

**City of Bellevue Neighborhood Congestion Reduction Program
148th Avenue NE and NE 8th Street Transportation Analysis Report
Contract Number 1850211.000
October 2019**

The engineering material and data contained in this report were prepared under the supervision and direction of the undersigned, whose seal as registered professional engineer is affixed below.



10/3/19

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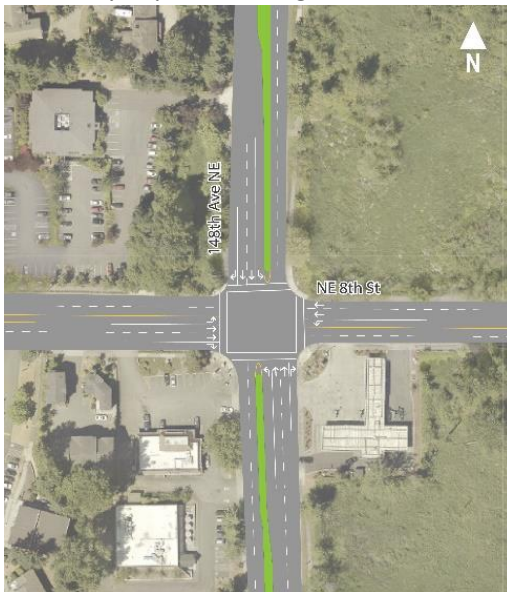
Date: October 3, 2019
To: Jun Suk An, PE, City of Bellevue
Cc: Darcy Akers, City of Bellevue
From: Jeremy Wheeler, PE, Concord Engineering
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Subject: 148th Avenue NE and NE 8th Street Intersection

1. Introduction

In November 2016, voters passed the Neighborhood Safety, Connectivity and Congestion Levy. This levy supplements existing safety, sidewalk, maintenance, intelligent transportation systems (ITS) and bicycle facilities programs, helping the City to address a backlog of important projects. It also supports a new Neighborhood Congestion Reduction program to focus on reducing motor vehicle congestion, making it easier for residents to travel to and from their neighborhoods. Levy funding pays for the planning, public outreach, design, and construction associated with selected projects.

This study seeks to identify alternatives to mitigate traffic congestion, delay, and queueing issues at the intersection of 148th Avenue NE and NE 8th Street. At the conclusion of this study, the City will compare the costs and benefits of this study with other Neighborhood Congestion Reduction studies to determine which projects will move forward to design and construction.

This report presents the traffic analysis performed for the intersection of 148th Avenue NE and NE 8th Street (Figure 1), located in the Mobility Management Area (MMA) 9 East Bellevue. This intersection currently experiences significant traffic congestion with a Volume to Capacity (V/C) ratio that doesn't



meet the latest concurrency standard for MMA 9. Thus, intersection widening has been identified as a measure to increase the capacity.

This report starts with a brief introduction of the project background, followed by a description of the methods and assumptions that guide the traffic analysis. The report then provides a summary of the traffic analysis results for existing and baseline analysis. Following the baseline conditions analysis, four (4) alternatives were proposed and analyzed in the Alternatives Analysis section. The report concludes with a recommendation of proposed improvements to enhance traffic operations and safety at this study intersection, and closes with a summary of construction challenges and risks associated with the improvements.

Figure 1. Study Area

2. Methods and Assumptions

2.1 Analysis Scenarios

The traffic operations analysis includes the following scenarios:

- 2018 existing condition AM peak (8:00 AM to 9:00 AM) and PM peak (5:00 PM to 6:00 PM)
- 2035 baseline (no-build) condition AM peak and PM peak
- 2035 alternative conditions AM peak and PM peak (four alternatives)

2.2 Traffic Volumes

Traffic volumes for the existing conditions were collected on October 16, 2018, for both AM and PM peak periods. The City of Bellevue has developed the future year 2035 baseline traffic volumes using the Bellevue-Kirkland-Redmond (BKR) travel demand model with post-processing.

2.3 Modeling Tools

Synchro 10 software was used to perform the traffic operations analysis.

2.4 Signal Timing

As cycle length and splits vary dynamically throughout the peak hours under the adaptive traffic control system (SCATS), historical averages of the splits from SCATS were used. The analysis performed in this study used historical SCATS average data collected on October 16th, 2018 (the detailed signal timing information is included in Appendix A of this report). Signal timing in the alternative models were optimized in order to maximize the reduction of the overall intersection delay with the modified channelization.

2.5 Measures of Effectiveness (MOE)

Performance metrics to assess traffic conditions included:

- Average intersection delay (reported in seconds)
- Intersection level of service (LOS)

2.6 Design Standards and Considerations

Design of recommended improvements adheres to City, State, AASHTO, and other local applicable design standards and guidelines. The level of design for concepts is suitable for inclusion in the City's Transportation Improvement Program or Transportation Facilities Plan with planning level cost estimates, which capture inflation, contingencies, and other cost variability. The key design criteria can be found in Appendix B of this report.

3. Existing Conditions Analysis

3.1 Traffic Volumes

The AM and PM peak hour turning movement volumes for the existing 2018 conditions are shown in Figure 2. The complete two-hour traffic counts are included in Appendix C of this report.

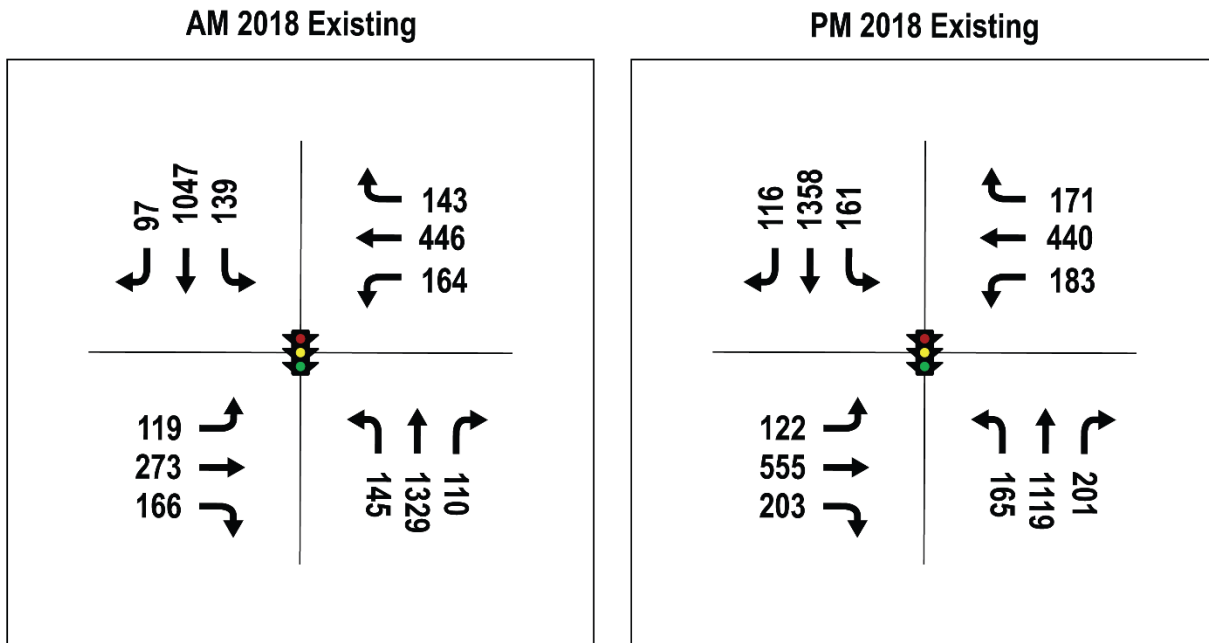


Figure 2. 2018 Existing AM & PM Peak Hour Turning Movement Volumes

3.2 Traffic Operations Analysis

The existing AM and PM peak hour delay and LOS synchro results are shown in Table 1. In Table 1, movements that experience LOS E or F are highlighted.

During the AM peak hour, the intersection operates at LOS D with an average control delay of 37 seconds. The movements that operate at LOS E or F are the northbound and southbound left turn movements, and the eastbound and westbound through movements.

During the PM peak hour, the intersection also operates at LOS D, but with a longer average control delay (45 seconds) than that of the AM peak (37 seconds). The movements that operate at LOS E or F are the southbound and northbound left turn movements, the eastbound and westbound through movements, and the westbound left turn movement.

The study intersection (148th Avenue NE and NE 8th Street) is within the City of Bellevue Mobility Management Area (MMA) 9: East Bellevue. The MMA threshold for this area is 0.85 volume-to-capacity (V/C) ratio and a congestion allowance of 5. The congestion allowance is the maximum number of intersections within the MMA that are allowed to exceed the V/C ratio. The study intersection currently

operates with V/C ratios of 0.83 and 0.88 in the AM and PM peak hours, respectively; therefore, the intersection currently exceeds the MMA threshold during the PM peak hour.

Table 1. Existing AM and PM Peak Hour Delay & LOS

Scenario		Intersection	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
2018 Ex AM	Delay*	37	51	55	22	45	76	96	13	1	90	31	6	
	LOS	D	D	E	C	D	E	F	B	A	F	C	A	
2018 Ex PM	Delay*	45	48	66	22	70	70	72	23	5	84	44	8	
	LOS	D	D	E	C	E	E	E	C	A	F	D	A	

*The unit for Vehicle Delay is second/vehicle.

3.3 Collision Analysis

This collision analysis evaluated 5-year historical collision data collected from January 2014 to December 2018 within the vicinity of the study intersection. A total of 52 collisions were reported during the five-year period. Table 2 and Figure 3 provide a summary of collisions by type. As noted, the two most frequent types of collisions reported were rear-ends (35%) and right-angles (23%). Table 3 and Figure 4 summarize the collision data by severity. The majority of collisions resulted in no injury (75%), 21% of collisions resulted in possible injury, and 4% of collisions resulted in non-disabling injury. One reported collision involved a pedestrian and a second incident involved a bicyclist. The collision involving a pedestrian was caused by the pedestrian disregarding traffic control devices. The collision involving a bicyclist was caused by the motor vehicle not granting right of way. Both collisions resulted in possible injury.

Table 2. Collision Type Summary

Collision Type	2014	2015	2016	2017	2018	Total
Right Angle	4	2	4	1	1	12
Sideswipe/Lane Change	2	1	2	2	1	8
Rear End	3	5	2		8	18
Approach Turn	2		1	1	2	6
Pedestrian				1		1
Bicycle		1				1
Other	2	1	2		1	6
Total	13	10	11	5	13	52

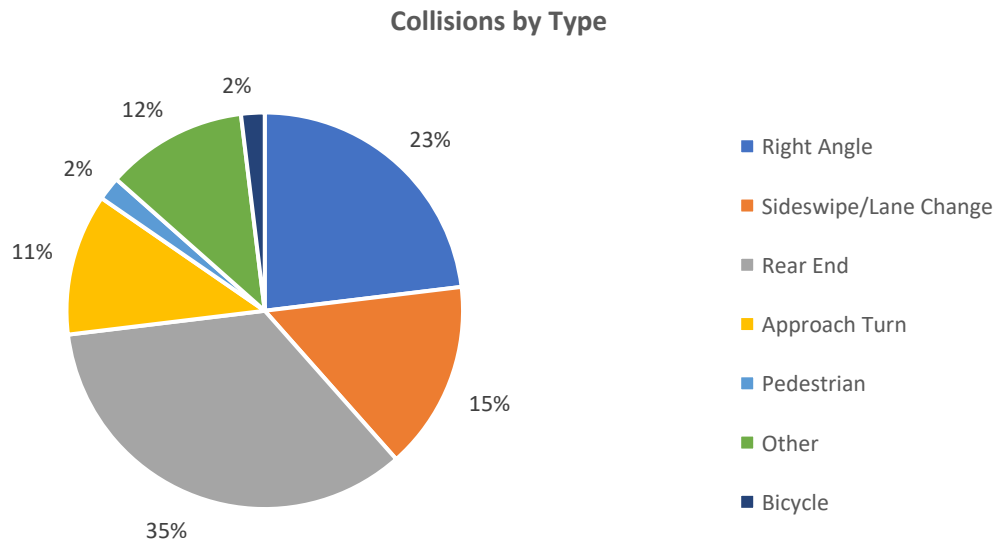


Figure 3. Summary by Collision Type

Table 3. Collision Severity Summary

Collision Severity	2014	2015	2016	2017	2018	Total
No Injury	11	6	7	3	12	39
Non-Disabling Injury			1	1		2
Possible Injury	2	4	3	1	1	11
Total	13	10	11	5	13	52

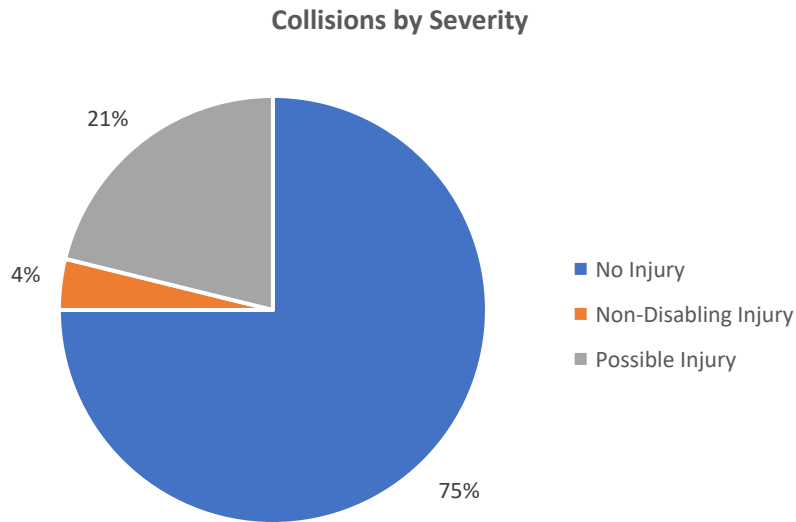


Figure 4. Summary by Collision Severity

Table 4 provides a summary of the collisions by vehicle movement. The westbound approach had the highest frequency of reported collisions (18 out of 52 collisions). Furthermore, approximately 75% of reported collisions involved a right-turning vehicle.

Table 4. Collisions by Vehicle Movement

Direction	Left Turn	Through	Right Turn	Subtotal
Eastbound	3	4	8	15
Westbound	1	1	16	18
Southbound	0	1	6	7
Northbound	2	2	8	12
Total	6	8	38	52

4. 2035 Baseline Analysis

4.1 2035 Baseline Volumes

The forecasted 2035 baseline traffic volumes for both the AM and PM peak hours are shown in Figure 6. For comparison purpose, the existing conditions traffic volumes for both the AM and PM peak hours are also included in Figure 5.

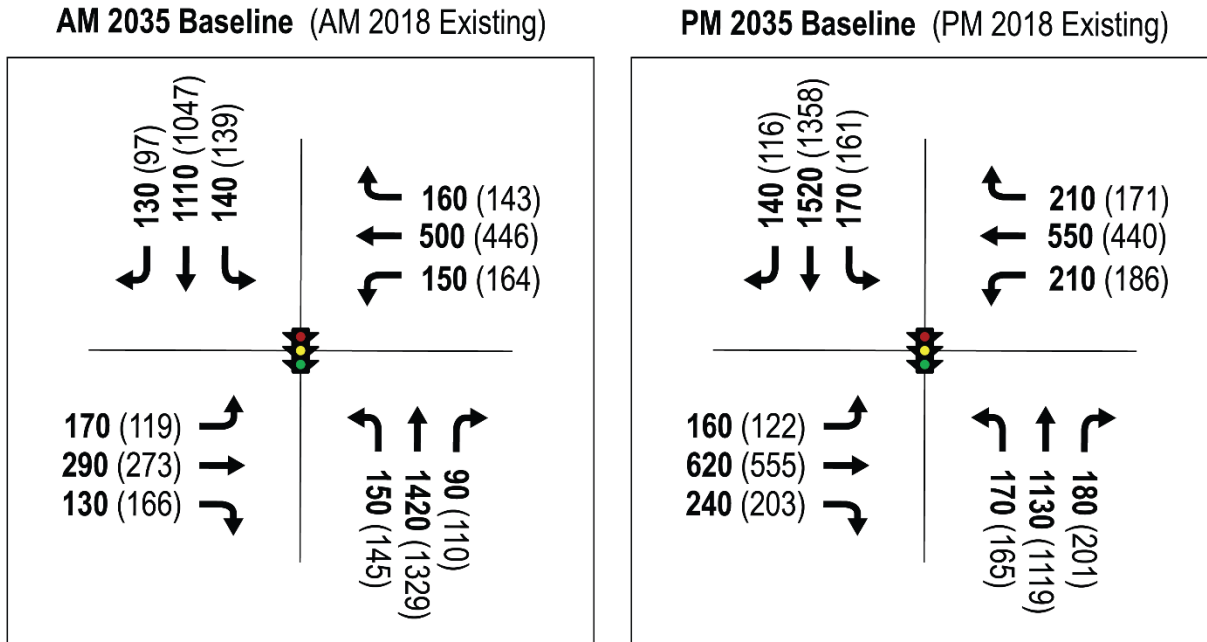


Figure 5. 2035 Baseline AM & PM Peak Hour Turning Movement Volumes

4.2 Baseline Traffic Operations

The 2035 baseline delay and LOS results for AM and PM peak hours are summarized in Table 5 and Table 6, respectively. With the increase in volumes, the intersection would experience more delay during both AM and PM peak hours. During the AM peak hour, while the intersection would continue to operate at LOS D, each vehicle would experience 8 more seconds of delay when crossing the intersection with eastbound left turn movement degrading from LOS D to LOS E. During the PM peak hour, the intersection LOS would degrade from D to E with eastbound left turn and southbound through movements degrading to LOS E or F.

Table 5. 2035 Baseline AM Peak Delay and LOS Results

Scenario		Intersection	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
2018 Existing	Delay*	37	51	55	22	45	76		96	13	1	90	31	6
	LOS	D	D	E	C	D	E		F	B	A	F	C	A
2035 Baseline	Delay*	45	69	55	17	44	108		97	15	0	91	34	9
	LOS	D	E	E	B	D	F		F	B	A	F	C	A

*The unit for Vehicle Delay is second/vehicle.

Table 6. 2035 Baseline PM Peak Delay and LOS Results

Scenario		Intersection	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
2018 Existing	Delay*	45	48	66	22	70	70		72	23	5	84	44	8
	LOS	D	D	E	C	E	E		E	C	A	F	D	A
2035 Baseline	Delay*	64	57	77	27	89	136		73	22	4	88	61	11
	LOS	E	E	E	C	F	F		E	C	A	F	E	B

*The unit for Vehicle Delay is second/vehicle.

5. Alternatives Analysis

5.1 Alternative Descriptions

Four (4) alternatives were considered at the intersection of 148th Avenue NE & NE 8th Street:

- **Alternative 1:** Add dual left turn lanes to eastbound and westbound approaches (NE 8th Street)
- **Alternative 2:** Add dual left turn lanes to northbound and southbound approaches (148th Avenue NE)
- **Alternative 3:** Add dual left turn lanes to all four approaches
- **Alternative 4:** Add dual left turn lanes to all four approaches and a right turn lane on the westbound approach (NE 8th Street)

Each alternative concept has been designed to be compatible with the planned City of Bellevue signal replacement project at this intersection that is anticipated to be constructed in 2019. The City's project will remove the signal poles in the median and install new signal poles at the roadside. The pole locations will be forward compatible with future roadway widening. Furthermore, to minimize private property impacts, 6-foot attached (curb-tight) sidewalks and 11-foot wide vehicle travel lanes are proposed for each alternative. The conceptual drawings and preliminary cost estimates for each alternative are included in Appendix D and E of this report, respectively. The impacts associated with each alternative are described in the following sections.

5.1.1 Alternative 1

Alternative 1 conceptual design is depicted in Figure 6. Alternative 1 would require widening NE 8th Street and moving the existing curb lines out approximately 6 feet to the north and south, respectively. The impacts of the widening to the existing facilities are summarized as follows:

- West leg of the intersection:
 - North side of NE 8th Street
 - King County Metro RapidRide bus stop relocation
 - Likely relocation or replacement of a stormwater quality facility
 - Acquisition of easement as the roadway widening will extend approximately 2 feet into the adjacent properties.
 - South side of NE 8th Street
 - Driveway and landscape frontage reconstruction in front of a retail-commercial property (currently Super Supplements)
- East leg of the intersection
 - North side of NE 8th Street
 - Likely impacts to the Kelsey Creek critical areas, which would require a new retaining wall to mitigate the impacts
 - South side of NE 8th Street
 - Potential impacts to the Kelsey Creek critical areas
 - King County Metro RapidRide bus stop relocation or reconfiguration
 - Possible power vault and transformer relocation adjacent to the bus stop
 - Driveway and frontage reconstruction in front of a gas station

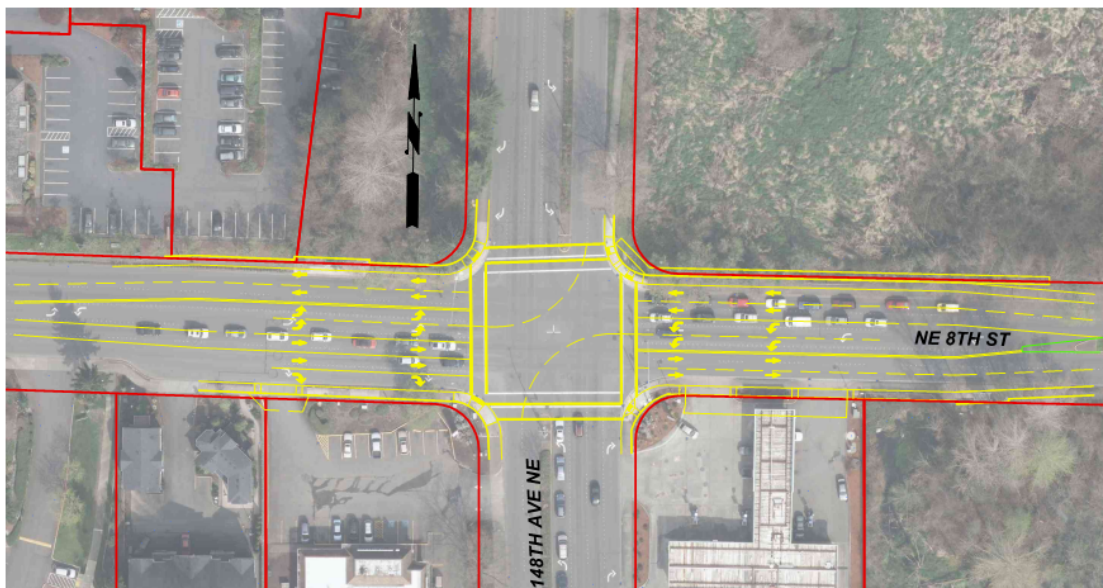


Figure 6. Alternative 1 – Dual Left Turn Lanes for Eastbound and Westbound (NE 8th Street)

5.1.2 Alternative 2

Alternative 2 conceptual design is depicted in Figure 7. Alternative 2 would require widening 148th Avenue NE 2 feet to the west and keep the east curb line intact. This alternative would also require removing segments of the landscaped medians to accommodate the dual left turn lanes for both northbound and southbound approaches. In addition, the illumination located in the landscaped medians would be impacted. This alternative would also result in some driveway reconstruction and minimal private property impacts.

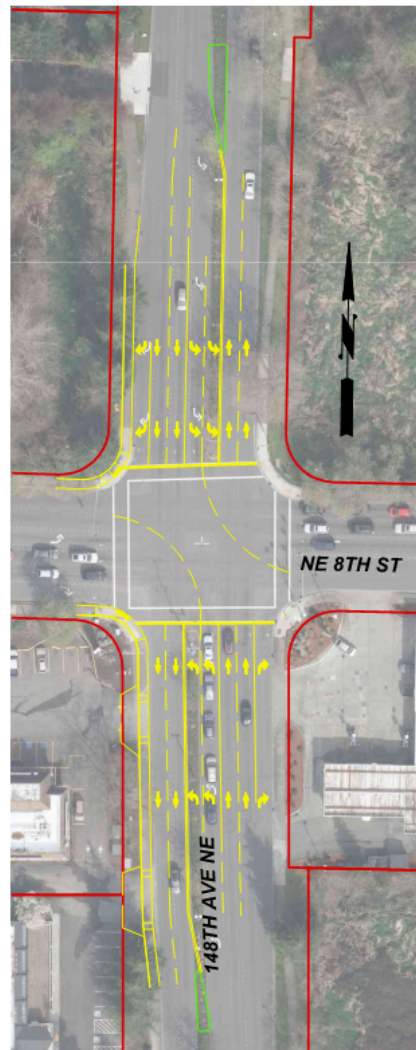


Figure 7. Alternative 2 – Dual Left Turn Lanes for Northbound and Southbound (148th Avenue NE)

5.1.3 Alternative 3

Alternative 3 would combine all the improvements from both Alternatives 1 and 2 into one improvement package to construct dual left turn lanes for all approaches. The Alternative 3 concept is depicted in Figure 8.

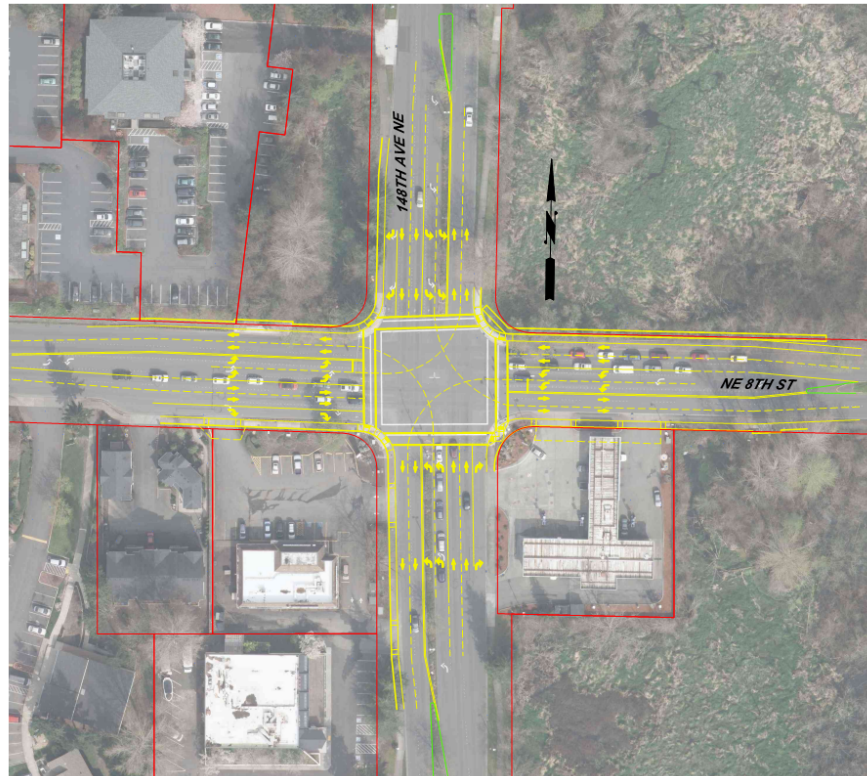


Figure 8. Alternative 3 –Dual Left Turn Lanes for All Approaches

5.1.4 Alternative 4

Alternative 4 would include all of the improvements from Alternative 3 (construct dual left turn lanes for all approaches) and an additional westbound right turn lane. This Alternative was developed as a result of public outreach process as multiple comments regarding the addition of a westbound right turn pocket were received. The City used this input as the basis to develop this alternative. The Alternative 4 concept is depicted in Figure 9.

On the east leg of the intersection on the north side of NE 8th Street, the right turn lane would have impacts to the Kelsey Creek wetland area and would require a new retaining wall and replacement of the existing Kelsey Creek culverts beneath NE 8th Street. It should also be noted that the City owns the parcel on the northeast corner of the intersection and widening footprint for the right turn lane in the concept plan was limited to be within the City right-of-way and not encroach into the parcel to the east, this resulted in a turn pocket with approximately 210 feet of vehicle storage.

All four alternatives are compatible with a City signal maintenance project anticipated to be constructed in 2019 that relocates the existing signals to accommodate additional left turn lanes on all four legs.

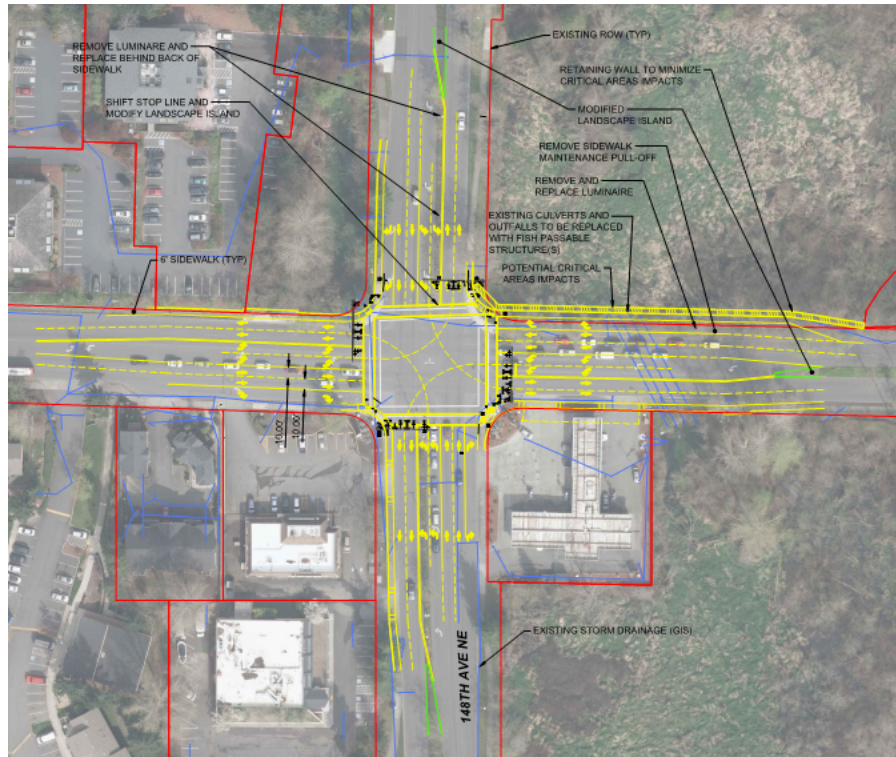


Figure 9. Alternative 4 –Dual Left Turn Lanes for All Approaches and Right Turn Lane for Westbound Approach (NE 8th Street)

5.2 Alternatives Analysis

5.2.1 Traffic Analysis Results

Table 7 and Table 8 provide a summary of the alternatives delay and LOS results for AM and PM peaks, respectively. Eastbound and westbound left turn movement at the study intersection currently operate with protected/permissive phasing. For the purpose of this analysis, dual left turn movements are assumed to operate with protected phasing. Signal timings are optimized to reduce the overall intersection delay and ensure all movements operate at LOS E or better.

The Synchro model results demonstrate that all four alternatives would improve the traffic operations over the 2035 baseline for both AM and PM peak hours. During the AM peak hour, the intersection would operate at the same LOS D as that of the baseline for Alternatives 1 to 3, with Alternative 4 improving to LOS C. Delay would decrease gradually from Alternatives 1 to 4. During the PM peak hour, Alternative 1 would operate at the same LOS E as the baseline with an 8 second delay reduction while Alternatives 2, 3, and 4 would operate at LOS D. Overall, Alternative 4 would provide the greatest overall benefit to traffic operation for both AM and PM peak hours.

Table 7. AM Peak Delay and LOS Results

Scenario		Intersection	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
2018 Existing	Delay*	37	51	55	22	45	76		96	13	1	90	31	6
	LOS	D	D	E	C	D	E		F	B	A	F	C	A
2035 Baseline	Delay*	45	69	55	17	44	108		97	15	0	91	34	9
	LOS	D	E	E	B	D	F		F	B	A	F	C	A
2035 Alt 1	Delay*	42	77	50	11	70	68		67	29	1	79	36	6
	LOS	D	E	D	B	E	E		E	C	A	E	D	A
2035 Alt 2	Delay*	39	76	46	12	36	70		66	25	1	77	34	6
	LOS	D	E	D	B	D	E		E	C	A	E	C	A
2035 Alt 3	Delay*	37	77	49	13	71	66		66	19	1	78	30	5
	LOS	D	E	D	B	E	E		E	B	A	E	C	A
2035 Alt 4	Delay*	33	72	52	14	71	62	16	66	16	1	75	27	5
	LOS	C	E	D	B	E	E	B	E	B	A	E	C	A

*The unit for Vehicle Delay is second/vehicle.

Table 8. PM Peak Delay and LOS Results

Scenario		Intersection	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
2018 Existing	Delay*	45	48	66	22	70	70		72	23	5	84	44	8
	LOS	D	D	E	C	E	E		E	C	A	F	D	A
2035 Baseline	Delay*	64	57	77	27	89	136		73	22	4	88	61	11
	LOS	E	E	E	C	F	F		E	C	A	F	E	B
2035 Alt 1	Delay*	56	78	58	30	76	71		78	31	9	75	70	11
	LOS	E	E	E	C	E	E		E	C	A	E	E	B
2035 Alt 2	Delay*	50	69	66	23	71	74		78	15	2	75	60	6
	LOS	D	E	E	C	E	E		E	B	A	E	E	A
2035 Alt 3	Delay*	48	77	63	20	71	73		79	13	1	78	55	6
	LOS	D	E	E	C	E	E		E	B	A	E	E	A
2035 Alt 4	Delay*	42	77	63	20	79	57	19	80	11	1	78	49	6
	LOS	D	E	E	B	E	E	B	E	B	A	E	D	A

*The unit for Vehicle Delay is second/vehicle.

5.2.2 Multi Modal Level of Service (MMLOS) Evaluation

Policy TR-40 in the Bellevue Comprehensive Plan states that the City should establish multimodal level of service standards. In April 2017, the Bellevue Transportation Commission recommended multimodal metrics, standards, and guidelines to evaluate the performance of vehicle, pedestrian, bicycle, and

transit modes. Table 9 provides a summary of the MMLOS impacts across the 2035 Baseline and four alternatives as compared to the 2018 existing condition.

Table 9. Project MMLOS Evaluation

Mode	No Build	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Vehicle	Does Not Improve	Improves	Improves	Improves	Improves
Transit	Does Not Improve	Improves	Improves	Improves	Improves
Bike	Does Not Improve				
Pedestrian	Does Not Improve				

Vehicle Mode

Under MMLOS guidelines, vehicle LOS is evaluated based on the intersection volume to capacity (V/C) ratio. Table 10 provides a summary of the intersection V/C Ratio. For 2035 baseline, vehicle LOS will be negatively impacted due to increase in the V/C ratio. Under all four alternatives, vehicle LOS will improve as a result of the decrease in the V/C ratio. Alternatives 3 and 4 provide a larger benefit to vehicle LOS compared to Alternative 1.

Table 10. Intersection V/C ratio

Scenario	AM	PM
2018 Existing	0.83	0.88
2035 Baseline	0.92	1.01
2035 Alt 1	0.89	0.97
2035 Alt 2	0.88	0.96
2035 Alt 3	0.84	0.94
2035 Alt 4	0.78	0.88

Transit Mode

Transit speed LOS will be negatively impacted as a result of the vehicle delay increase in the 2035 Baseline. Under all four alternatives, transit speed LOS would improve as a result of the reduction in vehicle delay. Furthermore, there would be no impact to transit stop LOS as existing transit stop amenities will be maintained or relocated under all alternatives.

Bike and Pedestrian Mode

Bike and pedestrian LOS will remain the same under the 2035 Baseline and all four alternatives because the existing bike and pedestrian facilities types will be maintained under all alternatives.

5.3 Alternatives Comparison

A summary of the alternative comparison is presented in Table 11. Based on the constraints and conceptual designs, Alternatives 1 and 2 have significantly different costs and risks. Alternative 1 would have greater costs and risks due to the significant impacts of the required roadway widening on NE 8th Street. Alternative 2 would have lower costs and risks as it is anticipated to be primarily constructed within the existing 148th Avenue NE cross-section, with relatively lower cost impacts to the existing

median, street lighting located within the median, curb ramps, sidewalks, and driveways. Alternative 4 has a considerably larger cost due to the long retaining wall to minimize impacts to wetlands and the replacement of culverts beneath NE 8th street conveying Kelsey creek.

Table 11. Alternatives Analysis Comparison

2035 Baseline	Alternative 1 – Dual Left Turn for EB/WB Approaches	Alternative 2 – Dual Left Turn for NB/SB Approaches	Alternative 3 – Dual Left Turn for all Approaches	Alternative 4 – Dual Left Turns and WB Right Turn Lane
Traffic Operations				
AM LOS: D AM V/C: 0.92 PM LOS: E PM V/C: 1.01 Significant delay and operating over capacity	AM LOS: D AM V/C: 0.89 PM LOS: E PM V/C: 0.97 Improved operations by adding dual left turn lanes	AM LOS: D AM V/C: 0.88 PM LOS: D PM V/C: 0.96 Improved operations by adding dual left turn lanes	AM LOS: D AM V/C: 0.84 PM LOS: D PM V/C: 0.94 Improved operations by adding dual left turn lanes	AM LOS: C AM V/C: 0.78 PM LOS: D PM V/C: 0.88 Improved operations by adding dual left turn lanes and right turn lane
Traffic Safety				
Collision rates are anticipated to be unchanged or higher	Reduced congestion may reduce collision frequency	Reduced congestion may reduce collision frequency	Reduced congestion may reduce collision frequency	Reduced congestion may reduce collision frequency
Multi-Modal Impacts				
Lower transit speeds due to increased intersection delay Same level of transit amenities No change to existing pedestrian and bicycle conditions	Higher transit speeds due to decreased intersection delay Same level of transit amenities No change to existing pedestrian and bicycle conditions	Higher transit speeds due to decreased intersection delay Same level of transit amenities No change to existing pedestrian and bicycle conditions	Higher transit speeds due to decreased intersection delay Same level of transit amenities No change to existing pedestrian and bicycle conditions	Higher transit speeds due to decreased intersection delay Same level of transit amenities No change to existing pedestrian and bicycle conditions
Right-of-Way				
None	Sidewalk easement or some ROW acquisition	Minimal private property impacts	Sidewalk easement or some ROW acquisition	Sidewalk easement or some ROW acquisition
Stormwater Impacts				
None	Relocate or replace existing water quality facility	None	Relocate or replace existing water quality facility	Relocate or replace existing water quality facility Replace Existing Culverts conveying Kelsey Creek beneath NE 8th
Utility Impacts				
None	Transformer and power vault relocation	None	Transformer and power vault relocation	Transformer and power vault relocation
Environmental Impacts				
None	Potential impacts to critical areas associated with Kelsey Creek.	None	Potential impacts to critical areas associated with Kelsey Creek.	Potential impacts to critical areas associated with Kelsey Creek.
Construction Costs				
None	\$2.7 million	\$1.2 million	\$3.6 million	\$5.7 million

6. Recommendation

Alternative 4 (Figure 10) is recommended for this study intersection because it would provide the greatest operational benefits of all of the alternatives that were evaluated in this study. However, if funding for these improvements is constrained, a project phasing approach could be implemented beginning with the project that offers optimal operational benefits with the least associated costs, impacts, and risks. Based on the alternatives analysis presented in this report, the northbound and southbound dual left turn lanes (presented as Alternative 2 in this report) would be the optimal lead project with a phased approach.

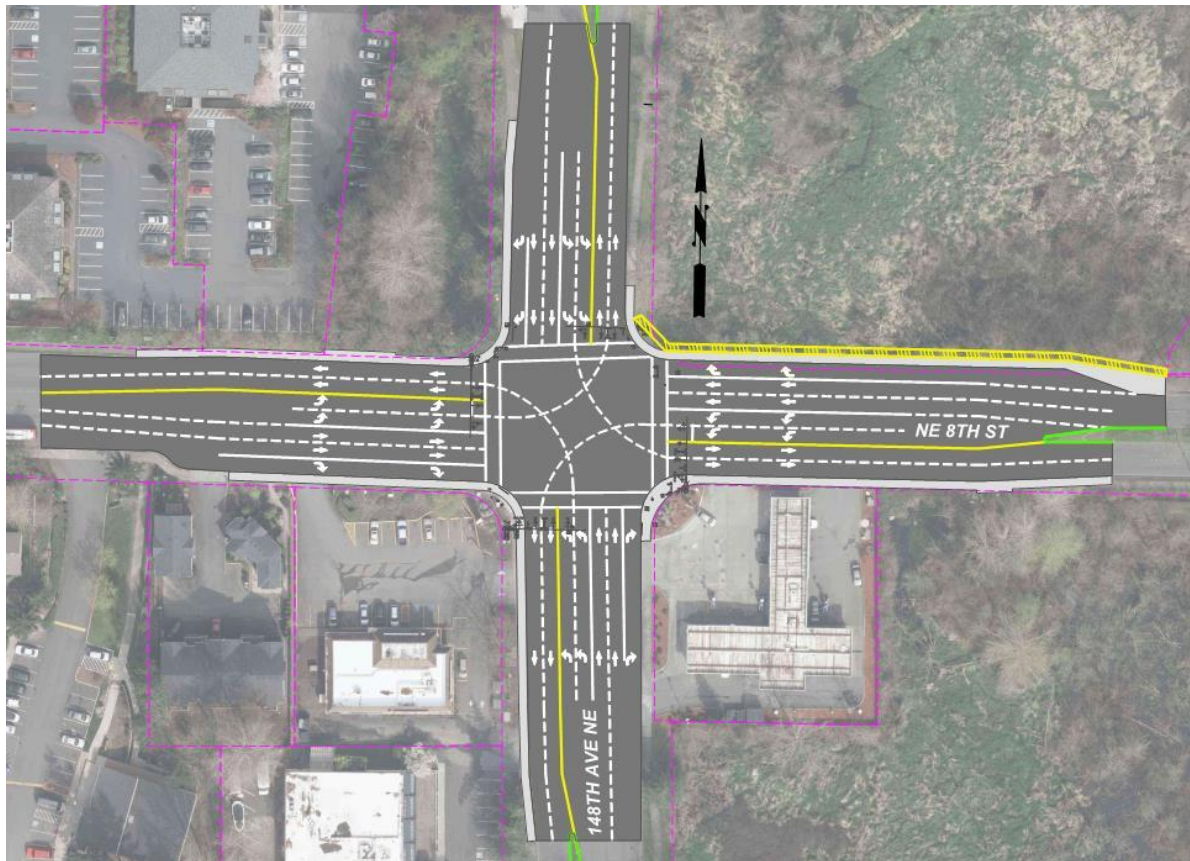


Figure 10. Recommended Alternative – Dual Left Turn Lanes for All Approaches and Right Turn Lane for Westbound Approach (NE 8th Street)

7. Construction Challenges and Risks

Constructing Dual Left Turn Lanes on 148th Avenue NE (Alternatives 2, 3, 4)

Adding dual left turn lanes to the northbound and southbound approaches has relatively low project challenges and risks as the modifications to the existing right of way are primarily minor curb and roadway widening, intersection curb return reconstruction, and landscaped median removal. The reconstruction on adjacent property is limited to minor driveway connection reconstruction.

Due to the shift in curb line, the existing catch basins and concrete inlets would be relocated and adjusted to grade. The water quality treatment structure located in the sidewalk in the northwest corner of the intersection presents a cost risk to the project. This structure will likely need to be relocated or replaced as it will be in conflict with the newly constructed curb return and sidewalk. The exact type of facility is not known and will be determined in final design. The associated drainage pipe across NE 8th Street leading to this structure may also need to be replaced depending on how the water quality structure is modified. A final design survey would need to be conducted to provide conclusive information. Relocated illumination from the median to the east side of 148th Avenue NE will be likely in the Kelsey Creek critical buffer area and may require additional environmental permitting. However, it should be noted that the footprint of the illumination impacts will be relatively minor and are not anticipated to be a significant project cost or risk.

Concept plans for these alternatives are included in the Appendix.

Constructing Dual Left Turn Lanes on NE 8th Street (Alternatives 1, 3, 4)

Adding dual left turns to the eastbound and westbound approaches has higher costs and risks because widening both sides of NE 8th Street would have significant impacts to the Kelsey Creek critical area and buffer, existing King County Metro RapidRide bus stops, as well as an existing power vault and transformer.

Kelsey Creek passes beneath NE 8th Street in multiple corrugated metal pipe culverts. The conceptual design assumes that the culverts will be protected and remain in place for alternatives 1 and 3. For alternative 4, the additional widening will exceed the length of the existing culverts and they are assumed to be replaced and upgraded with a fish passable box culvert. These concept alternatives propose to construct a retaining wall on the north side of NE 8th, east of the intersection to reduce the impacts to the Kelsey Creek critical areas as required by environmental permitting. The retaining wall is anticipated to be a Structural Earth Wall with moment slab with a traffic barrier, it is anticipated this wall system will be able to span around the culverts while they are protected in place for alternatives 1 and 3. According to the 2018 City of Bellevue Shoreline Master Program, lower Kelsey Creek is a part of SMP jurisdiction area and may include additional standards that are required to be met by shoreline projects and furthermore, it may require a longer schedule to obtain the necessary permitting for this phase of the project. On the south side of NE 8th at this culvert crossing, there is more space for widening and retaining walls are not anticipated.

The relocation of the King County Metro RapidRide stops will require close coordination with King County Metro. It is anticipated that this project will be provide the widened sidewalk and infrastructure to allow King County to relocate the RapidRide stop amenities.

An underground power vault and transformer in close vicinity to the eastern RapidRide bus stop will need to be relocated due to being in conflict with the widened sidewalk. The cost of this relocation may be the responsibility of the franchise utility (Puget Sound Energy) but is dependent on the franchise utility agreement in place for this area.

There will be some right of way costs but it will be relatively low as the City of Bellevue owns the majority of the property surrounding this intersection that would be impacted by this project.

New concrete inlets and catch basins will be needed in both directions of the curb lines on the east leg and to the north of the NE 8th Street on the west leg of the intersection due to the shift of the existing curb and gutter. It is assumed that these facilities will connect into the existing drainage system and existing outfalls in the project vicinity. The amount of new impervious area will be small enough that new water quality facilities will not be required. As mentioned above, an existing water quality structure located at the northwest corner of the intersection discharging to the detention pond behind the sidewalk will likely need to be relocated or replaced due to conflicts with the relocated curb return. The exact type of water quality facility is not known and will be determined in the final design. An underground drainage facility such as a media filter system has been assumed to be the replacement for the existing water quality facility. The existing detention pond collects runoff from a part of the west leg and part of the north leg in the intersection. The new impervious area created by the roadway widening is approximately 500 square feet which is small enough that ideally there is capacity in the existing facility for the additional impervious area. However, with new drainage standards, that is a project cost risk that impacting the existing facility would require reconstruction or retrofitting of the existing pond. The invert and elevations are not available for this phase of the design and a survey of existing storm and sewer facilities will need to be obtained for a complete assessment of the challenges and risks.

Concept plans for these alternatives are included in the appendices.

Appendix A – SCATS Historical Average Signal Timing Card

Appendix B – Key Design Criteria



City of Bellevue
Transportation Department
Design Standards Documentation

CIP No. _____

Created Date: _____

Project Name and Description

Approval Date: _____

Study Area 4 - 148th Avenue NE & NE 8th ST -Adding
 Eastbound and Westbound left turn lanes

Last Revised Date: _____ 5/22/2019

Project Funding and Design Standards

- City funds only - Use City of Bellevue Design Manual local funding
 Outside funding - Use WSDOT Local Agency Guidelines (LAG) Manual
 Potential for future outside funding - Use WSDOT Local Agency Guidelines (LAG) Manual

Speed & Terrain Designations

35 Design Speed
 _____ 35 Posted Speed
 _____ AASHTO Terrain
 Level _____

WSDOT STATE AID ENGINEER REVIEW/APPROVAL?

YES _____ NO _____

FHWA Controlling Design Criteria

Design Speed	1
Lane Width	2
Shoulder Width	3
Bridge Width	4
Structural Capacity	5
Horizontal Alignment	6
Vertical Alignment	7
Grade	8
Stopping Sight Distance	9
Cross Slope	10
Superelevation	11
Vertical Clearance	12
Horizontal Clearance	13

Roadway Classifications

Bellevue Comp Plan	AASHTO	Federal Functional	RCW (WSDOT)
Major Arterial	<input checked="" type="checkbox"/> Principal Arterial	<input type="checkbox"/> Principal Arterial	<input type="checkbox"/> State Route
Minor Arterial	<input type="checkbox"/> Minor Arterial	<input type="checkbox"/> Minor Arterial	<input type="checkbox"/> Major Arterial
Collector Arterial	<input type="checkbox"/> Collector	<input type="checkbox"/> Collector	<input type="checkbox"/> Secondary Arterial
Local Street	<input type="checkbox"/> Local Street	<input type="checkbox"/> Local Street	<input type="checkbox"/> Access Street

Project Type (See LAG 42.4)

New Construction	<input type="checkbox"/>
Re-Construction	<input checked="" type="checkbox"/>
3R	<input type="checkbox"/>
2R	<input type="checkbox"/>
Bridge Rehabilitation	<input type="checkbox"/>
Trails	<input type="checkbox"/>
Pedestrian Facility	<input type="checkbox"/>
Other	<input type="checkbox"/>

CIP No. _____

Approval Date: _____

Project Name and Description

Last Revised Date: _____

Bellevue Spot Improvements-Study Area 4 - 148th Avenue NE & NE 8th ST -Adding Eastbound and Westbound left turn lanes

COB ID	Design Element	Standard	Source	Existing/Proposed Condition	Design Exception?	LAG Design Deviation?	LAG Criteria (NALE = Not a LAG Element)	Comments, also refer to WSDOT Design Manual Chapter 1100
1	LANE WIDTH	11 FT Urban areas	AASHTO Geometric Design 4.3	11' lanes			NALE	WSDOT Chapter 1231.
2	No. of Lanes			In the existing condition, the number of lanes are as follows; 1. 4 lanes with right and left turn pockets in the northbound and southbound directions. 2. 4 lanes with left turn pocket in the westbound direction. 3. 5 lanes with right turn pocket in the eastbound direction and one of the lanes is a left turn lane which continues as a two way left turn lane further along the road. Additional new left turn lanes are added in the proposed condition either in the east-west direction or north-south direction or on all four legs of the intersection.			NALE	
3	Bike Lane Width (ft)	Min 5' wide	COB TDM 14	N/A, no bike lane proposed on facility			NALE	
4	Parking Bay Width (ft)	Meet table 1	COB TDM 3D	N/A			NALE	
5	Drainage Type: Vertical Curb, Curb& Gutter (ft), other	Curb and Gutter use on all public streets	COB TDM 11	Curb and Gutter			NALE	
6	Planting Strip (ft)	4 FT Min	COB TDM 3B	The project requires widening of the existing roadway. The existing planting strip and sidewalk is removed and 6FT sidewalk without planting strip is proposed to minimize property impacts and critical area impacts.			1	
7	Sidewalk Width (ft)	6 FT Min	COB TDM 14	The project requires widening of the existing roadway. The existing sidewalk is removed and relocated to accommodate the additional lane.			NALE	
8	Medians		COB TDM 8	The project requires widening of the existing roadway. The existing median in the north-south direction will be removed and there will be no medians in the proposed conditions in order to minimize property impacts and critical area impacts.				
9	Pavement Type	10 IN HMA	COB TDM RC-100-1	10 IN HMA			NALE	Check Geotechnical Report for additional requirements.
10	Bus Route, stops, shelters,pads	N/A		Replacement of Rapid Ride Bus stop, shelters and pads due to the roadway widening.			NALE	Coordinate with Metro and Traffic Engineering Division.

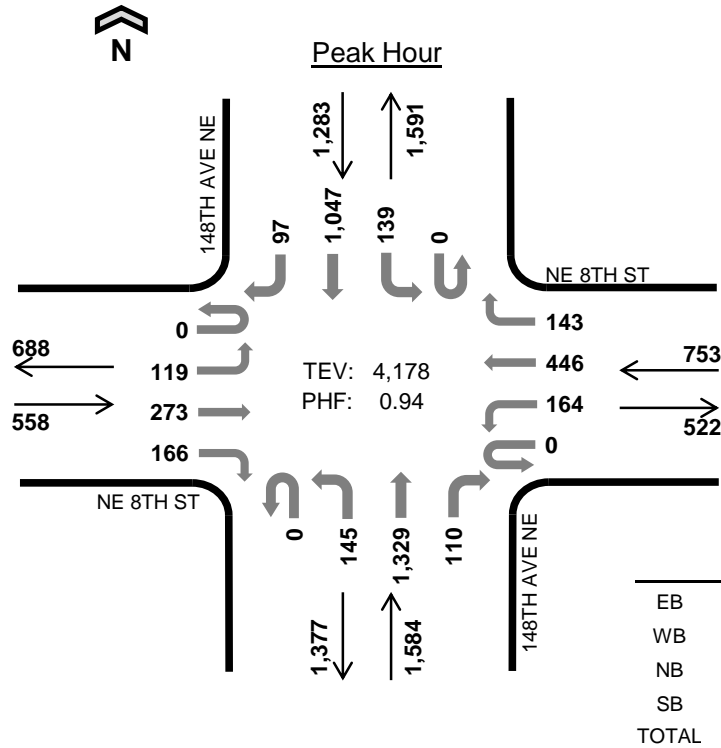
COB ID	Design Element	Standard	Source	Existing/Proposed Condition	Design Exception?	LAG Design Deviation?	LAG Criteria (NALE = Not a LAG Element)	Comments, also refer to WSDOT Design Manual Chapter 1100
11	DESIGN SPEED	35 MPH on NE 8th ST between 124th AVENUE NE to 156th AVENUE NE and 35 MPH on 148th Avenue NE from SE 28th ST to NE 24th ST.		Proposed: 35 MPH at the intersection of NE 8th ST and 148th Avenue NE.			NALE	
12	Posted speed	Existing Ordinance is 35 MPH on NE 8th ST between 124th AVENUE NE to 156th AVENUE NE and 35 MPH on 148th Avenue NE from SE 28th ST to NE 24th ST.		Proposed: 35 MPH at the intersection of NE 8th ST and 148th Avenue NE.			NALE	
13	CROSS SLOPE	2% Lane	WSDOT DM 1250.02	2% Lane			NALE	
14	Design Vehicle	AASHTO SU-30	COB TDM 9	Meets standard			NALE	Check Truck and Bus Routes
15	Thru Lane Alignments Across Intersection	6 FT	WSDOT DM 1310.02(3)	1FT to 2 FT offset between the proposed through lanes due to the widening of the road.			NALE	
17	Intersection Skew Angle	85 to 95 degrees	COB TDM 9C	Existing intersection alignment is not modified.			NALE	AASHTO, city design manual.
18	Corner Radii	Meet design vehicle turn movements	COB TDM 9	Meets standard			NALE	
19	Minimum Curb Return (ft)	30 FT	COB TDM 9C	Proposed curb radius at all the four corners of the intersection is 30 FT and meets standard.			NALE	
20	Taper	$(WT / 60) * S_{SL}^2$	COB TDM CH-190-1	Meets standard			NALE	

COB ID	Design Element	Standard	Source	Existing/Proposed Condition	Design Exception?	LAG Design Deviation?	LAG Criteria (NALE = Not a LAG Element)	Comments, also refer to WSDOT Design Manual Chapter 1100
21	Spacing	150 FT to nearest intersection 100 FT from other driveways	COB TDM 5I COB TDM 5H	<p>At the Gas Station in the southeast corner of the intersection:</p> <ol style="list-style-type: none"> Proposed driveway separation is 44 feet and matches existing. The Proposed driveway is 32 feet from the intersection and is located at the same location as the existing. <p>The driveway to Super Supplements located in the NE 8th ST to the west of the intersection is 115 feet from the intersection and matches existing.</p> <p>At Super Supplements in the 148th AVE NE, Existing driveway separation is 87 feet and the Proposed driveways are located in the same location as existing. Also the proposed driveway is located 49 feet from the intersection and matches existing.</p>			NALE	city design manual & AASHTO

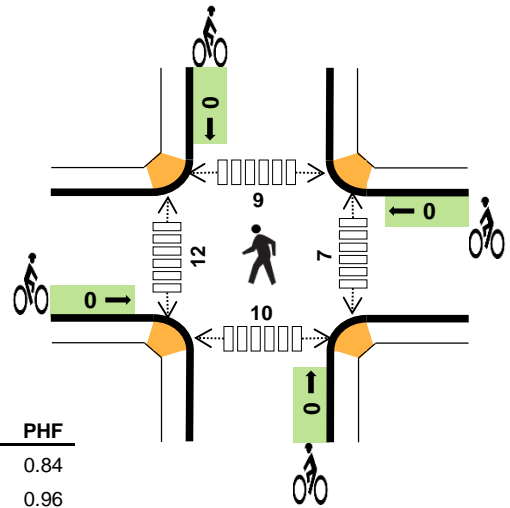
Appendix C – Two Hour AM & PM Peak Turning Movement Count



148TH AVE NE NE 8TH ST



Date: Tue, Oct 16, 2018
Count Period: 7:30 AM to 9:30 AM
Peak Hour: 8:00 AM to 9:00 AM



Two-Hour Count Summaries

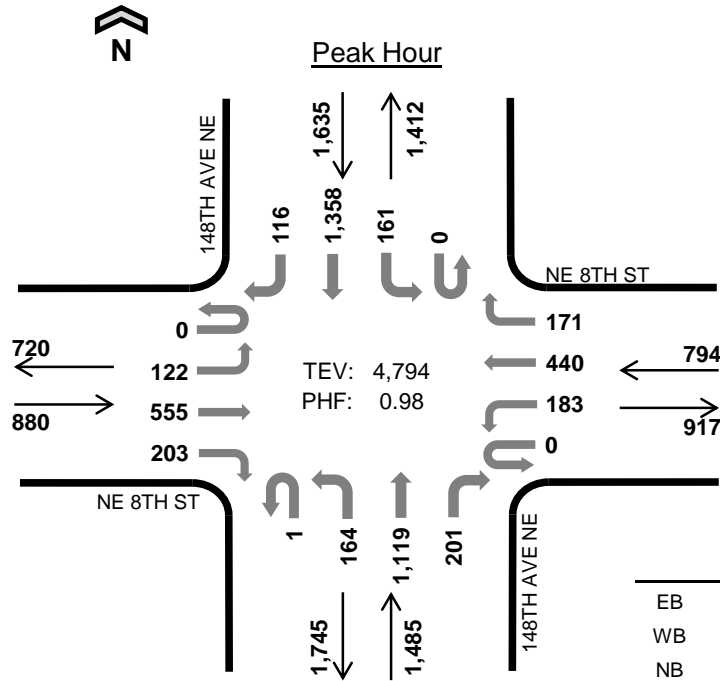
Interval Start	NE 8TH ST Eastbound				NE 8TH ST Westbound				148TH AVE NE Northbound				148TH AVE NE Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:30 AM	0	20	32	17	0	28	75	27	0	30	325	35	0	19	229	23	860	0
7:45 AM	0	17	37	21	0	37	142	23	0	42	323	32	0	29	265	35	1,003	0
8:00 AM	0	26	67	41	0	35	118	27	0	46	328	35	0	36	316	31	1,106	0
8:15 AM	0	33	82	51	0	44	114	33	0	45	255	30	0	39	276	29	1,031	4,000
8:30 AM	0	36	65	35	0	47	101	38	0	26	363	19	0	25	186	16	957	4,097
8:45 AM	0	24	59	39	0	38	113	45	0	28	383	26	0	39	269	21	1,084	4,178
9:00 AM	0	29	51	19	0	39	98	36	1	35	382	26	0	25	248	17	1,006	4,078
9:15 AM	0	30	59	18	0	39	103	38	0	25	364	25	0	31	264	15	1,011	4,058
Count Total	0	215	452	241	0	307	864	267	1	277	2,723	228	0	243	2,053	187	8,058	0
Peak Hour	0	119	273	166	0	164	446	143	0	145	1,329	110	0	139	1,047	97	4,178	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

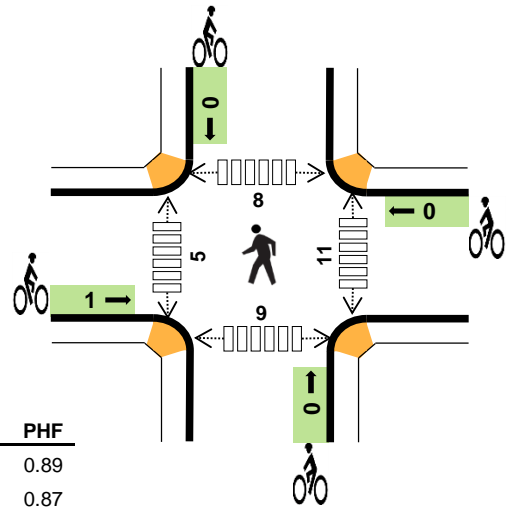
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:30 AM	5	8	9	6	28	0	0	0	0	0	4	4	3	2	13
7:45 AM	7	7	5	9	28	0	0	0	0	0	3	3	3	2	11
8:00 AM	4	3	7	11	25	0	0	0	0	0	1	4	2	3	10
8:15 AM	6	10	8	6	30	0	0	0	0	0	3	2	4	2	11
8:30 AM	6	4	6	7	23	0	0	0	0	0	1	3	0	2	6
8:45 AM	5	5	11	9	30	0	0	0	0	0	2	3	3	3	11
9:00 AM	3	10	6	9	28	0	0	0	0	0	3	5	2	2	12
9:15 AM	2	4	9	14	29	0	0	0	0	0	1	3	0	4	8
Count Total	38	51	61	71	221	0	0	0	0	0	18	27	17	20	82
Peak Hour	21	22	32	33	108	0	0	0	0	0	7	12	9	10	38



148TH AVE NE NE 8TH ST



Date: Tue, Oct 16, 2018
 Count Period: 4:00 PM to 6:00 PM
 Peak Hour: 5:00 PM to 6:00 PM



	HV %:	PHF
EB	0.9%	0.89
WB	1.9%	0.87
NB	0.9%	0.95
SB	0.7%	0.95
TOTAL	1.0%	0.98

Two-Hour Count Summaries

Interval Start	NE 8TH ST Eastbound				NE 8TH ST Westbound				148TH AVE NE Northbound				148TH AVE NE Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	42	109	57	0	54	88	41	0	45	263	42	0	31	325	34	1,131	0
4:15 PM	0	25	97	40	0	43	75	33	0	40	273	38	0	38	373	38	1,113	0
4:30 PM	0	27	132	49	0	38	87	42	0	40	256	47	0	35	368	18	1,139	0
4:45 PM	0	32	130	45	0	49	93	36	0	42	268	52	0	43	348	26	1,164	4,547
5:00 PM	0	33	128	59	0	47	108	42	0	29	274	49	0	35	377	17	1,198	4,614
5:15 PM	0	24	140	49	0	52	123	54	1	32	280	48	0	39	358	28	1,228	4,729
5:30 PM	0	33	127	39	0	50	107	39	0	53	285	54	0	46	293	33	1,159	4,749
5:45 PM	0	32	160	56	0	34	102	36	0	50	280	50	0	41	330	38	1,209	4,794
Count Total	0	248	1,023	394	0	367	783	323	1	331	2,179	380	0	308	2,772	232	9,341	0
Peak Hour	0	122	555	203	0	183	440	171	1	164	1,119	201	0	161	1,358	116	4,794	0

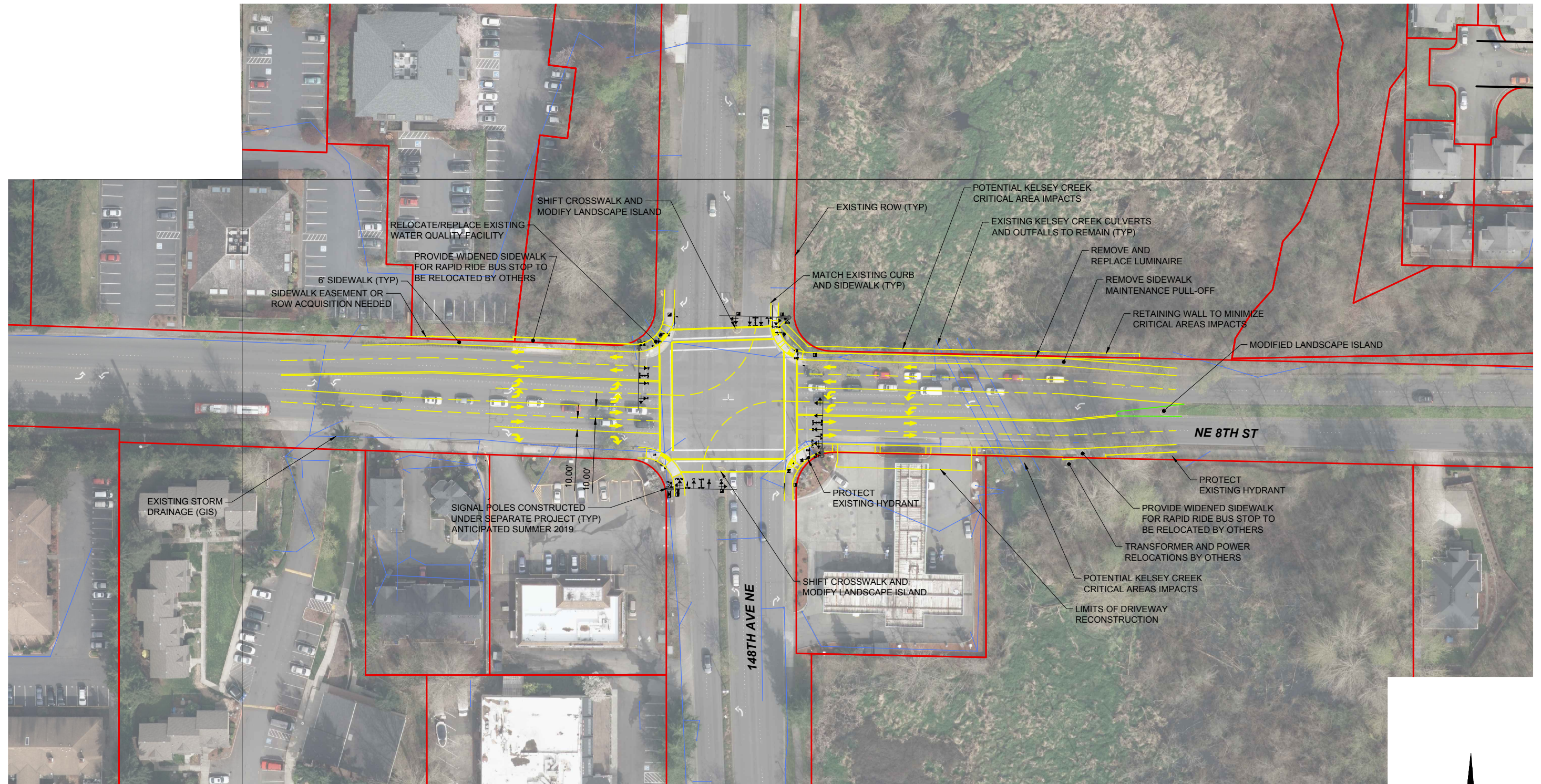
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	5	8	9	6	28	0	0	0	0	0	11	1	4	4	20
4:15 PM	2	7	2	3	14	0	0	0	0	0	2	5	2	0	9
4:30 PM	5	3	2	1	11	0	0	0	0	0	4	0	0	1	5
4:45 PM	5	4	3	4	16	0	0	0	0	0	2	5	0	5	12
5:00 PM	3	3	3	7	16	0	0	0	0	0	4	2	2	5	13
5:15 PM	1	4	4	3	12	0	0	0	0	0	1	2	0	0	3
5:30 PM	2	1	2	1	6	0	0	0	0	0	3	0	3	1	7
5:45 PM	2	7	4	1	14	1	0	0	0	1	3	1	3	3	10
Count Total	25	37	29	26	117	1	0	0	0	1	30	16	14	19	79
Peak Hour	8	15	13	12	48	1	0	0	0	1	11	5	8	9	33

Appendix D – Conceptual Alternative Drawings

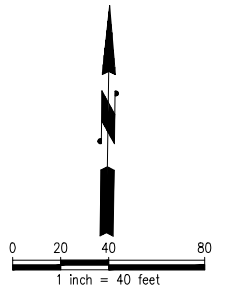
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Jun 20, 2019 - 4:10pm
abull



NOTES:

1. ALL PROPOSED LANE WIDTHS 11' UNLESS NOTED OTHERWISE.



10% DESIGN - NOT FOR CONSTRUCTION

NO.	DATE	BY	APPR.	REVISIONS

Approved By		DESIGNED BY :	DATE
TRANSPORTATION DESIGN MANAGER	DATE	S. RAJAN	3/20/19
PROJECT MANAGER	DATE	S. BULL	3/20/19
	DATE	J. MATHEWS	3/20/19
	DATE	CHECKED BY	DATE



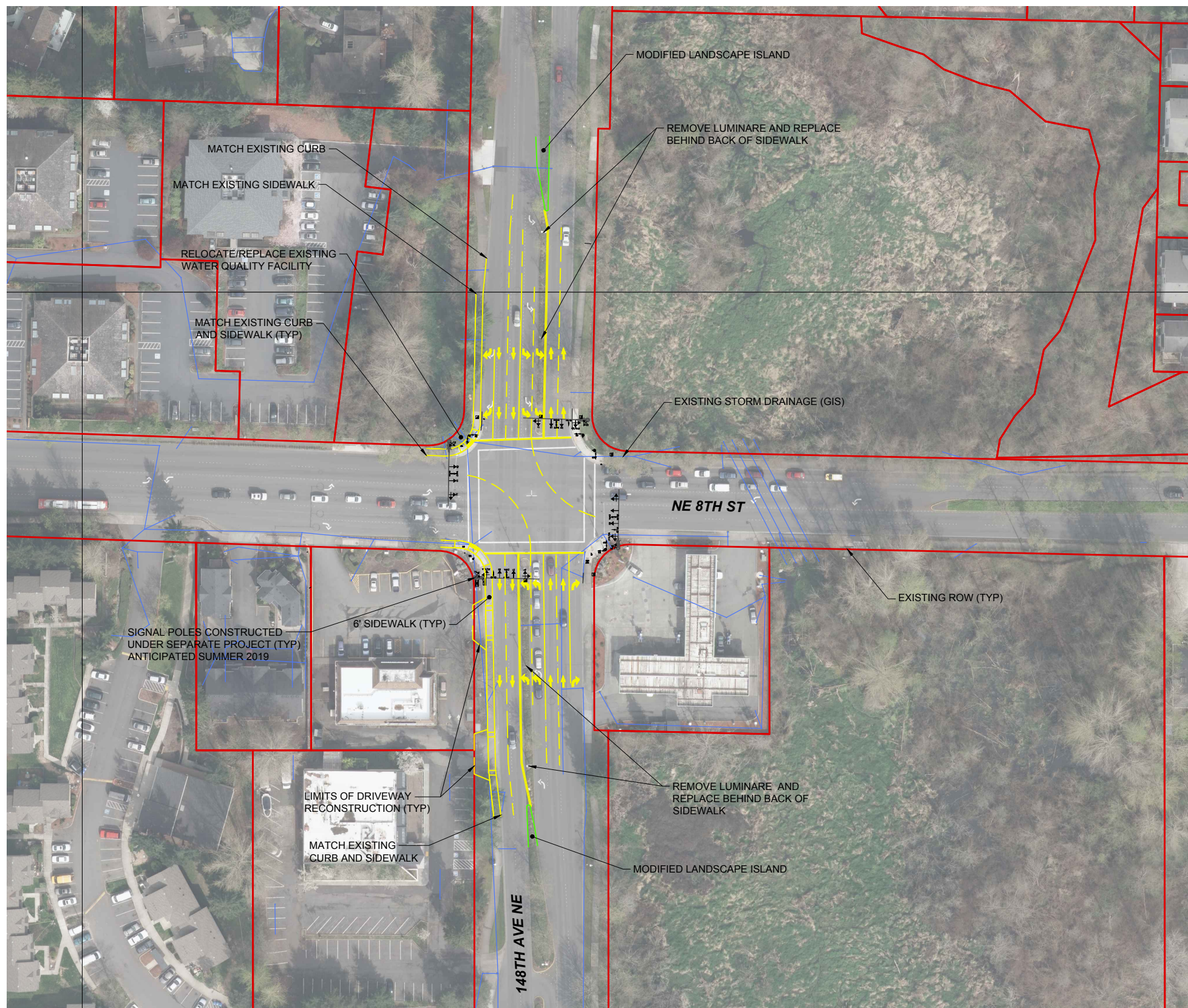
BELLEVUE SPOT IMPROVEMENTS

**STUDY AREA 4
148TH AVE NE & NE 8TH ST
ALTERNATIVE-1**

SHT _____ OF _____

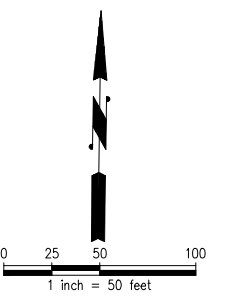
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Jun 20, 2019 - 12:23pm



NOTES:

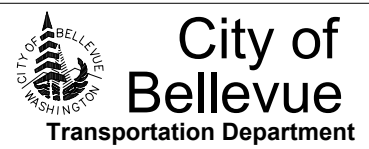
1. ALL PROPOSED LANE WIDTHS 11' UNLESS NOTED OTHERWISE.



10% DESIGN - NOT FOR CONSTRUCTION

NO.	DATE	BY	APPR.	REVISIONS

Approved By		DESIGNED BY :	DATE
TRANSPORTATION DESIGN MANAGER	DATE	S. RAJAN	3/20/19
PROJECT MANAGER	DATE	S. BULL	3/20/19
	DATE	J. MATTHEWS	3/20/19
	DATE	CHECKED BY	DATE



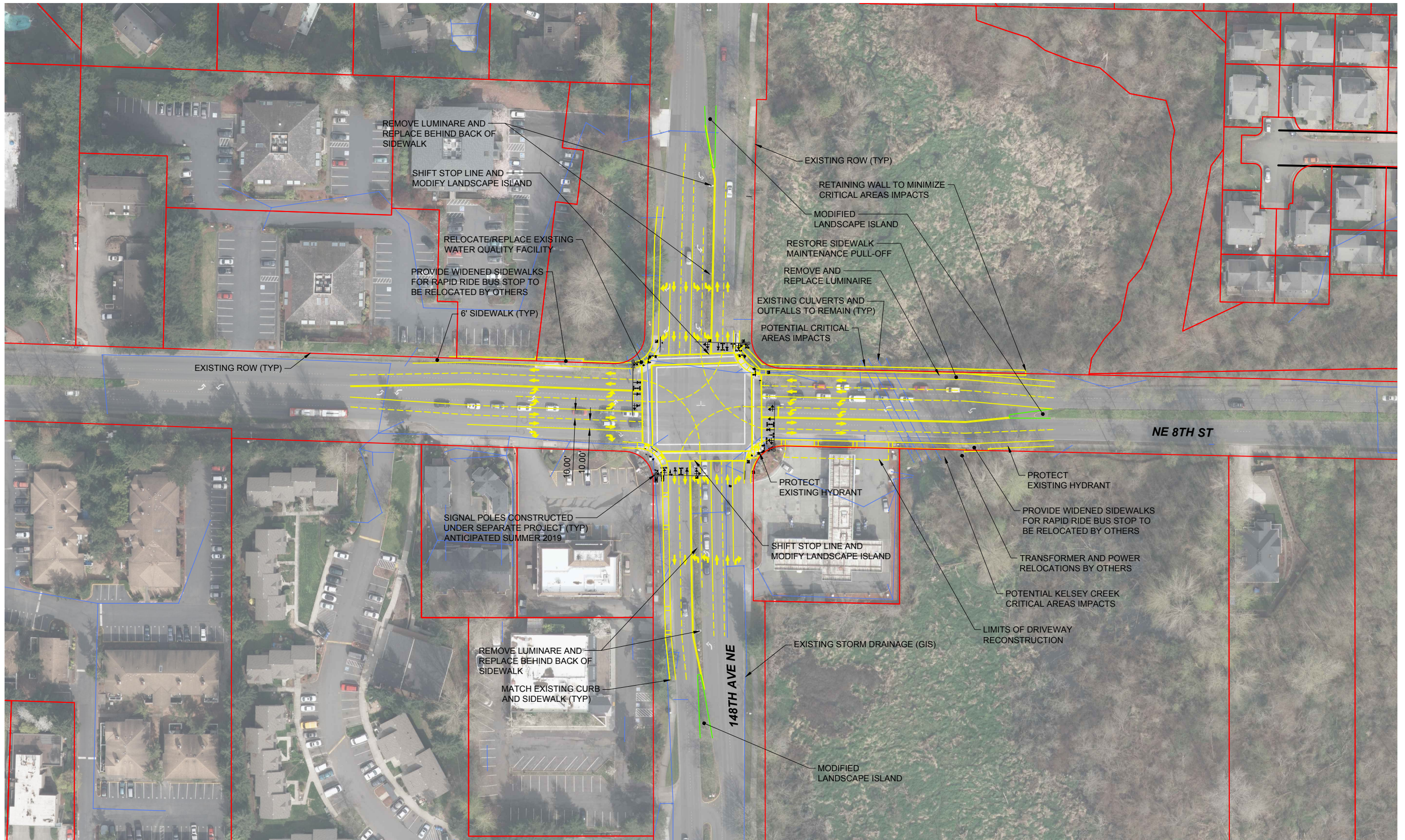
BELLEVUE SPOT IMPROVEMENTS

STUDY AREA 4
148TH AVE NE & NE 8TH ST
ALTERNATIVE-2

SHT _____ OF _____

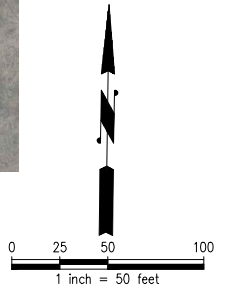
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Jun 20, 2019 - 3:45pm
sbull



NOTES:

- 1. ALL PROPOSED LANE WIDTHS 11' UNLESS NOTED OTHERWISE.



10% DESIGN - NOT FOR CONSTRUCTION

NO.	DATE	BY	APPR.	REVISIONS

Approved By		DESIGNED BY :	DATE
TRANSPORTATION DESIGN MANAGER	DATE	S. RAJAN	3/20/19
PROJECT MANAGER	DATE	S. BULL	3/20/19
	DATE	J. MATTHEWS	3/20/19
	DATE	CHECKED BY	DATE



BELLEVUE SPOT IMPROVEMENTS

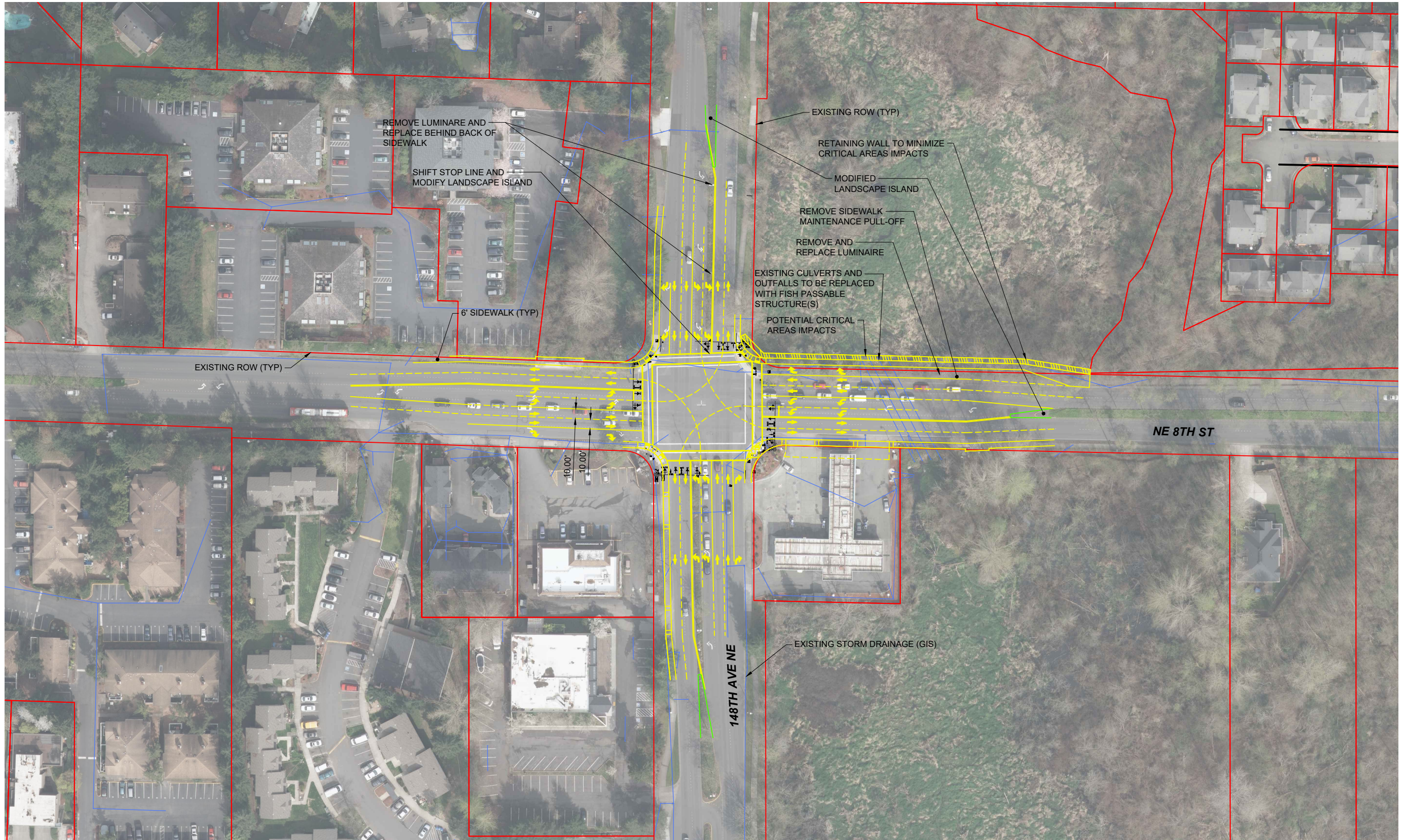
**STUDY AREA 4
148 AVE NE & NE 8TH ST
ALTERNATIVE-3**

SHT _____ OF _____

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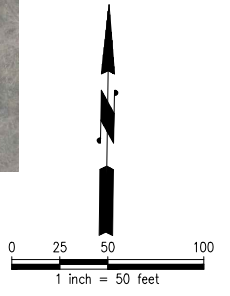
sranyog

Sep 19, 2019 - 10:23am



NOTES:

- 1. ALL PROPOSED LANE WIDTHS 11' UNLESS NOTED OTHERWISE.



10% DESIGN - NOT FOR CONSTRUCTION

NO.	DATE	BY	APPR.	REVISIONS

Approved By		DESIGNED BY :	DATE
TRANSPORTATION DESIGN MANAGER	DATE	S. RAJAN	8/20/19
PROJECT MANAGER	DATE	S. BULL	8/20/19
	DATE	J. MATTHEWS	8/20/19
	DATE	CHECKED BY	DATE



BELLEVUE SPOT IMPROVEMENTS

STUDY AREA 4
148 AVE NE & NE 8TH ST
ALTERNATIVE-4 NEW RT.TURN

SHT ____ OF ____

Appendix E – Preliminary Cost Estimate

OPINION OF PROBABLE COST - SUMMARY

PROJECT: 140th and 148th Spot Improvements -Study Area 4 -Alternative 1- 148TH AVE NE & NE 8TH ST, EAST-WEST LEFT TURNS

CIP NO.
DATE: 09/18/19

I. RIGHT OF WAY ACQUISITION & EASEMENT AND REIMBURSEMENT COSTS		\$	25,000.00
II. CONSTRUCTION			
1. Grading/Drainage			
2. Structures			
3. Surfacing/Paving			
4. Roadside Development			
5. Traffic Services & Safety			
	\$ 882,800		
6. Miscellaneous Items Not Yet Estimated			
20.0% of (Lines 1 through 5) @ 5% Level	\$ 176,560.00	\$ 1,059,360	
7. Allowance for 5%-Level Accuracy			
30.0% of (Lines 1 through 6)	\$ 317,808.00		
8. Mobilization, Survey, Potholing			
15% of (Line 1 through 6)	\$ 158,904.00		
9. Maintenance of Traffic			
15% of (Line 1 through 6)	\$ 158,904.00	\$ 1,694,976.0	
10. Construction Engineering			
15.0% of (Lines 1 through 9)	\$ 254,246.40		
11. Construction Contingency			
10.0% of (Lines 1 through 9)	\$ 169,497.60		\$ 2,118,720.00
III. DESIGN ENGINEERING AND CITY COSTS			
1. Design Engineering (Consultant Contract)			
15.0% of (CONSTRUCTION cost not incl contingency)	\$ 292,383.36		
2. Agency Administration			
10.0% of (CONSTRUCTION cost not incl contingency)	\$ 194,922.24		
3. Alignment Survey			
2.0% of (CONSTRUCTION cost not incl contingency)	\$ 38,984.45		
TOTAL ESTIMATED COST		\$	2,670,100.00

Assumptions:

1. Estimate calculated in 2019 dollars.
2. Estimate is based on 10% Design

Preliminary Engineer's Estimate of Probable Cost

Study Area 4							
ITEM NO.	STD ITEM NO.	ITEM	QTY	UNIT	UNIT PRICE	TOTAL COST	% OF CONST
ROADWAY							
	25	CLEARING AND GRUBBING	0.46	Acre	\$40,000	\$18,400.00	2.1%
	310	ROADWAY EXCAVATION INCL. HAUL	685	CY	\$40.00	\$27,400.00	3.1%
	5120	CRUSHED SURFACING TOP COURSE	300	TON	\$50.00	\$15,000.00	1.7%
	5767	HMA CL 1/2" PG 64-22	720	TON	\$200.00	\$144,000.00	16.3%
	6700	CEMENT CONC. TRAFFIC CURB AND GUTTER	1050	LF	\$35.00	\$36,750.00	4.2%
	7055	CEMENT CONC. SIDEWALK	705	SY	\$70.00	\$49,350.00	5.6%
	7058	CEMENT CONC. CURB RAMP TYPE	5	EA	\$2,000.00	\$10,000.00	1.1%
	SP	FENCING	120	LF	\$50.00	\$6,000.00	0.7%
		PLANING BITUMINOUS PAVEMENT	6230	SY	\$3.00	\$18,690.00	2.1%
DRAINAGE/UTILITIES							
	3541	SCHEDULE A STORM SEWER PIPE 12 IN. DIAM.	340	LF	\$50.00	\$17,000.00	1.9%
		CONCRETE INLET	5	EA	\$1,000.00	\$5,000.00	0.6%
	3091	CATCH BASIN TYPE 2	2	EA	\$3,000.00	\$6,000.00	0.7%
		CATCH BASIN TYPE 1	1	EA	\$2,000.00	\$2,000.00	0.2%
		ADJUST TO GRADE	1	EA	\$500.00	\$500.00	
		SDMH-48"	1	EA	\$4,600.00	\$4,600.00	
	SP	RELOCATE/REPLACE WQ FACILITY	1	EA	\$30,000.00	\$30,000.00	3.4%
STRUCTURE							
	SP	STRUCTURAL EARTH WALL (SEW)	1490	SF	\$60.00	\$89,400.00	10.1%
	SP	SEW TRAFFIC BARRIER	300	LF	\$460.00	\$138,000.00	15.6%
	SP	GRAVEL BORROW FOR STRUCTURAL EARTH WALL	390	CY	\$35.00	\$13,650.00	1.5%
	SP	DECORATIVE RAILING	300	LF	\$90.00	\$27,000.00	3.1%
ENVIRONMENT							
		EROSION/WATER POLLUTION CONTROL	1	LS	\$25,000.00	\$25,000.00	2.8%
		SWPPP PREPARATION AND MAINTENANCE	1	LS	\$2,000.00	\$2,000.00	0.2%
		SPCC PLAN	1	LS	\$2,000.00	\$2,000.00	0.2%
		MITIGATION PLANTING	1	LS	\$15,000.00	\$15,000.00	1.7%
TRAFFIC AND ILLUMINATION							
		PERMANENT SIGNING AND STRIPING	1	LS	\$10,000.00	\$10,000.00	1.1%
		TRAFFIC SIGNAL MODIFICATIONS	1	LS	\$130,000.00	\$130,000.00	14.7%
		ILLUMINATION	1	LS	\$20,000.00	\$20,000.00	2.3%
		KC RAPID RIDE FOUNDATIONS FOR SHELTER RELOCATIONS	1	LS	\$15,000.00	\$15,000.00	1.7%
LANDSCAPING							
		LANDSCAPE RESTORATION	1	LS	\$5,000.00	\$5,000.00	0.6%
Subtotal						\$882,800.00	

ASSUMPTION: PROJECT CONSTRUCTS RAPID RIDE BUS STOP FOUNDATIONS AND CONDUIT, SHELTERS AND FIXTURES CONSTRUCTED BY KC METRO.

OPINION OF PROBABLE COST - SUMMARY

PROJECT: 140th and 148th Spot Improvements -Study Area 4 - Alternative 2 - 148TH AVE NE & NE 8TH ST, NORTH - SOUTH LEFT TURN LANES

CIP NO.
DATE: 09/18/19

I. RIGHT OF WAY ACQUISITION & EASEMENT AND REIMBURSEMENT COSTS					\$ 10,000.00
II. CONSTRUCTION					
1. Grading/Drainage					
2. Structures					
3. Surfacing/Paving					
4. Roadside Development					
5. Traffic Services & Safety					
	\$ 407,800				
6. Miscellaneous Items Not Yet Estimated					
20.0% of (Lines 1 through 5) @ 5% Level	\$ 81,560.00			\$ 489,360	
7. Allowance for 5%-Level Accuracy					
30.0% of (Lines 1 through 6)	\$ 146,808.00				
8. Mobilization, Survey, Potholing					
15% of (Line 1 through 6)	\$ 73,404.00				
9. Maintenance of Traffic					
15% of (Line 1 through 6)	\$ 73,404.00			\$ 782,976.0	
10. Construction Engineering					
15.0% of (Lines 1 through 9)	\$ 117,446.40				
11. Construction Contingency					
10.0% of (Lines 1 through 9)	\$ 78,297.60				\$ 978,720.00
III. DESIGN ENGINEERING AND CITY COSTS					
1. Design Engineering (Consultant Contract)					
15.0% of (CONSTRUCTION cost not incl contingency)	\$ 135,063.36				
2. Agency Administration					
10.0% of (CONSTRUCTION cost not incl contingency)	\$ 90,042.24				
3. Alignment Survey					
2.0% of (CONSTRUCTION cost not incl contingency)	\$ 18,008.45				
TOTAL ESTIMATED COST					
					\$ 1,231,834.05

Assumptions:

1. Estimate calculated in 2019 dollars.
2. Estimate is based on 10% Design



1601 Fifth Avenue, Suite 1600
Seattle, WA 98101
206.622.5822

Client: City of Bellevue
Project: 140th and 148th Spot Improvements
Title: Study Area 4 - 148th/NE 8th- Alternative 2
By: SGR
Date: 9/18/2019

Preliminary Engineer's Estimate of Probable Cost

Study Area 4							
ITEM NO.	STD ITEM NO.	ITEM	QTY	UNIT	UNIT PRICE	TOTAL COST	% OF CONST
ROADWAY							
25		CLEARING AND GRUBBING	0.25	Acre	\$40,000	\$10,000.00	2.5%
310		ROADWAY EXCAVATION INCL. HAUL	430	CY	\$40.00	\$17,200.00	4.2%
5120		CRUSHED SURFACING TOP COURSE	140	TON	\$50.00	\$7,000.00	1.7%
5767		HMA CL 1/2" PG 64-22	260	TON	\$200.00	\$52,000.00	12.8%
6700		CEMENT CONC. TRAFFIC CURB AND GUTTER	480	LF	\$35.00	\$16,800.00	4.1%
7055		CEMENT CONC. SIDEWALK	300	SY	\$70.00	\$21,000.00	5.1%
7058		CEMENT CONC. CURB RAMP TYPE	2	EA	\$2,000.00	\$4,000.00	1.0%
SP		FENCING	0	LF	\$50.00	\$0.00	0.0%
		PLANING BITUMINOUS PAVEMENT	10340	SY	\$3.00	\$31,020.00	7.6%
DRAINAGE/UTILITIES							
3541		SCHEDULE A STORM SEWER PIPE 12 IN. DIAM.	175	LF	\$50.00	\$8,750.00	2.1%
3091		CATCH BASIN TYPE 2	2	EA	\$3,000.00	\$6,000.00	1.5%
		CONCRETE INLET	1	EA	\$1,000.00	\$1,000.00	0.2%
3105		ADJUST TO GRADE	0	EA	\$500.00	\$0.00	0.0%
		RELOCATE/REPLACE WQ FACILITY	1	EA	\$30,000.00	\$30,000.00	7.4%
						\$0.00	0.0%
STRUCTURE							
SP		GRAVITY BLOCK WALL	0	SF	\$120.00	\$0.00	0.0%
SP		CONCRETE STAIRWAY	0	LS	\$3,000.00	\$0.00	0.0%
ENVIRONMENT							
		EROSION/WATER POLLUTION CONTROL	1	LS	\$10,000.00	\$10,000.00	2.5%
		SWPPP PREPARATION AND MAINTENANCE	1	LS	\$2,000.00	\$2,000.00	0.5%
		SPCC PLAN	1	LS	\$2,000.00	\$2,000.00	0.5%
TRAFFIC AND ILLUMINATION							
						\$0.00	0.0%
		PERMANENT SIGNING AND STRIPING	1	LS	\$4,000.00	\$4,000.00	1.0%
		TRAFFIC SIGNAL MODIFICATIONS	1	LS	\$80,000.00	\$80,000.00	19.6%
		ILLUMINATION	1	LS	\$100,000.00	\$100,000.00	24.5%
LANDSCAPING							
		LANDSCAPE RESTORATION	1	LS	\$5,000.00	\$5,000.00	1.2%
Subtotal						\$407,800.00	

OPINION OF PROBABLE COST - SUMMARY

PROJECT: 140th and 148th Spot Improvements -Study Area 4 - 148TH AVE NE & NE 8TH ST Alternative 3 (TURN LANES ALL FOUR LEGS)

CIP NO.
DATE: 09/18/19

I. RIGHT OF WAY ACQUISITION & EASEMENT AND REIMBURSEMENT COSTS		\$ 35,000.00	
II. CONSTRUCTION			
1. Grading/Drainage			
2. Structures			
3. Surfacing/Paving			
4. Roadside Development			
5. Traffic Services & Safety			
	\$ 1,200,100		
6. Miscellaneous Items Not Yet Estimated			
20.0% of (Lines 1 through 5) @ 5% Level	\$ 240,020.00	\$ 1,440,120	
7. Allowance for 5%-Level Accuracy			
30.0% of (Lines 1 through 6)	\$ 432,036.00		
8. Mobilization, Survey, Potholing			
15% of (Line 1 through 6)	\$ 216,018.00		
9. Maintenance of Traffic			
15% of (Line 1 through 6)	\$ 216,018.00	\$ 2,304,192.0	
10. Construction Engineering			
15.0% of (Lines 1 through 9)	\$ 345,628.80		
11. Construction Contingency			
10.0% of (Lines 1 through 9)	\$ 230,419.20		\$ 2,880,240.00
III. DESIGN ENGINEERING AND CITY COSTS			
1. Design Engineering (Consultant Contract)			
15.0% of (CONSTRUCTION cost not incl contingency)	\$ 397,473.12		
2. Agency Administration			
10.0% of (CONSTRUCTION cost not incl contingency)	\$ 264,982.08		
3. Alignment Survey			
2.0% of (CONSTRUCTION cost not incl contingency)	\$ 52,996.42		
TOTAL ESTIMATED COST		\$ 3,630,700.00	

Assumptions:

1. Estimate calculated in 2019 dollars.
2. Estimate is based on 10% Design

Preliminary Engineer's Estimate of Probable Cost

Study Area 4							
ITEM NO.	STD ITEM NO.	ITEM	QTY	UNIT	UNIT PRICE	TOTAL COST	% OF CONST
ROADWAY							
	25	CLEARING AND GRUBBING	0.71	Acre	\$40,000	\$28,400.00	2.4%
	310	ROADWAY EXCAVATION INCL. HAUL	1115	CY	\$40.00	\$44,600.00	3.7%
	5120	CRUSHED SURFACING TOP COURSE	440	TON	\$50.00	\$22,000.00	1.8%
	5767	HMA CL 1/2" PG 64-22	980	TON	\$200.00	\$196,000.00	16.3%
	6700	CEMENT CONC. TRAFFIC CURB AND GUTTER	1530	LF	\$35.00	\$53,550.00	4.5%
	7055	CEMENT CONC. SIDEWALK	1005	SY	\$70.00	\$70,350.00	5.9%
	7058	CEMENT CONC. CURB RAMP TYPE	7	EA	\$2,000.00	\$14,000.00	1.2%
	SP	FENCING	120	LF	\$50.00	\$6,000.00	0.5%
		PLANING BITUMINOUS PAVEMENT	10340	SY	\$3.00	\$31,020.00	2.6%
DRAINAGE/UTILITIES							
	3541	SCHEDULE A STORM SEWER PIPE 12 IN. DIAM.	350	LF	\$50.00	\$17,500.00	1.5%
		CONCRETE INLET	6	EA	\$1,000.00	\$6,000.00	0.5%
	3091	CATCH BASIN TYPE 2	2	EA	\$3,000.00	\$6,000.00	0.5%
		CATCH BASIN TYPE 1	1	EA	\$2,000.00	\$2,000.00	0.2%
		ADJUST TO GRADE	1	EA	\$500.00	\$500.00	0.0%
		SDMH-48"	1	EA	\$4,600.00	\$4,600.00	0.4%
	SP	RELOCATE/REPLACE WQ FACILITY	1	EA	\$30,000.00	\$30,000.00	2.5%
STRUCTURE							
	SP	STRUCTURAL EARTH WALL (SEW)	1490	SF	\$60.00	\$89,400.00	7.4%
	SP	SEW TRAFFIC BARRIER	300	LF	\$460.00	\$138,000.00	11.5%
	SP	GRAVEL BORROW FOR STRUCTURAL EARTH WALL	390	CY	\$35.00	\$13,650.00	1.1%
	SP	DECORATIVE RAILING	300	LF	\$90.00	\$27,000.00	2.2%
ENVIRONMENT							
		EROSION/WATER POLLUTION CONTROL	1	LS	\$20,000.00	\$20,000.00	1.7%
		SWPPP PREPARATION AND MAINTENANCE	1	LS	\$3,500.00	\$3,500.00	0.3%
		SPCC PLAN	1	LS	\$2,000.00	\$2,000.00	0.2%
		MITIGATION PLANTING	1	LS	\$15,000.00	\$15,000.00	1.2%
TRAFFIC AND ILLUMINATION							
		PERMANENT SIGNING AND STRIPING	1	LS	\$14,000.00	\$14,000.00	1.2%
		TRAFFIC SIGNAL MODIFICATIONS	1	LS	\$195,000.00	\$195,000.00	16.2%
		ILLUMINATION	1	LS	\$120,000.00	\$120,000.00	10.0%
		KC RAPID RIDE FOUNDATIONS FOR SHELTER RELOCATIONS	1	LS	\$15,000.00	\$15,000.00	1.2%
LANDSCAPING							
		LANDSCAPE RESTORATION	1	LS	\$15,000.00	\$15,000.00	1.2%
Subtotal						\$1,200,100.00	

ASSUMPTION: PROJECT CONSTRUCTS RAPID RIDE BUS STOP FOUNDATIONS AND CONDUIT, SHELTERS AND FIXTURES CONSTRUCTED BY KC METRO.

OPINION OF PROBABLE COST - SUMMARY

PROJECT: 140th and 148th Spot Improvements -Study Area 4 - 148TH AVE NE & NE 8TH ST- Alternative 4 (TURN LANES ALL FOUR LEGS PLUS NEW RT TURN ON NE 8TH)

CIP NO.
DATE: 09/18/19

I. RIGHT OF WAY ACQUISITION & EASEMENT AND REIMBURSEMENT COSTS			\$ 35,000.00
II. CONSTRUCTION			
1. Grading/Drainage			
2. Structures			
3. Surfacing/Paving			
4. Roadside Development			
5. Traffic Services & Safety			
	\$ 1,893,300		
6. Miscellaneous Items Not Yet Estimated			
20.0% of (Lines 1 through 5) @ 5% Level	\$ 378,660.00	\$ 2,271,960	
7. Allowance for 5%-Level Accuracy			
30.0% of (Lines 1 through 6)	\$ 681,588.00		
8. Mobilization, Survey, Potholing			
15% of (Line 1 through 6)	\$ 340,794.00		
9. Maintenance of Traffic			
15% of (Line 1 through 6)	\$ 340,794.00	\$ 3,635,136.0	
10. Construction Engineering			
15.0% of (Lines 1 through 9)	\$ 545,270.40		
11. Construction Contingency			
10.0% of (Lines 1 through 9)	\$ 363,513.60		\$ 4,543,920.00
III. DESIGN ENGINEERING AND CITY COSTS			
1. Design Engineering (Consultant Contract)			
15.0% of (CONSTRUCTION cost not incl contingency)	\$ 627,060.96		
2. Agency Administration			
10.0% of (CONSTRUCTION cost not incl contingency)	\$ 418,040.64		
3. Alignment Survey			
2.0% of (CONSTRUCTION cost not incl contingency)	\$ 83,608.13		
TOTAL ESTIMATED COST			\$ 5,707,700.00

Assumptions:

1. Estimate calculated in 2019 dollars.
2. Estimate is based on 10% Design

Preliminary Engineer's Estimate of Probable Cost

Study Area 4							
ITEM NO.	STD ITEM NO.	ITEM	QTY	UNIT	UNIT PRICE	TOTAL COST	% OF CONST
ROADWAY							
	25	CLEARING AND GRUBBING	0.86	Acre	\$40,000	\$34,400.00	1.8%
	310	ROADWAY EXCAVATION INCL. HAUL	1120	CY	\$40.00	\$44,800.00	2.4%
	5120	CRUSHED SURFACING TOP COURSE	520	TON	\$50.00	\$26,000.00	1.4%
	5767	HMA CL 1/2" PG 64-22	1200	TON	\$200.00	\$240,000.00	12.7%
	6700	CEMENT CONC. TRAFFIC CURB AND GUTTER	1530	LF	\$35.00	\$53,550.00	2.8%
	7055	CEMENT CONC. SIDEWALK	1085	SY	\$70.00	\$75,950.00	4.0%
	7058	CEMENT CONC. CURB RAMP TYPE	7	EA	\$2,000.00	\$14,000.00	0.7%
	SP	FENCING	120	LF	\$50.00	\$6,000.00	0.3%
		PLANING BITUMINOUS PAVEMENT	10340	SY	\$3.00	\$31,020.00	1.6%
DRAINAGE/UTILITIES							
	3541	SCHEDULE A STORM SEWER PIPE 12 IN. DIAM.	350	LF	\$50.00	\$17,500.00	0.9%
		CONCRETE INLET	6	EA	\$1,000.00	\$6,000.00	0.3%
	3091	CATCH BASIN TYPE 2	2	EA	\$3,000.00	\$6,000.00	0.3%
		CATCH BASIN TYPE 1	1	EA	\$2,000.00	\$2,000.00	0.1%
		ADJUST TO GRADE	1	EA	\$500.00	\$500.00	0.0%
		SDMH-48"	1	EA	\$4,600.00	\$4,600.00	0.2%
	SP	RELOCATE/REPLACE WQ FACILITY	1	EA	\$30,000.00	\$30,000.00	1.6%
		REPLACE EX.CULVERTS WITH FISH PASSABLE BOX CULVERT STRUCTURE	120	LF	\$5,000.00	\$600,000.00	31.7%
STRUCTURE							
	SP	STRUCTURAL EARTH WALL (SEW)	1830	SF	\$60.00	\$109,800.00	5.8%
	SP	SEW TRAFFIC BARRIER	300	LF	\$460.00	\$138,000.00	7.3%
	SP	GRAVEL BORROW FOR STRUCTURAL EARTH WALL	475	CY	\$35.00	\$16,625.00	0.9%
	SP	DECORATIVE RAILING	300	LF	\$90.00	\$27,000.00	1.4%
ENVIRONMENT							
		EROSION/WATER POLLUTION CONTROL	1	LS	\$30,000.00	\$30,000.00	1.6%
		SWPPP PREPARATION AND MAINTENANCE	1	LS	\$3,500.00	\$3,500.00	0.2%
		SPCC PLAN	1	LS	\$2,000.00	\$2,000.00	0.1%
		MITIGATION PLANTING	1	LS	\$15,000.00	\$15,000.00	0.8%
TRAFFIC AND ILLUMINATION							
		PERMANENT SIGNING AND STRIPING	1	LS	\$14,000.00	\$14,000.00	0.7%
		TRAFFIC SIGNAL MODIFICATIONS	1	LS	\$195,000.00	\$195,000.00	10.3%
		ILLUMINATION	1	LS	\$120,000.00	\$120,000.00	6.3%
		KC RAPID RIDE FOUNDATIONS FOR SHELTER RELOCATIONS	1	LS	\$15,000.00	\$15,000.00	0.8%
LANDSCAPING							
		LANDSCAPE RESTORATION	1	LS	\$15,000.00	\$15,000.00	0.8%
Subtotal						\$1,893,300.00	

ASSUMPTION: PROJECT CONSTRUCTS RAPID RIDE BUS STOP FOUNDATIONS AND CONDUIT, SHELTERS AND FIXTURES CONSTRUCTED BY KC METRO.

Appendix F – Public Comments and Responses

Question/Comment: Thank you for inviting public comment on congestion and possible engineering solutions to it at these intersections. As one who regularly uses NE 8th Street and 148th Avenue to and from my home in Lake Hills for the past 29 years I am happy to point out some solutions and areas of concern.

In addition to the following specific comments, I would like to add that the recent trend of increasing signal lengths is not conducive to traffic flow but instead creates more gridlock up and down the street from the signals. Access to my own home is being severely and adversely impacted by too-long greens at 156th Avenue and Main and NE 8th. If you would like to see for yourselves I am only too happy to meet with you. A field visit is always helpful to give context to otherwise abstract data.

This is also my formal request that these intersections be recalibrated to decrease the green light times north and south. As a result of these too-long green signals you have created four to eight block-long lines of cars which gridlock all driveways and side streets. The accommodation of traffic, especially cut-through traffic from Issaquah, should not be a goal of your department or the city. It is certainly counter to any goals of this neighborhood and should be counter to the goals of any city worth the name. Protection of property is a paramount duty of government, certainly ahead of the service of commerce.

148th and NE 8th is another intersection needlessly impaired by unsynchronized left turns in the north-south direction. Westbound left turns (WB 8th to 148th SB), are restricted by the too-short left turn lane which is pinched by the median island (very evident when the north-south greens are too long). Rather than removing it I would suggest you synchronize all left turns as described above and shorten the lengthy north-south green lights and re-evaluate the intersection. This also eliminates the need for your double left-turn lanes which I think achieve nothing at tremendous cost to what remains of the one-time attractiveness of this road. Finally, I am often caught in a second cycle in the SB 148th to EB 8th left turn lanes because the left turn signal goes red before the queue is emptied. Again, synchronized left turn signals would ease this considerably without any need for demolition and related paving. This intersection is surely among the busiest in the city and any paving or demolition will create monumental traffic problems.

Another negative impact on my neighborhood's streets is the overwhelming and generally unnecessary number of Metro buses running every few minutes for about nineteen hours every day. These rolling roadblocks create their own traffic jams as they stop every two blocks, causing dangerous passing situations and more. They are not heavily used and their too-frequent stops create stalled traffic at every one of the intersections under study (and more). The region is crowing about the success of its light rail – why not give it time to reduce

some of the traffic we face? Supposedly the Microsoft crowd will enjoy the trains. They are certainly a significant portion of the traffic I see in my neighborhood, and on my street, every day. They represent the biggest change overall since we moved back to Bellevue in 1990 and they mirror the explosive growth of their Redmond campus.

Response: *Thank you for taking the time to provide us with feedback and sharing your experience as a frequent user of this area. You bring up some interesting points about the traffic signal timing so I am responding to some of the suggestions you've pointed out. I'm one of the transportation engineers that operate the traffic signals so I can provide some insights on why we time them this way.*

Unsynchronized left turns – I understand what you are referring to, which is that at some locations, the left turn phases both come at the same time before the through movements whereas at other locations, one left turn direction comes up before and the other direction comes up after (we call this leading and lagging left turns). We do this to coordinate the traffic signals along a corridor and to have progression in both directions. This is something that is difficult to explain with just words; thus, I have attached a document that pulls some information and diagrams from the Federal Highway Administration's Traffic Signal Timing Manual. Leading and lagging the left turns increases the bandwidth in the two different directions on a road so we may fully utilize the green time. Additionally, it doesn't necessarily impact the amount of green time allotted to the left turn movement, just when the movement is served.

Higher Cycle Lengths – There is definitely a trade-off between longer and shorter cycle lengths. If they are too long, queues will build up for some movements and then those movements will need more time to clear or more space for the queue. On the other hand, if it is too short, then some movements would not have enough time to clear and again queues could build up. The City has an adaptive signal system that measures the real time traffic volumes and congestion and then calculates the most efficient cycle length and green times for each movement. However, we also do control certain things like how high the cycle length can go and the minimum amount of time for each movement. Investing in an adaptive signal system helps to use the existing roadways to the fullest extent possible but still only add so much capacity.

I understand the frustration that 148th Avenue receives more time than side street movements, but it does often have twice the volume of the side street. Once you turn onto 148th Avenue or any major corridor to head to your next destination, you are now part of the "through" traffic and benefiting from the coordination. One of the reasons we are reviewing these intersections is because we have received feedback from residents about the impact to the neighborhoods. It is like a funnel and even if we shift green time from one movement to another, the overall amount of green time – or the width of the funnel - remains the same so only so much volume can pass through. That is why we are looking at medium to small sized projects that could help reduce congestion.

I also don't want to forget to recognize the other comments you have made in regards to the study areas in addition to the concerns about the left turns and cycle lengths. We understand your concern that we are overbuilding the Lake Hills Blvd intersection, that

there will be impacts from construction when we widen the roads, and that bus routes along the neighborhood streets can cause congestion.

Question/Comment: This might work. What about the massive congestion that will occur when PSE starts cutting down trees on 148th and putting up new power poles? Do you plan on doing your work simultaneous with the PSE project or would it be better to wait until they are done?

***Response:** In regards to whether this project will overlap with work by PSE – At this time, we do not know when this project would advance to full design and construction. All the projects identified in these congestion reduction studies will be compared to each other to be ranked and prioritized for funding this fall. However, when major projects do coincide, we try our best to minimize impacts to the traveling public by coordinating closures and detours. The City of Bellevue coordinate with franchise utility companies through monthly utility coordination meeting to discuss and share information about current and upcoming projects.*

Question/Comment: Why every other direction has a right turn lane except from west 8th to north 148th.

***Response:** Ultimately, we would like all approaches to have same layout but it is not always the case. For this study in specific, we evaluated the intersection to determine which dual left-turns (east-west or north-south) would provide more benefit in terms of the traffic operation improvements at the intersection. We did also check to see whether or not adding a westbound to northbound right-turn lane would have greater benefit over having a westbound to southbound dual left-turn lane. Our analysis indicates that having dual left-turn lanes would improve the overall intersection delay as compared to having a westbound to northbound right-turn lane. As a result of the amount of public comment on this item, the team is going to study the traffic benefits, impacts, and additional costs of a right turn pocket here and prepare a memo summarizing the implications of adding this.*

Question/Comment: I support the changes from a traffic perspective. I have been in these traffic hotspots called out in the study and the proposed solutions seem rational. I cannot speak to the impact to those individuals and businesses immediately adjacent to the changed areas, nor to the environmental impact. But I would expect that reasonable analysis and mitigations would be done by respective departments. Overall, I *do not* think that choking traffic lanes down or converting these major roads to say bike lanes would be wise. Improving traffic flow helps public and private transportation. In time we can look at congestion pricing, but I don't think we're there yet.

***Response:** Thank you for taking the time to email us to let us know that you support the changes from a traffic perspective. We are currently in study phase and only have conceptual design developed. We do not know when this project would advance to full design and construction. All the projects identified in these congestion reduction studies will be compared to each other to be ranked and prioritized for funding this fall.*

If the project does advance to a fully design, we will work with our real property team to coordinate with impacted property owners to obtain necessary easements to construct the project. We will have environmental engineers/biologists assess the project sites to determine environmental impact area, and refine our design to minimize the impact or prepare a mitigation plan.

The traffic analysis report prepared for these intersections should be available by the end of June on the City's website in case you are interested.