Street, one of these driveways will be limited to right-in/right-out access. As such, some site-generated trips will need to re-route to the existing driveway off of SW Borland Road. Based on weekday a.m. and p.m. traffic counts collected at the TPC Property driveways, a detailed summary of the assumed re-routed trips is shown in Figures F1 and F2 in *Appendix F*.
- Sequoia Ridge Subdivision – It is reasonable to expect some existing residential trips from the Sequoia Ridge Subdivision to use the proposed extension of SW Sagert Street as an alternative to SW Borland Road. A detailed summary of the assumed Sequoia Ridge re-routed trips is shown in Figures F3 and F4 in *Appendix F*.
- Regional Trips – It is reasonable to expect some existing regional traffic along the SW 65th Avenue and SW Borland Road corridors to use the new SW Sagert Street extension as a cut-through/alternative to navigating signalized SW 65th Avenue/SW Borland Road intersection. A detailed summary of the assumed re-routed regional trips is shown in Figures F5 and F6 in *Appendix F*.

Figures 9 and 10 summarize the more detailed rerouting of existing traffic shown in Appendix F at the formal study area intersections during the weekday a.m. and p.m. peak hours.

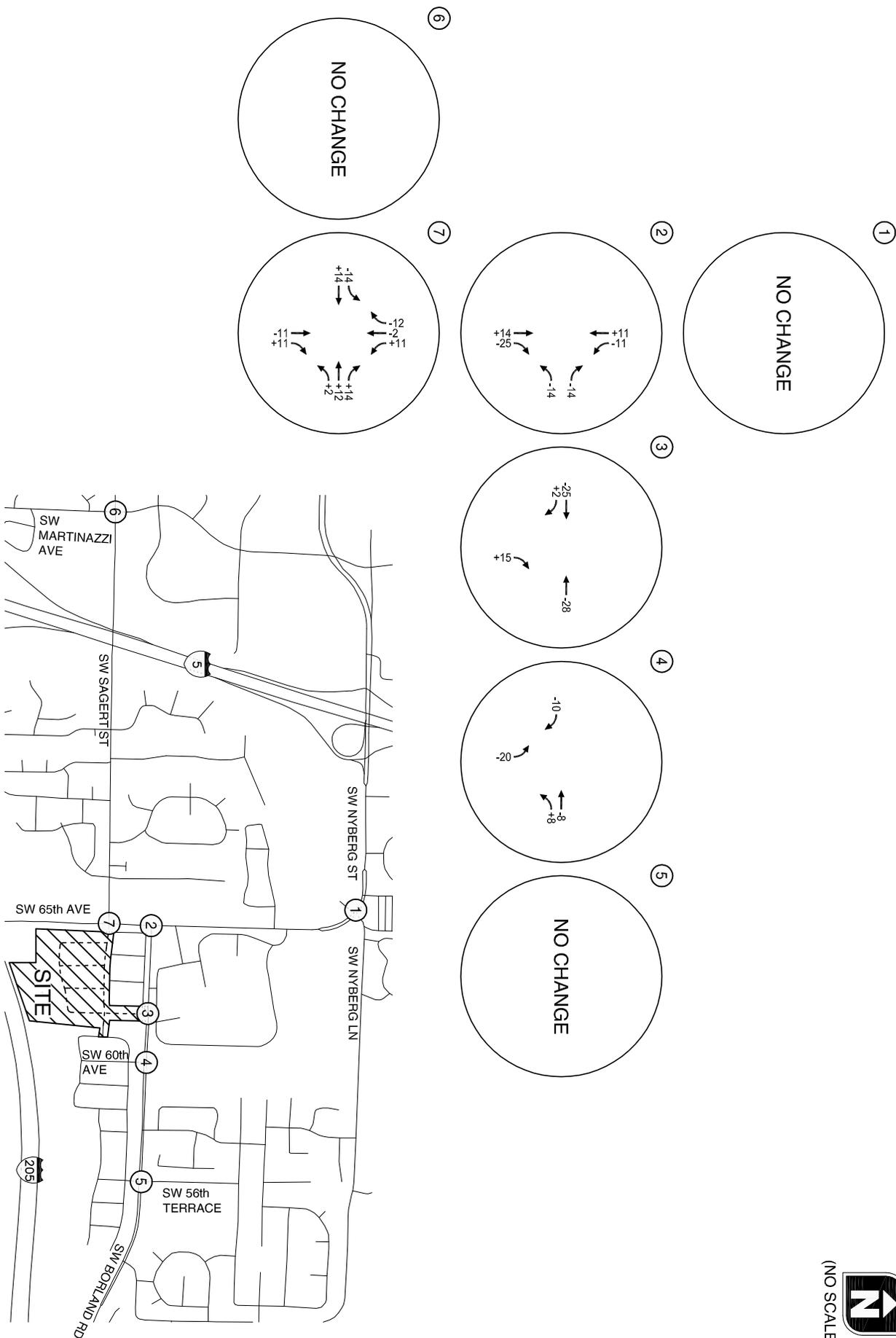
¹ As part of the approval process for obtaining access to SW Borland Road, the City of Tualatin included an interim access provision when the Mei Medical Building was originally developed. This provision states that interim access to SW Borland Road will be allowed until SW Sagert Street on the south side of the property becomes available for access.



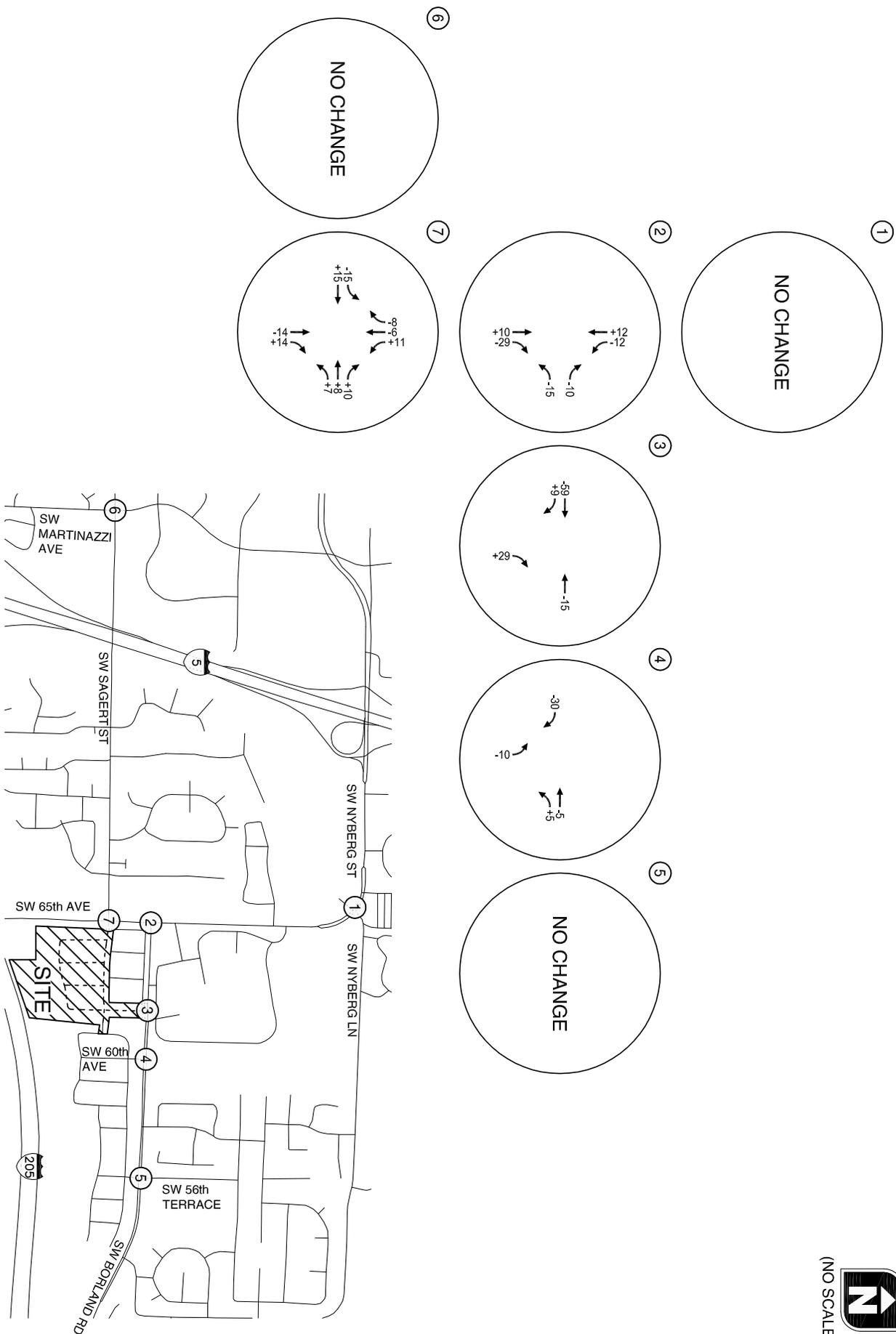
LEGEND

-  - STOP SIGN
-  - TRAFFIC SIGNAL
-  - PROPOSED

FIGURE 8
PROPOSED LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES TUALATIN, OREGON



2018 RE-ROUTED TRAFFIC
WEEKDAY AM PEAK HOUR
TUALATIN, OREGON



2018 RE-ROUTED TRAFFIC
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

Trip Generation

The projected weekday daily, a.m., and p.m. peak-hour vehicle trip ends for the proposed development were based on the *Trip Generation Manual*, 9th Edition (Reference 2). Table 5 summarizes the anticipated number of trips that will be generated by the proposed subdivision.

Table 5: Estimated Subdivision Trip Generation

Land Use	ITE Code	Size	Daily Trips	Weekday AM Peak Hour Trips			Weekday PM Peak Hour Trips		
				Total	In	Out	Total	In	Out
Single-Family Homes	210	79 units	752	65	16	49	85	54	31

Site Trip Distribution/Trip Assignment

The site-generated trips were distributed onto the study area roadway system according to the existing traffic patterns and the location of major trip origins and destinations. Figures 11 and 12 illustrate the assumed trip distribution pattern and the resulting assignment of site-generated trips to the study area intersections during the weekday a.m. and p.m. peak hours, respectively.

2018 Total Traffic Operations

The year 2018 background traffic volumes for the weekday a.m. and p.m. peak hours (shown in Figures 6 and 7) were combined with the rerouted traffic (shown in Figures 9 and 10) and the site-generated traffic (shown in Figures 11 and 12) to arrive at the total traffic volumes that are shown in Figures 13 and 14.

Figures 13, 14, and Table 6 summarize the forecast 2018 total traffic conditions for the study intersections during the weekday a.m. and p.m. peak hours. As shown, all intersections are forecast to operate at acceptable levels of service and v/c ratios during the peak hours with the exception of the SW Martinazzi Avenue/SW Sagert Street intersection. *Appendix "G" contains the 2018 total traffic conditions operational worksheets.*

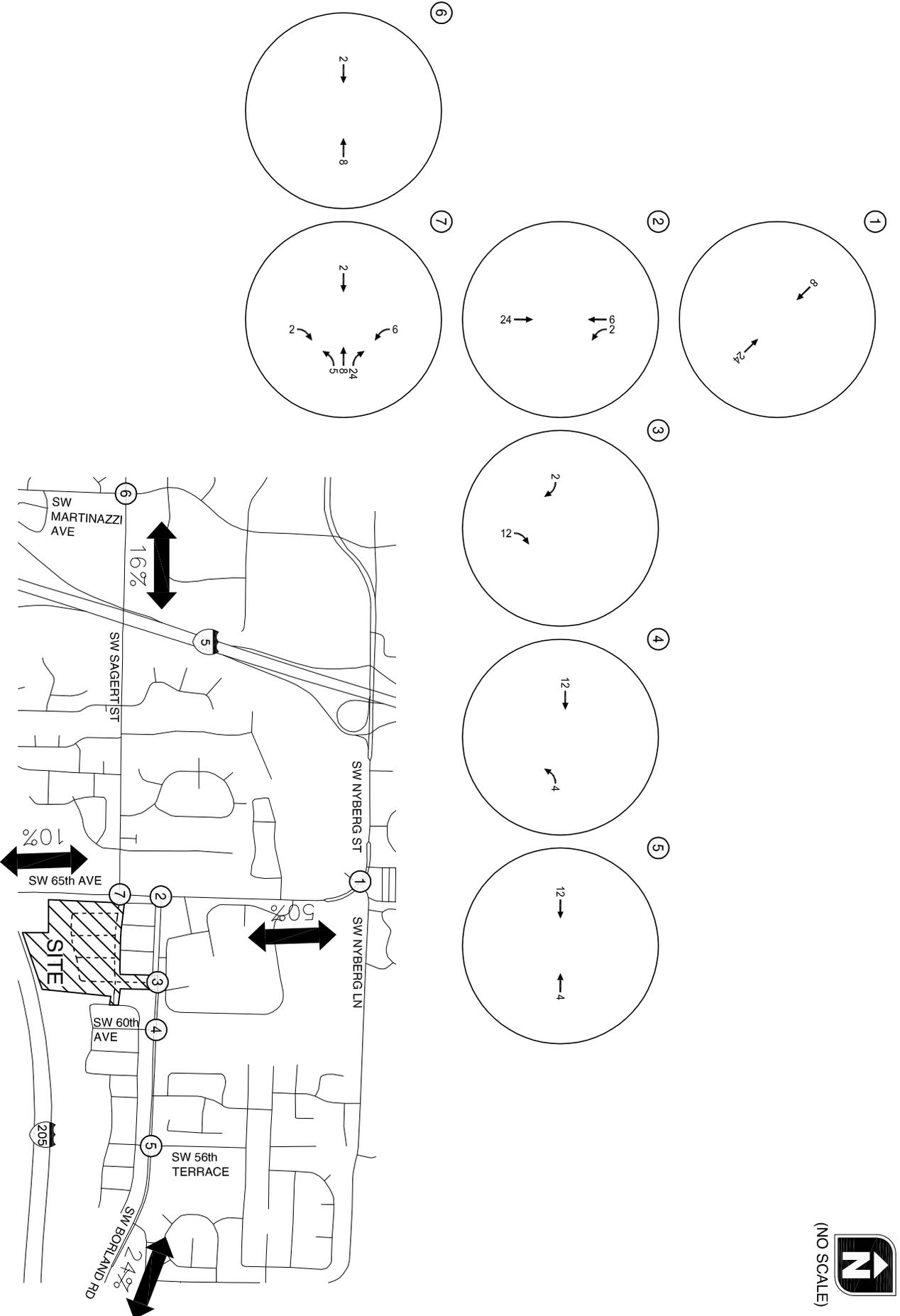


FIGURE 11
SITE-GENERATED TRIPS AND TRIP DISTRIBUTION
WEEKDAY AM PEAK HOUR
TUALATIN, OREGON

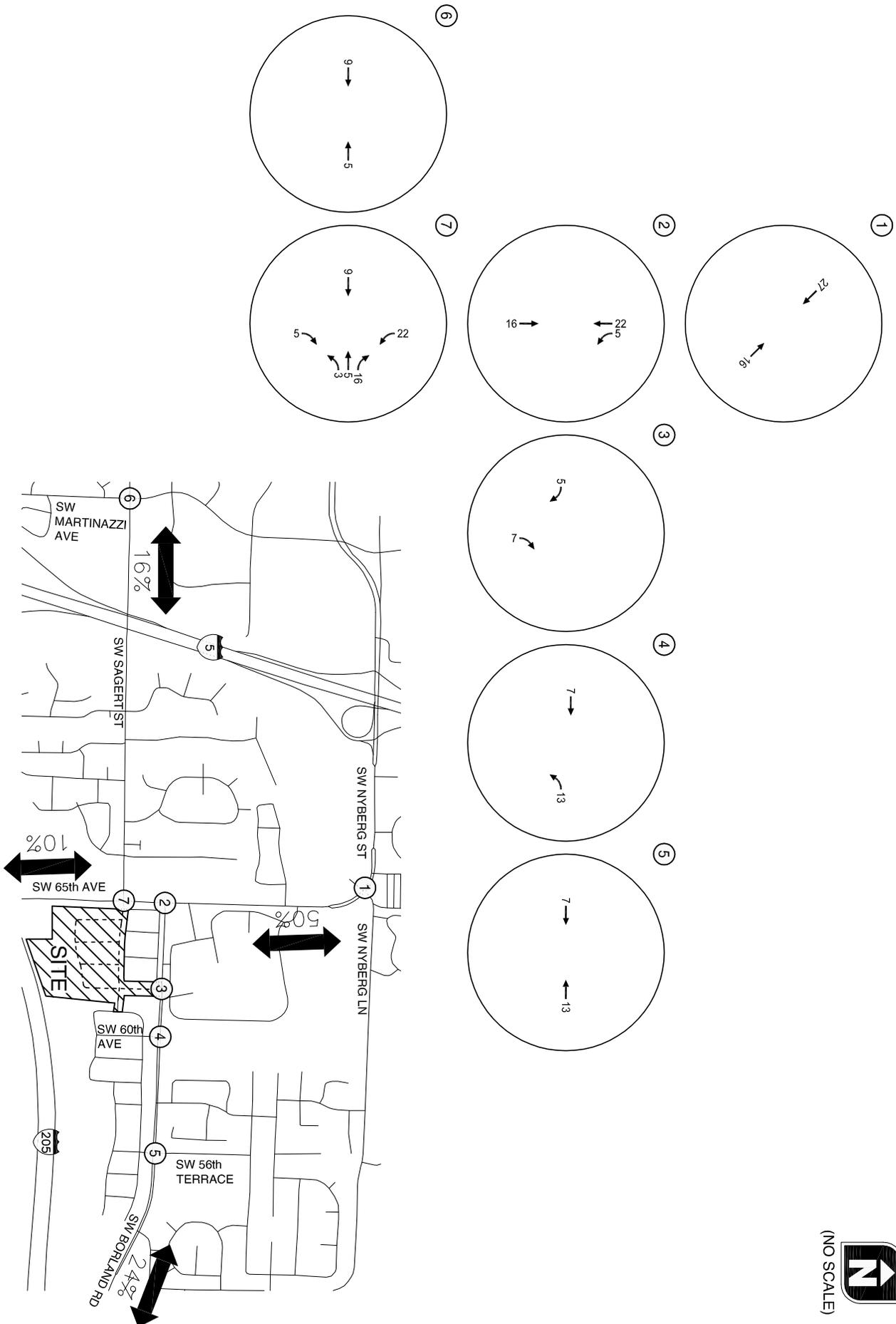
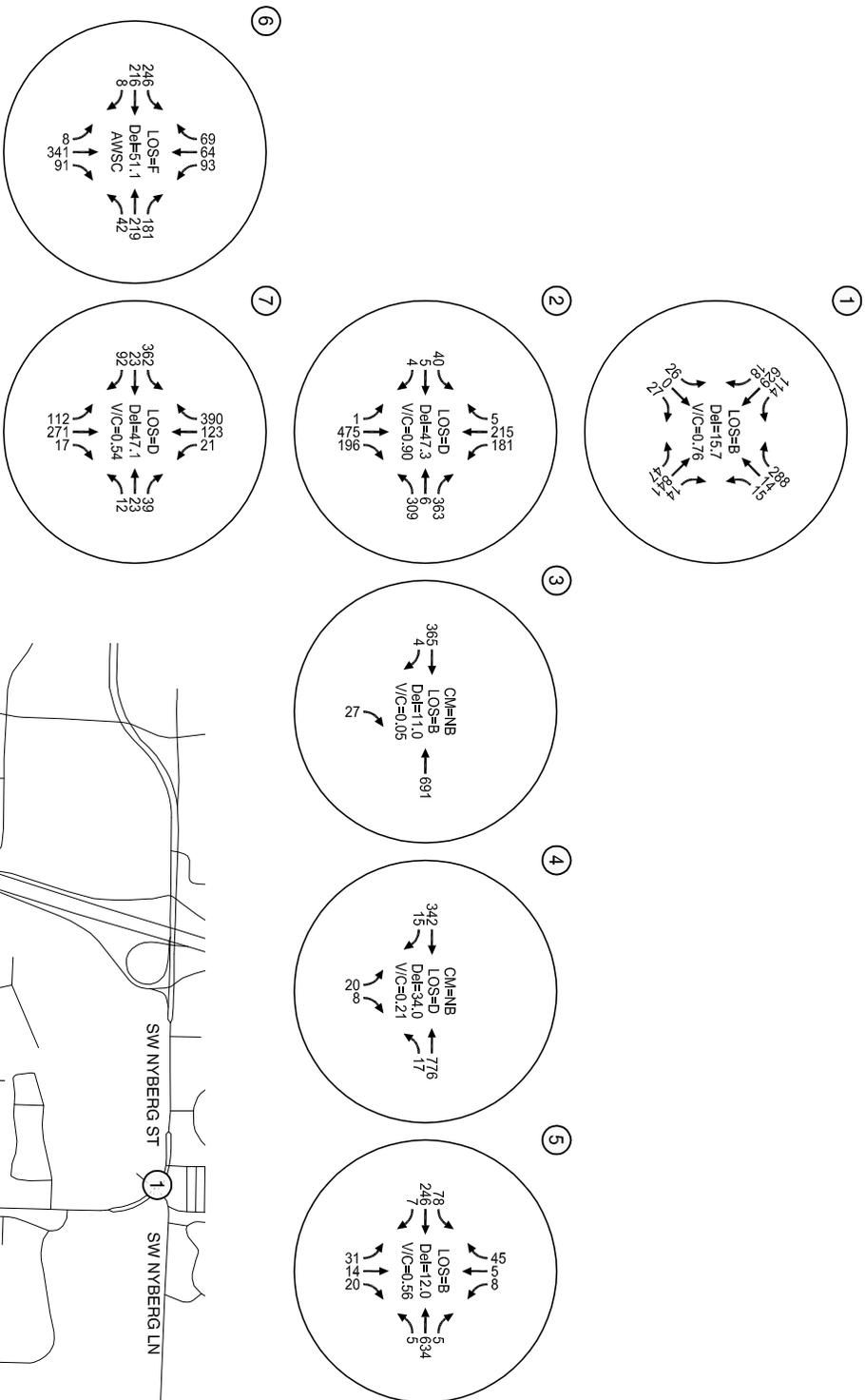
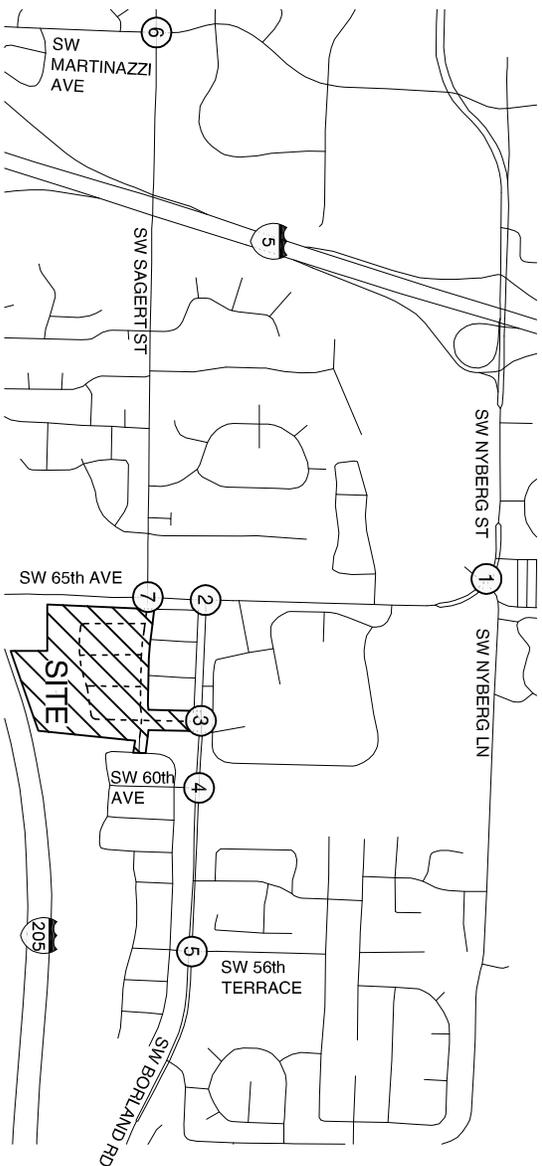


FIGURE 12
SITE-GENERATED TRIPS AND TRIP DISTRIBUTION
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

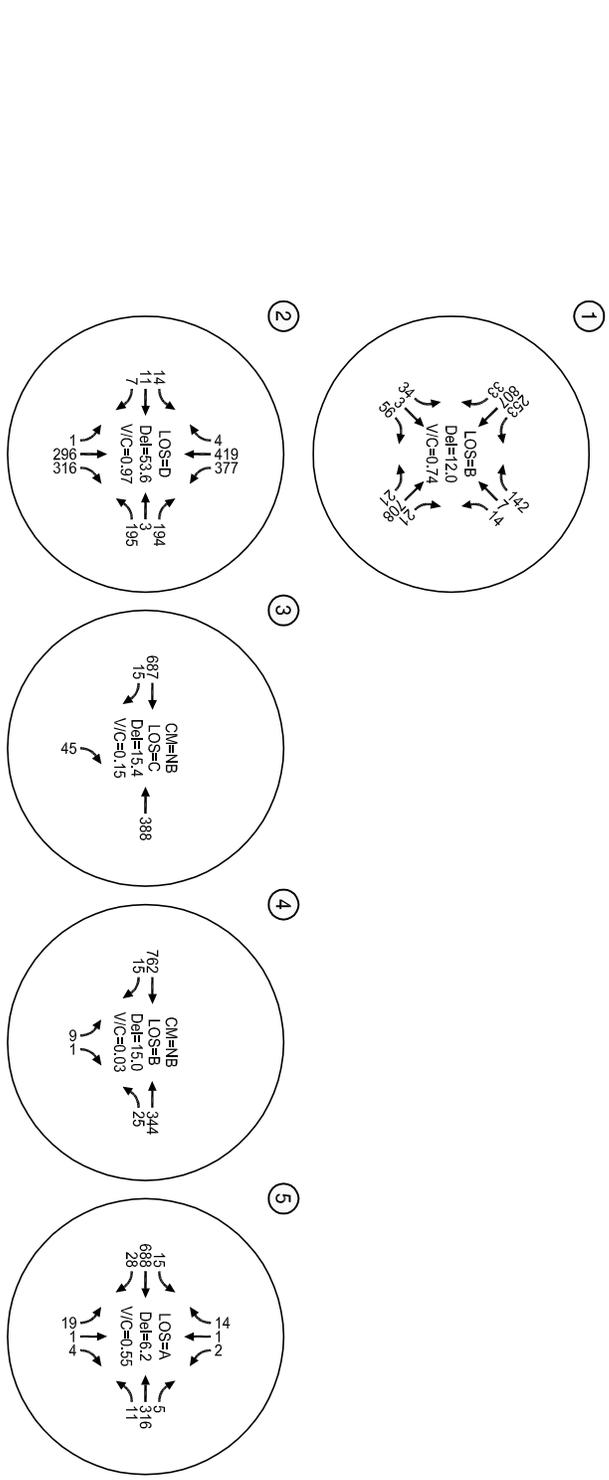


LEGEND

- CM = CRITICAL MOVEMENT (TWSC)
- LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC)/CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
- Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
- TWSC = TWO-WAY STOP CONTROL
- AWSC = ALL-WAY STOP CONTROL

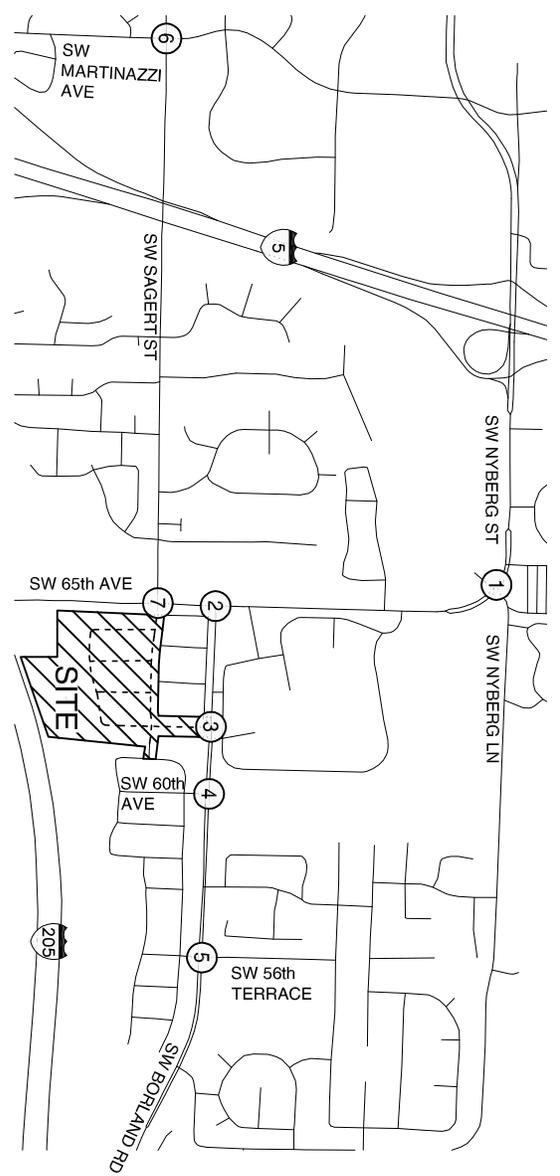


2018 TOTAL TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR
TUALATIN, OREGON



LEGEND

CM = CRITICAL MOVEMENT (TWSC)
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC)/CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
 TWSC = TWO-WAY STOP CONTROL
 AWSC = ALL-WAY STOP CONTROL



2018 TOTAL TRAFFIC CONDITIONS
 WEEKDAY PM PEAK HOUR
 TUALATIN, OREGON

SW Martinazzi Avenue/SW Sagert Street

The SW Martinazzi Avenue/SW Sagert Street intersection is forecast to continue to operate at LOS F. The proposed development is estimated to contribute an additional 0.6% and 0.7% increase in traffic volumes, respectively, during the weekday a.m. and p.m. peak hours. Given this relatively small increase, no development-driven traffic mitigation is recommended for the following reasons:

- The Tualatin TSP has identified mitigation for this intersection that, when implemented, will address near- and long-term operations.
- The Washington County Transportation Development Tax (TDT) in part funds an improvement project on SW Sagert Street that will add capacity and reduce delay to both intersections.

Table 6 – 2018 Total Traffic Conditions – Operations

Intersection	Maximum Operating Standard	Weekday AM Peak Hour		Weekday PM Peak Hour	
		LOS	V/C	LOS	V/C
Signalized Intersections					
SW 65 th Avenue/SW Borland Road	0.99 ¹	D	0.90	D	0.97
SW Nyberg Street/SW 65 th Avenue/SW Nyberg Lane	0.99 ¹	B	0.76	B	0.74
SW 56 th Terrace/SW Borland Road	0.99 ² / LOS E ³	B	0.56	A	0.55
SW 65 th Avenue/SW Sagert Street	0.99 ¹ / LOS E ³	D	0.54	D	0.57
Unsignalized Intersections⁴					
SW 60 th Avenue/SW Borland Road	0.99 ³ / LOS E ³	D	0.21	B	0.03
RIRO Access/SW Borland Road	0.99 ² / LOS E ³	B	0.05	C	0.15
All-Way Stop Controlled Intersections					
SW Martinazzi Avenue/SW Sagert Street	D ³	F	-	F	-

Notes:

¹ Washington County sets operating standards for both signalized and unsignalized intersections as a volume-to-capacity ratio no greater than 0.99.

² Clackamas County sets operating standards for both signalized and unsignalized intersections as a volume-to-capacity ratio no greater than 0.99.

³ The City of Tualatin considers LOS “D” acceptable and signalized intersections and LOS “E” at unsignalized intersections.

⁴ LOS and V/C reported for the highest delay or critical movement

2018 Total Traffic Queuing

A queuing analysis was completed at the SW 65th Avenue/SW Borland Road and SW 65th Avenue/SW Sagert Street signalized intersections under year 2018 total traffic volumes. Queues were analyzed using SimTraffic and the results reported are the average of five microsimulation runs. Table 5 documents the forecast 95th percentile queues for these intersections. *Appendix H contains the queuing worksheets for year 2018 background and total traffic conditions.*

Table 7: 2018 Total Traffic Conditions – 95th Percentile Queuing

Intersection	Movement	Available Storage (feet)	Weekday AM Peak Hour		Weekday PM Peak Hour	
			Forecast Length ¹	Exceeds Storage?	Forecast Length ¹	Exceeds Storage?
SW 65 th Avenue/ SW Borland Road	EB LT/TH/RT	150	125	No	75	No
	WB LT/TH	400	400	No	225	No
	WB RT	575	550	No	175	No
	NB LT	150	<25	No	<25	No
	NB TH/RT	350	350	No	275	No
	SB LT	675	175	No	350	No
	SB TH/RT	675	125	No	250	No
SW 65 th Avenue/ SW Sagert Street	EB LT	200	100	No	100	No
	EB TH/RT	1,000	550	No	1,000	No ²
	WB LT	125	50	No	50	No
	WB TH/RT	200	75	No	75	No
	NB LT	200	100	No	75	No
	NB TH/RT	>1,000	175	No	100	No
	SB LT	150	25	No	75	No
	SB TH	350	100	No	275	No
SB RT	50	75	Yes	100	Yes ³	

¹ Queue length rounded to 25 foot increments.

² Queue length will lead to intermittent blockage of SW Wampanoag Drive consistent with current conditions

³ Queue length will be accommodated in southbound through lane.

As shown in Table 7, during the a.m. and p.m. peak hours the forecast 95th percentile queues at the SW 65th Avenue/SW Borland Road intersection can be accommodated by the existing storage distance. Several movements at the SW 65th Avenue/SW Sagert Street intersection are anticipated to exceed the existing storage distance.

- During the a.m. and p.m. peak hours, the eastbound through-right lane is expected to extend past SW Wampanoag Drive. This condition exists today and no mitigation beyond the signalization of the intersection is suggested.
- During the a.m. and p.m. peak hours the southbound right-turn lane is expected to exceed the existing 50 feet of storage. Although the southbound right-turn will spill back, the 95th percentile queues for southbound through-left lane are forecast to operate within the existing 350 feet of storage.

It should be emphasized that the assumed timing of the proposed signal at SW 65th Avenue/SW Sagert Street and the existing signal at SW 65th Avenue/SW Borland Road have been optimized to control queuing between the two intersection. As shown in Table 7, the 95th percentile queues between these intersections are forecast to be less than the 350 feet of available storage; however, the east-west movements experience longer queues due to the north-south queue management.

CONCLUSIONS AND RECOMMENDATIONS

The results of the traffic impact analysis indicate that the proposed 79-unit single-family home subdivision on the Sagert Property can be constructed while maintaining acceptable levels of service and safety on the surrounding transportation system as long as the appropriate mitigations are in place. The findings of this analysis and our recommendations are discussed below.

FINDINGS

Year 2015 Existing Conditions

- Five of the seven study intersections currently operate at acceptable levels of service during the weekday a.m. and p.m. peak hours.
 - The SW Martinazzi Avenue/SW Sagert Street all-way stop-controlled intersection currently operates at LOS E during the weekday a.m. peak hour and LOS F during the weekday p.m. peak hour.
 - This intersection is included in the “unfunded” category of the City’s CIP and is noted as needing improvements. The City’s TSP calls for the eventual signalization of the intersection.
 - The SW 65th Avenue/SW Sagert Street all-way stop-controlled intersection currently operates at LOS F during the weekday a.m. and p.m. peak hours.
 - The current City of Tualatin’s Capital Improvement Plan (CIP) includes signalization of the SW 65th Avenue/SW Sagert Street intersection. With inclusion in the CIP, this funded improvement could potentially be constructed sometime within the 5-year CIP window.
- A review of historical crash data did not reveal any patterns or trends in the site vicinity that require mitigation associated with this project.

Year 2018 Background Traffic Conditions

- Five of seven study intersections are forecast to continue to operate at acceptable levels of service during the weekday a.m. and p.m. peak hours.
 - The SW Martinazzi Avenue/SW Sagert Street all-way stop-controlled intersection is forecast to operate at LOS F during both the weekday a.m. and p.m. peak hours.
 - The SW 65th Avenue/SW Sagert Street all-way stop-controlled intersection is forecast to continue to operate at LOS F during the weekday a.m. and p.m. peak hours.

Proposed Development Plan

- The proposed 79-unit single-family home subdivision is estimated to generate 752 daily net new trips; 65 net new trips (16 inbound, 49 outbound) are projected to occur during the weekday a.m. peak hour and 85 net new trips (54 inbound, 31 outbound) are projected to occur during the weekday p.m. peak hour.
- The proposed subdivision development will include an easterly extension of SW Sagert Street beginning at the SW Sagert Street/SW 65th Avenue intersection and connecting to an existing local street stub in the adjacent Sequoia Ridge neighborhood.
 - To meet the intent of the City's TSP and accommodate the development, this roadway should be designed to a modified version of the City's Minor Collector roadway standard.
 - The west end of the extension is proposed to be three travel lanes wide (adding a westbound left-turn lane) to better accommodate turning movement volumes at the SW Sagert Street/SW 65th Avenue intersection.
 - The east end of the extension will provide two travel lanes. This configuration will allow the roadway to better match the existing local street stub at the Sequoia Ridge neighborhood and provide a natural transition from the three-lane minor arterial configuration west of SW 65th Avenue to the designated local street section (the two-lane configuration should help minimize regional cut-through traffic).
 - The entire roadway extension will include sidewalks and bicycle lanes on both sides of the roadway.
- The extension of SW Sagert Street is anticipated to effect existing traffic patterns in the surrounding network resulting in some rerouting of existing trips.
- A network of local streets will be constructed within the proposed subdivision with all of these local streets to take access off of the extension of SW Sagert Street.
 - One of these local streets serving the eastern portion of the site is proposed to connect to SW Borland Road. Due to the configuration of the site and the width of the property that fronts SW Borland Road this access will be limited to right-in/right-movements.
- In conjunction with the proposed subdivision the SW Sagert Street/SW 65th Avenue intersection will be signalized.
 - The northbound, eastbound, and westbound intersection lane configurations will be reconfigured or redesigned.
 - A signal timing plan, coordinated with the existing SW Borland Road/SW 65th Avenue intersection, and using double cycled northbound and southbound movements, will be implemented to help manage queuing at these closely spaced intersections.

Year 2018 Total Traffic Conditions

- All of the study intersections, except the SW Martinazzi Avenue/SW Sagert Street intersection, are forecast to operate at acceptable levels of service during the weekday a.m. and p.m. peak hours.
 - Similar to background traffic conditions, the SW Martinazzi Avenue/SW Sagert Street all-way stop-controlled intersection is forecast to continue operate at LOS F during the weekday a.m. and p.m. peak hours. The proposed development is estimated to contribute an additional 0.6% and 0.7% increase in traffic volumes, respectively, during the weekday a.m. and p.m. peak hours. No mitigation measures are recommended in conjunction with the proposed site development given the relatively small percentage of site-generated traffic being added to this intersection.

RECOMMENDATIONS

The following list summarizes the mitigation measures recommended as part of this proposed development.

- SW Sagert Street should be extended to the east through the site as outlined in the project description.
- The SW Sagert Street/SW 65th Avenue intersection should be signalized.
- The signalized SW Sagert Street/SW 65th and SW Borland Road/SW 65th Avenue intersections should be timed and coordinated to manage queuing between these intersections.
- Landscaping, signage, and above ground utilities near the internal intersections and site access points should be located and maintained to ensure adequate sight distance.

Please contact us if you have any questions regarding our analysis findings or recommendations.

Sincerely,
KITTELSON & ASSOCIATES, INC.



Matt Hughart, AICP
Associate Planner

Chris Brehmer, P.E.
Principal Engineer

REFERENCES

1. Washington County Department of Land Use and Transportation, *Washington County Safety Priority Index System (SPIS) 2010-2012*, January 2014.
2. Institute of Transportation Engineers, *Trip Generation Manual*, 9th Edition, September 2012.

APPENDICES

- A. Level-of-Service Concept
- B. Traffic Counts
- C. Existing Conditions Worksheets
- D. Crash Data
- E. 2018 Background Conditions Worksheets
- F. Assumed Re-Routing of Trips
- G. 2018 Total Traffic Conditions Worksheets
- H. 2018 Total Traffic Queuing Worksheets

Appendix A
Level-of-Service Concept

APPENDIX A LEVEL-OF-SERVICE CONCEPT

Level of service (LOS) is a concept developed to quantify the degree of comfort (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or roadway segment. Six grades are used to denote the various level of service from “A” to “F”.¹

SIGNALIZED INTERSECTIONS

The six level-of-service grades are described qualitatively for signalized intersections in Table A1. Additionally, Table A2 identifies the relationship between level of service and average control delay per vehicle. Control delay is defined to include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Using this definition, Level of Service “D” is generally considered to represent the minimum acceptable design standard.

Table A-1 Level-of-Service Definitions (Signalized Intersections)

Level of Service	Average Delay per Vehicle
A	Very low average control delay, less than 10 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Average control delay is greater than 10 seconds per vehicle and less than or equal to 20 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for a level of service A, causing higher levels of average delay.
C	Average control delay is greater than 20 seconds per vehicle and less than or equal to 35 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Average control delay is greater than 35 seconds per vehicle and less than or equal to 55 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle length, or high volume/capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Average control delay is greater than 55 seconds per vehicle and less than or equal to 80 seconds per vehicle. This is usually considered to be the limit of acceptable delay. These high delay values generally (but not always) indicate poor progression, long cycle lengths, and high volume/capacity ratios. Individual cycle failures are frequent occurrences.
F	Average control delay is in excess of 80 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation. It may also occur at high volume/capacity ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such high delay values.

¹ Most of the material in this appendix is adapted from the Transportation Research Board, Highway Capacity Manual, (2000).

Table A-2 Level-of-Service Criteria for Signalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

UNSIGNALIZED INTERSECTIONS

Unsignalized intersections include two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections. The 2000 Highway Capacity Manual (HCM) provides models for estimating control delay at both TWSC and AWSC intersections. A qualitative description of the various service levels associated with an unsignalized intersection is presented in Table B3. A quantitative definition of level of service for unsignalized intersections is presented in Table B4. Using this definition, Level of Service “E” is generally considered to represent the minimum acceptable design standard.

Table A3 Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Delay per Vehicle to Minor Street
A	<ul style="list-style-type: none"> Nearly all drivers find freedom of operation. Very seldom is there more than one vehicle in queue.
B	<ul style="list-style-type: none"> Some drivers begin to consider the delay an inconvenience. Occasionally there is more than one vehicle in queue.
C	<ul style="list-style-type: none"> Many times there is more than one vehicle in queue. Most drivers feel restricted, but not objectionably so.
D	<ul style="list-style-type: none"> Often there is more than one vehicle in queue. Drivers feel quite restricted.
E	<ul style="list-style-type: none"> Represents a condition in which the demand is near or equal to the probable maximum number of vehicles that can be accommodated by the movement. There is almost always more than one vehicle in queue. Drivers find the delays approaching intolerable levels.
F	<ul style="list-style-type: none"> Forced flow. Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection.

Table A4 Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10.0 and ≤ 15.0
C	>15.0 and ≤ 25.0
D	>25.0 and ≤ 35.0
E	>35.0 and ≤ 50.0
F	>50.0

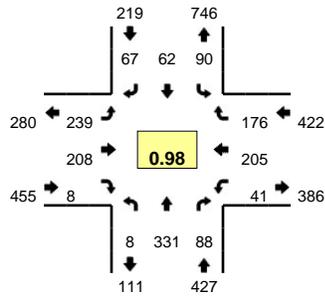
It should be noted that the level-of-service criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, there are a number of driver behavior considerations that combine to make delays at signalized intersections less galling than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, while drivers on the minor street approaches to TWSC intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections than signalized intersections. For these reasons, it is considered that the control delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. While overall intersection level of service is calculated for AWSC intersections, level of service is only calculated for the minor approaches and the major street left turn movements at TWSC intersections. No delay is assumed to the major street through movements. For TWSC intersections, the overall intersection level of service remains undefined: level of service is only calculated for each minor street lane.

In the performance evaluation of TWSC intersections, it is important to consider other measures of effectiveness (MOEs) in addition to delay, such as v/c ratios for individual movements, average queue lengths, and 95th-percentile queue lengths. By focusing on a single MOE for the worst movement only, such as delay for the minor-street left turn, users may make inappropriate traffic control decisions. The potential for making such inappropriate decisions is likely to be particularly pronounced when the HCM level-of-service thresholds are adopted as legal standards, as is the case in many public agencies.

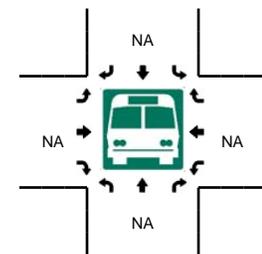
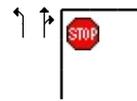
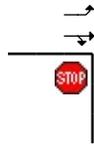
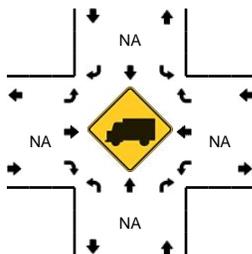
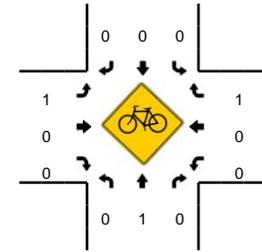
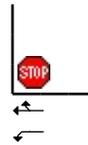
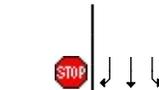
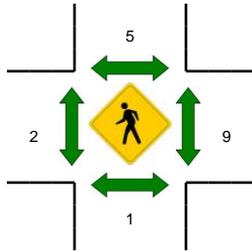
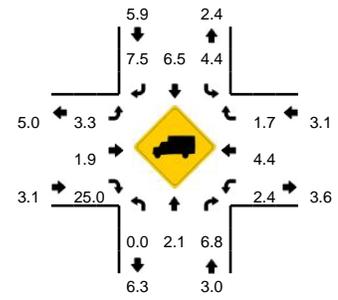
Appendix B
Traffic Counts

LOCATION: SW Martinazzi Ave -- SW Sagert St
CITY/STATE: Tualatin, OR

QC JOB #: 13173407
DATE: Thu, Jan 08 2015



Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:35 AM -- 7:50 AM

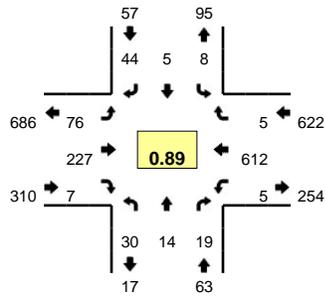


5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound)				SW Martinazzi Ave (Southbound)				SW Sagert St (Eastbound)				SW Sagert St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	18	7	0	3	0	3	0	20	5	1	0	2	15	9	0	83	
7:05 AM	0	15	1	0	3	3	4	0	15	2	0	0	4	16	13	0	76	
7:10 AM	1	28	2	0	1	3	6	0	11	6	0	0	3	16	10	0	87	
7:15 AM	0	19	4	0	3	4	4	0	14	5	0	0	3	18	11	0	85	
7:20 AM	0	26	2	0	5	1	1	0	24	7	0	0	3	14	12	0	95	
7:25 AM	0	13	7	0	5	4	6	0	14	10	0	0	4	21	13	0	97	
7:30 AM	0	34	1	0	4	6	5	0	20	6	0	0	6	21	13	0	116	
7:35 AM	3	32	8	0	6	7	7	0	17	9	2	0	4	18	18	0	131	
7:40 AM	1	29	5	0	8	8	4	0	26	13	0	0	4	16	16	0	130	
7:45 AM	0	21	7	0	1	6	5	0	21	18	2	0	4	23	21	0	129	
7:50 AM	0	34	8	0	4	5	7	0	28	11	0	0	3	17	10	0	127	
7:55 AM	0	24	11	0	13	6	7	0	22	15	1	0	4	17	13	0	133	1289
8:00 AM	0	20	8	0	7	5	11	0	18	22	1	0	3	15	12	0	122	1328
8:05 AM	1	26	11	0	15	0	0	0	16	27	0	0	2	16	7	0	121	1373
8:10 AM	1	29	11	0	6	8	3	0	21	18	1	0	1	16	9	0	124	1410
8:15 AM	0	28	7	0	5	2	3	0	16	21	0	0	3	15	18	0	118	1443
8:20 AM	1	31	4	0	11	3	6	0	15	28	1	0	5	16	21	0	142	1490
8:25 AM	1	23	7	0	10	6	9	0	19	20	0	0	2	15	18	0	130	1523
8:30 AM	1	15	7	0	6	2	5	0	12	15	0	0	4	24	26	0	117	1524
8:35 AM	0	11	1	0	6	6	2	0	18	9	0	0	0	13	18	0	84	1477
8:40 AM	0	11	3	0	8	4	4	0	8	8	0	0	1	18	16	0	81	1428
8:45 AM	0	14	4	0	7	5	5	0	11	7	0	0	2	16	9	0	80	1379
8:50 AM	1	14	1	0	10	6	2	0	18	15	0	0	1	10	14	0	92	1344
8:55 AM	0	16	2	0	8	1	4	0	12	11	0	0	0	9	4	0	67	1278
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	16	328	80	0	60	84	64	0	256	160	16	0	48	228	220	0	1560	
Heavy Trucks	0	0	0		4	4	4		4	12	0		0	8	4		40	
Pedestrians						12				0				20			32	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

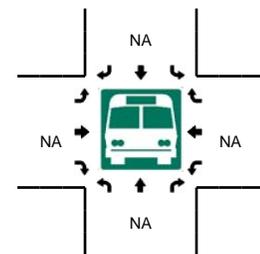
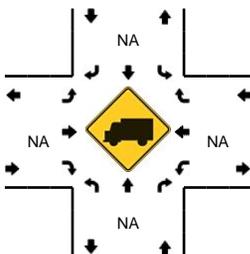
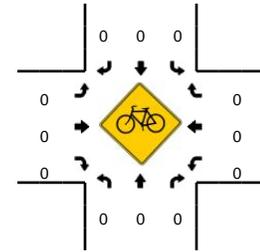
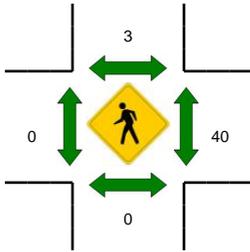
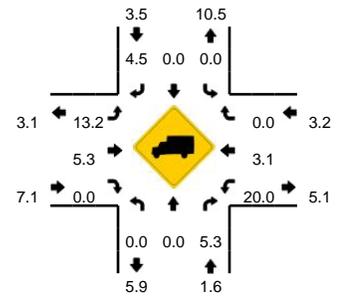
Comments:

LOCATION: SW 56th Ter -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13173409
DATE: Thu, Jan 08 2015



Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 8:05 AM -- 8:20 AM

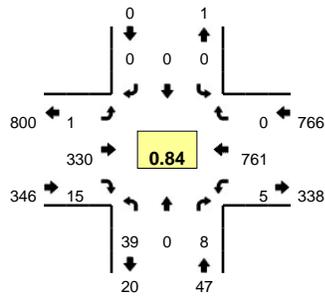


5-Min Count Period Beginning At	SW 56th Ter (Northbound)				SW 56th Ter (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	3	0	2	0	0	0	0	0	0	2	0	0	0	0	35	0	0	42	
7:05 AM	4	0	0	0	0	0	0	0	0	6	0	0	0	0	40	0	0	50	
7:10 AM	2	0	0	0	0	0	0	0	1	12	0	0	0	0	27	1	0	43	
7:15 AM	0	0	4	0	0	0	0	0	3	12	0	0	0	0	51	0	0	70	
7:20 AM	3	0	1	0	0	0	0	0	1	16	0	0	0	0	49	1	0	71	
7:25 AM	0	0	0	0	1	0	0	0	1	19	1	0	0	0	56	0	0	78	
7:30 AM	2	1	2	0	0	0	1	0	2	14	1	0	0	1	50	1	0	75	
7:35 AM	5	0	3	0	0	1	0	0	2	15	0	0	0	0	58	0	0	84	
7:40 AM	2	0	2	0	1	1	0	0	4	24	0	0	0	0	57	0	0	91	
7:45 AM	3	1	3	0	0	0	1	0	5	19	0	0	0	0	53	0	0	85	
7:50 AM	2	0	1	0	1	0	0	0	5	18	0	0	2	2	56	1	0	86	
7:55 AM	3	1	1	0	0	0	2	0	14	10	0	0	0	0	49	0	0	80	855
8:00 AM	0	1	0	0	0	0	2	0	9	20	0	0	0	0	59	0	0	91	904
8:05 AM	4	4	0	0	0	0	9	0	10	19	1	0	0	0	45	1	0	93	947
8:10 AM	1	4	1	0	2	0	9	0	9	20	2	0	1	1	56	1	0	106	1010
8:15 AM	1	2	0	0	1	2	6	0	11	20	2	0	0	0	52	1	0	98	1038
8:20 AM	3	0	3	0	3	1	10	0	3	28	1	0	0	0	39	0	0	91	1058
8:25 AM	4	0	3	0	0	0	4	0	2	20	0	0	1	1	38	0	0	72	1052
8:30 AM	0	0	0	0	0	0	0	0	0	28	1	0	0	0	49	0	0	78	1055
8:35 AM	3	0	0	0	0	0	0	0	2	23	1	0	0	0	57	0	0	86	1057
8:40 AM	3	0	0	0	0	0	2	0	0	14	0	0	0	0	32	0	0	51	1017
8:45 AM	3	0	0	0	0	0	0	0	0	16	0	0	0	0	39	0	0	58	990
8:50 AM	2	0	0	0	0	0	0	0	0	26	0	0	0	0	36	0	0	64	968
8:55 AM	0	0	0	0	0	0	0	0	2	20	1	0	0	0	36	0	0	59	947
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	24	40	4	0	12	8	96	0	120	236	20	0	4	612	12	0	1188		
Heavy Trucks	0	0	0	0	0	0	0	0	12	20	0	0	0	20	0	0	52		
Pedestrians		0				4				0				120			124		
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Railroad																			
Stopped Buses																			

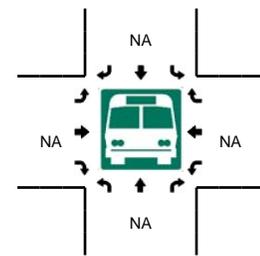
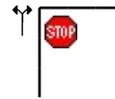
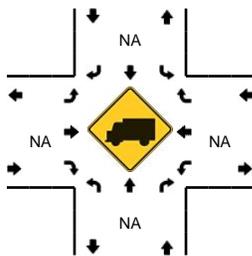
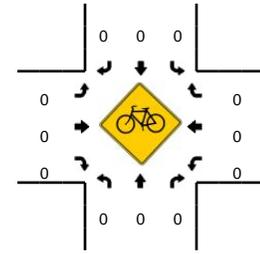
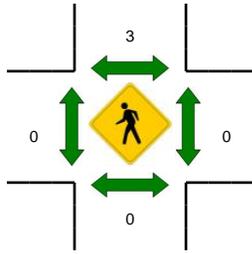
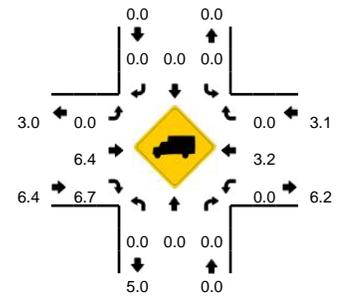
Comments:

LOCATION: SW 60th Ave -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13173411
DATE: Thu, Jan 08 2015



Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 8:05 AM -- 8:20 AM

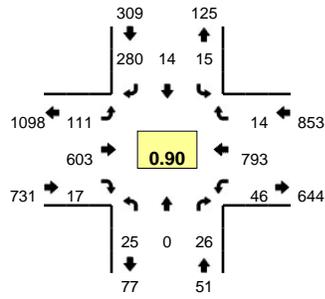


5-Min Count Period Beginning At	SW 60th Ave (Northbound)				SW 60th Ave (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	1	0	0	0	0	0	0	2	0	0	0	42	0	0	45	
7:05 AM	2	0	0	0	0	0	0	0	0	6	0	0	0	47	0	0	55	
7:10 AM	5	0	1	0	0	0	0	0	0	14	1	0	1	27	0	0	49	
7:15 AM	5	0	1	0	0	0	0	0	0	14	1	0	0	55	0	0	76	
7:20 AM	6	0	0	0	0	0	0	0	0	17	0	0	0	51	0	0	74	
7:25 AM	4	0	0	0	0	0	0	0	0	17	1	0	1	57	0	0	80	
7:30 AM	6	0	0	0	0	0	0	0	0	17	0	0	0	54	0	0	77	
7:35 AM	2	0	1	0	0	0	0	0	0	15	0	0	0	73	0	0	91	
7:40 AM	2	0	1	0	0	0	0	0	0	27	1	0	0	57	0	0	88	
7:45 AM	3	0	0	0	0	0	0	0	0	20	3	0	0	69	0	0	95	
7:50 AM	4	0	0	0	0	0	0	0	0	26	1	0	0	59	0	0	90	
7:55 AM	4	0	1	0	0	0	0	0	0	30	1	0	0	56	0	0	92	912
8:00 AM	0	0	1	0	0	0	0	0	0	37	0	0	1	61	0	0	100	967
8:05 AM	3	0	0	0	0	0	0	0	0	35	2	0	0	76	0	0	116	1028
8:10 AM	6	0	2	0	0	0	0	0	0	37	2	0	1	68	0	0	116	1095
8:15 AM	5	0	1	0	0	0	0	0	0	37	2	0	2	66	0	0	113	1132
8:20 AM	2	0	1	0	0	0	0	0	0	31	2	0	1	66	0	0	103	1161
8:25 AM	2	0	0	0	0	0	0	0	1	18	1	0	0	56	0	0	78	1159
8:30 AM	1	0	0	0	0	0	0	0	1	25	2	0	0	48	0	0	77	1159
8:35 AM	3	0	0	0	0	0	0	0	0	26	0	0	0	64	0	0	93	1161
8:40 AM	2	0	0	0	0	0	0	0	0	17	1	0	0	42	0	0	62	1135
8:45 AM	3	0	1	0	0	0	0	0	0	13	1	0	0	43	0	0	61	1101
8:50 AM	1	0	1	0	0	0	0	0	0	26	1	0	0	39	0	0	68	1079
8:55 AM	4	0	0	0	0	0	0	0	0	23	1	0	0	35	0	0	63	1050
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	56	0	12	0	0	0	0	0	0	436	24	0	12	840	0	0	1380	
Heavy Trucks	0	0	0	0	0	0	0	0	0	16	4	0	0	36	0	0	56	
Pedestrians						8				0				0			8	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																	0	
Stopped Buses																		

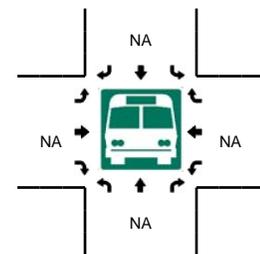
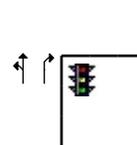
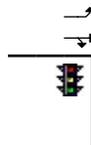
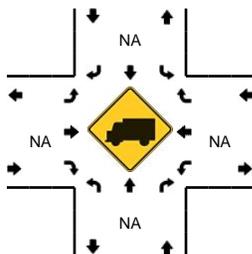
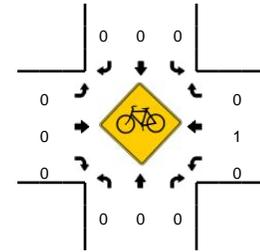
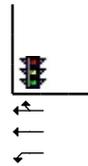
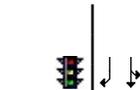
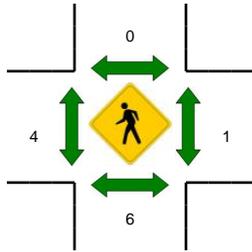
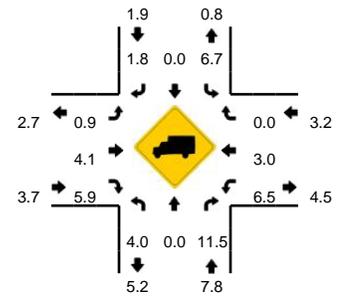
Comments:

LOCATION: SW Nyberg Ln -- SW Nyberg St/SW 65th Ave
CITY/STATE: Tualatin, OR

QC JOB #: 13173413
DATE: Thu, Jan 08 2015



Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

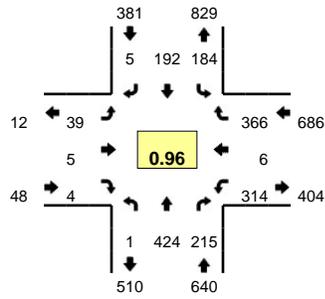


5-Min Count Period Beginning At	SW Nyberg Ln (Northbound)				SW Nyberg Ln (Southbound)				SW Nyberg St/SW 65th Ave (Eastbound)				SW Nyberg St/SW 65th Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	0	1	0	1	0	24	0	1	19	1	0	6	42	1	0	101	
7:05 AM	3	0	3	0	0	0	16	0	2	30	2	0	5	59	2	0	122	
7:10 AM	4	0	3	0	0	0	23	0	3	25	1	0	4	43	0	0	106	
7:15 AM	2	0	1	0	1	1	20	0	3	17	0	0	7	64	2	0	118	
7:20 AM	3	1	1	0	2	0	23	0	3	39	1	0	2	62	0	0	137	
7:25 AM	2	0	2	0	1	0	22	0	4	32	1	0	3	53	1	0	121	
7:30 AM	0	0	3	0	3	0	28	0	8	38	1	0	3	62	0	0	146	
7:35 AM	3	0	2	0	2	2	24	0	2	36	2	0	4	69	1	0	147	
7:40 AM	3	0	2	0	1	3	24	0	13	55	4	0	6	66	2	0	179	
7:45 AM	5	0	6	0	2	1	25	0	9	50	1	0	6	74	0	0	179	
7:50 AM	1	0	1	0	1	0	32	0	8	53	2	0	2	77	1	0	178	
7:55 AM	1	0	1	0	2	1	27	0	19	60	0	0	3	66	2	0	182	1716
8:00 AM	2	0	2	0	2	2	20	0	5	35	1	0	3	57	0	0	129	1744
8:05 AM	1	0	3	0	0	2	26	0	10	74	2	0	2	50	2	0	172	1794
8:10 AM	2	0	1	0	0	1	20	0	14	48	0	0	6	75	1	0	168	1856
8:15 AM	3	0	2	0	1	1	21	0	8	32	0	0	6	69	1	0	144	1882
8:20 AM	2	0	2	0	0	0	18	0	6	62	2	0	0	68	2	0	162	1907
8:25 AM	2	0	1	0	1	1	15	0	9	60	2	0	5	60	2	0	158	1944
8:30 AM	3	1	1	0	0	0	25	0	6	46	1	0	1	46	1	0	131	1929
8:35 AM	3	1	2	0	0	1	13	0	4	59	3	0	3	69	0	0	158	1940
8:40 AM	2	1	2	0	0	0	18	0	9	43	0	0	2	62	2	0	141	1902
8:45 AM	0	0	1	0	3	0	12	0	10	43	0	0	2	51	0	0	122	1845
8:50 AM	3	0	3	0	2	1	12	0	10	55	0	0	3	59	3	0	151	1818
8:55 AM	0	0	0	0	4	1	17	0	12	47	1	0	3	49	0	0	134	1770
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	28	0	32	0	20	8	336	0	144	652	12	0	44	868	12	0	2156	
Heavy Trucks	0	0	4	0	4	0	0	0	4	28	0	0	12	36	0	0	88	
Pedestrians		8				0				8				0			16	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																	0	
Stopped Buses																		

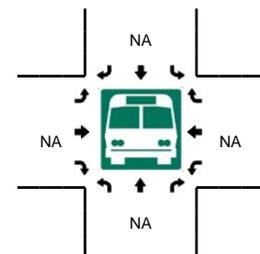
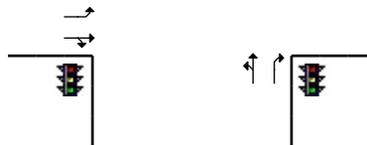
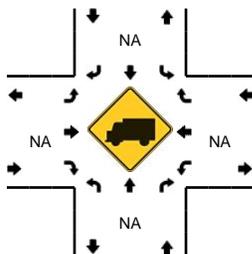
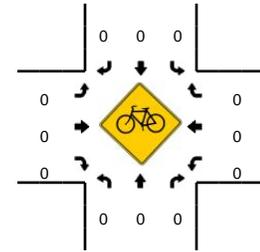
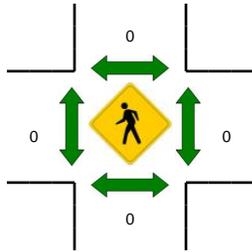
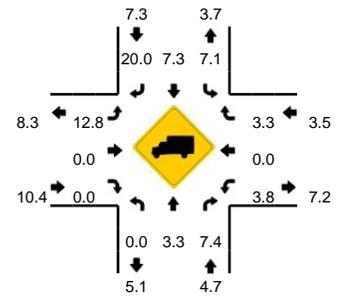
Comments:

LOCATION: SW 65th Ave -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13173415
DATE: Thu, Jan 08 2015



Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 8:10 AM -- 8:25 AM

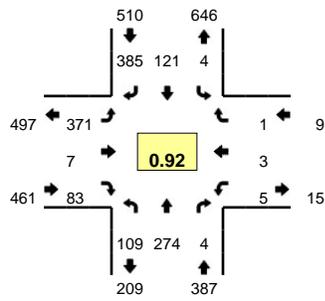


5-Min Count Period Beginning At	SW 65th Ave (Northbound)				SW 65th Ave (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	35	4	0	2	12	0	0	0	0	0	0	13	0	23	0	89	
7:05 AM	0	26	4	0	6	11	1	0	1	0	3	0	18	0	29	0	99	
7:10 AM	0	36	11	0	6	14	0	0	0	0	0	0	7	0	19	0	93	
7:15 AM	0	38	6	0	9	10	0	0	1	0	2	0	22	1	29	0	118	
7:20 AM	0	24	8	0	7	14	0	0	1	2	2	0	24	0	33	0	115	
7:25 AM	0	38	12	0	8	11	1	0	0	0	0	0	28	2	27	0	127	
7:30 AM	0	28	6	0	15	21	0	0	1	0	0	0	22	0	33	0	126	
7:35 AM	0	30	11	0	12	15	0	0	16	1	3	0	39	1	36	0	164	
7:40 AM	1	39	14	0	13	17	0	0	1	0	0	0	19	1	28	0	133	
7:45 AM	0	33	13	0	22	22	0	0	4	0	0	0	29	1	32	0	156	
7:50 AM	0	45	12	0	9	4	1	0	5	0	1	0	29	1	24	0	131	
7:55 AM	0	37	29	0	24	21	0	0	0	2	0	0	13	0	35	0	161	1512
8:00 AM	0	33	27	0	9	13	1	0	0	1	0	0	25	2	26	0	137	1560
8:05 AM	0	24	23	0	26	15	0	0	4	0	0	0	22	0	30	0	144	1605
8:10 AM	0	46	27	0	17	17	1	0	3	1	0	0	22	0	38	0	172	1684
8:15 AM	0	36	16	0	11	10	0	0	0	0	0	0	38	0	25	0	136	1702
8:20 AM	0	34	22	0	13	16	2	0	5	0	0	0	27	0	32	0	151	1738
8:25 AM	0	39	15	0	13	21	0	0	0	0	0	0	29	0	27	0	144	1755
8:30 AM	0	29	17	0	22	14	0	0	0	0	0	0	15	0	30	0	127	1756
8:35 AM	0	28	16	0	15	14	2	0	1	0	0	0	15	2	42	0	135	1727
8:40 AM	0	24	10	0	17	14	2	0	3	0	0	0	14	0	28	0	112	1706
8:45 AM	0	21	10	0	4	13	0	0	0	0	1	0	11	0	30	0	90	1640
8:50 AM	0	40	12	0	23	11	2	0	1	1	2	0	6	2	24	0	124	1633
8:55 AM	0	19	15	0	15	11	0	0	1	0	1	0	11	2	26	0	101	1573
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	464	260	0	164	172	12	0	32	4	0	0	348	0	380	0	1836	
Heavy Trucks	0	16	12		4	16	4		4	0	0		12	0	16		84	
Pedestrians		0				0				0				0				0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		0
Stopped Buses																		0

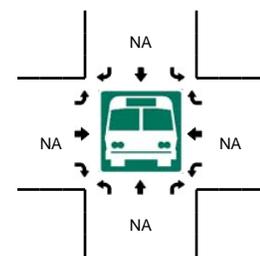
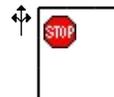
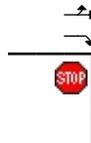
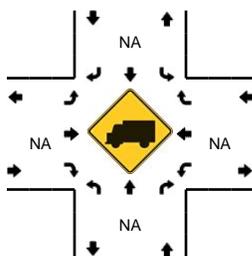
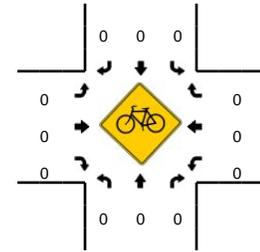
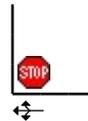
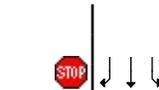
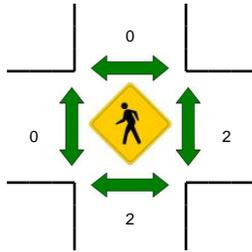
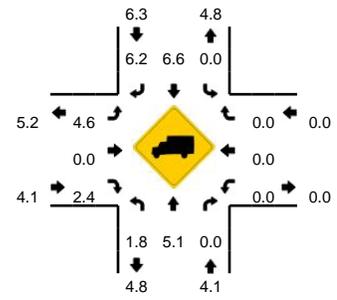
Comments:

LOCATION: SW 65th Ave -- SW Sagert St
CITY/STATE: Tualatin, OR

QC JOB #: 13173417
DATE: Thu, Jan 08 2015



Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 8:10 AM -- 8:25 AM

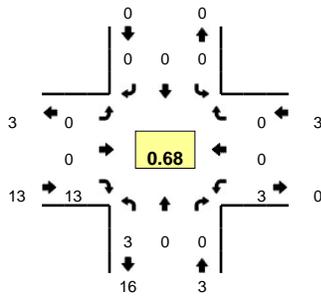


5-Min Count Period Beginning At	SW 65th Ave (Northbound)				SW 65th Ave (Southbound)				SW Sagert St (Eastbound)				SW Sagert St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U														
7:00 AM	2	15	0	0	0	2	21	0	27	0	2	0	0	0	0	0	69	
7:05 AM	5	16	0	0	0	2	26	0	16	0	4	0	0	0	0	0	69	
7:10 AM	6	25	0	0	0	8	14	0	22	0	2	0	0	0	0	0	77	
7:15 AM	5	23	0	0	0	9	25	0	22	1	3	0	0	0	0	0	88	
7:20 AM	5	14	0	0	1	11	25	0	22	0	4	0	0	0	0	0	82	
7:25 AM	6	24	0	0	1	9	26	0	25	0	4	0	0	0	0	0	95	
7:30 AM	10	23	2	0	0	14	29	0	15	0	6	0	0	0	0	0	99	
7:35 AM	5	18	0	0	1	9	37	0	24	0	4	0	2	0	0	0	100	
7:40 AM	14	27	1	0	0	15	25	0	22	1	5	0	1	0	0	0	111	
7:45 AM	8	28	0	0	1	17	32	0	27	1	8	0	0	0	0	0	122	
7:50 AM	6	27	1	0	1	5	32	0	31	0	6	0	0	0	0	0	109	
7:55 AM	7	25	0	0	0	10	30	0	33	2	5	0	0	0	0	0	112	1133
8:00 AM	18	23	0	0	0	7	29	0	38	1	10	0	0	0	0	0	126	1190
8:05 AM	5	18	0	0	0	13	26	0	33	0	6	0	0	1	0	0	102	1223
8:10 AM	10	25	0	0	1	8	28	0	35	0	8	0	0	1	0	0	116	1262
8:15 AM	11	21	0	0	0	7	34	0	38	1	10	0	2	1	0	0	125	1299
8:20 AM	11	16	0	0	0	6	40	0	44	0	11	0	0	0	1	0	129	1346
8:25 AM	4	23	0	0	0	10	43	0	31	1	4	0	0	0	0	0	116	1367
8:30 AM	9	11	0	0	1	7	22	0	30	0	10	0	0	0	0	0	90	1358
8:35 AM	4	21	0	0	0	5	25	0	32	0	4	0	0	0	0	0	91	1349
8:40 AM	7	13	0	0	2	3	18	0	13	0	3	0	0	0	0	0	59	1297
8:45 AM	7	18	0	0	0	7	20	0	20	0	3	0	0	0	0	0	75	1250
8:50 AM	3	18	0	0	1	4	14	0	33	0	1	0	0	0	0	0	74	1215
8:55 AM	7	17	0	0	0	5	17	0	15	0	2	0	0	0	0	0	63	1166
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U														
All Vehicles	128	248	0	0	4	84	408	0	468	4	116	0	8	8	4	0	1480	
Heavy Trucks	0	8	0	0	0	4	28	0	8	0	4	0	0	0	0	0	52	
Pedestrians		8				0				0				8			16	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

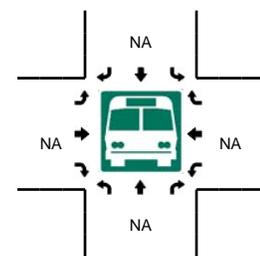
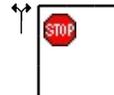
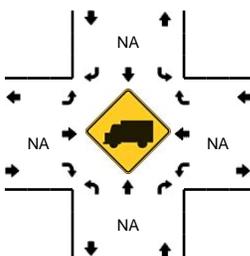
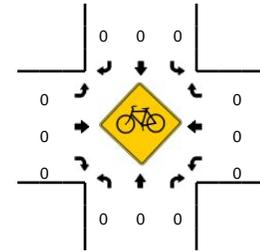
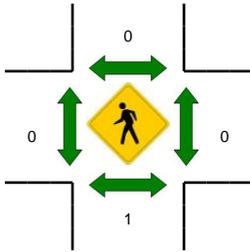
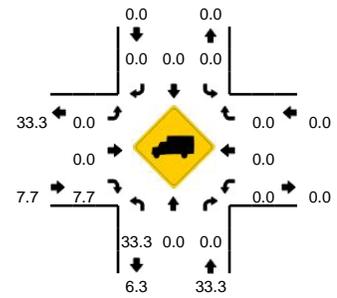
Comments:

LOCATION: East Site Dwy -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13173401
DATE: Thu, Jan 08 2015



Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

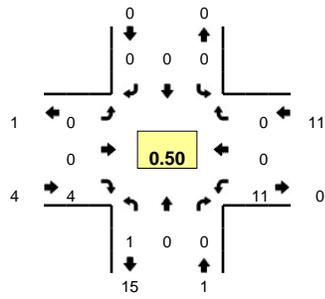


5-Min Count Period Beginning At	East Site Dwy (Northbound)				East Site Dwy (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:05 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	
7:10 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:25 AM	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	4	
7:30 AM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:40 AM	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	
7:45 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
7:50 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	
7:55 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	
8:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
8:05 AM	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	
8:20 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
8:25 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
8:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	
8:35 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	
8:40 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	
8:45 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
8:50 AM	0	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0	4	
8:55 AM	1	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	4	
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	4	0	0	0	0	0	0	0	0	0	24	0	0	0	0	0	28	
Heavy Trucks	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

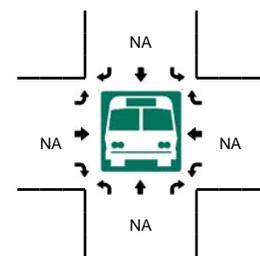
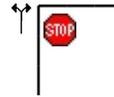
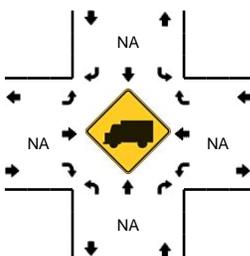
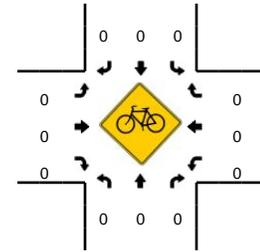
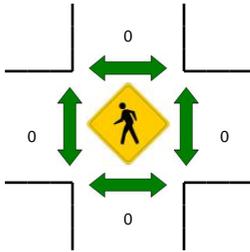
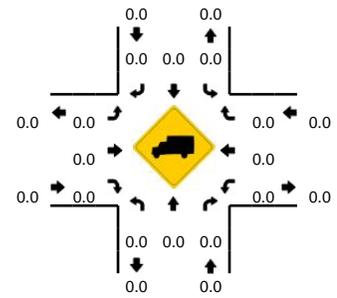
Comments:

LOCATION: Middle Site Dwy -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13173403
DATE: Thu, Jan 08 2015



Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 8:05 AM -- 8:20 AM

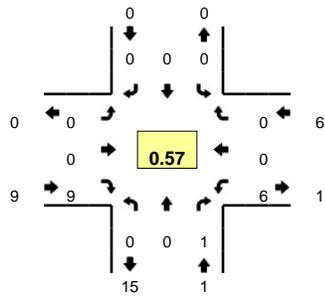


5-Min Count Period Beginning At	Middle Site Dwy (Northbound)				Middle Site Dwy (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2	
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:25 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:05 AM	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	3	
8:10 AM	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
8:25 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
8:30 AM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	
8:35 AM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	4	0	0	0	0	0	0	0	0	0	8	0	20	0	0	0	32	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Railroad																		
Stopped Buses																		

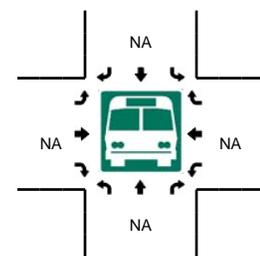
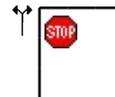
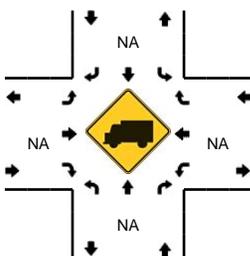
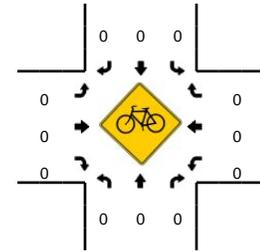
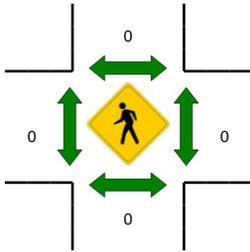
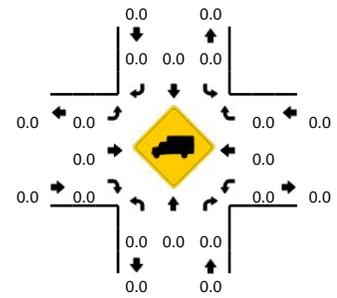
Comments:

LOCATION: West Site Dwy -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13173405
DATE: Thu, Jan 08 2015



Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

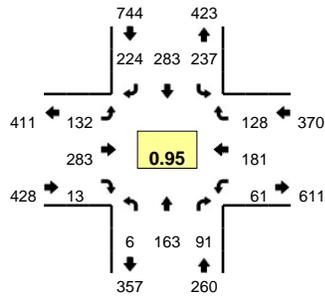


5-Min Count Period Beginning At	West Site Dwy (Northbound)				West Site Dwy (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	5	
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:10 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2	
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:50 AM	1	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	5	
8:55 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	0	0	0	0	0	0	0	16	0	12	0	0	0	28
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

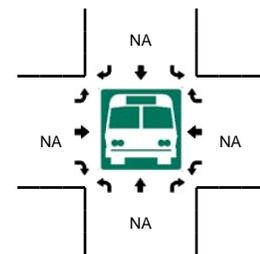
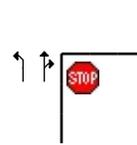
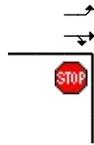
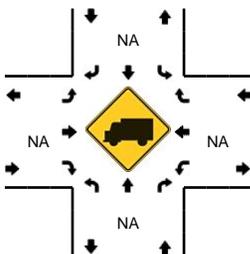
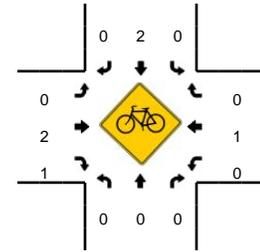
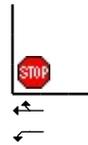
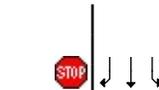
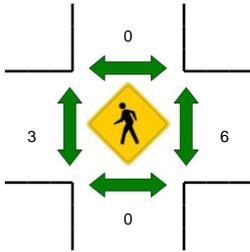
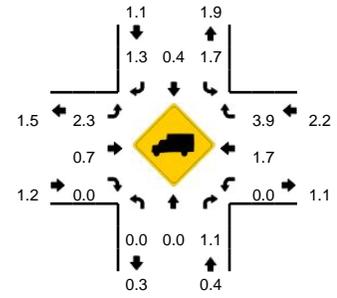
Comments:

LOCATION: SW Martinazzi Ave -- SW Sagert St
CITY/STATE: Tualatin, OR

QC JOB #: 13173408
DATE: Thu, Jan 08 2015



Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

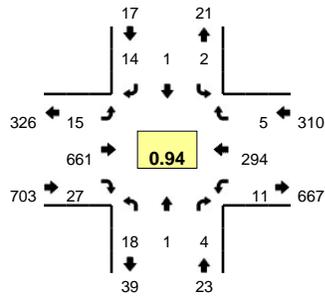


5-Min Count Period Beginning At	SW Martinazzi Ave (Northbound)				SW Martinazzi Ave (Southbound)				SW Sagert St (Eastbound)				SW Sagert St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	15	4	0	14	17	24	0	14	18	2	0	5	12	10	0	136	
4:05 PM	2	11	6	0	16	16	7	0	9	21	0	0	5	13	7	0	113	
4:10 PM	1	22	5	0	27	22	18	0	13	23	1	0	1	12	11	0	156	
4:15 PM	1	6	8	0	22	23	16	0	9	24	0	0	3	14	12	0	138	
4:20 PM	0	18	7	0	16	15	16	0	12	28	0	0	9	12	13	0	146	
4:25 PM	0	11	5	0	15	25	16	0	6	23	0	0	7	15	11	0	134	
4:30 PM	0	8	1	0	15	21	21	0	8	22	1	0	5	13	16	0	131	
4:35 PM	0	17	8	0	12	18	16	0	13	20	0	0	6	19	8	0	137	
4:40 PM	0	15	8	0	16	21	21	0	14	35	0	0	2	11	17	0	160	
4:45 PM	1	18	4	0	15	21	15	0	11	28	2	0	4	9	16	0	144	
4:50 PM	1	10	12	0	17	17	19	0	12	24	3	0	2	12	10	0	139	
4:55 PM	0	12	7	0	21	26	20	0	11	22	1	0	5	16	10	0	151	1685
5:00 PM	1	12	11	0	25	22	20	0	7	21	0	0	6	20	10	0	155	1704
5:05 PM	0	12	8	0	25	27	23	0	8	20	1	0	8	14	8	0	154	1745
5:10 PM	0	14	6	0	25	24	15	0	12	31	1	0	4	17	14	0	163	1752
5:15 PM	0	13	5	0	21	24	18	0	12	27	2	0	7	16	10	0	155	1769
5:20 PM	1	15	6	0	21	24	23	0	12	17	1	0	8	15	12	0	155	1778
5:25 PM	1	11	9	0	18	33	16	0	8	21	1	0	5	17	7	0	147	1791
5:30 PM	1	14	7	0	21	26	18	0	12	17	1	0	4	15	6	0	142	1802
5:35 PM	0	7	5	0	19	28	19	0	5	20	1	0	2	13	8	0	127	1792
5:40 PM	0	13	6	0	21	27	24	0	11	14	0	0	5	11	10	0	142	1774
5:45 PM	0	16	7	0	18	20	21	0	12	14	1	0	3	12	13	0	137	1767
5:50 PM	0	12	5	0	17	20	18	0	9	15	0	0	3	13	5	0	117	1745
5:55 PM	0	11	9	0	17	26	18	0	12	18	0	0	4	12	10	0	137	1731
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	4	168	68	0	268	288	224	0	144	300	16	0	76	192	144	0	1892	
Heavy Trucks	0	0	0	0	4	0	4	0	0	0	0	0	0	8	0	0	16	
Pedestrians	0	0	0	0	0	0	0	0	0	4	0	0	0	12	0	0	16	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

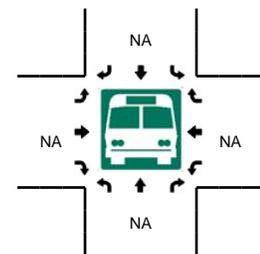
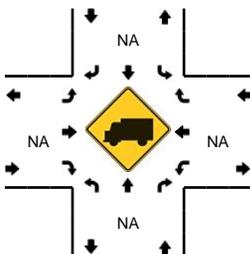
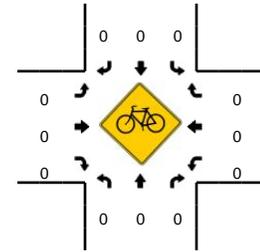
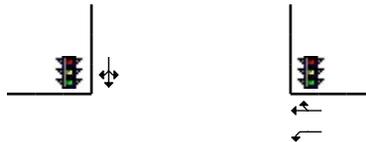
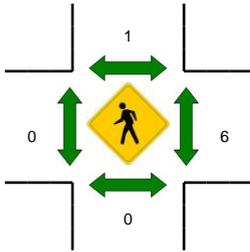
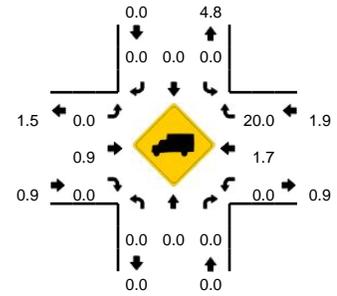
Comments:

LOCATION: SW 56th Ter -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13173410
DATE: Thu, Jan 08 2015



Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 4:50 PM -- 5:05 PM

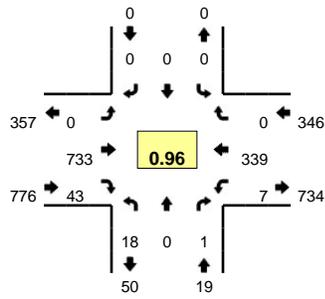


5-Min Count Period Beginning At	SW 56th Ter (Northbound)				SW 56th Ter (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	2	0	1	47	1	0	2	38	0	0	91	
4:05 PM	1	0	0	0	0	0	2	0	0	45	1	0	2	33	0	0	84	
4:10 PM	2	0	1	0	0	0	1	0	0	59	1	0	0	29	0	0	93	
4:15 PM	2	0	0	0	0	0	0	0	0	49	3	0	1	18	0	0	73	
4:20 PM	5	0	1	0	0	0	0	0	1	45	1	0	0	22	0	0	75	
4:25 PM	0	0	1	0	0	0	0	0	0	69	3	0	1	30	0	0	104	
4:30 PM	0	0	0	0	0	0	2	0	1	56	2	0	0	21	0	0	82	
4:35 PM	3	0	0	0	0	0	0	0	0	48	3	0	0	26	0	0	80	
4:40 PM	1	0	1	0	1	0	4	0	1	57	2	0	4	20	0	0	91	
4:45 PM	4	0	0	0	0	0	1	0	1	52	1	0	1	27	0	0	87	
4:50 PM	1	0	0	0	0	0	3	0	3	55	3	0	0	19	1	0	85	
4:55 PM	1	0	0	0	0	0	1	0	4	61	5	0	1	20	0	0	93	1038
5:00 PM	0	1	0	0	0	0	1	0	3	59	1	0	1	37	0	0	103	1050
5:05 PM	2	0	0	0	0	0	2	0	2	56	0	0	1	21	0	0	84	1050
5:10 PM	0	0	0	0	1	0	0	0	1	50	5	0	2	24	0	0	83	1040
5:15 PM	1	0	0	0	0	0	1	0	0	55	3	0	1	27	1	0	89	1056
5:20 PM	1	0	0	0	0	0	1	0	0	55	1	0	0	24	1	0	83	1064
5:25 PM	2	0	1	0	0	0	0	0	0	49	2	0	0	21	1	0	76	1036
5:30 PM	2	0	2	0	0	1	0	0	0	64	1	0	0	28	1	0	99	1053
5:35 PM	3	0	0	0	0	0	1	0	1	53	2	0	0	23	0	0	83	1056
5:40 PM	2	0	0	0	1	0	0	0	2	48	2	0	0	25	0	0	80	1045
5:45 PM	0	0	0	0	0	0	0	0	1	43	3	0	0	27	0	0	74	1032
5:50 PM	2	0	2	0	0	0	1	0	2	54	0	0	0	37	1	0	99	1046
5:55 PM	1	1	0	0	0	0	0	0	9	52	2	0	3	18	0	0	86	1039
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	8	4	0	0	0	0	20	0	40	700	36	0	8	304	4	0	1124	
Heavy Trucks	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4	
Pedestrians	0	0	0	0	0	4	0	0	0	0	0	0	0	16	0	0	20	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

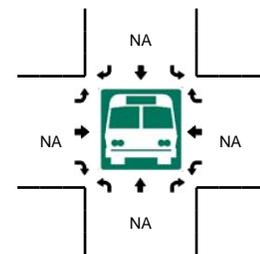
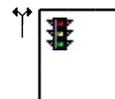
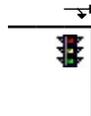
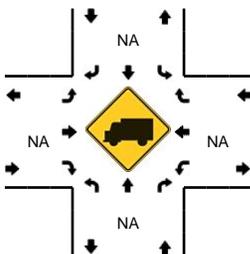
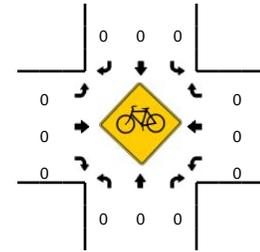
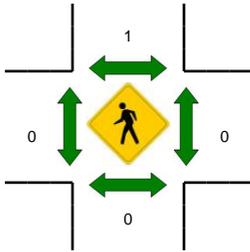
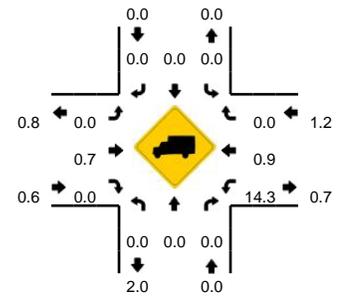
Comments:

LOCATION: SW 60th Ave -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13173412
DATE: Thu, Jan 08 2015



Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 4:50 PM -- 5:05 PM

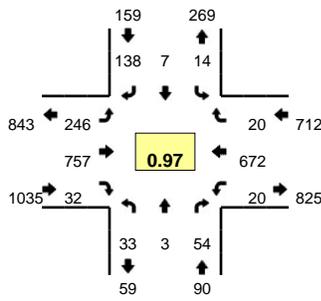


5-Min Count Period Beginning At	SW 60th Ave (Northbound)				SW 60th Ave (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	0	1	0	0	0	0	0	0	51	1	0	2	36	0	0	93	
4:05 PM	3	0	0	0	0	0	0	0	0	51	1	0	1	36	0	0	92	
4:10 PM	0	0	0	0	0	0	0	0	0	64	2	0	0	33	0	0	99	
4:15 PM	3	0	0	0	0	0	0	0	0	57	3	0	0	21	0	0	84	
4:20 PM	2	0	0	0	0	0	0	0	0	50	5	0	0	28	0	0	85	
4:25 PM	4	0	1	0	0	0	0	0	0	75	3	0	0	26	0	0	109	
4:30 PM	1	0	0	0	0	0	0	0	0	55	4	0	0	29	0	0	89	
4:35 PM	0	0	0	0	0	0	0	0	0	59	4	0	2	30	0	0	95	
4:40 PM	1	0	1	0	0	0	0	0	0	56	3	0	0	27	0	0	88	
4:45 PM	1	0	0	0	0	0	0	0	0	57	3	0	1	31	0	0	93	
4:50 PM	1	0	0	0	0	0	0	0	0	67	4	0	0	22	0	0	94	
4:55 PM	2	0	0	0	0	0	0	0	0	77	3	0	0	27	0	0	109	1130
5:00 PM	0	0	0	0	0	0	0	0	0	60	2	0	2	30	0	0	94	1131
5:05 PM	3	0	0	0	0	0	0	0	0	60	3	0	0	28	0	0	94	1133
5:10 PM	3	0	0	0	0	0	0	0	0	58	9	0	0	26	0	0	96	1130
5:15 PM	1	0	0	0	0	0	0	0	0	62	3	0	0	30	0	0	96	1142
5:20 PM	1	0	0	0	0	0	0	0	0	57	1	0	0	23	0	0	82	1139
5:25 PM	1	0	0	0	0	0	0	0	0	51	1	0	1	33	0	0	87	1117
5:30 PM	4	0	0	0	0	0	0	0	0	69	7	0	1	32	0	0	113	1141
5:35 PM	3	0	0	0	0	0	0	0	0	51	4	0	0	25	0	0	83	1129
5:40 PM	4	0	0	0	0	0	0	0	0	50	3	0	0	28	0	0	85	1126
5:45 PM	0	0	0	0	0	0	0	0	0	48	3	0	0	23	0	0	74	1107
5:50 PM	3	0	1	0	0	0	0	0	0	61	3	0	0	38	0	0	106	1119
5:55 PM	4	0	0	0	0	0	0	0	0	63	4	0	0	23	0	0	94	1104
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	12	0	0	0	0	0	0	0	0	816	36	0	8	316	0	0	1188	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

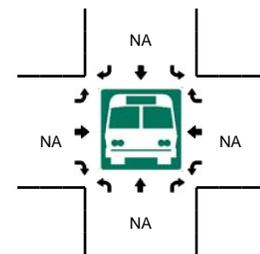
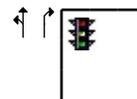
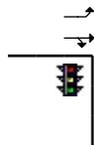
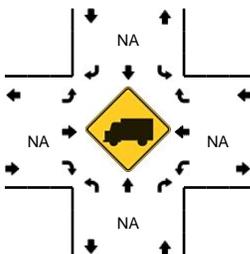
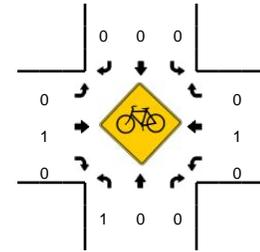
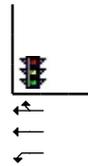
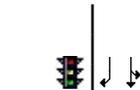
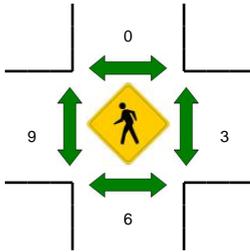
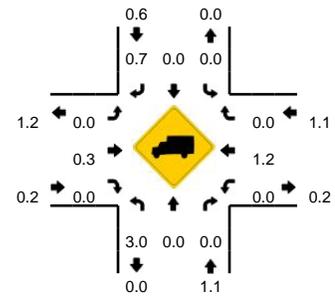
Comments:

LOCATION: SW Nyberg Ln -- SW Nyberg St/SW 65th Ave
CITY/STATE: Tualatin, OR

QC JOB #: 13173414
DATE: Thu, Jan 08 2015



Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:20 PM -- 5:35 PM

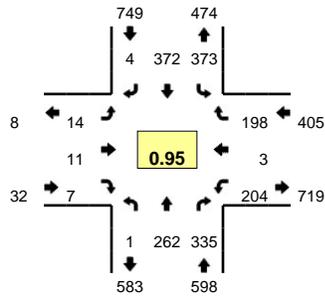


5-Min Count Period Beginning At	SW Nyberg Ln (Northbound)				SW Nyberg Ln (Southbound)				SW Nyberg St/SW 65th Ave (Eastbound)				SW Nyberg St/SW 65th Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	0	5	0	0	1	17	0	21	51	2	0	3	50	1	0	152	
4:05 PM	2	1	5	0	0	0	11	0	21	48	1	0	1	62	0	0	152	
4:10 PM	3	0	3	0	1	1	14	0	14	63	2	0	3	61	3	0	168	
4:15 PM	2	1	1	0	2	1	10	0	15	43	1	0	0	75	0	0	151	
4:20 PM	0	1	1	0	0	0	15	0	19	62	3	0	1	67	1	0	170	
4:25 PM	0	1	5	0	2	1	11	0	22	65	2	0	3	55	2	0	169	
4:30 PM	1	2	2	0	2	1	15	0	22	61	3	0	2	33	3	0	147	
4:35 PM	0	0	6	0	3	0	3	0	20	64	1	0	2	79	1	0	179	
4:40 PM	4	0	3	0	2	0	11	0	16	39	1	0	2	67	3	0	148	
4:45 PM	1	0	0	0	0	0	20	0	18	61	5	0	1	56	1	0	163	
4:50 PM	2	1	3	0	1	2	16	0	15	70	3	0	0	49	2	0	164	
4:55 PM	3	0	5	0	2	1	16	0	24	65	4	0	0	46	1	0	167	1930
5:00 PM	1	1	7	0	2	0	12	0	21	55	2	0	3	61	2	0	167	1945
5:05 PM	3	1	6	0	0	1	11	0	21	64	3	0	4	56	0	0	170	1963
5:10 PM	2	0	5	0	0	0	7	0	21	66	4	0	1	55	1	0	162	1957
5:15 PM	4	0	10	0	1	1	14	0	18	70	2	0	0	41	0	0	161	1967
5:20 PM	5	0	2	0	2	0	7	0	24	67	1	0	3	50	1	0	162	1959
5:25 PM	4	0	2	0	0	1	10	0	21	64	5	0	2	60	8	0	177	1967
5:30 PM	4	0	5	0	1	1	11	0	27	72	1	0	2	52	0	0	176	1996
5:35 PM	2	1	6	0	1	0	7	0	37	65	2	0	4	51	0	0	176	1993
5:40 PM	2	0	3	0	1	0	16	0	23	38	3	0	2	37	3	0	128	1973
5:45 PM	1	1	2	0	1	0	3	0	27	64	1	0	2	42	6	0	150	1960
5:50 PM	1	1	4	0	2	1	11	0	23	71	0	0	3	47	0	0	164	1960
5:55 PM	1	0	7	0	2	0	15	0	23	67	1	0	2	44	2	0	164	1957
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	52	0	36	0	12	8	112	0	288	812	28	0	28	648	36	0	2060	
Heavy Trucks	4	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	12	
Pedestrians											8						8	
Bicycles														1			1	
Railroad																		
Stopped Buses																		

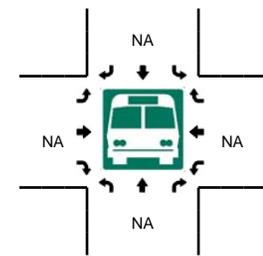
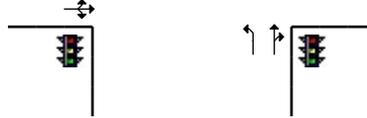
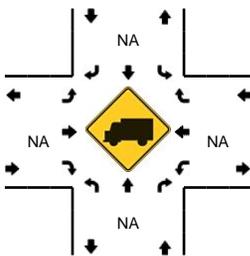
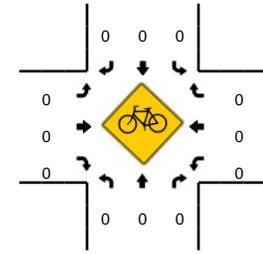
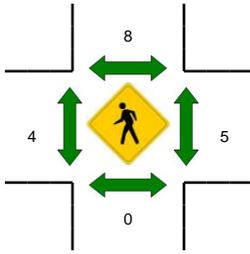
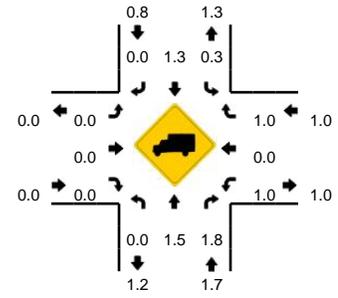
Comments:

LOCATION: SW 65th Ave -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13173416
DATE: Thu, Jan 08 2015



Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

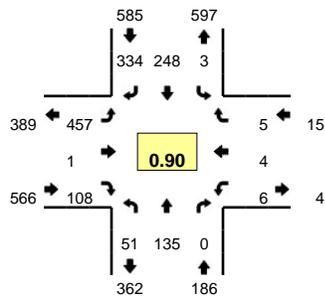


5-Min Count Period Beginning At	SW 65th Ave (Northbound)				SW 65th Ave (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	20	21	0	27	21	0	0	3	2	1	0	21	0	19	0	135	
4:05 PM	0	17	28	0	22	26	3	0	2	0	1	0	15	0	22	0	136	
4:10 PM	0	25	28	0	31	27	0	0	0	0	0	0	16	0	27	0	154	
4:15 PM	0	26	24	0	26	24	0	0	2	0	0	0	8	0	21	0	131	
4:20 PM	1	32	24	0	29	32	0	0	0	1	0	0	18	0	14	0	151	
4:25 PM	0	14	34	0	31	30	1	0	1	0	0	0	17	0	21	0	149	
4:30 PM	1	14	21	0	26	34	0	0	3	1	0	0	14	0	19	0	133	
4:35 PM	1	18	18	0	39	32	0	0	3	0	0	0	19	1	17	0	148	
4:40 PM	0	23	26	0	30	24	0	0	2	0	0	0	10	0	17	0	132	
4:45 PM	0	22	34	0	21	26	0	0	2	0	0	0	17	0	16	0	138	
4:50 PM	0	17	27	0	39	31	0	0	1	2	1	0	17	0	17	0	152	
4:55 PM	0	20	32	0	38	29	0	0	1	0	0	0	14	1	19	0	154	1713
5:00 PM	0	26	30	0	28	30	0	0	0	1	1	0	19	0	16	0	151	1729
5:05 PM	0	22	29	0	28	36	1	0	0	1	1	0	21	0	18	0	157	1750
5:10 PM	0	23	28	0	35	26	2	0	1	2	1	0	15	1	10	0	144	1740
5:15 PM	0	24	24	0	31	45	0	0	2	1	1	0	21	0	14	0	163	1772
5:20 PM	0	19	34	0	18	39	0	0	2	2	1	0	19	0	19	0	153	1774
5:25 PM	0	23	29	0	29	32	1	0	0	0	1	0	19	0	18	0	152	1777
5:30 PM	0	25	24	0	37	22	0	0	0	2	0	0	13	0	17	0	140	1784
5:35 PM	0	20	27	0	32	28	0	0	0	0	0	0	22	0	11	0	140	1776
5:40 PM	0	19	20	0	20	21	0	0	0	0	0	0	23	0	17	0	120	1764
5:45 PM	0	26	21	0	33	29	0	0	0	1	0	0	9	1	15	0	135	1761
5:50 PM	0	19	22	0	35	23	0	0	2	0	0	0	19	0	23	0	143	1752
5:55 PM	0	21	32	0	27	36	0	0	1	1	0	0	15	0	11	0	144	1742
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	264	348	0	312	464	4	0	16	12	12	0	236	0	204	0	1872	
Heavy Trucks	0	0	4	0	0	0	0	0	0	0	0	0	8	0	0	0	12	
Pedestrians	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

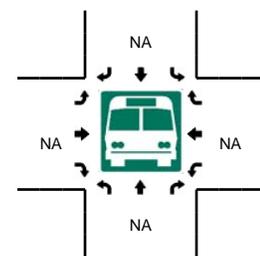
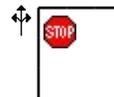
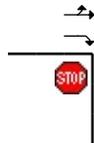
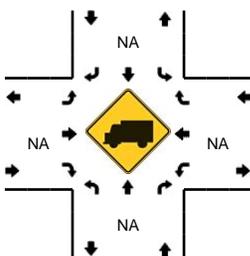
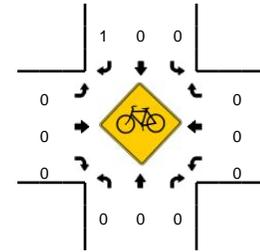
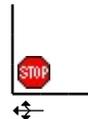
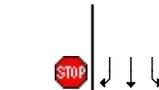
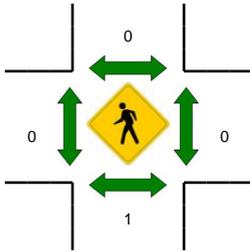
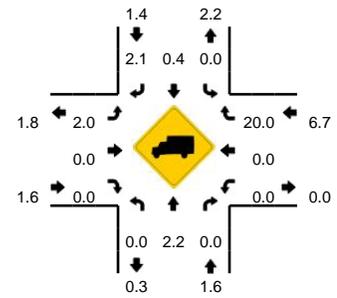
Comments:

LOCATION: SW 65th Ave -- SW Sagert St
CITY/STATE: Tualatin, OR

QC JOB #: 13173418
DATE: Thu, Jan 08 2015



Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

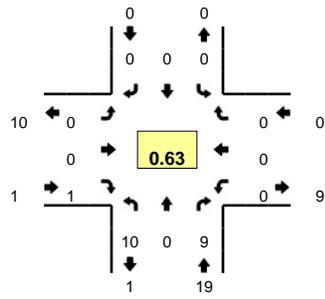


5-Min Count Period Beginning At	SW 65th Ave (Northbound)				SW 65th Ave (Southbound)				SW Sagert St (Eastbound)				SW Sagert St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U														
4:00 PM	3	10	0	0	0	15	27	0	31	1	9	0	0	0	0	0	96	
4:05 PM	2	7	0	0	0	23	23	0	38	0	6	0	1	1	2	0	103	
4:10 PM	1	12	0	0	0	21	21	0	41	0	14	0	0	0	0	0	110	
4:15 PM	5	14	0	0	1	15	17	0	33	0	8	0	0	0	0	0	93	
4:20 PM	2	19	0	0	0	18	31	0	39	1	7	0	0	2	1	0	120	
4:25 PM	2	8	0	0	1	14	34	0	35	0	4	0	0	1	0	0	99	
4:30 PM	4	8	0	0	0	22	28	0	32	0	7	0	0	0	1	0	102	
4:35 PM	6	7	0	0	0	16	33	0	27	0	6	0	0	0	2	0	97	
4:40 PM	9	14	0	0	1	12	20	0	37	0	8	0	1	0	0	0	102	
4:45 PM	5	8	0	0	0	21	24	0	41	0	6	0	1	0	0	0	106	
4:50 PM	4	13	0	0	0	19	29	0	32	0	11	0	0	0	0	0	108	
4:55 PM	5	14	0	0	0	22	21	0	41	0	7	0	0	1	0	0	111	1247
5:00 PM	2	12	0	0	0	19	31	0	41	0	7	0	0	0	1	0	113	1264
5:05 PM	6	11	0	0	0	30	28	0	41	0	12	0	0	1	1	0	130	1291
5:10 PM	2	10	0	0	1	20	21	0	40	0	16	0	0	0	0	0	110	1291
5:15 PM	5	13	0	0	1	23	40	0	36	1	9	0	4	1	1	0	134	1332
5:20 PM	1	8	0	0	0	31	34	0	42	0	9	0	0	1	0	0	126	1338
5:25 PM	4	13	0	0	0	20	27	0	45	0	7	0	0	0	0	0	116	1355
5:30 PM	2	12	0	0	0	15	26	0	34	0	10	0	0	0	0	0	99	1352
5:35 PM	3	5	0	0	0	18	30	0	35	0	7	0	0	0	0	0	98	1353
5:40 PM	6	11	0	0	0	20	25	0	32	0	6	0	0	0	0	0	100	1351
5:45 PM	3	16	0	0	0	13	25	0	34	0	7	0	0	0	0	0	98	1343
5:50 PM	2	11	0	0	0	12	28	0	31	0	8	0	0	0	0	0	92	1327
5:55 PM	1	8	1	0	0	19	33	0	40	0	7	0	1	0	1	0	111	1327
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U														
All Vehicles	40	136	0	0	4	296	404	0	492	4	100	0	16	8	4	0	1504	
Heavy Trucks	0	0	0	0	0	0	8	0	4	0	0	0	0	0	0	0	12	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																	0	
Stopped Buses																	0	

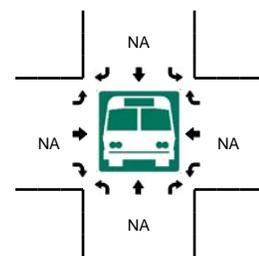
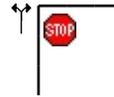
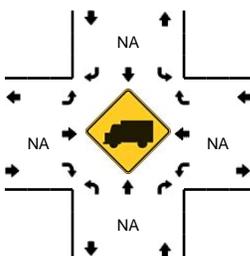
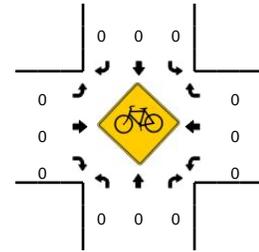
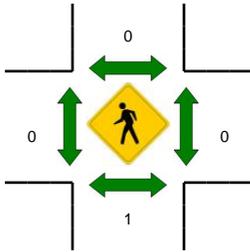
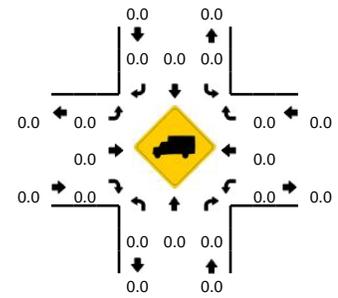
Comments:

LOCATION: East Site Dwy -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13173402
DATE: Thu, Jan 08 2015



Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

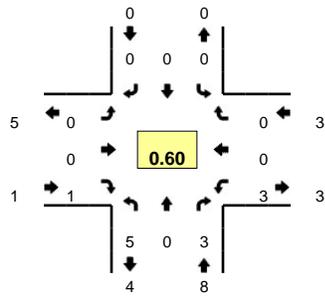


5-Min Count Period Beginning At	East Site Dwy (Northbound)				East Site Dwy (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:05 PM	1	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	4	
4:10 PM	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
4:15 PM	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4	
4:20 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
4:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:35 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
4:40 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:45 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
4:50 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
4:55 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	24
5:05 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	22
5:10 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	21
5:15 PM	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4	21
5:20 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	21
5:25 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	21
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
5:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	16
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
5:55 PM	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	15
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	16	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	32	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																	0	
Stopped Buses																	0	

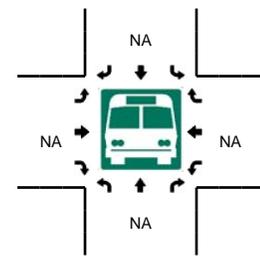
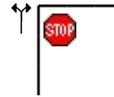
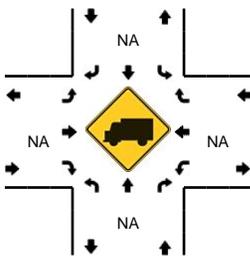
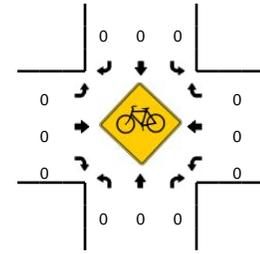
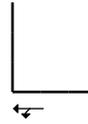
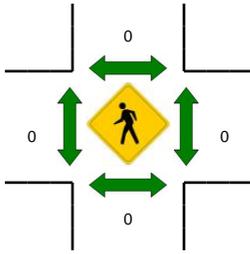
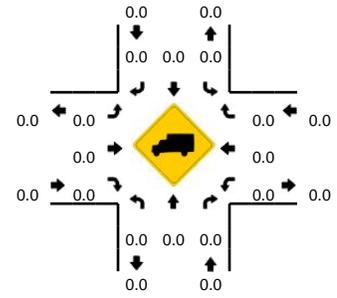
Comments:

LOCATION: Middle Site Dwy -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13173404
DATE: Thu, Jan 08 2015



Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 4:35 PM -- 4:50 PM

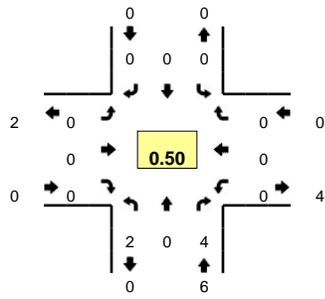


5-Min Count Period Beginning At	Middle Site Dwy (Northbound)				Middle Site Dwy (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
4:05 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
4:10 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:20 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:25 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
4:40 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:45 PM	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	3	
4:50 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:55 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2	
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:25 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
5:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:50 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	4	0	8	0	0	0	0	0	0	0	4	0	4	0	0	0	20	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

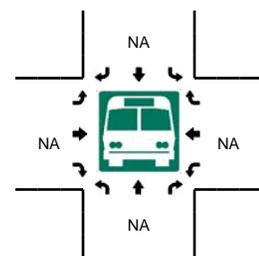
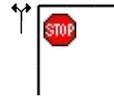
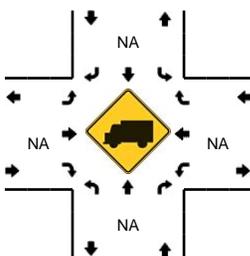
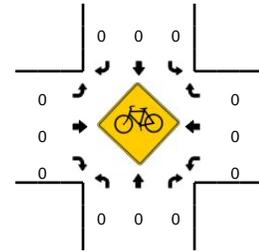
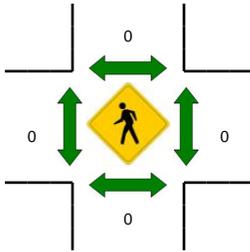
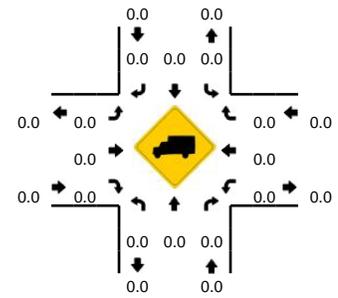
Comments:

LOCATION: West Site Dwy -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13173406
DATE: Thu, Jan 08 2015



Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:05 PM -- 5:20 PM



5-Min Count Period Beginning At	West Site Dwy (Northbound)				West Site Dwy (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
4:00 PM	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	
4:05 PM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	
4:10 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:15 PM	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4	
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:50 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	10
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
5:10 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8
5:15 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	4	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																			
Stopped Buses																			

Comments:

Appendix C
*2015 Existing Conditions
Worksheets*

Sagert Farms
1: SW Nyberg Ln & SW Nyberg St/SW 65th Ave

Existing AM Peak Hour
1/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	603	17	46	793	14	25	0	26	15	14	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.97	1.00
Satd. Flow (prot)	1787	1817		1686	3496			1727	1442		1786	1583
Flt Permitted	0.21	1.00		0.27	1.00			0.74	1.00		0.85	1.00
Satd. Flow (perm)	390	1817		478	3496			1337	1442		1550	1583
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)	123	670	19	51	881	16	28	0	29	17	16	311
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	24	0	0	53
Lane Group Flow (vph)	123	688	0	51	896	0	0	28	5	0	33	258
Confl. Peds. (#/hr)			6	6			4		1	1		4
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	4%	6%	7%	3%	0%	4%	0%	12%	7%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Prot	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8	8		4	4 5
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	41.3	33.6		32.3	29.1			11.3	11.3		11.3	25.0
Effective Green, g (s)	41.3	33.6		32.3	29.1			11.3	11.3		11.3	25.0
Actuated g/C Ratio	0.62	0.51		0.49	0.44			0.17	0.17		0.17	0.38
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.4	2.5		2.6	2.5			1.6	1.6		1.6	
Lane Grp Cap (vph)	406	923		292	1539			228	246		264	598
v/s Ratio Prot	0.04	c0.38		0.01	0.26				0.00			c0.16
v/s Ratio Perm	0.15			0.08				0.02			0.02	
v/c Ratio	0.30	0.75		0.17	0.58			0.12	0.02		0.12	0.43
Uniform Delay, d1	6.3	12.9		9.7	13.9			23.2	22.8		23.2	15.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	3.1		0.2	0.5			0.1	0.0		0.1	0.2
Delay (s)	6.6	16.0		9.9	14.4			23.3	22.8		23.3	15.5
Level of Service	A	B		A	B			C	C		C	B
Approach Delay (s)		14.6			14.1			23.0			16.2	
Approach LOS		B			B			C			B	

Intersection Summary

HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Sagert Farms
2: SW 65th Ave & SW Borland Rd

Existing AM Peak Hour
1/26/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	39	5	4	314	6	366	1	424	215	184	192	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		0%			0%			2%			6%		
Total Lost time (s)		6.1			5.8	5.8	5.3	5.3		5.3	5.3		
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00		
Flt		0.99			1.00	0.85	1.00	0.95		1.00	1.00		
Flt Protected		0.96			0.95	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)		1632			1743	1568	1787	1712		1636	1711		
Flt Permitted		0.96			0.95	1.00	0.63	1.00		0.13	1.00		
Satd. Flow (perm)		1632			1743	1568	1184	1712		226	1711		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	41	5	4	327	6	381	1	442	224	192	200	5	
RTOR Reduction (vph)	0	2	0	0	0	230	0	12	0	0	0	0	
Lane Group Flow (vph)	0	48	0	0	333	151	1	654	0	192	205	0	
Heavy Vehicles (%)	13%	0%	0%	4%	0%	3%	0%	3%	7%	7%	7%	20%	
Turn Type	Split	NA		Split	NA	pt+ov	pm+pt	NA		pm+pt	NA		
Protected Phases	8	8		4	4	4 5	1	6		5	2		
Permitted Phases							6			2			
Actuated Green, G (s)		5.9			20.9	40.1	54.6	53.8		78.3	72.2		
Effective Green, g (s)		5.9			20.9	40.1	54.6	53.8		78.3	72.2		
Actuated g/C Ratio		0.05			0.17	0.33	0.45	0.44		0.64	0.59		
Clearance Time (s)		6.1			5.8		5.3	5.3		5.3	5.3		
Vehicle Extension (s)		1.0			2.0		1.0	3.0		2.5	3.0		
Lane Grp Cap (vph)		78			297	514	532	753		366	1010		
v/s Ratio Prot		c0.03			c0.19	0.10	0.00	c0.38		c0.08	0.12		
v/s Ratio Perm							0.00			0.25			
v/c Ratio		0.62			1.12	0.29	0.00	0.87		0.52	0.20		
Uniform Delay, d1		57.1			50.7	30.6	18.7	31.1		18.0	11.7		
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2		9.8			88.9	0.1	0.0	10.4		1.0	0.1		
Delay (s)		66.9			139.6	30.7	18.7	41.5		19.1	11.8		
Level of Service		E			F	C	B	D		B	B		
Approach Delay (s)		66.9			81.5			41.5			15.3		
Approach LOS		E			F			D			B		
Intersection Summary													
HCM 2000 Control Delay			52.1									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.84										
Actuated Cycle Length (s)			122.3									Sum of lost time (s)	22.5
Intersection Capacity Utilization			79.3%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	
Volume (veh/h)	330	15	5	761	39	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	393	18	6	906	46	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	1220					
pX, platoon unblocked					0.72	
vC, conflicting volume			411		1320	402
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			411		1249	402
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		66	99
cM capacity (veh/h)			1159		138	653

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	411	6	906	56
Volume Left	0	6	0	46
Volume Right	18	0	0	10
cSH	1700	1159	1700	159
Volume to Capacity	0.24	0.01	0.53	0.35
Queue Length 95th (ft)	0	0	0	37
Control Delay (s)	0.0	8.1	0.0	39.4
Lane LOS		A		E
Approach Delay (s)	0.0	0.1		39.4
Approach LOS				E

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		50.1%	ICU Level of Service A
Analysis Period (min)		15	

Sagert Farms
5: SW 56th Ter & SW Borland Rd

Existing AM Peak Hour
1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	227	7	5	612	5	30	14	19	8	5	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.2			5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.97			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Frt	1.00	1.00		1.00	1.00			0.96			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1597	1804		1504	1842			1706			1613	
Flt Permitted	0.24	1.00		0.60	1.00			0.84			0.95	
Satd. Flow (perm)	410	1804		945	1842			1471			1537	
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)	85	255	8	6	688	6	34	16	21	9	6	49
RTOR Reduction (vph)	0	1	0	0	0	0	0	16	0	0	44	0
Lane Group Flow (vph)	85	262	0	6	694	0	0	55	0	0	20	0
Confl. Peds. (#/hr)	3						3		40	40		
Heavy Vehicles (%)	13%	5%	0%	20%	3%	0%	0%	0%	5%	0%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	55.9	49.8		44.4	43.5			7.6			7.6	
Effective Green, g (s)	55.9	49.8		44.4	43.5			7.6			7.6	
Actuated g/C Ratio	0.76	0.67		0.60	0.59			0.10			0.10	
Clearance Time (s)	5.2	5.2		5.2	5.2			5.2			5.2	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	425	1215		574	1084			151			158	
v/s Ratio Prot	c0.02	0.15		0.00	c0.38							
v/s Ratio Perm	0.13			0.01				c0.04			0.01	
v/c Ratio	0.20	0.22		0.01	0.64			0.36			0.13	
Uniform Delay, d1	5.1	4.6		5.9	10.0			30.9			30.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	0.1		0.0	1.5			1.5			0.4	
Delay (s)	5.4	4.7		5.9	11.5			32.4			30.5	
Level of Service	A	A		A	B			C			C	
Approach Delay (s)		4.9			11.4			32.4			30.5	
Approach LOS		A			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			11.8			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			73.9			Sum of lost time (s)		15.6				
Intersection Capacity Utilization			64.1%			ICU Level of Service		C				
Analysis Period (min)			15									
c Critical Lane Group												

Intersection												
Intersection Delay, s/veh	47.4											
Intersection LOS	E											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	239	208	8	0	41	205	176	0	8	331	88
Peak Hour Factor	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	3	2	25	2	2	4	2	2	0	2	7
Mvmt Flow	0	244	212	8	0	42	209	180	0	8	338	90
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	25.9	58.7	75.3
HCM LOS	D	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	79%	0%	96%	0%	54%	0%	100%	0%
Vol Right, %	0%	21%	0%	4%	0%	46%	0%	0%	100%
Sign Control	Stop	Stop	Stop						
Traffic Vol by Lane	8	419	239	216	41	381	90	62	67
LT Vol	8	0	239	0	41	0	90	0	0
Through Vol	0	331	0	208	0	205	0	62	0
RT Vol	0	88	0	8	0	176	0	0	67
Lane Flow Rate	8	428	244	220	42	389	92	63	68
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.022	1	0.651	0.555	0.112	0.953	0.27	0.178	0.179
Departure Headway (Hd)	9.891	9.251	9.609	9.07	9.605	8.822	10.593	10.126	9.44
Convergence, Y/N	Yes	Yes	Yes						
Cap	364	398	376	397	373	412	339	354	379
Service Time	7.591	6.951	7.378	6.84	7.365	6.581	8.381	7.913	7.228
HCM Lane V/C Ratio	0.022	1.075	0.649	0.554	0.113	0.944	0.271	0.178	0.179
HCM Control Delay	12.8	76.5	28.7	22.7	13.6	63.6	17.3	15.1	14.3
HCM Lane LOS	B	F	D	C	B	F	C	C	B
HCM 95th-tile Q	0.1	12.1	4.4	3.3	0.4	10.9	1.1	0.6	0.6

Intersection

Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	90	62	67
Peak Hour Factor	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	4	6	7
Mvmt Flow	0	92	63	68
Number of Lanes	0	1	1	1

Approach SB

Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	15.8
HCM LOS	C

Lane

Sagert Farms
7: SW 65th Ave & SW Sagert St

Existing AM Peak Hour
1/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations															
Sign Control		Stop			Stop			Stop			Stop				
Volume (vph)	365	7	89	5	3	1	109	274	4	4	121	385			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Hourly flow rate (vph)	397	8	97	5	3	1	118	298	4	4	132	418			
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2									
Volume Total (vph)	404	97	10	421	4	550									
Volume Left (vph)	397	0	5	118	4	0									
Volume Right (vph)	0	97	1	4	0	418									
Hadj (s)	0.57	-0.67	0.04	0.12	0.50	-0.43									
Departure Headway (s)	8.0	6.8	9.6	7.5	7.9	7.0									
Degree Utilization, x	0.90	0.18	0.03	0.88	0.01	1.0									
Capacity (veh/h)	437	521	352	463	442	519									
Control Delay (s)	49.1	10.1	12.8	44.6	9.8	84.2									
Approach Delay (s)	41.6		12.8	44.6	83.6										
Approach LOS	E		B	E	F										
Intersection Summary															
Delay			57.9												
Level of Service			F												
Intersection Capacity Utilization			88.0%				ICU Level of Service				E				
Analysis Period (min)			15												

Sagert Farms
1: SW Nyberg St & 65th Ave/Nyberg St

Existing PM Peak Hour
1/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	246	757	32	20	672	20	33	3	54	14	7	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (prot)	1787	1868		1752	3516			1802	1615		1749	1599
Flt Permitted	0.27	1.00		0.24	1.00			0.73	1.00		0.78	1.00
Satd. Flow (perm)	503	1868		433	3516			1369	1615		1409	1599
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)	265	814	34	22	723	22	35	3	58	15	8	148
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	52	0	0	88
Lane Group Flow (vph)	265	847	0	22	743	0	0	38	6	0	23	60
Confl. Peds. (#/hr)	1		5	5		1	7					7
Heavy Vehicles (%)	1%	1%	0%	3%	2%	7%	0%	0%	0%	8%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Prot	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8	8		4	4.5
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	44.4	36.6		30.4	28.6			6.3	6.3		6.3	22.1
Effective Green, g (s)	44.4	36.6		30.4	28.6			6.3	6.3		6.3	22.1
Actuated g/C Ratio	0.71	0.58		0.48	0.46			0.10	0.10		0.10	0.35
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.4	2.5		2.6	2.5			1.6	1.6		1.6	
Lane Grp Cap (vph)	556	1090		247	1603			137	162		141	563
v/s Ratio Prot	c0.07	c0.45		0.00	0.21				0.00			0.04
v/s Ratio Perm	0.26			0.04				c0.03			0.02	
v/c Ratio	0.48	0.78		0.09	0.46			0.28	0.04		0.16	0.11
Uniform Delay, d1	4.3	9.9		9.1	11.8			26.1	25.5		25.8	13.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	3.4		0.1	0.2			0.4	0.0		0.2	0.0
Delay (s)	4.7	13.3		9.3	11.9			26.5	25.5		26.0	13.7
Level of Service	A	B		A	B			C	C		C	B
Approach Delay (s)		11.3			11.8			25.9			15.3	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			12.5		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			62.7		Sum of lost time (s)			18.0				
Intersection Capacity Utilization			69.8%		ICU Level of Service			C				
Analysis Period (min)			15									
c Critical Lane Group												

Sagert Farms
2: SW 65th Ave & Borland Rd

Existing PM Peak Hour
1/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	11	7	204	3	198	1	262	335	373	374	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			6%	
Total Lost time (s)		6.1			5.8	5.8	5.3	5.3		5.3	5.3	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frb, ped/bikes		1.00			1.00	1.00	1.00	0.98		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.92		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1757			1770	1599	1787	1658		1734	1822	
Flt Permitted		0.98			0.95	1.00	0.53	1.00		0.14	1.00	
Satd. Flow (perm)		1757			1770	1599	996	1658		252	1822	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	15	11	7	212	3	206	1	273	349	389	390	4
RTOR Reduction (vph)	0	7	0	0	0	129	0	31	0	0	0	0
Lane Group Flow (vph)	0	26	0	0	215	77	1	591	0	389	394	0
Confl. Peds. (#/hr)	10					10			4	4		
Heavy Vehicles (%)	6%	0%	0%	2%	25%	1%	0%	2%	2%	1%	1%	0%
Turn Type	Split	NA		Split	NA	pt+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	8	8		4	4	4.5	1	6		5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		3.5			18.2	46.4	51.9	51.1		84.6	78.5	
Effective Green, g (s)		3.5			18.2	46.4	51.9	51.1		84.6	78.5	
Actuated g/C Ratio		0.03			0.15	0.38	0.42	0.41		0.69	0.64	
Clearance Time (s)		6.1			5.8		5.3	5.3		5.3	5.3	
Vehicle Extension (s)		1.0			2.0		1.0	3.0		2.5	3.0	
Lane Grp Cap (vph)		49			260	600	423	686		511	1158	
v/s Ratio Prot		c0.01			c0.12	0.05	0.00	c0.36		c0.17	0.22	
v/s Ratio Perm							0.00			0.35		
v/c Ratio		0.53			0.83	0.13	0.00	0.86		0.76	0.34	
Uniform Delay, d1		59.2			51.1	25.3	20.8	33.0		26.6	10.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.5			18.1	0.0	0.0	10.8		6.3	0.2	
Delay (s)		64.7			69.3	25.3	20.8	43.8		32.9	10.6	
Level of Service		E			E	C	C	D		C	B	
Approach Delay (s)		64.7			47.8			43.7			21.7	
Approach LOS		E			D			D			C	

Intersection Summary

HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	123.5	Sum of lost time (s)	22.5
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	
Volume (veh/h)	733	43	7	339	18	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	814	48	8	377	20	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	1220					
pX, platoon unblocked						
vC, conflicting volume			862		1231	838
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			862		1231	838
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		90	100
cM capacity (veh/h)			789		196	369
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	862	8	377	21		
Volume Left	0	8	0	20		
Volume Right	48	0	0	1		
cSH	1700	789	1700	201		
Volume to Capacity	0.51	0.01	0.22	0.11		
Queue Length 95th (ft)	0	1	0	9		
Control Delay (s)	0.0	9.6	0.0	25.0		
Lane LOS		A		D		
Approach Delay (s)	0.0	0.2		25.0		
Approach LOS				D		
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			51.2%	ICU Level of Service	A	
Analysis Period (min)			15			

Sagert Farms
5: SW 56th Terrace & Borland Rd

Existing PM Peak Hour
1/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	661	27	11	294	5	18	1	4	2	1	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.2			5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.98			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1797	1869		1805	1876			1641			1641	
Flt Permitted	0.56	1.00		0.31	1.00			0.86			0.96	
Satd. Flow (perm)	1067	1869		584	1876			1463			1577	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	718	29	12	320	5	20	1	4	2	1	15
RTOR Reduction (vph)	0	1	0	0	0	0	0	4	0	0	14	0
Lane Group Flow (vph)	16	746	0	12	325	0	0	21	0	0	4	0
Confl. Peds. (#/hr)	8		1	1		8	3		3	3		3
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	50%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	49.4	48.5		49.4	48.5			4.2			4.2	
Effective Green, g (s)	49.4	48.5		49.4	48.5			4.2			4.2	
Actuated g/C Ratio	0.71	0.70		0.71	0.70			0.06			0.06	
Clearance Time (s)	5.2	5.2		5.2	5.2			5.2			5.2	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	771	1309		432	1314			88			95	
v/s Ratio Prot	0.00	c0.40		c0.00	0.17							
v/s Ratio Perm	0.01			0.02				c0.01			0.00	
v/c Ratio	0.02	0.57		0.03	0.25			0.24			0.04	
Uniform Delay, d1	2.9	5.2		3.5	3.7			31.0			30.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.7		0.0	0.1			1.4			0.2	
Delay (s)	2.9	5.9		3.5	3.9			32.4			30.8	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		5.8			3.9			32.4			30.8	
Approach LOS		A			A			C			C	

Intersection Summary

HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	15.6
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection												
Intersection Delay, s/veh	52.7											
Intersection LOS	F											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	132	283	13	0	61	181	128	0	6	163	91
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	0	2	2	1	4	2	0	1	2
Mvmt Flow	0	139	298	14	0	64	191	135	0	6	172	96
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	56.7	73.3	52.5
HCM LOS	F	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	64%	0%	96%	0%	59%	0%	100%	0%
Vol Right, %	0%	36%	0%	4%	0%	41%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	6	254	132	296	61	309	237	283	224
LT Vol	6	0	132	0	61	0	237	0	0
Through Vol	0	163	0	283	0	181	0	283	0
RT Vol	0	91	0	13	0	128	0	0	224
Lane Flow Rate	6	267	139	312	64	325	249	298	236
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.021	0.845	0.445	0.951	0.213	1	0.751	0.853	0.632
Departure Headway (Hd)	12.1	11.373	11.518	10.988	11.938	11.092	10.844	10.311	9.647
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	299	324	317	333	304	332	337	357	380
Service Time	9.724	8.996	9.137	8.607	9.576	8.731	8.47	7.937	7.272
HCM Lane V/C Ratio	0.02	0.824	0.438	0.937	0.211	0.979	0.739	0.835	0.621
HCM Control Delay	15	53.4	23	71.8	17.8	84.2	39.8	50.7	27.3
HCM Lane LOS	B	F	C	F	C	F	E	F	D
HCM 95th-tile Q	0.1	7.4	2.2	9.9	0.8	11.1	5.8	7.9	4.2

Intersection

Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	237	283	224
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	0	2
Mvmt Flow	0	249	298	236
Number of Lanes	0	1	1	1

Approach SB

Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	40.2
HCM LOS	E

Lane

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	457	1	108	6	4	5	51	136	0	3	248	334
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
Hourly flow rate (vph)	486	1	115	6	4	5	54	145	0	3	264	355
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2						
Volume Total (vph)	487	115	16	199	3	619						
Volume Left (vph)	486	0	6	54	3	0						
Volume Right (vph)	0	115	5	0	0	355						
Hadj (s)	0.53	-0.68	-0.12	0.11	0.50	-0.38						
Departure Headway (s)	7.4	6.2	8.5	7.7	7.5	6.6						
Degree Utilization, x	1.0	0.20	0.04	0.43	0.01	1.0						
Capacity (veh/h)	487	570	404	460	469	546						
Control Delay (s)	69.2	9.6	11.8	16.4	9.4	107.4						
Approach Delay (s)	57.8		11.8	16.4	106.9							
Approach LOS	F		B	C	F							
Intersection Summary												
Delay			72.8									
Level of Service			F									
Intersection Capacity Utilization			85.7%		ICU Level of Service		E					
Analysis Period (min)			15									

Appendix D
Crash Data

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW 65th Avenue & SW Borland Road
 January 1, 2009 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2013														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	0	2	2	0	0	0	0	2	2	0	2	0	0
2013 TOTAL	0	1	3	4	0	1	0	2	2	4	0	4	0	0
YEAR: 2010														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2010 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2009														
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2009 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
FINAL TOTAL	0	3	3	6	0	3	0	4	2	6	0	6	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 URBAN NON-SYSTEM CRASH LISTING

CITY OF TUALATIN, WASHINGTON COUNTY

SW 65th Avenue & SW Borland Road
 January 1, 2009 through December 31, 2013

SER#	INVEST	S P E D C O L K	D R S W A U C O D A T E	DATE	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFF-RD RDNBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	SPCL USE TRLR QTY OWNER V#	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	A G E E X	S L I C N S R E S	PED LOC ERROR	ACTN	EVENT	CAUSE
03617	CITY	N N N N N	07/07/2013	Sun 3P	0	SW BORLAND RD SW 65TH AVE	S 06	3-LEG 0	N TRF SIGNAL	N N	CLR DRY DAY	S-STRGHT REAR INJ	01 UNKN UNKN UNKNOWN	0 S N S N	01	DRVR	NONE	00	U UNK	042	000	000	07
													02 NONE PRVTE PSNGR CAR	0 S N S N	01	DRVR	INJC	18	M OR-Y OR<25	000	000	000	00
02560	NO RPT	N N N	05/10/2010	Mon 5P	0	SW BORLAND RD SW 65TH AVE	CN 01	3-LEG 0	N TRF SIGNAL	N N	CLD DRY DAY	S-1STOP REAR INJ	01 NONE PRVTE PSNGR CAR	0 N S S N	01	DRVR	INJC	20	F OR-Y OR<25	026	000	000	07
													02 NONE PRVTE PSNGR CAR	0 N S S N	01	DRVR	NONE	26	M OR-Y OR<25	000	000	000	00
92202	CITY	N N N N N	06/17/2009	Wed 12P	0	SW BORLAND RD SW 65TH AVE	CN 04	3-LEG 0	N TRF SIGNAL	N N	CLR DRY DAY	ANGL-OTH TURN INJ	01 NONE PRVTE PSNGR CAR	0 S N S N	01	DRVR	NONE	47	M OR-Y OR<25	000	000	000	04
													02 NONE PRVTE PSNGR CAR	0 N E S N	01	DRVR	INJC	23	M OR-Y OR<25	020	000	000	04
00603	NONE	N N N	02/01/2013	Fri 10A	0	SW BORLAND RD SW 65TH AVE	CN 04	3-LEG 0	N TRF SIGNAL	N Y	CLR DRY DAY	ANGL-OTH ANGL PDO	01 NONE PRVTE PSNGR CAR	0 W E S N	01	DRVR	NONE	44	F OR-Y OR<25	097	000	000	00
													02 NONE PRVTE PSNGR CAR	0 S N S N	01	DRVR	NONE	37	M OR-Y OR<25	097	000	000	00
06017	CITY	N N N N N	04/06/2013	Sat 8A	0	SW BORLAND RD SW 65TH AVE	CN 04	3-LEG 0	N TRF SIGNAL	N N	RAIN WET DAY	O-1TURN TURN PDO	01 NONE PRVTE PSNGR CAR	0 S N S N	01	DRVR	NONE	18	F OR-Y OR<25	000	000	000	00
													02 NONE PRVTE PSNGR CAR	0 N E S N	01	DRVR	NONE	42	M OTH-Y OR<25	028,004	000	000	02
81166	CITY	N N N N N	04/06/2013	Sat 8A	0	SW BORLAND RD SW 65TH AVE	CN 04	3-LEG 0	N TRF SIGNAL	N N	RAIN WET DAY	O-1TURN TURN PDO	01 NONE PRVTE PSNGR CAR	0 S N S N	01	DRVR	NONE	18	F OR-Y OR<25	000	000	000	00

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE
 SW 65th Avenue & SW Nyberg Lane / SW Nyberg Street
 January 1, 2009 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2013														
REAR-END	0	1	1	2	0	2	0	2	0	2	0	2	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	0	1	1	0	0
2013 TOTAL	0	2	1	3	0	4	0	3	0	2	1	3	0	0
YEAR: 2012														
BACKING	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	1
2012 TOTAL	0	2	1	3	0	2	0	3	0	3	0	3	0	1
YEAR: 2011														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2011 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2010														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	0	1	0	1	1	0	0
2010 TOTAL	0	2	0	2	0	3	0	1	1	1	1	2	0	0
FINAL TOTAL	0	7	2	9	0	10	0	8	1	7	2	9	0	1

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW 65th Avenue & SW Sagert Street
 January 1, 2009 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2013														
TURNING MOVEMENTS	0	1	1	2	0	1	0	1	1	2	0	2	0	0
2013 TOTAL	0	1	1	2	0	1	0	1	1	2	0	2	0	0
YEAR: 2012														
ANGLE	0	0	1	1	0	0	0	0	1	0	1	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	0	1	1	0	1	0	0
2012 TOTAL	0	1	1	2	0	2	0	0	2	1	1	2	0	0
YEAR: 2011														
REAR-END	0	1	0	1	0	1	0	0	1	1	0	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2011 TOTAL	0	1	1	2	0	1	0	1	1	2	0	2	0	0
YEAR: 2010														
TURNING MOVEMENTS	0	3	1	4	0	4	0	2	2	3	1	4	0	0
2010 TOTAL	0	3	1	4	0	4	0	2	2	3	1	4	0	0
YEAR: 2009														
REAR-END	0	0	1	1	0	0	0	0	1	0	1	1	0	0
2009 TOTAL	0	0	1	1	0	0	0	0	1	0	1	1	0	0
FINAL TOTAL	0	6	5	11	0	8	0	4	7	8	3	11	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW Martinazzi Avenue & SW Sagert Street
 January 1, 2009 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2013														
ANGLE	0	2	0	2	0	3	0	1	1	1	1	2	0	0
2013 TOTAL	0	2	0	2	0	3	0	1	1	1	1	2	0	0
YEAR: 2012														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	0	1	1	0	1	0	1
2012 TOTAL	0	1	1	2	0	1	0	1	1	2	0	2	0	1
YEAR: 2010														
ANGLE	0	1	1	2	0	1	0	1	1	2	0	2	0	0
2010 TOTAL	0	1	1	2	0	1	0	1	1	2	0	2	0	0
YEAR: 2009														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	0	1	1	0	0
2009 TOTAL	0	1	1	2	0	1	0	2	0	1	1	2	0	0
FINAL TOTAL	0	5	3	8	0	6	0	5	3	6	2	8	0	1

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

Appendix E
*2018 Background
Conditions Worksheets*

Sagert Farms
1: SW Nyberg Ln & SW Nyberg St/SW 65th Ave

2018 Background AM Peak Hour

4/1/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	621	18	47	817	14	26	0	27	15	14	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.97	1.00
Satd. Flow (prot)	1787	1817		1686	3496			1727	1442		1786	1583
Flt Permitted	0.20	1.00		0.25	1.00			0.74	1.00		0.85	1.00
Satd. Flow (perm)	374	1817		446	3496			1337	1442		1558	1583
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)	127	690	20	52	908	16	29	0	30	17	16	320
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	25	0	0	49
Lane Group Flow (vph)	127	709	0	52	923	0	0	29	5	0	33	271
Confl. Peds. (#/hr)			6	6			4		1	1		4
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	4%	6%	7%	3%	0%	4%	0%	12%	7%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Prot	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8	8		4	4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	42.7	35.0		33.7	30.5			12.0	12.0		12.0	25.7
Effective Green, g (s)	42.7	35.0		33.7	30.5			12.0	12.0		12.0	25.7
Actuated g/C Ratio	0.63	0.51		0.49	0.45			0.18	0.18		0.18	0.38
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.4	2.5		2.6	2.5			1.6	1.6		1.6	
Lane Grp Cap (vph)	393	932		278	1563			235	253		274	596
v/s Ratio Prot	0.04	c0.39		0.01	0.26				0.00			c0.17
v/s Ratio Perm	0.17			0.08				0.02			0.02	
v/c Ratio	0.32	0.76		0.19	0.59			0.12	0.02		0.12	0.46
Uniform Delay, d1	6.6	13.3		10.0	14.2			23.7	23.2		23.7	16.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	3.5		0.3	0.5			0.1	0.0		0.1	0.2
Delay (s)	6.9	16.8		10.2	14.7			23.8	23.3		23.7	16.2
Level of Service	A	B		B	B			C	C		C	B
Approach Delay (s)		15.3			14.4			23.5			16.9	
Approach LOS		B			B			C			B	

Intersection Summary

HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	68.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Sagert Farms
2: SW 65th Ave & SW Borland Rd

2018 Background AM Peak Hour

4/1/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↖	↗	↖	↖	↗	↖
Volume (vph)	40	5	4	323	6	377	1	437	221	190	198	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			6%	
Total Lost time (s)		6.1			5.8	5.8	5.3	5.3		5.3	5.3	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Flt		0.99			1.00	0.85	1.00	0.95		1.00	1.00	
Flt Protected		0.96			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1631			1743	1568	1787	1712		1636	1711	
Flt Permitted		0.96			0.95	1.00	0.63	1.00		0.13	1.00	
Satd. Flow (perm)		1631			1743	1568	1177	1712		223	1711	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	42	5	4	336	6	393	1	455	230	198	206	5
RTOR Reduction (vph)	0	2	0	0	0	224	0	11	0	0	0	0
Lane Group Flow (vph)	0	49	0	0	342	169	1	674	0	198	211	0
Heavy Vehicles (%)	13%	0%	0%	4%	0%	3%	0%	3%	7%	7%	7%	20%
Turn Type	Split	NA		Split	NA	pt+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	8	8		4	4	4 5	1	6		5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		6.1			20.8	40.8	58.2	57.4		82.7	76.6	
Effective Green, g (s)		6.1			20.8	40.8	58.2	57.4		82.7	76.6	
Actuated g/C Ratio		0.05			0.16	0.32	0.46	0.45		0.65	0.60	
Clearance Time (s)		6.1			5.8		5.3	5.3		5.3	5.3	
Vehicle Extension (s)		1.0			2.0		1.0	3.0		2.5	3.0	
Lane Grp Cap (vph)		78			285	504	544	774		368	1033	
v/s Ratio Prot		c0.03			c0.20	0.11	0.00	c0.39		c0.08	0.12	
v/s Ratio Perm							0.00			0.27		
v/c Ratio		0.63			1.20	0.33	0.00	0.87		0.54	0.20	
Uniform Delay, d1		59.2			53.0	32.7	18.6	31.3		18.7	11.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.9			118.7	0.1	0.0	10.5		1.2	0.1	
Delay (s)		70.1			171.7	32.8	18.6	41.8		19.9	11.4	
Level of Service		E			F	C	B	D		B	B	
Approach Delay (s)		70.1			97.5			41.8			15.5	
Approach LOS		E			F			D			B	

Intersection Summary

HCM 2000 Control Delay	58.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	126.8	Sum of lost time (s)	22.5
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	
Volume (veh/h)	340	15	5	784	40	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	405	18	6	933	48	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	1220					
pX, platoon unblocked					0.71	
vC, conflicting volume			423		1359	414
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			423		1302	414
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		62	99
cM capacity (veh/h)			1147		127	643

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	423	6	933	57
Volume Left	0	6	0	48
Volume Right	18	0	0	10
cSH	1700	1147	1700	146
Volume to Capacity	0.25	0.01	0.55	0.39
Queue Length 95th (ft)	0	0	0	42
Control Delay (s)	0.0	8.2	0.0	44.5
Lane LOS		A		E
Approach Delay (s)	0.0	0.1		44.5
Approach LOS				E

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

Sagert Farms
5: SW 56th Ter & SW Borland Rd

2018 Background AM Peak Hour
4/1/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	78	234	7	5	630	5	31	14	20	8	5	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.2			5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.97			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Frt	1.00	1.00		1.00	1.00			0.96			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1597	1804		1504	1842			1701			1611	
Flt Permitted	0.24	1.00		0.59	1.00			0.86			0.95	
Satd. Flow (perm)	404	1804		938	1842			1506			1545	
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)	88	263	8	6	708	6	35	16	22	9	6	51
RTOR Reduction (vph)	0	1	0	0	0	0	0	16	0	0	46	0
Lane Group Flow (vph)	88	270	0	6	714	0	0	57	0	0	20	0
Confl. Peds. (#/hr)	3						3		40	40		
Heavy Vehicles (%)	13%	5%	0%	20%	3%	0%	0%	0%	5%	0%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	59.5	53.4		47.8	46.9			7.9			7.9	
Effective Green, g (s)	59.5	53.4		47.8	46.9			7.9			7.9	
Actuated g/C Ratio	0.76	0.69		0.61	0.60			0.10			0.10	
Clearance Time (s)	5.2	5.2		5.2	5.2			5.2			5.2	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	422	1238		582	1110			152			156	
v/s Ratio Prot	c0.02	0.15		0.00	c0.39							
v/s Ratio Perm	0.14			0.01				c0.04			0.01	
v/c Ratio	0.21	0.22		0.01	0.64			0.37			0.13	
Uniform Delay, d1	5.3	4.5		5.8	10.0			32.6			31.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	0.1		0.0	1.4			1.5			0.4	
Delay (s)	5.6	4.6		5.8	11.5			34.2			32.2	
Level of Service	A	A		A	B			C			C	
Approach Delay (s)		4.9			11.4			34.2			32.2	
Approach LOS		A			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			12.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			77.8			Sum of lost time (s)			15.6			
Intersection Capacity Utilization			65.2%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection												
Intersection Delay, s/veh	50.7											
Intersection LOS	F											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	246	214	8	0	42	211	181	0	8	341	91
Peak Hour Factor	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	3	2	25	2	2	4	2	2	0	2	7
Mvmt Flow	0	251	218	8	0	43	215	185	0	8	348	93
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	27.6	68	76.1
HCM LOS	D	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	79%	0%	96%	0%	54%	0%	100%	0%
Vol Right, %	0%	21%	0%	4%	0%	46%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	8	432	246	222	42	392	93	64	69
LT Vol	8	0	246	0	42	0	93	0	0
Through Vol	0	341	0	214	0	211	0	64	0
RT Vol	0	91	0	8	0	181	0	0	69
Lane Flow Rate	8	441	251	227	43	400	95	65	70
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.023	1	0.679	0.579	0.116	0.994	0.284	0.187	0.188
Departure Headway (Hd)	10.005	9.364	9.745	9.207	9.73	8.946	10.777	10.309	9.624
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	357	388	372	392	369	408	334	348	372
Service Time	7.784	7.142	7.498	6.96	7.474	6.691	8.537	8.069	7.384
HCM Lane V/C Ratio	0.022	1.137	0.675	0.579	0.117	0.98	0.284	0.187	0.188
HCM Control Delay	13	77.3	30.9	23.9	13.8	73.8	17.8	15.4	14.6
HCM Lane LOS	B	F	D	C	B	F	C	C	B
HCM 95th-tile Q	0.1	12	4.8	3.5	0.4	12.1	1.1	0.7	0.7

Intersection

Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	93	64	69
Peak Hour Factor	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	4	6	7
Mvmt Flow	0	95	65	70
Number of Lanes	0	1	1	1

Approach SB

Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	16.1
HCM LOS	C

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	376	7	92	5	3	1	112	282	4	4	125	397
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	409	8	100	5	3	1	122	307	4	4	136	432
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2						
Volume Total (vph)	416	100	10	433	4	567						
Volume Left (vph)	409	0	5	122	4	0						
Volume Right (vph)	0	100	1	4	0	432						
Hadj (s)	0.57	-0.67	0.04	0.12	0.50	-0.43						
Departure Headway (s)	8.1	6.8	9.7	7.6	8.0	7.1						
Degree Utilization, x	0.93	0.19	0.03	0.91	0.01	1.0						
Capacity (veh/h)	438	518	352	464	437	519						
Control Delay (s)	55.1	10.2	13.0	50.2	9.9	101.1						
Approach Delay (s)	46.4		13.0	50.2	100.4							
Approach LOS	E		B	F	F							
Intersection Summary												
Delay			67.4									
Level of Service			F									
Intersection Capacity Utilization			90.2%	ICU Level of Service	E							
Analysis Period (min)			15									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	253	780	33	21	692	21	34	3	56	14	7	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (prot)	1787	1868		1752	3516			1801	1615		1749	1599
Flt Permitted	0.27	1.00		0.22	1.00			0.73	1.00		0.78	1.00
Satd. Flow (perm)	508	1868		411	3516			1367	1615		1406	1599
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)	272	839	35	23	744	23	37	3	60	15	8	153
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	54	0	0	86
Lane Group Flow (vph)	272	873	0	23	765	0	0	40	6	0	23	67
Confl. Peds. (#/hr)	1		5	5		1	7					7
Heavy Vehicles (%)	1%	1%	0%	3%	2%	7%	0%	0%	0%	8%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Prot	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8	8		4	4.5
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	48.2	40.3		34.7	32.8			6.3	6.3		6.3	21.7
Effective Green, g (s)	48.2	40.3		34.7	32.8			6.3	6.3		6.3	21.7
Actuated g/C Ratio	0.72	0.61		0.52	0.49			0.09	0.09		0.09	0.33
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.4	2.5		2.6	2.5			1.6	1.6		1.6	
Lane Grp Cap (vph)	548	1132		252	1734			129	153		133	521
v/s Ratio Prot	c0.07	c0.47		0.00	0.22				0.00			0.04
v/s Ratio Perm	0.29			0.04				c0.03			0.02	
v/c Ratio	0.50	0.77		0.09	0.44			0.31	0.04		0.17	0.13
Uniform Delay, d1	4.2	9.7		8.7	10.9			28.1	27.3		27.7	15.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.5	3.2		0.1	0.1			0.5	0.0		0.2	0.0
Delay (s)	4.6	12.9		8.8	11.0			28.6	27.4		27.9	15.8
Level of Service	A	B		A	B			C	C		C	B
Approach Delay (s)		10.9			11.0			27.9			17.4	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			12.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			66.5			Sum of lost time (s)			18.0			
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												
Volume (vph)	14	11	7	210	3	204	1	270	345	384	385	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			6%	
Total Lost time (s)		6.1			5.8	5.8	5.3	5.3		5.3	5.3	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frb, ped/bikes		1.00			1.00	1.00	1.00	0.98		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.92		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1757			1770	1599	1787	1658		1734	1822	
Flt Permitted		0.98			0.95	1.00	0.52	1.00		0.13	1.00	
Satd. Flow (perm)		1757			1770	1599	986	1658		236	1822	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	15	11	7	219	3	212	1	281	359	400	401	4
RTOR Reduction (vph)	0	7	0	0	0	132	0	31	0	0	0	0
Lane Group Flow (vph)	0	26	0	0	222	80	1	609	0	400	405	0
Confl. Peds. (#/hr)	10					10			4	4		
Heavy Vehicles (%)	6%	0%	0%	2%	25%	1%	0%	2%	2%	1%	1%	0%
Turn Type	Split	NA		Split	NA	pt+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	8	8		4	4	4 5	1	6		5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		3.6			19.1	48.3	54.8	53.9		88.4	82.2	
Effective Green, g (s)		3.6			19.1	48.3	54.8	53.9		88.4	82.2	
Actuated g/C Ratio		0.03			0.15	0.38	0.43	0.42		0.69	0.64	
Clearance Time (s)		6.1			5.8		5.3	5.3		5.3	5.3	
Vehicle Extension (s)		1.0			2.0		1.0	3.0		2.5	3.0	
Lane Grp Cap (vph)		49			263	601	426	696		503	1167	
v/s Ratio Prot		c0.01			c0.13	0.05	0.00	c0.37		c0.18	0.22	
v/s Ratio Perm							0.00			0.37		
v/c Ratio		0.53			0.84	0.13	0.00	0.88		0.80	0.35	
Uniform Delay, d1		61.5			53.2	26.3	21.1	34.1		29.8	10.7	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.5			20.4	0.0	0.0	11.9		8.2	0.2	
Delay (s)		67.0			73.6	26.3	21.1	46.0		38.0	10.8	
Level of Service		E			E	C	C	D		D	B	
Approach Delay (s)		67.0			50.5			46.0			24.3	
Approach LOS		E			D			D			C	

Intersection Summary		
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.84	
Actuated Cycle Length (s)	128.3	Sum of lost time (s) 22.5
Intersection Capacity Utilization	89.0%	ICU Level of Service E
Analysis Period (min)	15	

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	
Volume (veh/h)	755	44	7	349	19	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	839	49	8	388	21	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	1220					
pX, platoon unblocked						
vC, conflicting volume			888		1267	863
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			888		1267	863
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		89	100
cM capacity (veh/h)			771		186	357
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	888	8	388	22		
Volume Left	0	8	0	21		
Volume Right	49	0	0	1		
cSH	1700	771	1700	191		
Volume to Capacity	0.52	0.01	0.23	0.12		
Queue Length 95th (ft)	0	1	0	10		
Control Delay (s)	0.0	9.7	0.0	26.3		
Lane LOS		A		D		
Approach Delay (s)	0.0	0.2		26.3		
Approach LOS				D		
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			52.4%	ICU Level of Service	A	
Analysis Period (min)	15					

Sagert Farms
5: SW 56th Terrace & Borland Rd

2018 Background PM Peak Hour
4/1/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	681	28	11	303	5	19	1	4	2	1	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.2			5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.98			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1797	1869		1805	1876			1647			1640	
Flt Permitted	0.56	1.00		0.30	1.00			0.84			0.96	
Satd. Flow (perm)	1058	1869		567	1876			1440			1577	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	740	30	12	329	5	21	1	4	2	1	15
RTOR Reduction (vph)	0	1	0	0	0	0	0	4	0	0	14	0
Lane Group Flow (vph)	16	769	0	12	334	0	0	22	0	0	4	0
Confl. Peds. (#/hr)	8		1	1		8	3		3	3		3
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	50%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	52.3	51.4		52.3	51.4			4.3				4.3
Effective Green, g (s)	52.3	51.4		52.3	51.4			4.3				4.3
Actuated g/C Ratio	0.72	0.71		0.72	0.71			0.06				0.06
Clearance Time (s)	5.2	5.2		5.2	5.2			5.2				5.2
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0				3.0
Lane Grp Cap (vph)	775	1330		426	1335			85				93
v/s Ratio Prot	0.00	c0.41		c0.00	0.18							
v/s Ratio Perm	0.01			0.02				c0.02				0.00
v/c Ratio	0.02	0.58		0.03	0.25			0.26				0.04
Uniform Delay, d1	2.8	5.1		3.5	3.6			32.4				32.0
Progression Factor	1.00	1.00		1.00	1.00			1.00				1.00
Incremental Delay, d2	0.0	0.7		0.0	0.1			1.6				0.2
Delay (s)	2.8	5.8		3.5	3.8			34.1				32.2
Level of Service	A	A		A	A			C				C
Approach Delay (s)		5.8			3.8			34.1				32.2
Approach LOS		A			A			C				C

Intersection Summary

HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	15.6
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection												
Intersection Delay, s/veh	57.6											
Intersection LOS	F											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	136	291	13	0	63	186	132	0	6	168	94
Peak Hour Factor	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	0	2	2	1	4	2	0	1	2
Mvmt Flow	0	143	306	14	0	66	196	139	0	6	177	99
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	64.8	74.2	59.2
HCM LOS	F	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	64%	0%	96%	0%	58%	0%	100%	0%
Vol Right, %	0%	36%	0%	4%	0%	42%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	6	262	136	304	63	318	244	291	231
LT Vol	6	0	136	0	63	0	244	0	0
Through Vol	0	168	0	291	0	186	0	291	0
RT Vol	0	94	0	13	0	132	0	0	231
Lane Flow Rate	6	276	143	320	66	335	257	306	243
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.021	0.882	0.463	0.995	0.225	1	0.782	0.888	0.665
Departure Headway (Hd)	12.24	11.512	11.644	11.078	12.197	11.35	10.965	10.432	9.739
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	295	317	312	330	297	325	334	349	374
Service Time	9.92	9.192	9.307	8.778	9.846	8.999	8.637	8.104	7.439
HCM Lane V/C Ratio	0.02	0.871	0.458	0.97	0.222	1.031	0.769	0.877	0.65
HCM Control Delay	15.2	60.2	23.9	83.1	18.3	85.3	43.7	57.1	29.8
HCM Lane LOS	C	F	C	F	C	F	E	F	D
HCM 95th-tile Q	0.1	8.1	2.3	10.9	0.8	10.9	6.3	8.6	4.6

Intersection

Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	244	291	231
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	0	2
Mvmt Flow	0	257	306	243
Number of Lanes	0	1	1	1

Approach SB

Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	44.6
HCM LOS	E

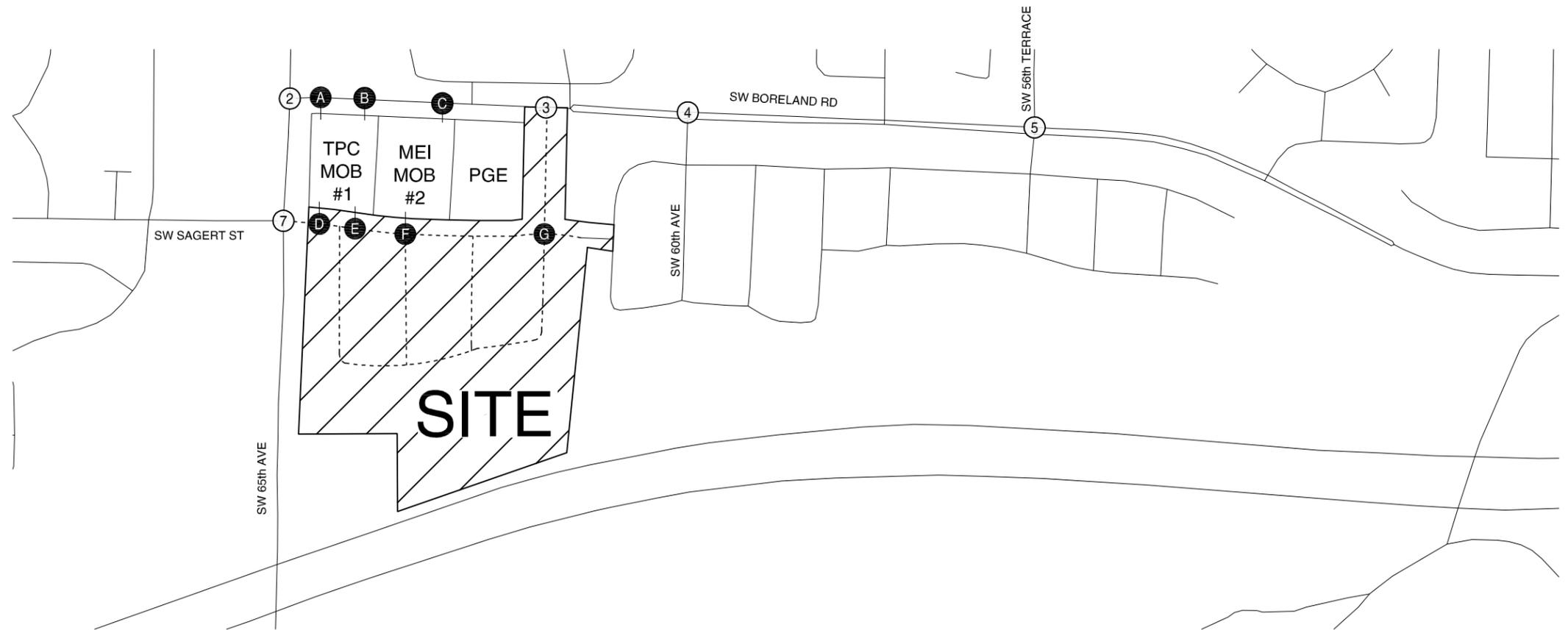
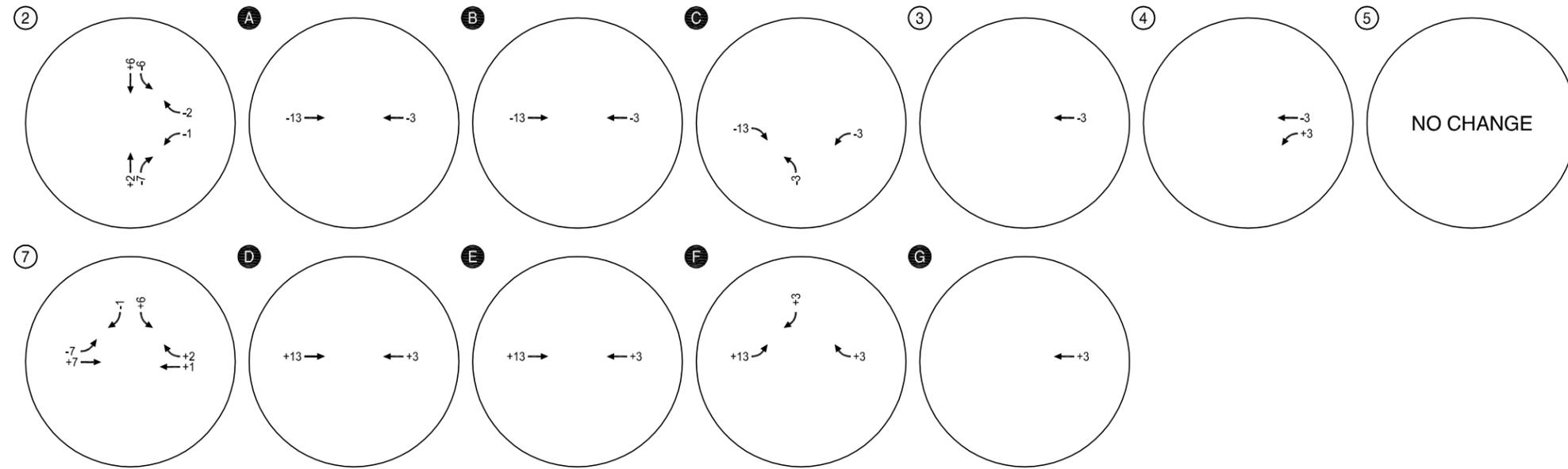
Lane

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	471	1	111	6	4	5	53	140	0	3	255	344
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
Hourly flow rate (vph)	501	1	118	6	4	5	56	149	0	3	271	366
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2						
Volume Total (vph)	502	118	16	205	3	637						
Volume Left (vph)	501	0	6	56	3	0						
Volume Right (vph)	0	118	5	0	0	366						
Hadj (s)	0.53	-0.68	-0.12	0.12	0.50	-0.38						
Departure Headway (s)	7.5	6.3	8.5	7.7	7.5	6.7						
Degree Utilization, x	1.0	0.21	0.04	0.44	0.01	1.0						
Capacity (veh/h)	487	568	402	460	468	546						
Control Delay (s)	78.4	9.7	11.9	16.7	9.4	120.8						
Approach Delay (s)	65.3		11.9	16.7	120.2							
Approach LOS	F		B	C	F							
Intersection Summary												
Delay			81.7									
Level of Service			F									
Intersection Capacity Utilization			87.8%		ICU Level of Service		E					
Analysis Period (min)			15									

Appendix F
Assumed Re-routing of
Trips



(NO SCALE)

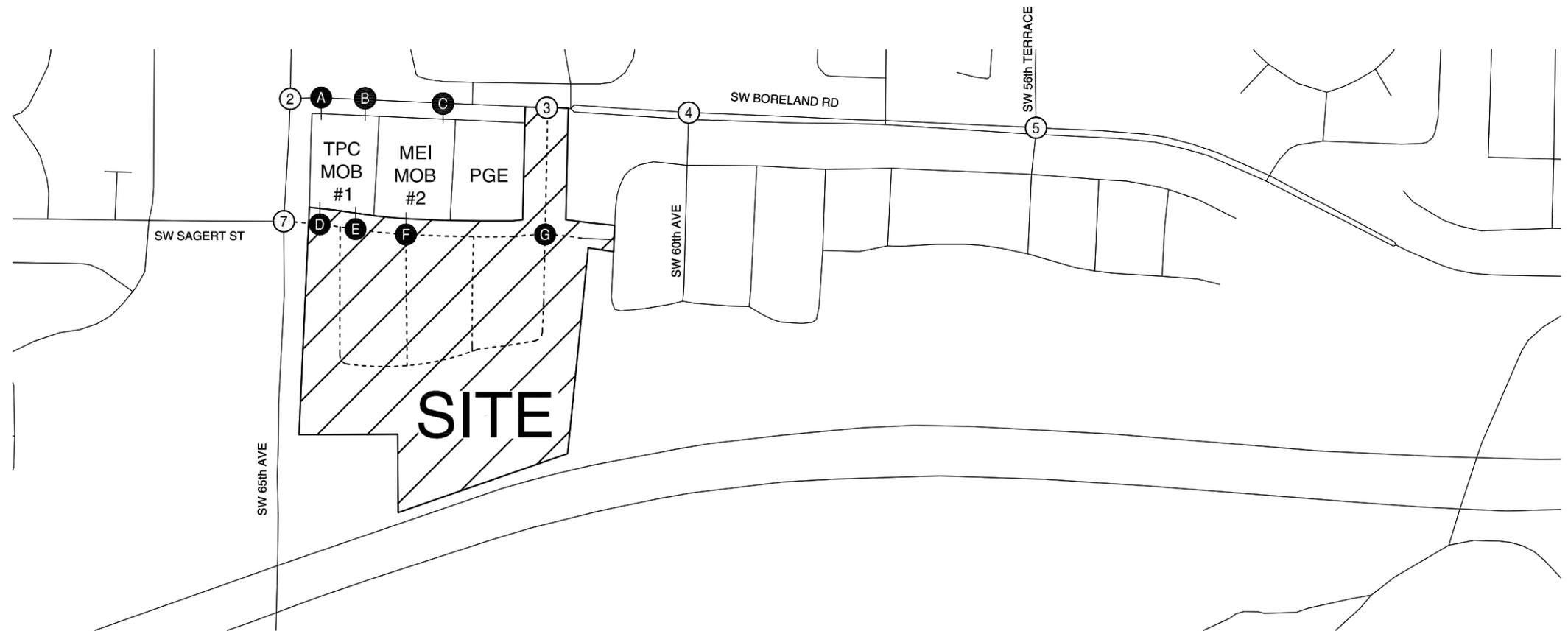
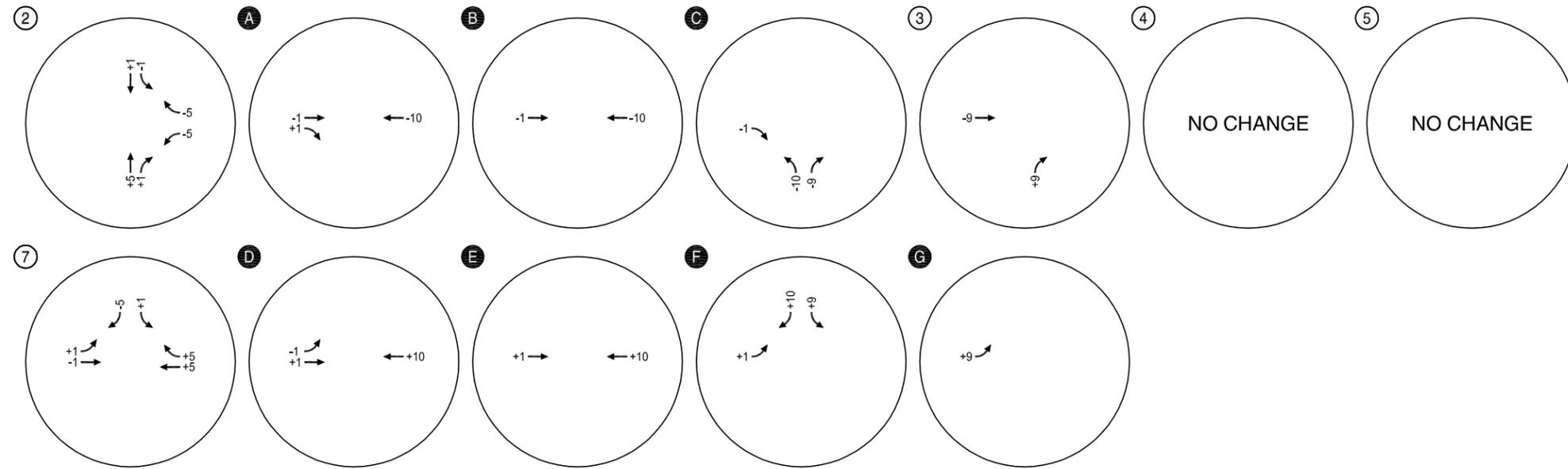


- LEGEND**
- ① - STUDY INTERSECTIONS
 - A - EXISTING/PROPOSED ACCESS
 - MOB - MEDICAL OFFICE BUILDINGS

RE-ROUTE OF EXISTING MEDICAL OFFICE BUILDING TRIPS
WEEKDAY AM PEAK HOUR
TUALATIN, OREGON

FIGURE
F1

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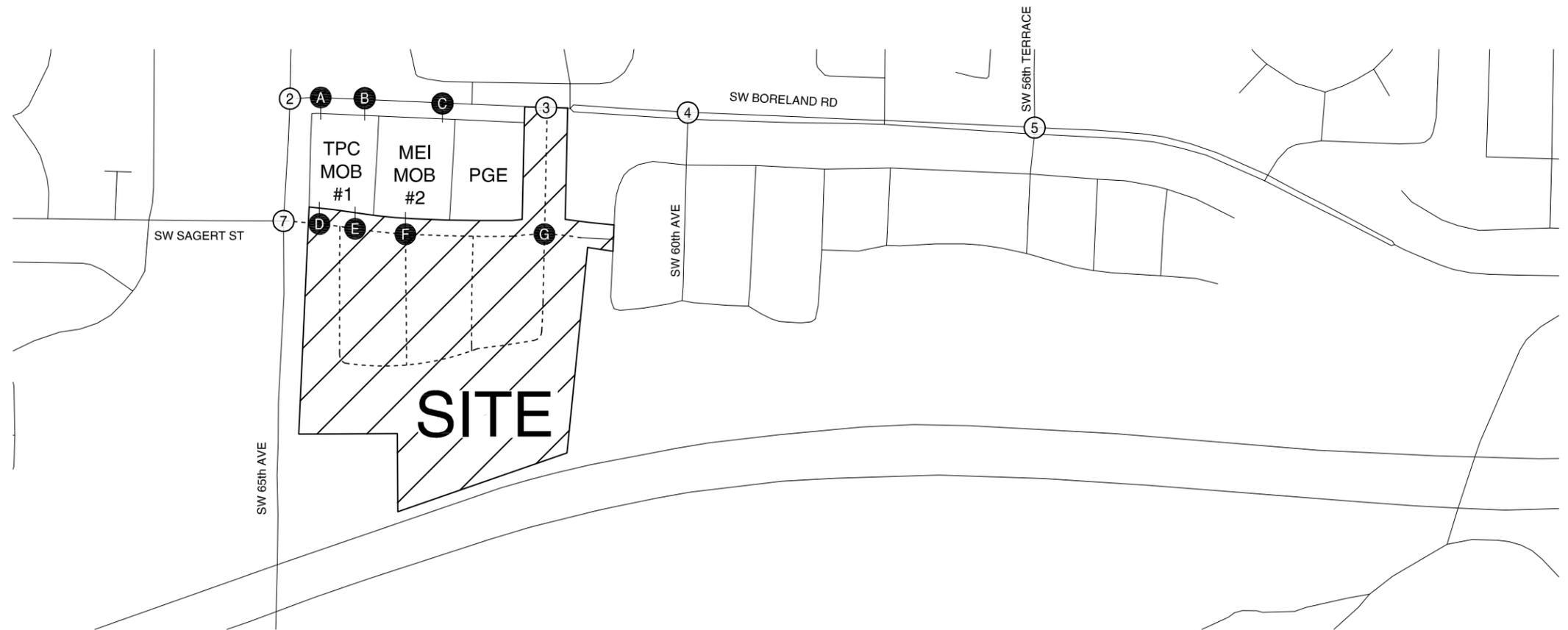
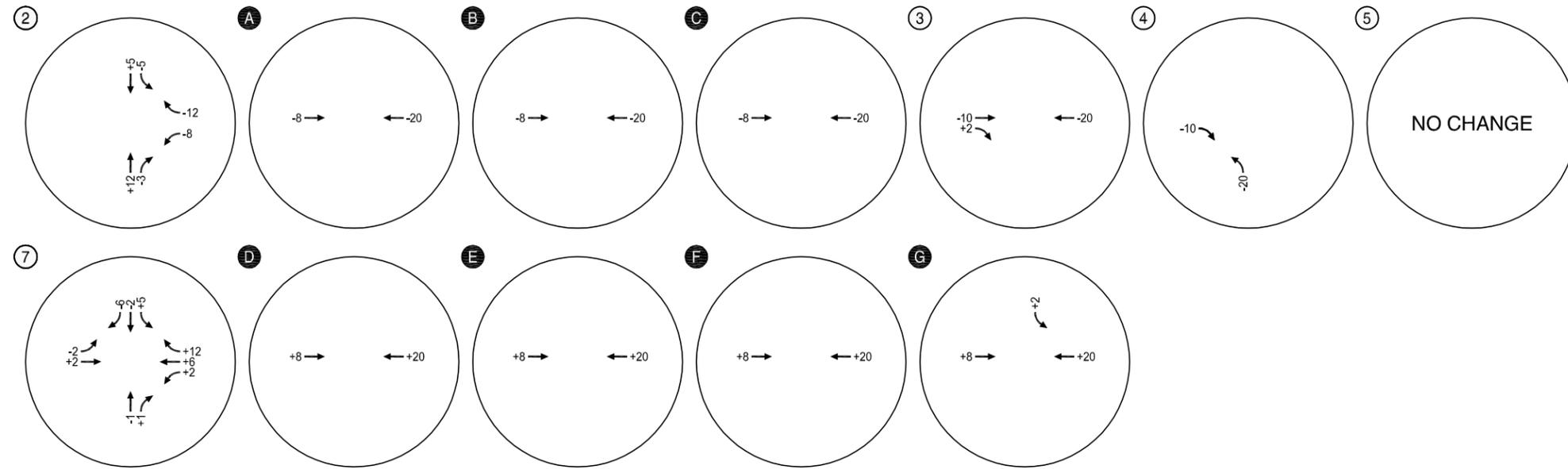


- LEGEND**
- ① - STUDY INTERSECTIONS
 - A - EXISTING/PROPOSED ACCESS
 - MOB - MEDICAL OFFICE BUILDINGS

RE-ROUTE OF EXISTING MEDICAL OFFICE BUILDING TRIPS
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

FIGURE
F2

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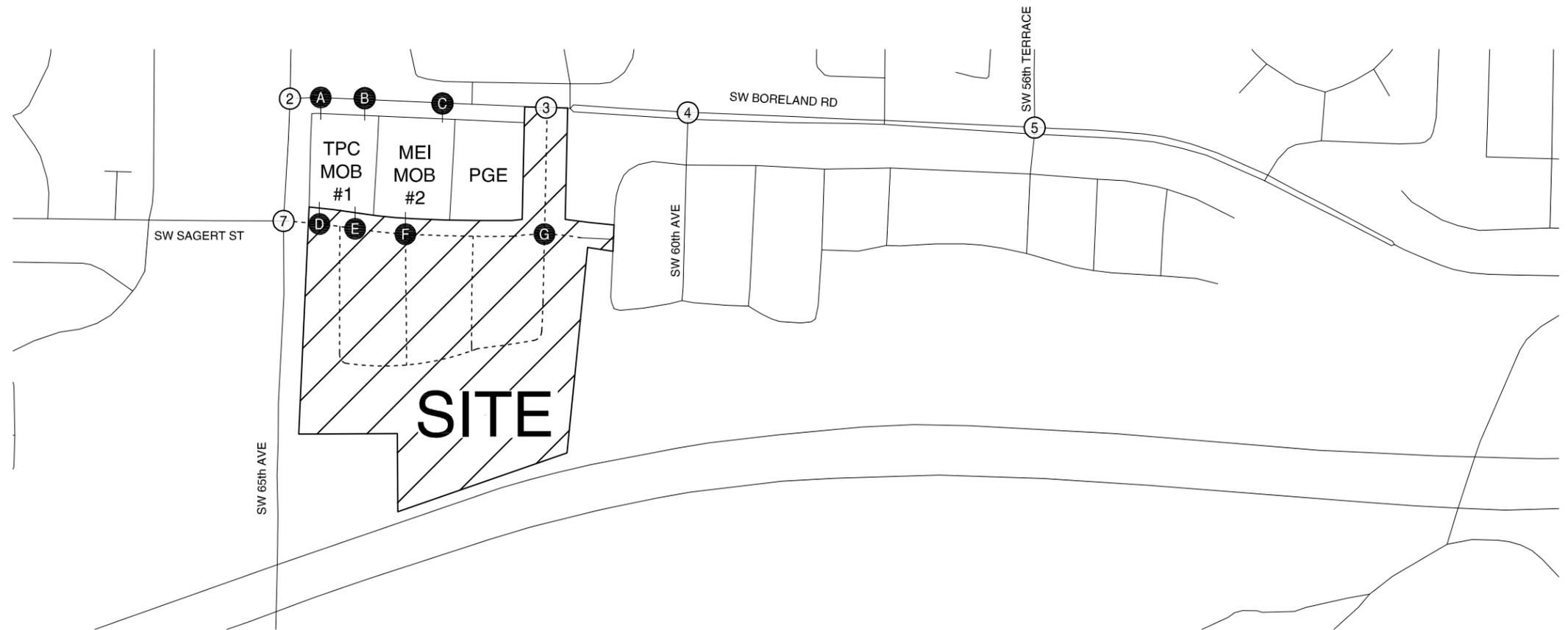
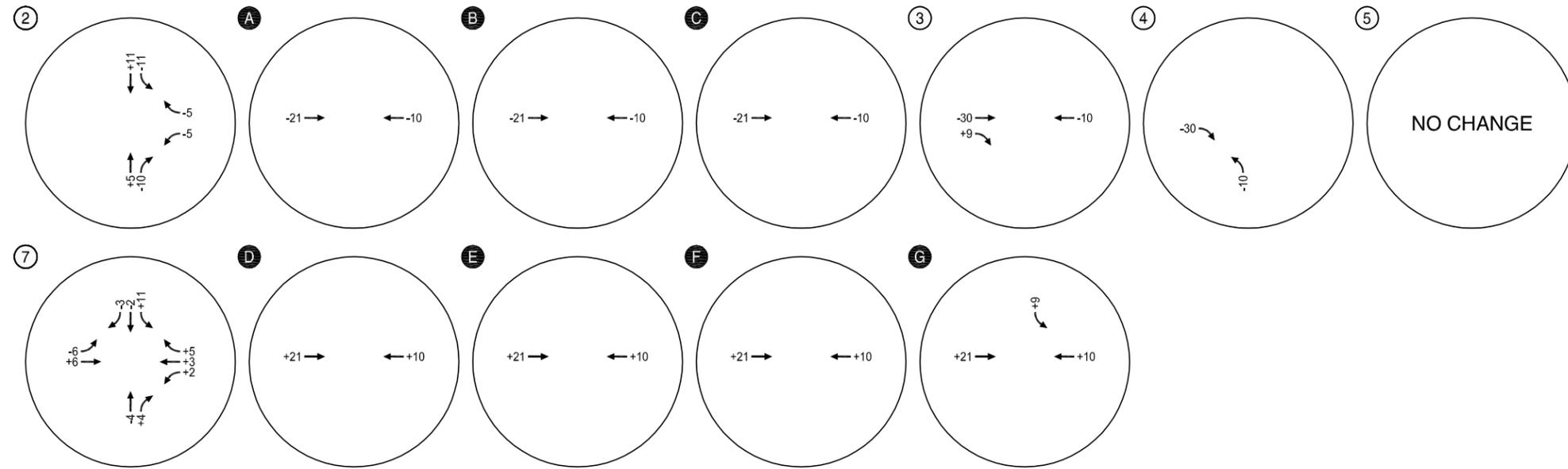


- LEGEND**
- ① - STUDY INTERSECTIONS
 - A - EXISTING/PROPOSED ACCESS
 - MOB - MEDICAL OFFICE BUILDINGS

RE-ROUTE OF EXISTING SEQUOIA RIDGE TRIPS
WEEKDAY AM PEAK HOUR
TUALATIN, OREGON

FIGURE
F3

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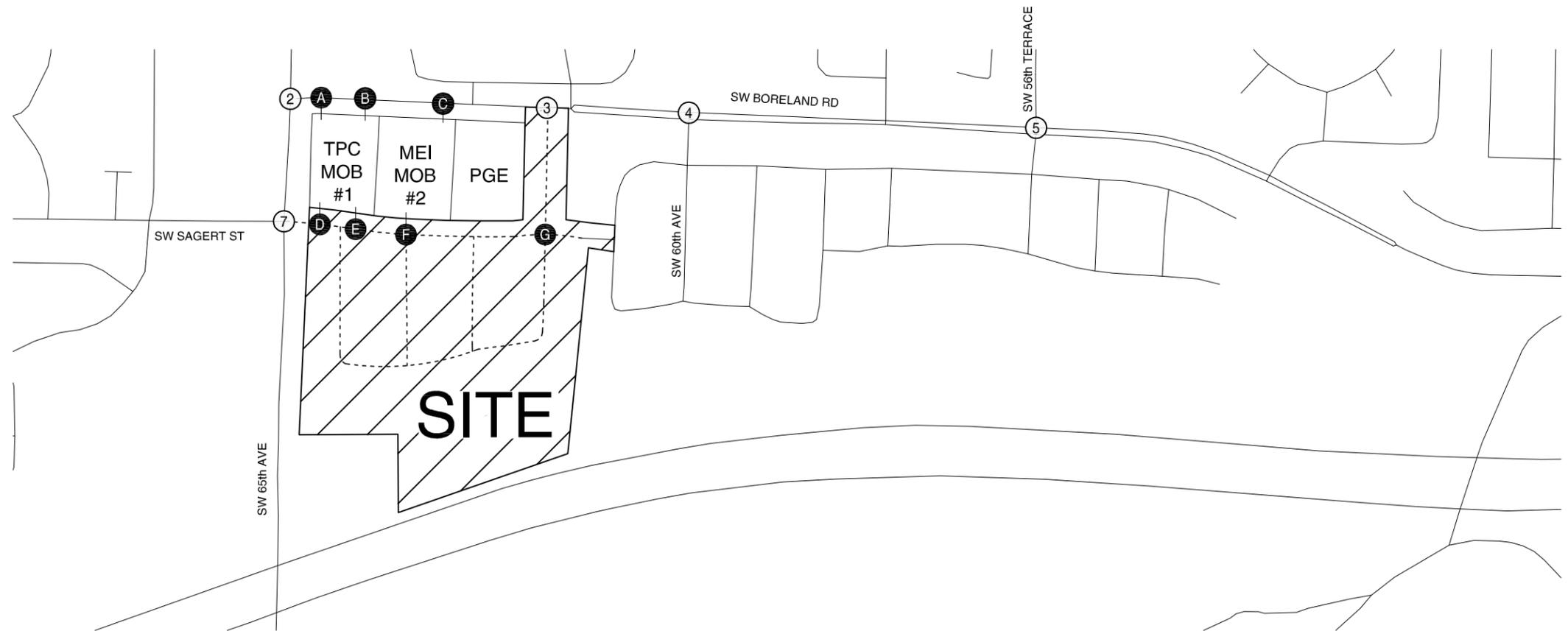
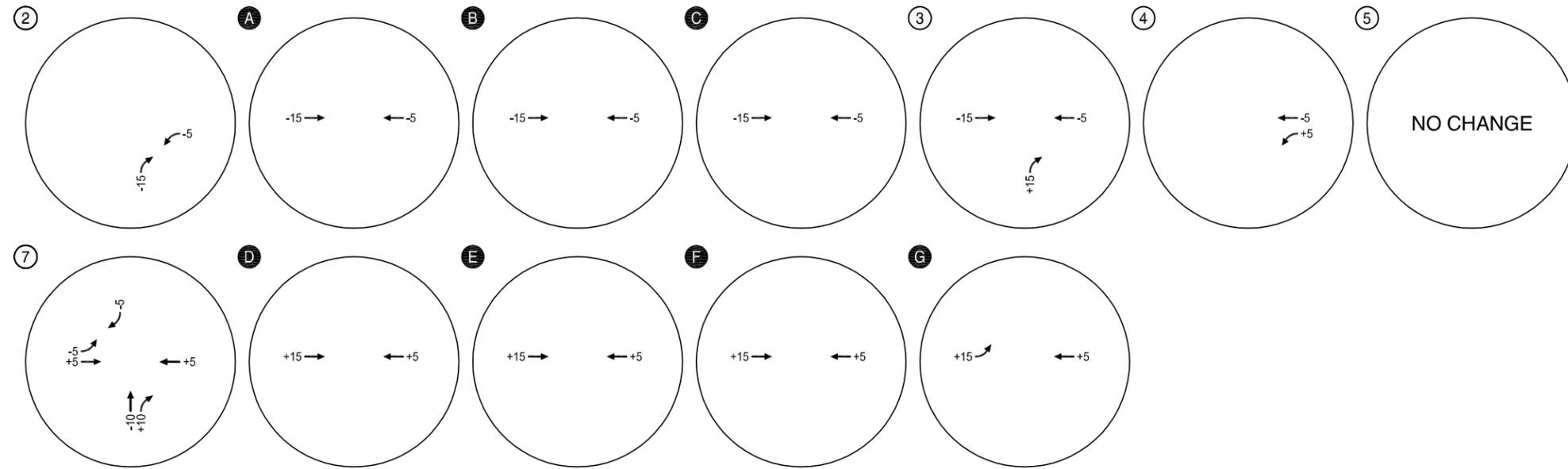
LEGEND

- ① - STUDY INTERSECTIONS
- Ⓐ - EXISTING/PROPOSED ACCESS
- MOB - MEDICAL OFFICE BUILDINGS

RE-ROUTE OF EXISTING SEQUOIA RIDGE TRIPS
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

FIGURE
F4

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- LEGEND**
- ① - STUDY INTERSECTIONS
 - A - EXISTING/PROPOSED ACCESS
 - MOB - MEDICAL OFFICE BUILDINGS

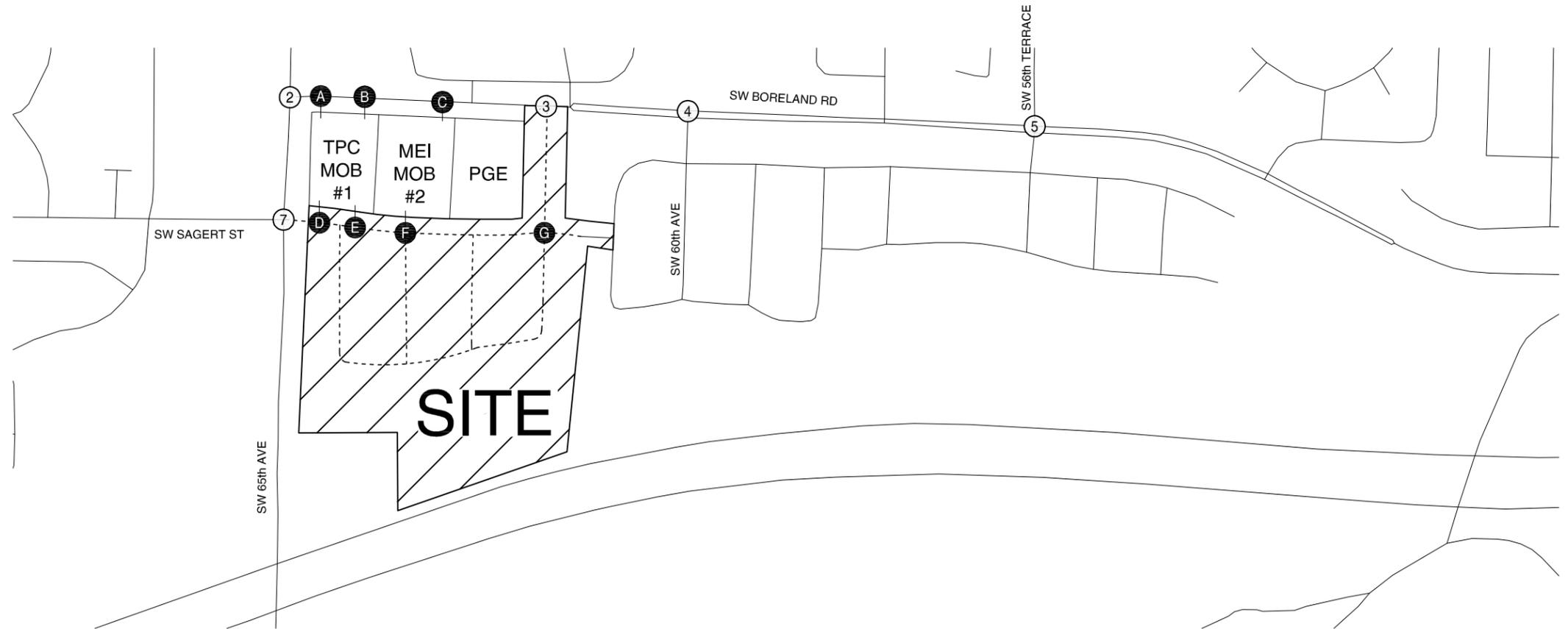
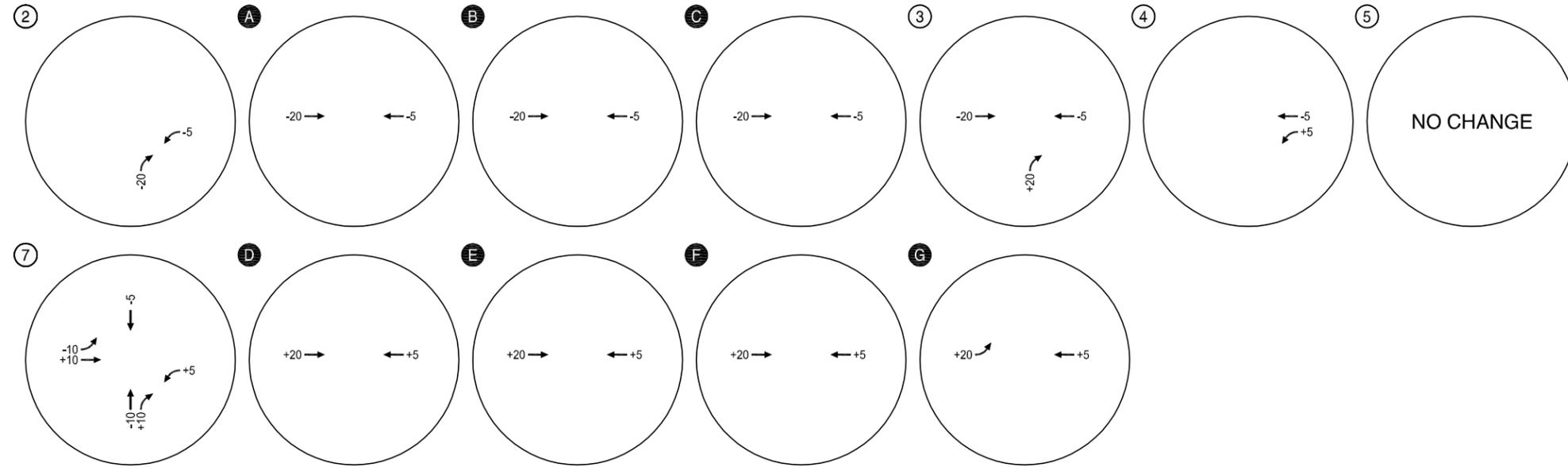
RE-ROUTE OF EXISTING REGIONAL TRAFFIC
WEEKDAY AM PEAK HOUR
TUALATIN, OREGON

FIGURE
F5

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(NO SCALE)



LEGEND

- ① - STUDY INTERSECTIONS
- Ⓐ - EXISTING/PROPOSED ACCESS
- MOB - MEDICAL OFFICE BUILDINGS

RE-ROUTE OF EXISTING REGIONAL TRAFFIC
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

FIGURE
F6

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Appendix G
*2018 Total Traffic
Conditions Worksheets*

2018 Total Traffic AM Peak Hour
1: SW Nyberg Ln & SW Nyberg St/SW 65th Ave

Sagert Farms
4/14/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	629	18	47	841	14	26	0	27	15	14	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.97	1.00
Satd. Flow (prot)	1787	1817		1686	3496			1726	1442		1786	1583
Flt Permitted	0.19	1.00		0.24	1.00			0.74	1.00		0.85	1.00
Satd. Flow (perm)	356	1817		433	3496			1337	1442		1561	1583
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)	127	699	20	52	934	16	29	0	30	17	16	320
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	25	0	0	45
Lane Group Flow (vph)	127	718	0	52	949	0	0	29	5	0	33	275
Confl. Peds. (#/hr)			6	6			4		1	1		4
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	4%	6%	7%	3%	0%	4%	0%	12%	7%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Prot	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8	8		4	4 5
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	43.4	35.6		34.2	31.0			12.3	12.3		12.3	26.1
Effective Green, g (s)	43.4	35.6		34.2	31.0			12.3	12.3		12.3	26.1
Actuated g/C Ratio	0.63	0.52		0.49	0.45			0.18	0.18		0.18	0.38
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.4	2.5		2.6	2.5			1.6	1.6		1.6	
Lane Grp Cap (vph)	385	936		272	1568			237	256		277	597
v/s Ratio Prot	0.04	c0.40		0.01	0.27				0.00			c0.17
v/s Ratio Perm	0.17			0.09				0.02			0.02	
v/c Ratio	0.33	0.77		0.19	0.61			0.12	0.02		0.12	0.46
Uniform Delay, d1	6.8	13.4		10.2	14.4			23.9	23.4		23.9	16.2
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	3.6		0.3	0.6			0.1	0.0		0.1	0.2
Delay (s)	7.1	17.1		10.4	15.0			23.9	23.4		23.9	16.4
Level of Service	A	B		B	B			C	C		C	B
Approach Delay (s)		15.6			14.7			23.7			17.1	
Approach LOS		B			B			C			B	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	69.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

2018 Total Traffic AM Peak Hour
2: SW 65th Ave & SW Borland Rd

Sagert Farms
4/14/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	40	5	4	309	6	363	1	475	196	181	215	5	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Grade (%)		0%			0%			2%			6%		
Total Lost time (s)		5.6			5.3	5.3	3.5	4.8		4.8	4.8		
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00		
Fr _t		0.99			1.00	0.85	1.00	0.96		1.00	1.00		
Fl _t Protected		0.96			0.95	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)		1502			1605	1444	1646	1590		1507	1577		
Fl _t Permitted		0.96			0.95	1.00	0.62	1.00		0.16	1.00		
Satd. Flow (perm)		1502			1605	1444	1067	1590		260	1577		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	42	5	4	322	6	378	1	495	204	189	224	5	
RTOR Reduction (vph)	0	2	0	0	0	218	0	11	0	0	0	0	
Lane Group Flow (vph)	0	49	0	0	328	160	1	688	0	189	229	0	
Heavy Vehicles (%)	13%	0%	0%	4%	0%	3%	0%	3%	7%	7%	7%	20%	
Turn Type	Split	NA		Split	NA	pt+ov	pm+pt	NA		pm+pt	NA		
Protected Phases	8	8		4	4	4 5	1	6 9		5	2 10		
Permitted Phases							6 9			2 10			
Actuated Green, G (s)		5.2			27.5	34.2	64.9	64.1		76.1	71.3		
Effective Green, g (s)		5.7			28.0	35.2	66.4	65.1		77.1	72.3		
Actuated g/C Ratio		0.04			0.22	0.27	0.51	0.50		0.59	0.56		
Clearance Time (s)		6.1			5.8		4.0			5.3			
Vehicle Extension (s)		1.0			2.0		3.0			2.5			
Lane Grp Cap (vph)		65			345	390	550	796		223	877		
v/s Ratio Prot		c0.03			c0.20	0.11	0.00	c0.43		c0.05	0.14		
v/s Ratio Perm							0.00			c0.46			
v/c Ratio		0.76			0.95	0.41	0.00	0.86		0.85	0.26		
Uniform Delay, d1		61.5			50.3	38.9	15.6	28.6		44.9	15.0		
Progression Factor		1.00			1.00	1.00	1.10	0.93		1.00	1.00		
Incremental Delay, d2		35.0			35.3	0.3	0.0	8.0		24.3	0.2		
Delay (s)		96.5			85.6	39.1	17.1	34.7		69.2	15.1		
Level of Service		F			F	D	B	C		E	B		
Approach Delay (s)		96.5			60.7			34.6			39.6		
Approach LOS		F			E			C			D		
Intersection Summary													
HCM 2000 Control Delay			47.3									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.90										
Actuated Cycle Length (s)			130.0									Sum of lost time (s)	25.0
Intersection Capacity Utilization			84.7%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

2018 Total Traffic AM Peak Hour
3: Proposed Road & SW Borland Rd

Sagert Farms
4/14/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻		↻
Volume (veh/h)	365	4	0	691	0	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	435	5	0	823	0	32
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage (veh)	2					
Upstream signal (ft)	929					
pX, platoon unblocked			0.98		0.98	0.98
vC, conflicting volume			440		1261	438
vC1, stage 1 conf vol					438	
vC2, stage 2 conf vol					823	
vCu, unblocked vol			418		1255	416
tC, single (s)			4.1		6.7	6.2
tC, 2 stage (s)					5.7	
tF (s)			2.2		3.8	3.3
p0 queue free %			100		100	95
cM capacity (veh/h)			1127		341	628
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	439	823	32			
Volume Left	0	0	0			
Volume Right	5	0	32			
cSH	1700	1700	628			
Volume to Capacity	0.26	0.48	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	11.0			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.0			
Approach LOS			B			
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			39.7%	ICU Level of Service		A
Analysis Period (min)			15			

2018 Total Traffic AM Peak Hour
4: SW 60th Ave & SW Borland Rd

Sagert Farms
4/14/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	
Volume (veh/h)	342	15	17	776	20	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	407	18	20	924	24	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)				1220		
pX, platoon unblocked					0.72	
vC, conflicting volume			425		1380	416
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			425		1333	416
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		80	99
cM capacity (veh/h)			1145		121	641
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	425	20	924	33		
Volume Left	0	20	0	24		
Volume Right	18	0	0	10		
cSH	1700	1145	1700	157		
Volume to Capacity	0.25	0.02	0.54	0.21		
Queue Length 95th (ft)	0	1	0	19		
Control Delay (s)	0.0	8.2	0.0	34.0		
Lane LOS			A	D		
Approach Delay (s)	0.0	0.2		34.0		
Approach LOS				D		
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			50.8%	ICU Level of Service	A	
Analysis Period (min)			15			

2018 Total Traffic AM Peak Hour
5: SW 56th Ter & SW Borland Rd

Sagert Farms
4/14/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	78	246	7	5	634	5	31	14	20	8	5	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.2			5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.97			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Frt	1.00	1.00		1.00	1.00			0.96			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1597	1804		1504	1842			1700			1611	
Flt Permitted	0.24	1.00		0.59	1.00			0.87			0.95	
Satd. Flow (perm)	402	1804		927	1842			1509			1546	
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)	88	276	8	6	712	6	35	16	22	9	6	51
RTOR Reduction (vph)	0	0	0	0	0	0	0	16	0	0	46	0
Lane Group Flow (vph)	88	284	0	6	718	0	0	57	0	0	20	0
Confl. Peds. (#/hr)	3						3		40	40		
Heavy Vehicles (%)	13%	5%	0%	20%	3%	0%	0%	0%	5%	0%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.1	54.0		48.3	47.4			7.9			7.9	
Effective Green, g (s)	60.1	54.0		48.3	47.4			7.9			7.9	
Actuated g/C Ratio	0.77	0.69		0.62	0.60			0.10			0.10	
Clearance Time (s)	5.2	5.2		5.2	5.2			5.2			5.2	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	422	1242		577	1113			152			155	
v/s Ratio Prot	c0.02	0.16		0.00	c0.39							
v/s Ratio Perm	0.14			0.01				c0.04			0.01	
v/c Ratio	0.21	0.23		0.01	0.65			0.37			0.13	
Uniform Delay, d1	5.4	4.5		5.8	10.0			32.9			32.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	0.1		0.0	1.4			1.5			0.4	
Delay (s)	5.6	4.6		5.8	11.5			34.5			32.5	
Level of Service	A	A		A	B			C			C	
Approach Delay (s)		4.9			11.4			34.5			32.5	
Approach LOS		A			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			12.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			78.4			Sum of lost time (s)			15.6			
Intersection Capacity Utilization			65.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection												
Intersection Delay, s/veh	51.1											
Intersection LOS	F											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	246	216	8	0	42	219	181	0	8	341	91
Peak Hour Factor	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	3	2	25	2	2	4	2	2	0	2	7
Mvmt Flow	0	251	220	8	0	43	223	185	0	8	348	93
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	28.1	69.5	75.1
HCM LOS	D	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	79%	0%	96%	0%	55%	0%	100%	0%
Vol Right, %	0%	21%	0%	4%	0%	45%	0%	0%	100%
Sign Control	Stop	Stop	Stop						
Traffic Vol by Lane	8	432	246	224	42	400	93	64	69
LT Vol	8	0	246	0	42	0	93	0	0
Through Vol	0	341	0	216	0	219	0	64	0
RT Vol	0	91	0	8	0	181	0	0	69
Lane Flow Rate	8	441	251	229	43	408	95	65	70
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.022	1	0.685	0.589	0.116	1	0.285	0.187	0.189
Departure Headway (Hd)	9.787	9.178	9.822	9.283	9.75	8.972	10.799	10.334	9.653
Convergence, Y/N	Yes	Yes	Yes						
Cap	366	397	369	391	368	404	334	348	372
Service Time	7.532	6.923	7.543	7.003	7.494	6.717	8.529	8.065	7.384
HCM Lane V/C Ratio	0.022	1.111	0.68	0.586	0.117	1.01	0.284	0.187	0.188
HCM Control Delay	12.8	76.3	31.4	24.5	13.8	75.4	17.8	15.4	14.6
HCM Lane LOS	B	F	D	C	B	F	C	C	B
HCM 95th-tile Q	0.1	12.1	4.9	3.6	0.4	12.2	1.2	0.7	0.7

Intersection

Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	93	64	69
Peak Hour Factor	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	4	6	7
Mvmt Flow	0	95	65	70
Number of Lanes	0	1	1	1

Approach

SB

Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	16.1
HCM LOS	C

Lane

2018 Total Traffic AM Peak Hour
7: SW 65th Ave & SW Sagert St

Sagert Farms
4/14/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	362	23	92	12	23	39	112	271	17	21	123	390
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			-2%	
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.91		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	1484		1662	1585		1581	1605		1674	1652	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.67	1.00		0.49	1.00	1.00
Satd. Flow (perm)	1583	1484		1662	1585		1111	1605		862	1652	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	393	25	100	13	25	42	122	295	18	23	134	424
RTOR Reduction (vph)	0	69	0	0	40	0	0	2	0	0	0	208
Lane Group Flow (vph)	393	56	0	13	27	0	122	311	0	23	134	216
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	2%	5%	0%	0%	7%	6%
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	Perm
Protected Phases	4	4		8	8			2 10			6 9	
Permitted Phases							2 10			6 9		6 9
Actuated Green, G (s)	40.7	40.7		5.8	5.8		63.5	63.5		63.5	63.5	63.5
Effective Green, g (s)	40.7	40.7		5.8	5.8		63.5	63.5		63.5	63.5	63.5
Actuated g/C Ratio	0.31	0.31		0.04	0.04		0.49	0.49		0.49	0.49	0.49
Clearance Time (s)	5.0	5.0		5.0	5.0							
Vehicle Extension (s)	3.0	3.0		3.0	3.0							
Lane Grp Cap (vph)	495	464		74	70		542	783		421	806	692
v/s Ratio Prot	c0.25	0.04		0.01	c0.02			c0.19			0.08	
v/s Ratio Perm							0.11			0.03		0.15
v/c Ratio	0.79	0.12		0.18	0.38		0.23	0.40		0.05	0.17	0.31
Uniform Delay, d1	40.8	31.9		59.8	60.4		19.1	21.1		17.5	18.5	20.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.74	0.71	4.27
Incremental Delay, d2	8.5	0.1		1.1	3.5		0.2	0.3		0.0	0.1	0.2
Delay (s)	49.4	32.0		60.9	63.8		19.3	21.4		12.9	13.3	85.9
Level of Service	D	C		E	E		B	C		B	B	F
Approach Delay (s)		45.2			63.4			20.8			66.3	
Approach LOS		D			E			C			E	

Intersection Summary

HCM 2000 Control Delay	47.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

2018 Total Traffic PM Peak Hour
1: SW Nyberg St & 65th Ave/Nyberg St

Sagert Farms
4/14/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	253	807	33	21	708	21	34	3	56	14	7	142	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00	
Satd. Flow (prot)	1787	1869		1752	3516			1800	1615		1749	1599	
Flt Permitted	0.27	1.00		0.21	1.00			0.73	1.00		0.78	1.00	
Satd. Flow (perm)	513	1869		384	3516			1366	1615		1406	1599	
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)	272	868	35	23	761	23	37	3	60	15	8	153	
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	55	0	0	84	
Lane Group Flow (vph)	272	902	0	23	782	0	0	40	5	0	23	69	
Confl. Peds. (#/hr)	1		5	5		1	7					7	
Heavy Vehicles (%)	1%	1%	0%	3%	2%	7%	0%	0%	0%	8%	0%	1%	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Prot	Perm	NA	pt+ov	
Protected Phases	5	2		1	6			8	8		4	4.5	
Permitted Phases	2			6			8			4			
Actuated Green, G (s)	51.4	43.5		38.5	36.6			6.3	6.3		6.3	21.1	
Effective Green, g (s)	51.4	43.5		38.5	36.6			6.3	6.3		6.3	21.1	
Actuated g/C Ratio	0.74	0.62		0.55	0.53			0.09	0.09		0.09	0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0		
Vehicle Extension (s)	2.4	2.5		2.6	2.5			1.6	1.6		1.6		
Lane Grp Cap (vph)	539	1166		249	1846			123	145		127	484	
v/s Ratio Prot	c0.06	c0.48		0.00	0.22				0.00			0.04	
v/s Ratio Perm	0.31			0.05				c0.03			0.02		
v/c Ratio	0.50	0.77		0.09	0.42			0.33	0.04		0.18	0.14	
Uniform Delay, d1	4.0	9.5		8.4	10.1			29.7	28.9		29.3	17.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	3.1		0.1	0.1			0.6	0.0		0.3	0.0	
Delay (s)	4.5	12.6		8.6	10.2			30.3	29.0		29.6	17.8	
Level of Service	A	B		A	B			C	C		C	B	
Approach Delay (s)		10.8			10.2			29.5			19.3		
Approach LOS		B			B			C			B		
Intersection Summary													
HCM 2000 Control Delay			12.0									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.74										
Actuated Cycle Length (s)			69.7									Sum of lost time (s)	18.0
Intersection Capacity Utilization			72.4%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

2018 Total Traffic PM Peak Hour
2: SW 65th Ave & Borland Rd

Sagert Farms
4/14/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	11	7	195	3	194	1	296	316	377	419	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			2%			6%	
Total Lost time (s)		5.6			5.3	5.3	4.8	4.8		4.8	4.8	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes		1.00			1.00	1.00	1.00	0.98		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.92		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1618			1630	1473	1646	1542		1597	1679	
Flt Permitted		0.98			0.95	1.00	0.17	1.00		0.14	1.00	
Satd. Flow (perm)		1618			1630	1473	289	1542		236	1679	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	15	11	7	203	3	202	1	308	329	393	436	4
RTOR Reduction (vph)	0	7	0	0	0	123	0	32	0	0	0	0
Lane Group Flow (vph)	0	26	0	0	206	79	1	605	0	393	440	0
Confl. Peds. (#/hr)	10					10			4	4		
Heavy Vehicles (%)	6%	0%	0%	2%	25%	1%	0%	2%	2%	1%	1%	0%
Turn Type	Split	NA		Split	NA	pt+ov	custom	NA		pm+pt	NA	
Protected Phases	8	8		4	4	4.5	1	6.9		5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		3.3			16.8	49.0	29.5	40.2		55.4	55.4	
Effective Green, g (s)		3.8			17.3	44.7	30.0	41.2		55.9	55.9	
Actuated g/C Ratio		0.03			0.15	0.39	0.26	0.36		0.49	0.49	
Clearance Time (s)		6.1			5.8		5.3			5.3	5.3	
Vehicle Extension (s)		1.0			2.0		1.0			2.5	3.0	
Lane Grp Cap (vph)		53			245	572	93	552		438	816	
v/s Ratio Prot		c0.02			c0.13	0.05	0.00	c0.39		c0.21	0.26	
v/s Ratio Perm							0.00			0.22		
v/c Ratio		0.49			0.84	0.14	0.01	1.10		0.90	0.54	
Uniform Delay, d1		54.7			47.5	22.7	33.0	36.9		38.9	20.6	
Progression Factor		1.00			1.00	1.00	0.59	0.43		1.00	1.00	
Incremental Delay, d2		2.6			21.3	0.0	0.0	59.8		20.5	2.5	
Delay (s)		57.3			68.8	22.7	19.5	75.7		59.4	23.1	
Level of Service		E			E	C	B	E		E	C	
Approach Delay (s)		57.3			46.0			75.6			40.2	
Approach LOS		E			D			E			D	

Intersection Summary

HCM 2000 Control Delay	53.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	26.3
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

2018 Total Traffic PM Peak Hour
3: Proposed Road & SW Borland Rd



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻		↻
Volume (veh/h)	687	15	0	388	10	45
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	755	16	0	426	11	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		None			
Median storage (veh)	2					
Upstream signal (ft)	929					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			771		1190	763
vC1, stage 1 conf vol					763	
vC2, stage 2 conf vol					426	
vCu, unblocked vol			697		1158	687
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	88
cM capacity (veh/h)			824		404	408
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	771	426	60			
Volume Left	0	0	11			
Volume Right	16	0	49			
cSH	1700	1700	407			
Volume to Capacity	0.45	0.25	0.15			
Queue Length 95th (ft)	0	0	13			
Control Delay (s)	0.0	0.0	15.4			
Lane LOS				C		
Approach Delay (s)	0.0	0.0	15.4			
Approach LOS				C		
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			Err%	ICU Level of Service	H	
Analysis Period (min)			15			

2018 Total Traffic PM Peak Hour
4: SW 60th Ave & SW Borland Rd

Sagert Farms
4/14/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	
Volume (veh/h)	762	14	25	344	9	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	847	16	28	382	10	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		TWLTL			
Median storage (veh)	2					
Upstream signal (ft)	1220					
pX, platoon unblocked						
vC, conflicting volume			862		1292	854
vC1, stage 1 conf vol	854					
vC2, stage 2 conf vol	438					
vCu, unblocked vol			862		1292	854
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)	5.4					
tF (s)			2.2		3.5	3.3
p0 queue free %			96		97	100
cM capacity (veh/h)			789		373	361

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	862	28	382	11
Volume Left	0	28	0	10
Volume Right	16	0	0	1
cSH	1700	789	1700	371
Volume to Capacity	0.51	0.04	0.22	0.03
Queue Length 95th (ft)	0	3	0	2
Control Delay (s)	0.0	9.7	0.0	15.0
Lane LOS		A		B
Approach Delay (s)	0.0	0.7		15.0
Approach LOS				B

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		51.0%	ICU Level of Service A
Analysis Period (min)		15	

2018 Total Traffic PM Peak Hour
5: SW 56th Terrace & Borland Rd

Sagert Farms
4/14/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	688	28	11	316	5	19	1	4	2	1	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.2			5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.98			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1797	1869		1805	1876			1647			1640	
Flt Permitted	0.55	1.00		0.29	1.00			0.82			0.96	
Satd. Flow (perm)	1045	1869		560	1876			1408			1577	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	748	30	12	343	5	21	1	4	2	1	15
RTOR Reduction (vph)	0	1	0	0	0	0	0	4	0	0	14	0
Lane Group Flow (vph)	16	777	0	12	348	0	0	22	0	0	4	0
Confl. Peds. (#/hr)	8		1	1		8	3		3	3		3
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	50%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	53.0	52.1		53.0	52.1			4.4			4.4	
Effective Green, g (s)	53.0	52.1		53.0	52.1			4.4			4.4	
Actuated g/C Ratio	0.73	0.71		0.73	0.71			0.06			0.06	
Clearance Time (s)	5.2	5.2		5.2	5.2			5.2			5.2	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	767	1333		421	1338			84			95	
v/s Ratio Prot	0.00	c0.42		c0.00	0.19							
v/s Ratio Perm	0.01			0.02				c0.02			0.00	
v/c Ratio	0.02	0.58		0.03	0.26			0.26			0.04	
Uniform Delay, d1	2.8	5.1		3.6	3.7			32.8			32.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.8		0.0	0.1			1.7			0.2	
Delay (s)	2.8	5.9		3.6	3.8			34.4			32.5	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		5.8			3.8			34.4			32.5	
Approach LOS		A			A			C			C	

Intersection Summary

HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	73.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	244	291	231
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	0	2
Mvmt Flow	0	257	306	243
Number of Lanes	0	1	1	1

Approach

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	43.6
HCM LOS	E

Lane

Intersection

Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	244	291	231
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	0	2
Mvmt Flow	0	257	306	243
Number of Lanes	0	1	1	1

Approach

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	43.6
HCM LOS	E

Lane

2018 Total Traffic PM Peak Hour
7: 65th Ave & Sagert St

Sagert Farms
4/14/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	456	25	111	16	17	31	53	126	19	36	249	336
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			-2%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.90		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1630	1495		1662	1580		1536	1617		1671	1733	1488
Flt Permitted	0.95	1.00		0.95	1.00		0.53	1.00		0.64	1.00	1.00
Satd. Flow (perm)	1630	1495		1662	1580		864	1617		1127	1733	1488
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)	485	27	118	17	18	33	56	134	20	38	265	357
RTOR Reduction (vph)	0	77	0	0	32	0	0	3	0	0	0	79
Lane Group Flow (vph)	485	68	0	17	19	0	56	151	0	38	265	278
Confl. Peds. (#/hr)			1	1					2	2		
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	5%	3%	0%	0%	2%	1%
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	Perm
Protected Phases	4	4		8	8			2			6	
Permitted Phases							2			6		6
Actuated Green, G (s)	45.7	45.7		5.3	5.3		67.0	67.0		67.0	67.0	67.0
Effective Green, g (s)	45.7	45.7		5.3	5.3		67.0	67.0		67.0	67.0	67.0
Actuated g/C Ratio	0.35	0.35		0.04	0.04		0.52	0.52		0.52	0.52	0.52
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	573	525		67	64		445	833		580	893	766
v/s Ratio Prot	c0.30	0.05		0.01	c0.01			0.09			0.15	
v/s Ratio Perm							0.06			0.03		c0.19
v/c Ratio	0.85	0.13		0.25	0.30		0.13	0.18		0.07	0.30	0.36
Uniform Delay, d1	38.9	28.6		60.4	60.6		16.3	16.8		15.8	18.0	18.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.74	0.71	0.52
Incremental Delay, d2	11.1	0.1		2.0	2.7		0.6	0.5		0.2	0.8	1.2
Delay (s)	50.0	28.8		62.4	63.2		16.9	17.3		11.8	13.5	10.9
Level of Service	D	C		E	E		B	B		B	B	B
Approach Delay (s)		45.1			63.0			17.2			12.0	
Approach LOS		D			E			B			B	

Intersection Summary

HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

10:

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1023	1085	1623			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS						
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

2018 Total Traffic PM Peak Hour
11: West Dwy & SW Borland Rd

Sagert Farms
4/14/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	739	0	0	393	0	0	0	0	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	786	0	0	418	0	0	0	0	0	0	0
Pedestrians												11
Lane Width (ft)												12.0
Walking Speed (ft/s)												4.0
Percent Blockage												1
Right turn flare (veh)												
Median type								None				None
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	220	0	0	393	0	11	0			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	220	0	0	393	0	11	0			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	12	100	100	53	100	100			100		
cM capacity (veh/h)	465	898	1091	144	896	1066	1636			1636		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	786	418	0	0								
Volume Left	0	0	0	0								
Volume Right	0	0	0	0								
cSH	898	896	1700	1700								
Volume to Capacity	0.88	0.47	0.00	0.00								
Queue Length 95th (ft)	289	63	0	0								
Control Delay (s)	29.6	12.5	0.0	0.0								
Lane LOS	D	B										
Approach Delay (s)	29.6	12.5	0.0	0.0								
Approach LOS	D	B										
Intersection Summary												
Average Delay				23.7								
Intersection Capacity Utilization			42.2%		ICU Level of Service					A		
Analysis Period (min)			15									

Appendix H
*2018 Total Traffic
Queuing Worksheets*

Queuing and Blocking Report
 2018 Total Traffic AM Peak Hour

4/13/2015

Intersection: 2: SW 65th Ave & SW Borland Rd

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	160	374	764	12	358	209	162
Average Queue (ft)	60	259	247	1	198	98	51
95th Queue (ft)	132	394	542	7	336	173	120
Link Distance (ft)	348		1295		356		1689
Upstream Blk Time (%)					0		
Queuing Penalty (veh)					2		
Storage Bay Dist (ft)		350		150		800	
Storage Blk Time (%)		8	1		15		
Queuing Penalty (veh)		28	2		0		

Intersection: 7: SW 65th Ave & SW Sagert St

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (ft)	99	569	52	96	125	241	72	139	76
Average Queue (ft)	96	303	13	41	53	90	8	33	45
95th Queue (ft)	105	537	39	77	106	184	31	87	81
Link Distance (ft)		4160		387		2242		356	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	75		150		100		150		50
Storage Blk Time (%)	54	1			0	6		2	3
Queuing Penalty (veh)	59	6			1	7		8	4

Zone Summary

Zone wide Queuing Penalty: 116

Queuing and Blocking Report
 2016 Total Traffic PM Peak Hour

4/13/2015

Intersection: 2: SW 65th Ave & Borland Rd

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	TR
Maximum Queue (ft)	89	257	207	6	318	430	328
Average Queue (ft)	32	142	102	0	178	211	132
95th Queue (ft)	70	229	179	4	273	352	258
Link Distance (ft)	334		2590		357		1689
Upstream Blk Time (%)					0		
Queuing Penalty (veh)					0		
Storage Bay Dist (ft)		400		150		575	
Storage Blk Time (%)					20	0	
Queuing Penalty (veh)					0	0	

Intersection: 7: 65th Ave & Sagert St

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (ft)	100	946	51	85	92	128	154	303	75
Average Queue (ft)	98	546	12	33	31	46	25	135	67
95th Queue (ft)	101	983	39	70	69	95	87	264	90
Link Distance (ft)		4159		691		2242		357	
Upstream Blk Time (%)								0	
Queuing Penalty (veh)								0	
Storage Bay Dist (ft)	75		500		100		150		50
Storage Blk Time (%)	60	2			0	1	0	14	6
Queuing Penalty (veh)	82	10			0	0	0	54	16

Zone Summary

Zone wide Queuing Penalty: 163



MEMORANDUM

Date: August 6, 2015

Project #: 17299

To: Tony Doran
City of Tualatin
18880 SW Martinazzi Avenue
Tualatin, OR 97062

From: Chris Brehmer, P.E.; Matt Hughart; and Patrick Marnell

Project: Sagert Farms Housing Development

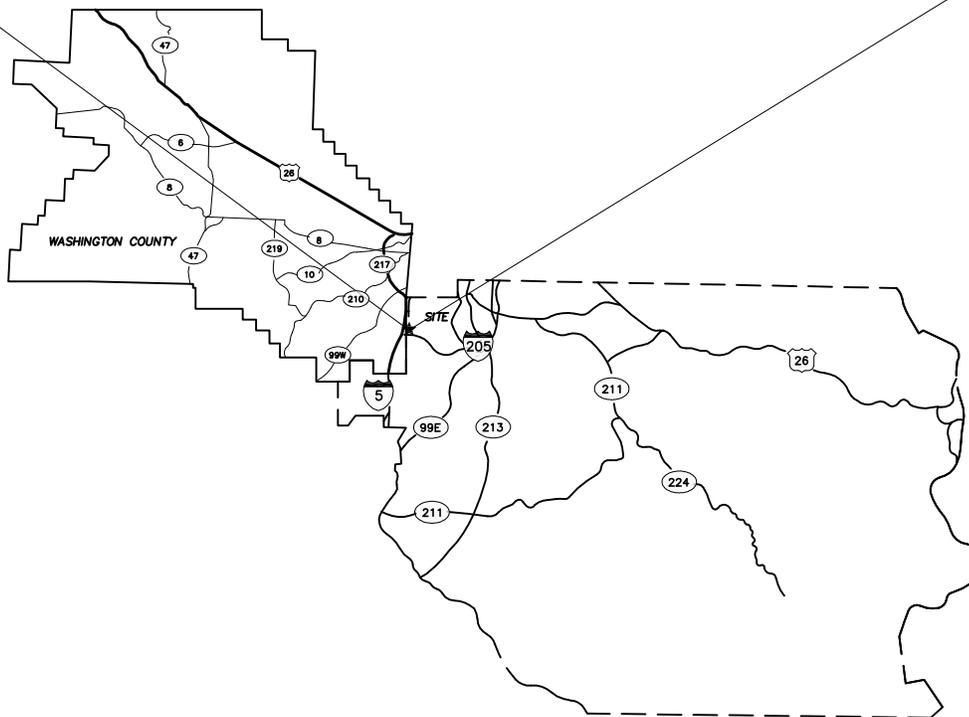
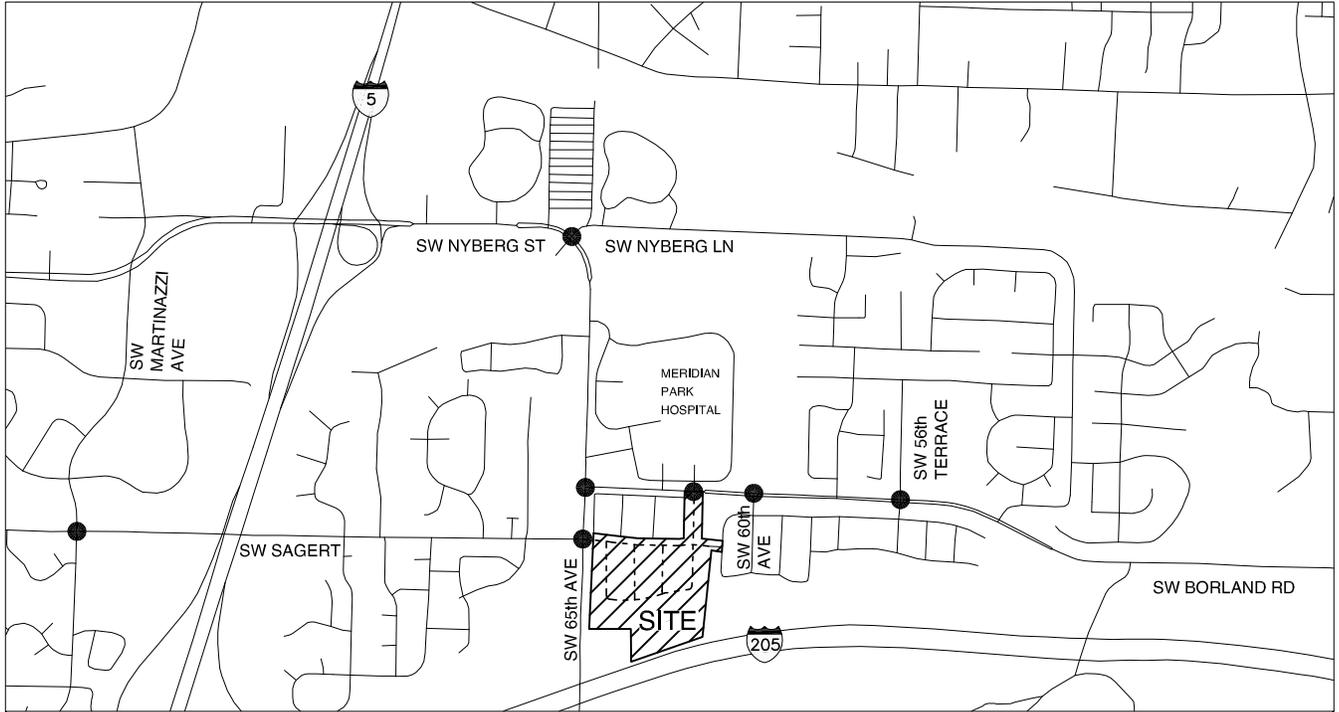
Subject: Updated Borland Road Access Design

This memorandum updates the previously submitted *Sagert Farms Development Transportation Impact Analysis (TIA)* dated June 2, 2015. The TIA was prepared under the development assumption of a limited-access (right-in/right-out) local street connection to SW Borland Road. Based on review comments from Clackamas County Staff, an alternate full-movement local street connection to SW Borland Road has been evaluated. As shown in Figures 1 and 2, the alternate local street connection (herein referred to as SW 61st Terrace) would intersect SW Borland Road opposite the existing Meridian Park Hospital access. This memorandum presents a summary of the updated operations analysis for the Sagert Farms Development under this revised local street connection. For ease of comparison, the figure numbers in this memorandum are consistent with the figure numbers in the previous TIA.

Existing Operations

Supplemental manual turning movement counts were collected at the Meridian Park Hospital accesses located on the north side of Borland Road in July 2015. These traffic counts were collected during the morning (7:00 to 9:00 a.m.) and evening (4:00 to 6:00 p.m.) peak time periods. These counts were combined with the January 2015 turning movement counts presented in the previously submitted TIA to estimate existing traffic conditions at the existing hospital driveways. *Attachment "A" contains the additional traffic count worksheets.*

Figure 3 illustrates the existing lane configurations and traffic control devices at the study intersections, including the SW Borland Road/Meridian Park Hospital access intersection. Figures 4 and 5 summarize the operational analyses for the updated study intersections during the existing weekday AM and PM peak hours. As shown in these figures, the existing SW Borland Road/Meridian Park Hospital access intersection operates within acceptable LOS and V/C ratio standards during the existing a.m. and p.m. peak hours. *Attachment "B" contains the additional existing traffic operation worksheets.*



LEGEND

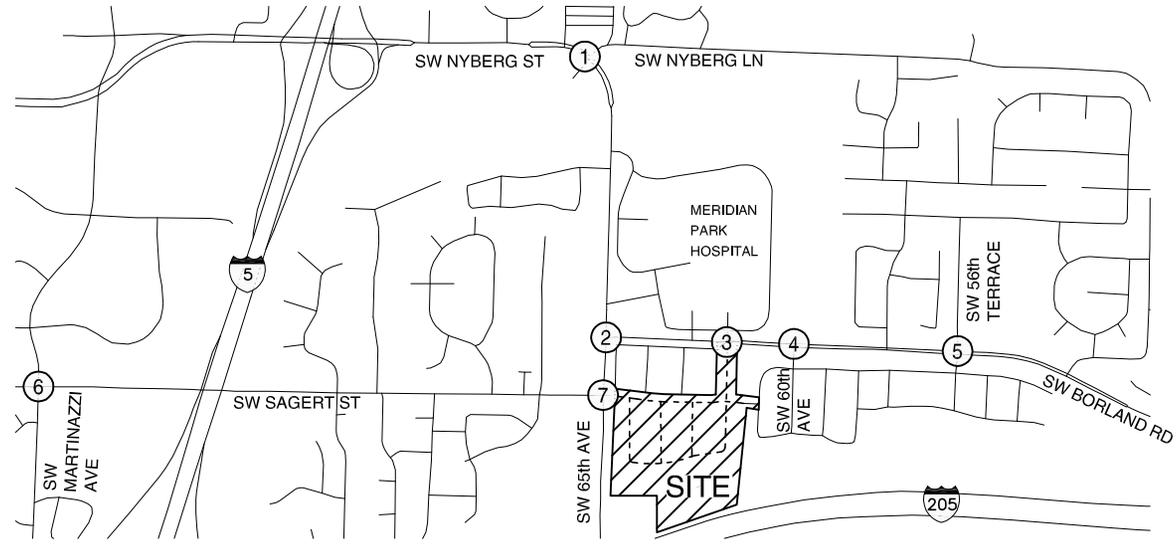
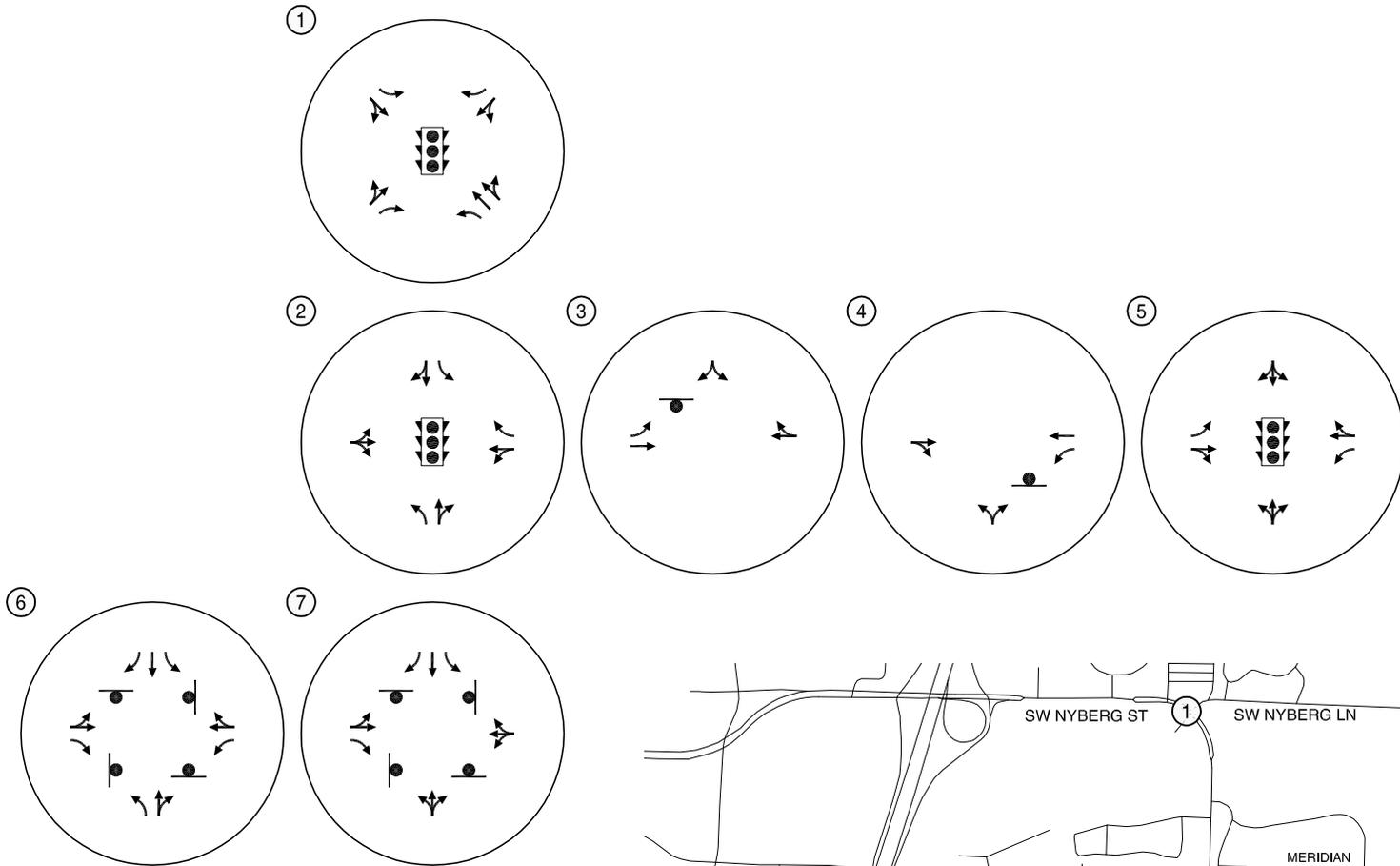
- - STUDY INTERSECTION

**SITE VICINITY MAP
TUALATIN, OREGON**

**FIGURE
1**

\\kittelso.com\is\H_Portland\profile\17299 - Sagert Farms\dwgs\figs\17299_figs_7.27.2015.dwg Aug 05, 2015 - 4:57pm - pmamell Layout Tab: 01 Site Vic

H:\profile\17299 - Sagert Farms\dwg\figs\17299_fig_7_27_2015.dwg Aug 06, 2015 - 3:54pm - pmarmell Layout Tab: 03 Lane Config

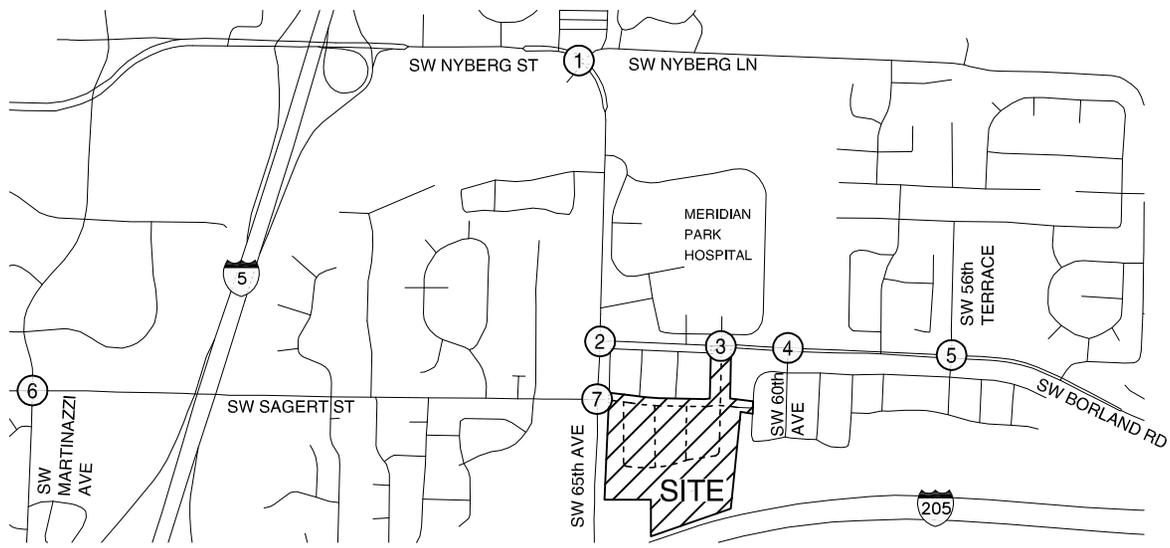
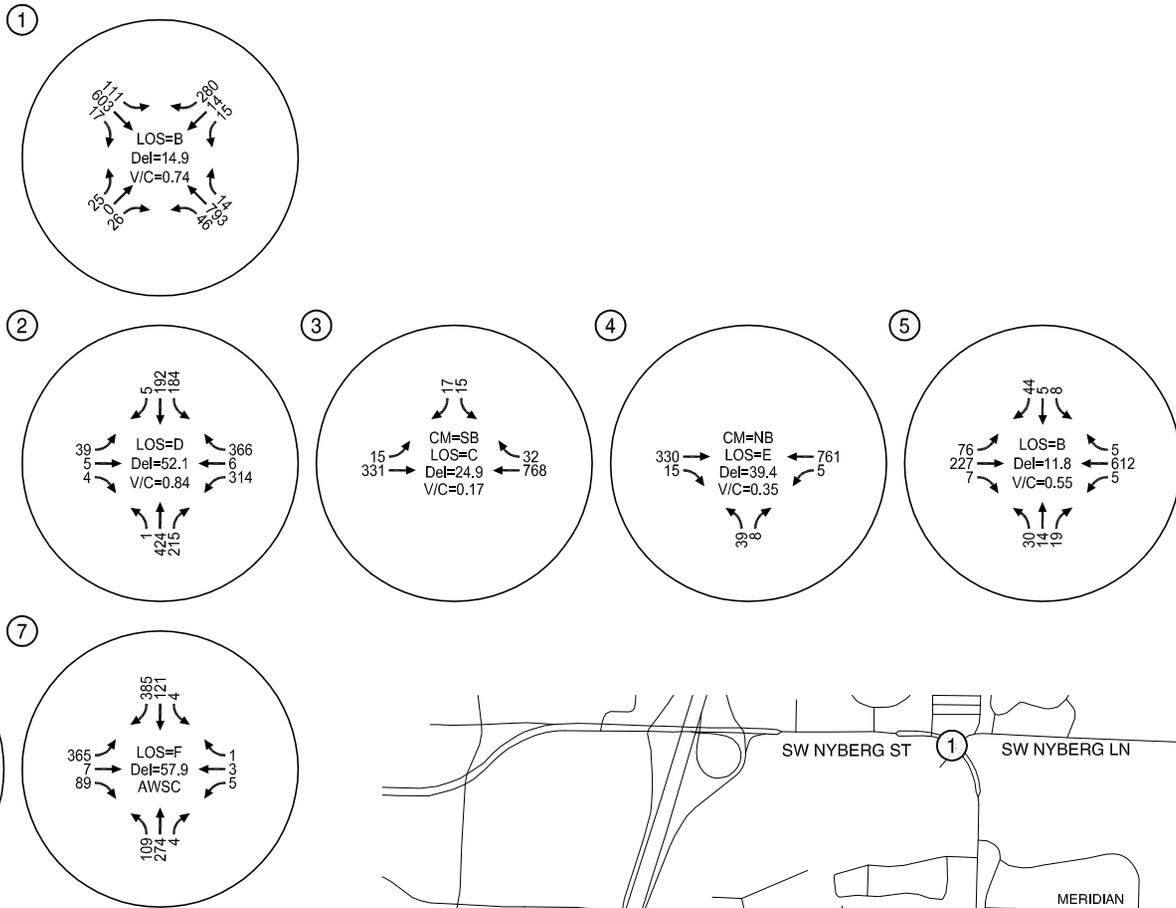


LEGEND

-  - STOP SIGN
-  - TRAFFIC SIGNAL

EXISTING LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES TUALATIN, OREGON

FIGURE 3



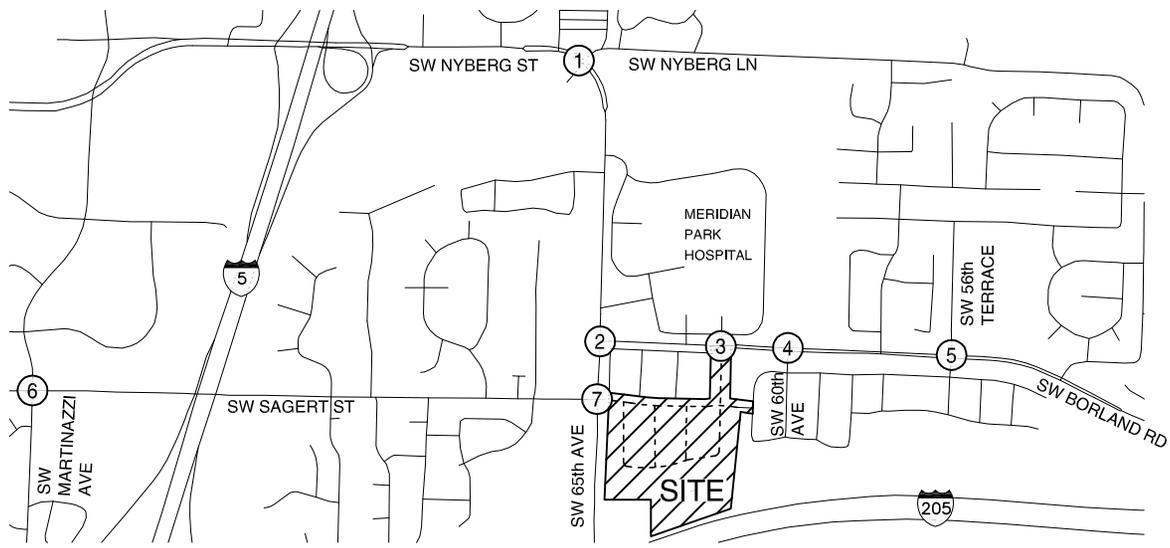
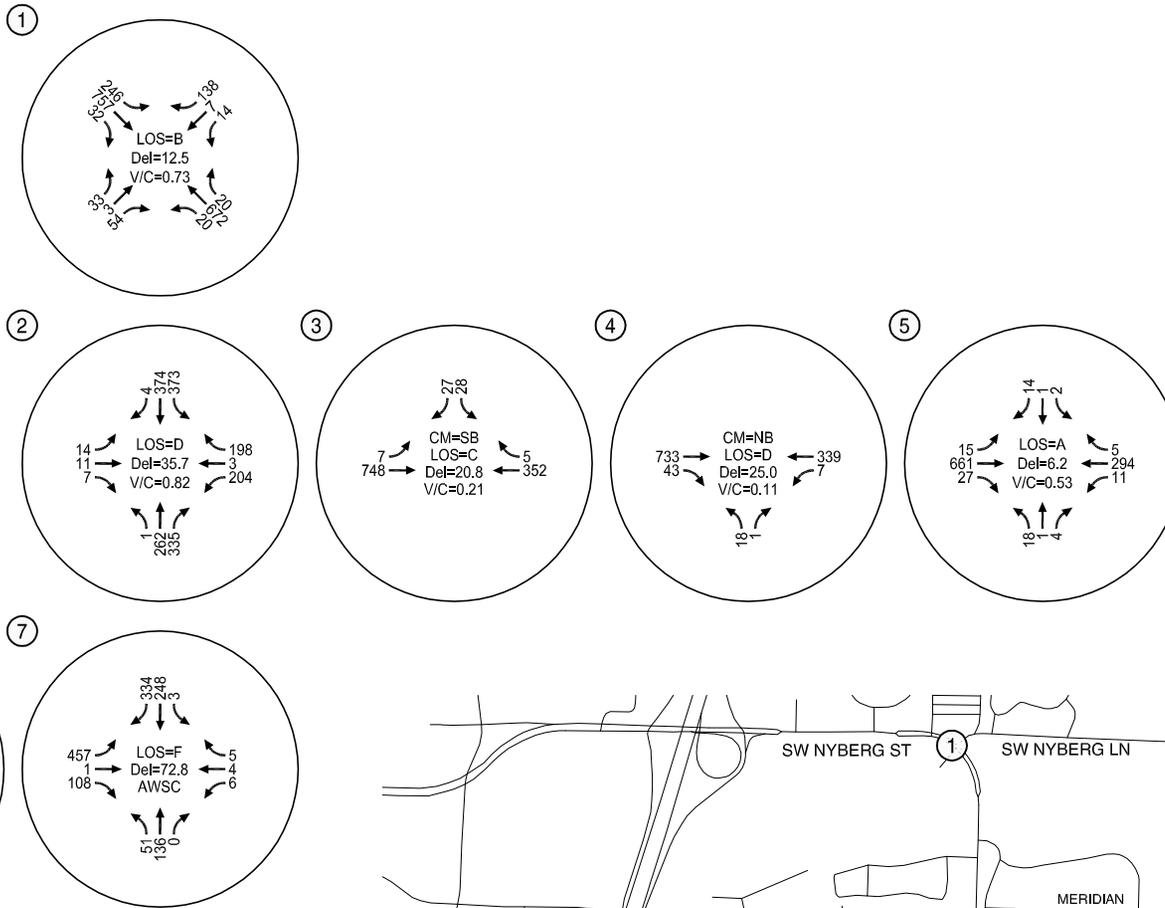
LEGEND

- CM = CRITICAL MOVEMENT (TWSC)
- LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC)/CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
- Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
- TWSC = TWO-WAY STOP CONTROL
- AWSC = ALL-WAY STOP CONTROL

EXISTING TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR
TUALATIN, OREGON

FIGURE
4

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LEGEND

- CM = CRITICAL MOVEMENT (TWSC)
- LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC)/CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
- Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
- TWSC = TWO-WAY STOP CONTROL
- AWSC = ALL-WAY STOP CONTROL

EXISTING TRAFFIC CONDITIONS
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

FIGURE
5

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2018 Background Operations

Year 2018 forecast background traffic volumes were developed as described in the previously submitted TIA. Figures 6 and 7 summarize the operational analyses for the updated study intersections during the forecast year 2018 background weekday a.m. and p.m. peak hours. As shown in these figures, the SW Borland Road/Meridian Park Hospital access intersection is forecast to operate within acceptable LOS and V/C ratio standards during the forecast year 2018 background a.m. and p.m. peak hours. *Attachment "C" contains the additional background traffic operation worksheets.*

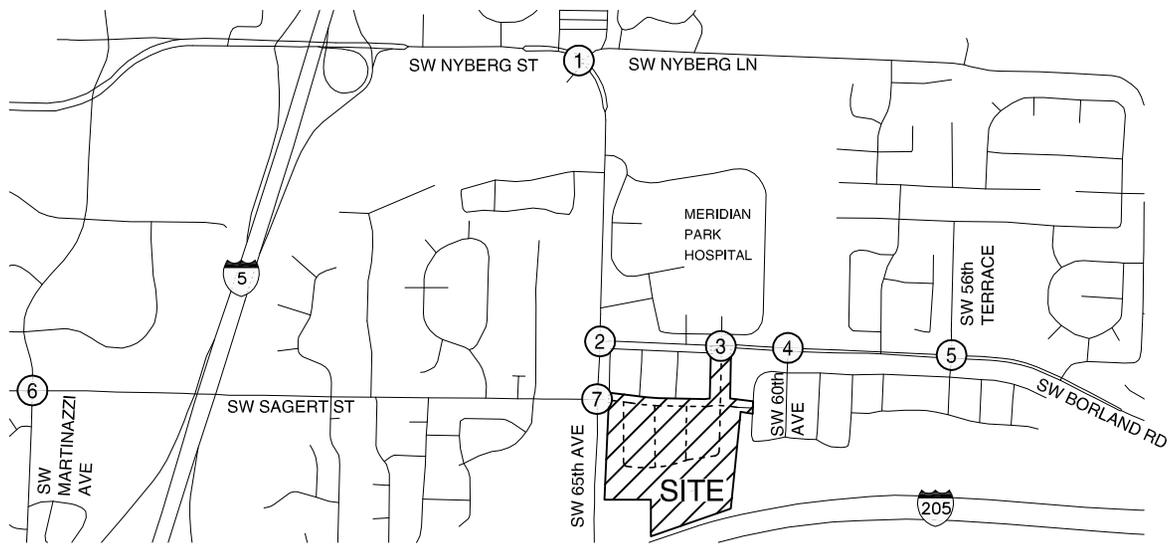
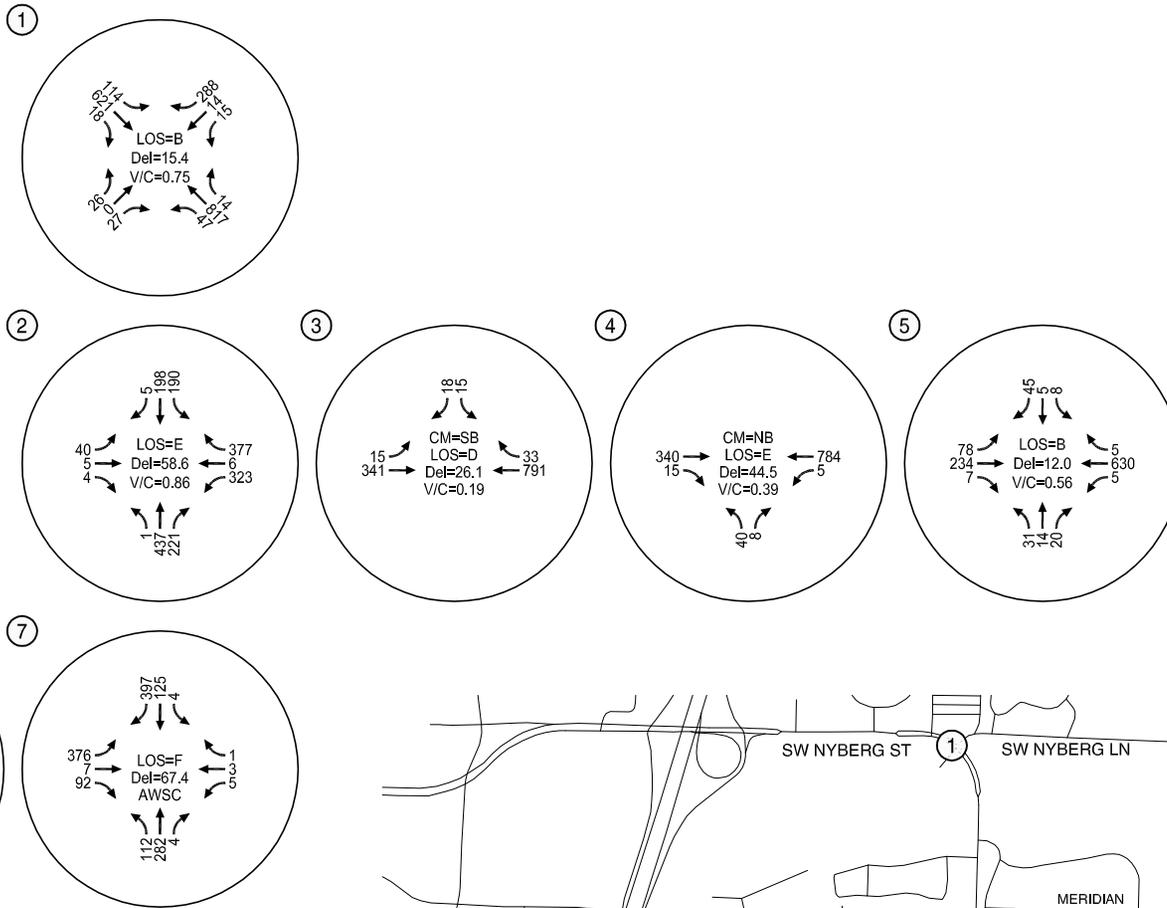
Proposed Development Plan

The proposed 79-home subdivision development remains as described in the previously submitted TIA, except for the access to SW Borland Road. Instead of a RIRO access to SW Borland Road, the updated development plan proposes the construction SW 61st Terrace with a full-movement public intersection at SW Borland Road. This local street would align with the existing Meridian Park access creating the SW Borland Road/Meridian Park Hospital access/SW 61st Terrace intersection.

A left-turn lane warrant analysis was performed to determine if a westbound left-turn lane would be needed at the SW Borland Road/Meridian Park Hospital access/Proposed SW 61st Terrace intersection. Based on the methodology from *Volume Warrants for Left-Turn Storage Lanes at Unsignalized Grade Intersections* by Harmelink, a westbound left-turn lane is warranted at this intersection under p.m. peak hour conditions. *Attachment "D" contains the additional background traffic operation worksheets.* Figure 8 illustrates the proposed/assumed lane configurations and traffic control devices at all of the study intersections.

Re-Routing of Existing Volumes and Generated Trips

The previously submitted TIA accounted for changes to study area travel patterns for a proposed RIRO access to SW Borland Road. The proposed SW Borland Road/Meridian Park Hospital access/SW 61st Terrace intersection will allow for left-turn movements which will result in further changes to the study area travel patterns. Figures 9 and 10 summarize the more detailed rerouting of existing traffic shown in Appendix F at the formal study area intersections during the weekday a.m. and p.m. peak hours. Figures 11 and 12 illustrate the trip distribution pattern and the updated assignment of site-generated trips to the study area intersections during the weekday a.m. and p.m. peak hours, respectively.



LEGEND

- CM = CRITICAL MOVEMENT (TWSC)
- LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC)/CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
- Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
- TWSC = TWO-WAY STOP CONTROL
- AWSC = ALL-WAY STOP CONTROL

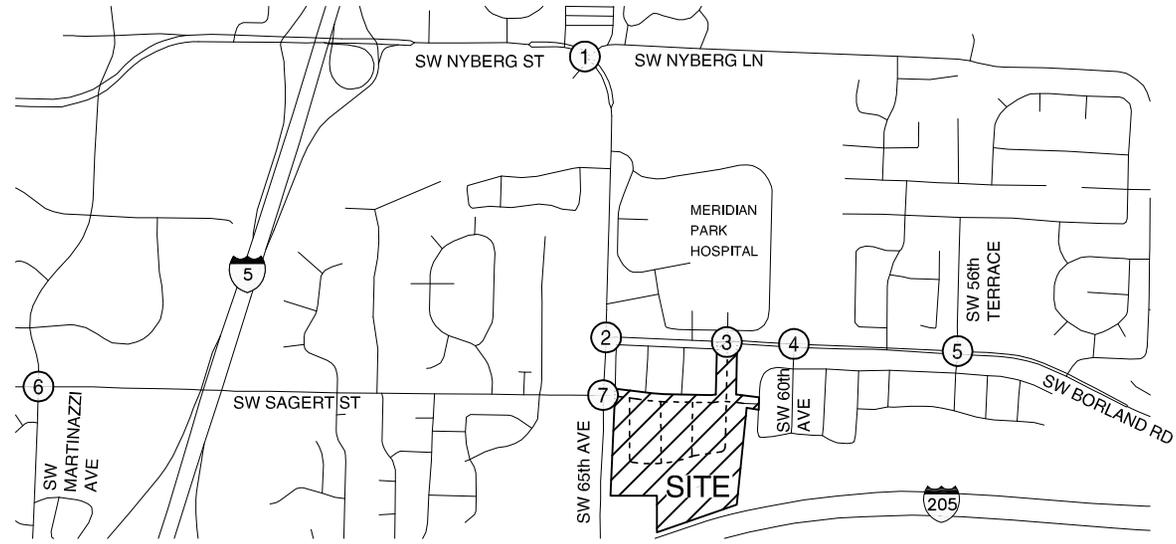
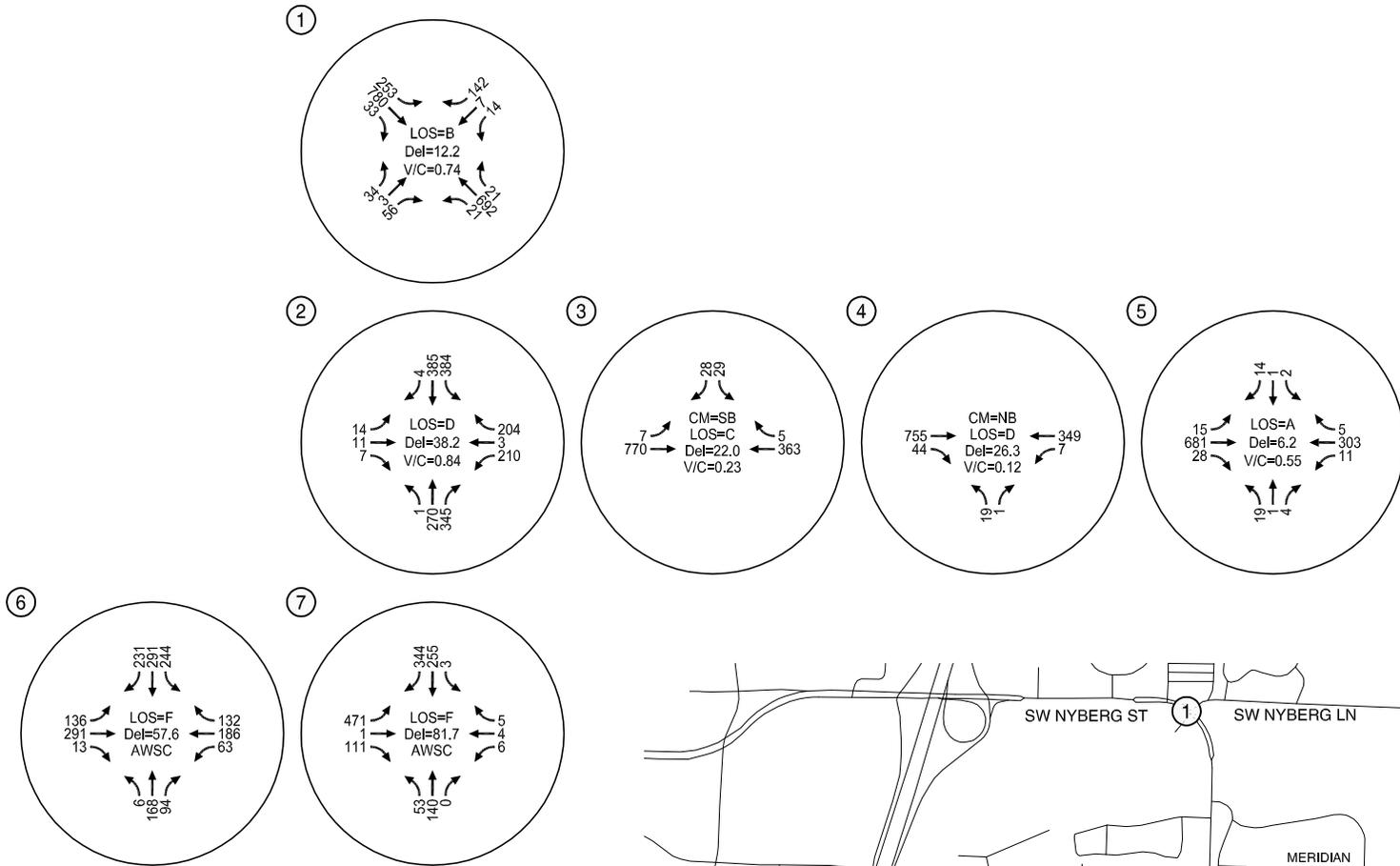
2018 BACKGROUND TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR
TUALATIN, OREGON

FIGURE
6

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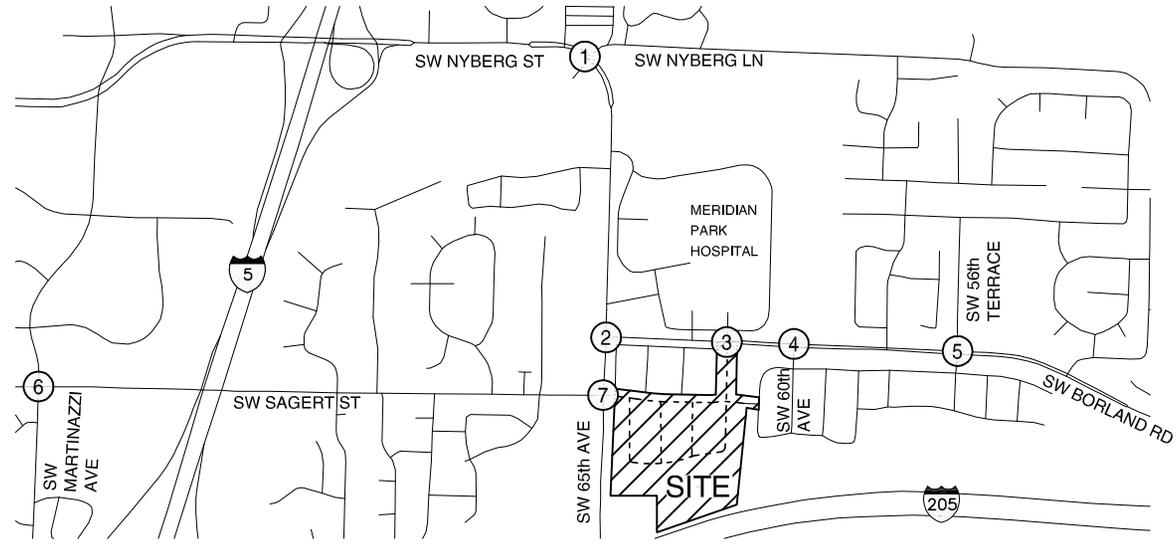
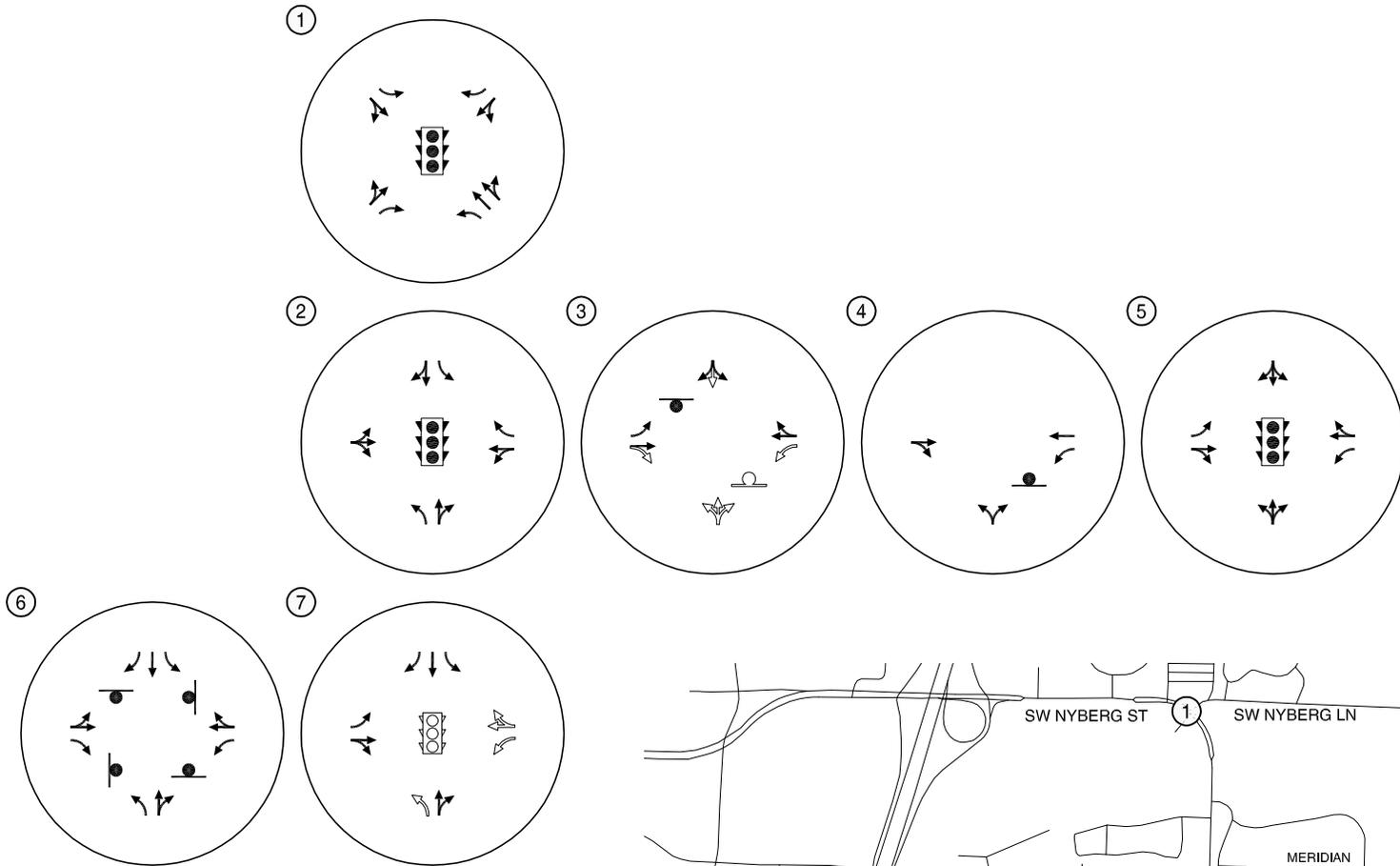


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- Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
- TWSC = TWO-WAY STOP CONTROL
- AWSC = ALL-WAY STOP CONTROL

2018 BACKGROUND TRAFFIC CONDITIONS
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

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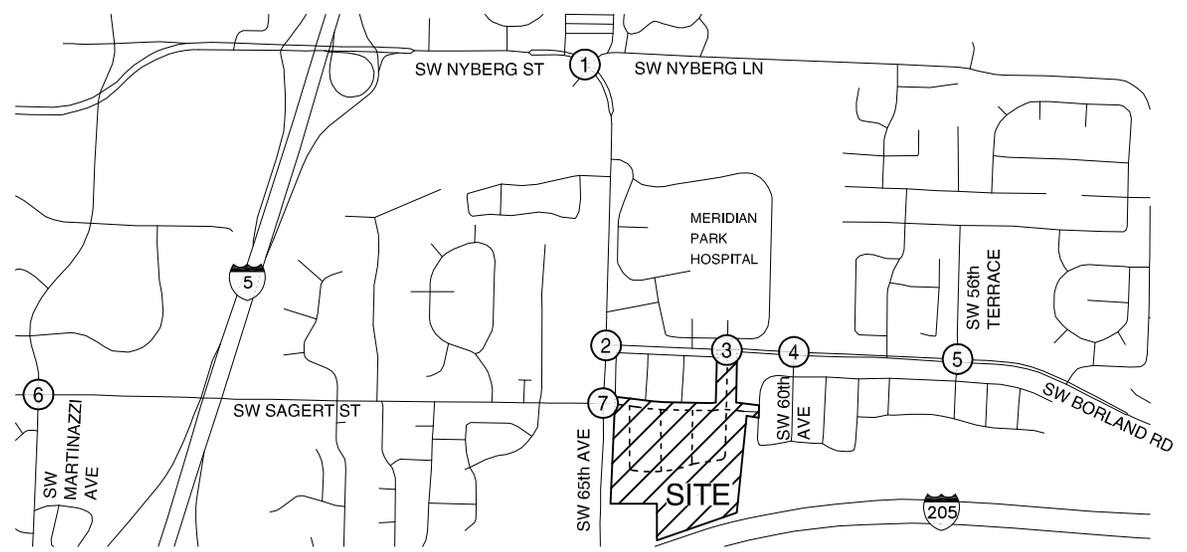
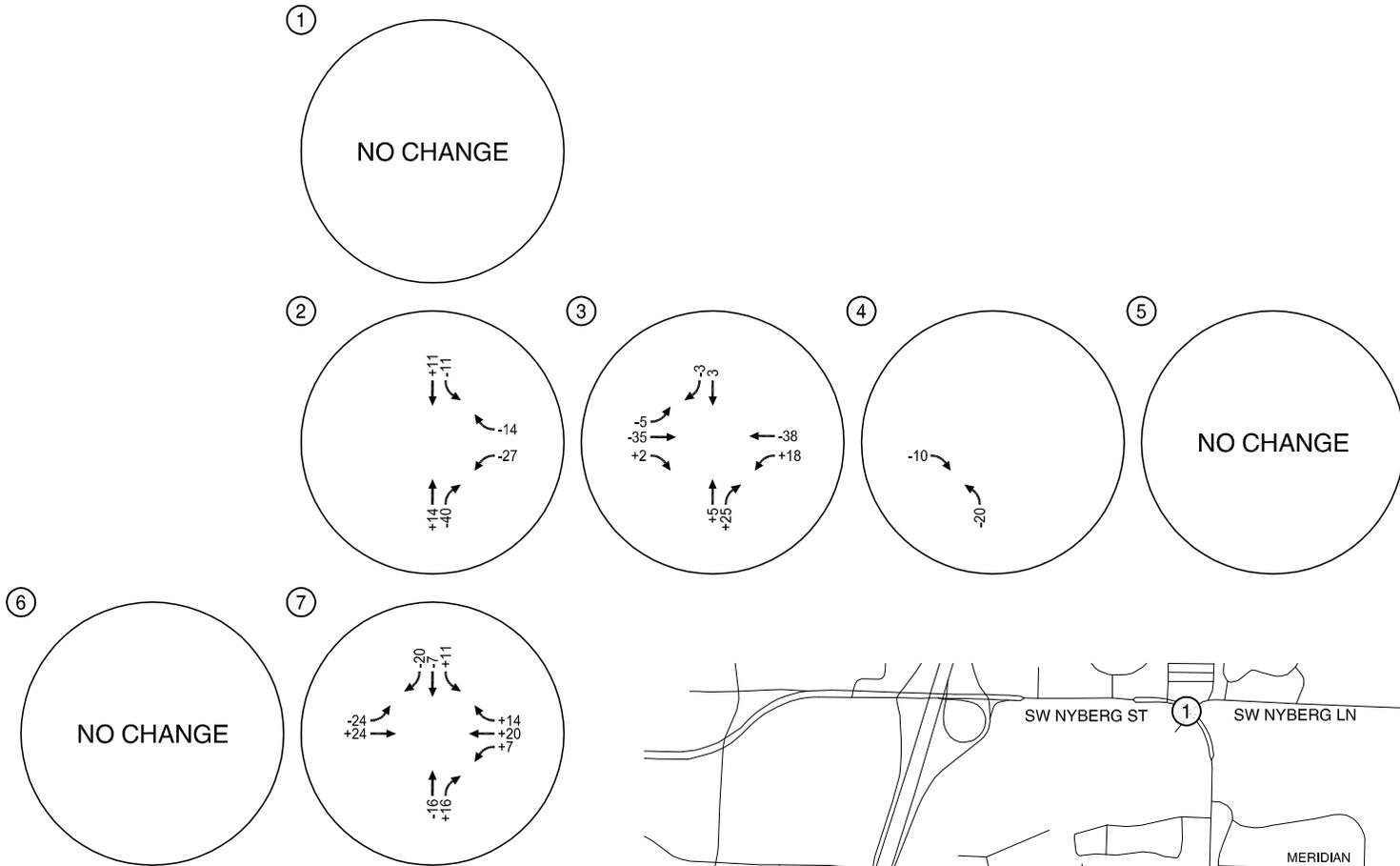
LEGEND

- STOP SIGN
- TRAFFIC SIGNAL
- PROPOSED

PROPOSED LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES TUALATIN, OREGON



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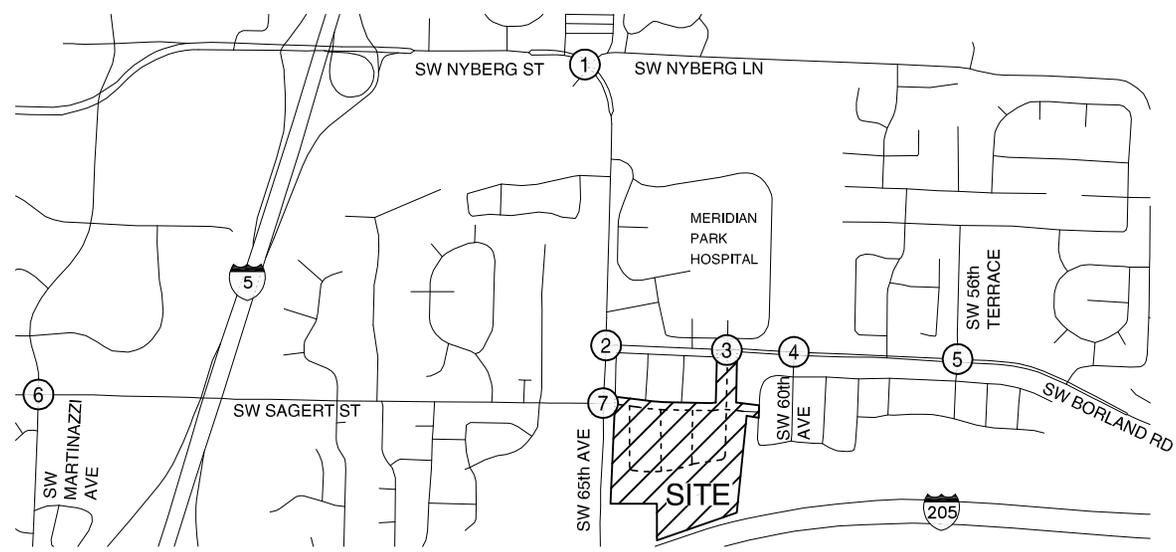
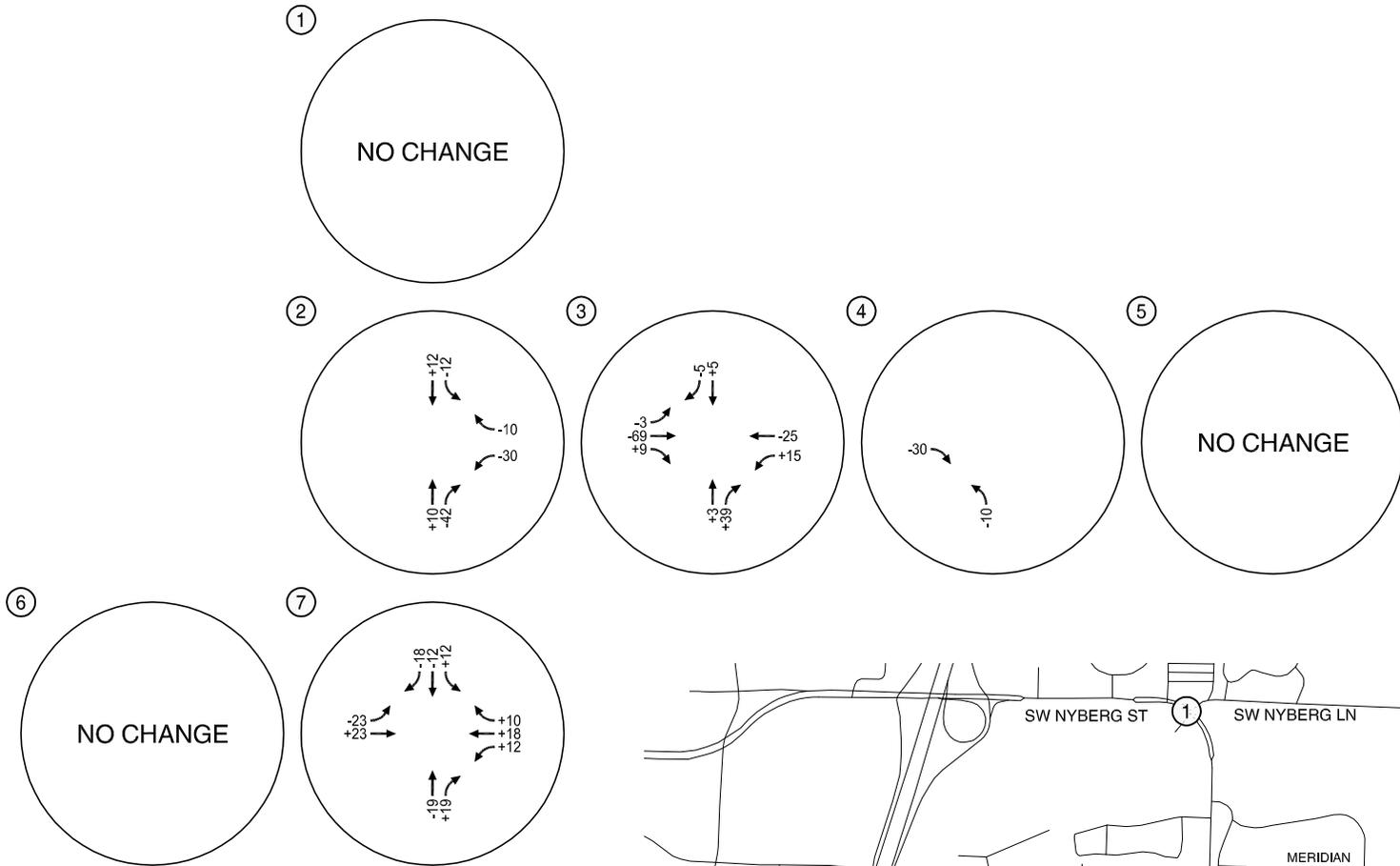


2018 RE-ROUTED TRAFFIC
WEEKDAY AM PEAK HOUR
TUALATIN, OREGON

FIGURE
9



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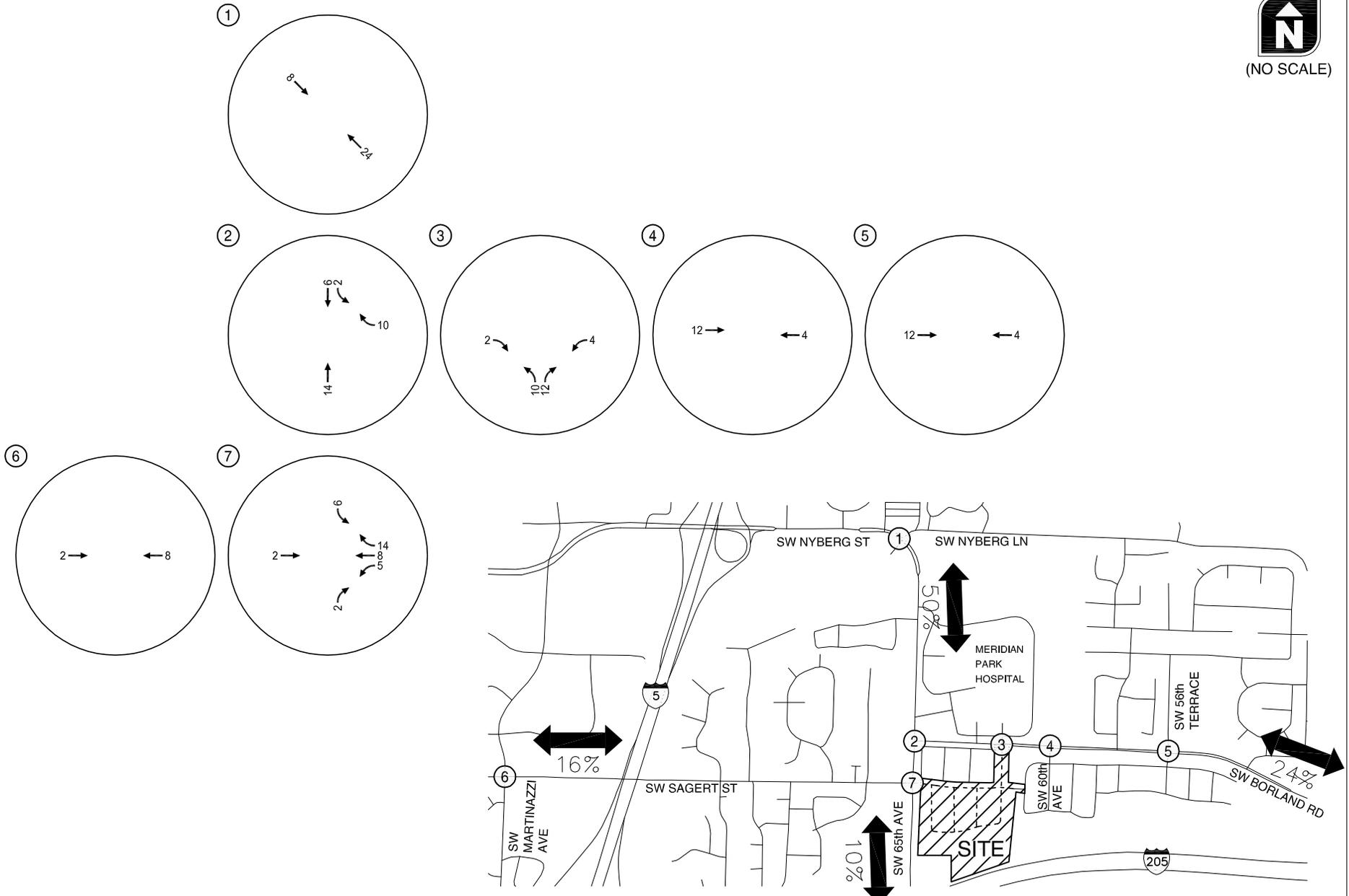


2018 RE-ROUTED TRAFFIC
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

FIGURE
10



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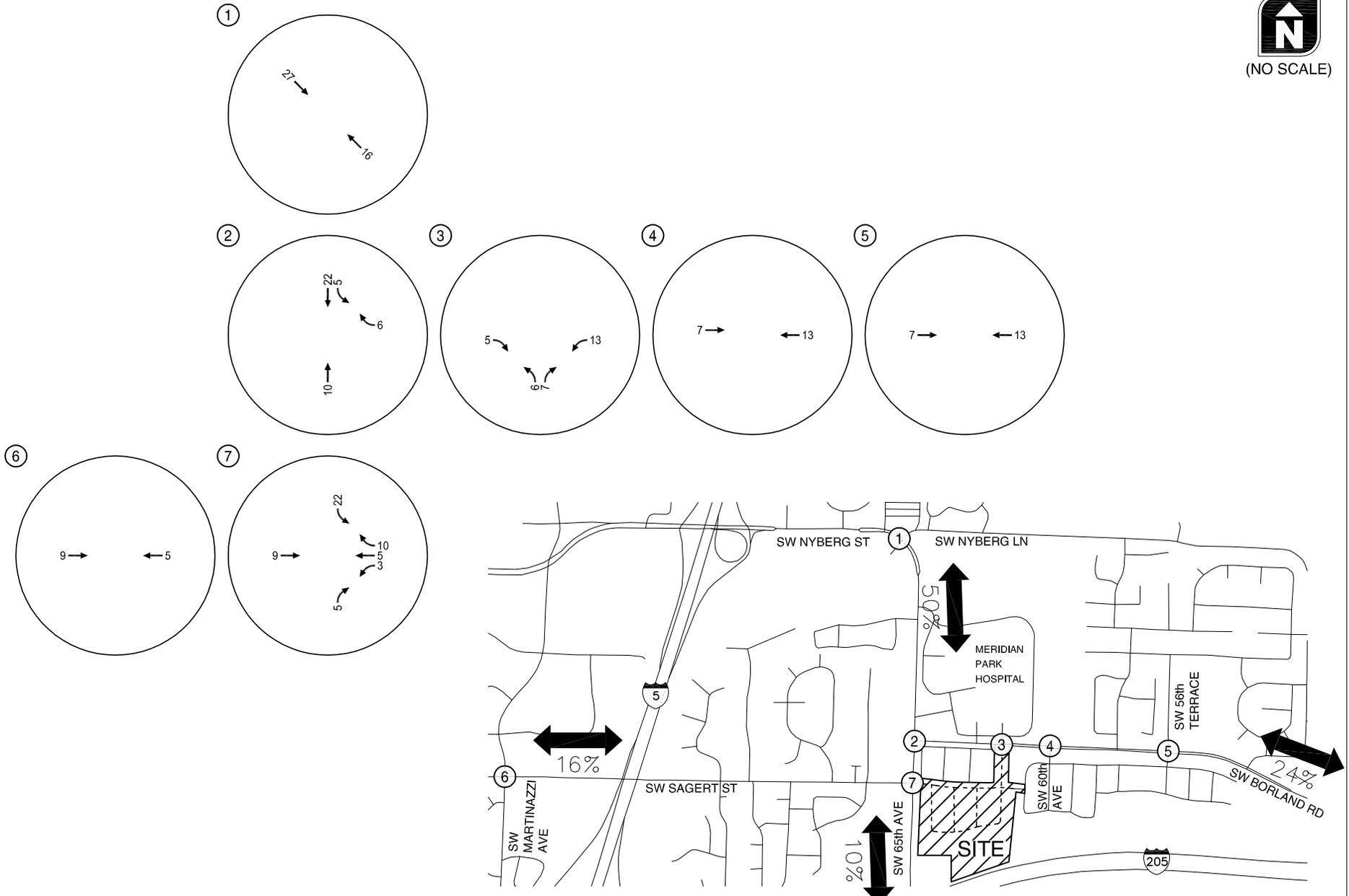


SITE-GENERATED TRIPS AND TRIP DISTRIBUTION WEEKDAY AM PEAK HOUR TUALATIN, OREGON

FIGURE 11



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**SITE-GENERATED TRIPS AND TRIP DISTRIBUTION
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON**

**FIGURE
12**

2018 Total Traffic Operations

Year 2018 forecast total traffic volumes were developed as described in the previously submitted TIA, but accounting for the above described changes in travel patterns resulting from the proposed SW Borland Road/Meridian Park Hospital access/Proposed SW 61st Terrace intersection. Figures 13 and 14 summarize the operational analysis for all study intersections during the forecast year 2018 total traffic weekday a.m. and p.m. peak hours.

As shown in these figures, all study intersections, with the exception of the SW Martinazzi Avenue/SW Sagert Street intersection, are forecast to operate within acceptable LOS and V/C ratio standards during the forecast year 2018 total traffic a.m. and p.m. peak hours (consistent with the June 2, 2015 TIA). The SW Martinazzi Avenue/SW Sagert Street intersection is forecast to continue to operate at LOS F and is addressed in the previously submitted TIA. *Attachment "E" contains the updated total traffic operation worksheets.*

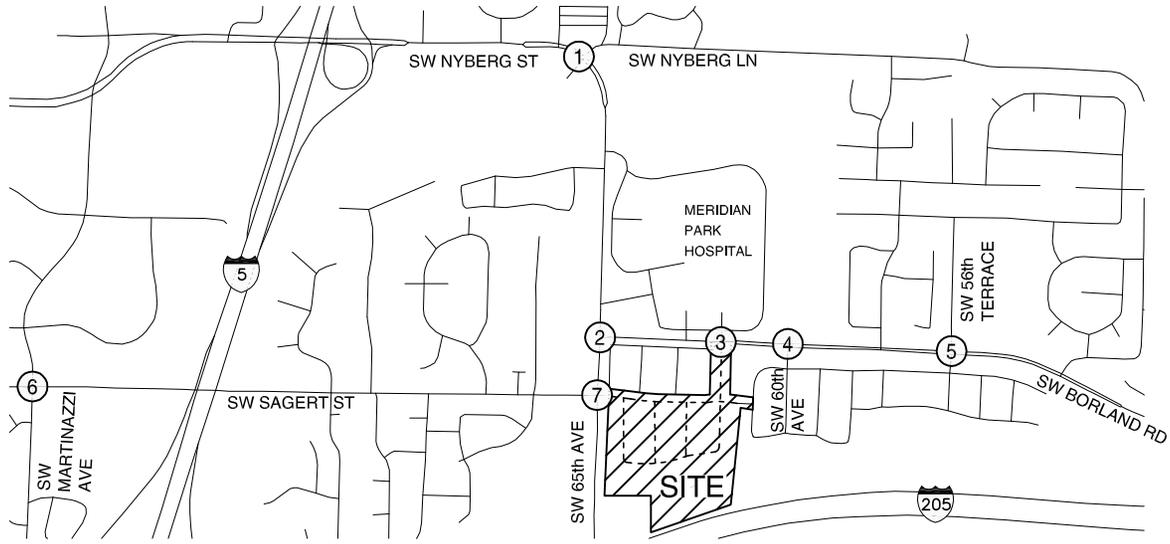
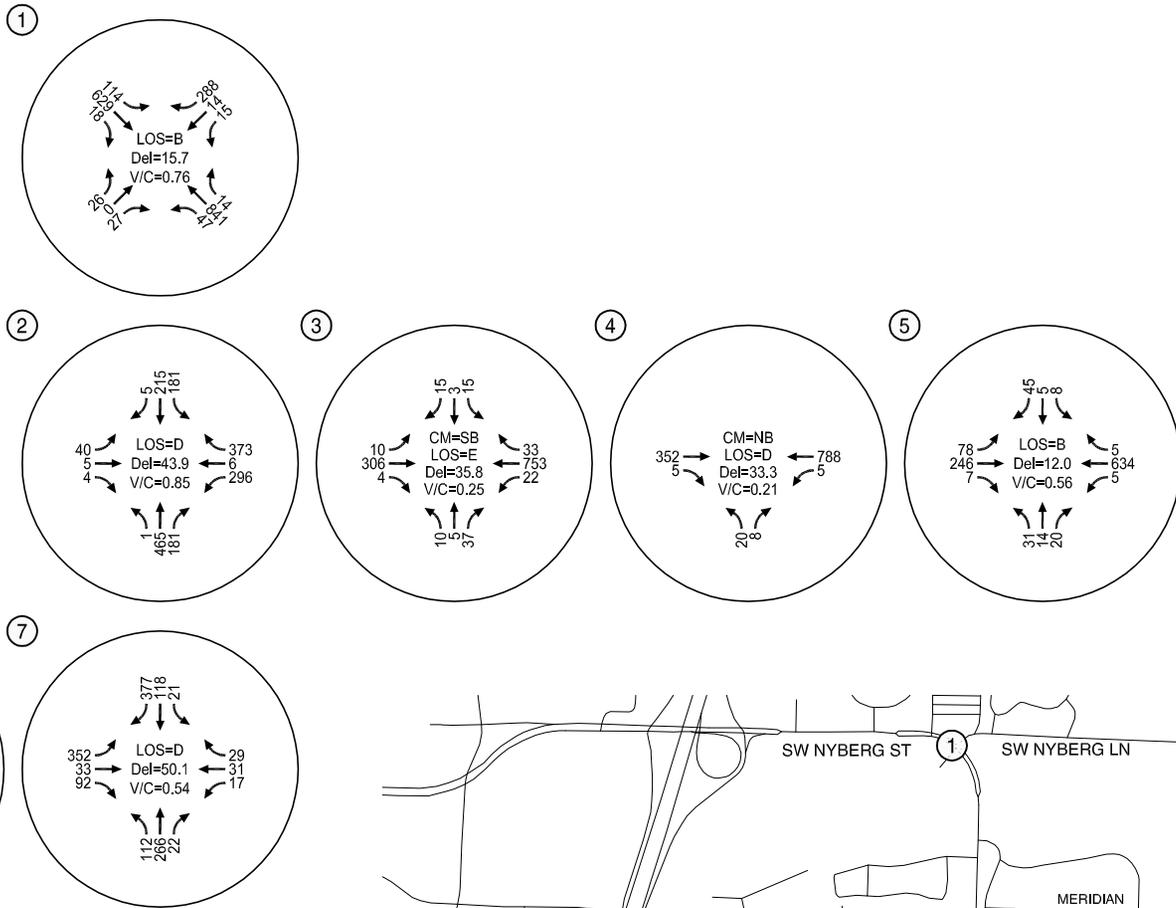
Queuing

Synchro was used to estimate the 95th percentile queue length in the proposed westbound left-turn lane at the newly proposed SW Borland Road local street connection. The resulting 95th percentile queue is forecast to be 25 feet or less during the weekday a.m. and p.m. total traffic conditions. *The total traffic operation worksheets (Attachment "E") display the results of the 95th percentile queuing analysis.*

Preliminary Sight Distance Measurement

Preliminary intersection sight distance measurements were made at the proposed SW 61st Terrace connection to SW Borland Road in recognition that there are a large grove of sequoia trees located in the southeast quadrant of the future intersection. Using field measurements and detailed survey information, it was preliminarily determined that sufficient¹ intersection sight distance exists for vehicles on the northbound approach. This is illustrated in Exhibit 1.

¹¹ Clackamas County measures intersection sight distance using a design speed that is equal to the existing posted speed plus 5 mph. This section of SW Borland Road is posted at 35 mph, so the intersection sight distance calculations are based on a 40 mph speed. Using 40 mph, the County-required intersection sight distance looking to the east along SW Borland Road (for left-turns) would be 445 feet. The county-required intersection sight distance looking to the west along Borland Road (for right-turns) would be 385 feet.



LEGEND

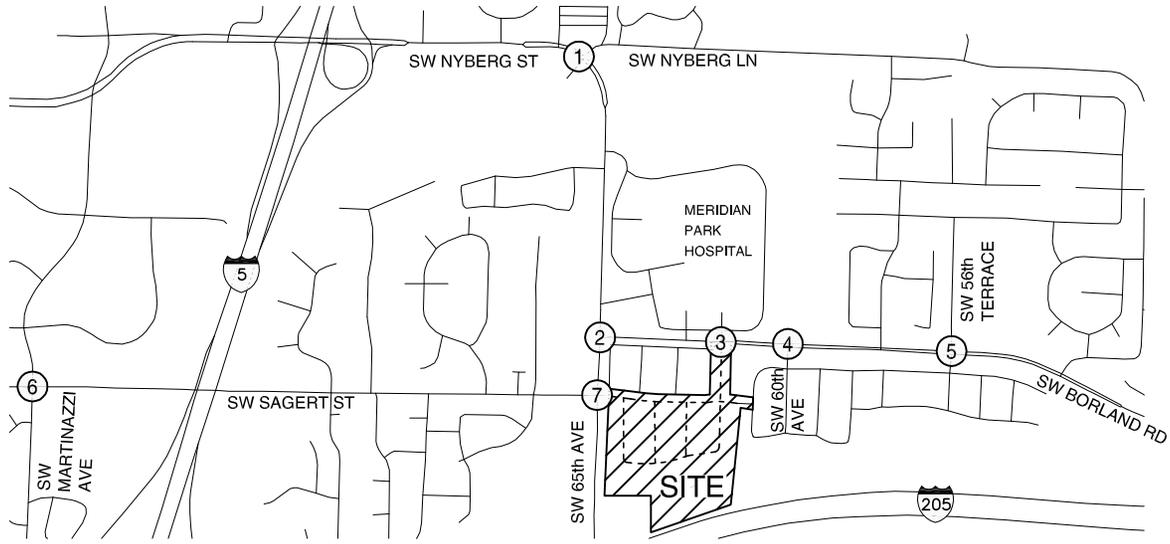
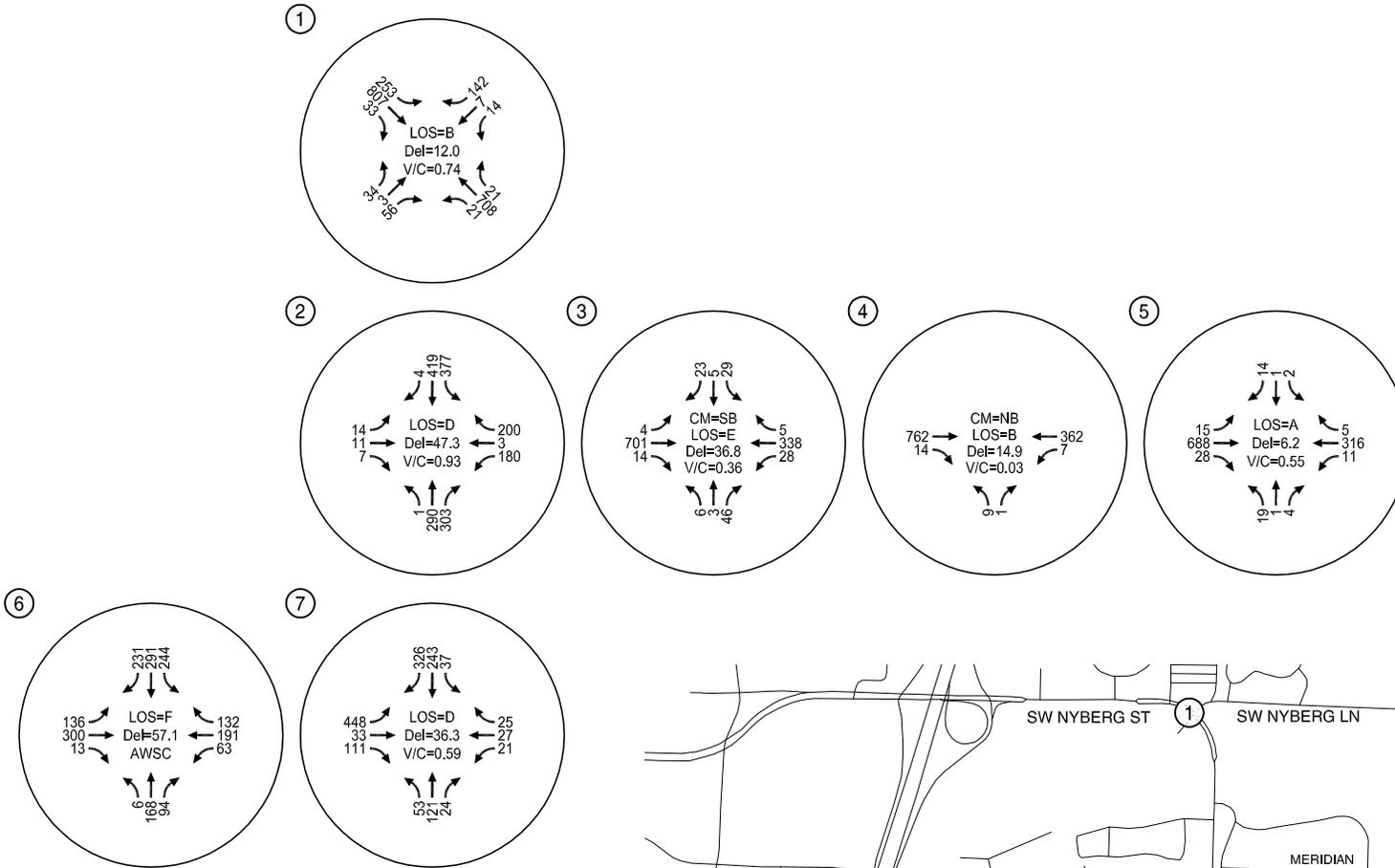
- CM = CRITICAL MOVEMENT (TWSC)
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- Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
- TWSC = TWO-WAY STOP CONTROL
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2018 TOTAL TRAFFIC CONDITIONS
 WEEKDAY AM PEAK HOUR
 TUALATIN, OREGON **FIGURE 13**

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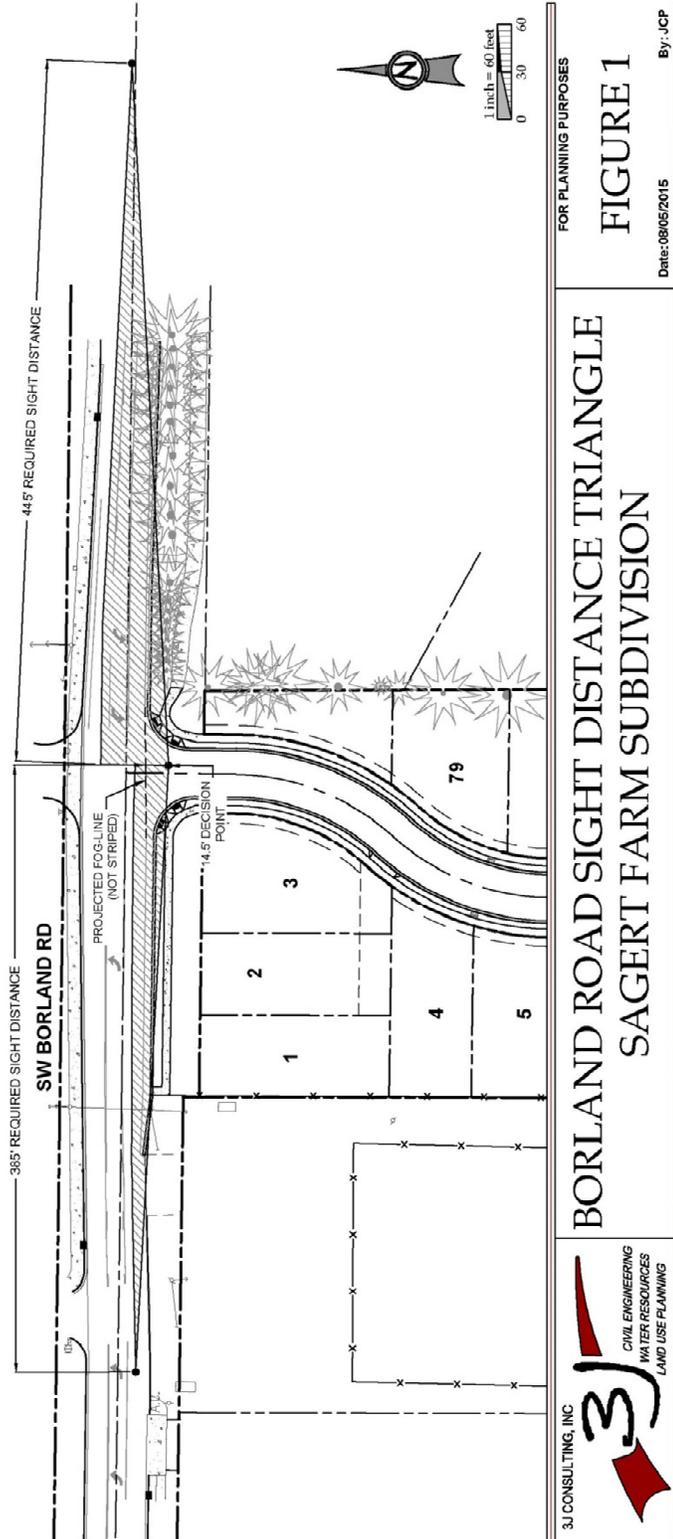
LEGEND

- CM = CRITICAL MOVEMENT (TWSC)
- LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC)/CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
- Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
- TWSC = TWO-WAY STOP CONTROL
- AWSC = ALL-WAY STOP CONTROL

2018 TOTAL TRAFFIC CONDITIONS
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

FIGURE
14

Exhibit 1 – SW Borland Road/SW 61st Terrace Preliminary Sight Distance Exhibit (as prepared by 3J Consulting, Inc. 8/6/15)



Findings

The following list replaces the findings presented previously submitted TIA.

- The existing SW Borland Road/Meridian Park Hospital access intersection operates at acceptable levels of service during the existing weekday a.m. and p.m. peak hours.
- The SW Borland Road/Meridian Park Hospital access intersection is forecast to operate at acceptable levels of service during the forecast year 2018 background weekday a.m. and p.m. peak hours.
- The proposed SW Borland Road/Meridian Park Hospital access intersection/SW 61st Terrace intersection meets the volume-based warrants a westbound left-turn lane.
- The SW Borland Road/Meridian Park Hospital access intersection/SW 61st Terrace intersection is forecast to operate at acceptable levels of service during forecast year 2018 total traffic weekday a.m. and p.m. peak hours.
- All other study intersections are forecast to operate at levels of service and V/C ratios similar to those as described in the previously submitted TIA.
- Preliminary measurements have indicated that sufficient intersection sight distance exists at the proposed northbound approach of SW 61st Terrace at SW Borland Road.

Recommendations

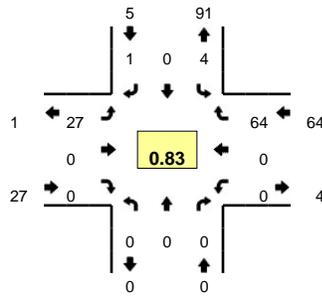
The following list supplements the mitigation measures recommended in the presented previously submitted TIA.

- The SW Borland Road/Meridian Park Hospital access intersection/SW 61st Terrace intersection should be constructed with a westbound left-turn lane.
- Landscaping, signage, and above ground utilities near the SW Borland Road/Meridian Park Hospital access intersection/SW 61st Terrace intersection should be located and maintained to ensure adequate sight distance.

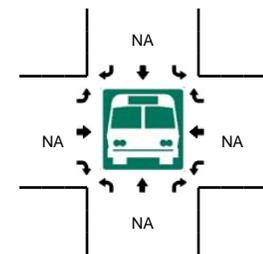
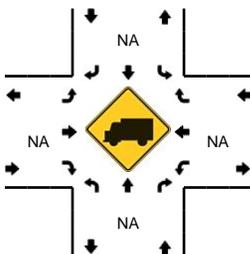
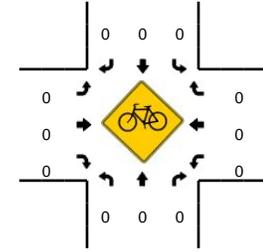
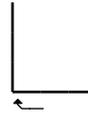
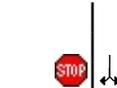
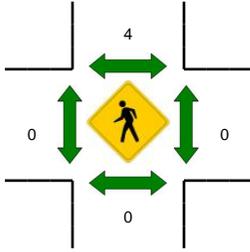
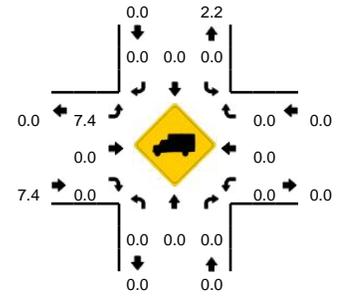
Attachment A
*Additional Traffic Count
Worksheets*

LOCATION: Meridian Park Hospital Dwy -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13541803
DATE: Wed, Jul 15 2015



Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 8:00 AM -- 8:15 AM

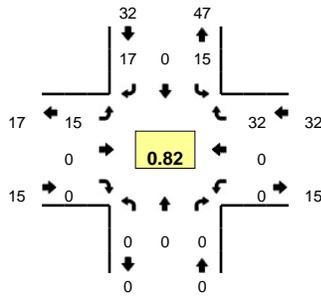


5-Min Count Period Beginning At	Meridian Park Hospital Dwy (Northbound)				Meridian Park Hospital Dwy (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:30 AM	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	5	0	8	
7:35 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	5	0	7	
7:40 AM	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	2	0	6	
7:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	7	0	8	
7:50 AM	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	5	0	9	
7:55 AM	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	4	0	8	
8:00 AM	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	6	0	9	
8:05 AM	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	6	0	8	
8:10 AM	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	9	0	12	
8:15 AM	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	5	0	8	
8:20 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	4	0	6	
8:25 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	6	0	7	96
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41
9:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33
9:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
9:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
9:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	0	0	0	0	4	0	4	0	24	0	0	0	0	0	84	0	116		
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Pedestrians	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	8		
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Railroad																			
Stopped Buses																			

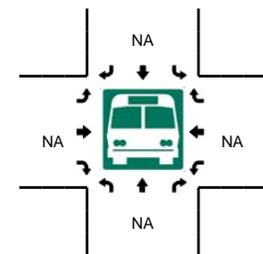
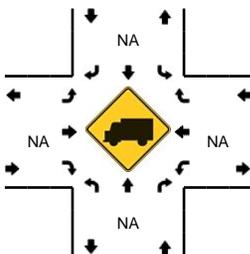
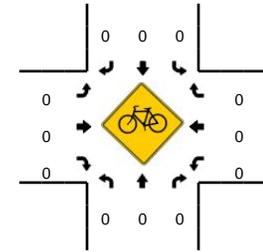
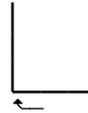
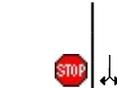
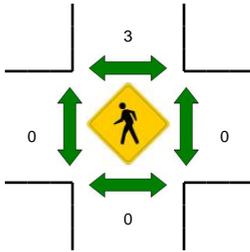
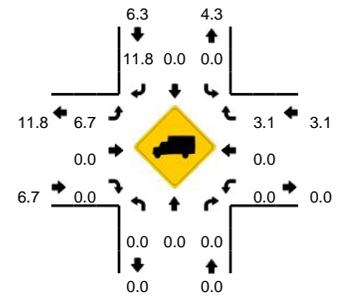
Comments:

LOCATION: Meridian Park Hospital Dwy -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13541801
DATE: Wed, Jul 15 2015



Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

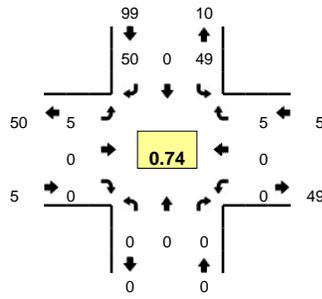


5-Min Count Period Beginning At	Meridian Park Hospital Dwy (Northbound)				Meridian Park Hospital Dwy (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:30 AM	0	0	0	0	3	0	2	0	2	0	0	0	0	0	2	0	9	
7:35 AM	0	0	0	0	6	0	3	0	0	0	0	0	0	0	1	0	10	
7:40 AM	0	0	0	0	0	0	1	0	2	0	0	0	0	0	2	0	5	
7:45 AM	0	0	0	0	0	0	1	0	2	0	0	0	0	0	3	0	6	
7:50 AM	0	0	0	0	1	0	2	0	2	0	0	0	0	0	2	0	7	
7:55 AM	0	0	0	0	2	0	1	0	1	0	0	0	0	0	4	0	8	
8:00 AM	0	0	0	0	0	0	2	0	1	0	0	0	0	0	3	0	6	
8:05 AM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	6	
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	
8:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2	
8:20 AM	0	0	0	0	2	0	0	0	2	0	0	0	0	0	6	0	10	
8:25 AM	0	0	0	0	1	0	1	0	3	0	0	0	0	0	2	0	7	79
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
9:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
9:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
9:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
9:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	0	0	0	0	36	0	24	0	16	0	0	0	0	0	20	0	96	
Heavy Trucks	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4	
Pedestrians	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

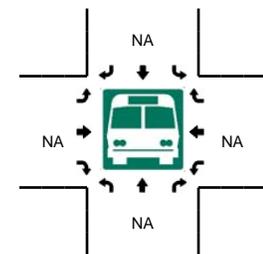
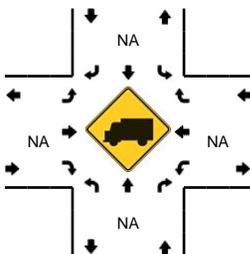
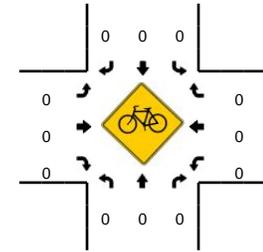
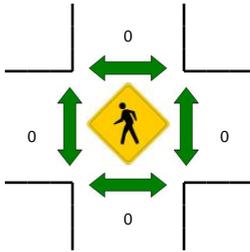
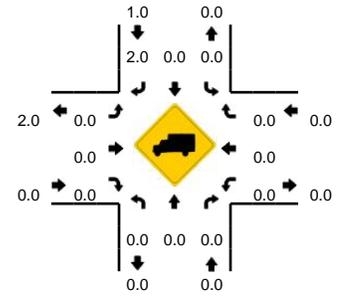
Comments:

LOCATION: Meridian Park Hospital Dwy -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13541804
DATE: Tue, Jul 14 2015



Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

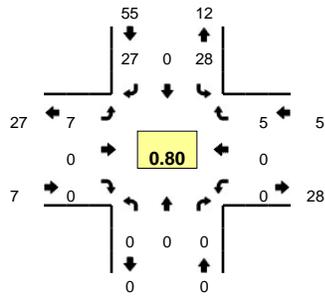


5-Min Count Period Beginning At	Meridian Park Hospital Dwy (Northbound)				Meridian Park Hospital Dwy (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:40 PM	0	0	0	0	4	0	5	0	0	0	0	0	0	0	0	0	9	
4:45 PM	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	4	
4:50 PM	0	0	0	0	2	0	5	0	0	0	0	0	0	0	2	0	9	
4:55 PM	0	0	0	0	2	0	4	0	0	0	0	0	0	0	0	0	6	
5:00 PM	0	0	0	0	6	0	6	0	0	0	0	0	0	0	1	0	13	
5:05 PM	0	0	0	0	10	0	4	0	0	0	0	0	0	0	0	0	14	
5:10 PM	0	0	0	0	2	0	8	0	0	0	0	0	0	0	0	0	10	
5:15 PM	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	8	
5:20 PM	0	0	0	0	3	0	4	0	2	0	0	0	0	0	1	0	10	
5:25 PM	0	0	0	0	5	0	3	0	1	0	0	0	0	0	0	0	9	
5:30 PM	0	0	0	0	6	0	1	0	2	0	0	0	0	0	0	0	9	
5:35 PM	0	0	0	0	3	0	4	0	0	0	0	0	0	0	1	0	8	
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	96
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	87
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
6:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
6:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36
6:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
6:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
6:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	72	0	72	0	0	0	0	0	0	0	4	0	148	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

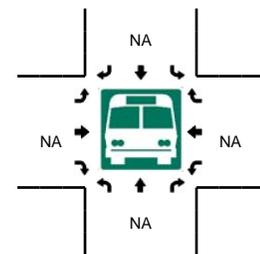
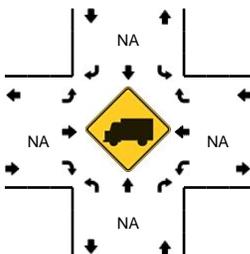
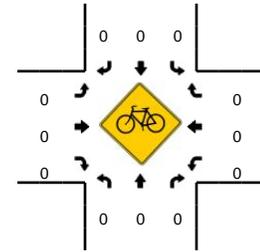
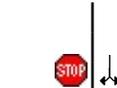
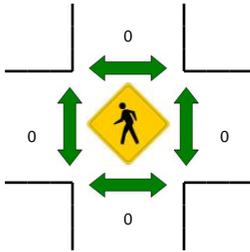
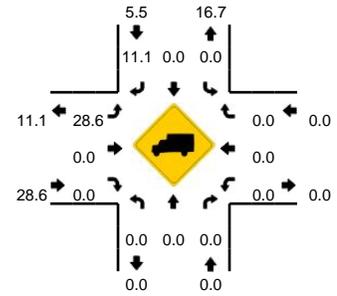
Comments:

LOCATION: Meridian Park Hospital Dwy -- SW Borland Rd
CITY/STATE: Tualatin, OR

QC JOB #: 13541802
DATE: Tue, Jul 14 2015



Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 5:25 PM -- 5:40 PM



5-Min Count Period Beginning At	Meridian Park Hospital Dwy (Northbound)				Meridian Park Hospital Dwy (Southbound)				SW Borland Rd (Eastbound)				SW Borland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:40 PM	0	0	0	0	4	0	2	0	2	0	0	0	0	0	0	0	8	
4:45 PM	0	0	0	0	1	0	3	0	0	0	0	0	0	0	1	0	5	
4:50 PM	0	0	0	0	3	0	3	0	0	0	0	0	0	0	1	0	7	
4:55 PM	0	0	0	0	1	0	2	0	0	0	0	0	0	0	1	0	4	
5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
5:05 PM	0	0	0	0	4	0	5	0	0	0	0	0	0	0	1	0	10	
5:10 PM	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	4	
5:15 PM	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	
5:20 PM	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	4	
5:25 PM	0	0	0	0	2	0	2	0	0	0	0	0	0	0	1	0	5	
5:30 PM	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	3	
5:35 PM	0	0	0	0	5	0	4	0	4	0	0	0	0	0	0	0	13	67
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42
6:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32
6:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
6:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
6:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
6:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	36	0	24	0	20	0	0	0	0	0	4	0	84	
Heavy Trucks	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	8	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

Attachment B
*Additional Existing Traffic
Operation Worksheets*



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↷		↷	
Volume (veh/h)	15	331	768	32	15	17
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	18	394	914	38	18	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		929				
pX, platoon unblocked					0.99	
vC, conflicting volume	952				1363	933
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	952				1362	933
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				89	94
cM capacity (veh/h)	730				159	325
Direction, Lane #						
	EB 1	EB 2	WB 1	SB 1		
Volume Total	18	394	952	38		
Volume Left	18	0	0	18		
Volume Right	0	0	38	20		
cSH	730	1700	1700	219		
Volume to Capacity	0.02	0.23	0.56	0.17		
Queue Length 95th (ft)	2	0	0	15		
Control Delay (s)	10.1	0.0	0.0	24.9		
Lane LOS	B			C		
Approach Delay (s)	0.4		0.0	24.9		
Approach LOS				C		
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			52.4%		ICU Level of Service	A
Analysis Period (min)			15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↘		↙	↘
Volume (veh/h)	7	748	352	5	28	27
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	8	822	387	5	31	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		929				
pX, platoon unblocked					0.91	
vC, conflicting volume	392				1227	390
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	392				1198	390
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				83	96
cM capacity (veh/h)	1177				186	663
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	8	822	392	60		
Volume Left	8	0	0	31		
Volume Right	0	0	5	30		
cSH	1177	1700	1700	288		
Volume to Capacity	0.01	0.48	0.23	0.21		
Queue Length 95th (ft)	0	0	0	19		
Control Delay (s)	8.1	0.0	0.0	20.8		
Lane LOS	A			C		
Approach Delay (s)	0.1		0.0	20.8		
Approach LOS				C		
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			49.4%		ICU Level of Service	A
Analysis Period (min)			15			

Attachment C
*Additional Background
Traffic Operation
Worksheets*



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↘		↙	↘
Volume (veh/h)	15	341	791	33	15	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	18	406	942	39	18	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		929				
pX, platoon unblocked					0.99	
vC, conflicting volume	981				1403	961
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	981				1402	961
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				88	93
cM capacity (veh/h)	712				150	313
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	18	406	981	39		
Volume Left	18	0	0	18		
Volume Right	0	0	39	21		
cSH	712	1700	1700	210		
Volume to Capacity	0.03	0.24	0.58	0.19		
Queue Length 95th (ft)	2	0	0	17		
Control Delay (s)	10.2	0.0	0.0	26.1		
Lane LOS	B			D		
Approach Delay (s)	0.4		0.0	26.1		
Approach LOS				D		
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			53.6%		ICU Level of Service	A
Analysis Period (min)			15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↘		↙	
Volume (veh/h)	7	770	363	5	29	28
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	8	846	399	5	32	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		929				
pX, platoon unblocked					0.90	
vC, conflicting volume	404				1263	402
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	404				1237	402
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				82	95
cM capacity (veh/h)	1165				176	653
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	8	846	404	63		
Volume Left	8	0	0	32		
Volume Right	0	0	5	31		
cSH	1165	1700	1700	274		
Volume to Capacity	0.01	0.50	0.24	0.23		
Queue Length 95th (ft)	0	0	0	22		
Control Delay (s)	8.1	0.0	0.0	22.0		
Lane LOS	A			C		
Approach Delay (s)	0.1		0.0	22.0		
Approach LOS				C		
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			50.5%		ICU Level of Service	A
Analysis Period (min)			15			

Attachment D
*Left-Turn Warrant
Analysis Worksheets*

Left-Turn Lane Warrant Analysis

Project #: 17299
 Project Name: Sagert
 Analyst: PSM
 Intersection: Borland/Proposed Road
 Scenario: AM Peak
 Date: 8/5/2015
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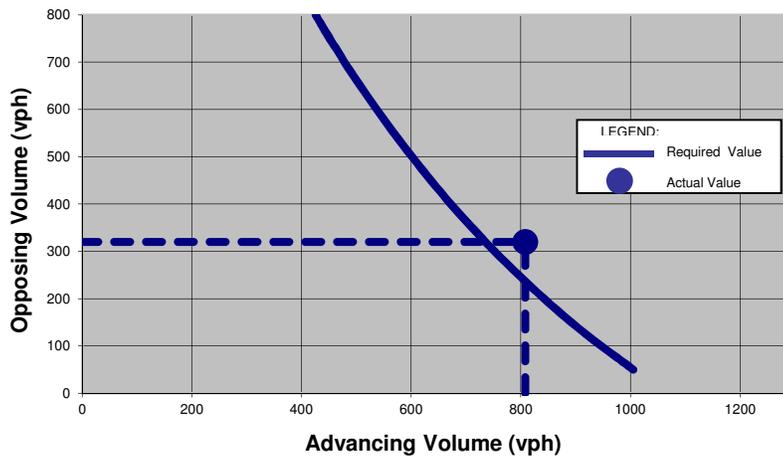


KITTELSON & ASSOCIATES, INC.
 610 SW Alder, Suite 700
 Portland, Oregon 97205
 (503) 228-5230
 Fax: (503) 273-8169

Input Data:

Advancing Volume (vph) =	808
Left-turning Vehicles (vph) =	22
Opposing Volume (vph) =	320
Speed (mph) =	35
Number of Approach Lanes =	1 (not applicable for two lanes)
% Left-Turning Vehicles	3%
Critical Gap (sec) =	5
Maneuver Time (sec) =	3
Exit Time (sec) =	1.9
Utilization Factor =	0.02

Left-Turn Lane Warrant Analysis Results



* Based on *Volume Warrants for Left-Turn Storage Lanes at Unsignalized Grade Intersections* (D. Harmelink)

Left-Turn Lane Warrant Analysis

Project #: 17299
 Project Name: Sagert
 Analyst: PSM
 Intersection: Borland/Proposed Road
 Scenario: PM Peak
 Date: 8/5/2015
 File: H:\profile\17299 - Sagert Farms\Excel\[17299_LT Warrant_PM.xls]Main

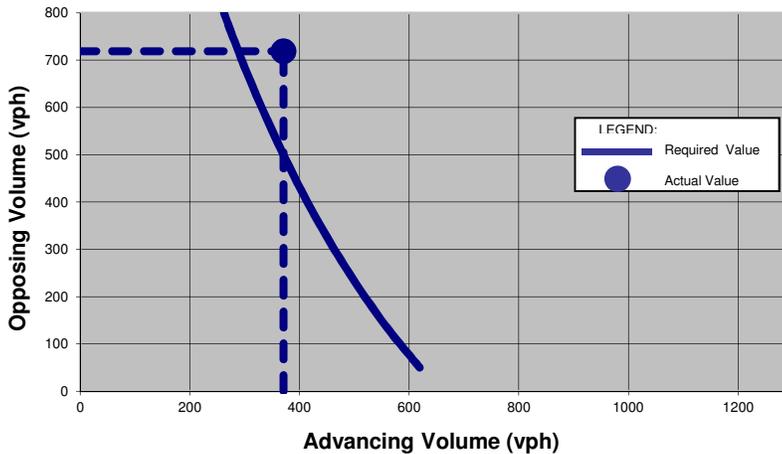


KITTELSON & ASSOCIATES, INC.
 610 SW Alder, Suite 700
 Portland, Oregon 97205
 (503) 228-5230
 Fax: (503) 273-8169

Input Data:

Advancing Volume (vph) =	371
Left-turning Vehicles (vph) =	28
Opposing Volume (vph) =	719
Speed (mph) =	35
Number of Approach Lanes =	1 (not applicable for two lanes)
% Left-Turning Vehicles	8%
Critical Gap (sec) =	5
Maneuver Time (sec) =	3
Exit Time (sec) =	1.9
Utilization Factor =	0.02

Left-Turn Lane Warrant Analysis Results



* Based on *Volume Warrants for Left-Turn Storage Lanes at Unsignalized Grade Intersections* (D. Harmelink)

Attachment E
*Updated Background
Traffic Operation
Worksheets*

2018 Total Traffic AM Peak Hour - No RIRO + WB LT Lane
 1: SW Nyberg Ln & SW Nyberg St/SW 65th Ave

Sagert Farms
 8/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	629	18	47	841	14	26	0	27	15	14	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.97	1.00
Satd. Flow (prot)	1787	1817		1686	3496			1726	1442		1786	1583
Flt Permitted	0.19	1.00		0.24	1.00			0.74	1.00		0.85	1.00
Satd. Flow (perm)	356	1817		433	3496			1337	1442		1561	1583
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)	127	699	20	52	934	16	29	0	30	17	16	320
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	25	0	0	45
Lane Group Flow (vph)	127	718	0	52	949	0	0	29	5	0	33	275
Confl. Peds. (#/hr)			6	6			4		1	1		4
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	4%	6%	7%	3%	0%	4%	0%	12%	7%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Prot	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8	8		4	4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	43.4	35.6		34.2	31.0			12.3	12.3		12.3	26.1
Effective Green, g (s)	43.4	35.6		34.2	31.0			12.3	12.3		12.3	26.1
Actuated g/C Ratio	0.63	0.52		0.49	0.45			0.18	0.18		0.18	0.38
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	2.4	2.5		2.6	2.5			1.6	1.6		1.6	
Lane Grp Cap (vph)	385	936		272	1568			237	256		277	597
v/s Ratio Prot	0.04	c0.40		0.01	0.27				0.00			c0.17
v/s Ratio Perm	0.17			0.09				0.02			0.02	
v/c Ratio	0.33	0.77		0.19	0.61			0.12	0.02		0.12	0.46
Uniform Delay, d1	6.8	13.4		10.2	14.4			23.9	23.4		23.9	16.2
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	3.6		0.3	0.6			0.1	0.0		0.1	0.2
Delay (s)	7.1	17.1		10.4	15.0			23.9	23.4		23.9	16.4
Level of Service	A	B		B	B			C	C		C	B
Approach Delay (s)		15.6			14.7			23.7			17.1	
Approach LOS		B			B			C			B	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	69.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

2018 Total Traffic AM Peak Hour - NO RIRO + WB LT Lane
2: SW 65th Ave & SW Borland Rd

Sagert Farms
8/6/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	40	5	4	296	6	373	1	465	181	181	215	5	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Grade (%)		0%			0%			2%			6%		
Total Lost time (s)		5.6			5.3	5.3	3.5	4.8		4.8	4.8		
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00		
Flt		0.99			1.00	0.85	1.00	0.96		1.00	1.00		
Flt Protected		0.96			0.95	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)		1502			1605	1444	1646	1594		1507	1577		
Flt Permitted		0.96			0.95	1.00	0.62	1.00		0.19	1.00		
Satd. Flow (perm)		1502			1605	1444	1067	1594		304	1577		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	42	5	4	308	6	389	1	484	189	189	224	5	
RTOR Reduction (vph)	0	2	0	0	0	227	0	10	0	0	0	0	
Lane Group Flow (vph)	0	49	0	0	314	162	1	663	0	189	229	0	
Heavy Vehicles (%)	13%	0%	0%	4%	0%	3%	0%	3%	7%	7%	7%	20%	
Turn Type	Split	NA		Split	NA	pt+ov	pm+pt	NA		pm+pt	NA		
Protected Phases	8	8		4	4	4 5	1	6 9		5	2 10		
Permitted Phases							6 9			2 10			
Actuated Green, G (s)		5.2			26.6	32.8	66.3	65.5		77.0	72.2		
Effective Green, g (s)		5.7			27.1	33.8	67.8	66.5		78.0	73.2		
Actuated g/C Ratio		0.04			0.21	0.26	0.52	0.51		0.60	0.56		
Clearance Time (s)		6.1			5.8		4.0			5.3			
Vehicle Extension (s)		1.0			2.0		3.0			2.5			
Lane Grp Cap (vph)		65			334	375	562	815		244	887		
v/s Ratio Prot		c0.03			c0.20	0.11	0.00	c0.42		c0.04	0.14		
v/s Ratio Perm							0.00			c0.42			
v/c Ratio		0.76			0.94	0.43	0.00	0.81		0.77	0.26		
Uniform Delay, d1		61.5			50.7	40.1	14.9	26.6		42.8	14.5		
Progression Factor		1.00			1.00	1.00	1.09	0.93		1.00	1.00		
Incremental Delay, d2		35.0			33.6	0.3	0.0	5.1		13.7	0.2		
Delay (s)		96.5			84.2	40.4	16.2	29.7		56.5	14.7		
Level of Service		F			F	D	B	C		E	B		
Approach Delay (s)		96.5			60.0			29.6			33.6		
Approach LOS		F			E			C			C		
Intersection Summary													
HCM 2000 Control Delay			43.9									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.85										
Actuated Cycle Length (s)			130.0									Sum of lost time (s)	25.0
Intersection Capacity Utilization			82.3%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

2018 Total Traffic AM Peak Hour - No RIRO + WB LT Lane
 3: Proposed Road & SW Borland Rd

Sagert Farms
 8/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	306	4	22	753	33	10	5	37	15	3	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	12	364	5	26	896	39	12	6	44	18	4	18
Pedestrians								1				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		929										
pX, platoon unblocked				0.99			0.99	0.99	0.99	0.99	0.99	
vC, conflicting volume	936			370			1360	1380	368	1404	1362	916
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	936			354			1358	1378	352	1402	1360	916
tC, single (s)	4.1			4.1			7.4	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.8	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			88	96	94	83	97	95
cM capacity (veh/h)	740			1198			96	139	686	103	142	333
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	12	369	26	936	62	39						
Volume Left	12	0	26	0	12	18						
Volume Right	0	5	0	39	44	18						
cSH	740	1700	1198	1700	268	156						
Volume to Capacity	0.02	0.22	0.02	0.55	0.23	0.25						
Queue Length 95th (ft)	1	0	2	0	22	24						
Control Delay (s)	9.9	0.0	8.1	0.0	22.4	35.8						
Lane LOS	A		A		C	E						
Approach Delay (s)	0.3		0.2		22.4	35.8						
Approach LOS					C	E						
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			52.2%		ICU Level of Service				A			
Analysis Period (min)			15									

2018 Total Traffic AM Peak Hour - No RIRO + WB LT Lane
4: SW 60th Ave & SW Borland Rd

Sagert Farms
8/5/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	
Volume (veh/h)	352	5	5	788	20	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	419	6	6	938	24	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	1220					
pX, platoon unblocked					0.71	
vC, conflicting volume			425		1372	422
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			425		1319	422
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		81	99
cM capacity (veh/h)			1145		123	636
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	425	6	938	33		
Volume Left	0	6	0	24		
Volume Right	6	0	0	10		
cSH	1700	1145	1700	160		
Volume to Capacity	0.25	0.01	0.55	0.21		
Queue Length 95th (ft)	0	0	0	19		
Control Delay (s)	0.0	8.2	0.0	33.3		
Lane LOS		A		D		
Approach Delay (s)	0.0	0.1		33.3		
Approach LOS				D		
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			51.5%	ICU Level of Service	A	
Analysis Period (min)	15					

2018 Total Traffic AM Peak Hour - No RIRO + WB LT Lane
5: SW 56th Ter & SW Borland Rd

Sagert Farms
8/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	78	246	7	5	634	5	31	14	20	8	5	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	5.2		5.2	5.2			5.2			5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.97			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Frt	1.00	1.00		1.00	1.00			0.96			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1597	1804		1504	1842			1700			1611	
Flt Permitted	0.24	1.00		0.59	1.00			0.87			0.95	
Satd. Flow (perm)	402	1804		927	1842			1509			1546	
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)	88	276	8	6	712	6	35	16	22	9	6	51
RTOR Reduction (vph)	0	0	0	0	0	0	0	16	0	0	46	0
Lane Group Flow (vph)	88	284	0	6	718	0	0	57	0	0	20	0
Confl. Peds. (#/hr)	3						3		40	40		
Heavy Vehicles (%)	13%	5%	0%	20%	3%	0%	0%	0%	5%	0%	0%	5%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.1	54.0		48.3	47.4			7.9				7.9
Effective Green, g (s)	60.1	54.0		48.3	47.4			7.9				7.9
Actuated g/C Ratio	0.77	0.69		0.62	0.60			0.10				0.10
Clearance Time (s)	5.2	5.2		5.2	5.2			5.2				5.2
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0				3.0
Lane Grp Cap (vph)	422	1242		577	1113			152				155
v/s Ratio Prot	c0.02	0.16		0.00	c0.39							
v/s Ratio Perm	0.14			0.01				c0.04				0.01
v/c Ratio	0.21	0.23		0.01	0.65			0.37				0.13
Uniform Delay, d1	5.4	4.5		5.8	10.0			32.9				32.1
Progression Factor	1.00	1.00		1.00	1.00			1.00				1.00
Incremental Delay, d2	0.2	0.1		0.0	1.4			1.5				0.4
Delay (s)	5.6	4.6		5.8	11.5			34.5				32.5
Level of Service	A	A		A	B			C				C
Approach Delay (s)		4.9			11.4			34.5				32.5
Approach LOS		A			B			C				C
Intersection Summary												
HCM 2000 Control Delay			12.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			78.4			Sum of lost time (s)			15.6			
Intersection Capacity Utilization			65.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection												
Intersection Delay, s/veh	51.1											
Intersection LOS	F											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	246	216	8	0	42	219	181	0	8	341	91
Peak Hour Factor	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	3	2	25	2	2	4	2	2	0	2	7
Mvmt Flow	0	251	220	8	0	43	223	185	0	8	348	93
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	3
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	3	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	3	2
HCM Control Delay	28.1	69.5	75.1
HCM LOS	D	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	79%	0%	96%	0%	55%	0%	100%	0%
Vol Right, %	0%	21%	0%	4%	0%	45%	0%	0%	100%
Sign Control	Stop	Stop	Stop						
Traffic Vol by Lane	8	432	246	224	42	400	93	64	69
LT Vol	8	0	246	0	42	0	93	0	0
Through Vol	0	341	0	216	0	219	0	64	0
RT Vol	0	91	0	8	0	181	0	0	69
Lane Flow Rate	8	441	251	229	43	408	95	65	70
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.022	1	0.685	0.589	0.116	1	0.285	0.187	0.189
Departure Headway (Hd)	9.787	9.178	9.822	9.283	9.75	8.972	10.799	10.334	9.653
Convergence, Y/N	Yes	Yes	Yes						
Cap	366	397	369	391	368	404	334	348	372
Service Time	7.532	6.923	7.543	7.003	7.494	6.717	8.529	8.065	7.384
HCM Lane V/C Ratio	0.022	1.111	0.68	0.586	0.117	1.01	0.284	0.187	0.188
HCM Control Delay	12.8	76.3	31.4	24.5	13.8	75.4	17.8	15.4	14.6
HCM Lane LOS	B	F	D	C	B	F	C	C	B
HCM 95th-tile Q	0.1	12.1	4.9	3.6	0.4	12.2	1.2	0.7	0.7

Intersection

Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	93	64	69
Peak Hour Factor	0.92	0.98	0.98	0.98
Heavy Vehicles, %	2	4	6	7
Mvmt Flow	0	95	65	70
Number of Lanes	0	1	1	1

Approach

SB

Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	16.1
HCM LOS	C

Lane

2018 Total Traffic AM Peak Hour - NO RIRO + WB LT Lane
7: SW 65th Ave & SW Sagert St

Sagert Farms
8/6/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	352	33	92	17	31	29	112	266	22	21	118	377
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			-2%	
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	1505		1662	1623		1581	1601		1674	1652	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.67	1.00		0.49	1.00	1.00
Satd. Flow (perm)	1583	1505		1662	1623		1123	1601		866	1652	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	383	36	100	18	34	32	122	289	24	23	128	410
RTOR Reduction (vph)	0	70	0	0	30	0	0	2	0	0	0	208
Lane Group Flow (vph)	383	66	0	18	36	0	122	311	0	23	128	202
Confl. Peds. (#/hr)			2	2					2	2		
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	2%	5%	0%	0%	7%	6%
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	Perm
Protected Phases	4	4		8	8			2 10			6 9	
Permitted Phases							2 10			6 9		6 9
Actuated Green, G (s)	39.5	39.5		6.3	6.3		64.2	64.2		64.2	64.2	64.2
Effective Green, g (s)	39.5	39.5		6.3	6.3		64.2	64.2		64.2	64.2	64.2
Actuated g/C Ratio	0.30	0.30		0.05	0.05		0.49	0.49		0.49	0.49	0.49
Clearance Time (s)	5.0	5.0		5.0	5.0							
Vehicle Extension (s)	3.0	3.0		3.0	3.0							
Lane Grp Cap (vph)	480	457		80	78		554	790		427	815	699
v/s Ratio Prot	c0.24	0.04		0.01	c0.02			c0.19			0.08	
v/s Ratio Perm							0.11			0.03		0.14
v/c Ratio	0.80	0.15		0.23	0.46		0.22	0.39		0.05	0.16	0.29
Uniform Delay, d1	41.6	33.0		59.5	60.2		18.7	20.7		17.1	18.1	19.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.74	0.72	5.01
Incremental Delay, d2	9.0	0.1		1.4	4.2		0.2	0.3		0.0	0.1	0.2
Delay (s)	50.6	33.1		60.9	64.4		18.9	21.0		12.8	13.0	97.6
Level of Service	D	C		E	E		B	C		B	B	F
Approach Delay (s)		46.0			63.6			20.4			74.8	
Approach LOS		D			E			C			E	

Intersection Summary		
HCM 2000 Control Delay	50.1	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.54	
Actuated Cycle Length (s)	130.0	Sum of lost time (s) 20.0
Intersection Capacity Utilization	55.1%	ICU Level of Service B
Analysis Period (min)	15	

c Critical Lane Group

2016 Total Traffic PM Peak Hour - No RIRO + WB LT lane
 1: SW Nyberg St & 65th Ave/Nyberg St

Sagert Farms
 8/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	253	807	33	21	708	21	34	3	56	14	7	142	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00	
Satd. Flow (prot)	1787	1869		1752	3516			1800	1615		1749	1599	
Flt Permitted	0.27	1.00		0.21	1.00			0.73	1.00		0.78	1.00	
Satd. Flow (perm)	513	1869		384	3516			1366	1615		1406	1599	
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)	272	868	35	23	761	23	37	3	60	15	8	153	
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	55	0	0	84	
Lane Group Flow (vph)	272	902	0	23	782	0	0	40	5	0	23	69	
Confl. Peds. (#/hr)	1		5	5		1	7					7	
Heavy Vehicles (%)	1%	1%	0%	3%	2%	7%	0%	0%	0%	8%	0%	1%	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Prot	Perm	NA	pt+ov	
Protected Phases	5	2		1	6			8	8		4	4.5	
Permitted Phases	2			6			8			4			
Actuated Green, G (s)	51.4	43.5		38.5	36.6			6.3	6.3		6.3	21.1	
Effective Green, g (s)	51.4	43.5		38.5	36.6			6.3	6.3		6.3	21.1	
Actuated g/C Ratio	0.74	0.62		0.55	0.53			0.09	0.09		0.09	0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0		
Vehicle Extension (s)	2.4	2.5		2.6	2.5			1.6	1.6		1.6		
Lane Grp Cap (vph)	539	1166		249	1846			123	145		127	484	
v/s Ratio Prot	c0.06	c0.48		0.00	0.22				0.00			0.04	
v/s Ratio Perm	0.31			0.05				c0.03			0.02		
v/c Ratio	0.50	0.77		0.09	0.42			0.33	0.04		0.18	0.14	
Uniform Delay, d1	4.0	9.5		8.4	10.1			29.7	28.9		29.3	17.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	3.1		0.1	0.1			0.6	0.0		0.3	0.0	
Delay (s)	4.5	12.6		8.6	10.2			30.3	29.0		29.6	17.8	
Level of Service	A	B		A	B			C	C		C	B	
Approach Delay (s)		10.8			10.2			29.5			19.3		
Approach LOS		B			B			C			B		
Intersection Summary													
HCM 2000 Control Delay			12.0									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.74										
Actuated Cycle Length (s)			69.7									Sum of lost time (s)	18.0
Intersection Capacity Utilization			72.4%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

2016 Total Traffic PM Peak Hour - No RIRO + WB LT lane
2: SW 65th Ave & Borland Rd

Sagert Farms
8/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	11	7	180	3	200	1	290	303	377	419	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			2%			6%	
Total Lost time (s)		5.6			5.3	5.3	4.8	4.8		4.8	4.8	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frb, ped/bikes		1.00			1.00	1.00	1.00	0.98		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.92		1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1618			1629	1473	1646	1542		1597	1679	
Flt Permitted		0.98			0.95	1.00	0.51	1.00		0.10	1.00	
Satd. Flow (perm)		1618			1629	1473	879	1542		168	1679	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	15	11	7	188	3	208	1	302	316	393	436	4
RTOR Reduction (vph)	0	7	0	0	0	127	0	27	0	0	0	0
Lane Group Flow (vph)	0	26	0	0	191	81	1	591	0	393	440	0
Confl. Peds. (#/hr)	10					10			4	4		
Heavy Vehicles (%)	6%	0%	0%	2%	25%	1%	0%	2%	2%	1%	1%	0%
Turn Type	Split	NA		Split	NA	pt+ov	custom	NA		custom	NA	
Protected Phases	8	8		4	4	4 5	1	6 9		5	2 10	
Permitted Phases							6			2		
Actuated Green, G (s)		3.4			18.2	49.5	35.6	49.3		71.2	79.1	
Effective Green, g (s)		3.9			18.7	50.5	36.6	50.3		71.7	80.1	
Actuated g/C Ratio		0.03			0.14	0.39	0.28	0.39		0.55	0.62	
Clearance Time (s)		6.1			5.8		5.3			5.3		
Vehicle Extension (s)		1.0			2.0		1.0			2.5		
Lane Grp Cap (vph)		48			234	572	256	596		442	1034	
v/s Ratio Prot		c0.02			c0.12	0.05	0.00	c0.38		c0.22	0.26	
v/s Ratio Perm							0.00			0.27		
v/c Ratio		0.55			0.82	0.14	0.00	0.99		0.89	0.43	
Uniform Delay, d1		62.2			54.0	25.7	33.6	39.6		37.4	13.0	
Progression Factor		1.00			1.00	1.00	1.45	0.86		1.00	1.00	
Incremental Delay, d2		6.6			18.4	0.0	0.0	29.8		19.0	0.3	
Delay (s)		68.8			72.4	25.8	48.7	63.9		56.4	13.3	
Level of Service		E			E	C	D	E		E	B	
Approach Delay (s)		68.8			48.1			63.9			33.6	
Approach LOS		E			D			E			C	

Intersection Summary		
HCM 2000 Control Delay	47.3	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.93	
Actuated Cycle Length (s)	130.0	Sum of lost time (s) 26.8
Intersection Capacity Utilization	89.7%	ICU Level of Service E
Analysis Period (min)	15	

c Critical Lane Group

2016 Total Traffic PM Peak Hour - No RIRO + WB LT lane
 3: Proposed Road & SW Borland Rd

Sagert Farms
 8/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	701	14	28	338	5	6	3	46	29	5	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	4	770	15	31	371	5	7	3	51	32	5	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		929										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	377			786			1248	1225	778	1267	1230	374
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	377			663			1204	1178	654	1227	1184	374
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			95	98	87	71	96	96
cM capacity (veh/h)	1193			798			126	157	401	111	156	677
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	4	786	31	377	60	63						
Volume Left	4	0	31	0	7	32						
Volume Right	0	15	0	5	51	25						
cSH	1193	1700	798	1700	303	174						
Volume to Capacity	0.00	0.46	0.04	0.22	0.20	0.36						
Queue Length 95th (ft)	0	0	3	0	18	38						
Control Delay (s)	8.0	0.0	9.7	0.0	19.8	36.8						
Lane LOS	A		A		C	E						
Approach Delay (s)	0.0		0.7		19.8	36.8						
Approach LOS					C	E						
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			54.4%		ICU Level of Service				A			
Analysis Period (min)			15									

2016 Total Traffic PM Peak Hour - No RIRO + WB LT lane
4: SW 60th Ave & SW Borland Rd

Sagert Farms
8/5/2015



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	
Volume (veh/h)	762	14	7	362	9	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	847	16	8	402	10	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		TWLTL			
Median storage (veh)	2					
Upstream signal (ft)	1220					
pX, platoon unblocked						
vC, conflicting volume			862		1272	854
vC1, stage 1 conf vol	854					
vC2, stage 2 conf vol	418					
vCu, unblocked vol			862		1272	854
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)	5.4					
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	100
cM capacity (veh/h)			789		378	361

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	862	8	402	11
Volume Left	0	8	0	10
Volume Right	16	0	0	1
cSH	1700	789	1700	376
Volume to Capacity	0.51	0.01	0.24	0.03
Queue Length 95th (ft)	0	1	0	2
Control Delay (s)	0.0	9.6	0.0	14.9
Lane LOS		A		B
Approach Delay (s)	0.0	0.2		14.9
Approach LOS				B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

2016 Total Traffic PM Peak Hour - No RIRO + WB LT lane
5: SW 56th Terrace & Borland Rd

Sagert Farms
8/5/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	15	688	28	11	316	5	19	1	4	2	1	14	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.2	5.2		5.2	5.2			5.2			5.2		
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00		
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.98		
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00		
Frt	1.00	0.99		1.00	1.00			0.98			0.89		
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99		
Satd. Flow (prot)	1797	1869		1805	1876			1647			1640		
Flt Permitted	0.55	1.00		0.29	1.00			0.82			0.96		
Satd. Flow (perm)	1045	1869		560	1876			1408			1577		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	16	748	30	12	343	5	21	1	4	2	1	15	
RTOR Reduction (vph)	0	1	0	0	0	0	0	4	0	0	14	0	
Lane Group Flow (vph)	16	777	0	12	348	0	0	22	0	0	4	0	
Confl. Peds. (#/hr)	8		1	1		8	3		3	3		3	
Confl. Bikes (#/hr)						1							
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	50%	0%	0%	0%	
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA		
Protected Phases	5	2		1	6			8				4	
Permitted Phases	2			6			8			4			
Actuated Green, G (s)	53.0	52.1		53.0	52.1			4.4				4.4	
Effective Green, g (s)	53.0	52.1		53.0	52.1			4.4				4.4	
Actuated g/C Ratio	0.73	0.71		0.73	0.71			0.06				0.06	
Clearance Time (s)	5.2	5.2		5.2	5.2			5.2				5.2	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			3.0				3.0	
Lane Grp Cap (vph)	767	1333		421	1338			84				95	
v/s Ratio Prot	0.00	c0.42		c0.00	0.19								
v/s Ratio Perm	0.01			0.02				c0.02				0.00	
v/c Ratio	0.02	0.58		0.03	0.26			0.26				0.04	
Uniform Delay, d1	2.8	5.1		3.6	3.7			32.8				32.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00				1.00	
Incremental Delay, d2	0.0	0.8		0.0	0.1			1.7				0.2	
Delay (s)	2.8	5.9		3.6	3.8			34.4				32.5	
Level of Service	A	A		A	A			C				C	
Approach Delay (s)		5.8			3.8			34.4				32.5	
Approach LOS		A			A			C				C	

Intersection Summary

HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	73.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	244	291	231
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	0	2
Mvmt Flow	0	257	306	243
Number of Lanes	0	1	1	1

Approach SB

Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	43.6
HCM LOS	E

Lane

Intersection

Intersection Delay, s/veh
 Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	244	291	231
Peak Hour Factor	0.92	0.95	0.95	0.95
Heavy Vehicles, %	2	2	0	2
Mvmt Flow	0	257	306	243
Number of Lanes	0	1	1	1

Approach SB

Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	43.6
HCM LOS	E

Lane

2016 Total Traffic PM Peak Hour - No RIRO + WB LT lane
7: 65th Ave & Sagert St

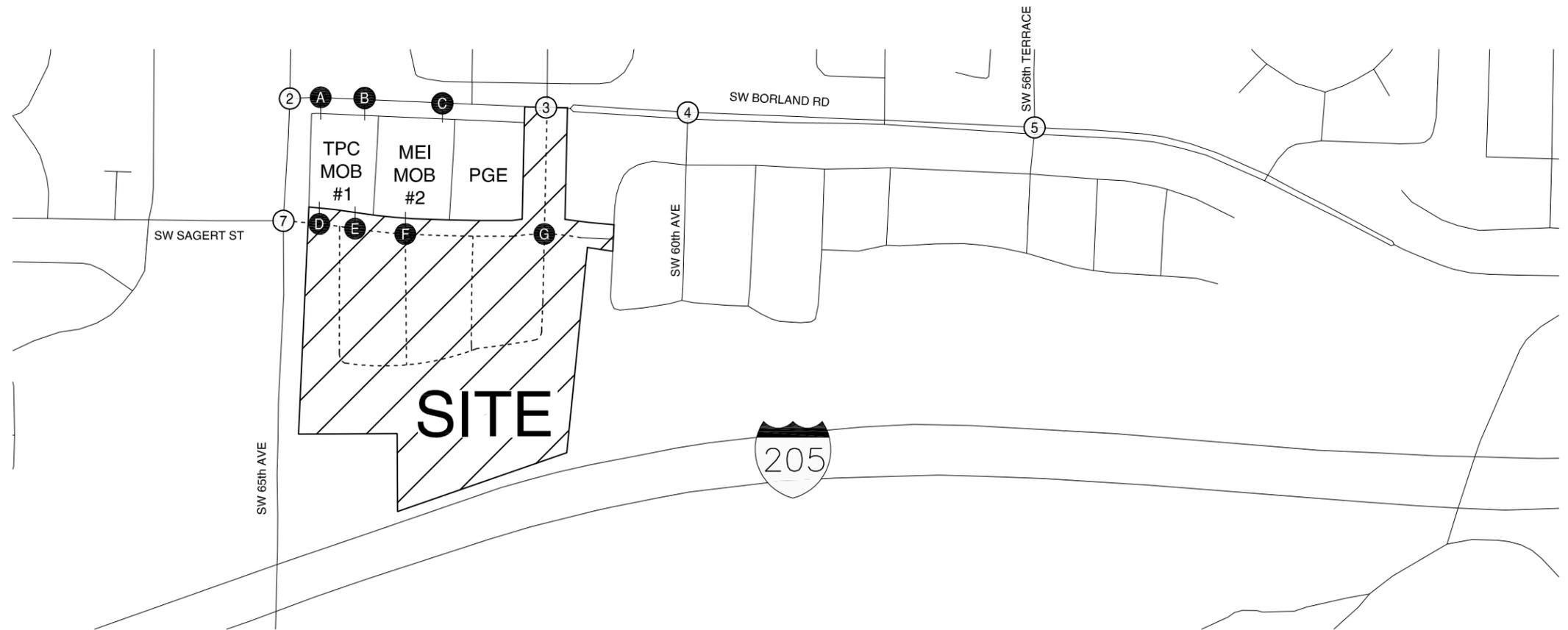
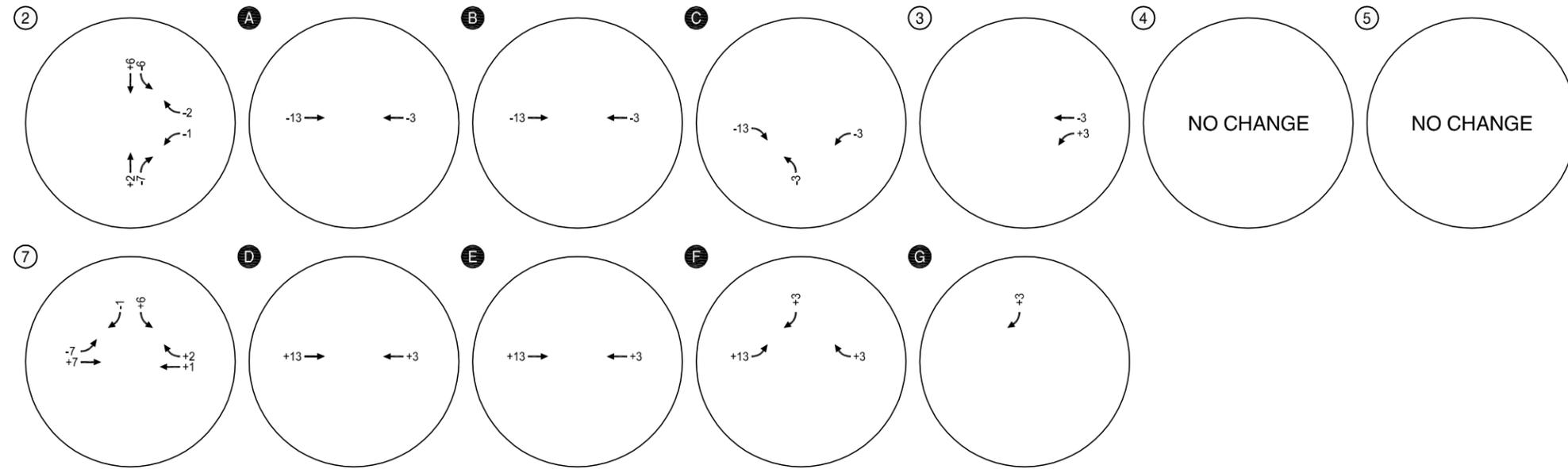
Sagert Farms
8/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	448	33	111	21	27	25	53	121	24	37	243	326
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			-2%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.93		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1630	1508		1662	1623		1536	1607		1671	1733	1488
Flt Permitted	0.95	1.00		0.95	1.00		0.52	1.00		0.63	1.00	1.00
Satd. Flow (perm)	1630	1508		1662	1623		846	1607		1114	1733	1488
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)	477	35	118	22	29	27	56	129	26	39	259	347
RTOR Reduction (vph)	0	80	0	0	26	0	0	4	0	0	0	86
Lane Group Flow (vph)	477	73	0	22	30	0	56	151	0	39	259	261
Confl. Peds. (#/hr)			1	1					2	2		
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	5%	3%	0%	0%	2%	1%
Turn Type	Split	NA		Split	NA		custom	NA		custom	NA	custom
Protected Phases	4	4		8	8			2 10			6 9	
Permitted Phases							2			6		6
Actuated Green, G (s)	42.4	42.4		5.8	5.8		53.5	65.8		53.5	65.8	53.5
Effective Green, g (s)	42.4	42.4		5.8	5.8		53.5	65.8		53.5	65.8	53.5
Actuated g/C Ratio	0.33	0.33		0.04	0.04		0.41	0.51		0.41	0.51	0.41
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0			4.0		4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0			3.0		3.0
Lane Grp Cap (vph)	531	491		74	72		348	813		458	877	612
v/s Ratio Prot	c0.29	0.05		0.01	c0.02			0.09			c0.15	
v/s Ratio Perm							0.07			0.04		c0.18
v/c Ratio	0.90	0.15		0.30	0.42		0.16	0.19		0.09	0.30	0.43
Uniform Delay, d1	41.7	31.0		60.1	60.5		24.1	17.5		23.3	18.6	27.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.97	0.90	0.90
Incremental Delay, d2	17.8	0.1		2.2	3.9		1.0	0.1		0.3	0.2	2.0
Delay (s)	59.5	31.2		62.4	64.4		25.1	17.6		23.0	16.9	26.7
Level of Service	E	C		E	E		C	B		C	B	C
Approach Delay (s)		52.6			63.8			19.6			22.5	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Appendix F
Assumed Re-routing of
Trips

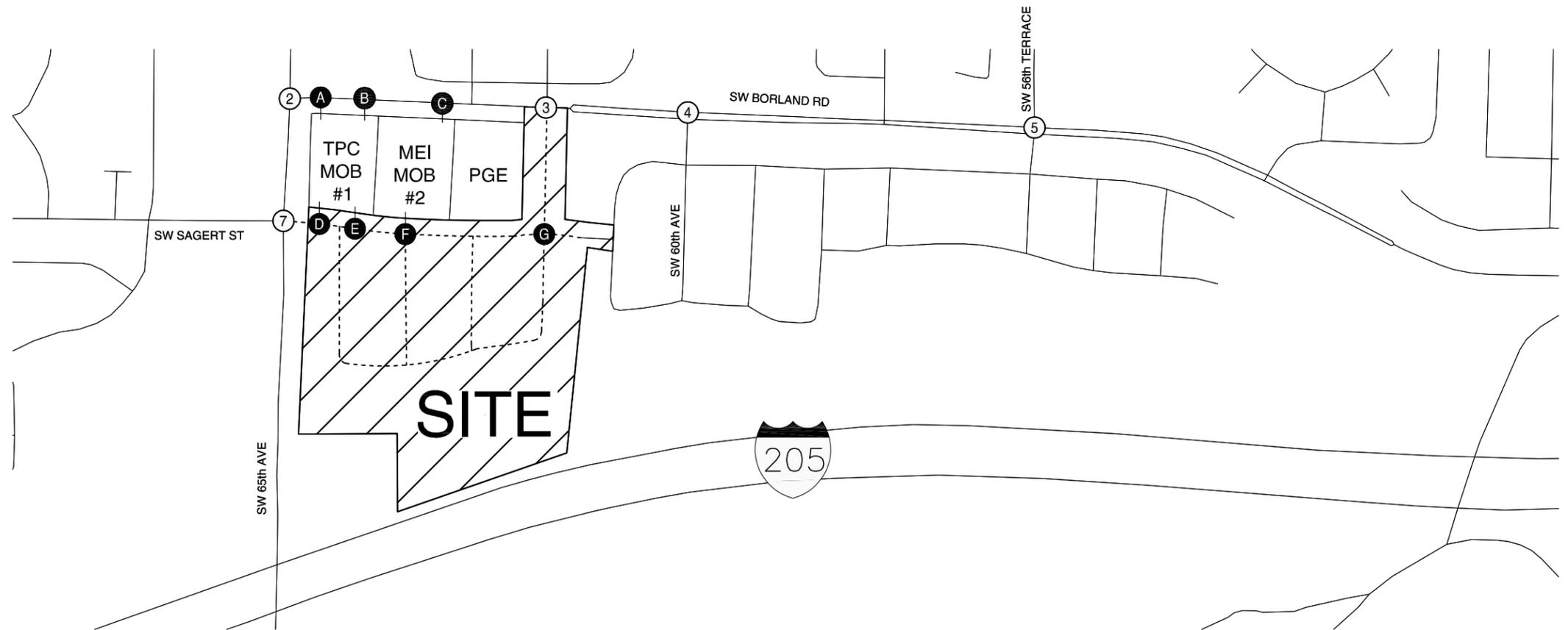
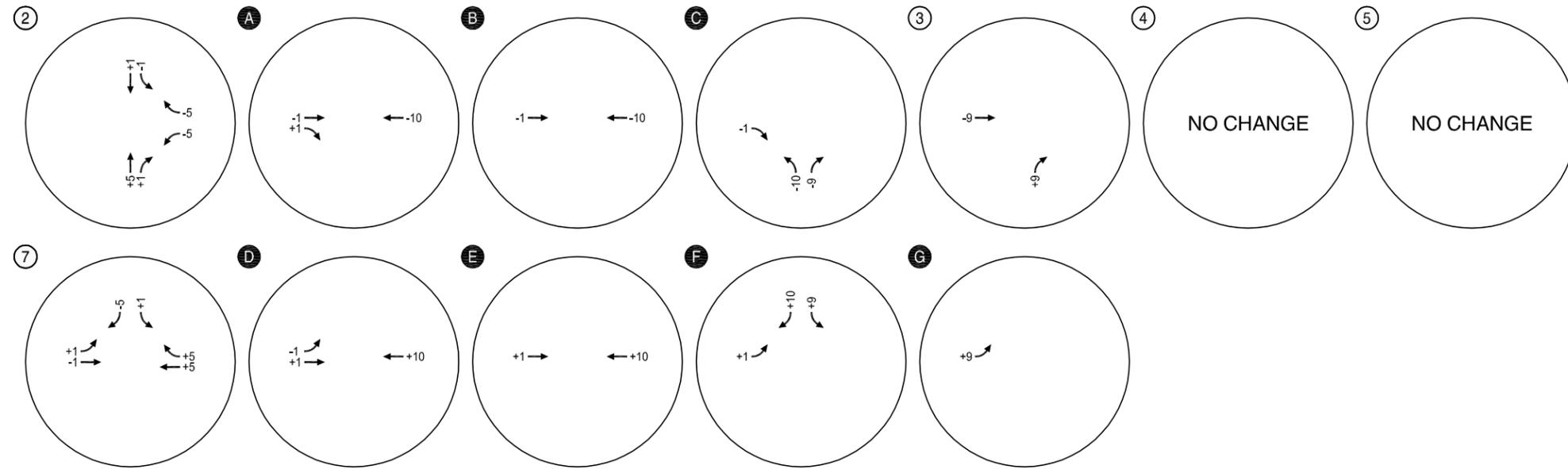


- LEGEND**
- ① - STUDY INTERSECTIONS
 - A - EXISTING/PROPOSED ACCESS
 - MOB - MEDICAL OFFICE BUILDINGS

RE-ROUTE OF EXISTING MEDICAL OFFICE BUILDING TRIPS
WEEKDAY AM PEAK HOUR
TUALATIN, OREGON

FIGURE
F1

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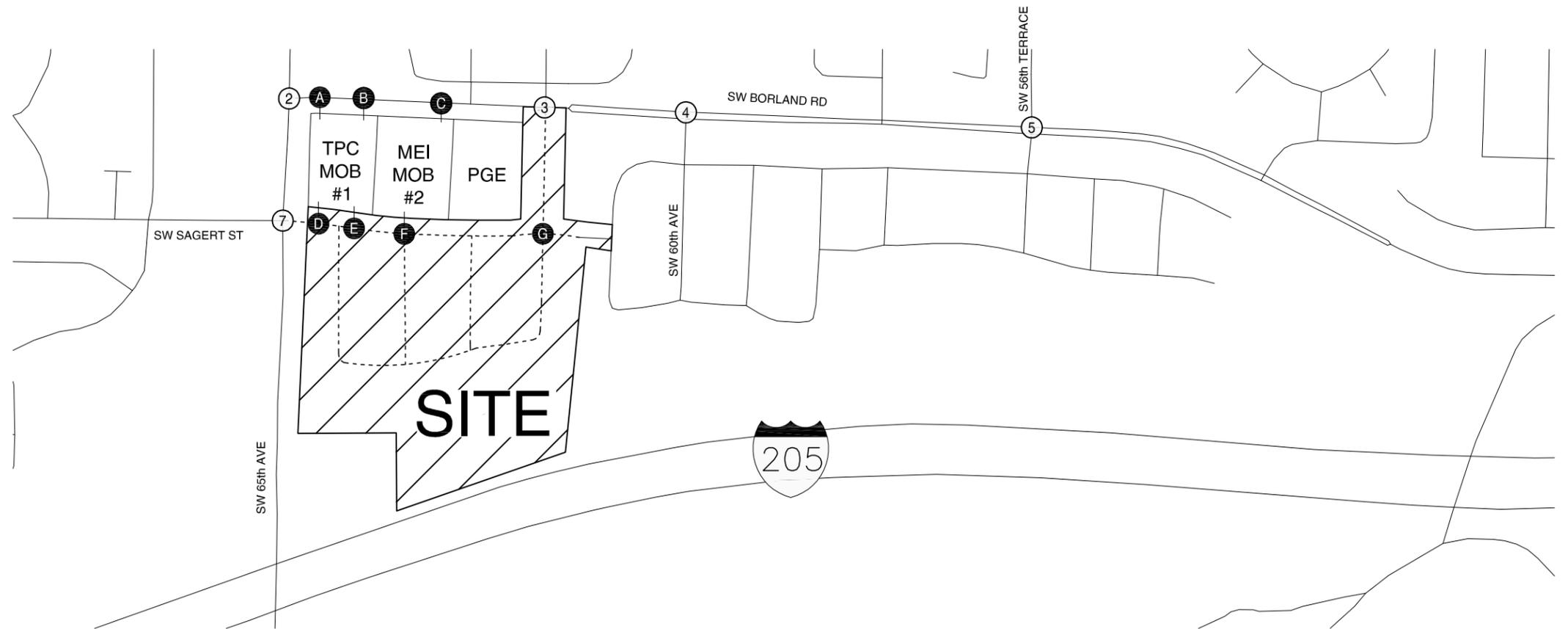
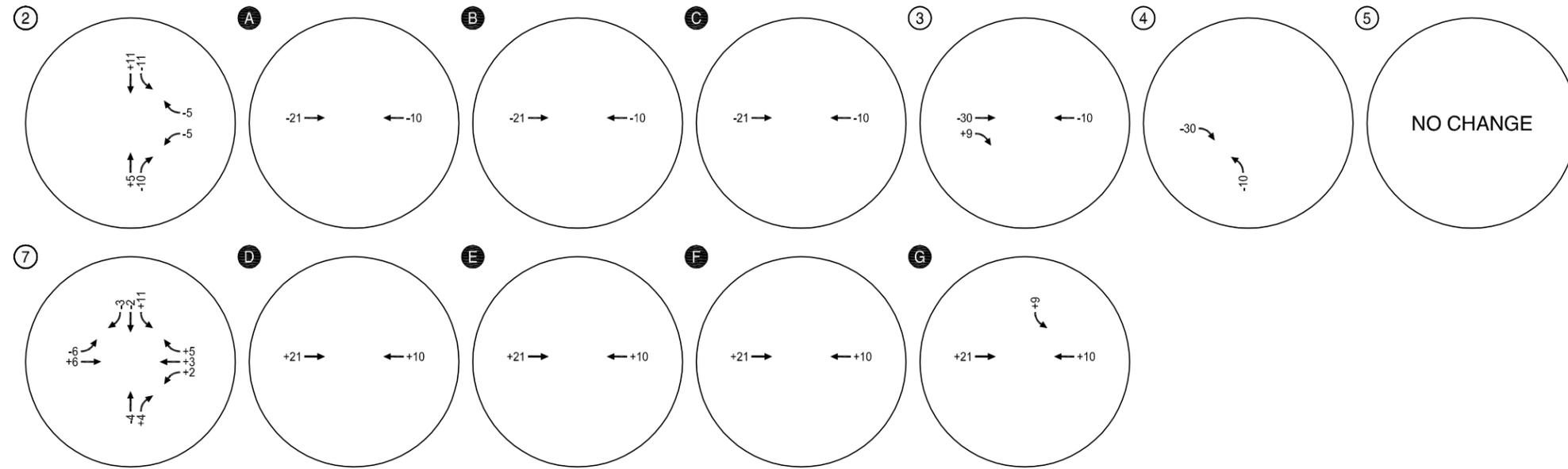


- LEGEND**
- ① - STUDY INTERSECTIONS
 - A - EXISTING/PROPOSED ACCESS
 - MOB - MEDICAL OFFICE BUILDINGS

RE-ROUTE OF EXISTING MEDICAL OFFICE BUILDING TRIPS
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

FIGURE
F2

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LEGEND

- ① - STUDY INTERSECTIONS
- A - EXISTING/PROPOSED ACCESS
- MOB - MEDICAL OFFICE BUILDINGS

RE-ROUTE OF EXISTING SEQUOIA RIDGE TRIPS
WEEKDAY PM PEAK HOUR
TUALATIN, OREGON

FIGURE
F4

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