3. INTERSECTION CONTROL ALTERNATIVES

To alleviate the level of service deficiencies documented in Chapter 2, improvement options were considered at each of the primary intersections. In general, options included a Roundabout (RBT), All Way Stop Control (AWSC), Two Way Stop Control (TWSC), and Signals. Specific criteria considered in the alternatives analysis include:

- Pedestrian crossing locations and amenities (protected or controlled crossing locations such as roundabouts and beacons).
- Operation during special events (school activities, and events at the regional athletic complex).
- Potential non-motorized and transit facilities that are or should be considered in the project area.
- Impacts of access management strategy and new development cross-connections to maintain safety along the corridor.

Alternative controls at each intersection, recommendations and preliminary costs are discussed in the following sections.

3.1 NOLL ROAD - HOSTMARK STREET INTERSECTION

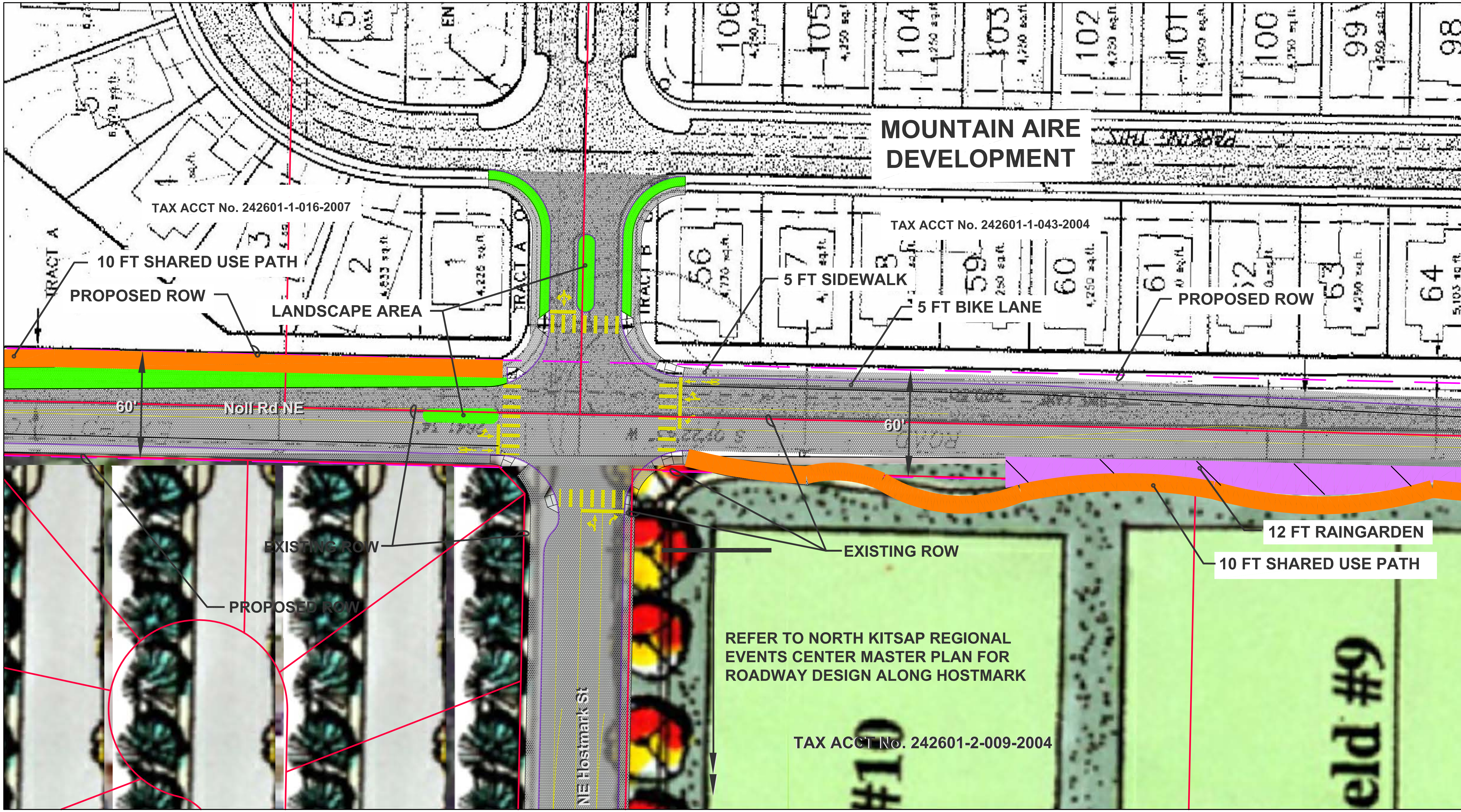
Traffic analysis shows that the intersection of Noll and Hostmark is projected to operate at LOS F under its current configuration, which fails the city's LOS without improvements.

The intersection of Noll Road and Hostmark Street is projected to meet signal warrants by the 2030 horizon year, but not by 2010. Alternatives considered at this intersection consist of a RBT, adding turn lanes under a two-way stop-control (TWSC), and an all-way stop-control (AWSC) option. A traffic signal option was also included. Operational analysis of these alternatives is presented below in Table 3-1. Schematic drawings of the AWSC and RBT options at the Noll-Hostmark intersection are shown in Figures 3-1 and 3-2, respectively.

Table 3-1. Level of Service (LOS) Summary – Noll Road / Hostmark Street

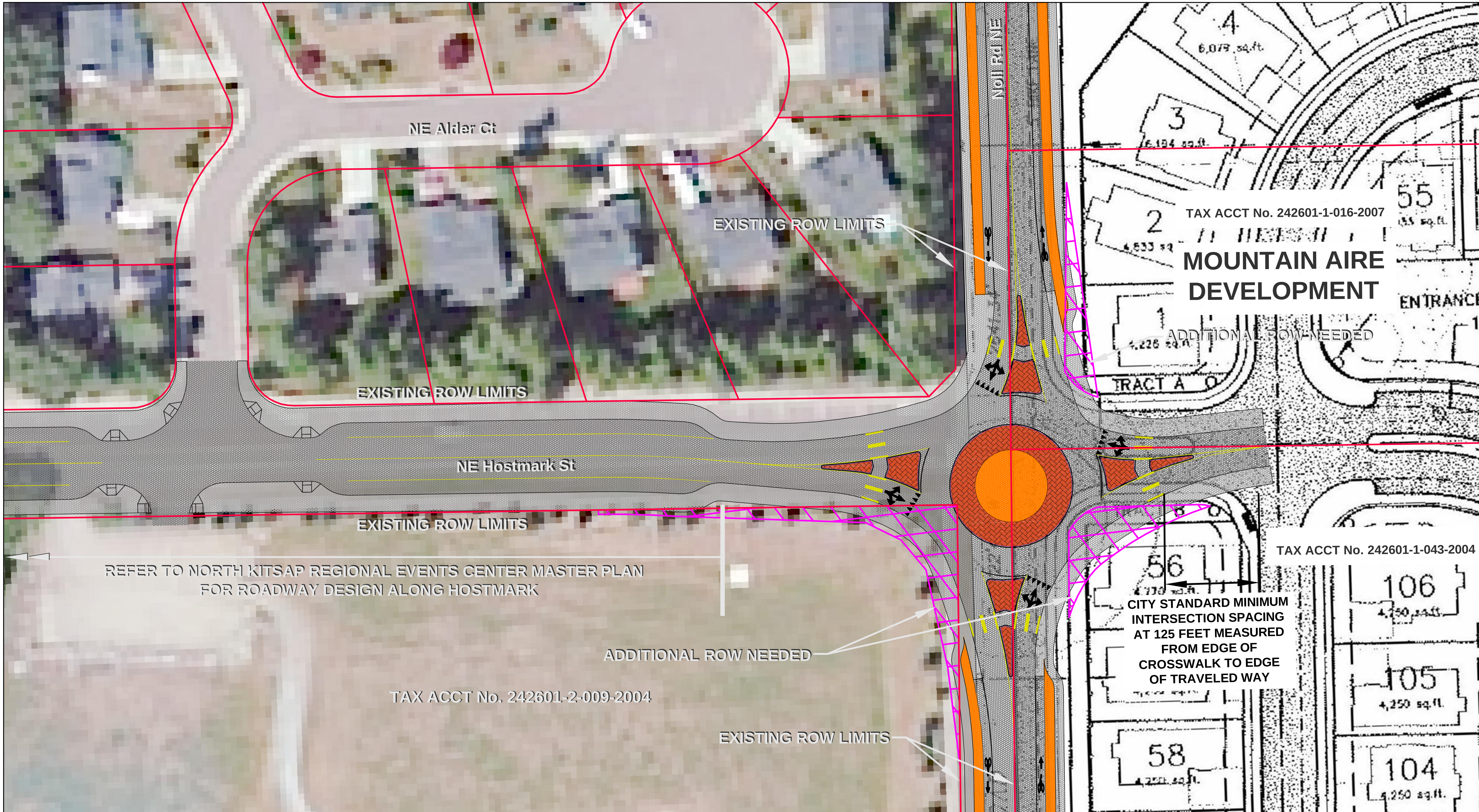
	AM Peak Hour				PM Peak Hour			
	Projected 2010		Projected 2030		Projected 2010		Projected 2030	
	LOS		LOS		LOS		LOS	
Control Type	Worst Movement	Int. Average	Worst Movement	Int. Average	Worst Movement	Int. Average	Worst Movement	Int. Average
AWSC	A	A	D	C	A	A	C	C
Roundabout	B	A	B	B	B	A	B	A
TWSC	B	A	F	F	B	A	D	D
Signal	A	A	B	B	A	A	B	A

The TWSC option is not viable in 2030 because, despite the addition of multiple turn lanes, the delay for east and west-bound traffic is above the City's LOS standard.



Parametrix DATE: Dec 29, 2008 FILE: BR2237829P01T01F-XX_Intersections

Figure 3-1
Noll Road Improvements
Noll Road NE and NE Hostmark Street Intersection
All-way Stop Control or Signal - Preferred Plan



Parametrix DATE: Dec 31, 2008 FILE: RAB_Figure01

N

SCALE IN FEET

0 50 100

TAX ACCT No	TAXPAYER	APPROX ROW NEEDED (SF)
242601-1-016-2007	CAPSTONE HOMES INC	1100
242601-1-043-2004	CAPSTONE HOMES INC	1700
242601-2-009-2004	SCHOOL DISTRICT 400 NORTH KITSAP	3300

Figure 3-2
Noll Road Improvements
Noll Road NE and NE Hostmark Street Intersection
Preliminary Roundabout Alternative

The estimated cost for intersection controls at the Noll-Hostmark intersection is summarized in Table 3-2. These cost estimates are based on 2008 construction costs, and do not include costs for any additional right-of-way that may be required. Actual costs will vary depending on the design details, such as landscaping, bulb-outs and textured concrete. The ultimate lane configuration is similar among the non-roundabout options—each requires lane additions. While a roundabout requires an increased intersection area, it does not require additional through lanes.

Table 3-2. Summary of Noll-Hostmark Intersection Control Costs

Alternative	Estimated Cost
Roundabout	$375,000
All Way Stop	$187,500
Signal	$187,500

Table 3-3 provides a qualitative comparison of the three intersection alternatives relative to operation, safety, cost and other evaluation criteria.

3.1.1 Recommended Intersection Option

Based on stakeholder evaluation and feedback, it was determined that channelization with interim AWSC and eventual signalization provided the best combination of pedestrian safety, LOS, right-of-way and cost.

All way stop control would operate at LOS D or better on all intersection approaches, but would achieve this by introducing a new stop controlled movement. By stopping the north-south traffic, which currently has a free movement, the delay is better balanced among the approaches. Geometry of the intersection will be unbalanced; not all lanes have an opposing lane, and width transitions must be accomplished through the intersection area.

The primary benefit of the AWSC alternative is lower cost – about 50 percent of the cost for a RBT or signal. This option does not provide reserve capacity to provide for larger than expected growth; nor does it provide for high volume periods such as during special events. With proper geometric improvements, all-way stop control would provide a viable, low-cost interim measure for the corridor. Longer term, adequate LOS is provided by adding a traffic signal to the AWSC concept.

One benefit of a signal is that it could likely be staged so that low-cost intersection improvements could be constructed with the corridor improvements, and the intersection could operate under stop control until such time a signal is warranted. During the period before a signal is warranted, however, there will likely be several years of decreasing performance and excessive delays.

Table 3-3. Intersection Improvement Alternatives, Noll & Hostmark

Comments	Round-About	All-Way Stop	Turn Lanes	Signal	Comments
LOS	● (green)	● (yellow)	● (red)	● (green)	Roundabout and signal have less delay (LOS B) than AWSC (LOS C) or the TWSC's worst movement (LOS F).
Queuing	● (yellow)	● (yellow)	● (yellow)	● (yellow)	Each option will experience moderate queuing during peak hours.
Lane Requirements	● (green)	● (yellow)	● (yellow)	● (yellow)	A roundabout does not require addition of any approach/storage lanes. Other options require a NB left turn lane, which increase crossing distance.
Collision Severity	● (green)	● (red)	● (red)	● (red)	Collision severity is typically reduced by the low-speed, low-angle of collision of a roundabout. All-way stop provides lower speeds than two-way stop.
Collision Frequency	● (green)	● (yellow)	● (yellow)	● (red)	Single-lane roundabouts typically decrease collisions. Signals typically increase collisions.
Pedestrian Mobility	● (green)	● (yellow)	● (red)	● (green)	The roundabout provides more pedestrian islands, and allows pedestrians to cross one lane of traffic at a time. RBT may create concerns for use by small children.
Pedestrian Safety	● (yellow)	● (yellow)	● (red)	● (green)	The roundabout lowers speeds and number of conflicts. RBT not best for use by small children. AWSTC has narrower crossings and slower speeds.
ROW Acquisition	● (yellow)	● (green)	● (green)	● (green)	More land required with the roundabout option. All other options require a SB right turn lane and NB left turn lane.
Network Connectivity	● (green)	● (green)	● (green)	● (green)	All maintain good network connectivity.
Construction $	● (yellow)	● (green)	● (green)	● (yellow)	Higher roadway area and landscaping costs with a RBT; higher costs with signal due to electrical improvements. Signal and roundabout costs estimated at $375,000; AWSC improvements estimated at approximately $187,000.
Maintenance $	● (yellow)	● (green)	● (green)	● (yellow)	More landscaping maintenance at roundabout compared to typical road.
Aesthetics	● (green)	● (green)	● (red)	● (red)	Roundabout has opportunities for landscaping center island features. AWSC allows approach islands.
Emergency Response	● (green)	● (green)	● (green)	● (green)	All options provide good mobility for emergency response vehicles.

Better ● (green) ● (yellow) ● (red) **Worse**

3.1.2 Noll – Hostmark Intersection Lane Requirements

Analysis of lane requirements and right-of-way assumed that as residential development occurs in the Noll Road corridor, pedestrian and bicycle traffic will increase significantly. Accommodation of these transportation modes is especially important given the proximity of schools to the intersection. It was assumed that 30 pedestrians and 5 bicycles will cross each intersection leg during the AM and PM peak hours. Although this is much higher than the existing peak of 10 pedestrians crossing only one intersection leg, the higher assumed value allows for what may happen during an event at the adjacent sports field complex.

3.1.2.1 Channelization Alternatives

The first alternative considered was a signalization of the single-lane approaches, assuming construction of the east leg was done as part of the Mountain Aire development. Table 3-4 summarizes the operations analysis for Alternative 1 and also provides channelization and phasing information.

Table 3-4. Alternative 1 - Single-Lane Approaches - 2030 AM and PM Peak Hour Summary

			AM Peak Hour				PM Peak Hour			
App.	Chann.	Phasing	LOS	Delay	V/C	95th Percentile Queue (ft)	LOS	Delay	V/C	95th Percentile Queue (ft)
Single-Lane Approach Signal			**C**	**33.3**	**0.95**		**B**	**13.6**	**0.69**	
EB	LTR	Prot/Perm	D	54.8	0.94	#356	B	17.5	0.74	#260
WB	LTR	Permitted	B	18.1	0.11	46	A	8.9	0.06	24
NB	LTR	Prot/Perm	D	44.7	0.95	#380	B	12.7	0.65	189
SB	LTR	Permitted	B	12.0	0.62	244	A	8.7	0.30	78

As Table 3-4 indicates, this alternative operates at LOS D or better on all approaches during the peak hours, but exhibits long queues on the eastbound (EB) approach during both the AM and PM peak hours and the northbound (NB) approach during the AM peak hour. The (#) symbol indicates that the 95th-percentile volume exceeds capacity, so the actual queue may be longer. The queue length shown is the maximum after two signal cycles. This alternative is also very near capacity with an overall v/c ratio of 0.95 and two approaches with v/c ratios greater than 0.90. This indicates that this alternative has little reserve capacity for large events or excess volumes if the corridor grows more quickly than anticipated. Due to these constraints, this alternative is not preferred.

Three additional alternatives were created by sequentially adding auxiliary lanes to find which alternative might best serve the traffic demand without over-designing the intersection. Although a southbound (SB) right-turn lane provides operational benefit, it was removed from consideration due to right-of-way constraints. Alternative 2 adds a right-turn lane to the eastbound right turn (EBRT) approach and is summarized below in Table 3-5.

Table 3-5. Alternative 2 – Add EBRT Lane - 2030 AM and PM Peak Hour Summary

			AM Peak Hour				PM Peak Hour			
App.	**Chann.**	**Phasing**	**LOS**	**Delay**	**V/C**	**95th Percentile Queue (ft)**	**LOS**	**Delay**	**V/C**	**95th Percentile Queue (ft)**
Overall Intersection			**B**	**18.5**	**0.76**		**A**	**9.9**	**0.59**	
EB	LT_R	Prot/Perm	C	32.2	0.72 (LT)	192 (LT)	B	11.5	0.56 (LT)	126 (LT)
WB	LTR	Permitted	C	26.2	0.14	58	A	9.5	0.07	24
NB	LTR	Prot/Perm	B	16.2	0.77	#378	A	9.9	0.61	191
SB	LTR	Permitted	A	9.7	0.56	233	A	6.9	0.27	77

As Table 3-5 indicates, this alternative operates at LOS C or better for all approaches with the addition of an EBRT lane. No approach has a v/c ratio greater than 0.77 which leaves enough reserve capacity in case the traffic volumes are greater than projected. Although 378 foot queues are expected on one leg, only the NBLT queue may be greater than estimated as indicated by the (#). This alternative operates better than the Alternative 1 because it allows green signal time to be redistributed within the intersection. Whether or not this alternative is selected, signal timing, detection, and especially optimization will be vitally important to the success of the signal.

The operational summary of Alternative 3 is shown below in Table 3-6; this alternative adds only a northbound left-turn lane to the intersection.

Table 3-6. Alternative 3 – Add Only NBLT Lane - 2030 AM and PM Peak Hour Summary

			AM Peak Hour				PM Peak Hour			
App.	**Chann.**	**Phasing**	**LOS**	**Delay**	**V/C**	**95th Percentile Queue (ft)**	**LOS**	**Delay**	**V/C**	**95th Percentile Queue (ft)**
Overall Intersection			**C**	**29.8**	**0.81**		**B**	**17.9**	**0.53**	
EB	LTR	Prot/Perm	D	50.0	0.93	#347	C	29.0	0.84	#260
WB	LTR	Permitted	B	17.5	0.11	45	B	12.4	0.07	24
NB	L_TR	Prot/Perm	B	17.1	0.76 (L)	#148 (L)	A	8.5	0.32 (L)	93 (T)
SB	LTR	Permitted	C	25.9	0.78	#395	B	13.6	0.32	101

As Table 3-6 shows, adding only the NBLT lane does not substantially improve overall intersection operations. Individual approach v/c ratios are now 0.93 or less, and queuing is still greater than 300 feet on two approaches and could be longer than reported for three of the approaches as indicated by the (#). In short, Alternative 3 does not provide as much delay, capacity, or queuing benefit as Alternative 1.

Alternative 4 combines the improvements of Alternatives 2 and 3, adding both an EBRT and a NBLT lane. Table 3-7 below summarizes the operational analysis d for this alternative.

Table 3-7. Alternative 4 – Add Both EBRT & NBLT Lanes - 2030 AM and PM Peak Hour Summary

			AM Peak Hour				PM Peak Hour			
App.	**Chann.**	**Phasing**	**LOS**	**Delay**	**V/C**	**95th Percentile Queue (ft)**	**LOS**	**Delay**	**V/C**	**95th Percentile Queue (ft)**
Overall Intersection			**C**	**20.1**	**0.68**		**B**	**12.4**	**0.45**	
EB	LT_R	Prot/Perm	C	32.4	0.72	192	B	17.6	0.66 (L)	126 (L)
WB	LTR	Permitted	C	26.2	0.14	58	B	13.7	0.08	64
NB	L_TR	Prot/Perm	A	8.1	0.56 (L)	95 (L)	A	6.5	0.28 (L)	93 (TR)
SB	LTR	Permitted	B	19.2	0.68	350	B	12.4	0.32	109

As Table 3-7 indicates, adding both the EBRT and the NBLT lanes improves the overall v/c ratio to 0.68, with the worst approach at 0.72, which is less than any other alternative. While this alternative improves capacity significantly over that of Alternative 2, Alternative 4 also increases the pedestrian crossing distance on the south leg. However, the significant improvement in operations from adding the NBLT lane outweighs the increased crossing distance. The improved operations from adding the NBLT lane is especially seen in the results of the sensitivity analysis.

3.1.2.2 Sensitivity Analysis

Although projected future volumes projected are expected to provide a good estimate of future growth, the degree of growth potential in the project area led to the development of an alternate demand scenario to capture additional potential development and account for the possibility that traffic volumes grow faster than expected. Therefore, a sensitivity analysis was conducted in which the projected 2030 peak hour volumes were increased by 15-percent. Table 3-8 summarizes the AM peak hour operations for these two alternatives with increased volumes. The AM peak hour was selected because it is the controlling peak hour for this intersection. So that results could be compared, the same signal cycle length (100 seconds) was used in the comparison.

Table 3-8. Alternative 2 and 4 Sensitivity Analysis Summary – 2030 AM Peak Hour

			Alternative 2 (+ EBRT)				Alternative 4 (+ EBRT & + NBLT)			
App.	**Chann.**	**Phasing**	**LOS**	**Delay**	**V/C**	**95th Percentile Queue (ft)**	**LOS**	**Delay**	**V/C**	**95th Percentile Queue (ft)**
Overall Intersection			**D**	**41.7**	**0.97**		**C**	**25.2**	**0.77**	
EB	LT_R	Prot/Perm	D	44.7	0.84 (L)	#282 (L)	D	41.1	0.84 (L)	#285 (L)
WB	LTR	Permitted	D	38.9	0.25	82	C	29.0	0.16	71
NB	LTR/L_TR	Prot/Perm	E	69.6	1.04	#393	B	16.5	0.76 (L)	#139 (L)
SB	LTR	Permitted	C	20.6	0.74	427	B	19.8	0.73	426

As Table 3-8 indicates, capacity is exceed on the northbound approach of Alternative 2. This failure could result in extremely long queues and very long delays, requiring several signal cycles for NB vehicles to pass through the intersection. As a result, the overall v/c for the intersection is very close to 1.0. Alternative 4 still operates very well, although long queuing is expected on the SB approach, it should clear quickly and usually within the same cycle it develops. It will be very important for the actuated signal timing to be monitored regularly and updated as needed.

3.1.2.3 Recommended Intersection Geometry

Based on the analysis described above, both an EBRT and NBLT are needed to meet a LOS D standard and avoid 300 foot+ traffic queues. Until about 2020, AWST provides adequate intersection control. The primary benefit of the AWSC interim option is lower cost – about 50 percent of the cost for a signal. After approximately 2020, signalization is needed. During the period before the signal is warranted, there will likely be several years of decreasing performance and delays. A total of 60 feet of right-of-way is needed to accommodate the recommended improvements. Geometry of the intersection will be unbalanced; not all lanes have an opposing lane, and width transitions must be accomplished through the intersection area. Specific design recommendations for full build out and opening year are as follows:

Full Build-Out (2030)

An eastbound right-turn (EBRT) pocket with 200 feet of effective storage should be provided, along with a northbound left-turn (NBLT) pocket with 150 feet of effective storage. The signal should operate under protected-permitted left-turn phasing for the eastbound and northbound approaches and permitted phasing for the southbound and westbound approaches. If desired, an eastbound right-turn overlap with the northbound left-turn protected phase may also be added to further improve eastbound right-turn operations.

Opening Year (2010) & Interim Solutions

In the case that the ultimate improvements are not constructed immediately, initial construction and interim solutions were devised. Interim year 2020 and 2025 turning movement volumes were estimated by assuming linear growth between 2010 opening year and the 2030 horizon year. These volumes were then used to evaluate the intersection under all-way stop-control (AWSC).

If the ultimate channelization is constructed first without the signalized control, the intersection is projected to operate well (LOS C or better at 2020) under All-Way Stop-Control (AWSC) until sometime between 2020 and 2025 assuming linear growth. In case construction of the NBLT lane is not immediately available, the intersection will operate acceptably for a similar period of time without it; however when the signal is installed, the NBLT pocket must also be constructed.

If two-way stop-control is selected for interim control on the ultimate channelization, the intersection will operate at LOS D or better into the year 2015 with- or without the NBLT lane under linear growth. By the year 2020, the intersection will fail with- or without the NBLT lane. In any case, right-of-way for the additional lanes should be secured at the outset of the project.

3.1.2.4 Estimated Costs for Recommended Improvements

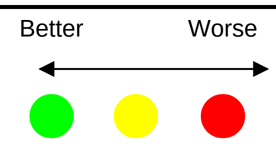
The estimated cost for the Noll-Hostmark intersection is $187,500 for interim AWSC, and $187,500 for final signalization for total of $375,000. Approximately half of these costs will be funded by developers, with the remainder funded by the City. These cost estimates are based on 2008 construction costs, and assume no additional right-of-way is required. As shown in Figure 3-1, portions of the shared path adjacent to the Strawberry Fields complex extend outside of the right-of-way. The path location is however, consistent with the Master Plan for the sports field complex prepared by the Public Facility District (PFD).

3.2 NOLL ROAD - LINCOLN ROAD INTERSECTION

The worst movement at the intersection of Noll and Lincoln is projected to operate at LOS F during the AM peak hour by 2030 and the intersection is projected to meet traffic signal warrants by 2010. When an intersection meets traffic signal warrants, a roundabout is usually considered warranted as well as a signal. Table 3-9 provides a qualitative comparison of the two intersection alternatives.

Table 3-9. Comparison of Intersection Improvement Alternatives, Noll & Lincoln

Comments	Roundabout	Signal	Comments
LOS	Green	Green	Both alternatives operate at LOS A or B for all approaches and the overall intersection.
Queuing	Green	Green	Both alternatives exhibit low levels of queuing.
Collision Severity	Green	Red	Collision severity is greatly reduced by the low-speed, low-angle of collision design of a roundabout
Collision Frequency	Green	Yellow	Single-lane roundabouts typically decrease collisions. New signals typically increase collisions--especially rear-end collisions.
Pedestrian Mobility	Green	Green	Both options provide the means for non-motorized travel to cross either corridor.
Pedestrian Safety	Green	Green	Both options can provide protection for pedestrians.
ROW	Yellow	Green	More land is required with the roundabout option. ROW costs may therefore be greater.
Network Connectivity	Green	Green	Both maintain good network connectivity
Construction $	Yellow	Yellow	Cost difference primarily signal equipment vs. additional RBT landscaping. Each option approximately $300,000, including realignment of the intersection.
Maintenance $	Yellow	Yellow	Landscaping maintenance at RBT vs. electrical components and signal timing costs.
Aesthetics	Green	Red	The RBT provides opportunities for landscaping. The signal adds poles and electrical equipment to the streetscape.
Emergency Response	Green	Green	Either option provides good mobility for emergency response vehicles



Installation of a signal at the existing intersection would operate at LOS A or B for all approaches during peak hours, but would require widening Lincoln Road to 3 or 4 lanes as well as widening the Lincoln Road approaches. This widening would increase pedestrian crossing distance and exposure, as well as required right-of-way. Re-alignment of the intersection would improve safety and signal performance.

Kitsap County has identified, as a joint effort with the City of Poulsbo, a roundabout (RBT) intersection improvement project at this location. The roundabout alternative would build a single-lane modern roundabout with an inscribed diameter of about 130 feet and single-lane entries and exits on all legs. The roundabout would improve safety, reduce pedestrian crossing distances, and provide opportunities for central island landscaping or gateway features. A roundabout would require realignment of the intersection. The estimated cost for either a signal or a RBT at this location is approximately $375,000. These estimates are based on 2008 construction costs for similar projects, and assume no additional right-of-way. The majority (if not all) of the additional right-of-way needed at the Lincoln-Noll intersection is on property owned by the City.

Based on stakeholder evaluation and feedback, it was determined that the RBT option provides the best combination of pedestrian safety, LOS, right-of-way need, and cost at the Noll Road – Lincoln Road intersection. The RBT at the Noll-Lincoln intersection is shown in Figure 3-3.

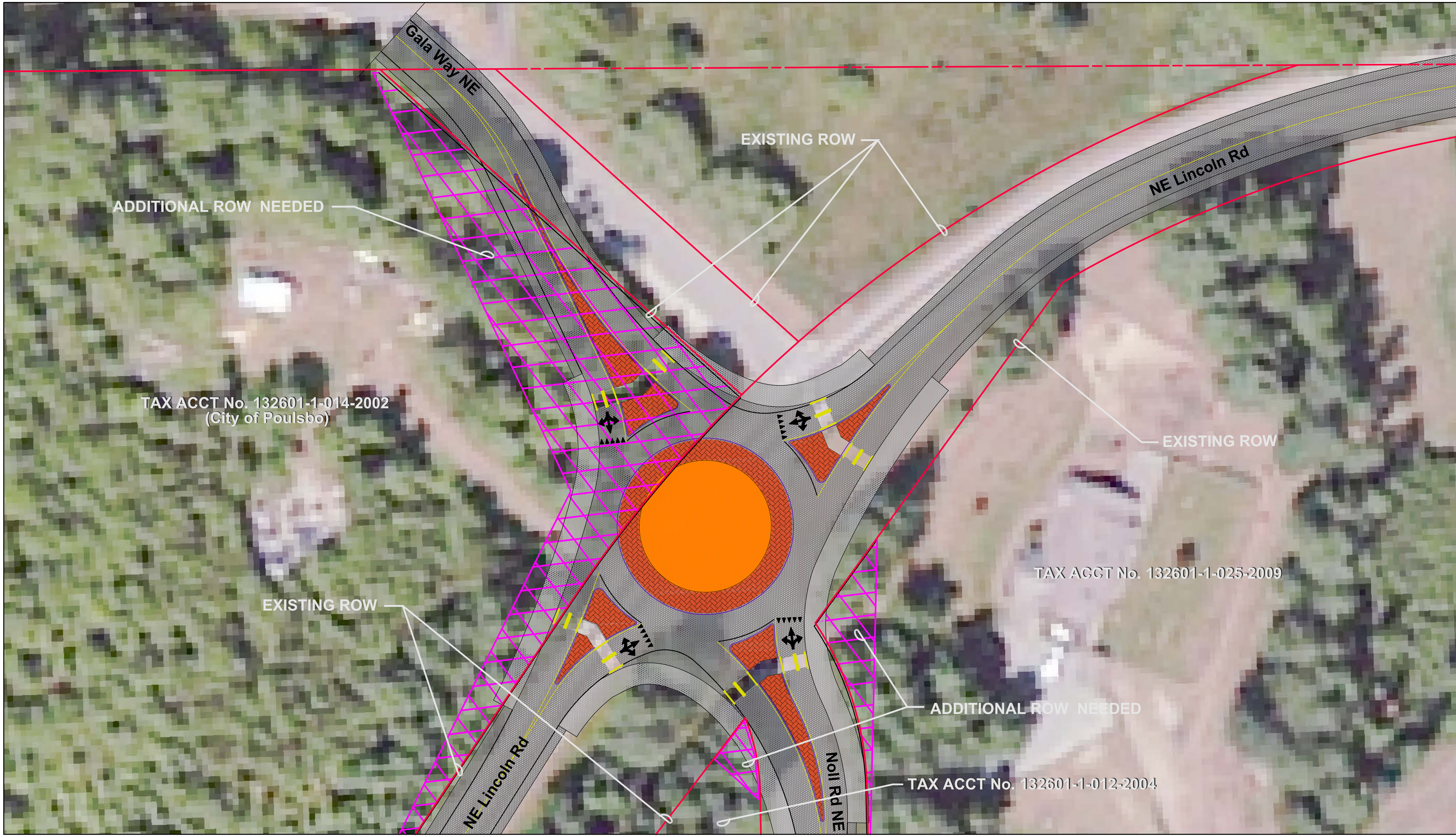
3.3 NOLL ROAD – SR 305 INTERSECTION

The southbound Noll Road approach at SR-305 currently operates at LOS F during both peak hours. The WSDOT 2007-2026 Highway System Plan (HSP) identifies a project to add a center left turn and acceleration lane on SR-305 at Noll Road. This project is identified as a Tier 1 Capacity project with a construction date between 2 and 20 years from 2007 – a specific data has not been identified. This project is currently unfunded. If the alternative alignment is constructed to Johnson Road, traffic volumes at Noll and SR-305 would be reduced to the point where traffic control at this location may not be required; although the center turn lane may still be constructed as a safety and capacity improvement. With the alternative alignment, traffic control would likely be required at Johnson Way in the future.

3.4 SR 305 – JOHNSON WAY INTERSECTION

The potential Johnson Way extension alignment would require the improvement of the current intersection of Johnson Way with SR 305. Intersection improvements at this location have been established as an unfunded priority by WSDOT, and have also been identified as a condition of approval for the proposed Johnson Ridge development. Early coordination with the Washington State Department of Transportation (WSDOT) will be crucial if any improvements are to occur within WSDOT right-of-way. In addition, this alternative proposes alignment paralleling the City’s sewer line which would require obtaining additional right-of-way from the private property owner. The future development status of the property between Noll Road and the plat of Johnson Ridge is uncertain.

The intersection of Johnson Way and SR-305 has been identified as a preferred location for a signal because this location would have one more approach leg than at Noll and SR-305, and this signal would serve more motorists. Figure 3-4 presents that proposed intersection. Funding for the intersection would be provided by the developer of the property served by the new road.



Parametrix DATE: Dec 29, 2008 FILE: BR2237829P01T01F-XX_Intersections

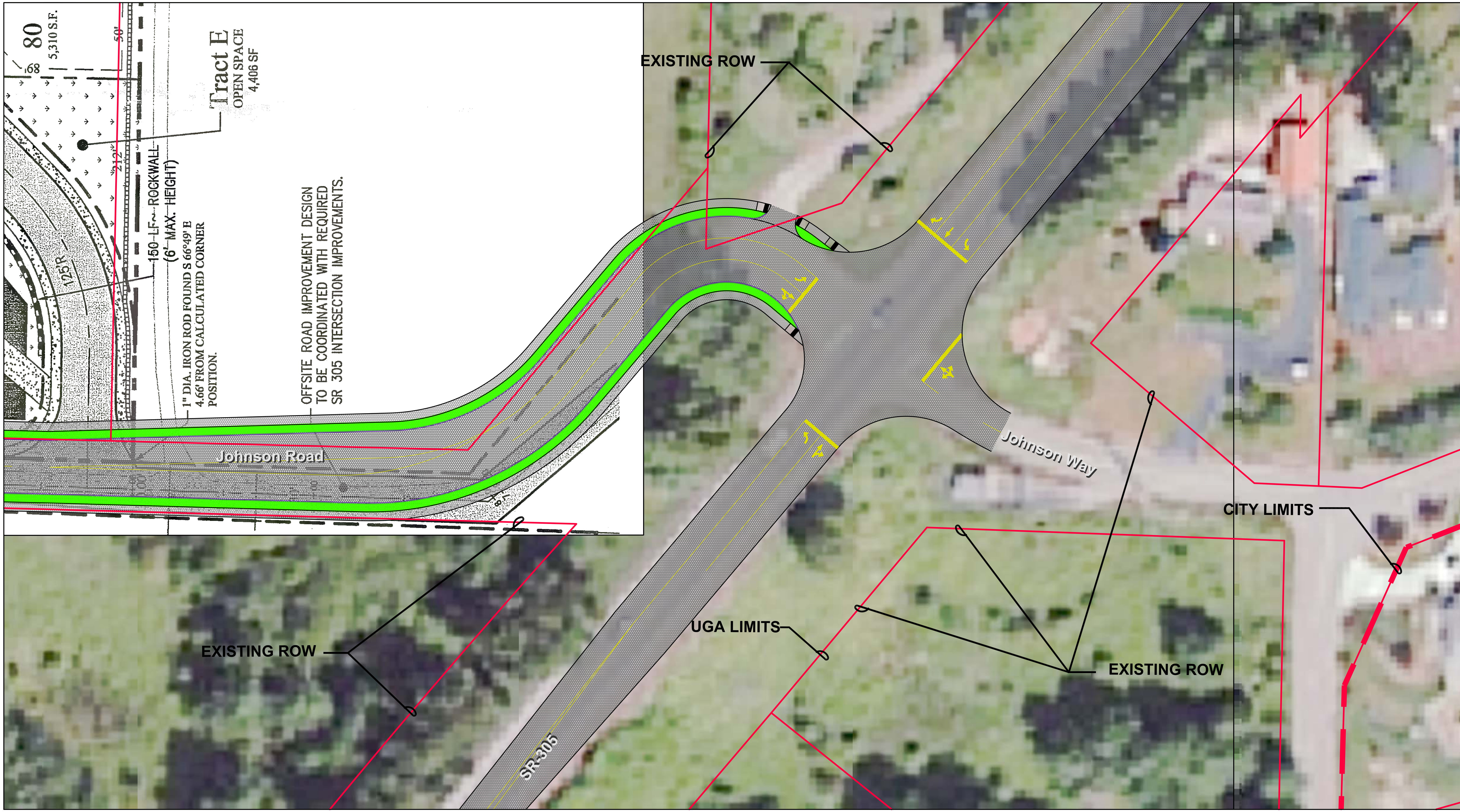
N

SCALE IN FEET

0 50 100

TAX ACCT No	TAXPAYER	APPROX ROW NEEDED (SF)
132601-1-014-2002	CITY OF POULSBO	23100
132601-1-012-2004	UNITED TELEPHONE OF NW/SPRINT	600
132601-1-025-2009	JOHN W & JANET ROSEBEARY	2500

Figure 3-3
Noll Road Improvements
Noll Road NE and NE Lincoln Road Intersection
Preliminary Roundabout - Preferred Plan



Parametrix DATE: Dec 29, 2008 FILE: BR2237829P01T01F-XX_Intersections

N

SCALE IN FEET

0 50 100

Figure 3-4
Noll Road Improvements
Johnson Road and SR-305 Intersection
Proposed Traffic Signal Plan

If a signal were to be installed at Johnson Way, however, left turn movements during peak hours will likely divert to the signal from the existing Noll Road intersection. Improvements at Johnson Way and SR-305 may thus alleviate the need for additional improvements at Noll Road and SR-305.

3.5 SECONDARY INTERSECTIONS

The operational forecasts does not show a need for providing left turn lanes at the secondary intersections of Noll-Bjorn, Noll-Kevos Pond Drive, Noll – Johnson Road, and Noll - Mesford. As infill development occurs, or if background growth is significantly faster than expected, conditions may warrant use of turn lanes at selected locations in the future. If the additional lane is needed, it is likely that the proposed 12-foot wide rain garden could be converted into an additional lane and therefore avoids the need for additional right-of-way.

3.5.1 Other Intersections

Intersection improvements at Noll and Mesford are discussed in Chapter 4 along with analysis of the Languanet-Maranatha connector.

3.6 SUMMARY OF PRELIMINARY INTERSECTION COSTS FOR RECOMMENDED IMPROVEMENTS

Preliminary intersection costs were determined by applying planning level unit costs for various intersection improvements. Intersection costs are summarized in Table 3-10 and include allowances for engineering, permits, unlisted construction items (mobilization, channelization, illumination, traffic control, traffic signing, driveways, etc.) and contingencies.

Table 3-10. Summary of Preliminary Intersection Improvement Costs (2008 Dollars)

Intersection	Description	Base Cost[1]	Allowance for Unlisted Items	Total Costs
Noll Road – Lincoln Road	Roundabout	$250,000	50%	$375,000
Noll Road – Hostmark Street, Phase 1	All Way Stop Control	$125,000	50%	$187,500
Noll Road – Hostmark Street, Phase 2	Signal	$125,000	50%	$187,500
Noll Road – Johnson Way Connector	One Way Stop Control[3]	NA - Developer[4]	50%	$0
Noll Road – SR 305	Turn Lanes	NA - WSDOT[4]	50%	$0
Johnson Way – SR 305	Signal	NA - Developer[4]	50%	$0
			TOTALS	**$750,000**

[1] Base cost is for construction only.
[2] Allowance includes engineering and permits (12%), mobilization (8%), unlisted construction items (20%) and contingencies (10%).
[3] Stop control on south Noll Road.
[4] Project costs to be borne by developer or WSDOT as noted.