

Technical Memorandum

To: Kelly Reid, AICP, City of Oregon City
From: Jessica Hijar; Brian Davis; Todd Mobley, PE
Date: October 25, 2019
Subject: Gardiner Middle School Replacement
Traffic Impact Study Addendum #1



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Introduction

This memorandum is prepared in response to the Determination of Application Incompleteness, dated October 23, 2019 from the City of Oregon City. The memorandum also serves as an addendum to the original Traffic Impact Study¹ (TIS) prepared in support of Gardiner Middle School, clarifying the impacts to the neighborhood per the City's letter.

Page two of the incompleteness notice identifies three specific items that are requested in order to deem the application complete. These are:

- a. *More information on vehicle queuing on Williams. How will it compare to what is currently experienced on Hood and Ethel?*
- b. *More information on how vehicles will interact with students walking and biking to school on Williams Street and at the driveway and circulation areas on the site.*
- c. *A turning template for the driveway entrance from Williams Street to the drop off area and parking lot.*

Responses to each of these three items are flagged in the appropriate sections below. Additional information is also provided regarding school traffic circulation changes and impacts within the neighborhood relative to both passenger vehicle and bus traffic. Characteristics and the conditions of the primarily affected streets in the neighborhood are also addressed. These additional items were not flagged as necessary for completeness, but are provided as additional information and evidence.

School Traffic on Neighborhood Streets

The main roads that serve school traffic within the neighborhood are Ethel Street, Hood Street, Williams Street, and Leonard Street. The characteristics of these roadways are provided in the following table.

¹ *Gardiner Middle School Replacement*, Traffic Impact Study, dated September 18, 2019 by Lancaster Engineering



Table 1: Summary of Neighborhood Street Characteristics

Street Name	Jurisdiction	Classification	Speed (MPH)	Curbs	Side-walks	On-Street Parking	Bike Lanes
Ethel Street	Oregon City	Local Road	25	No	No	No	No
Hood Street	Oregon City	Local Road	25	Partial	Partial	Yes	No
Williams Street	Oregon City	Local Road	25	No	No	Partial	No
Leonard Street	Oregon City	Local Road	25	No	No	Yes	No

The existing site configuration routes all passenger vehicles and buses entering the site via Hood Street and exiting via Ethel Street. The proposed new access configuration would route all school bus traffic onto Hood Street for both ingress and egress movements. For other automotive traffic including both faculty/staff trips and car-based pick-up and drop-offs, the proposed new configuration would route traffic onto Williams Street for both ingress and egress movements. Accordingly, Williams Street is projected to see an increase in passenger vehicle traffic with the school replacement project.

As explained in the TIS, the trip generation of the school is based upon enrollment and district boundaries that are unaffected by the proposal, and accordingly, the number of site trips generated by the new layout of the school will be comparable to the existing school. However, the distribution of site trips within the neighborhood will change due to the altered access configuration. A summary of the observed number of bus trips and total trips on Ethel Street, Hood Street, and Williams Street under existing conditions, and the projected volumes for the new facility during its first year of operation are shown in Table 2. It should be noted that the school is currently served by twelve 40-foot buses and four 30-foot buses.

Table 2: Traffic Volumes under Existing and Proposed Conditions

	Passenger Vehicle & Bus Trips (bus trips shown in parentheses)		
	Ethel Street	Hood Street	Williams Street
Existing Configuration			
Morning Peak Hour	176 (7)	193 (10)	98 (0)
Afternoon Peak Hour	105 (9)	104 (11)	78 (1)
Evening Peak Hour	54 (0)	64 (0)	23 (0)
Proposed Configuration			
Morning Peak Hour	46 (0)	46 (17)	373 (0)
Afternoon Peak Hour	30 (0)	28 (21)	229 (0)
Evening Peak Hour	14 (0)	14 (0)	112 (0)
Net Change			
Morning Peak Hour	-130 (-7)	-147 (+7)	+275 (0)
Afternoon Peak Hour	-75 (-9)	-76 (+10)	+151 (0)
Evening Peak Hour	-40 (0)	-50 (0)	+89 (0)



Under existing conditions, vehicles will sometimes use Leonard or Johnson Street to access Linn Avenue via Hood or Williams Street when the intersection of Linn Avenue at Ethel Street is congested. Similarly, people may use these streets to access Linn Avenue farther north when the intersection of Linn Avenue and Williams Street is congested during the short-duration school peak. However, this constitutes only a small portion of site trips under existing conditions. Further, most site trips arrive from and depart toward the south along Linn Avenue, so it is likely that a smaller number of trips will divert due to congestion following the reconfiguration. Thus, Johnson and Leonard Streets are not projected to see a significant difference in traffic volumes resulting from the proposal.

Configuration & Condition of Neighborhood Streets

There are two existing homes and two existing businesses which have driveways fronting Ethel Street. Seven homes, one business, and one apartment complex have driveways that front Hood Street. Three driveways associated with the First Presbyterian Church front Williams Street in addition to three existing homes. Since there are a higher number of driveways along Hood Street, concentrating a greater proportion of site traffic along Williams Street is appropriate and will reduce the overall impacts to the neighborhood, considering all three east/west streets.

Pavement condition is similar along Hood and Williams Streets. Both streets are in relatively poor condition, with significant alligator cracking occurring along the length of both streets east of Linn Avenue. The pavement condition along Ethel Street is slightly better, however alligator cracking and other signs of fatigue are still visible along its length at a less pronounced intensity than other streets. There is not expected to be a significant difference in safety or maintenance needs along Hood or Williams Streets resulting from the new circulation pattern.

Vehicle Queuing

Response to completeness item: a. More information on vehicle queuing on Williams. How will it compare to what is currently experienced on Hood and Ethel?

Under existing conditions, significant queues are sometimes observed along Hood Street. This occurs primarily during the afternoon peak hour when parents arrive to pick-up students. The linear configuration of the school's parking lot parallel to Leonard Street and the existing parking lot east of Hood Street exacerbate current queuing issues, creating a variety of conflicting movements, each of which cause delays and resulting queuing downstream. Further, under existing conditions buses and cars both arrive and depart along the same route; this extends queues due to the size and number of buses and creates an additional conflict where buses re-enter public right of way at the eastern end of Ethel Street.

The proposed new access configuration is intended to mitigate these existing issues by providing a longer and more organized pick-up and drop-off zone. The new configuration includes significantly more on-site queue



storage, and parking is organized such that there are far fewer conflicts between vehicles entering and exiting parking spaces and those circulating through the pick-up/drop-off areas.

Further, by separating bus traffic from private vehicles by routing the former onto Hood Street, lengths of queues are expected to be further reduced. There are twelve 40-foot buses and four 30-foot buses anticipated by the school. Generally, 30 to 40-foot buses are about twice as long as a typical passenger vehicle. Thus, rerouting the buses is equivalent to removing approximately 32 passenger vehicles—about 15% of all afternoon peak hour private traffic—in terms of the impacts to queuing.

It is noted that the proposed bus access on Hood Street has enough storage for all buses to queue within the site without impacting public streets. Thus, the impacts to the neighborhood due to queuing, particularly along Hood Street, are expected to be significantly less following redevelopment than under existing conditions.

Williams Extension & Site Access

Response for completeness item: c. A turning template for the driveway entrance from Williams Street to the drop off area and parking lot.

Turning movements to and from Williams Street were examined using the standard design passenger design vehicle “P” from AASHTO. The turning movement analysis was conducted using AutoTURN software. As shown in Figure 1, passenger vehicles can access the site without impeding opposing traffic flow.



Figure 1: AutoTURN Analysis



Under existing conditions, on-street parking is available along both sides of Williams Street. The width of the roadway is sufficient to allow for people to park in diagonal or perpendicular configuration, and this is commonly observed on the south side of Williams Street between Linn Avenue and Leonard Street though no striping, signage, or other guidance is in place. This on-street parking on the south side of Williams Street was observed to be related primarily to a daycare within the adjacent church.

Potential conflicts between through traffic and vehicles using these parking spaces are expected to increase as traffic volumes increase on Williams Street due to the reconfigured site access. While this on-street parking is sometimes more convenient for people arriving at the church or school, the existing church parking lot and proposed new school lot provide an ample supply of off-street parking. It is therefore recommended that on-street parking be prohibited along the south side of Williams Street between the main church driveway opposite Johnson Street and Leonard Street.

Pedestrian and Bicycle Considerations

Response to completeness item: b. More information on how vehicles will interact with students walking and biking to school on Williams Street and at the driveway and circulation areas on the site.

Under existing conditions, students cycling or walking to and from school often have to share the roadway with arriving vehicles. Some students were observed utilizing Williams Street and Leonard Street, which handle low volumes of vehicular traffic under existing conditions. Following the reconfiguration, the increase in private cars along Williams Street will create additional conflicts with people cycling and walking.

Considering the unique roadway configuration resulting from the Williams Street extension and limited available right-of-way, the District is prepared to accept additional conditions of approval to provide enhanced crossings and sidewalks near the site to ensure safety for people walking and cycling.

Neighborhood Traffic Impacts

As explained in the following sections, the school replacement will alter school traffic patterns through the neighborhood and overall, will reduce impacts from current conditions. Impacts to Ethel, Hood, and Williams Street are addressed below.

Ethel Street

Currently, Ethel Street carries all traffic exiting the school, except the few drivers who may use Leonard or Johnson Streets to divert to other routes. This exiting school traffic includes both passenger vehicles and buses. Ethel Street will see the largest decrease in traffic as a result of the school replacement, with a decrease in both passenger cars and buses.



Hood Street

Because it carries all entering school trips currently, Hood Street will also see a significant decrease in traffic volumes as a result of this project. However, bus traffic will continue to use Hood Street. Under the new configuration, both entering and exiting buses will use Hood Street, so there will be an increase of approximately 16 exiting buses during each of the two school peaks. Compared to the significant reduction in passenger vehicles, this minor increase in bus traffic still represents a significant improvement. While buses are larger vehicles, they are driven by professional drivers and are concentrated in short-duration peaks that coincide with school start and end times. For the majority of the day, Hood Street will see little to no school traffic.

Williams Street

As described above and addressed in the TIS, the proposed project does move all passenger vehicle and general school traffic to Williams Street. Of the three local east/west streets through the neighborhood, Williams Street has the lowest concentration of homes and the entire south side of the street is adjacent to a church, which operates a daycare facility. For these reasons, focusing general school traffic on Williams Avenue is appropriate. Further, keeping buses on Hood Street reduces impacts on that facility while improving safety and queuing by separating the two vehicle types.