City of Bellevue

MEMORANDUM

DATE: November 5, 2014

TO: Transportation Commission

FROM: Mark Poch, Traffic Engineering Manager
Kurt Latt, Senior Transportation Engineer
Michael Ingram, Senior Transportation Planner

SUBJECT: Channelization of 116th Avenue NE, from NE 12th Street to Northup Way

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Purpose

Transportation Department staff have proposed rechannelizing the segment of 116th Avenue NE from NE 12th Street to Northup Way to remove one of the two northbound through lanes and implement bicycle lanes on both sides of the roadway. At the meeting on November 13th, staff will offer information that responds to questions identified by Commissioners and by City Council members in initial briefings on the proposed channelization change in September. Staff will also discuss the next steps in the review of this proposed project, including the public engagement element. The City Council has requested the Transportation Commission review this proposal and develop a recommendation to be brought back to Council for their consideration.

Background

The Transportation Department is in the design phase for the 2015 pavement overlay program. Among the streets scheduled for overlay is 116th Avenue NE between NE 12th Street and Northup Way. Overlays present low-cost opportunities to improve the layout and channelization of streets as part of the paving operation. At the meeting on September 25th, Transportation Department staff briefed the Commission on a proposed revision to the channelization of 116th Avenue NE to accommodate bike lanes on both sides of the roadway. The briefing to the Commission followed an earlier discussion with the City Council (on September 15th) at which Council Members identified various questions about the project benefits and impacts and requested the Transportation Commission review the project and develop a recommendation.

Project Overview

116th Avenue NE from NE 12th Street to Northup Way provides a key link into Downtown for cyclists traveling to and from the north and northeast. At the north end, 116th Avenue leads to the SR 520 Trail and connects to the City's forthcoming bicycle facility on Northup Way (to be completed in 2016). At the south end of this segment, the new NE 12th Street bridge provides a separated bicycle path over the freeway to Downtown. Staff has heard from the public over the years—including during the recent Downtown Transportation Plan update process—about

the need to have a better connection for cyclists into Downtown from the 520 Trail. Observations support that this segment of 116th Avenue NE is a well-travelled route for cycling. The City's Pedestrian and Bicycle Plan identifies bicycle lanes for both directions of this segment (project B-109). Additional project information is included in the attached Management Brief (which was previously transmitted to the Commission in conjunction with the September 25th meeting).

Project Evaluation

Transportation Department staff have completed various engineering investigations and related feasibility analyses of the proposed concept. The following provides a brief overview of the analysis areas which will be described in greater detail at the November 13th Commission Meeting.

Traffic Modeling Update – The City's modeling group updated its model to reflect the most recent available information on land use forecasts to the year 2024 as well as including street network updates of the adopted TFP. The evaluation scenarios include options of implementing the NE 15th St/16th St (Zone 1) connection which connects 120th Avenue NE to NE 12th St east of 116th Ave NE and would provide a new linkage to the Bel-Red district. Funding for this connection is currently in the City Manager's Preliminary Budget for 2015-2021 (due to be decided by the Council in early December). Since this link provides a significant effect on travel patterns in the area and on traffic volumes at the 116th Ave NE/NE 12th St intersection, it was deemed appropriate to assess traffic conditions with and without this Zone 1 connection. Staff also provided a "select link" run of the cases, to evaluate the extent of trips that might divert to other nearby roadways as a result of the proposed bike lane concept. These mappings of diversion and further discussion of the traffic model preparation is provided in Appendix A.

Level of Service (LOS) – Using the updated modeling information, staff prepared intersection operational analysis to assess delay at the intersections on either end of the proposed affected segment. The City's standard procedures of SYNCRHO analysis were utilized to assess the degree of delay at the two intersections on either end of the proposal segment for each scenario. Appendix B provides an overview of intersection LOS and delay for the various traffic model comparison cases. Appendix B also provides LOS for the case that came up at the September Commission meeting by Commission members and the public to assess the implications of beginning the bike lane immediately at the NE 12th St/116th intersection. In that case, an exclusive right turn lane would occur south of the NE 12th St intersection.

Safety Analysis – Collision history was investigated for the 116th Ave NE corridor (NE 12th St to Northup Way at 0.70 miles in length) and as requested by the Commission, the 112th Ave NE corridor was also included for comparison (NE 12th St to NE 24th St at 0.73 miles in length). The resulting collision frequency per year is shown in Appendix C. Also highlighted in Appendix C are the pedestrian and bicycle related collisions which have occurred. There have been no pedestrian collisions over the subject 116th Ave NE corridor. However, there was one pedestrian collision on 112th Ave NE where a landscape crew had parked halfway on the travel way/planter area and the individual, while working, was struck by a northbound vehicle (injured, but not fatally). The specifics of the collision are not known as it was a hit and run

with little information on the circumstances of the collision. The bicycle related collisions for the two corridors of 116th and 112th are as follows:

- 116th Ave NE – Bike collision occurred approximately 200 feet south of NE 19th St in April 2014. The cyclist was traveling northbound in the curbside lane and was struck from behind by a motorist. The collision occurred around 8:00 pm near sunset and the cyclist had reflective lights on the bike and jacket. The cyclist incurred injuries but not fatally. This collision was a hit and run and little information on the circumstances are available.
- 112th Ave NE – Bike collision occurred near Hidden Valley Park driveway (1900 blk) in August 2013. The cyclist was traveling southbound in the bike shoulder and was struck by a vehicle traveling across the street, east to west, from one driveway to another. The collision occurred around 10:00 am and the nature of the injuries were not disclosed.
- 112th Ave NE – Bike collision occurred near a business park driveway north of NE 15th St. The cyclist was traveling northbound in the bike shoulder and was struck by a motorist making a right turn into the driveway on the east side of the street. The collision occurred around 7:30 am under daylight conditions. The cyclist incurred relatively minor injuries.

Staff also investigated in more detail the collision occurrence types along the 116th Ave NE corridor over the affected proposal segment. The summary chart, also provided in Appendix C, describes all collision types occurring over the past 5 years as a function of influence with the driveways in the corridor. As shown, driveways on the west side of the roadway influenced only one collision while the eastside driveways influenced 11 collisions over this time period. Recall that currently the west side driveways have only one southbound through lane while the northbound direction has two through lanes. This demonstrates a correlation to the added challenges by drivers negotiating and turning across two through lanes as compared to one travel lane. If the proposal is implemented it would be expected that the collision rates for the northbound direction would decrease and driveway safety would improve.

Overall, the general collision frequency does not appear to be out of the ordinary for the area corridors (both 116th and 112th). However, having three cyclist related collisions over five years on these two corridors is clearly undesirable and staff, regardless of the outcome of the proposal, will be looking into potential ways of improving safety for cyclists in the area.

Bike Counts – Bicycle counts for 116th Ave NE north of NE 12th St were obtained from video camera recordings that were preserved during the test simulation of the proposal back in May 2014. During that simulation, cameras from the 116th Ave NE /NE 12th St intersection recorded the number of cyclists traveling both southbound and northbound in the corridor. Staff then prepared a summary of this activity which is attached in Appendix D. As shown, the 116th corridor bicycle activity of 163 cyclists for a one-day observation reflects the high importance of this corridor connection to area regional routes such as the SR 520 trail and the link into downtown Bellevue. At the request of the Commission, staff also conducted a bicycle count for the 112th Ave NE corridor north of NE 12th St recently, which resulted in 46 cyclists in a one-day observation. The cyclist activity level along 112th Ave NE would be expected to be higher in the summer months (or May) but that data was not available and reflects the less desirable weather conditions of late October (count was performed on a cool/dry day).

Other Investigations – Staff have investigated and addressed a variety of other topics that were specifically identified by the City Council. These are included in Appendix E in a Q & A format. Topics addressed include the following:

- What is the impact on emergency Response? – Staff met with City Fire Department representatives to solicit feedback on potential operational or emergency response concerns. Fire Department staff indicated they can continue to serve the public in a responsive manner that does not compromise public safety. City staff also met with Children's Hospital representatives which indicated they are supportive of the concept and do not anticipate adverse impacts to their facility operations. Staff is in the process of reaching out to other area hospital representatives for additional feedback.
- The City is spending millions of dollars on building new roads and adding capacity, especially in the Bel-Red area; how would removing a lane on 116th Avenue align with this broader context? – The city is planning for significant growth in land use in the Bel-Red area and forecasts growth in travel demand associated with this more intensive use. The current and planned roadway projects on 120th Avenue NE, 124th Avenue NE and NE 15th Street will support the growth in Bel-Red, as well as in the broader area. 116th Avenue NE is zoned to allow for modest growth and the city expects gradual redevelopment along the corridor. The roadway network is being planned and built to support the increases in land use for the area and throughout the city. The need for these other corridor improvements is established whether or not there are any changes in lane conditions for 116th Ave NE.
- Are bike lanes the appropriate way to accommodate cyclists on this corridor? What about other options, such as a separated path on one side? -- The Pedestrian and Bicycle Transportation Plan identifies bike lanes as the desired accommodation on this corridor. The elimination of one northbound lane frees up 10' of space between the curbs, which allows for installation of a standard 5' bike lane on either side of the road. Other types of facilities, such as a separated path adjacent to a roadway, require more space (potentially including property acquisition) and involve engineering and construction work that is beyond the scope of what can be accomplished in conjunction with a street overlay.

Staff will provide greater detail of the work effort described herein at the Commission meeting on November 13, 2014. Also, next steps will be discussed, including preparations for the upcoming open house on December 11, 2014.

Attachments:

Appendix A – Traffic Modeling Forecasts
Appendix B – Level of Service Summary (and SYNCRHO worksheets)
Appendix C – Safety Analysis
Appendix D – Bicycle Volume Counts
Appendix E – Council Questions and Answers
Appendix F – Management Brief for City Council, dated September 15, 2014

Appendix A

Traffic Modeling Forecasts

Traffic Modeling Forecasts Summary

The City of Bellevue's Transportation Department prepared updated forecasts of traffic volumes for existing and forecast 2024 conditions. The City's Traffic Model is periodically updated to reflect changes in land use and street network conditions. To provide insight into the implications of converting the 116th Ave NE corridor between NE 12th St and Northup Way, the model was updated with forecast conditions of known pipeline developments and reflects the street network of the City's adopted Transportation Facilities Plan (TFP).

The evaluation scenarios also include options of implementing the NE 15th St/16th St (Zone 1) connection which connects 120th Avenue NE to NE 12th St east of 116th Ave NE and would provide a new linkage to the Bel-Red district. Funding for this connection is currently in the City Manager's Preliminary Budget. Since this link provides a significant effect on travel patterns in the area and on traffic volumes at the 116th Ave NE/NE 12th St intersection, it was deemed appropriate to assess traffic conditions with and without this Zone 1 connection. The following table describes the assessment scenarios:

Traffic Model Scenarios

Without 116th Proposal	With 116th Proposal
Existing Conditions **[1]**	Existing Conditions **[2]**
2024 TFP **[3]** W/O 15th/16th Zone 1	2024 TFP **[4]** W/O 15th/16th Zone 1
2024 TFP **[5]** W/ 15th/16th Zone 1	2024 TFP **[6]** W/ 15th/16th Zone 1

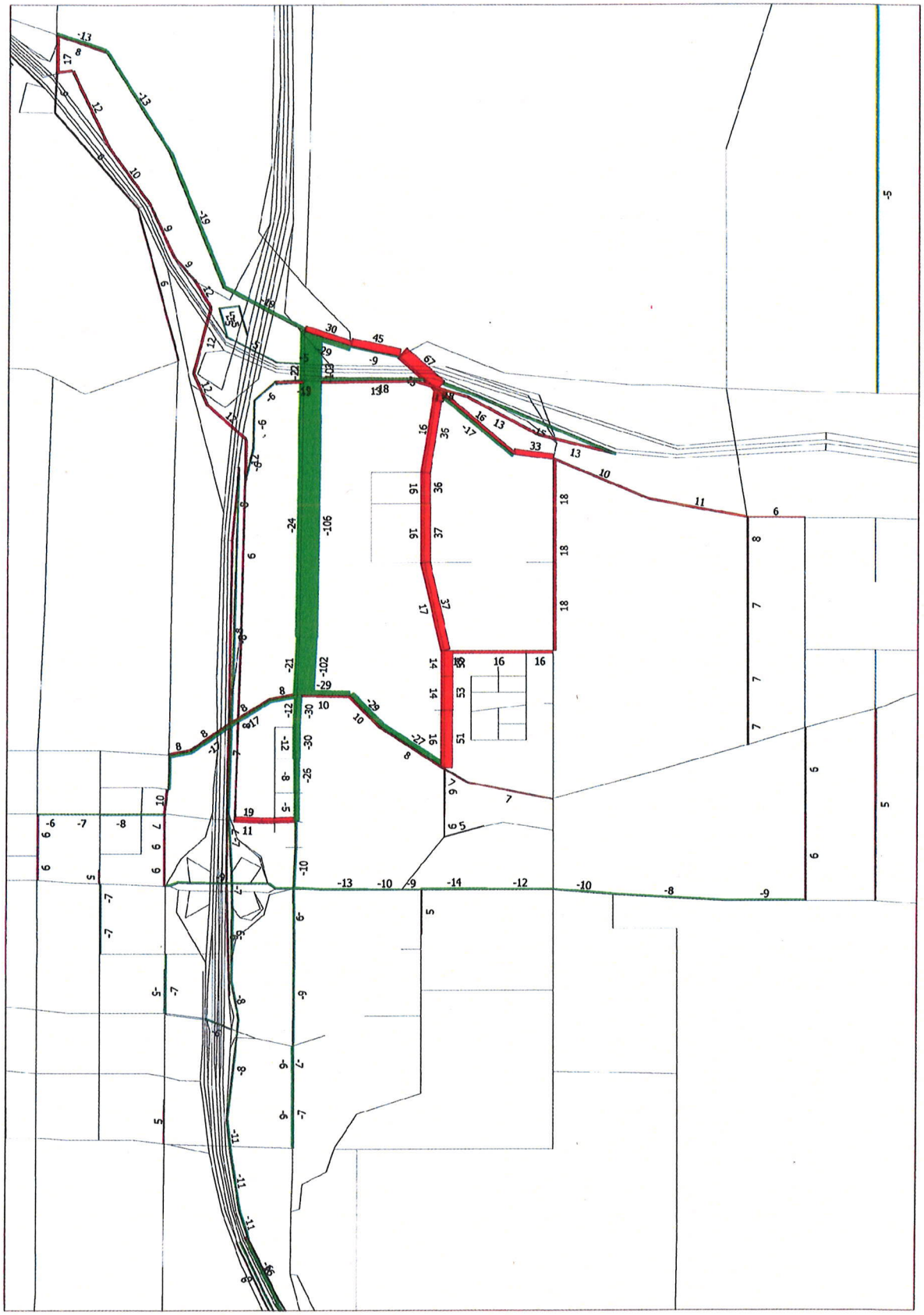
Note: Each Scenario is labeled with a **[x]** numerical value for ease of tracking. These labels are utilized in Traffic Model build conditions, SYNCHRO LOS outputs, Model "Select Link" cases and other technical analyses to help distinguish scenario cases.

The above traffic model scenarios for the PM peak hour were utilized in assessing intersection operations for the intersections of 116th Ave NE/NE 12th St and for 116th Ave NE/Northup Way (refer to Appendix B).

These scenarios were also utilized in determining the extent of potential traffic diversion as a result of the 116th proposal. Traffic Model Plots #1, #2, and #3 included in this appendix display traffic diversion results for Existing, Year 2024 W/O 15th, and Year 2024 W/ 15th conditions, respectively. For example, Plot #3 displays the traffic on the network for forecast 2024 conditions (with 15th Zone 1) as developed by subtracting the "With Project condition [6]" from the "Without Project condition [5]". The diverted trips show up as red band widths and their values are shown on the nearby streets of these plots.

TRAFFIC MODEL PLOT #1

BKR Delta Volume [Scen. 114 - 104]



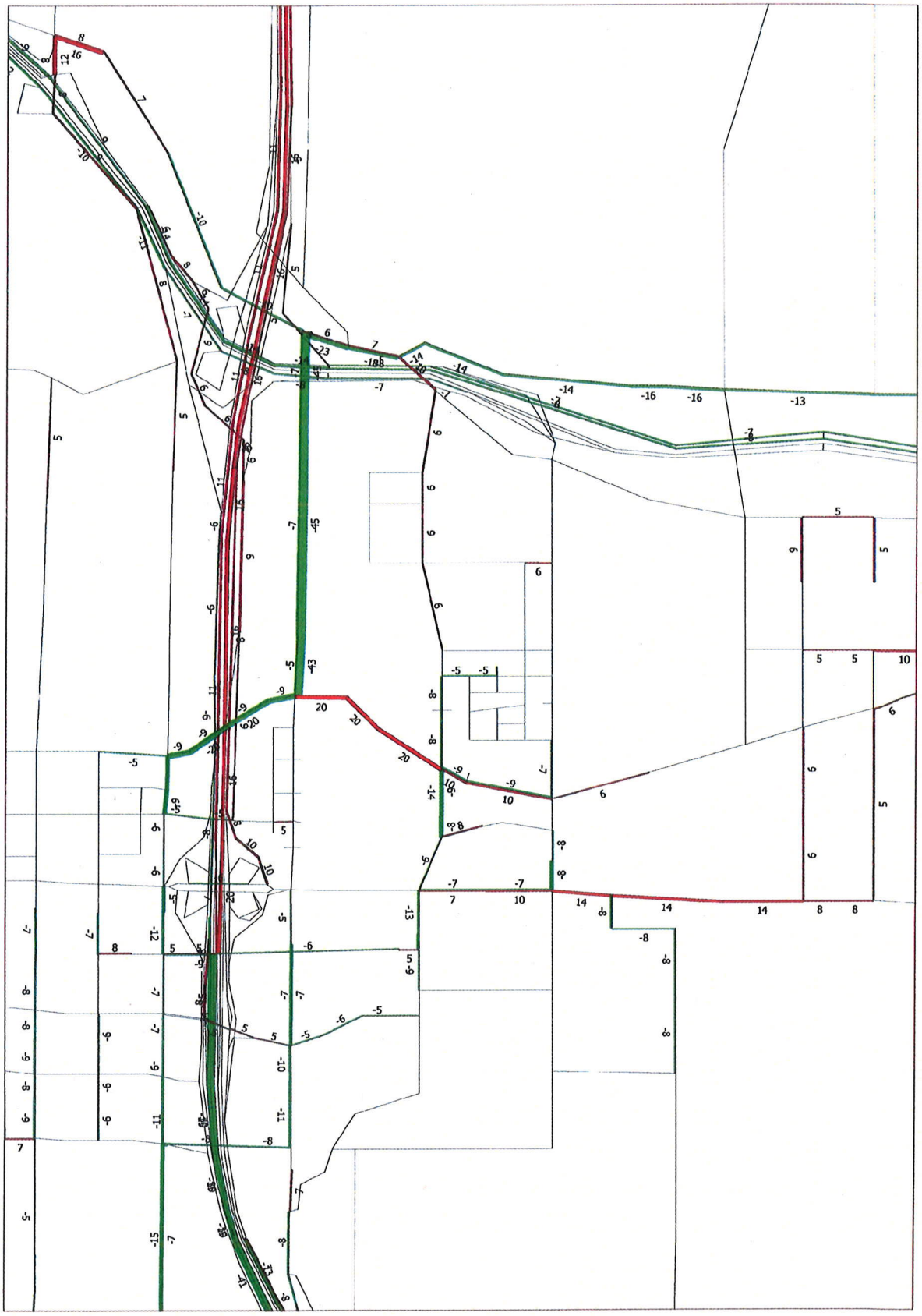
<NEWVDF> DRAFT MP12R7 5/21/12
Scenario 114: MP00_R15.0 PM, 2013 Base 116th 1 In NB [2]
Scenario 104: MP00_R15.0 PM, 2013 Base 116th 2 In NB (No Action) [1]
2014-10-30 13:19
Transportation Department
Modeling and Analysis Group

PLOT is [2] - [1]

EXIST. BASE CASE

TRAFFIC MODEL PLOT #2

BKR Delta Volume [Scen. 214 - 204]



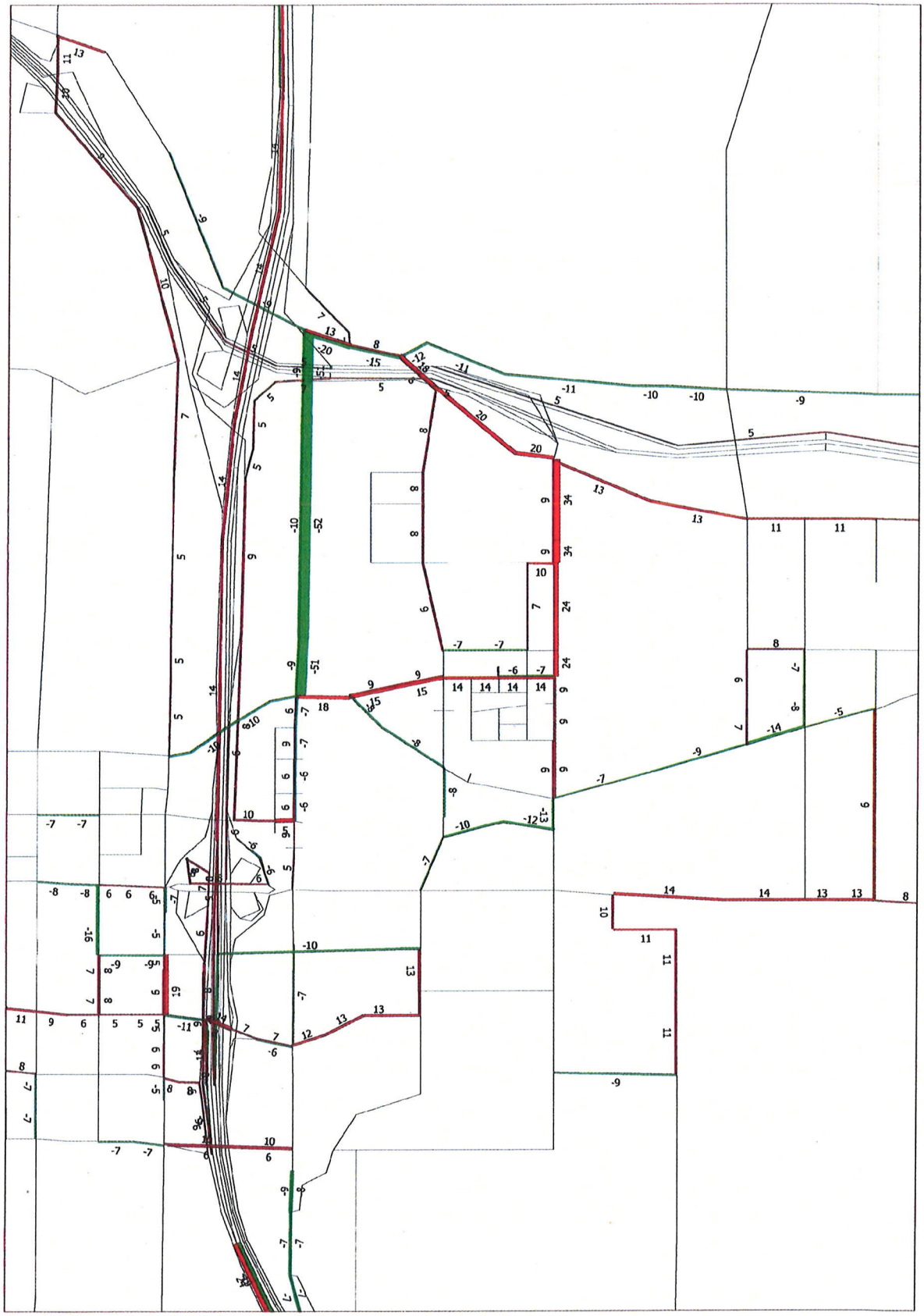
<NEWVDF> DRAFT MP12R7 5/21/12
Scenario 214: MP12R7_r12 116th 1 ln NB [4]
Scenario 204: MP12R7_r12 116th 2 ln NB (No Action) [3]
2014-10-30 13:18
Transportation Department
Modeling and Analysis Group

PLOT is [4] - [3]

2024 W/O 15th ZONE 1

TRAFFIC MODEL PLOT #3

BKR Delta Volume [Scen. 314 - 304]



<NEWVDF> DRAFT MP12R7 5/21/12
Scenario 314: MP12R7_r12 w/ 15z1 116th 1 In NB [6]
Scenario 304: MP12R7_r12 w/ 15z1 116th 2 In NB (No Action) [5]
2014-10-30 13:18
Transportation Department
Modeling and Analysis Group

PLOT IS [6] - [5]

2024 W/ 15th ZONE 1

Appendix B

Level of Service Summary

- Level of Service Proposal Assessment:

  116th Ave NE at NE 12th St

  116th Ave NE at Northup Way

- Level of Service Alternative "B"

  Alternative "B" (116th Ave NE at NE 12th St)
  Northbound Right Only Lane South Leg

Level Of Service Summary

116th Ave NE at NE 12th St

Condition	Without Proposal (Existing Geometry) LOS	Delay	With Proposal (Add Bike Lanes) LOS	Delay
Existing Conditions	C	34.2	C	33.3
Future 2024 Without 15th St Zone 1	D	37.1	D	36.6
Future 2024 With 15th St Zone 1	D	52.9	D	54.6

116th Ave NE at Northup Way

Condition	Without Proposal (Existing Geometry) LOS	Delay	With Proposal (Add Bike Lanes) LOS	Delay
Existing Conditions	B	14.7	B	14.2
Future 2024 Without 15th St Zone 1	B	17.8	B	18.8
Future 2024 With 15th St Zone 1	B	15.3	B	15.5

Notes: Year 2024 includes the adopted TFP network and land use. Traffic model updated October 2014.

Level of Service Summary

ALTERNATIVE B - Northbound Right Only Lane South Leg

116th Ave NE at NE 12th St - Total Intersection

Condition	With Proposal [1] LOS	With Proposal [1] Delay	ALT "B" [2] Exclusive NB Right LOS	ALT "B" [2] Exclusive NB Right Delay
Existing Conditions	C	33.3	C	34.1
Future 2024 Without 15th St Zone 1	D	36.6	D	36.4
Future 2024 With 15th St Zone 1	D	54.6	D	54.9

1.) With Proposal condition removes the northbound through lane beginning around 600 feet north of the NE 12th St/116th Ave NE intersection

2.) Alternative "B" begins the bike lane immediately on the north leg of the 116th/12th intersection (no merge north of intersection and changes the south leg so that the curb lane is an exclusive right only lane rather than a right through lane.

116th Ave NE at NE 12th St - Northbound Approach

Condition	With Proposal NB Thru Delay	With Proposal NB Total Delay	With Proposal NB 95% Queue	ALT "B" NB Thru Delay	ALT "B" NB Total Delay	ALT "B" NB 95% Queue
Existing Conditions	41.6	40.2	262	64.2	42.2	>475*
Future 2024 Without 15th St Zone 1	33.1	33.7	235	52.7	33.1	361
Future 2024 With 15th St Zone 1	55.6	56.2	>343 *	94.0	54.7	>515*

* = overcapacity

Appendix C

Safety Analysis

- Collision Corridor Summary

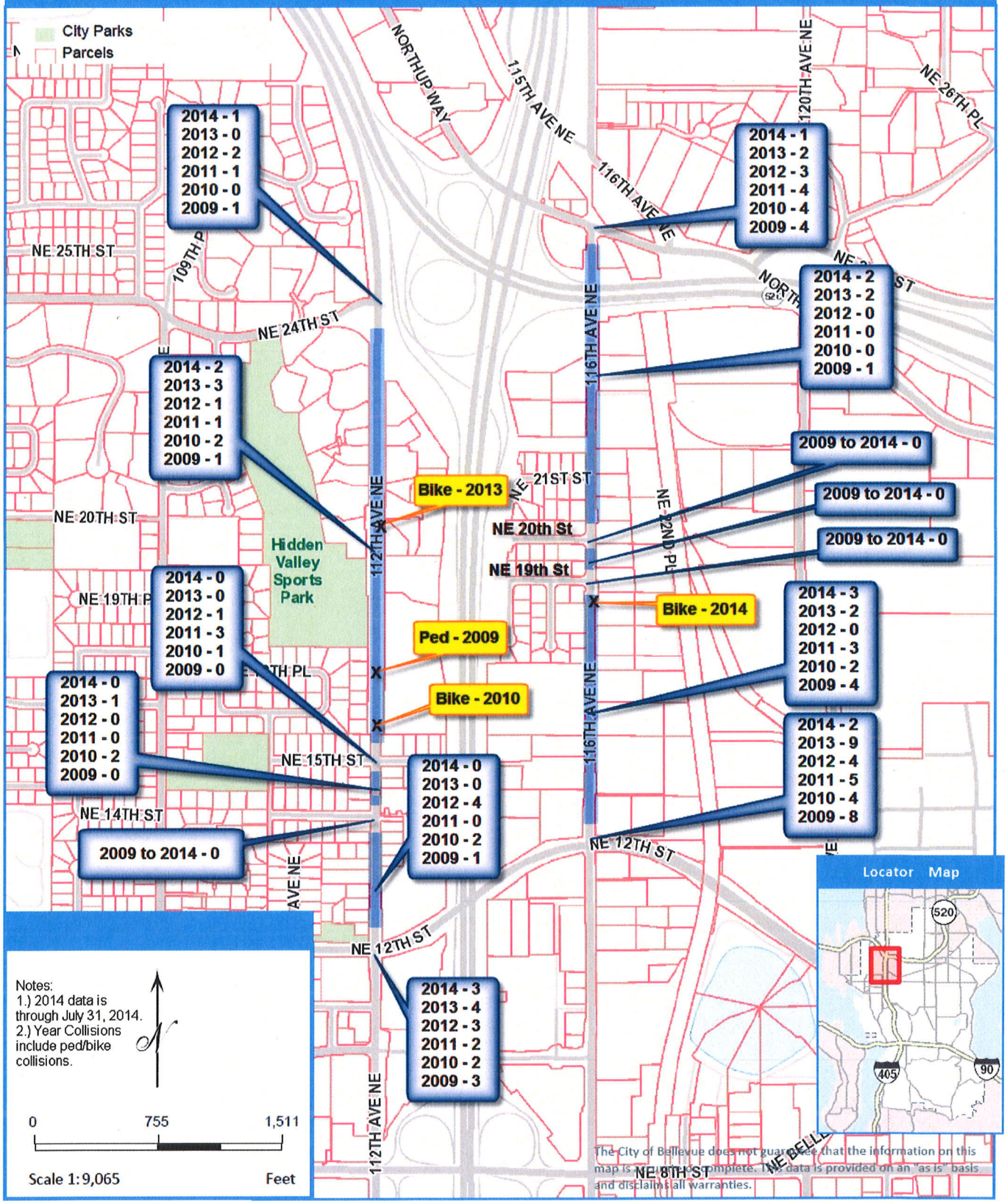
  116th Ave NE – NE 12th St to Northup Way

  112th Ave NE – NE 12th St to NE 24th St

- Collision Type Chart

  116th Ave NE – Between NE 12th St and Northup Way

Collision Summary



Map Generated on: 10/28/2014

116th Ave NE - NE 12th St to Northup Way Corridor Collision Summary

Segment	Date	Time	Collisions			Collision Type
			Driveway - Related		Other	
			West Side	East Side		
NE 12th St to NE 19th St	03/17/2009	8:06	X			Rear End
	03/31/2009	16:39		X		Right Angle
	04/16/2009	13:09			X	Other / U-Turn
	09/17/2009	11:39			X	Rear End
	02/12/2010	6:04		X		Backing
	07/28/2010	16:46			X	Rear End
	05/16/2011	9:07		X		Right Angle
	08/04/2011	15:20		X		Right Angle
	12/12/2011	8:39		X		Approach Turn
	04/24/2013	15:58		X		Right Angle
	08/30/2013	14:29			X	Sideswipe/Lane Change
	02/04/2014	11:02		X		Right Angle
	04/10/2014	20:08			**X**	**Bicycle (struck in NB lane)**
	06/02/2014	9:46		X		Right Angle
at NE 19th St	04/30/2009	15:23			X	Sideswipe/Lane Change
NE 19th St to NE 20th St	05/06/2009	16:04		X		Right Angle
at NE 20th St	-	-				0 collisions
NE 20th St to NE 21st St	10/21/2009	10:25			X	Rear End
at NE 21st St	-	-				0 collisions
NE 21st St to Northup Wy	06/30/2009	7:19			X	Sideswipe/Lane Change
	04/02/2013	14:26			X	Rear End
	10/21/2013	18:42		X		Right Angle
	01/08/2014	17:15		X		Right Angle
	03/25/2014	18:26			X	Head On

Note: Collision Summary for 1/1/2009 to 7/31/2014 (5+ years)

Appendix D

- Bicycle Volume Counts

  116th Ave NE – NE 12th St to Northup Way

  112th Ave NE – NE 12th St to NE 24th St

116th Ave NE - Bike Count (north of NE 12th St)
Thursday, May 15th, 2014
6:00 AM to 9:00 PM

15-Minute Interval Summary
6:00 AM to 9:00 PM

Interval Start Time	Northbound	Southbound	Hourly NB	Hourly SB	Hourly Total
6:00 AM	3	1	6	9	15
6:15 AM	0	1			
6:30 AM	2	1			
6:45 AM	1	6			
7:00 AM	0	3	5	15	20
7:15 AM	1	4			
7:30 AM	1	5			
7:45 AM	3	3			
8:00 AM	1	6	8	14	22
8:15 AM	2	1			
8:30 AM	3	6			
8:45 AM	2	1			
9:00 AM	0	3	2	7	9
9:15 AM	0	0			
9:30 AM	1	2			
9:45 AM	1	2			
10:00 AM	1	3	2	4	6
10:15 AM	0	1			
10:30 AM	0	0			
10:45 AM	1	0			
11:00 AM	1	2	3	3	6
11:15 AM	1	1			
11:30 AM	1	0			
11:45 AM	0	0			
12:00 PM	3	0	4	2	6
12:15 PM	0	0			
12:30 PM	0	1			
12:45 PM	1	1			
1:00 PM	0	1	1	7	8
1:15 PM	1	2			
1:30 PM	0	1			
1:45 PM	0	3			
2:00 PM	0	1	0	4	4
2:15 PM	0	1			
2:30 PM	0	2			
2:45 PM	0	0			
3:00 PM	1	0	1	1	2

15-Minute Interval Summary
6:00 AM to 9:00 PM

Interval Start Time	Northbound	Southbound	Hourly NB	Hourly SB	Hourly Total
3:15 PM	0	0			
3:30 PM	0	0			
3:45 PM	0	1			
4:00 PM	1	0	9	5	14
4:15 PM	1	3			
4:30 PM	3	1			
4:45 PM	4	1			
5:00 PM	2	3	12	9	21
5:15 PM	5	1			
5:30 PM	3	4			
5:45 PM	2	1			
6:00 PM	1	2	8	7	15
6:15 PM	2	1			
6:30 PM	3	2			
6:45 PM	2	2			
7:00 PM	4	0	6	6	12
7:15 PM	0	1			
7:30 PM	2	3			
7:45 PM	0	2			
8:00 PM	0	0	0	3	3
8:15 PM	0	3			
8:30 PM	0	0			
8:45 PM	0	0			
Total Observed	**67**	**96**	67	96	
				GRAND TOTAL	**163**

Peak Hour Summary

8:00 AM to 9:00 AM	Northbound	Southbound	Total
Volume	8	14	**22**

112th Ave NE - Bike Count (north of NE 12th St)
Wednesday, October 29th, 2014
6:00 AM to 9:00 PM

15-Minute Interval Summary
6:00 AM to 9:00 PM

Interval Start Time	Northbound	Southbound	Hourly NB	Hourly SB	Hourly Total
6:00 AM	0	0	0	2	2
6:15 AM	0	1			
6:30 AM	0	0			
6:45 AM	0	1			
7:00 AM	1	2	2	3	5
7:15 AM	0	0			
7:30 AM	0	1			
7:45 AM	1	0			
8:00 AM	1	1	2	2	4
8:15 AM	0	1			
8:30 AM	1	0			
8:45 AM	0	0			
9:00 AM	0	0	0	2	2
9:15 AM	0	0			
9:30 AM	0	1			
9:45 AM	0	1			
10:00 AM	0	0	2	0	2
10:15 AM	1	0			
10:30 AM	0	0			
10:45 AM	1	0			
11:00 AM	0	1	1	6	7
11:15 AM	1	0			
11:30 AM	0	4			
11:45 AM	0	1			
12:00 PM	1	0	1	1	2
12:15 PM	0	0			
12:30 PM	0	0			
12:45 PM	0	1			
1:00 PM	0	0	2	0	2
1:15 PM	0	0			
1:30 PM	1	0			
1:45 PM	1	0			
2:00 PM	0	0	1	1	2
2:15 PM	0	0			
2:30 PM	0	1			
2:45 PM	1	0			
3:00 PM	0	1	1	2	3

15-Minute Interval Summary
6:00 AM to 9:00 PM

Interval Start Time	Northbound	Southbound	Hourly NB	Hourly SB	Hourly Total
3:15 PM	1	0			
3:30 PM	0	0			
3:45 PM	0	1			
4:00 PM	0	0	1	3	4
4:15 PM	0	0			
4:30 PM	0	1			
4:45 PM	1	2			
5:00 PM	1	0	1	3	4
5:15 PM	0	3			
5:30 PM	0	0			
5:45 PM	0	0			
6:00 PM	0	0	1	0	1
6:15 PM	0	0			
6:30 PM	1	0			
6:45 PM	0	0			
7:00 PM	0	1	2	2	4
7:15 PM	2	1			
7:30 PM	0	0			
7:45 PM	0	0			
8:00 PM	0	0	1	1	2
8:15 PM	0	0			
8:30 PM	1	0			
8:45 PM	0	1			
Total Observed	**18**	**28**	18	28	
				GRAND TOTAL	**46**

Peak Hour Summary

11:00 AM to 12:00 PM	Northbound	Southbound	Total
Volume	1	6	**7**

Appendix E

Council Questions and Answers

116th Ave NE from NE 12th St to Northup Way Channelization

Mayor and Councilmember Communications on Proposal

Issues identified at Council meeting, September 15, 2014

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1. Is there a policy basis for converting a car lane to a bike lane?
   Response: There is no adopted policy that directly addresses the issue of converting a vehicle lane to a bike lane. However, the City's adopted Pedestrian and Bicycle Transportation Plan includes policy language indicating that pedestrian and bicycle needs identified in the plan should be weighed whenever there are competing demands for City right-of-way (PB-3). The Comprehensive Plan also includes policy language that pedestrian and bicycle needs be considered along with other travel modes in all aspects of developing the transportation system (TR-77). And another policy in the Comprehensive Plan indicates that the city should incorporate pedestrian and bicycle facilities into roadway projects (TR-24).

2. Is the proposal consistent with adopted city plans? For example the Transit Plan calls for Business Access and Transit Lanes (BAT) on 116th. Does this conflict with the Ped-Bike Plan or any other city Plans?
   Response: There are no adopted City Plans designating specific lane configurations over the limits of the subject corridor. However, several City Plans do reference policies to encourage improved accommodations of non-motorized travel as well as considering options for BAT lanes. The adopted Pedestrian and Bicycle Plan identifies Project B-109 to add bike lanes in the corridor as well as sidewalk improvements on the west side of the street (project S-309). The Bellevue Transit Master Plan identifies potential improvements to the NE 12th St/116th Ave NE and Northup Way/116th Ave NE intersections to enhance transit speed and reliability as well as potential BAT lane designation or other speed and reliability improvements along the corridor, as useful and feasible (project L19). In the near-term, incorporating BAT lanes into the corridor is not warranted, given the relatively good level of speed and reliability for transit service along the corridor. BAT lanes or other treatments would be a longer term horizon consideration if transit reliability degrades.

3. Are bike lanes the most appropriate means of accommodating cyclists in the corridor? For example, why not a shared path on one side?

Response: The Pedestrian and Bicycle Transportation Plan identifies bike lanes as the desired accommodation on this corridor. The elimination of one northbound lane frees up 10' of space between the curbs, which allows for installation of a standard 5' bike lane on either side of the road. Other types of facilities, such as a separated path adjacent to a roadway, require more space and involve engineering and construction work (and likely property acquisition) that is beyond the scope of what can be accomplished in conjunction with a street overlay. Having a shared path on one side can also be more confusing for drivers and less safe as they are not expecting cyclists to be traveling across the driveway in two different directions. The bike lanes provide uniformity of travel and direction, which supports safer conditions.

4. There are planned parallel bike routes nearby, such as the Eastside Rail Corridor (ERC), – why are bike lanes needed on 116th Avenue NE with these other routes planned in the future?
   Response: The proposed 116th Avenue NE bike lanes could be implemented in 2015 and at little cost, if done in conjunction with the planned street overlay. The Pedestrian and Bicycle Transportation Plan identifies other north-south bicycle facilities, including the trail on the ERC and bicycle facilities on 120th Avenue NE in the Bel-Red and Wilburton areas. The timeline for implementing these other projects is not yet clear and funding for them is not yet identified. The City's Transportation Facilities Plan has a 2024 horizon and identifies funding for constructing 120th Avenue improvements south of NE 15th Street; from NE 15th Street to Northup Way, only design funding is identified. The ERC is owned by King County (primarily) and by Sound Transit (the segment from NE 6th Street to SR 520). King County will start a planning process for a trail in 2015, but no funding for implementation is identified. It is unlikely a trail though the portion owned by Sound Transit could be open until after completion in 2021 of the LRT maintenance facility planned for a site north of NE 15th Street. At such time as the ERC trail and/or the 120th Avenue bicycle facilities are completed, there may be less need for the bike lanes on 116th Avenue NE, at least for regional or through trips. However, 116th Avenue NE bike lanes would still be useful for local access and offer the most direct routing for certain origins and destinations.

5. The City is spending millions on building new roads and adding capacity – How does removing a car lane on 116th Avenue square with all the improvements being built elsewhere, particularly in the Bel-Red District?
   Response: The city is planning for significant growth in land use in the Bel-Red area and forecasts growth in travel demand associated with this more intensive use. The current and planned roadway projects on NE 4th Street, 120th Avenue NE, 124th Avenue NE and NE 15th Street will support growth in Bel-Red, as well as in the broader area. Traffic modeling performed with these roadway projects shows that regardless of the bike lane project, there will be significant changes in travel patterns as drivers utilize these newly constructed or improved corridors. The roadway network is being planned and built to support the increases in land use for the area and throughout the city. The need for these other corridor

improvements is established whether or not there are any changes in lane conditions for 116th Ave NE. And with the proposal, the resulting change in traffic conditions for the network is relatively minor and does not significantly weigh on the required needs for street system improvements that are planned.

6. Reducing the northbound travel lanes from two to one requires a merge north of NE 12th St – how will this work?
   Response: The proposal will maintain travel lanes at the traffic signal with NE 12th St/116th Ave NE to allow continued through put of vehicle volumes through the intersection. The merge occurring about 600 feet north of NE 12th St affords the current two northbound through lanes to continue through the intersection and preserve the capacity at the signal. These types of merges are fairly routine and an example of one occurs immediately to the west across the NE 12th St crossing at 112th Ave NE. In that instance, there are no operational concerns with the merge despite it having a shorter merge distance than the proposal.

7. How will the proposed changes affect turn movements at driveways?
   Response: Similar projects have found it to be safer and easier to turn in and out of driveways. With a single lane to turn across, drivers find it easier to maneuver and negotiate the turning movements with less confusion about approaching traffic. This is demonstrated by the current conditions and review of accidents which show a strong correlation with fewer collisions occurring associated with west side driveways (crossing one-lane) than with east side driveways (crossing two lanes).

8. Does this proposal adversely affect emergency response, particularly to hospitals in the area?
   Response: The transportation analysis of street system operations shows no significant increase in delay as a result of the proposal. Additionally, Transportation Department staff have consulted with City Fire Department representatives to determine if any operational or response concerns exist. Staff has also met with Children's Hospital representatives and intend to meet with other area hospitals. The analysis and feedback thus far does not indicate any adverse effects on emergency response as a result of the project.

9. Adding new travel lanes requires thorough analysis. Will the city do a similar analysis in considering the removal of a travel lane?
   Response: The Transportation Department has performed an investigation into the feasibility and performance of the proposal. A broad range of factors have been considered including:
   - traffic model forecasting and travel link assessment,
   - intersection level of service,
   - daily and peak hour traffic conditions,
   - collision history,
   - consultation with area hospitals and fire department staff,

- bicycle counts in the subject corridor and adjacent corridors,
- legal consultation,
- real time test simulation of proposal, and
- design development of the proposal.

The Department continues to vet the proposal with the Transportation Commission in pursuit of finalizing a recommendation on the plan. There is no specific environmental review process required under the State Environmental Policy Act (SEPA) in conjunction with minor road and street improvements that do not add vehicular capacity nor is there any requirement associated with a project to convert an existing travel lane to bike lanes.

10. How was the construction of 116th paid for? Are there legal implications in repurposing a car lane to a bike lane if funded with certain tax dollars?
    Response: Research indicates that some improvements in the corridor were funded using a Local Improvement District (established in the 1960s). Investigation to date has not revealed any constraint on how the space on the roadway can be allocated. Staff will continue to research this question.

11. Wouldn't this proposal cause diversion to other nearby routes?
    Response: The Transportation Department conducted traffic modeling for existing and forecast year 2024 conditions. With these analyses, a "select link" procedure is used to determine the travel routes for traffic under a particular scenario. In modeling the removal of one northbound through lane over the planned section between NE 12th St and Northup Way, there would be some diversion of traffic to other streets. This diversion varies by scenario and reflects variables in the planned street network. For instance, in the year 2024 horizon, about 50 vehicles traveling northbound (PM peak) on 116th Ave NE would be redirected and dispersed to other streets in the surrounding network. The extent of that diversion dispersed across the network is small and not expected to have significant changes in operational delay for other street system intersections.

12. How does this proposal impact the concurrency standards for roadway level of service in the area?
    Response: The intersections at 116th Avenue NE/NE 12th Street and 116th Avenue NE/Northup Way operate well within their capacity and adopted level of service standards. Analysis shows this proposal for adding bike lanes on the corridor does not significantly affect operations at these intersections. Forecasts for 2024 show these intersections remaining well within their respective standards, with or without the conversion of a northbound travel lane to bike lanes in the middle segment of the corridor. The potentially diverted trips on surrounding streets as a result of the proposal are not expected to change concurrency conditions for other intersections in the area.

13. Are there examples in Bellevue of taking away travel lanes for bike lanes?
Response: Bellevue has occasionally rechannelized roadway segments and added striped shoulder bicycle facilities. The segment that is perhaps most similar to the 116th Avenue NE corridor is 112th Avenue NE from NE 12th Street to NE 24th Street. In the 1990s this roadway was reconfigured from 4 travel lanes to 3 lanes with striped shoulders on both sides. Another example is on NE 8th Street in Crossroads, where the roadway from just west of 160th Avenue to 164th Avenue was changed from 4 travel lanes to 3 travel lanes with striped shoulders.

Appendix F

September 25, 2014 Transportation Commission Memorandum

(with Council Brief)

City of Bellevue

MEMORANDUM

DATE: September 25, 2014

TO: Transportation Commission

FROM: Michael Ingram, Senior Transportation Planner
Mark Poch, Traffic Engineering Manager
Kurt Latt, Senior Transportation Engineer

SUBJECT: Channelization of 116th Avenue NE, from NE 12th Street to Northup Way

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Introduction

The Transportation Department is in the design phase for the 2015 pavement overlay program. Among the streets scheduled for overlay is 116th Avenue NE between NE 12th Street and Northup Way. Overlays present low-cost opportunities to improve the layout and channelization of streets as part of the paving operation. At the Council meeting on September 15th, staff briefed Council Members on a potential revision to the channelization of 116th Avenue NE to accommodate bike lanes on both sides of the roadway as part of the overlay project. The Council directed staff to work with the Transportation Commission to evaluate the benefits and the effects of the potential rechannelization as well as engage the public for input.

Project Overview and Next Steps

116th Avenue NE from NE 12th Street to Northup Way provides a key link into Downtown for cyclists traveling to and from the north and northeast. At the north end, 116th Avenue leads to the SR 520 Trail and connects to the City's forthcoming bicycle facility on Northup Way (to be completed in 2016). At the south end of this segment, the new NE 12th Street bridge provides a separated bicycle path over the freeway to Downtown. Staff has heard from the public over the years—including during the recent Downtown Transportation Plan update process—about the need to have a better connection for cyclists into Downtown from the 520 Trail. Observations support that this segment of 116th Avenue NE is a well-travelled route for cycling. The City's Pedestrian and Bicycle Plan identifies bicycle lanes for both directions of this segment (project B-109).

At the meeting on September 25, staff will brief the Commission on the project concept and the questions posed by Council Members. The meeting will also be an opportunity for Commissioners to identify any additional questions and to discuss next steps in the review of this proposed project. Please see the attached Management Brief for additional information about this proposed rechannelization project.

Attachment: Management Brief for City Council, dated September 15, 2014

City of Bellevue

Management Brief

TO: Mayor Balducci and City Councilmembers

FROM: David Berg, Director, 452-6468
Mark Poch, Traffic Engineering Manager, 452-6137
Mike Ingram, Senior Transportation Planner, 452-4166
Kurt Latt, Senior Transportation Engineer, 452-6020
Transportation Department

DATE: September 15, 2014

SUBJECT: Planned Change to 116th Avenue NE from NE 12th Street to Northup Way

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DIRECTION NEEDED FROM COUNCIL:
____ Action
____ Discussion
_X_ Information

Overview:
The Transportation Department is in the design phase for the 2015 pavement overlay program. Among the streets scheduled for overlay is 116th Avenue NE between NE 12th Street and Northup Way. Overlays present low-cost opportunities to improve the layout and channelization of streets as part of the paving operation. With each road segment, staff reviews City plans and policies for consistency and considers opportunities for improvement where modifications can be incorporated into an overlay.

The subject segment of 116th Avenue is configured with two northbound through lanes, one southbound through lane and a center two-way left-turn lane. This segment does not have bike lanes, but it is identified in the City's adopted Pedestrian and Bicycle Plan as having bike lanes in the future. Staff evaluated changing the configuration to accommodate bike lanes in both directions as part of the overlay project. This would result in one through lane in each direction, a center left-turn lane and bike lanes in both directions. Analysis indicates this change can be accommodated with minimal effect on vehicular operations while improving conditions for bicyclists. Pedestrians could also benefit as the proposed lane configuration is more accommodating of crosswalks in the corridor, which could be included in the pavement overlay plan. The lanes would remain essentially unchanged at either end of the road segment at each signal. However, between the signals, one northbound through lane would be removed to accommodate the bike lanes within the existing curb-to-curb width of the street. Staff is prepared to start outreach in October to adjacent businesses, landowners and the public of this planned change to the roadway and will return to Council with a project update prior to finalizing the overlay contract for bid advertisement.

Project Description and Need:
116th Avenue NE over the subject segment provides a key link into Downtown for cyclists traveling to and from the north and northeast (see Figure A). At the north end, 116th Avenue NE leads to the SR 520 Trail and connects to the City's forthcoming bicycle facilities on Northup Way (bike lanes to be completed in 2016). At the south end of this segment, the new NE 12th Street bridge provides a separated bicycle path over the freeway to Downtown.

Staff has heard from the public over the years about the need to have a better connection for cyclists into Downtown from the 520 Trail. Observations support that this segment of 116th Avenue NE is a well-traveled route for cycling. The City's Pedestrian and Bicycle Transportation Plan identifies bicycle lanes for both directions of this segment (project B-109). The alternative approach, widening 116th Avenue NE over the 0.7 mile segment to incorporate bike lanes while maintaining existing lanes, would present significant challenges, and there are currently no plans or identified funding for widening this roadway.

As shown in Figure A, the plan would modify most of the 0.7-mile corridor to a three-lane configuration, but would not reduce the number of vehicle lanes approaching the traffic signals at either end of the corridor.

Analysis:
There were three key operations assessments:

1. Intersection computer software (SYNCRO) was used to assess the operations of a far-side merge condition for 116th Avenue NE north of NE 12th Street.
2. A real-time field test was conducted with a far-side merge on 116th Avenue NE north of NE 12th Street to simulate the removal of the northbound through lane over the subject portion of 116th Avenue NE.
3. Traffic forecasts for the 2024 horizon year were reviewed and effect of changes to the lanes was modeled on the street network with the current 4-lane configuration and the planned 3-lane configuration (in the center segment of the corridor).

With no changes in the number of approach lanes at the north end traffic signal with Northup Way, there was no operations assessment necessary for this intersection. The capacity of the signal and its operation would remain unchanged with or without the planned channelization revisions.

For the south end of the corridor, at the NE 12th Street signal, the vehicle lanes also remain unchanged for all approaches. However, north of the signal about 600 feet (far-side) there would be a transitional merge area due to the removal of one northbound through lane. This distance affords motorists sufficient time to merge to the single northbound through lane north of the intersection. Maintaining the two far side through lanes for this 600 foot section out of the intersection allows motorists to travel through the signal as they do today. Although it should be recognized when these merge conditions are created, there tends to be an added emphasis towards the inside through lane as motorists anticipate the merge on the far side of

the intersection (a similar situation exists on 112th Avenue NE, which transitions from two lanes to one north of NE 12th Street). This condition was simulated with the software as well as with the real-time field test that set up the control zone for the merge area. The results of these analyses and actual field observations of the test support there being minimal effect on signal operations and overall vehicle movement.

In addition to the intersection operation assessments described above, qualitative reviews of traffic volumes along the corridor were conducted. Traffic volumes in the corridor have been relatively constant over the past decade at around 11,000 vehicles per day. This daily volume is generally split in half for each direction of travel despite the fact that the southbound direction has one through lane and the northbound direction has two through lanes. In other words, the volume occurring now in the northbound direction can be readily accommodated by only one through lane, as evidenced by the single southbound through lane today. Forecasts for the 2013-2024 Transportation Facilities Plan indicate volumes on 116th Avenue NE, north of NE 12th Street, in the 2024 horizon year remain steady and comparable to today's conditions. Modeling analysis of the lane reduction shows the change would have minor effect on overall volumes on 116th Avenue and involve minimal diversion of traffic to other routes.

Safety was also reviewed for the corridor and it was determined that the plan would have benefits on several fronts. First, vehicle safety would be improved as traffic now turning in to or out of driveways on the east side of the roadway must turn across two through lanes. There are fewer instances of accidents occurring for driveways on the west side, in part due to the one through lane being crossed as compared to the two through lanes on the east side of the road. With the planned project, most driveways on the east side would have fewer vehicle lanes to turn across and accordingly provide a safer condition for motorists.

Secondly, pedestrians would realize a safety benefit from the planned project by having fewer vehicle lanes to cross. With the overlay design, staff is evaluating the potential addition of a marked crosswalk mid-segment in the NE 19th Street to NE 21 Street vicinity (there currently are no marked crosswalks between NE 12th Street and NE 24th Street). Having a single through lane in each direction with a center turn lane affords a safer crossing for pedestrians than the current conditions, where two through lanes can result in what is called a "multi-lane threat". In the multi-lane threat situation, one motorist stops to yield for a pedestrian crossing in the marked crosswalk while another motorist comes alongside the stopped vehicle in the second through lane and their line of sight is blocked by the initially stopped vehicle. These multi-lane threats are a serious safety concern for pedestrians and the Transportation Department takes great care to address these where marked crosswalks exist. As the design of the overlay plans progress, the exact location and treatment of a marked crosswalk will be developed to improve pedestrian safety to the greatest extent practical.

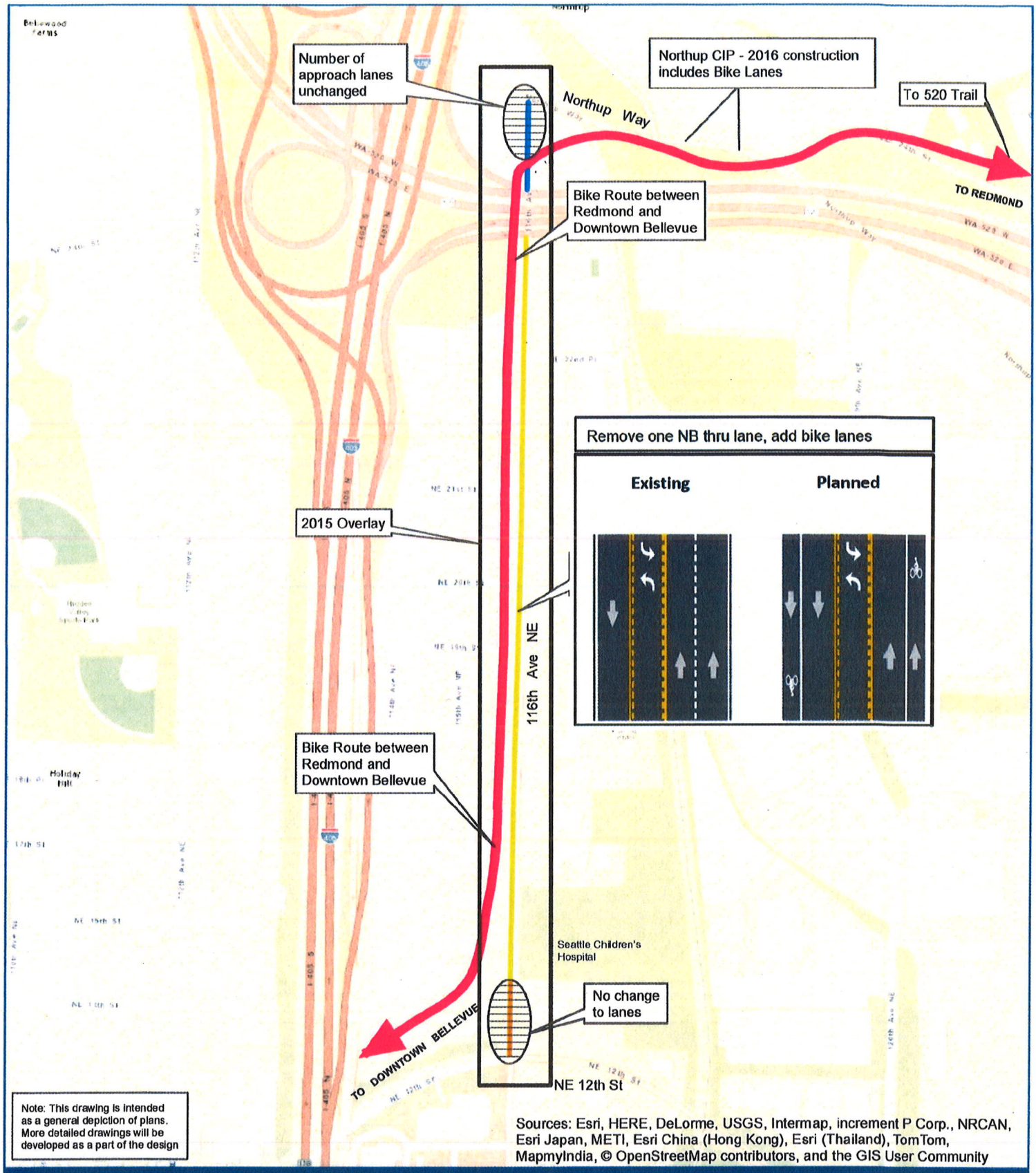
Pedestrians will also benefit from the addition of a buffer space from motorized vehicle traffic by having the bike lanes next to the existing narrow sidewalks (which, along much of the corridor are directly adjacent to the curb, with no planter strip to provide a buffer).

Cyclists will benefit from the addition of bike lanes in the corridor. The bike lanes will create designated areas for cyclists, moving them out of general vehicle lanes and reducing the friction and stress that can accompany sharing a lane with faster-moving motor vehicles. Motorists will benefit by having bicyclists out of the general vehicle lanes, thus removing the impediment associated with slower-moving bicyclists and reducing the sometimes awkward vehicle movements that occur as motorists navigate around slower moving cyclists.

Additional Background and Context:
Over the years, the City has occasionally reconfigured roadways to reduce travel lanes and add striped shoulder bicycle lanes. One example that is perhaps most similar to the planned change for the 116th Avenue NE corridor is a change made to a parallel route in the 1990s, when 112th Avenue NE between NE 12th Street and NE 24th Street was reconfigured from four travel lanes to three lanes with striped shoulders on both sides. (Daily traffic volumes on 112th Avenue NE average approximately 9,400 vehicles per day.) And 116th Avenue NE was itself modified in the 1990s to add a two-way turn lane (previously, the roadway was configured with two northbound through plus two southbound through lanes). In the case of the current plan for 116th Avenue NE, there is little difference in cost to configure the roadway as three lanes plus bike lanes or to continue the existing four-lane channelization at the time of the street overlay.

Although modifying 116th Avenue NE to add bike lanes would improve conditions for the near-term, there are other needs identified for this corridor. In addition to the bike lanes, the Pedestrian and Bicycle Transportation Plan identifies a need for improvements to the sidewalk on the west side, and there are significant ADA access issues posed by utility poles on the eastern sidewalk. Furthermore, the recently completed Bellevue Transit Master Plan identifies potential improvements to the NE 12th Street and Northup Way intersections to enhance transit speed and reliability as well as potential BAT lane designation or other speed and reliability improvements along the corridor, as useful and feasible. These changes would require a more extensive analysis and dedicated funding beyond the scope of what could be conducted and implemented in conjunction with the annual street overlay program. In the future, a comprehensive corridor study would be an effective means to consider the various needs identified for this roadway, evaluate and reconcile competing priorities and determine a long-range vision for the roadway. If future conditions change (e.g., by development of a trail on the Eastside Rail Corridor) and circumstances warrant removing the bike lanes or changing the channelization, modifications could be made at relatively modest cost.

Next Steps:
Staff is prepared to start outreach in October to adjacent businesses, landowners and the public of this planned change to the roadway and will return to Council with a project update, including reporting on the outreach effort, prior to finalizing the overlay contract for bid advertisement.



Note: This drawing is intended as a general depiction of plans. More detailed drawings will be developed as a part of the design

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, Mapmyindia, © OpenStreetMap contributors, and the GIS User Community

City of Bellevue
GIS Services

116th Ave NE Overlay - Vicinity

Figure A

440
Feet

Date: 9/10/2014 File Name: V:\lr\arcgis\VicinityMap116thAveNEChannelizationMap1.mxd IT Department