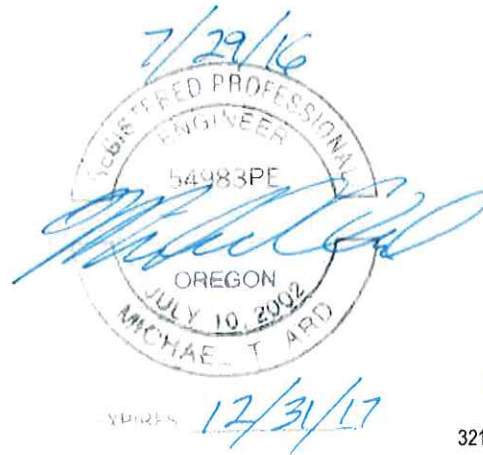


TECHNICAL MEMORANDUM

TO: Jabra Khasho, City of Beaverton
FROM: Michael Ard, PE
DATE: July 29, 2016
SUBJECT: 75th Terrace Transportation Analysis



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This memorandum reports the findings of a transportation analysis for the area surrounding the proposed 75th Terrace subdivision in Beaverton, Oregon.

Project Description

The proposed nine-lot subdivision will be located on tax lots 1S112AB 4300, 4500, and 4703, which are zoned R-7 by the city of Beaverton.

Based on data from the ITE Trip Generation Manual, the addition of nine single-family dwellings would be projected to result in seven new trips during the morning peak hour, with two entering and five exiting the site. During the evening peak hour, nine new trips would be projected with six entering and three exiting the site. Based on the minimal addition of site trips resulting from the proposed development, a detailed traffic impact study is not required for the proposed subdivision.

Although the proposed development will not result in significant added traffic volumes to area streets and intersections, it is notable that the proposed development will extend the existing SW 75th Terrace alignment to intersect SW Canyon Lane on the north side of the proposed development. This street extension will result in a continuous two-way street connection between SW Canyon Road and SW Canyon Lane. Accordingly, existing residents in the immediate vicinity have expressed concerns regarding the potential for people traveling in the vicinity to use SW 75th Terrace in conjunction with SW Copel Street as a cut-through travel route.

Upon completion of the proposed development, a continuous street connection will be available along the entire length of SW 75th Terrace and the extreme east end of SW Copel Street that connects SW Canyon Road to SW Canyon Lane. This connection will have a length of approximately 1,150 feet.

Existing Vicinity Streets and Intersections

SW Canyon Road is a four-lane roadway classified by the Oregon Department of Transportation as a District Highway, and by the City of Beaverton as an Arterial. It generally has two through travel lanes in each direction with a posted speed limit of 40 mph between the northeast and southwest ends of SW Canyon Lane.

Jabra Khasho
July 29, 2016
Page 2 of 5

SW Canyon Lane is a two-lane roadway approximately 1.15 miles long that connects to SW Canyon Road at the northeast and southwest ends of the street. It is classified by the City of Beaverton as a Neighborhood Route. It has a posted speed limit of 25 mph. Speed humps are in place at regular intervals between SW Canyon Road and SW West Slope Drive, which provides a connection to West Sylvan Middle School and West Sylvan Park.

SW 75th Terrace is a local residential street with a statutory residential speed limit of 25 mph. It has a single travel lane in each direction, with no center-line striping. It has sidewalks in place along both sides of the roadway and currently terminates with a type 3 barricade at the south end of the proposed development.

SW Copel Street is a local residential street with a statutory residential speed limit of 25 mph. It has a single travel lane in each direction with no center-line striping. It has sidewalks only on the north side of the roadway from SW Canyon Road to 110 feet west of SW 75th Terrace. It connects to SW 76th Avenue and SW Memory Lane west of SW 75th Terrace, but none of these streets currently connect to any point of ingress/egress other than the intersection of SW Canyon Road at SW Copel Street.

The intersection of SW Copel Street at SW 75th Terrace is an uncontrolled T-intersection. Entering vehicles must use caution and generally must yield to vehicles that have previously entered the intersection as well as traffic on the right.

The intersection of SW Copel Street at SW Canyon Road is a T-intersection operating under stop control for the eastbound Copel Street approach. Through traffic traveling along SW Canyon Road does not stop.

West Sylvan Middle School

The west Sylvan Middle School campus is located at the west end of SW West Slope Drive, west northwest from the proposed nine-lot subdivision. It accommodates approximately 950 children in grades 6 through 8. The school is located near the extreme west end of the enrollment boundary, and draws students from Chapman, Forest Park, Ainsworth, Bridlemile and the Spanish Immersion schools. School generally is in session from 9:15 AM to 3:45 PM, with doors opening at 9:00 AM.

Other Existing Conditions of Note

Although not expected to directly serve the proposed development, examination of existing streets in the site vicinity revealed that most streets intersecting SW Canyon Road between the northeast and southwest ends of SW Canyon Lane are dead-end roadways. The two exceptions are SW Crestdale Drive on the east side of SW Canyon Road which connects to SW Canyon Drive and SW Linden Road, which connects to SW West Point Drive, which in turn connects to SW Canyon Lane. The existing street system therefore generally does not provide connections between SW Canyon Road and other through streets connecting to the greater street network. Notably, both SW Crestdale Drive and SW Linden Road are limited to one-way traffic traveling away from SW Canyon Road where



Jabra Khasho
July 29, 2016
Page 3 of 5

they connect. This one-way restriction limits opportunities for cut-through traffic and ensures that the intersections do not accommodate vehicles entering SW Canyon Road.

Crash history was also examined for the intersection of SW Canyon Road at SW Copel Street in order to determine whether there have been crashes that may be indicative of design concerns. The crash history examined was for the most recent five years for which complete data is available, from January 2010 through December 2014. Based on the crash data, there were three reported crashes during the five-year analysis period. These included two rear-end collisions and one fixed-object collision. The crashes resulted in no serious injuries or fatalities, although two of the collisions resulted in a "possible injury/complaint of pain". No apparent existing design deficiencies were identified which could have contributed to the crash history.

Traffic Volumes Without Cut-Through Traffic

The existing neighborhood served by the SW Copel Street access to SW Canyon Road consists of 40 homes. Under existing conditions, these homes must all use SW Copel Street to access SW Canyon Road for trips to and from the neighborhood. This results in approximately 400 daily trips on SW Copel Street immediately west of SW Canyon Road.

Upon completion of the proposed nine-lot subdivision, some of the trips to and from the existing neighborhood would be expected to divert to the new travel path, although most would continue to use SW Copel Street to reach SW Canyon Drive. The added trips from the proposed subdivision would be expected to result in a slight increase in overall daily traffic volumes, with approximately 450 daily trips on SW Copel Street west of SW Canyon Road.

Future Cut-Through Traffic Sources

In considering the potential volume of cut-through traffic along the proposed SW 75th Terrace extension, it is critical to assess the potential sources and destinations of cut-through traffic. One potential primary source of cut-through traffic is West Sylvan Middle School. Due to the school's location at the west end of the enrollment boundary, nearly all trips to and from the school are expected to travel to and from the northeast. The homes in the vicinity of SW Canyon Road and SW Canyon Drive that could benefit from a cut-through route along the SW 75th Terrace alignment represent approximately 20 percent of the homes within the enrollment boundary for Bridlemile Elementary School, or approximately five percent of the total enrollment at West Sylvan Middle School.

For the remainder of students not living within the above-described area, a cut-through connection along the SW 75th Terrace alignment would represent an increased travel distance of approximately 74 percent as compared to using the northeast end of SW Canyon Lane directly to reach SW West Slope Drive. Additionally, the travel route along SW 75th Terrace requires approximately 40 percent more travel time either to or from the school. Accordingly, most trips to and from the West Sylvan Middle School campus would not be expected to utilize the newly extended SW 75th Terrace street connection.



Since students traveling longer distances to school are more likely than average to ride the school bus, the five percent of students living within the area that could benefit from a cut-through travel path along SW 75th Terrace are two to three times more likely than average to arrive at the school by being dropped off by parents.

In addition to school trips, some trips to and from residences in the site vicinity that currently utilize SW Canyon Lane could divert to SW 75th Terrace. However, the most direct travel paths to and from destinations to the northeast and southwest along SW Canyon Road generally are directly via SW Canyon Lane rather than through SW 75th Terrace. Accordingly, no significant diversion of existing residential trips from the site vicinity is anticipated.

Projected Total Future Traffic Volumes

Based on the analysis of likely future cut-through traffic sources, it is projected that future cut-through traffic could represent approximately 200 added daily trips along SW 75th Terrace and the east end of SW Copel Street. In total, SW 75th Terrace would be projected to accommodate approximately 200-400 daily trips, and SW Copel Street east of SW 75th Terrace would be projected to accommodate approximately 500-700 daily trips. The lower end of these ranges represents conditions if few people use the potential cut-through route, and the upper end represents conditions if nearly all people that could benefit from the new street connection utilize it.

It should be noted that SW Copel Street west of SW 75th Terrace is projected to accommodate approximately 290 trips per day, similar to existing conditions, since it will not be part of any potential cut-through route and will not experience traffic increases associated with the proposed nine-lot subdivision.

Based on the analysis, the daily traffic volumes along streets in the site vicinity will generally be below 500 trips per day. The only segment that would be projected to experience traffic volumes in excess of 500 trips per day is the approximately 85-foot-long segment between SW Canyon Road and SW 75th Terrace. Notably, this road segment has no homes that front along either side of the roadway. Additionally, the total traffic volume anticipated along this road segment is still projected to be well below the 1,000 trips-per-day threshold typically used to assess livability of local neighborhood streets.

Other Considerations

The proposed street cross-section for the new extension of SW 75th Terrace from its existing northern terminus to SW Canyon Lane includes a narrowed mid-block width or “choker” treatment. Although most of the new street will have a width of 32 feet from curb to curb, the width within the choker will reduce to as little as 20 feet. This width is sufficient for safe emergency vehicle access to and through the community, but serves to visually narrow the roadway and acts as a traffic calming measure. The narrowed section reinforces to drivers that this is a residential neighborhood where high speeds and high volumes of traffic are not appropriate.



Jabra Khasho
July 29, 2016
Page 5 of 5

In addition to consideration of likely future cut-through traffic under normal conditions, it is appropriate to consider the potential for congestion along SW Canyon Lane to increase travel times such that the new SW 75th Terrace alignment becomes a viable alternate route for both school and neighborhood traffic. Recent observations of existing conditions in the site vicinity revealed no significant congestion that would result in such diversions during the morning and evening peak hours; however direct observations were not conducted while school was in session. If during the peak periods of school activity the intersection of SW Canyon Road at SW Canyon Lane has significant queues, traffic volumes in excess of those described above could divert to SW 75th Terrace. Accordingly, it may be appropriate to monitor conditions while school is in session to confirm that further traffic-calming treatments will not be needed to mitigate for congested conditions that occur outside the summer season. If traffic volumes and speeds that are not appropriate for the street are experienced, additional traffic-calming measures can be implemented such as speed humps and turning-movement restrictions. These measures would serve both to reduce the maximum reasonable travel speeds along the street and reduce the potential utility of using the street for cut-through traffic.

Conclusions

Based on the detailed analysis, the connection of SW 75th Terrace through the proposed nine-lot subdivision to SW Canyon Lane could result in an increase of 200 daily trips along SW 75th Terrace and along SW Copel Street between SW 75th Terrace and SW Canyon Road. This increase in traffic will be noticeable to residents, but is well within the safe and comfortable carrying capacity of local residential streets.

Since traffic conditions were observed and monitored during the summer season, it may be appropriate to verify that SW Canyon Lane does not suffer from significant congestion at the periods of peak school activity during the school year. A mid-block choker which reduces the road width from 32 feet to 20 feet will be provided as a traffic-calming measure along the new street connection. This treatment will visually reinforce that SW 75th Terrace is a residential street, and help to reduce both cut-through traffic volumes and vehicle speeds. If significant congestion does occur, it may be appropriate to implement additional traffic calming measures such as speed humps and/or turning movement restrictions in order to maintain safe, livable streets within the existing and proposed residential communities.

If you have any questions regarding this information, please don't hesitate to contact me directly.

APPENDIX

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TRIP GENERATION CALCULATIONS

Land Use: Single-Family Detached Housing
Land Use Code: 210
Variable: Dwelling Units
Variable Value: 9

AM PEAK HOUR

Trip Rate: 0.75

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	2	5	7

PM PEAK HOUR

Trip Rate: 1.00

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	6	3	9

WEEKDAY

Trip Rate: 9.52

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	43	43	86

SATURDAY

Trip Rate: 9.91

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	45	45	90

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TRIP GENERATION CALCULATIONS

Land Use: Middle School/Junior High School
Land Use Code: 522
Variable: Students
Variable Value: 956

AM PEAK HOUR

Trip Rate: 0.54

	Enter	Exit	Total
Directional Distribution	55%	45%	
Trip Ends	284	232	516

PM PEAK HOUR

Trip Rate: 0.16

	Enter	Exit	Total
Directional Distribution	49%	51%	
Trip Ends	75	78	153

WEEKDAY

Trip Rate: 1.62

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	774	774	1,548

PM PEAK HOUR OF GENERATOR

Trip Rate: 0.31

	Enter	Exit	Total
Directional Distribution	45%	55%	
Trip Ends	133	163	296

CDS380
07/29/2016

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF BEAVERTON, WASHINGTON COUNTY, 01/01/2010 to 12/31/2014

CITY OF BEAVERTON, WASHINGTON COUNTY

Total crash records: 3

SR	PR	RS	W	CLASS	CITY STREET	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR CITY	MOVE	FROM	TO	# TYPE	SURTY	E X RES	LOC	ERROR	ACT EVENT	CRUSE
NO	RPT	N	N	DATE	FIRST STREET	LOC	(MEDIAN)	TRAF-	RNDBT	DRY	COLL	TRF	OWNER	FROM	TO	DRVR	INJC	A S	E LICNS	PED			
				TH	SECOND STREET	LOC	(LANES)	CONF	DRY	LIGHT	SURTY	VA TYPE											
05923	N	N	N	10/09/2014	SW CANYON RD	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE	0	STREET	SW-NE	01 DRVR	INJC	43 F	OR-Y	052,026	026	32	
				2P	SW COPEL ST	SW	0	STOP SIGN	N	DAY	INJ	PSNGR CAR		SW-NE									
												02 NONE	0	STOP	SW-NE	01 DRVR	INJC	38 F	OR-Y	000	000	00	
												PRVTE	PSNGR CAR										
02590	Y	N	N	05/27/2010	SW CANYON RD	INTER	3-LEG	N	Y	RAIN	FIX OBJ	01 NONE	0	TURN-L	SW-W	01 DRVR	NONE	17 M	OR-Y	050,001,081	017	30,08	
				5P	SW COPEL ST	W	0	STOP SIGN	N	WET	FIX	PRVTE		SW-W									
												PSNGR CAR											
07506	N	N	N	07/06/2012	SW CANYON RD	INTER	3-LEG	N	N	CLR	S-1STOP	01 NONE	0	STREET	W-E	01 DRVR	INJC	36 F	OR-Y	043,026	000	07	
				3P	SW COPEL ST	W	0	STOP SIGN	N	DAY	INJ	PRVTE		W-E									
												PSNGR CAR											
												02 NONE	0	STOP	W-E	01 DRVR	NONE	59 M	OR-Y	000	000	00	
												PSNGR CAR											

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.