

MEMORANDUM

Date:	November 2, 2009	TG:	09249.00
To:	Chris Benner – Trillium Corporation		
From:	Dan McKinney, Jr. – Transpo Group Stefanie Fishman, PE, PTOE– Transpo Group		
cc:	Pam Andrews – Trillium Corporation Don Kehrer – Kehrer and Associates		
Subject:	Semiahmoo West Preliminary Transportation Study		

The purpose of this memorandum is to present the County with preliminary traffic information related to the proposed Phase 1 development for Semiahmoo West. The project description, trip generation, trip distribution, preliminary concurrency evaluation and operational analysis are provided to allow the County to proceed with the review process.

Project Description

The Semiahmoo Company is proposing to develop Semiahmoo West, a subdivision and Planned Unit Development (PUD) covering approximately 624 acres of land on the uplands of the Birch Point peninsula. The site lies within the unincorporated area of Whatcom County in the Urban Growth Area of the City of Blaine. The proposed Plat of Semiahmoo West has been prepared and submitted. This Plat divides the property into large tracts for future subdivision in accordance with the PUD. It also allows for implementation of Phase 1 of the development of the Semiahmoo West PUD by creating 28 residential lots and associated open space and infrastructure. [Attachment 1](#) shows the site vicinity near the project.

This analysis focuses on the transportation impacts associated with the development of the 28 single-family residential units as part of Phase 1. A site plan is illustrated in [Attachment 2](#).

Roadway System

The following summarizes the existing conditions of roadways serving Birch Bay.

Birch Point Road is a major collector that connects to Semiahmoo Drive to the west and Shintaffer Road to the east. It serves as an extension of Birch Bay Drive and provides connections to and from the Birch Bay Village development. The roadway has two travel lanes. Lane widths are typically 10 to 11 feet in width; a section of the road near Birch Bay Village has narrower travel lanes. Some portions of the roadway have gravel shoulders, ranging between three feet and eight feet wide, and the other portions have paved shoulders ranging between four and six feet wide. The posted speed limit is 30 mph and 45 mph. The primary access point to Semiahmoo West will be via Birch Point Road.

Birch Bay Drive is a two lane rural major collector that ties in to Point Whitehorn Road to the south and to Birch Point Road to the north. It provides connections to the Birch Bay Village and Semiahmoo areas. All-way stop signs control traffic flows at major street crossings. The roadway typically has ten foot lanes and four foot wide paved shoulders. The posted speed limit is 20 mph between May 5 and September 15 and 35 mph the remainder of the year. It provides access to developments and activities along the Birch Bay waterfront.

Shintaffer Road is classified as a major collector between Birch Bay Drive and Lincoln Road in the Birch Bay UGA; north of Lincoln Road, in the Blaine UGA, it is classified as a local street. It

has two lanes of travel ranging between nine and thirteen feet in width. There are narrow gravel shoulders (1 to 2 feet wide) on both sides, about one to two feet wide. The posted speed limit on this roadway is 35 mph. It connects Drayton Harbor Road to the north with Birch Bay Drive to the south.

Harborview Road is a two lane major collector roadway with eleven foot lanes along the majority of the roadway and seventeen foot lanes (combined with paved shoulders) near Drayton Harbor Road. There is no striped delineation between the travel lanes and paved shoulders. Along sections of the roadway there are paved shoulders up to five feet in width. There are also gravel shoulders along other sections ranging between four and six feet wide, while other portions of the roadway have no shoulders. To the north it connects with Drayton Harbor Road and to the south it connects to Birch Bay Drive. The posted speed limit along this road is 40 mph.

Birch Bay-Lynden Road is the primary east-west road, connecting Birch Bay with I-5. It has two lanes between ten and thirteen feet wide. Generally the minor side streets are stop controlled. However, major streets (Harborview Road, Blaine Road, Portal Way, east I-5 ramps) are all-way stop controlled. Some sections of the roadway have paved shoulders, between three and seven feet in width. There are also nine foot wide gravel shoulders along some sections, while other portions of the roadway have little or no shoulders. The posted speed limit along this road is 50 mph between Blaine Road (SR 548) and I-5. To the west the road connects to Harborview Road and to the east to Guide Meridian Road (SR 539). West of Blaine Road the posted speed limit is 40 mph.

Trip Generation

Project trip generation estimates were developed based the average rate contained in the Institute of Transportation Engineers (ITE) *Trip Generation* (8th Edition, 2008). Specifically, the Single Family Residential Land Use # 210 was used. Net new trip generation is based on 28 single-family units. The results are summarized in [Table 1](#).

Table 1. Trip Generation Summary

Single Family Residential (LU 210)	Size (SF)	Rate (DU/SF)	Net New Project Trips ¹		
			Total	In	Out
Daily	28 units	9.57	268	134	134
Weekday AM Peak Hour	28 units	0.75	21	5	16
Weekday PM Peak Hour	28 units	1.01	28	18	10

1. Trip rates from ITE *Trip Generation*, 8th Edition.

As illustrated in [Table 1](#), the development is anticipated to generate 268 daily trips with 21 trips during the weekday AM peak hour and 28 trips during the weekday PM peak hour.

Trip Distribution and Assignment

The distribution and assignment of traffic was estimated based on existing travel patterns and an understanding of the study area. [Attachment 3](#) illustrates the trip distribution and weekday PM peak hour assignment of project traffic in the vicinity of the site. This includes approximately 50 percent to/from Interstate 5 via Birch Bay-Lynden Road, 35 percent to/from downtown Blaine, 10 percent to/from the Birch Bay area, and 5 percent locally.

Traffic Operations

An analysis was conducted at the site access and one off-site intersection (Birch Point Road/ Shintaffer Road) to evaluate the traffic operations with the proposed project during the 2014 horizon year. The level of service (LOS) analysis methodology was based on procedures identified in the *Highway Capacity Manual* (2000), and were evaluated using Synchro 7.0 for intersection analysis.

At stop-sign-controlled intersections, LOS is measured in seconds of delay per vehicle for the worse movement. Traffic operations for an intersection can be described alphabetically with a range of levels of service (LOS A through F), with LOS A indicating free-flowing traffic and LOS F indicating extreme congestion and long vehicle delays.

Existing turning movement counts provided in the *Birch Bay Transportation Planning Study* were used to forecast future 2014 with-project traffic volumes. Future 2014 with-project traffic volumes were determined using a three percent annual growth rate. This is consistent with the growth rate used within the *Birch Bay Transportation Planning Study*.

Table 2 highlights the results of the LOS analysis conducted at the site access for 2009 future with-project conditions. The LOS worksheets are included in **Attachment 4**.

Table 2. 2014 With Project LOS Summary – Weekday PM Peak Hour

Intersection	2014 With Project		
	LOS ¹	Delay ²	WM ³
Site Access / Birch Point Road	B	12.5	SB
Birch Point Road / Shintaffer Road	B	10.7	SB

1. Level of service, based on 2000 *Highway Capacity Manual* methodology.

2. Average delay in seconds per vehicle.

3. Worst movement reported for unsignalized intersections.

As shown in **Table 2**, both the site access and Birch Point Road / Shintaffer Road intersections are anticipated to operate at LOS B during the 2014 with-project weekday PM peak hour conditions. The intersection of Birch Point Road/Shintaffer Road was also shown to operate at LOS B in the Birch Bay Transportation Planning Study.

Concurrency

Whatcom County code requires all developments to complete a concurrency analysis based on procedures identified in the Transportation Concurrency Management (Chapter 20.78). This is to ensure that adequate transportation facilities are available or provided concurrent with development, in accordance with the Growth Management Act (RCW 36.70A.070) and consistent with WAC 365-195-510 and 365-195-835. The County will complete their concurrency assessment based on the trip generation and assignment information provided in **Attachment 3**. Specifically, the roadway links that are impacted by 10 or more weekday PM peak hour trips in one direction will be evaluated.

As a preliminary assessment, the capacities of the links impacted by 10 or more peak hour trips in one direction were evaluated as shown in Table 3. The forecasted volumes were derived using the same three percent growth rate and project volumes as completed in the traffic operations section above. This growth rate accounts for pipeline traffic and general growth anticipated in the Birch Bay area.

As shown in Table 3, 2014 with-project weekday PM peak hour traffic volumes along the study roadway segments are anticipated to be below the capacity threshold and meet the capacity standard set by the County.

Table 3. Peak Direction Roadway Link Capacity Analysis – Weekday PM Peak Hour

Roadway	Segment	Existing Volume	2014 With-Project Volume	Capacity Threshold ¹	Future (2014) V/C Ratio	Roadway Capacity Standard ²
Birch Point Rd	Site Access – Shintaffer Rd	245	303	783	0.39	0.75
Birch Point Rd	Shintaffer Rd – Harborview Rd	180	217	783	0.28	0.90
Harborview Rd	Birch Bay Dr – Birch Bay-Lynden Rd	450	530	882	0.60	0.90
Birch Bay-Lynden Rd	Harborview Rd – Blaine Rd	470	555	864	0.64	0.90

1. Based on Whatcom County Concurrency spreadsheet.

2. Whatcom County roadway capacity standard as set by the concurrency program.

Summary

Based on a preliminary analysis of intersections and roadway link capacities, the development of 28 single family homes would likely not have a significant impact on traffic operations in the area. This preliminary information will be reviewed by Whatcom County staff to verify that the project meets the adopted concurrency thresholds and determine if additional transportation analysis will be required.

/Attachment



NOT TO SCALE



Site Vicinity

Semiahmoo Spit Master Plan

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ATTACHMENT

1



NOT TO SCALE



Proposed Site Plan

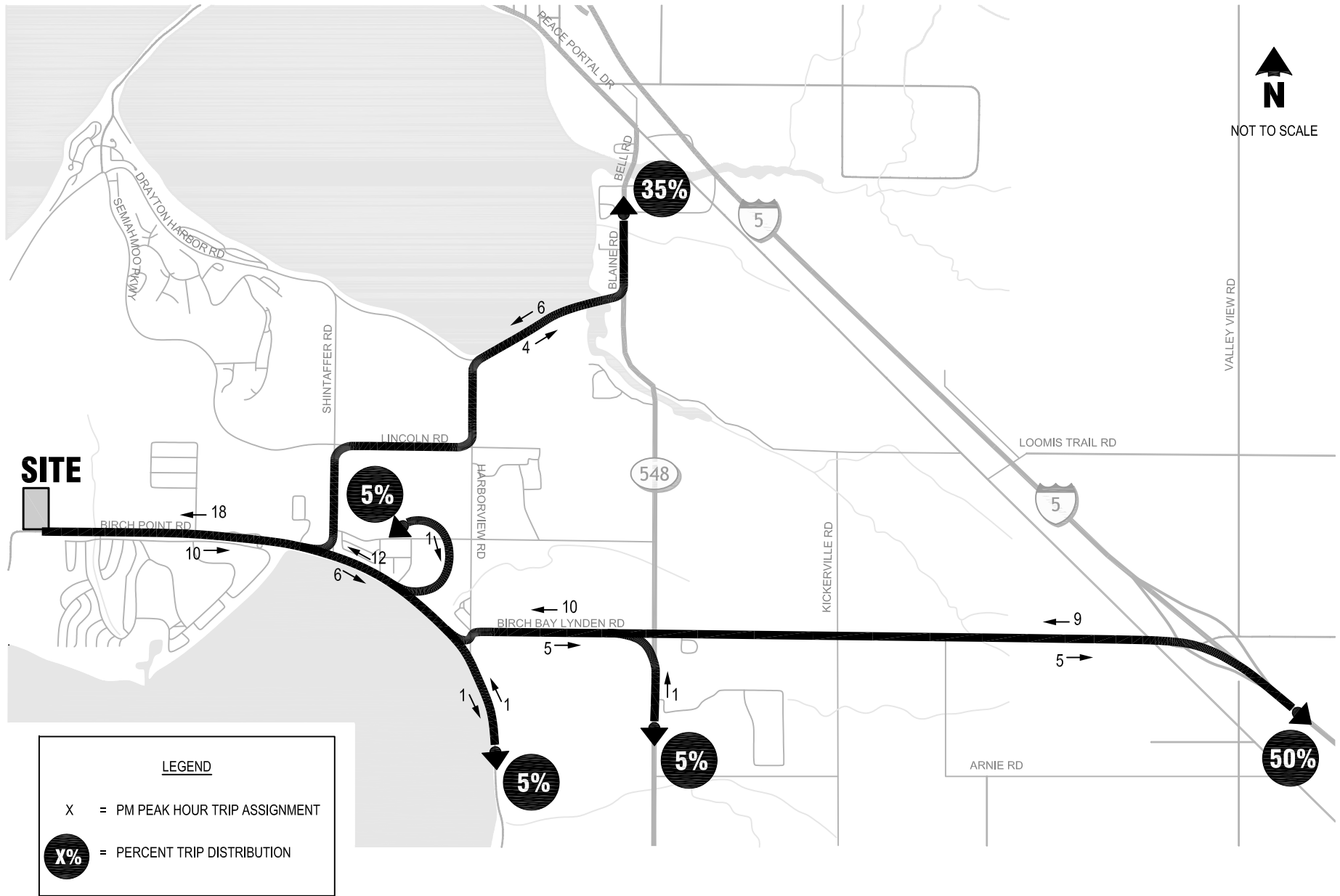
Semiahmoo West

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ATTACHMENT



2



Trip Distribution and Assignment

Semiahmoo West

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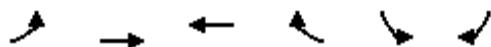
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3

HCM Unsignalized Intersection Capacity Analysis

3: Birch Bay Dr & Site Access

11/2/2009



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↕	
Volume (veh/h)	0	215	285	18	10	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	234	310	20	11	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	329				553	320
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	329				553	320
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	100
cM capacity (veh/h)	1230				494	721

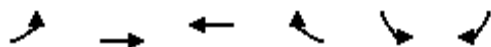
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	234	329	11
Volume Left	0	0	11
Volume Right	0	20	0
cSH	1230	1700	494
Volume to Capacity	0.00	0.19	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	12.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	12.5
Approach LOS			B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		26.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

2: Birch Bay Dr & Shintaffer Rd

11/2/2009



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	49	161	202	15	15	81
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	55	181	227	17	17	91
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	244				526	235
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	244				526	235
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				97	89
cM capacity (veh/h)	1334				494	809

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	236	244	108
Volume Left	55	0	17
Volume Right	0	17	91
cSH	1334	1700	735
Volume to Capacity	0.04	0.14	0.15
Queue Length 95th (ft)	3	0	13
Control Delay (s)	2.1	0.0	10.7
Lane LOS	A		B
Approach Delay (s)	2.1	0.0	10.7
Approach LOS			B

Intersection Summary			
Average Delay		2.8	
Intersection Capacity Utilization		38.6%	ICU Level of Service
Analysis Period (min)		15	A