

December 13, 2016

Steve Regner, Associate Planner
Community Development Department
City of Beaverton
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RECEIVED

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**City of Beaverton
Planning Services**

**RE: Responses to November 28, 2016, Loftis Appeal
75th Terrace Subdivision –File Nos. APP2016-0004/LD2016-0017/TP2016-0010/SDM2016-0008**

Dear Mr. Regner,

We are in receipt of the November 28, 2016, Loftis Appeal to the Director's Decision on Casefiles LD2016-0017/TP2016-0010/SDM2016-0008 for 75th Terrace. The Loftis letter raises concerns about potential cut-through traffic with the extension of SW 75th Terrace to SW Canyon Lane, particularly related to school traffic. The original application included a Transportation Analysis Memo from Lancaster Engineering that reviewed existing traffic conditions during the summer months. The Loftis appeal states that traffic observations should be made when school is in session. It should be noted that while Lancaster's observations were completed during summer months, school traffic was estimated based on the number of students and the attendance boundaries.

While the Transportation Analysis was not a required submittal, the Applicant was aware of concerns of cut-through traffic and hired Lancaster to prepare an analysis of the area. After receipt of the appeal, Lancaster scheduled to complete additional AM and PM conditions during active school days. Unfortunately, school was cancelled due to snow on the morning of the scheduled observation. Lancaster has now completed their analysis, and provided the attached memo. Please note that the additional traffic observations were completed for the school morning and afternoon peak periods. The evening peak period was already observed with no impact from the school.

Please do not hesitate to call or email with additional questions or concerns.

Sincerely,

AKS ENGINEERING & FORESTRY, LLC



Mimi Doukas, AICP, RLA – Associate

Attachment: Dec 13, 2016 Memo from Lancaster Engineering
Cc: Mike Biggi

TECHNICAL MEMORANDUM



TO: Jabra Khasho, City of Beaverton
FROM: Michael Ard, PE
DATE: December 13, 2016
SUBJECT: 75th Terrace Transportation Analysis Update

EXPIRES: 12/31/17

**LANCASTER
ENGINEERING**

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This memorandum reports additional findings related to the proposed 75th Terrace subdivision in Beaverton, Oregon. Specifically, area residents had expressed concerns that observations of traffic conditions in the site vicinity were conducted while school was not in session. While traffic volumes associated with the nearby West Sylvan Middle School campus were projected in our analysis, we were unable to directly observe queuing during the peak periods of school activity at the intersection of SW Canyon Road and SW Canyon Lane. Since school queues may impact route selection during the school peak periods, additional observations were undertaken to determine how school traffic will impact traffic conditions and cut-through traffic potential along SW 75th Terrace.

As previously described in our prior analysis, 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. 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.

Since most students live in areas to the northeast of the campus, school traffic generally enters the area by traveling southbound on SW Canyon Road, turning right onto SW Canyon Lane, and turning right onto SW West Slope Drive. These turning movements and roadways are relatively free-flowing during all hours, and no entering trips would be expected to divert to the new SW 75th Terrace street connection.

Vehicles exiting the campus generally travel east on SW West Slope Drive, turn left onto SW Canyon Lane, then turn left onto SW Canyon Road at the traffic signal. Since some congestion may occur along this route, there is a potential for vehicles to divert from this travel route to the new SW 75th Terrace alignment.

It was noted in our prior analysis that approximately 400 daily trips enter and exit SW Copel Street at Canyon Road under existing conditions. It was projected based on the added trips from the proposed nine-lot subdivision that this volume would increase to approximately 450 daily trips, and cut-through traffic could increase the total traffic volumes to between 500 and 700 daily trips. This estimate is now refined based on the observations conducted while school was in session.

Schools generate their highest traffic volumes during the morning from about 20 minutes prior to the start of the school day to about 5 minutes after classes begin, and during the afternoon from about 5 minutes prior to school release to about 20 minutes after school release. Accordingly, observations

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were made from about 8:30 AM to 9:20 AM and from 3:30 PM to 4:10 PM. The timing of these observations ensured that there were no queues present prior to the start of the observations, and operations were actively observed until after all school-related queuing and congestion had cleared.

Morning Peak Observations

Morning peak hour observations related to school traffic were conducted on December 13, 2016 starting at 8:30 AM. At the start of the observation period there was little demand on the eastbound approach of SW Canyon Lane to SW Canyon Road, with approaching queues clearing on every cycle of the traffic signal. Some traffic congestion is present northbound along SW Canyon Road; however the northbound queues cleared at 8:55 AM (before the school doors first open to students at 9:00 AM), and adequate capacity was available to serve all traffic on all intersection approaches prior to the start of the school peak.

Eastbound traffic volumes increased as a result of school traffic starting at about 9:01 AM, with the average eastbound queue increasing from 1-4 vehicles to 5-10 vehicles per signal cycle. The eastbound approach cleared during nearly every cycle of the traffic signal even with the addition of school traffic. The exception was from 9:07 to 9:10 AM, when the eastbound queues did not clear for two consecutive cycles. Even as bus traffic was added to the eastbound traffic flow, significant queues did not occur.

Based on the observations of existing morning peak hour traffic, no significant diversion of exiting trips to SW 75th Terrace would be anticipated during the morning peak hour. The only vehicles that would be expected to utilize the new connection would be those with destinations directly accessed via the new street. Accordingly, our prior analysis properly accounted for the impacts of the school on cut-through traffic during the morning peak period.

Afternoon Peak Observations

Although total school-related traffic volumes are typically higher during the morning peak hour than during the afternoon peak, the intensity of the peak traffic demands may be higher for a brief period of time in the afternoon since many parents wait at the school prior to school release, exiting simultaneously as quickly as students can load into their respective vehicles. Accordingly, exiting queues have the potential to be more significant during the afternoon peak despite the lower overall traffic volumes.

Afternoon peak hour observations related to school traffic were conducted on Wednesday December 7, 2016 starting at 3:30 PM. Similar to the morning peak hour observations, at the start of the observation period there was little demand on the eastbound approach of SW Canyon Lane at SW Canyon Road, with approaching queues clearing on every cycle of the traffic signal.

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Eastbound traffic volumes increased as a result of school traffic starting at about 3:50 PM (5 minutes after school release time), with the average eastbound queue increasing from 2-3 vehicles to 10 vehicles at that time. Notably, the signal can accommodate 10-11 eastbound vehicles per traffic signal cycle. The eastbound approach consistently cleared until 3:53 PM, at which point longer queues began to accumulate eastbound approaching SW Canyon Road as more vehicles arrived per cycle than could be served. School-related traffic resulted in a continuous standing queue on the eastbound approach from 3:53 PM until 4:07 PM. During this period of congestion there is the potential for eastbound traffic to divert to the new SW 75th Terrace connection if it will provide faster service than waiting in the eastbound queue at the traffic signal.

As traffic diverts to SW 75th Terrace, the nearly all diverted trips would be expected to ultimately turn left from SW Copel Street eastbound to SW Canyon Road northbound, since nearly all traffic arriving at the traffic signal is turning right during the school peak period. The average delay for eastbound left-turns from SW Copel Street to SW Canyon Road was estimated to be 25 seconds. Accordingly, during the 14-minute period of queuing and congestion the intersection could accommodate up to 33 left-turning vehicles. This represents an upper-bound to the potential traffic diversion, since if more vehicles diverted they would experience a higher average delay than if they had remained on SW Canyon Lane.

Based on the afternoon peak period observations, it is anticipated that between 5 and 33 vehicles would divert to SW 75th Terrace during the afternoon peak period with the new street connection completed.

Projected Total Future Traffic Volumes

Based on the analysis of likely future cut-through traffic sources and the additional school observations, it is projected that future cut-through traffic could represent approximately 230 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 205-430 daily trips, and SW Copel Street east of SW 75th Terrace would be projected to accommodate approximately 505-730 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.

Similar to the prior analysis results, 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.



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Other Considerations

Previously we had recommended monitoring of traffic conditions following completion of the street connection, and assessing the potential need for traffic calming treatments if there are high volumes of diverted traffic, or to reduce travel speeds along the residential street if traffic is traveling at unsafe speeds. In addition to these considerations, our observations of operation of the traffic signal at SW Canyon Road and SW Canyon Lane during the school peak period led to some potential recommendations for improving operation and serving the school demands more efficiently.

It was noted that although the green time provided for the eastbound approach was generally sufficient for the observed demands during the morning peak period, there was a 14-minute period where the green time provided was not sufficient to clear the queues during the afternoon peak. During this time of day through traffic volumes along SW Canyon Road are not particularly heavy. Accordingly, it may be possible to re-time the intersection to provide additional green time for the eastbound approach, thereby reducing congestion in the vicinity of the signal, improving overall operation, and reducing the potential for queues to lead to undesired cut-through traffic on the new SW 75th Terrace connection.

Additionally, it was noted that occasionally only 1-6 vehicles would make it through the intersection from the eastbound queue during the green time despite having more vehicles waiting in the queue. In several instances it was observed that the green terminated early due to "gapping out", which occurs when there is not a vehicle on the eastbound detector and the intersection returns to major-street green since there is no apparent demand on the side-street approach. This situation represents a problem with detection, which could be corrected by either increasing the gap time for the eastbound approach or providing additional detection. Either of these actions would be expected to significantly decrease the amount of wasted capacity on the eastbound approach, and again would be expected to reduce congestion, queueing and cut-through traffic.

Conclusions

Based on the additional analysis of traffic conditions during school operation, the connection of SW 75th Terrace through the proposed nine-lot subdivision to SW Canyon Lane could result in an increase of 230 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. The results of the original analysis remain valid.

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

