

Oregon 219/Phase 1 Bypass/Wilsonville Road Intersection

The City of Newberg amended its TSP in 2013 to reflect the FEIS Alternative for Phase 1. Since that time, ODOT and the Ladd Hill Neighborhood Association (LHNA) have continued to investigate potential design options related specifically to the Oregon 219/Phase 1 Bypass/Wilsonville Road intersection to ensure that the Phase 1 Bypass will not cause significant traffic impacts to Wilsonville Road. As part of the 2013 TSP Amendment, ODOT committed to installing specific signage that would discourage traffic from using Wilsonville Road and to provide ongoing traffic monitoring to ensure that no unanticipated impacts occur once Phase 1 of the Bypass is open to traffic.

In addition to LHNA, Clackamas County and the City of Wilsonville have also raised questions about the potential use of Wilsonville Road to travel between I-5 and the Phase 1 Bypass. In response to these questions, ODOT explored additional design options that seek to minimize Phase 1 Bypass-related traffic using Wilsonville Road. In reviewing these additional design options, ODOT sought solutions that minimize potential delays to the overall schedule to open the Phase 1 Bypass to traffic in 2017. As part of the Phase 1 Bypass opening, it is essential that both Oregon 219 and Springbrook Road are improved to accommodate traffic between Oregon 99W and the Phase 1 Bypass in southeast Newberg. Any modifications to the design for Wilsonville Road must be included in the Phase 1G project, which is scheduled to go to construction bid in February 2016 and be completed in 2017. With these objectives in mind, ODOT identified two important considerations to assess:

- Could the modified design option be constructed within the current project right-of-way footprint? The right-of-way purchase process for the Phase 1 Bypass is well under way, and changes or additional right-of-way acquisition could delay construction completion.
- Would the design option require additional utility relocation? Most utilities have been or are in the process of being relocated. Requiring utility companies to move additional utilities or relocate utilities that have been moved could delay construction or increase the costs of Phase 1 Bypass construction if ODOT is required to pay the relocation costs.

Further discussion on each of the design options considered related to Wilsonville Road is provided below. These options were reviewed relative to projected intersection operations and the potential effect of out-of-direction travel on nearby ODOT and Newberg roads.

The following intersections were analyzed under Opening Year 2017 conditions:

- Oregon 219/Phase 1 Bypass
- Oregon 219/Springbrook Road/Industrial Parkway
- Oregon 219/Wynooski Road
- Springbrook Road/Wilsonville Road
- Springbrook Road/2nd Street/Fernwood Road

A summary of each option's intersection operations is provided in Table 1 at the end of this report as well as within the description of each option. Traffic analysis figures for each option are included in Appendix A.

Option 1 – Full Movement Intersection

Option 1 represents the Final Design Alternative proposed by ODOT as part of the requested TSP Amendment for the Oregon 219 lane configuration modification presented in this document (i.e., one continuous through lane southbound on Oregon 219). As part of Option 1, all turning movements would be allowed at the Oregon 219/Phase 1 Bypass/Wilsonville Road intersection. As such, travel between Wilsonville Road and the Phase 1 Bypass could occur via through movements at the signalized intersection. The proposed intersection configuration as part of Option 1 is reflected in Figure B.

As shown below in Table 1, the v/c ratio at the Oregon 219/Phase 1 Bypass/Wilsonville Road intersection is projected to be 0.76. Although this value is slightly above ODOT's design standard for a new intersection on the state highway system, the proposed design would meet the OHP mobility standard and provide enhanced safety benefits (see the previous section of this report for further discussion). The Oregon 219/Springbrook Road/Industrial Parkway, the existing Springbrook Road/Wilsonville Road, and Springbrook Road/2nd Street/Fernwood Road intersections will all meet the performance standards.

Because Option 1 is currently part of ODOT's recommended design, it can be built within the available right-of-way, with no further utility impacts or schedule delays.



Option 2 – Traffic Signal at the Springbrook Road/Wilsonville Road Intersection

Option 2 would maintain the existing configuration of Wilsonville Road and eliminate the future connection to the Oregon 219/Phase 1 Bypass intersection. Today, Wilsonville Road intersects Springbrook Road approximately 500 feet east of Oregon 219 at an unsignalized junction. Under Option 2, the Springbrook Road/Wilsonville Road intersection would require signalization or the installation of a roundabout. A traffic signal could operate with one lane in each direction on Springbrook Road plus a westbound left turn lane.

A roundabout at the Springbrook Road/Wilsonville Road intersection would require a two-lane entry on the westbound approach of Springbrook Road and a single-lane entry on the eastbound approach. Construction of the roundabout at the Springbrook Road/Wilsonville Road intersection would require additional right-of-way at the intersection. It would also likely cause additional utility relocations and impacts to existing parking areas and building structures. For these reasons, the roundabout option at the Springbrook Road/Wilsonville Road intersection has been eliminated from further consideration.

Figure C displays the roadway and intersection configurations for Option 2.

Under Option 2, anyone wishing to travel between the Phase 1 Bypass and Wilsonville Road would need to travel through the Springbrook Road/Wilsonville Road and Oregon 219/Springbrook Road/Industrial Parkway intersections. No direct connection between Wilsonville Road and the Phase 1 Bypass would be provided.

As a signalized intersection, the Springbrook/Wilsonville Road intersection would function at a v/c ratio of 0.68; as a multilane roundabout, the intersection would also function at a v/c ratio of 0.68. As shown in the Table 1, the operations at the remaining intersections would be similar to that experienced under Option 1.

Given the relatively close spacing of signalized intersections in this design option, a preliminary queuing analysis was performed assuming opening year traffic conditions. This analysis found that queues in the dual westbound left-turn lanes at the Oregon 219/Springbrook Road/Industrial Parkway intersection would extend approximately 400 feet. With approximately 450 feet available between intersections, these queues could theoretically be accommodated; however, there is insufficient distance for vehicles to transition into the turn lanes and no room for additional traffic growth in the future. Furthermore, this analysis assumed a balanced use of the dual left-turn lanes. Given the demand for traffic to make a right turn at the Phase 1 Bypass intersection downstream, it is likely that a majority of traffic would favor the right-hand lane. As such, queues at the Oregon 219/Springbrook Road/Industrial Parkway intersection are expected to extend into the Springbrook Road/Wilsonville Road intersection periodically during peak travel periods.

These queue spillback issues could cause blockages and conflicts for vehicles turning at the Springbrook Road/Wilsonville Road intersection, thereby reducing the intersection performance. Additionally, standing queues within the intersection would create concerns for pedestrian safety and other nonmotorized users.

Construction of a traffic signal at the Springbrook Road/Wilsonville Road intersection and modifying the Oregon 219/Phase 1 Bypass intersection would not result in right-of-way impacts. This option would likely require additional utility relocations, and the redesign could result in minor delays to the construction schedule.

While this option may perform acceptably in 2017, the opening year of the Phase 1 Bypass, as traffic volumes continue to grow the queuing will block the Springbrook Road/Wilsonville Road intersection. This amount of queuing will be problematic to traffic corridor operations and is not an acceptable option for Wilsonville Road, since there is no capacity for the future projected growth.



Option 3 – Right In and Out at Springbrook Road/Wilsonville Road Intersection

Option 3 is the same as Option 2 except that the Springbrook Road/Wilsonville Road intersection would be right-in/right-out on the Wilsonville Road approach instead of allowing for full movement and signalization. Like Option 2, no direct connection between the Phase 1 Bypass and Wilsonville Road would be provided.

Option 3 would cause additional out-of-direction movements for westbound drivers seeking to travel between Wilsonville Road and the Phase 1 Bypass. Under this option, westbound travelers would need to use the Springbrook Road/Wilsonville Road, Springbrook Road/2nd Street/Fernwood Road, and Oregon 219/Springbrook Road/Industrial/Parkway intersections. In addition, travelers would either use 2nd Street, Hayes Street, or Oregon 99W to travel between northbound Springbrook Road and southbound Oregon 219 to access the Phase 1 Bypass. This would result in additional impacts to both city streets and state highways. Option 3 is reflected in Figure D.

Under this option, the Springbrook Road/Wilsonville Road intersection would function with a v/c ratio of 0.63. As shown in the Table 1, the operations at the remaining intersections would be similar to that experienced under Option 1.

Given the out-of-direction travel anticipated with this option, the Springbrook Road/2nd Street/Fernwood Road intersection operations were also reviewed. Per this analysis, this intersection would operate at a v/c ratio of 0.85, which meets the performance standard. However, approximately 200 vehicles per hour would need to find alternative routes and/or make U-turns to access the Phase 1 Bypass.

Option 3 can be built within the existing project right-of-way and with no utility impacts and no schedule delays.

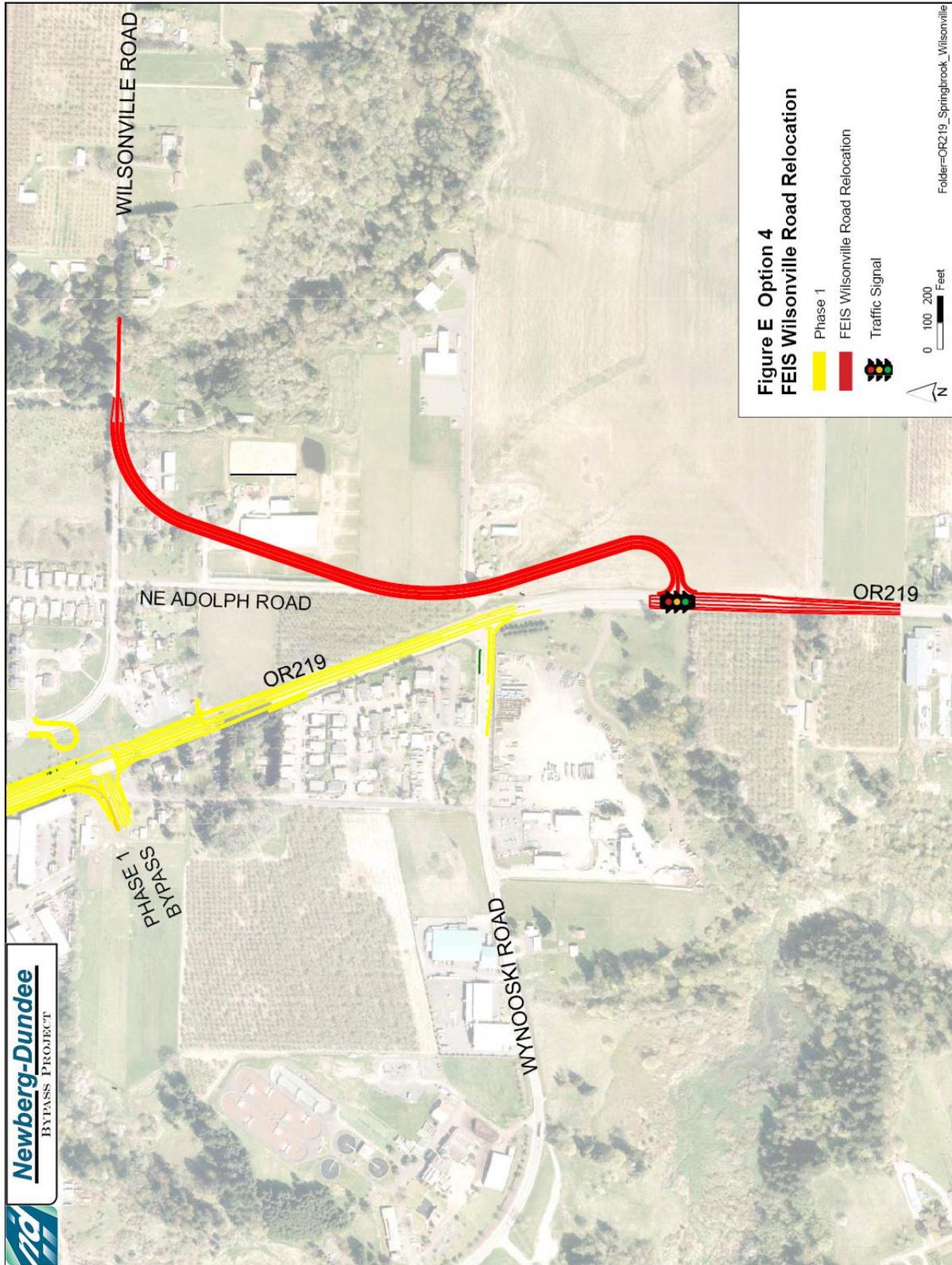


Option 4 – FEIS Wilsonville Road Relocation

Option 4 was developed as part of the FEIS Preferred Bypass Alternative for the relocation of Wilsonville Road. This option assumes that the Full Bypass and the Oregon 219 Interchange are constructed. No further relocation of Wilsonville Road would be required. Option 4 would realign Wilsonville Road to a new intersection on Oregon 219 south of the Oregon 219/Wynook Road intersection. The southerly connection would occur partially via Adolf Road. This option would provide a direct connection between Wilsonville Road and Oregon 219, but would not directly provide a connection to the Phase 1 Bypass. Drivers would go through the new Oregon 219 intersection to travel to/from Wilsonville Road and the Phase 1 Bypass. Under this option, the new Oregon 219/Wilsonville Road intersection would require signalization. Option 4 is reflected in Figure E.

Under this option, the new signalized Oregon 219/Wilsonville Road intersection would operate acceptably with a v/c ratio of 0.54. As shown in the Table 1, the operations at the remaining intersections would be similar to that experienced under Option 1.

Option 4 would require new right-of-way, additional utility relocations, and could delay the construction schedule if it was added to the Phase 1G project.



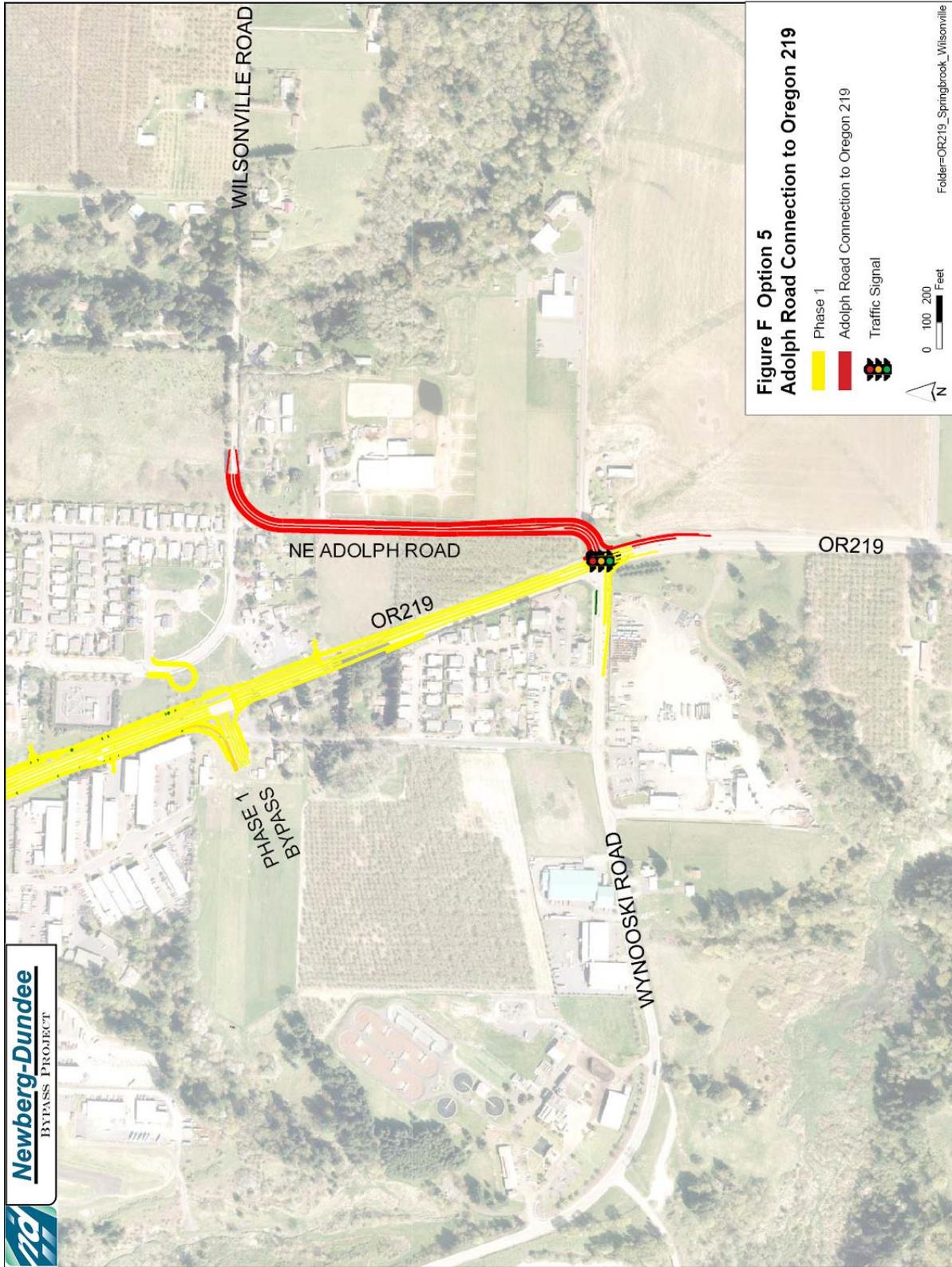
Option 5 – Adolf Road Connection to Oregon 219

Option 5 is similar to Option 4 except that Wilsonville Road would intersect Oregon 219 at the Oregon 219/Wynooski Road intersection rather than to the south. Option 5 would also create a southerly connection of Wilsonville Road to Oregon 219 that uses more of the Adolf Road right-of-way than Option 4 does. Option 5 is reflected in Figure F.

Like Option 4, Option 5 would not provide a direct connection between the Phase 1 Bypass and Wilsonville Road. Rather, drivers would use Oregon 219 to travel between Wilsonville Road and the Phase 1 Bypass.

Under this option, the Oregon 219/Wynooski Road/Wilsonville Road intersection would operate at a v/c ratio of 0.58 assuming signalization. As shown in Table 1, the operations at the remaining intersections would be similar to that experienced under Option 1.

Option 5 would require new right-of-way, additional utility relocations and could delay the construction schedule if it was added to the Phase 1G project.

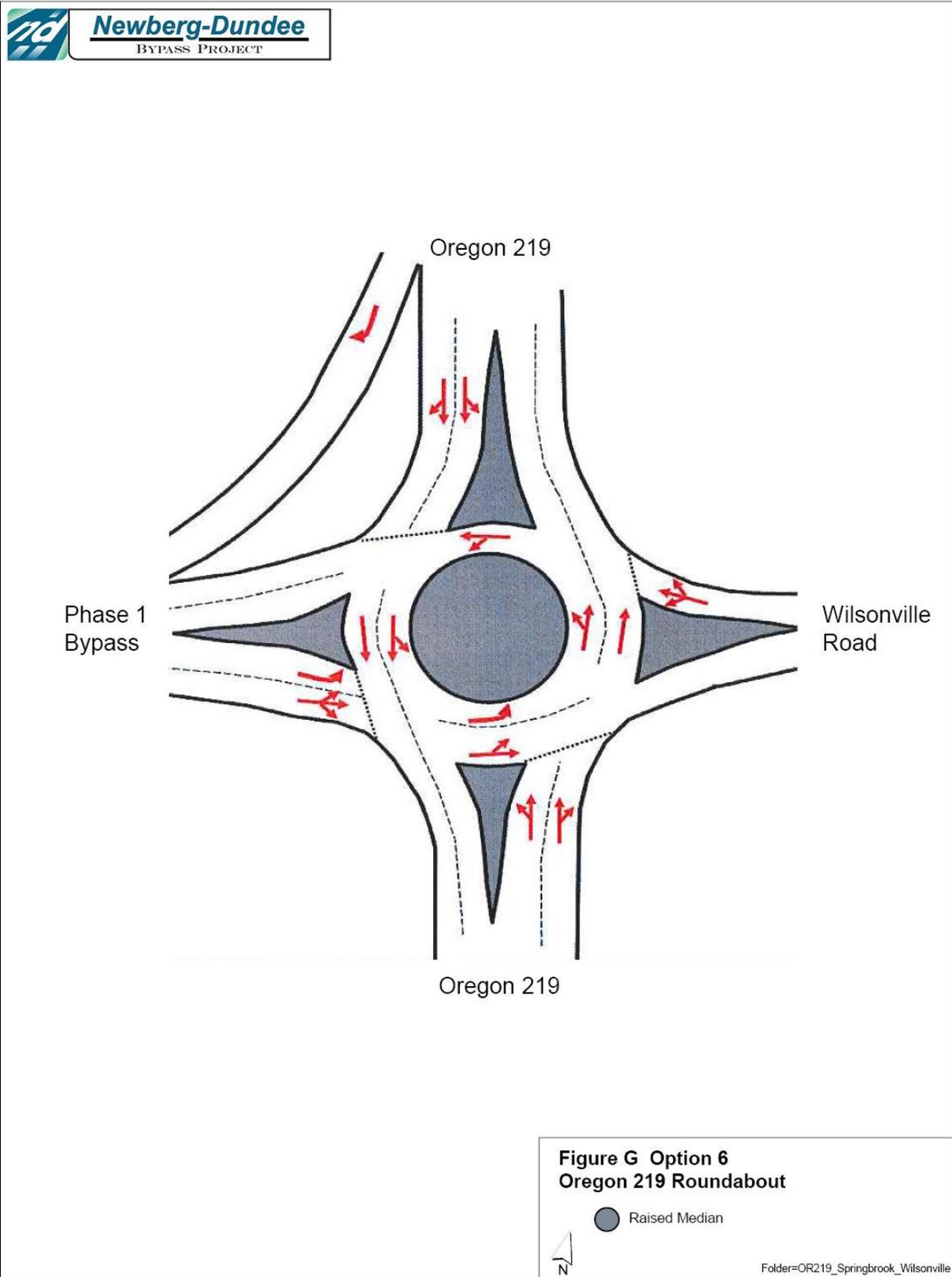


Option 6 – Oregon 219 Roundabout

Option 6 would be the same as Option 1 except that the Oregon 219/Phase 1 Bypass/Wilsonville Road intersection would be constructed with a roundabout rather than a traffic signal. Construction of a roundabout would require two lanes northbound and southbound on Oregon 219. Like Option 1, Option 6 provides direct access between Wilsonville Road and the Phase 1 Bypass. This option is reflected in Figure G.

Assuming a multilane roundabout, the Oregon 219/Phase 1 Bypass/Wilsonville Road roundabout would operate with a v/c ratio of 0.66. As shown in the Table 1, the operations at the remaining intersections would be the same as that experienced under Option 1.

Construction of a roundabout at the Oregon 219/Phase 1 Bypass/Wilsonville Road intersection would likely result in additional right-of-way impacts. This option would also likely require additional utility relocations, and the redesign could result in minor delays to the construction schedule.



Option 7 – No Connection from Eastbound Phase 1 Bypass to Wilsonville Road

Option 7 is similar to Option 1 except that no eastbound through movements would be allowed at the Oregon 219/Phase 1 Bypass/Wilsonville Road intersection. Under this option, westbound Wilsonville Road travelers could access the Phase 1 Bypass directly via the intersection, whereas eastbound travelers would either need to turn left or right onto Oregon 219 and find an alternative route to Wilsonville Road. Figure H represents this option. As shown, this intersection would require signalization as well as raised medians to prohibit eastbound through movements.

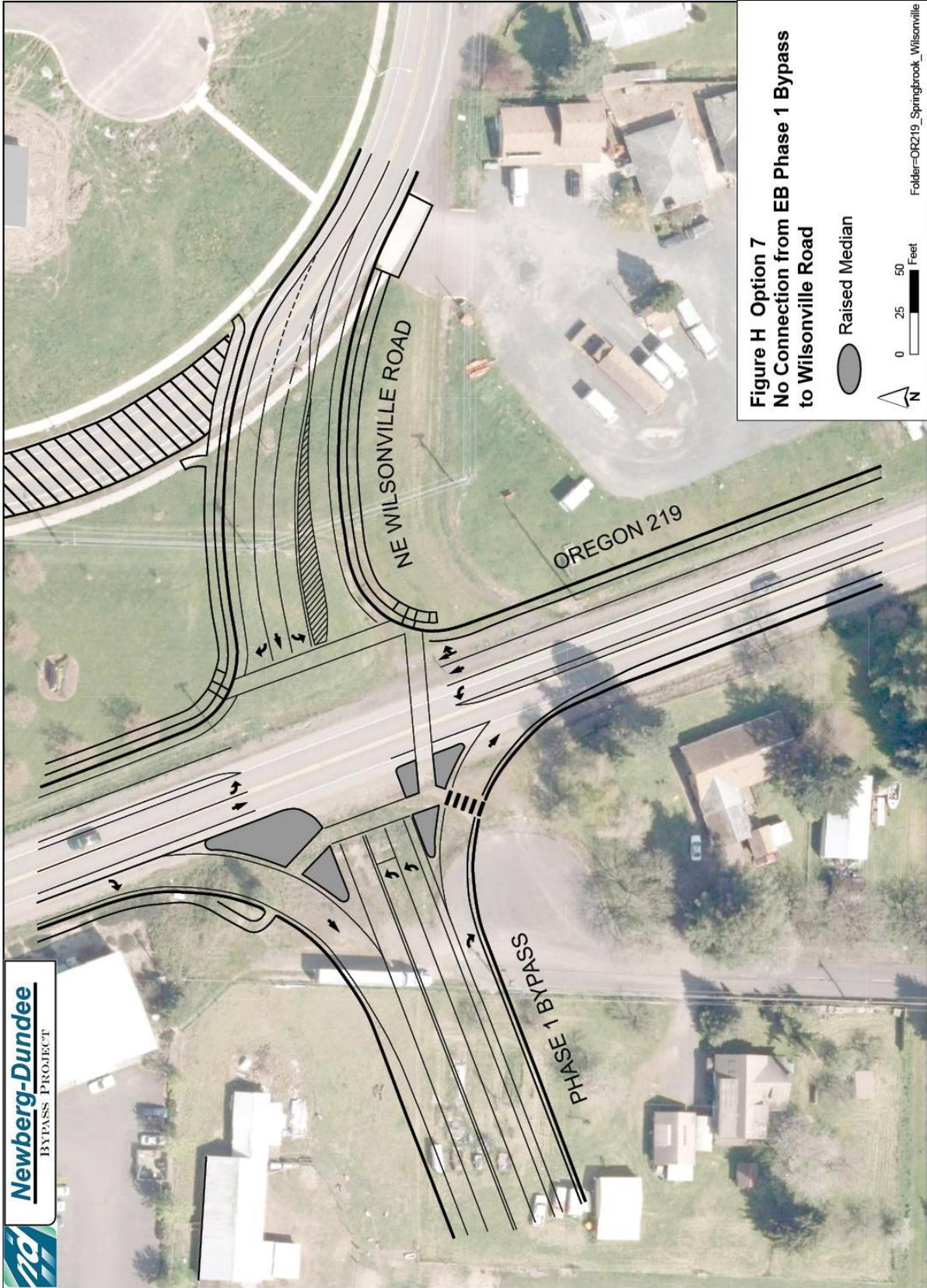
In the absence of eastbound through movements at the Oregon 219/Phase 1 Bypass/Wilsonville Road intersection, eastbound travelers would potentially use one of a number of alternative routes to travel between the Phase 1 Bypass and Wilsonville Road. These could include:

- Travelers could turn right to head southbound on Oregon 219 and make a U-turn at a median opening or at the Oregon 219/Wynooski Road intersection. After heading northbound, the traveler could turn right onto Wilsonville Road at the Oregon 219/Phase 1 Bypass/Wilsonville Road traffic signal.
- Travelers could turn left to head northbound on Oregon 219 and make one of the following maneuvers to head southbound:
 - Make a U-turn at a median opening and turn left onto Wilsonville Road at the Oregon 219/Phase 1 Bypass/Wilsonville Road traffic signal.
 - Make a U-turn at the Oregon 219/Springbrook Road/Industrial Parkway traffic signal to head southbound on Oregon 219. The traveler can then turn left at the Oregon 219/Phase 1 Bypass/Wilsonville Road traffic signal.
 - Turn right at the Oregon 219/Springbrook Road/Industrial Parkway traffic signal and then turn right onto McKern Court (currently Wilsonville Road). The traveler could then turn left into Springbrook Estates and follow the local street system to get to Wilsonville Road. This would result in cut-through traffic in the Springbrook Estates neighborhood.
 - Turn right at the Oregon 219/Springbrook Road/Industrial Parkway traffic signal and then turn right onto Fernwood Road. The traveler could then travel past the Chehalem Glenn Golf Course and turn right onto Corral Creek Road, turn right onto Renne Road, and then turn left onto Wilsonville Road.

For the purposes of the traffic analysis, all eastbound travelers between the Phase 1 Bypass and Wilsonville Road were assumed to use the Fernwood Road/Corral Creek/Renne Road option discussed above. This option affects the most number of intersections and thereby provides a conservative analysis of impact.

Under this option, the Oregon 219/Phase 1 Bypass/Wilsonville Road intersection would operate with a v/c ratio of 0.76. As shown in the Table 1, the operations at the remaining intersections would be similar to that experienced under Option 1. This option would require an estimated 25 vehicles per hour to use alternate routes to access Wilsonville Road from the Phase 1 Bypass, but these do not result in significant impacts to the performance of the intersections.

Option 7 may result in minor increases to the construction schedule associated with redesign of the intersection. No additional right-of-way and no additional utility relocation costs are anticipated with this option.



Option 8 – No Through Traffic

This option was developed by ODOT and LHNA in early 2015. Under this option, no direct connection would be provided between Wilsonville Road and the Phase 1 Bypass. Rather, the eastbound and westbound through movements would be prohibited at the Oregon 219/Phase 1 Bypass/Wilsonville Road intersection. For those travelers desiring to travel between Wilsonville Road and the Phase 1 Bypass, there are a number of routes that could be used:

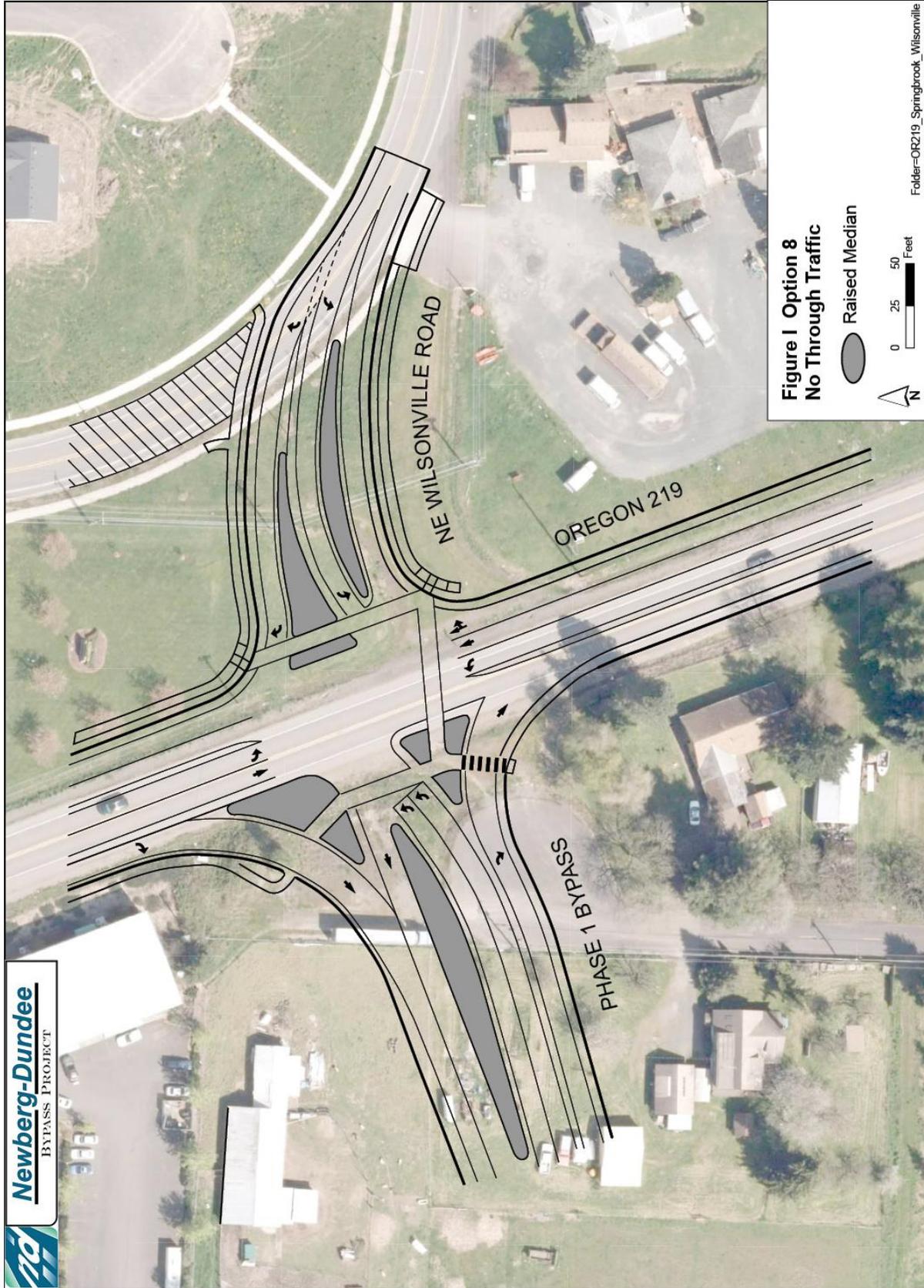
- Use a median opening to make a U-turn on Oregon 219 and then turn at the Oregon 219/Phase 1 Bypass/Wilsonville Road traffic signal.
- Make a U-turn at the Oregon 219/Springbrook Road/Industrial Parkway traffic signal and then turn at the Oregon 219/Phase 1 Bypass/Wilsonville Road traffic signal.
- Use Springbrook Road and McKern Court (currently Wilsonville Road). The traveler could then turn left into Springbrook Estates and follow the local street system to travel between Wilsonville Road and the Phase 1 Bypass. This would result in cut-through traffic in the Springbrook Estates neighborhood.
- Use Springbrook Road, Fernwood Road, Corral Creek Road, and Renne Road to travel between Wilsonville Road and Bypass.

As shown in Figure I, this option would require signalization as well as raised medians to prohibit eastbound and westbound through movements at the Oregon 219/Phase 1 Bypass/Wilsonville Road intersection.

For the purposes of the traffic analysis, similar to Option 7, all travel between Wilsonville Road and the Phase 1 Bypass was assumed to use the Fernwood Road/Corral Creek/Renne Road route as this impacts the most number of study intersections.

Under this option, the Oregon 219/Phase 1 Bypass/Wilsonville Road intersection would operate with a v/c ratio of 0.67. As shown in the Table 1, the operations at the remaining intersections would be similar to that experienced under Option 1. This option would require an estimated 50 vehicles (25 vehicles in each direction) per hour to use alternate routes to travel between Wilsonville Road and the Phase 1 Bypass; however, these trips do not result in significant impacts to the performance of the intersections.

Option 8 may result in minor increases to the construction schedule associated with intersection redesign. No additional right-of-way and no additional utility relocation costs are anticipated with this option.



Summary of Traffic Operations

Table 1 summarizes the traffic operations at the four affected intersections associated with the design options considered.

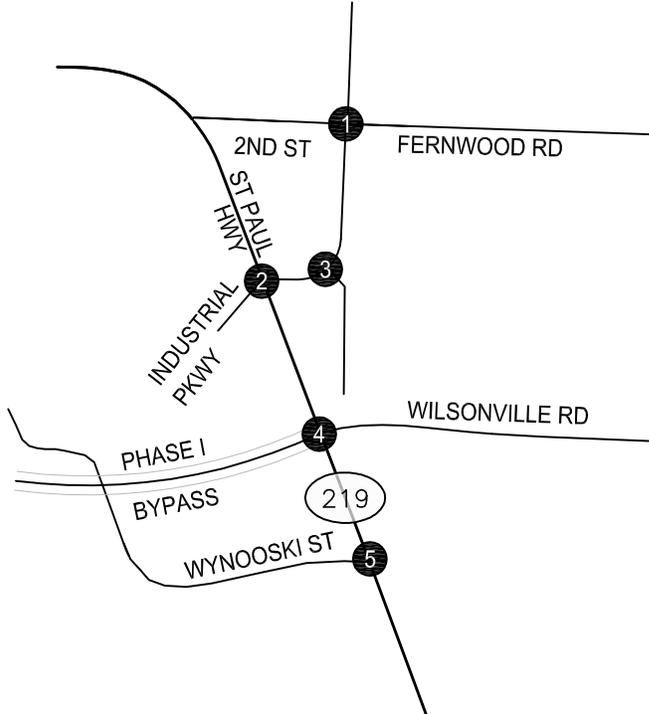
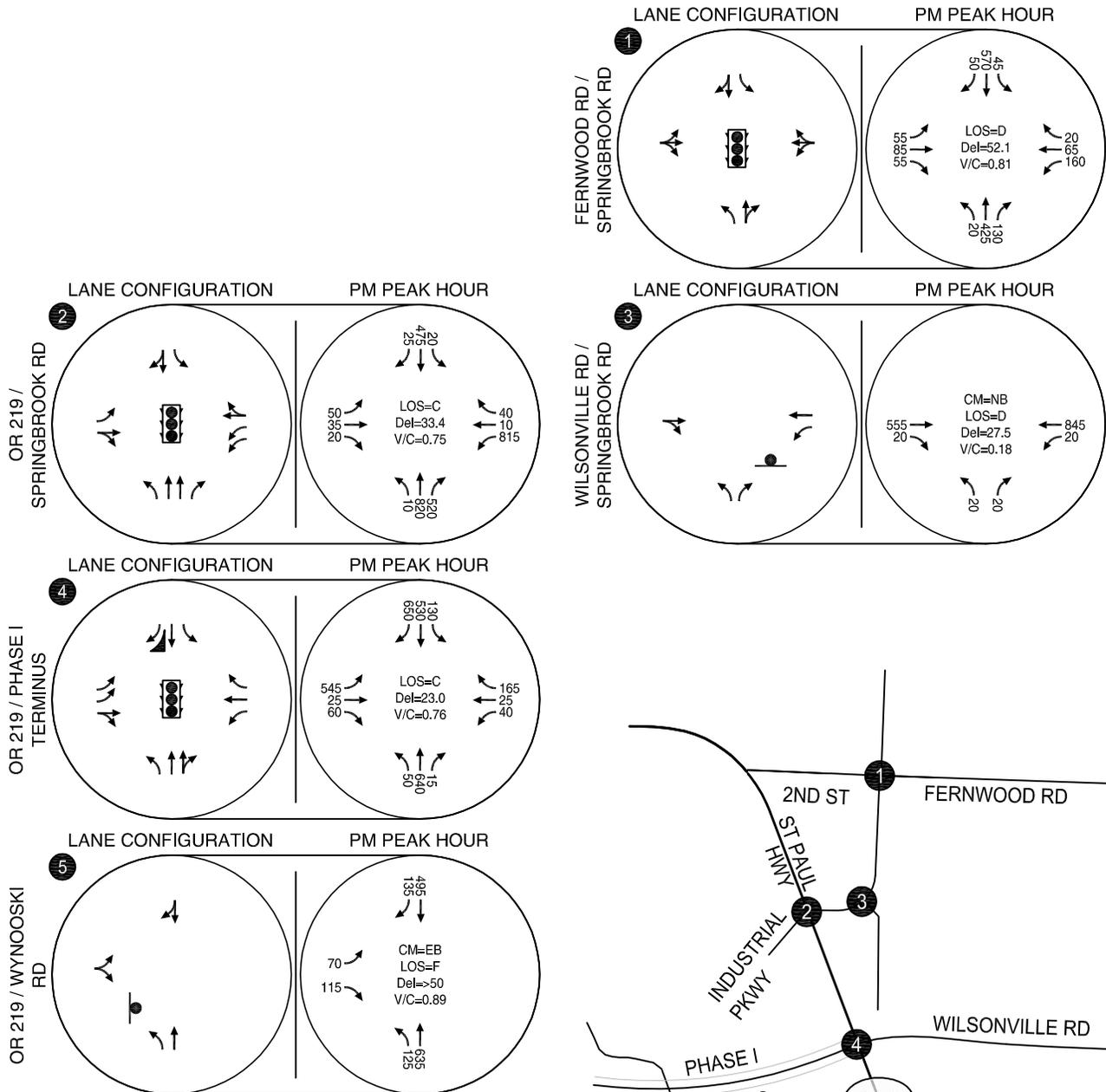
Table 1. Opening Year of Bypass (2017) Intersection Operations

Intersection	Performance Standard	Option 1 Full Movement Intersection	Option 2 Traffic Signal at Springbrook/Wilsonville Road Intersection	Option 3 Right In/Out at Springbrook/Wilsonville Road Intersection	Option 4 FEIS Wilsonville Road Relocation	Option 5 Adolph Road Connection to Oregon 219	Option 6 Oregon 219 Roundabout	Option 7 No Connection from EB Phase 1 Bypass to Wilsonville Road	Option 8 No Through Traffic
OR 219/Springbrook Rd	0.80	0.75	0.71	0.75	0.75	0.75	0.75	0.75	0.76
OR 219/Bypass	0.65	0.76	0.68	0.70	0.74	0.74	0.66	0.76	0.67
OR 219/Wynooski Rd	0.80	0.89	0.89	0.89	0.93	0.58	0.89	0.89	0.89
Springbrook Rd/ Wilsonville Rd	0.90	0.18	0.68	0.63	0.18	0.18	0.18	0.19	0.20
Springbrook Rd/2nd St/ Fernwood Rd	0.90	0.78	0.78	0.85	0.78	0.78	0.78	0.79	0.81

Appendix A

Traffic Analysis Figures

Attachment 1

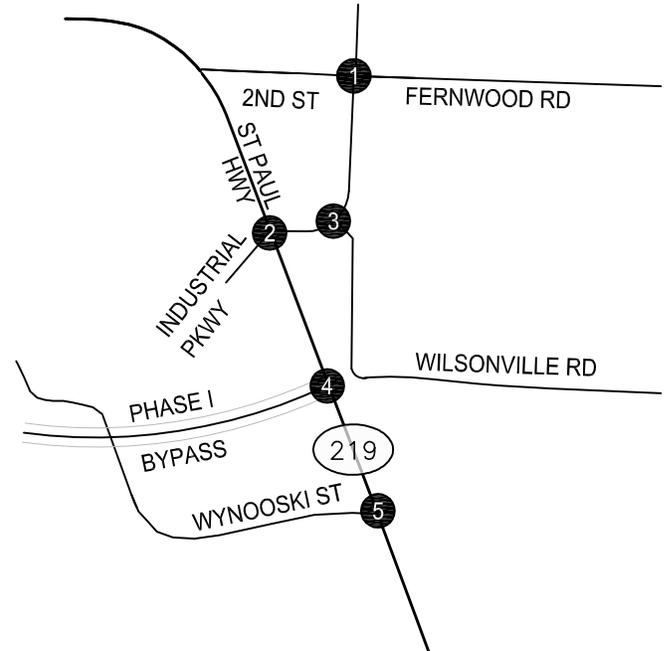
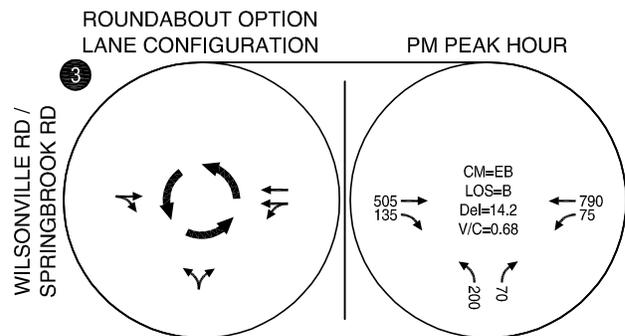
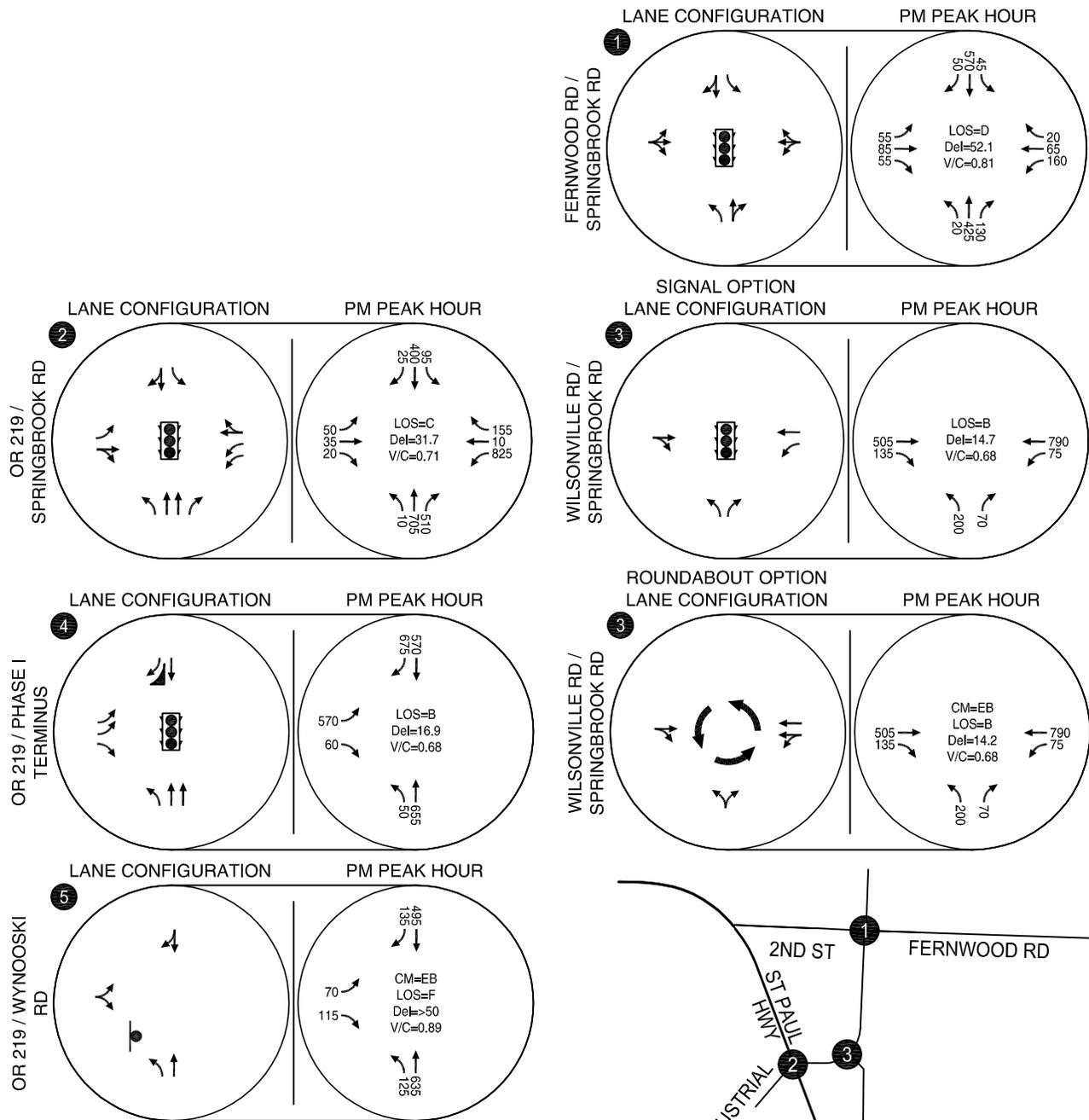


 - STOP SIGN
 - TRAFFIC SIGNAL
 CM = CRITICAL MOVEMENT (TWSC)
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED) / CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**Option 1 Traffic Conditions
Year 2016 PM Peak Hour
Newberg, Oregon**

**Figure
1**

K:\H_Portland\proj\figs\2015 August Analysis ZHB\0372_August_fig.dwg Nov 16, 2015 - 2:26pm - zbugg Layout Tab: Option 1



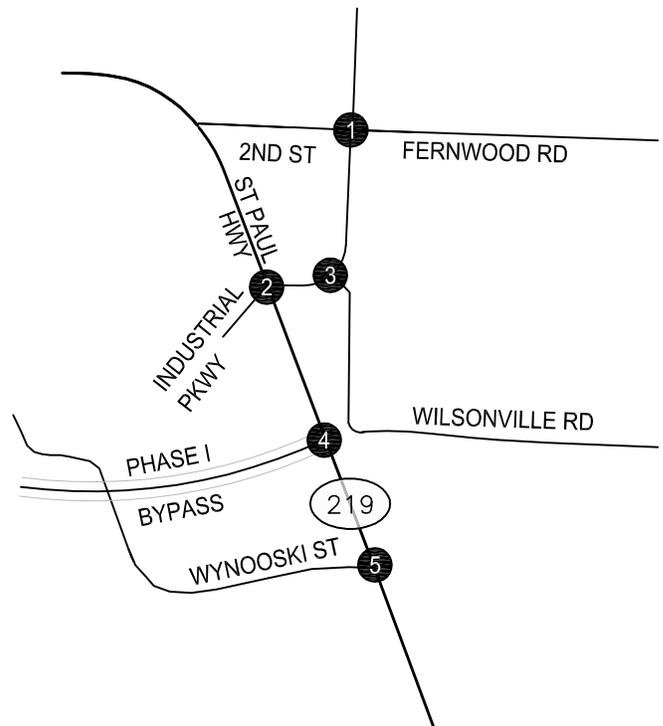
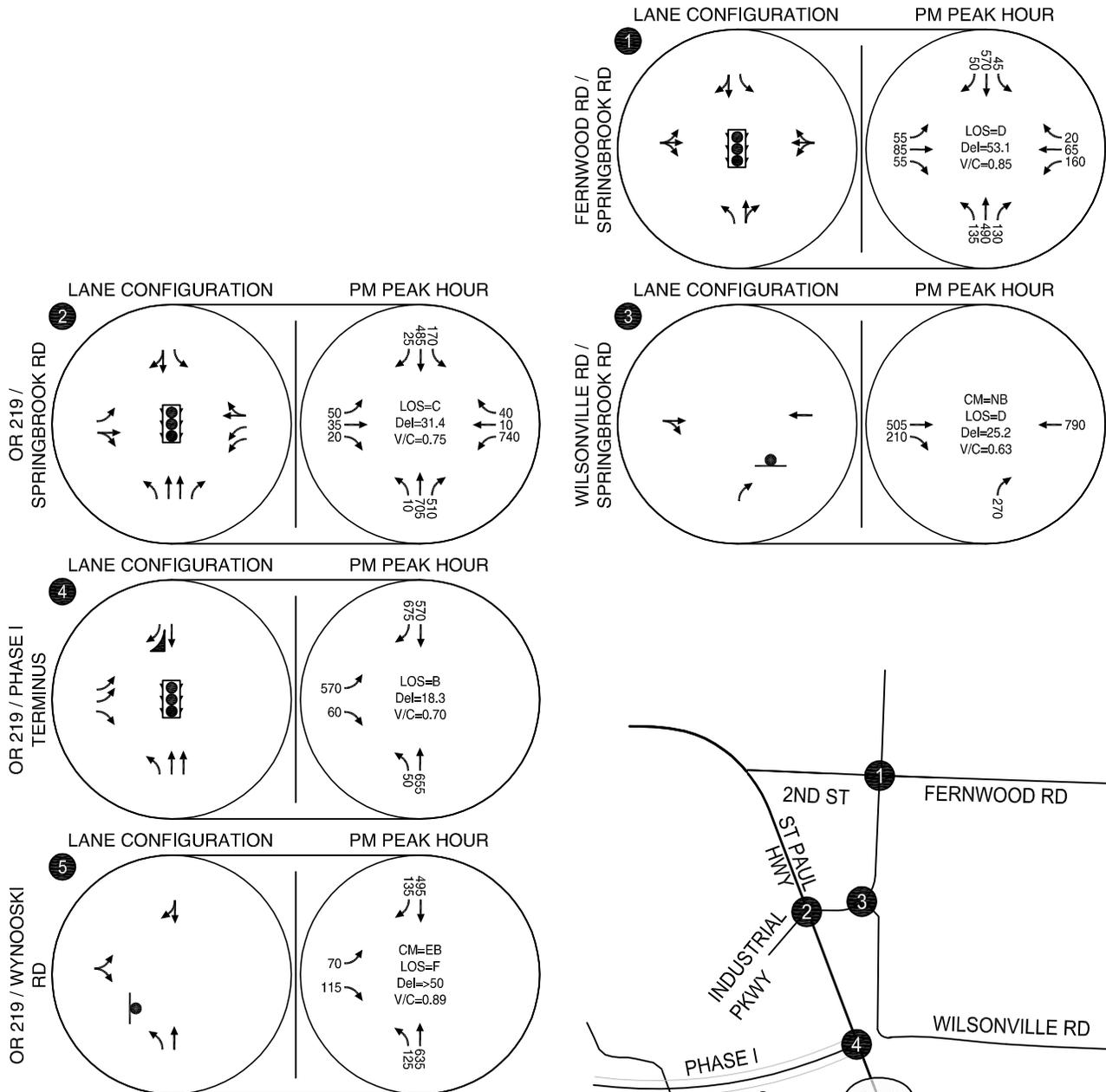
- STOP SIGN
- TRAFFIC SIGNAL
- ROUNDABOUT

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED) / CRITICAL MOVEMENT LEVEL OF SERVICE
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED) / CRITICAL MOVEMENT CONTROL DELAY
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**Option 2 Traffic Conditions
 Year 2016 PM Peak Hour
 Newberg, Oregon**

**Figure
 2**

K:\L_Portland\proj\figs\2015 August Analysis ZHB\0372_August_fig3.dwg Nov 16, 2015 - 2:26pm - zbugg Layout Tab: Option 2



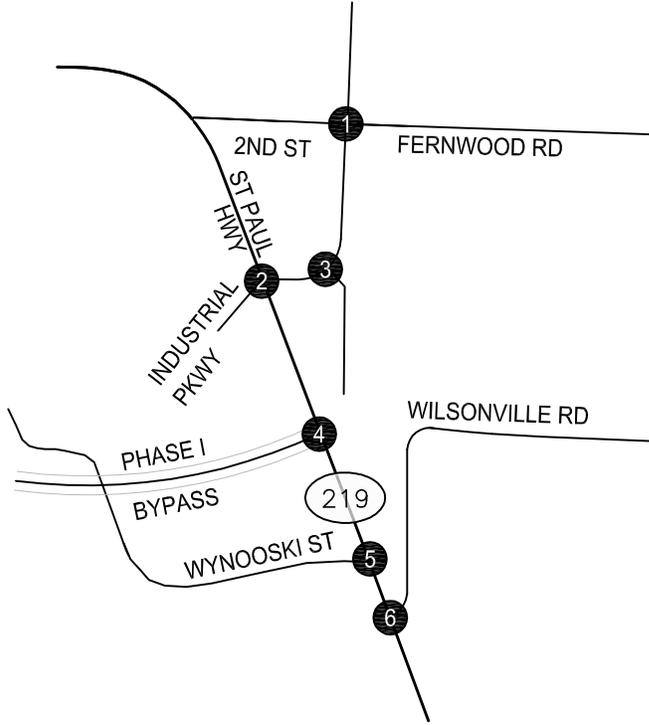
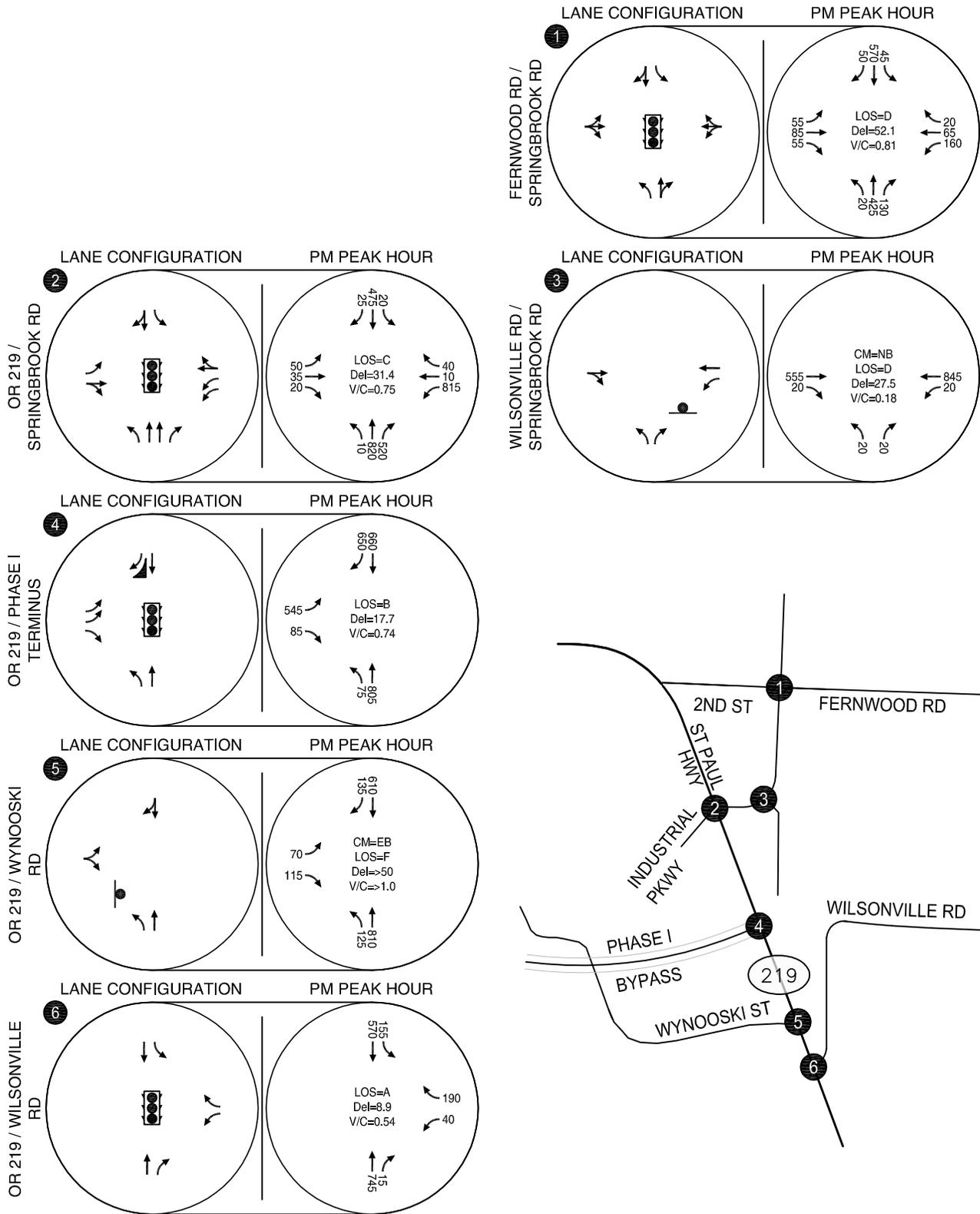
- STOP SIGN
- TRAFFIC SIGNAL

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

**Option 3 Traffic Conditions
 Year 2016 PM Peak Hour
 Newberg, Oregon**

**Figure
 3**

K:\H_Portland\proj\lib\9372 - Newberg-Dundee Bypass\2015 August Analysis ZHB\9372_August_figs.dwg Nov 16, 2015 - 2:27pm - zbugg Layout Tab: Option 3



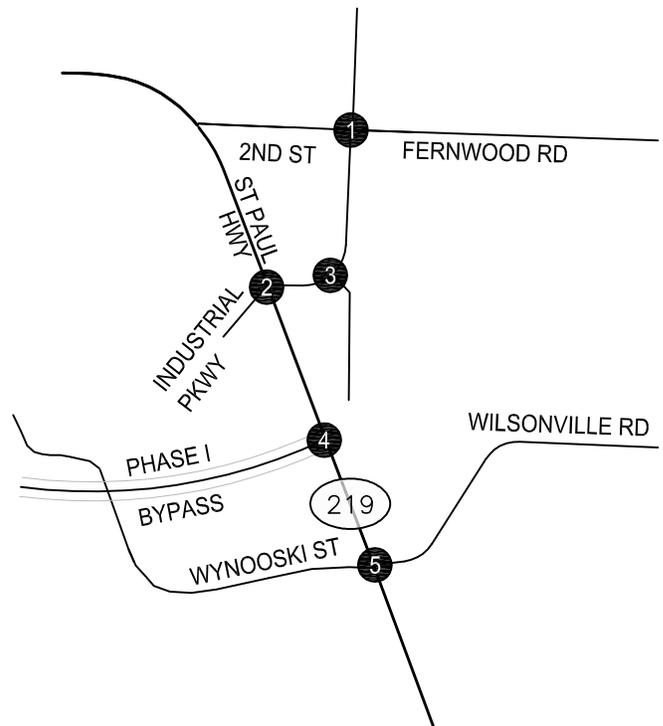
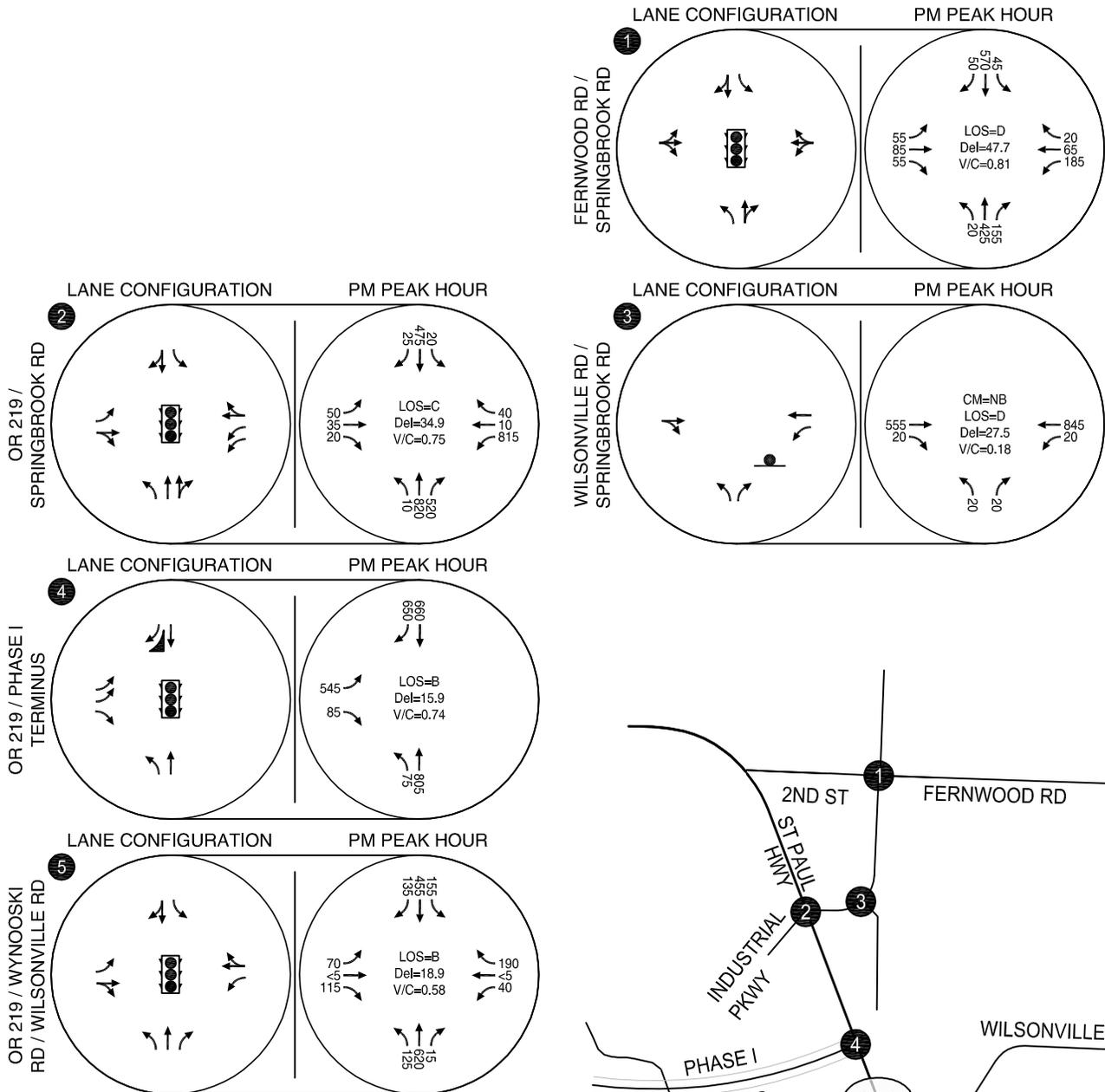
● - STOP SIGN
 - TRAFFIC SIGNAL

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

**Option 4 Traffic Conditions
 Year 2016 PM Peak Hour
 Newberg, Oregon**

**Figure
 4**

K:\H_Portland\proj\160372 - Newberg-Dundee Bypass\2015 August Analysis ZHB\0372_August_figs.dwg Nov 16, 2015 - 2:27pm - zbugg Layout Tab: Option 4



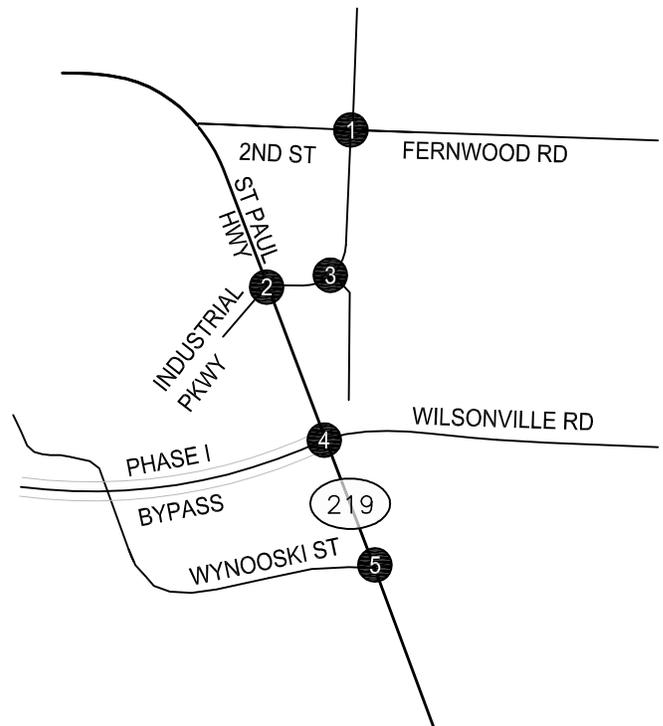
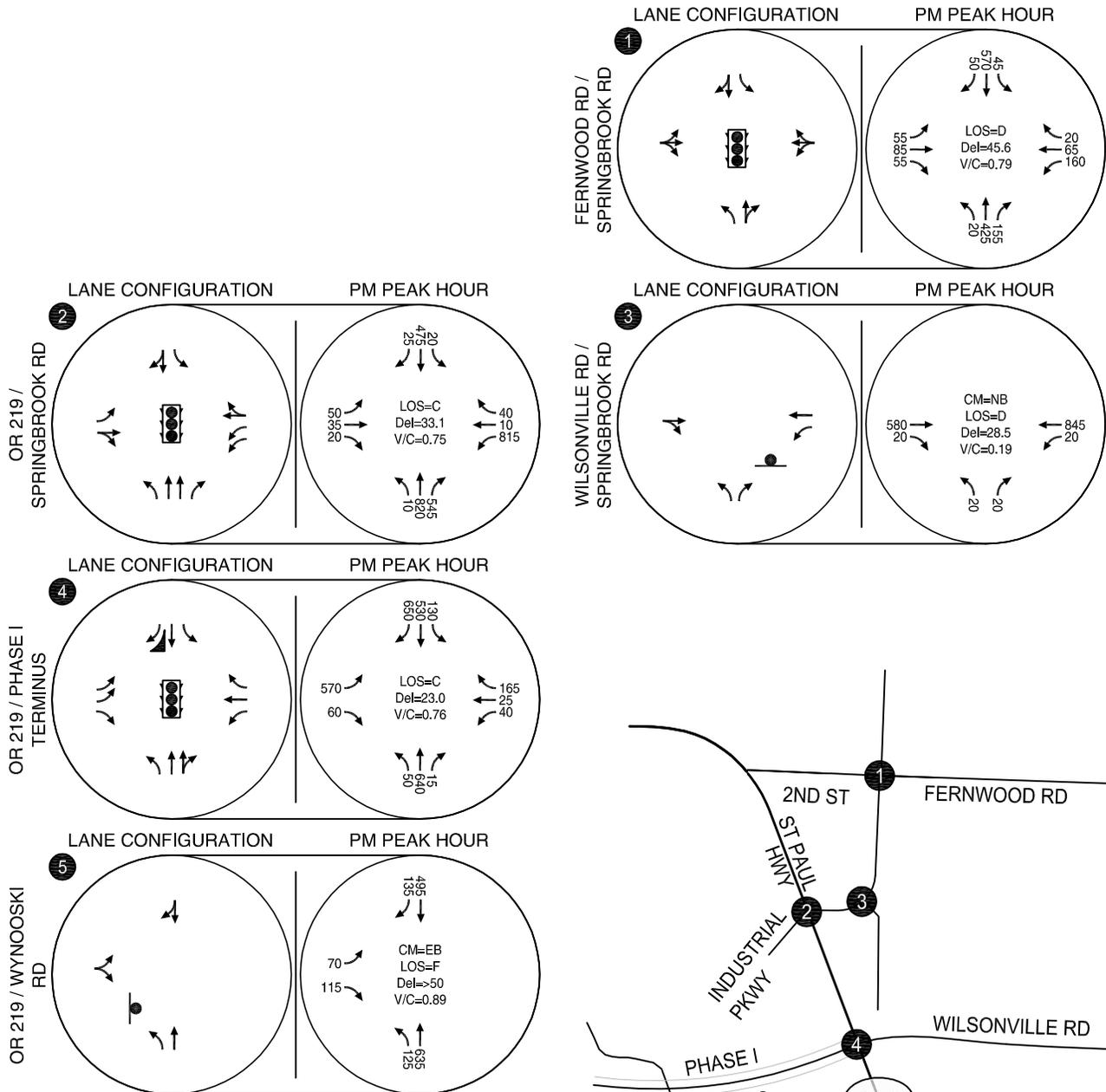
- STOP SIGN
- TRAFFIC SIGNAL

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

**Option 5 Traffic Conditions
 Year 2016 PM Peak Hour
 Newberg, Oregon**

**Figure
 5**

K:\L_Portland\proj\160372 - Newberg-Dundee Bypass\2015 August Analysis\ZHB\0372_August_figs.dwg Nov.16.2015 - 2:27pm - zbugg Layout Tab: Option 5



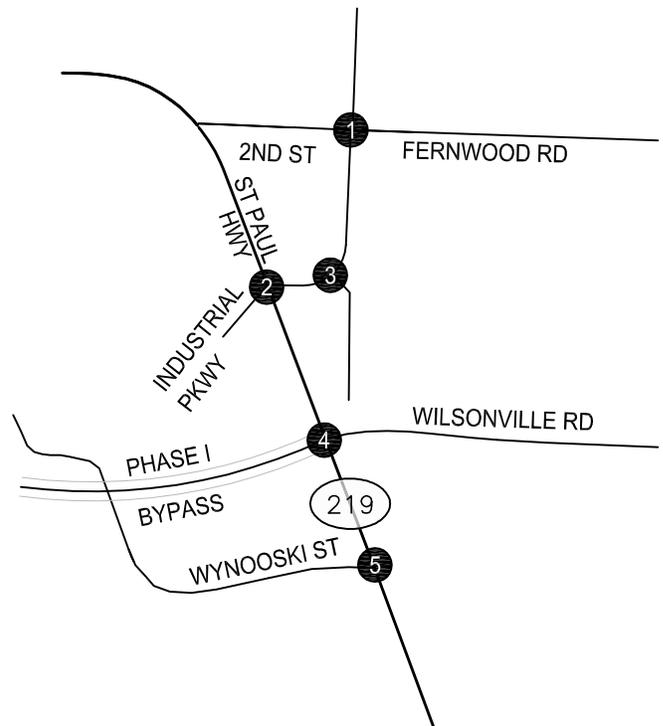
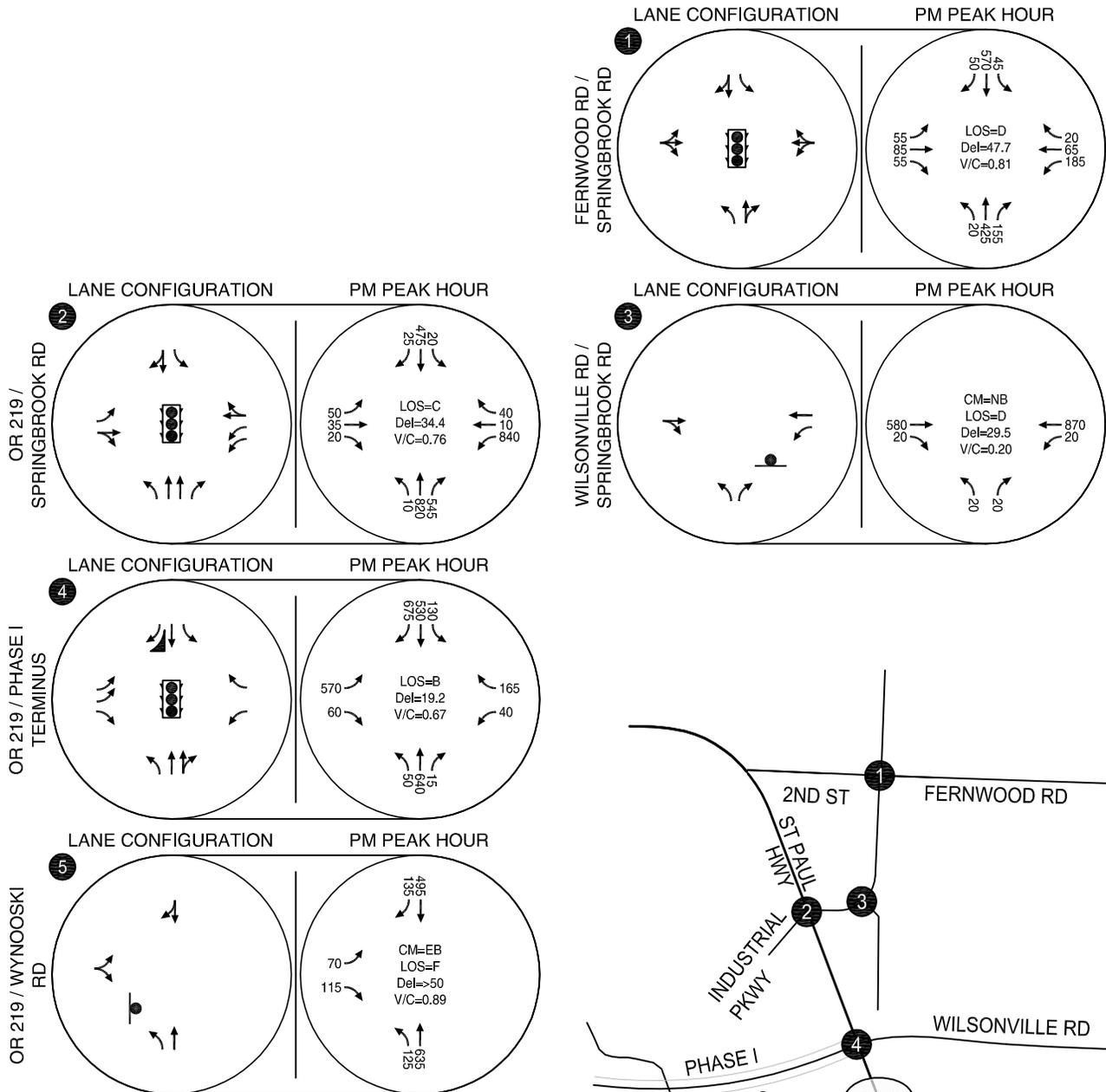
- STOP SIGN
- TRAFFIC SIGNAL

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

**Option 7 Traffic Conditions
 Year 2016 PM Peak Hour
 Newberg, Oregon**

**Figure
 7**

K:\H_Portland\proj\lib\9372 - Newberg-Dundee Bypass\2015 August Analysis ZHB\9372_August_figs.dwg Nov 16, 2015 - 2:27pm - zbugg Layout Tab: Option 7



- STOP SIGN
- TRAFFIC SIGNAL

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

**Option 8 Traffic Conditions
 Year 2016 PM Peak Hour
 Newberg, Oregon**

**Figure
 8**