CITY COUNCIL AGENDA ITEM
CITY OF SHORELINE, WASHINGTON

AGENDA TITLE: Point Wells Traffic Study
DEPARTMENT: Public Works
PRESENTED BY: Mark Relph, Public Works Director
Rich Meredith, Traffic Engineer

PROBLEM/ISSUE STATEMENT:

The City of Shoreline staff developed a traffic and safety analysis related to the impacts of redevelopment of the Point Wells site. A report was finalized in July 2009. This staff report is to present some of the findings from that analysis

In February 2009, Snohomish County issued a draft Supplemental Environmental Impact Statement (SEIS) related to a proposed rezone of the Point Wells property to accommodate higher density redevelopment. In reviewing the SEIS, staff felt that the traffic analysis did not reasonably portray the traffic impacts in the City of Shoreline, so a traffic model was developed to evaluate the transportation impacts of Point Wells development in the City of Shoreline and to respond to the traffic analysis in the draft SEIS. The traffic analysis looked at the magnitude of impacts in the City, and compared them to the draft SEIS to see the effectiveness of building the mitigation projects.

Attached is a copy of the Traffic and Safety analysis report used to provide comments to Snohomish County.

FINANCIAL IMPACT:

No direct financial impact is expected.

RECOMMENDATION

No action required. This report is for information purposes only.

Approved By: City Manager _____   City Attorney _____

INTRODUCTION

The City of Shoreline staff developed a traffic and safety analysis related to the impacts of redevelopment of the Point Wells site. A report was finalized in July 2009. This staff report is to present some of the findings from that analysis.

BACKGROUND

In February 2009, Snohomish County released a draft SEIS on the impacts of rezoning the Point Wells property to accommodate higher density redevelopment. Staff felt the traffic analysis did not reasonably portray the traffic impacts in the City of Shoreline, so a traffic model was developed to respond to the draft SEIS, and get a better understanding of the magnitude of impacts and evaluate the effectiveness of the mitigation projects.

Methodology and Assumptions

Traffic simulation models are a tool that can be used to help make decisions on the impacts and feasibility of projects and roadways designs. While helpful, they are an approximation, as they are based on assumptions and predictions. Traffic simulation models must be balanced with engineering judgment.

For this analysis, staff created 10 scenarios. Two were related to existing conditions and future (year 2025) conditions without any Point Wells redevelopment. Eight other scenarios were created with increasing amounts of traffic from Point Wells. These eight scenarios also simulate the proposed mitigation projects.

These are the proposed mitigations incorporated into the simulation model:
- NW Richmond Beach Road at 3rd Ave NW – widened to provide left-turn lanes
- NW 195th Street & 20th Avenue NW – install new traffic signal
- NW Richmond Beach Road & 15th Avenue NW – install new traffic signals
- Richmond Beach Drive NW & NW 196th Street – all-way stop control
- 24th Avenue NW & NW 196th Street – all-way stop control
- Aurora Ave N – improvements are complete and in operation to N 205th St.

The results of each of the scenarios were summarized in the tables of Appendix B. The measure commonly used in transportation engineering is Level of Service (LOS).

Intersection operations are divided into six different LOS categories A thru F. Each category represents a different amount of congestion, or more specifically vehicle delay (measured in seconds). It is important to understand that intersections operating at LOS F are not gridlocked or at a standstill. It means that drivers are experiencing longer than desirable delays.

In large models, the predicted intersection operations are less accurate the greater the distance they are from the proposed traffic source. In this study, the operation of the intersection of Aurora Ave N at N 205th St is predicted to reach LOS F. However, it is

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almost four miles away from Point Wells, making it very difficult to accurately predict how many trips from Point Wells actually go through this intersection in the evening or PM peak hour.

Level of Service Criteria for Signalized and All-Way Stop Controlled Intersections

Level of Service (LOS)	Average Delay per Vehicle (sec/veh)
A	<= 10
B	> 10 – 20
C	> 20 – 35
D	> 35 – 55
E	> 55 – 80
F	> 80

CONCLUSIONS

Comparing the results of the different scenarios, the model shows us that even with the proposed mitigation projects, the traffic impacts along the Richmond Beach corridor begin to degrade to unacceptable levels after approximately 825 peak hour trips from Point Wells. Intersections at LOS C or D in the 825-trip scenario degrade to LOS E in the 950-trip scenario.

Typically, peak-hour traffic volumes are about 10% of the daily traffic volumes. Using this as a rule of thumb, this means that 825 PM peak-hour vehicles relates to a daily traffic volume of 8,250 vehicles. This reasoning leads to the staff recommendation that development at Point Wells should be limited to that which generates a maximum of 8,250 vehicles per day.

However, staff also recommends that the developer fund a more thorough and detailed traffic study for the corridor. Such a study would look at a larger area, include a morning or AM peak-hour analysis, and evaluate other mitigation projects. The results of this study may suggest modifying the recommended vehicles per day from Point Wells, and would also result in an agreed upon list of mitigation projects for the corridor. The mitigation projects not only will address traffic flow and safety, but will also include pedestrian and bicycle needs. The success of the corridor study will be dependent on a collaborative process involving City of Shoreline staff, the developer, and Richmond Beach residents.

RECOMMENDATION

No action required. This report is for information purposes only.

ATTACHMENTS

Attachment A: March 23, 2009 Point Wells SEIS Comments
Attachment B: Summarized Results of Models
Attachment C: Collision Data (2006-2008)
Attachment D: Mitigation Planning Level Cost Estimates

March 19, 2009

Steve Skorney
Snohomish County Planning and Development Services M/S #604
3000 Rockefeller Ave
Everett, WA 98201-4201

Subject: Paramount Docket XIII DSEIS Comment

The City of Shoreline appreciates the opportunity to comment on the SDEIS. This comment letter is a follow up to our comments presented at the February 25 Planning Commission hearing orally and in writing; those comments are incorporated into this letter by reference.

The City's comments in this letter will focus solely on the contents of the SDEIS issued on February 6, 2009. It will not focus on the merits of the proposal. Our additional comments on the merits of the proposal will be offered prior to or at the County Council Public Hearing which has not yet been scheduled.

Shoreline's DSEIS comments focus on three areas:

1. Transportation

2. Police and Fire Provision

3. Other Service Provision

Transportation

Transportation Model Assumptions Are Flawed

1. Model assigns too high a proportion of trips coming from and going to Snohomish County.

Figures 3.11-5 & 6 – the study assumes that 60% of all trips generated for Point Wells are related to Snohomish County, and only 40% for King County, including Seattle. Of these, perhaps 5% to the north and 5% to the south may be destined for the eastside. Given that the major population and employment center for the region lies to the south of Point Wells, it appears that the trip distribution assumption should be more 50%-50%, or even 40%-60% instead. By designating only 40% of the trips to the south, the model does not adequately address impacts in King County and the City of Shoreline.

2. Assumption about Background Traffic Growth is High

It appears that one of the assumptions used to develop the future scenario uses a sustained background traffic growth rate of approximately 1.5%, with some areas even higher. This may not be valid for a couple reasons. First, the City of Shoreline is essentially "built-out", with development occurring either on scattered lots throughout the city, through sub-division of individual parcels, or demolition

of existing structures. Second, the City of Shoreline has been experiencing a decline in traffic volumes over the last 4 years (2004 to 2008) in the range of 6%. While there may be some years of positive traffic growth, it is unlikely that there will be sustained growth for 18 years, especially given the current economic outlook.

The impact of the lower traffic growth is very important in understanding the significances of the Point Wells development. With little traffic growth, the need for some of the future capacity and safety projects is focused not on background growth but rather the redevelopment of Point Wells itself as the major trigger.

Perhaps stated differently, the DEIS traffic modeling overstates the background growth, thereby diluting the true impact of the proposed development as the traffic disperses through the network of streets. Therefore, the mitigation for the development is likely to be understated.

.(I think we need to clarify this. The lack of background traffic growth means that the general City funded improvements the SEIS contemplates may not be necessary. So the developer cannot count on these being in place to mitigate the traffic impacts from Point Wells, which in turn means that they would be responsible for a much larger share of the improvements)

Assumption about future Bus Service are optimistic. The SEIS references the Community Transit and Metro routes located in the study area. However, as the SEIS correctly identifies, the nearest part of the project site is approximately ½ mile from the nearest transit route. Metro is the only transit provider this close to the site. Currently, Metro has two routes that provide service in the vicinity of the proposed project. One is an all day, local route that travels from Richmond Beach to the Northgate Transit center. The other route is a weekday, peak only route that travels from Richmond Beach to downtown Seattle. (The SEIS incorrectly identifies only one route in this area - the all day, local route.) While the proposed zoning may result in density sufficient to support transit, there are no assumptions made in the SEIS that transit service to the site will increase.

On a side note, there are reasons to believe that it is unlikely that transit service would be extended to the site. Community Transit provides no service in the area and would travel through Shoreline to serve this site. Metro's service is overwhelmingly located within King County, with only three routes that cross very slightly into Snohomish County. The development may be able to fund some service extensions but, there is no description of how this will be accomplished and for how long. Over the past few years, King County has trended toward removing their service in Snohomish County. As an agency that is primarily supported by King County tax dollars and facing significant budget constraints, it is highly unlikely that Metro would extend any routes to serve Snohomish County, solely because there is a large population concentration nearby.

3. Model assumes a greater dispersion of traffic onto local streets than is likely to occur

Appendix C lists the existing and assumed future traffic volumes assigned to each turning movement at study intersections. It appears that the model assumptions allocate too many trips onto local streets and collectors instead of using the minor and principal arterials. For example, in following the eastbound PM trips from Point Wells, 87% of the traffic disburses off of NW Richmond Beach Rd before Fremont Ave N. The traffic modeling in the EIS assumes that only 13% of the trips make it to SR99, where 4% turn north, 2% turn south, and 9% continuing west. SR 99 is a state highway and a principal arterial and a significant north/south connector. Our staff believes that a more reasonable assumption is that a much higher percentage of trips, perhaps 60%, will reach SR 99 and use it to travel both north and south and to make connections to I-5. This may trigger a need for additional roadway improvements that is not recognized in the modeling done for the DSEIS.

4. Planned transportation improvements in King County are not included in the model; staff is unsure of the effect on the model if these improvements were to be included.

Appendix E – The travel demand forecasting report lists the highway improvement projects in the pipeline for 2015 and 2025. However, only Snohomish county projects are listed, most with little to no significance to the Point Wells proposal. Absent are any projects in King County, especially those that are significant to the SEIS, such as the Aurora Corridor Improvement Project, phases II and III.

5. Zonal analysis of traffic flow south of Richmond Beach Road is lacking, leading to less accuracy in traffic forecast

Appendix E, Figure 2 shows the zones used to develop the model. The main corridor for access to the site is NW Richmond Beach Road in Shoreline. There were a number of new split zones created north of NW Richmond Beach Rd to help improve the accuracy of the forecasting model. However, there was only one split created to the south. If splitting up the zones improves the accuracy of the model, then the lack of this attention in the region of the most impact brings into question the accuracy of the forecast in the area.

Traffic Safety is not adequately addressed

In the area of traffic safety, the report mentions the intersection of 3rd Ave NW and NW Richmond Beach Rd along with the roadway segments of NW Richmond Beach Road between 15th Ave NW and 12th Ave NW, and between 8th Ave NW and 3rd Ave NW as having some of the highest collision rates in the study area. However, there does not appear to be any discussion on the impacts of the development on safety nor offer mitigation to improve safety. A significant increase in volumes associated with the Point Wells development may decrease safety and increase congestion in the corridor, and specifically at 3rd Ave NW and NW Richmond Beach Rd. It is likely that more projects to improve safety and traffic flow will be required in addition to those listed in the study

Conclusion

The SEIS does a reasonable job considering the Snohomish County impacts, but does not achieve a thorough analysis of the impacts and mitigation needed along the only access route, primarily through the City of Shoreline. Considering that the effect of some of the assumptions in the traffic model that understate the vehicle trips along the roadway system in the City of Shoreline, it is our staff conclusion that full development of the Point Wells site will result in greater impacts than discussed in the study. Corrections to the present and future conditions need to be made to improve confidence in the model output and conclusions.

With current information, it is difficult to estimate the true impacts of increased traffic on Shoreline's streets with the information in the DSEIS.

Staff's initial analysis suggests that the impacts of a development of 3500 units on Shoreline's streets would result in impacts that will be impossible to mitigate.

There will be considerable impact to Richmond Beach Dr NW. Current daily traffic volumes are 790 vpd, with 50am and 50pm peak hour trips. The study indicates that the am peak hour volume will increase to 1,085, and the pm peak hour to 1,310 vehicles. Given the narrow, winding geometry of this roadway, it may not be able to handle this traffic without considerable congestion and delay.

This leads to the following conclusions:

- Development of this area will need to be significantly scaled back for the concepts identified in the DSEIS.

- Traffic model should be modified to address its failings and the model re-run to identify unavoidable significant impacts if the property is developed at the levels assumed in the DSEIS, and b) if impacts can be mitigated to an acceptable level and an acceptable cost, identification of mitigations, their cost, and who should be responsible for bearing the cost.

- If significant impacts cannot be mitigated or if the cost of mitigation is unreasonably high, alternative (less intense) growth scenarios should be identified and analyzed to learn if the reduced growth scenario can be adequately mitigated.

- When considering mitigation measures, traffic and pedestrian safety measures should be taken into account and costs defined.

Shoreline staff would be pleased to assist in reviewing assumptions and outputs of the traffic modeling to make sure that it reflects an accurate representation of reality.

Police and Fire Provision

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The Point Wells area connects to the regional road network only via Richmond Beach Road in the City of Shoreline. . Neither Snohomish County nor the Town of Woodway currently provide vehicular access, police, fire, or emergency medical services to the lowland areas, nor have they indicated their ability to provide such urban services or facilities in the future.

We have enclosed a map of the closest County Police and Fire facility and their approximate distance to Point Wells. We request that the final SEIS address this issue and estimate the time it would take for Police and Fire to respond and determine whether the response times should be considered significant adverse impacts.

Other Service Provision

In addition to not providing police or fire protection to this area, neither Snohomish County nor the Town of Woodway current provide parks, code compliance, or sewer service to the lowland areas. These services are integral to a creating and maintaining a residential community. We request-that the Final SEIS address these issues in some detail—for example, given the proximity of Snohomish County parkland and library facilities, where are they located and what is the likelihood that Point Wells residents would use Snohomish County facilities when Shoreline facilities are much closer?

Our staff is available to answer questions or assist with analysis. Please contact Steven Cohn at 206-801-2511 or scohn@shorelinewa.gov

Sincerely,

Robert Olander

City Manager

Richmond Beach Rd - Point Wells Impact Analysis Model

Intersection Analysis	2007 Base - Shoreline							2025 Base - Shoreline						
	Overall LOS	Approach LOS				Ave Intersect Delay (sec)	Intersect Capacity Utilization	Overall LOS	Approach LOS				Ave Intersect Delay (sec)	Intersect Capacity Utilization
		EB	WB	NB	SB				EB	WB	NB	SB		
Richmond Beach Dr NW/NW 196th St	A		A			6.5	18.9	A		A	A	A	7.4	21.1
NW 196th St/24th Ave NW	A	A	A	A	A	7.3	25.3	A	A	A	A	A	7.7	26.3
NW 196th St/20th Ave NW	A	A	A	A	B	9.1	39.6	B	B	B	A	A	7.2	47.2
NW Richmond Bch Rd/15th Ave NW (w)	A				B	1.5	27.3	A	A	A		C	3.6	32.2
NW Richmond Bch Rd/15th Ave NW (e)	A	A	B	A		9.8	38.1	A	A	A	C		3.8	45.5
NW Richmond Bch Rd/8th Ave NW	C	C	C	D	D	30.5	61	D	D	D	E	D	53.7	86
NW Richmond Bch Rd/3rd Ave NW	A	A	A	B	B	5.5	62.2	A	A	A	B	C	8.8	66.5
N Richmond Bch Rd/Dayton Ave N	B	B	A	C		12.2	41.6	B	B	A	C		11.3	50
N 185th St/Fremont Ave N	C	C	C	D	D	33.4	59.4	C	C	B	D	D	33.3	73.3
N 185th St/Linden Ave N	C	C	B	D	D	21.9	42.4	B	A	B	D	D	16.8	49.4
N 185th St/Midvale Ave N	A	A	A	A	A	6.1	47.7	B	B	B	C	C	18.9	61.8
Aurora Ave N/N 205th St	D	F	E	B	D	42.3	90	E	F	F	E	E	74.7	110.8
Aurora Ave N/N 200th St	C	E	E	B	B	29.2	85.9	C	F	F	C	B	33.7	95.6
Aurora Ave N/N 192nd St	A	E	E	A	A	8.7	61.7	B	F	E	A	B	14	75.4
Aurora Ave N/N 185th St	C	E	E	C	B	29.6	77.6	D	E	F	D	C	54.2	94.7
Aurora Ave N/N 175th St	C	E	D	C	C	34.2	75.3	D	E	E	D	D	50.7	98.1
Midvale Ave N/N 175th St	B	A	A	E	E	10.6	48.4	B	B	A	C	C	11.8	63.8
Fremont Ave N/N 175th St	A	B	B	A	A	7.4	55.9	A	B	B	A	A	8.1	63.4

Arterial Route Analysis	Travel Time	Distance (mi)	Ave Speed (mph)	Arterial LOS	Travel Time	Distance (mi)	Ave Speed (mph)	Arterial LOS
EB NW Rchmnd Bch Rd btwn 20 Ave NW/15 Av	45.9	0.3	23	C	45.9	0.3	23	C
EB Richmond Bch Rd btwn 15 Ave NW/Dayton A	217.2	1.4	22.9	C	247.8	1.4	20.6	C
EB N 185th St btwn Dayton Ave N/Midvale Ave I	193.5	0.6	11.3	E	195.1	0.6	11.2	E
WB N 185th St btwn Midvale/Fremont Ave N	178.1	0.4	8.9	E	207.1	0.4	7.6	E
WB Richmd Bch Rd btwn Fremont/20 Ave NW	170.4	1.1	22.5	C	275.4	1.7	22.1	C
NB Aurora Ave N btwn N 205th St/N 175th St	257.1	1.7	24	C	363.1	1.7	17	D
SB Aurora Ave N btwn N 205th St/N 175th St	240.6	1.7	24.8	C	276.9	1.7	21.6	D

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Richmond Beach Rd - Point Wells Impact Analysis Model

Intersection Analysis	2025 Point Wells - 0550 trips								2025 Point Wells - 0700 trips							
	Overall LOS	Approach LOS				Ave Intersect Delay (sec)	Diff from 2025 base	Intersect Capacity Utilization	Overall LOS	Approach LOS				Ave Intersect Delay (sec)	Diff from 2025 base	Intersect Capacity Utilization
		EB	WB	NB	SB					EB	WB	NB	SB			
Richmond Beach Dr NW/NW 196th St	B		B	A	B	12.8	5.4	52.1	C		B	A	C	16.6	9.2	61
NW 196th St/24th Ave NW	B	C	B	B	A	13.2	5.5	45.5	C	C	C	B	A	17.6	9.9	45.7
NW 196th St/20th Ave NW	A	A	A	A	A	8.2	1.0	62.6	A	A	A	A	B	8.7	1.5	66.8
NW Richmond Bch Rd/15th Ave NW (w)	A	A	A		E	5.8	2.2	40.8	A	A	A		C	3.2	(0.4)	42.1
NW Richmond Bch Rd/15th Ave NW (e)	A	A	A	E		4	0.2	60.2	A	A	A	C		3	(0.8)	64.2
NW Richmond Bch Rd/8th Ave NW	E	E	D	F	D	66	12.3	91.2	E	E	E	F	E	78	24.3	93.5
NW Richmond Bch Rd/3rd Ave NW	A	A	A	C	C	9.9	1.1	71.3	B	A	A	C	C	11.3	2.5	73.7
N Richmond Bch Rd/Dayton Ave N	B	B	A	C		13.3	2.0	58	B	B	A	C		13.4	2.1	59.4
N 185th St/Fremont Ave N	D	C	D	D	D	37.8	4.5	78.4	D	C	B	E	E	37.2	3.9	80.5
N 185th St/Linden Ave N	A	A	A	C	C	9.7	(7.1)	55	B	A	A	D	D	12.4	(4.4)	55.9
N 185th St/Midvale Ave N	C	B	B	D	D	21.5	2.6	63	B	B	B	C	C	19.1	0.2	63.6
Aurora Ave N/N 205th St	E	F	F	E	E	79.2	4.5	112.4	E	F	F	E	E	79.3	4.6	112.8
Aurora Ave N/N 200th St	C	F	F	C	B	34.9	1.2	97.6	D	F	E	D	B	38.3	4.6	98
Aurora Ave N/N 192nd St	B	F	E	A	B	14.6	0.6	77.2	B	F	E	A	B	13.9	(0.1)	77.5
Aurora Ave N/N 185th St	D	F	F	D	C	53.8	(0.4)	98.7	D	F	F	D	D	54.5	0.3	99.5
Aurora Ave N/N 175th St	D	F	F	D	C	50.8	0.1	101.1	D	F	F	D	C	50.7	0.0	102.2
Midvale Ave N/N 175th St	B	A	A	F	F	14.5	2.7	64.9	B	A	A	F	F	14.4	2.6	65.1
Fremont Ave N/N 175th St	A	B	B	A	A	8.1	0.0	64.5	A	B	B	A	A	9.5	1.4	64.7

Arterial Route Analysis	Travel Time	Distance (mi)	Ave Speed (mph)	Diff in Travel Time	Arterial LOS	Travel Time	Distance (mi)	Ave Speed (mph)	Diff in Travel Time	Arterial LOS
EB NW Rchmnd Bch Rd btwn 20 Ave NW/15 Av	47.5	0.3	22.2	(0.8)	C	47.3	0.3	22.3	(0.7)	C
EB Richmond Bch Rd btwn 15 Ave NW/Dayton A	251.4	1.4	20.3	(0.3)	C	276.2	1.4	18.5	(2.1)	C
EB N 185th St btwn Dayton Ave N/Midvale Ave	207.6	0.6	10.5	(0.7)	E	193.6	0.6	11.3	0.1	E
WB N 185th St btwn Midvale/Fremont Ave N	234.5	0.4	6.7	(0.9)	F	210.6	0.4	7.5	(0.1)	E
WB Richmd Bch Rd btwn Fremont/20 Ave NW	274.1	1.7	22.2	0.1	C	301.5	1.7	20.2	(1.9)	C
NB Aurora Ave N btwn N 205th St/N 175th St	366.9	1.7	16.8	(0.2)	E	380.5	1.7	16.2	(0.8)	E
SB Aurora Ave N btwn N 205th St/N 175th St	272.5	1.7	21.9	0.3	D	281.5	1.7	21.2	(0.4)	D

printed 3/19/2010

Richmond Beach Rd - Point Wells Impact Analysis Model

Intersection Analysis	2025 Point Wells - 0825 trips								2025 Point Wells - 0950 trips							
	Overall LOS	Approach LOS				Ave Intersect Delay (sec)	Diff from 2025 base	Intersect Capacity Utilization	Overall LOS	Approach LOS				Ave Intersect Delay (sec)	Diff from 2025 base	Intersect Capacity Utilization
		EB	WB	NB	SB					EB	WB	NB	SB			
Richmond Beach Dr NW/NW 196th St	C		C	A	D	22.9	15.5	68.5	E		D	A	E	36.6	29.2	76
NW 196th St/24th Ave NW	D	D	D	B	B	25.3	17.6	45.9	E	E	F	B	B	43.2	35.5	49
NW 196th St/20th Ave NW	A	A	A	A	B	9.2	2.0	70.2	A	A	B	B	B	9.6	2.4	73.8
NW Richmond Bch Rd/15th Ave NW (w)	A	A	A		C	3.4	(0.2)	43.1	A	A	A		C	3.1	(0.5)	44.2
NW Richmond Bch Rd/15th Ave NW (e)	A	A	A	C		3	(0.8)	67.5	A	A	A	C		3.1	(0.7)	70.8
NW Richmond Bch Rd/8th Ave NW	E	E	E	F	E	76.6	22.9	95.5	F	E	F	F	E	83.6	29.9	97.4
NW Richmond Bch Rd/3rd Ave NW	B	A	A	C	D	12.3	3.5	76.8	B	A	A	C	D	13.7	4.9	78.7
N Richmond Bch Rd/Dayton Ave N	B	B	A	C		13.5	2.2	60.5	B	B	A	C		13.6	2.3	61.7
N 185th St/Fremont Ave N	D	C	C	E	E	38.8	5.5	82.3	D	C	C	E	E	40.8	7.5	84.1
N 185th St/Linden Ave N	B	A	A	D	D	11.8	(5.0)	56.6	B	A	A	D	D	11.9	(4.9)	57.4
N 185th St/Midvale Ave N	B	B	B	C	C	18.6	(0.3)	64	B	B	B	C	C	18.7	(0.2)	64.5
Aurora Ave N/N 205th St	F	F	F	E	E	80.5	5.8	113	F	F	F	F	E	82.4	7.7	113.3
Aurora Ave N/N 200th St	D	F	F	C	B	35.7	2.0	98.3	D	F	F	C	B	36	2.3	98.6
Aurora Ave N/N 192nd St	B	F	E	A	B	14.8	0.8	77.7	B	F	E	A	B	14.8	0.8	77.9
Aurora Ave N/N 185th St	E	F	F	D	D	59.5	5.3	100.1	E	F	F	D	D	62.2	8.0	101.7
Aurora Ave N/N 175th St	D	F	F	D	C	51.3	0.6	102.9	D	F	F	D		54	3.3	103.8
Midvale Ave N/N 175th St	B	A	A	F	F	14.3	2.5	65.2	A	A	A	D	D	9.6	(2.2)	65.4
Fremont Ave N/N 175th St	A	B	B	A	A	8.1	0.0	64.9	A	B	B	A	A	8.1	0.0	65.2

Arterial Route Analysis	Travel Time	Distance (mi)	Ave Speed (mph)	Diff in Travel Time	Arterial LOS	Travel Time	Distance (mi)	Ave Speed (mph)	Diff in Travel Time	Arterial LOS
EB NW Rchmnd Bch Rd btwn 20 Ave NW/15 Av	47.5	0.3	22.2	(0.8)	C	47.4	0.3	22.3	(0.7)	C
EB Richmond Bch Rd btwn 15 Ave NW/Dayton A	255.3	1.4	20	(0.6)	C	259.5	1.4	19.7	(0.9)	C
EB N 185th St btwn Dayton Ave N/Midvale Ave	194.8	0.6	11.2	0.0	E	195.8	0.6	11.1	(0.1)	E
WB N 185th St btwn Midvale/Fremont Ave N	229.8	0.4	6.9	(0.7)	F	239.9	0.4	6.6	(1.0)	F
WB Richmd Bch Rd btwn Fremont/20 Ave NW	312.2	1.7	19.5	(2.6)	C	322.7	1.7	18.9	(3.2)	C
NB Aurora Ave N btwn N 205th St/N 175th St	376.6	1.7	16.4	(0.6)	E	384.4	1.7	16.1	(0.9)	E
SB Aurora Ave N btwn N 205th St/N 175th St	291.4	1.7	20.5	(1.1)	D	292.3	1.7	20.4	(1.2)	D

Richmond Beach Rd - Point Wells Impact Analysis Model

Intersection Analysis	2025 Point Wells - 1100 trips								2025 Point Wells - 1225 trips							
	Overall LOS	Approach LOS				Ave Intersect Delay (sec)	Diff from 2025 base	Intersect Capacity Utilization	Overall LOS	Approach LOS				Ave Intersect Delay (sec)	Diff from 2025 base	Intersect Capacity Utilization
		EB	WB	NB	SB					EB	WB	NB	SB			
Richmond Beach Dr NW/NW 196th St	F		F	A	F	71.6	64.2	84.9	F		F	A	F	101.6	94.2	92.4
NW 196th St/24th Ave NW	F	F	F	B	B	77.8	70.1	54	F	F	F	B	B	113.2	105.5	58.4
NW 196th St/20th Ave NW	B	A	B	B	B	10.1	2.9	78	B	A	B	B	B	10.4	3.2	81.5
NW Richmond Bch Rd/15th Ave NW (w)	A	A	A		C	3.2	(0.4)	46.3	A	A	A		C	3	(0.6)	48.6
NW Richmond Bch Rd/15th Ave NW (e)	A	A	A	C		3.8	0.0	74.8	A	A	A	C		3.4	(0.4)	78.2
NW Richmond Bch Rd/8th Ave NW	F	E	F	F	E	88.1	34.4	99.6	F	E	F	F	E	94.5	40.8	101.6
NW Richmond Bch Rd/3rd Ave NW	B	A	A	C	D	14.5	5.7	80.9	B	B	A	C	D	15.8	7.0	82.9
N Richmond Bch Rd/Dayton Ave N	B	B	A	C		14.1	2.8	63.2	B	B	A	C		14.5	3.2	64.3
N 185th St/Fremont Ave N	D	C	C	E	E	43.8	10.5	86.2	D	C	D	E	E	47.7	14.4	88
N 185th St/Linden Ave N	B	A	A	D	D	11.6	(5.2)	58.9	B	A	A	D	D	11.3	(5.5)	60.2
N 185th St/Midvale Ave N	B	B	B	C	C	19.2	0.3	64.9	B	B	B	C	C	19.4	0.5	65.4
Aurora Ave N/N 205th St	F	F	F	F	E	81.5	6.8	113.6	F	F	F	F	E	82.2	7.5	113.9
Aurora Ave N/N 200th St	D	F	F	D	B	40.8	7.1	99.1	D	F	F	D	B	41.9	8.2	99.4
Aurora Ave N/N 192nd St	B	F	E	A	C	15.7	1.7	78.2	B	F	E	A	C	15.5	1.5	78.5
Aurora Ave N/N 185th St	E	F	F	D	E	65.4	11.2	103.7	E	F	F	D	E	69.2	15.0	105.5
Aurora Ave N/N 175th St	D	F	F	D	C	54	3.3	104.8	E	F	F	D	C	55.5	4.8	105.6
Midvale Ave N/N 175th St	B	A	A	D	D	10.5	(1.3)	65.6	A	A	A	D	D	9.6	(2.2)	65.7
Fremont Ave N/N 175th St	A	B	B	A	A	8.1	0.0	65.4	A	B	B	A	A	8.2	0.1	65.6

Arterial Route Analysis	Travel Time	Distance (mi)	Ave Speed (mph)	Diff in Travel Time	Arterial LOS	Travel Time	Distance (mi)	Ave Speed (mph)	Diff in Travel Time	Arterial LOS
EB NW Rchmnd Bch Rd btwn 20 Ave NW/15 Av	47.2	0.3	22.4	(0.6)	C	46.9	0.3	22.5	(0.5)	C
EB Richmond Bch Rd btwn 15 Ave NW/Dayton A	261.6	1.4	19.6	(1.0)	C	260	1.4	19.7	(0.9)	C
EB N 185th St btwn Dayton Ave N/Midvale Ave N	196.6	0.6	11.1	(0.1)	E	198.1	0.6	11	(0.2)	E
WB N 185th St btwn Midvale/Fremont Ave N	249.7	0.4	6.3	(1.3)	F	264.9	0.4	6	(1.6)	F
WB Richmd Bch Rd btwn Fremont/20 Ave NW	328.3	1.7	18.6	(3.5)	C	342.4	1.7	17.8	(4.3)	D
NB Aurora Ave N btwn N 205th St/N 175th St	403	1.7	15.3	(1.7)	E	407.5	1.7	15.2	(1.8)	E
SB Aurora Ave N btwn N 205th St/N 175th St	301.2	1.7	19.8	(1.8)	D	311.3	1.7	19.2	(2.4)	D

Richmond Beach Rd - Point Wells Impact Analysis Model

Intersection Analysis	2025 Point Wells - 1286 trips								2025 Point Wells - 1350 trips							
	Overall LOS	Approach LOS				Ave Intersect Delay (sec)	Diff from 2025 base	Intersect Capacity Utilization	Overall LOS	Approach LOS				Ave Intersect Delay (sec)	Diff from 2025 base	Intersect Capacity Utilization
		EB	WB	NB	SB					EB	WB	NB	SB			
Richmond Beach Dr NW/NW 196th St	F		F	A	F	120.7	113.3	96	F		F	A	F	142	134.6	99.9
NW 196th St/24th Ave NW	F	F	F	B	B	130.8	123.1	60.2	F	F	F	B	B	154.5	146.8	62.9
NW 196th St/20th Ave NW	B	A	B	B	B	10.6	3.4	83.2	B	A	B	B	B	11	3.8	85
NW Richmond Bch Rd/15th Ave NW (w)	A	A	A		C	3	(0.6)	49.5	A	A	A		C	4.3	0.7	50.8
NW Richmond Bch Rd/15th Ave NW (e)	A	A	A	C		3.5	(0.3)	79.8	A	A	A	C		4.6	0.8	81.5
NW Richmond Bch Rd/8th Ave NW	F	E	F	F	E	97.6	43.9	102.4	F	E	F	F	F	97.3	43.6	103.6
NW Richmond Bch Rd/3rd Ave NW	B	B	A	C	D	16.6	7.8	83.7	B	B	B	C	D	15.8	7.0	84.8
N Richmond Bch Rd/Dayton Ave N	B	B	B	C		14.8	3.5	65	B	B	B	C		15	3.7	65.5
N 185th St/Fremont Ave N	D	C	D	E	E	49.3	16.0	88.7	D	C	C	E	F	49.8	16.5	89.8
N 185th St/Linden Ave N	B	A	A	D	D	10.8	(6.0)	60.8	B	A	A	D	D	11.1	(5.7)	61.7
N 185th St/Midvale Ave N	B	B	B	C	C	19.4	0.5	65.6	B	B	B	C	C	19.4	0.5	65.8
Aurora Ave N/N 205th St	F	F	F	F	E	82.6	7.9	114.1	F	F	F	F	E	82.9	8.2	114.2
Aurora Ave N/N 200th St	D	F	F	D	B	42.3	8.6	99.6	D	F	F	D	B	43	9.3	99.7
Aurora Ave N/N 192nd St	B	F	E	A	C	16.1	2.1	78.6	B	F	E	A	C	16	2.0	78.7
Aurora Ave N/N 185th St	E	F	F	D	E	71.6	17.4	106.3	E	F	F	D	E	71	16.8	107.2
Aurora Ave N/N 175th St	E	F	F	D	C	56.1	5.4	105.9	E	F	F	D	C	56.5	5.8	106.5
Midvale Ave N/N 175th St	A	A	A	D	D	9.6	(2.2)	65.8	A	A	A	D	D	9.6	(2.2)	65.9
Fremont Ave N/N 175th St	A	B	B	A	A	8.2	0.1	65.7	A	B	B	A	A	8.2	0.1	65.8

Arterial Route Analysis	Travel Time	Distance (mi)	Ave Speed (mph)	Diff in Travel Time	Arterial LOS	Travel Time	Distance (mi)	Ave Speed (mph)	Diff in Travel Time	Arterial LOS
EB NW Rchmnd Bch Rd btwn 20 Ave NW/15 Av	47	0.3	22.5	(0.5)	C	47.1	0.3	22.4	(0.6)	C
EB Richmond Bch Rd btwn 15 Ave NW/Dayton A	261.5	1.4	19.6	(1.0)	C	259.4	1.4	19.7	(0.9)	C
EB N 185th St btwn Dayton Ave N/Midvale Ave	198.7	0.6	11	(0.2)	E	199.5	0.6	10.9	(0.3)	E
WB N 185th St btwn Midvale/Fremont Ave N	270.9	0.4	5.8	(1.8)	F	267.9	0.4	5.9	(1.7)	F
WB Richmd Bch Rd btwn Fremont/20 Ave NW	350.8	1.7	17.4	(4.7)	D	347.9	1.7	17.5	(4.6)	D
NB Aurora Ave N btwn N 205th St/N 175th St	410.7	1.7	15.1	(1.9)	E	410.1	1.7	15.1	(1.9)	E
SB Aurora Ave N btwn N 205th St/N 175th St	316.2	1.7	18.9	(2.7)	D	311.6	1.7	19.2	(2.4)	D

City of Shoreline - Intersection Collision Report

Reported Collisions from 1/1/2006 to 12/31/2008 sorted by Rate
Crash Rate per million entering vehicles per year

	Location	Signal	# of Crashes	# of Injuries	# of Fatal	Crash Rate	Injury Rate	Fatal Rate
1	3rd Ave NW & NW Richmond Beach Rd	y	19	11	0	0.81	0.47	0
2	10th Ave NE & NE 175th St	y	14	14	0	0.72	0.72	0
3	Meridian Ave N & N 155th St	y	15	7	0	0.70	0.33	0
4	25th Ave NE & NE 150th St		5	4	0	0.69	0.55	0
5	Linden Ave N & N 175th St		7	4	0	0.58	0.33	0
6	Linden Ave N & N 185th St	y	10	6	0	0.58	0.35	0
7	Greenwood Ave N & Carlyle Hall Rd N		5	0	0	0.58	0.00	0
8	15th Ave NE & NE Perkins Way	y	10	8	0	0.54	0.43	0
9	Fremont Ave N & N 200th St		5	0	0	0.50	0.00	0
10	Linden Ave N & N 160th St		5	2	0	0.46	0.18	0
11	Meridian Ave N & N 200th St	y	7	6	0	0.43	0.37	0
12	Midvale Ave N & N 185th St	y	6	4	0	0.42	0.28	0
13	Ashworth Ave N & N 185th St		6	8	0	0.42	0.55	0
14	5th Ave NE & NE 155th St	y	7	5	0	0.40	0.28	0
15	15th Ave NE & NE 155th St	y	8	6	0	0.36	0.27	0
16	Meridian Ave N & N 175th St	y	15	7	0	0.35	0.16	0
17	Fremont Ave N & N 185th St	y	8	5	0	0.34	0.21	0
18	5th Ave NE & NE 175th St	y	8	3	0	0.33	0.12	0
19	Meridian Ave N & N 185th St	y	8	3	0	0.33	0.12	0
20	15th Ave NE & NE 168th St		6	6	0	0.31	0.31	0
21	15th Ave NE & NE 150th St	y	6	6	0	0.31	0.31	0
22	19th Ave NE & Ballinger Way NE	y	9	6	0	0.28	0.19	0
23	15th Ave NE & NE 146th St		5	2	0	0.27	0.11	0
24	19th Ave NE & NE 205th St	y	5	1	0	0.24	0.05	0
25	Midvale Ave N & N 175th St	y	6	2	0	0.23	0.08	0
26	Westminster Wy N & N 155th St	y	5	3	0	0.23	0.14	0
27	Aurora Ave N & N 182nd St		8	4	0	0.19	0.10	0
28	Aurora Ave N & N 200th St	y	6	3	0	0.15	0.07	0
29	Aurora Ave N & N 165th St	y	6	1	0	0.14	0.02	0
30	Aurora Ave N & N 195th St		5	6	0	0.14	0.17	0
31	Aurora Ave N & N 192nd St	y	5	2	0	0.14	0.06	0
32	Aurora Ave N & N 185th St	y	7	3	0	0.14	0.06	0
33	Aurora Ave N & N 155th St	y	7	5	0	0.12	0.09	0
34	Aurora Ave N & N 160th St	y	5	5	0	0.11	0.11	0
35	Aurora Ave N & N 175th St	y	5	2	0	0.09	0.03	0

City of Shoreline - Intersection Collision Report

Reported Collisions from 1/1/2006 to 12/31/2008 sorted by Frequency
Crash Rate per 10 million entering vehicles per year

	Location	Signal	# of Crashes	# of Injuries	# of Fatal	Crash Rate	Injury Rate	Fatal Rate
1	3rd Ave NW & NW Richmond Beach Rd	y	19	11	0	0.81	0.47	0
2	Meridian Ave N & N 155th St	y	15	7	0	0.70	0.33	0
3	Meridian Ave N & N 175th St	y	15	7	0	0.35	0.16	0
4	10th Ave NE & NE 175th St	y	14	14	0	0.72	0.72	0
5	15th Ave NE & NE Perkins Way	y	10	8	0	0.54	0.43	0
6	Linden Ave N & N 185th St	y	10	6	0	0.58	0.35	0
7	19th Ave NE & Ballinger Way NE	y	9	6	0	0.28	0.19	0
8	15th Ave NE & NE 155th St	y	8	6	0	0.36	0.27	0
9	Fremont Ave N & N 185th St	y	8	5	0	0.34	0.21	0
10	Aurora Ave N & N 182nd St		8	4	0	0.19	0.10	0
11	5th Ave NE & NE 175th St	y	8	3	0	0.33	0.12	0
12	Meridian Ave N & N 185th St	y	8	3	0	0.33	0.12	0
13	Meridian Ave N & N 200th St	y	7	6	0	0.43	0.37	0
14	5th Ave NE & NE 155th St	y	7	5	0	0.40	0.28	0
15	Aurora Ave N & N 155th St	y	7	5	0	0.12	0.09	0
16	Linden Ave N & N 175th St		7	4	0	0.58	0.33	0
17	Aurora Ave N & N 185th St	y	7	3	0	0.14	0.06	0
18	Ashworth Ave N & N 185th St		6	8	0	0.42	0.55	0
19	15th Ave NE & NE 168th St		6	6	0	0.31	0.31	0
20	15th Ave NE & NE 150th St	y	6	6	0	0.31	0.31	0
21	Midvale Ave N & N 185th St	y	6	4	0	0.42	0.28	0
22	Aurora Ave N & N 200th St	y	6	3	0	0.15	0.07	0
23	Midvale Ave N & N 175th St	y	6	2	0	0.23	0.08	0
24	Aurora Ave N & N 165th St	y	6	1	0	0.14	0.02	0
25	Aurora Ave N & N 195th St		5	6	0	0.14	0.17	0
26	Aurora Ave N & N 160th St	y	5	5	0	0.11	0.11	0
27	25th Ave NE & NE 150th St		5	4	0	0.69	0.55	0
28	Westminster Wy N & N 155th St	y	5	3	0	0.23	0.14	0
29	Linden Ave N & N 160th St		5	2	0	0.46	0.18	0
30	15th Ave NE & NE 146th St		5	2	0	0.27	0.11	0
31	Aurora Ave N & N 192nd St	y	5	2	0	0.14	0.06	0
32	Aurora Ave N & N 175th St	y	5	2	0	0.09	0.03	0
33	19th Ave NE & NE 205th St	y	5	1	0	0.24	0.05	0
34	Greenwood Ave N & Carlyle Hall Rd N		5	0	0	0.58	0.00	0
35	Fremont Ave N & N 200th St		5	0	0	0.50	0.00	0

City of Shoreline - Mid-Block Collision Report

Reported Collisions from 1/1/2006 to 12/31/2008 sorted by Rate
Crash Rate per million vehicle-miles per year

	Location	# of Crashes	# of Injuries	# of Fatal	Crash Rate	Injury Rate	Fatal Rate
1	N 175th St from Linden Ave N to Aurora Ave N	14	7	0	35.06	17.53	0.00
2	Aurora Ave N from Westminster Way N to N 160th St	19	4	0	28.10	5.92	0.00
3	Meridian Ave N from N 175th St to N 176th St	9	9	0	22.49	22.49	0.00
4	N 167th St from Aurora Ave N to Stone Ave N	5	2	0	18.62	7.45	0.00
5	N 185th St from Aurora Ave N to Midvale Ave N	17	6	0	18.22	6.43	0.00
6	N 155th St from Aurora Ave N to Midvale Ave N	14	4	0	17.33	4.95	0.00
7	N 185th St from Meridian Ave N to Meridian Ct N	5	4	0	17.32	13.86	0.00
8	Aurora Ave N from N 184th St to N 185th St	18	8	1	12.45	5.53	0.69
9	3rd Ave NW from NW Richmond Beach Rd to NW 189th St	6	1	0	11.79	1.96	0.00
10	19th Ave NE from NE 199th St to Ballinger Way NE	7	3	0	10.63	4.56	0.00
11	Aurora Ave N from N 199th St to N 200th St	22	9	1	9.87	4.04	0.45
12	Meridian Ave N from N 203rd St to N 205th St	10	1	0	9.11	0.91	0.00
13	N 160th St from Linden Ave N to Aurora Ave N	10	3	0	8.81	2.64	0.00
14	15th Ave NE from NE 154th St to NE 155th St	7	4	0	7.73	4.42	0.00
15	5th Ave NE from NE 145th St to 145th St I-5 rp	5	1	0	7.29	1.46	0.00
16	15th Ave NE from NE 172nd St to NE 175th St	16	8	0	7.20	3.60	0.00
17	Aurora Ave N from N 175th St to Ronald Pl N	54	21	0	6.98	2.71	0.00
18	Aurora Ave N from N 185th St to N 192nd St	33	20	0	6.98	4.23	0.00
19	15th Ave NE from NE 146th St to NE 147th St	7	2	0	6.78	1.94	0.00
20	N 175th St from Aurora Ave N to Ronald Pl N	6	1	0	6.00	1.00	0.00
21	N 200th St from Aurora Ave N to Aurora Vill Mall N	8	7	0	5.94	5.20	0.00
22	Aurora Ave N from N 152nd St to N 155th St	37	16	0	5.80	2.51	0.00
23	Aurora Ave N from Ronald Pl N to N 175th St	19	10	0	5.52	2.90	0.00
24	15th Ave NE from NE 175th St to NE 177th St	10	7	0	4.82	3.38	0.00

City of Shoreline - Mid-Block Collision Report

Reported Collisions from 1/1/2006 to 12/31/2008 sorted by Rate
Crash Rate per million vehicle-miles per year

	Location	# of Crashes	# of Injuries	# of Fatal	Crash Rate	Injury Rate	Fatal Rate
25	NE 175th St from 12th Ave NE to 15th Ave NE	9	7	0	4.42	3.44	0.00
26	Aurora Ave N from N 167th St to N 170th St	22	8	0	4.21	1.53	0.00
27	NW Richmond Beach Rd from 1st Ave NW to 2nd Ave NW	5	2	0	4.14	1.66	0.00
28	Aurora Ave N from N 198th St to N 199th St	8	6	0	3.66	2.74	0.00
29	Aurora Ave N from N 149th St to N 152nd St	20	14	0	3.61	2.53	0.00
30	Aurora Ave N from N 160th St to N 163rd St	18	6	0	3.47	1.16	0.00
31	19th Ave NE from Ballinger Way NE to NE 205th St	6	1	0	3.19	0.53	0.00
32	N 185th St from Linden Ave N to Aurora Ave N	6	2	0	3.19	1.06	0.00
33	N 175th St from Corliss Ave N to 175th St RAMP SB	6			3.17	0.00	0.00
34	Aurora Ave N from N 182nd St to N 184th St	14	10	0	3.15	2.25	0.00
35	N 175th St from Midvale Ave N to Ashworth Ave N	14	7	0	3.10	1.55	0.00
36	15th Ave NE from Forest Park Dr NE to NE 205th St	7	4	0	3.07	1.76	0.00
37	Aurora Ave N from Ronald Pl N to N 182nd St	9	5	0	3.03	1.68	0.00
38	Aurora Ave N from N 145th St to N 149th St	21	4	0	3.01	0.57	0.00
39	NW Richmond Beach Rd from 12th Ave NW to 15th Ave NW	13	5	1	2.99	1.15	0.23
40	Ballinger Way NE from 19th Ave NE to NE 205th St	23	11	0	2.96	1.41	0.00
41	N 175th St from Wallingford Ave N to Meridian Ave N	9	3	0	2.94	0.98	0.00
42	N 175th St from Meridian Ave N to Corliss Ave N	17	4	0	2.90	0.68	0.00
43	Aurora Ave N from N 165th St to N 167th St	15	11	0	2.78	2.04	0.00
44	Aurora Ave N from Firlands Way N to N 198th St	8	7	0	2.76	2.42	0.00
45	Aurora Ave N from N 170th St to Ronald Pl N	18	13	0	2.71	1.96	0.00
46	NW Richmond Beach Rd from 3rd Ave NW to 8th Ave NW	13	7	0	2.61	1.41	0.00
47	Aurora Ave N from N 192nd St to N 195th St	17	9	0	2.57	1.36	0.00
48	NE 175th St from 8th Ave NE to 10th Ave NE	5	1	0	2.46	0.49	0.00

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City of Shoreline - Mid-Block Collision Report

Reported Collisions from 1/1/2006 to 12/31/2008 sorted by Rate
Crash Rate per million vehicle-miles per year

	Location	# of Crashes	# of Injuries	# of Fatal	Crash Rate	Injury Rate	Fatal Rate
49	Aurora Ave N from N 155th St to Westminster Way N	17	13	0	2.39	1.82	0.00
50	Ballinger Way NE from NE 195th St to 23rd Ave NE	11	3	0	2.11	0.58	0.00
51	NE 205th St from Ballinger Way NE to 19th Ave NE	6	4	0	1.99	1.33	0.00
52	Aurora Ave N from N 163rd St to N 165th St	10	3	0	1.93	0.58	0.00
53	Aurora Ave N from N 200th St to N 205th St	16	1	0	1.84	0.12	0.00
54	N Richmond Beach Rd from 1st Ave NW to Dayton Ave N	6	1	0	1.66	0.28	0.00

City of Shoreline - Mid-Block Collision Report

Reported Collisions from 1/1/2006 to 12/31/2008 sorted by Frequency
Crash Rate per million vehicle-miles per year

	Location	# of Crashes	# of Injuries	# of Fatal	Crash Rate	Injury Rate	Fatal Rate
1	Aurora Ave N from N 175th St to Ronald Pl N	54	21	0	6.98	2.71	0.00
2	Aurora Ave N from N 152nd St to N 155th St	37	16	0	5.80	2.51	0.00
3	Aurora Ave N from N 185th St to N 192nd St	33	20	0	6.98	4.23	0.00
4	Ballinger Way NE from 19th Ave NE to NE 205th St	23	11	0	2.96	1.41	0.00
5	Aurora Ave N from N 199th St to N 200th St	22	9	1	9.87	4.04	0.45
6	Aurora Ave N from N 167th St to N 170th St	22	8	0	4.21	1.53	0.00
7	Aurora Ave N from N 145th St to N 149th St	21	4	0	3.01	0.57	0.00
8	Aurora Ave N from N 149th St to N 152nd St	20	14	0	3.61	2.53	0.00
10	Aurora Ave N from Westminster Way N to N 160th St	19	4	0	28.10	5.92	0.00
9	Aurora Ave N from Ronald Pl N to N 175th St	19	10	0	5.52	2.90	0.00
12	Aurora Ave N from N 184th St to N 185th St	18	8	1	12.45	5.53	0.69
13	Aurora Ave N from N 160th St to N 163rd St	18	6	0	3.47	1.16	0.00
11	Aurora Ave N from N 170th St to Ronald Pl N	18	13	0	2.71	1.96	0.00
16	N 185th St from Aurora Ave N to Midvale Ave N	17	6	0	18.22	6.43	0.00
17	N 175th St from Meridian Ave N to Corliss Ave N	17	4	0	2.90	0.68	0.00
15	Aurora Ave N from N 192nd St to N 195th St	17	9	0	2.57	1.36	0.00
14	Aurora Ave N from N 155th St to Westminster Way N	17	13	0	2.39	1.82	0.00
18	15th Ave NE from NE 172nd St to NE 175th St	16	8	0	7.20	3.60	0.00
19	Aurora Ave N from N 200th St to N 205th St	16	1	0	1.84	0.12	0.00
20	Aurora Ave N from N 165th St to N 167th St	15	11	0	2.78	2.04	0.00
22	N 175th St from Linden Ave N to Aurora Ave N	14	7	0	35.06	17.53	0.00
24	N 155th St from Aurora Ave N to Midvale Ave N	14	4	0	17.33	4.95	0.00
21	Aurora Ave N from N 182nd St to N 184th St	14	10	0	3.15	2.25	0.00
23	N 175th St from Midvale Ave N to Ashworth Ave N	14	7	0	3.10	1.55	0.00

City of Shoreline - Mid-Block Collision Report

Reported Collisions from 1/1/2006 to 12/31/2008 sorted by Frequency
Crash Rate per million vehicle-miles per year

	Location	# of Crashes	# of Injuries	# of Fatal	Crash Rate	Injury Rate	Fatal Rate
26	NW Richmond Beach Rd from 12th Ave NW to 15th Ave NW	13	5	1	2.99	1.15	0.23
25	NW Richmond Beach Rd from 3rd Ave NW to 8th Ave NW	13	7	0	2.61	1.41	0.00
27	Ballinger Way NE from NE 195th St to 23rd Ave NE	11	3	0	2.11	0.58	0.00
31	Meridian Ave N from N 203rd St to N 205th St	10	1	0	9.11	0.91	0.00
29	N 160th St from Linden Ave N to Aurora Ave N	10	3	0	8.81	2.64	0.00
28	15th Ave NE from NE 175th St to NE 177th St	10	7	0	4.82	3.38	0.00
30	Aurora Ave N from N 163rd St to N 165th St	10	3	0	1.93	0.58	0.00
32	Meridian Ave N from N 175th St to N 176th St	9	9	0	22.49	22.49	0.00
33	NE 175th St from 12th Ave NE to 15th Ave NE	9	7	0	4.42	3.44	0.00
34	Aurora Ave N from Ronald Pl N to N 182nd St	9	5	0	3.03	1.68	0.00
35	N 175th St from Wallingford Ave N to Meridian Ave N	9	3	0	2.94	0.98	0.00
36	N 200th St from Aurora Ave N to Aurora Vill Mall N	8	7	0	5.94	5.20	0.00
38	Aurora Ave N from N 198th St to N 199th St	8	6	0	3.66	2.74	0.00
37	Aurora Ave N from Firlands Way N to N 198th St	8	7	0	2.76	2.42	0.00
41	19th Ave NE from NE 199th St to Ballinger Way NE	7	3	0	10.63	4.56	0.00
39	15th Ave NE from NE 154th St to NE 155th St	7	4	0	7.73	4.42	0.00
42	15th Ave NE from NE 146th St to NE 147th St	7	2	0	6.78	1.94	0.00
40	15th Ave NE from Forest Park Dr NE to NE 205th St	7	4	0	3.07	1.76	0.00
45	3rd Ave NW from NW Richmond Beach Rd to NW 189th St	6	1	0	11.79	1.96	0.00
46	N 175th St from Aurora Ave N to Ronald Pl N	6	1	0	6.00	1.00	0.00
47	19th Ave NE from Ballinger Way NE to NE 205th St	6	1	0	3.19	0.53	0.00
44	N 185th St from Linden Ave N to Aurora Ave N	6	2	0	3.19	1.06	0.00
49	N 175th St from Corliss Ave N to 175th St RAMP SB	6			3.17	0.00	0.00
43	NE 205th St from Ballinger Way NE to 19th Ave NE	6	4	0	1.99	1.33	0.00

City of Shoreline - Mid-Block Collision Report

Reported Collisions from 1/1/2006 to 12/31/2008 sorted by Frequency
Crash Rate per million vehicle-miles per year

	Location	# of Crashes	# of Injuries	# of Fatal	Crash Rate	Injury Rate	Fatal Rate
48	N Richmond Beach Rd from 1st Ave NW to Dayton Ave N	6	1	0	1.66	0.28	0.00
51	N 167th St from Aurora Ave N to Stone Ave N	5	2	0	18.62	7.45	0.00
50	N 185th St from Meridian Ave N to Meridian Ct N	5	4	0	17.32	13.86	0.00
53	5th Ave NE from NE 145th St to 145th St I-5 rp	5	1	0	7.29	1.46	0.00
52	NW Richmond Beach Rd from 1st Ave NW to 2nd Ave NW	5	2	0	4.14	1.66	0.00
54	NE 175th St from 8th Ave NE to 10th Ave NE	5	1	0	2.46	0.49	0.00

Point Wells Mitigation
Planning Level Cost Estimates

Project #	Location	Description of Improvement	Estimate
1	Richmond Beach Corridor Study	Safety, Efficiency, Multimodal Plan	$200,000.00
2	NW 196th Street Richmond Beach Dr NW to 24th Ave NW	Sidewalk on both sides of roadway	$2,053,773.00
3	NW 196th Street 24th Avenue NW to 20th Avenue NW	Sidewalk on the east side of roadway	$300,000.00
4	NW 195th Street & 20th Avenue NW	Traffic Signal with additional EB-WB left turn lanes	$1,330,973.00
5	NW Richmond Beach Rd NW & 15th Avenue NW	Traffic Signal and additional EB-WB left turn lanes	$2,208,156.00
6	NW Richmond Beach Rd NW & 3rd Avenue NW	Widen & replace trafffic signal for EB-WB left turns	$2,316,775.00
7a	Richmond Beach Dr. NW NW 196th Street to NW 205th Street	Sidewalk on the east side of roadway	$1,557,414.00
7b	Richmond Beach Dr. NW NW 196th Street to NW 205th Street	Sidewalk on the west side of roadway	$16,683,236.00
8	NW Richmond Beach Rd NW & 8th Avenue NW	Intersection Safety and Capacity Improvements	$2,131,458.00
9	Richmond Beach Dr NW & NW 196th Street	Intersection Improvements	$1,527,870.00
10	NW 196th Street & 24th Avenue NW	Intersection Improvements	$1,882,294.00

TOTAL with project #7a $15,508,713.00
TOTAL with project #7b $30,634,535.00

revised 03/19/2010

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Point Wells
Traffic and Safety Analysis

Introduction

This analysis was prepared in response to the draft SEIS prepared for Snohomish County's exploration of a rezone of the Point Wells site to accommodate redevelopment at a higher density. The purpose of this analysis is to evaluate traffic and safety impacts, as well as mitigations required of the proposed rezone and redevelopment.

Background

An initial analysis was conducted in 2006 by David Evans and Associates, a consultant for the developer group exploring the feasibility of redeveloping the Point Wells site. That analysis was limited in scope to the NW Richmond Beach Rd corridor. In order to understand the impacts and address early issues raised by residents, Snohomish County decided to take a more comprehensive look at a larger area. A draft SEIS was subsequently prepared by IFC Jones & Stokes.

Modeling Assumptions and Analysis

City of Shoreline staff and consultants initially reviewed the draft SEIS and expressed a number of concerns with the traffic analysis (see attachment A). In particular, Shoreline did not agree with some of the conclusions in the draft SEIS traffic analysis (such as growth rate, trip distribution, and overall mitigation). Therefore, utilizing many of the assumptions from the draft SEIS, Shoreline developed it's own models to that take a more detailed look at Point Wells redevelopment impacts within the City of Shoreline.

In order to develop the more detailed City model, several of assumptions were made. The first assumption is that the PM peak hour resulted in the most significant impacts in the draft SEIS, and therefore the Shoreline model examined the PM peak hour impacts in the updated model.

The next assumption is that Shoreline's Aurora Phase II project will break ground during the 4th quarter of 2009. The Aurora Phase III project, currently in design, will most likely be completed by 2025, the future target year in the draft SEIS. The Shoreline models were configured to incorporate the changes planned through these projects.

The volumes used in the future 2025 base model were taken from the draft SEIS when available. Since the Shoreline analysis modeled additional intersections, the future 2025 background volumes were developed using a 0.25% annual growth rate over existing conditions. The IFC Jones and Stokes model assumed a sustained annual growth rate of approximately 1.5% with some areas even higher. This higher growth rate dilutes the impact of new trips being generated by the proposed development, therefore under estimating mitigation for the development.

Once the model was developed for the year 2025, eight different residential scenarios were created to explore the effects of various levels of residential development and the associated vehicle trips.

Residential vehicle trip generation was determined by using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 7th edition. Vehicle trip generation was estimated for the proposed project using ITE Land Use Code 230, Residential/Townhouse.

All scenarios assumed the same trip generation corresponding to the full build-out of the proposed office and retail for the development which equated to 528 employee general office building and 136,000sf of retail.

The eight different residential scenarios evaluated were chosen based on increasing numbers of residential units in increments of 500 units as follows (again, with office and retail remaining constant through the scenarios):

Total Residential Trips			Total w/ Proposed Office/Retail Trips		
Units	Entering	Exiting	Entering	Exiting	Combined Trips
500	131	64	225	325	550
1000	231	114	325	375	700
1500	322	159	410	415	825
2000	408	200	495	455	950
2500	489	241	590	510	1,100
3000	568	280	675	550	1,225
3220	602	297	710	576	1,286
3500	645	318	760	590	1,350

The eight scenarios also assumed the following mitigation projects along the Richmond Beach Road corridor were in place. The model was configured to include these projects in the baseline and in all scenarios:
- NW Richmond Beach Road at 3rd Avenue NW – widen to provide left turn lanes.
- NW 195th Street & 20th Avenue NW – install new traffic signal
- NW Richmond Beach Road & 15th Avenue NW – install new traffic signal
- Richmond Beach Drive NW & NW 196th Street – all way stop control
- 24th Avenue NW & NW 196th Street – all way stop control

The results of the eight different Point Wells scenarios, in addition to the existing and future 2025 base conditions, are all summarized in attachment B, and the mitigation is discussed below.

Evaluation and Mitigation

Any redevelopment at the Point Wells site will have impacts along the Richmond Beach Rd corridor. These impacts include the increased risk to pedestrians where sidewalks do not exist, and improvement to intersections to maintain an adequate level of service and to maintain safe travel through the intersection. These mitigation projects presented below are in addition to the mitigation projects listed in the draft SEIS. Shoreline's analysis and recommendation below are divided into two categories: Mitigation Projects for All Scenarios and Mitigation Projects Required for 825 Trips and Above. The mitigation costs are summarized in Attachment D.

Mitigation Projects for All Scenarios

1. Multimodal Safety and Corridor Study:
The City of Shoreline Transportation Master Plan, in anticipation of a future development of Point Wells, has identified the need for a corridor study from the Point Wells site, down Richmond Beach Drive NW, then up the corridor to Aurora. This analysis should be funded by the developer and undertaken in cooperation with the City of Shoreline, and the residents and business community on the Richmond Beach Road corridor. The study needs to address multimodal usage (buses, bikes, and pedestrians), capacity and traffic flow, as well as safety improvements and impacts. This analysis should ultimately be approved by Shoreline City Council and would form the basis for developer mitigation.

2. NW196th St between Richmond Beach Dr NW and 24th Ave NW – Sidewalk and Safety:
NW 196th St is a collector arterial with a speed limit of 25 MPH. It consists of two 12 ft wide lanes, one in each direction. The terrain between Richmond Beach Rd NW and 24th Ave NW is made up of a generally uniform grade sloping down towards Richmond Beach Dr NW. There are no sidewalks

Improvements shown include, at a minimum, sidewalks on both sides of the street. Should more than 825 trips (4th Scenario) be approved, a continuous two-way center turn lane should also be required to help maintain traffic flow and improve pedestrian access across NW 196th St. This is a more effective and less expensive mitigation than the four lane option in the draft SEIS.

3. NW196th St between 24th Ave NW and 20th Ave NW – Sidewalk and Safety:
NW 196th St is a collector arterial with a speed limit of 25 MPH. It consists of two 12 ft wide lanes in each direction. The terrain between Richmond Beach Rd NW and 24th Ave NW is made up of a generally uniform grade sloping down towards 24th Ave NW. There is a sidewalk on the north side of the roadway, and part of the south side. A complete continuous sidewalk will be needed for any development at the Point Wells site.

4. NW 195th Street & 20th Avenue NW – Intersection Improvement:
This intersection is currently controlled by stop signs on all approaches. The model assumes this intersection will be signalized as per recommendations in the SEIS.

5. NW Richmond Beach Rd & 15th Ave NW – Intersection Improvement:

This intersection has offset north and south approaches. The south approach is currently controlled by stop signs on all approaches. The model assumes this intersection will be signalized as per recommendations in the SEIS. However, an option in lieu of a traffic signal may be twin roundabouts.

6. NW Richmond Beach Rd & 3rd Ave NW – Intersection Improvement:

NW Richmond Beach has four lanes without room for separate left turn lanes. This is a contributing factor to a number of reported collisions. Widening of NW Richmond Beach Rd will be required to accommodate any increase in trips from the Point Wells development.

7. Richmond Beach Dr NW between NW 196th St and NW 205th St – Sidewalks and Safety:

Richmond Beach Dr NW is a collector arterial with a speed limit of 25 MPH. It is the only road to serve the Point Wells site, and would carry all trips entering and exiting the development. It consists of two 12 ft wide lanes, one in each direction. The terrain between NW 196th St and NW 205th St is made up of a number of horizontal and vertical curves. There are no sidewalks, and only the east side has some areas wide enough to park. The current 50 PM peak hour trips (averaging one car every 72 seconds) allow for numerous gaps in traffic to allow easy pedestrian access along and across Richmond Beach Dr NW. Under existing conditions , even with the lack of sidewalks and pedestrian amenities, the low volume of vehicles can make the area seem friendlier to walkers and recreational bicyclists.

Staff reviewed the impacts of the eight different scenarios, and the increase in PM peak hour volumes in all the scenarios will require roadway safety improvements to mitigate the impacts of the development. *Adding just 550 trips as stated in the SEIS equates to an average of 1 car every 6.5 seconds in the peak hour.*

Improvements should include, at a minimum, a sidewalk on one side of the street. If more trips are approved, additional widening will be required to help maintain traffic flow and improve pedestrian access across Richmond Beach Dr NW.

8. NW Richmond Beach Rd & 8th Ave NW – Intersection Improvement:

This intersection is controlled by a traffic signal. It has five approaches, which adds to overall intersection delay. Should 550 trips or more be approved, this intersection will operate at LOS E or worse. Additional mitigations will be required, such as an intersection reconfiguration to eliminate the SW approach, or possibly a roundabout.

Mitigation Projects Required for 825 Trips and Above

9. Richmond Beach Dr NW & NW196th St – Intersection Improvement:

The model assumes this intersection will utilize additional stop signs to reduce overall driver delay. However, should more than 825 trips (4th Scenario) be approved, additional mitigations may be required, such as a channelized westbound to northbound right turn, an intersection reconfiguration, or even a roundabout. The draft SEIS recommends widening NW 196th St to

four lanes. However, given the movements to and from the Point Wells site, the extra lanes may not be of much benefit at this intersection.

10. NW 196th St & 24th Ave NW – Intersection Improvement:

The model assumes this intersection will utilize additional stop signs to reduce overall driver delay. However, should more than 825 trips (4th Scenario) be approved, additional mitigations may be required, such as an intersection reconfiguration, or even a roundabout.

Attachment C is the City of Shoreline reported collision report from 1/1/2006 to 12/31/2008 sorted by rate.

Shoreline's collision data are based on collision data provided by Washington Department of Transportation (WSDOT); however, there is a difference between the two databases as to how the collision data are assigned to the databases. The City of Shoreline, as do most municipalities, records intersection collisions as those *that actually occur within the intersection area*, in comparison WSDOT's *including all collisions occurring within 20 feet of all approaches and within the entire length of any of the turn pockets for all approaches.*

When comparing results of the collision records from WSDOT's and Shoreline's databases, it is important to understand these differences between how collisions are recorded in the two systems. For example, a collision history request for Richmond Beach Road NW would generate a higher number from WSDOT's database than from Shoreline's for the reasons stated above.

While increased traffic generated by the Point Wells development would likely result in a proportionate increase in the probability of traffic crashes those increases would not necessarily mean an increase in severity. Crash patterns and accident types are influenced by factors other than traffic volumes, such as roadway geometry, speed, and number of lanes, and compliance with regulatory signs and rules of the road. As congestion and the proportionate number of crashes increase, there would tend to be more of a change in crash *types,* such as rear-end accidents rather than a linear increase in crashes.

Appendix

Attachment A – Initial comments on draft SEIS
Attachment B – Summarized results of Models
Attachment C – Crash Data
Attachment D – Mitigation Projects and Estimates