

Date:	December 3, 2019
To:	Eric Klann, PE, City of Prineville
From:	Joe Bessman, PE
Project Reference No.:	1383
Project Name:	Prineville Housing Works



This memorandum provides a summary of the transportation characteristics of the proposed multifamily development located in the southeast corner of the NE Peters Road/Yellow Pine Road intersection in Prineville, Oregon. The location of the property is shown in Figure 1, and the preliminary site layout is illustrated in Figure 2. The proposed multifamily development will include up to 44 townhomes consisting of two- and three-bedroom units and courtyards and common space.



Figure 1. Site Vicinity Map. Source: Crook County GIS.

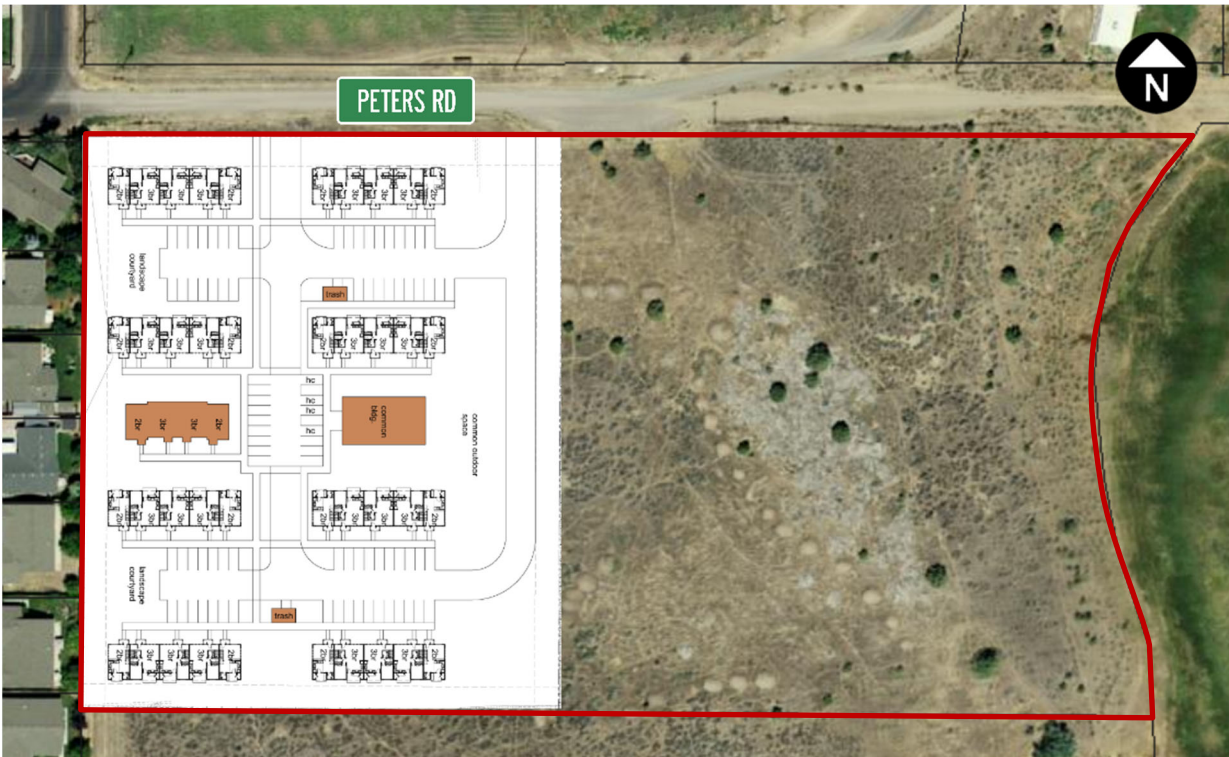


Figure 2. Preliminary Site Layout. (Source: Doug Circosta, dated 10-31-19)

As shown in Figures 1 and 2, the proposed site would be located east of the Stone Ridge subdivision with access provided by two driveways to the extension of NE Peters Road. Only the west side of the lot is being developed at this time. This project would include paving of the gravel section of Peters road to the eastern access.

SURROUNDING TRANSPORTATION INFRASTRUCTURE

The location of the project in northern Prineville is on the border of a mostly residential area and the rural area. The route along Peters Road contains several commercial businesses and the vacant Woodgrain Millworks site. The land directly to the south and east is undeveloped.

Major roadways within the vicinity of the site include NE Peters Road, which is classified by the City of Prineville as a *Major Collector* within the City's Transportation System Plan and Yellow Pine Road, which is designated as a *Minor Collector*. All other roadways surrounding the project site are designated as *Local Streets*.

West of the site, NE Peters Road is a paved two-lane road with a posted speed of 25 mph. The paved shoulder width varies, and sidewalks are provided on the north side of the road where new development has occurred. Along the site frontage, the roadway is a narrow, unimproved gravel road. Improvements will be required to this roadway section as part of site development. In addition, the current traffic control at the Peters Road/Yellow Pine Road should be revised to maintain Peters Road as the through route as designated by its functional classification.

Within the site vicinity, Yellow Pine Road has curbs and gutter throughout. Curb-tight Sidewalks are provided on the west side of the road and on-street parking is available on both sides of the street. The

southbound terminus of Yellow Pine Road and Peters Road is stop-sign controlled but includes a sign stating that “Right Turns Permitted without Stopping”.

Most vehicles to and from the site will travel from N Main Street which is located west of NE Peters Road. N Main Street is designated a *Minor Arterial* and connects south to the City core and Oregon 126 and Oregon 26. Table 1 summarizes area roadway characteristics.

Table 1. Area Roadway Characteristics

Roadway	Functional Classification	Number of Lanes, Posted Speed	Sidewalks?	Bicycle Lanes?	Parking?
N Main Street	Minor Arterial	3-Lanes 35 mph	No	Yes, south of Peters Road	No
NE Peters Road	Major Collector	2-Lanes 25 mph	Partial along the north	Partial east of Buckboard Lane	No
Yellow Pine Road	Minor Collector	2-Lanes 25 mph	Along the west side	No	Yes, both sides

TRIP GENERATION

Trip generation estimates are commonly prepared based on the standard reference *Trip Generation, 10th Edition*, published by the Institute of Transportation Engineers (ITE). Multifamily housing is classified based on the number of building levels. Buildings with one or two levels are classified with ITE’s *Multifamily Housing (Low-Rise)* classification. The land use description from the ITE manual are provided below:

Multifamily Housing (Low-Rise): *Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors).*

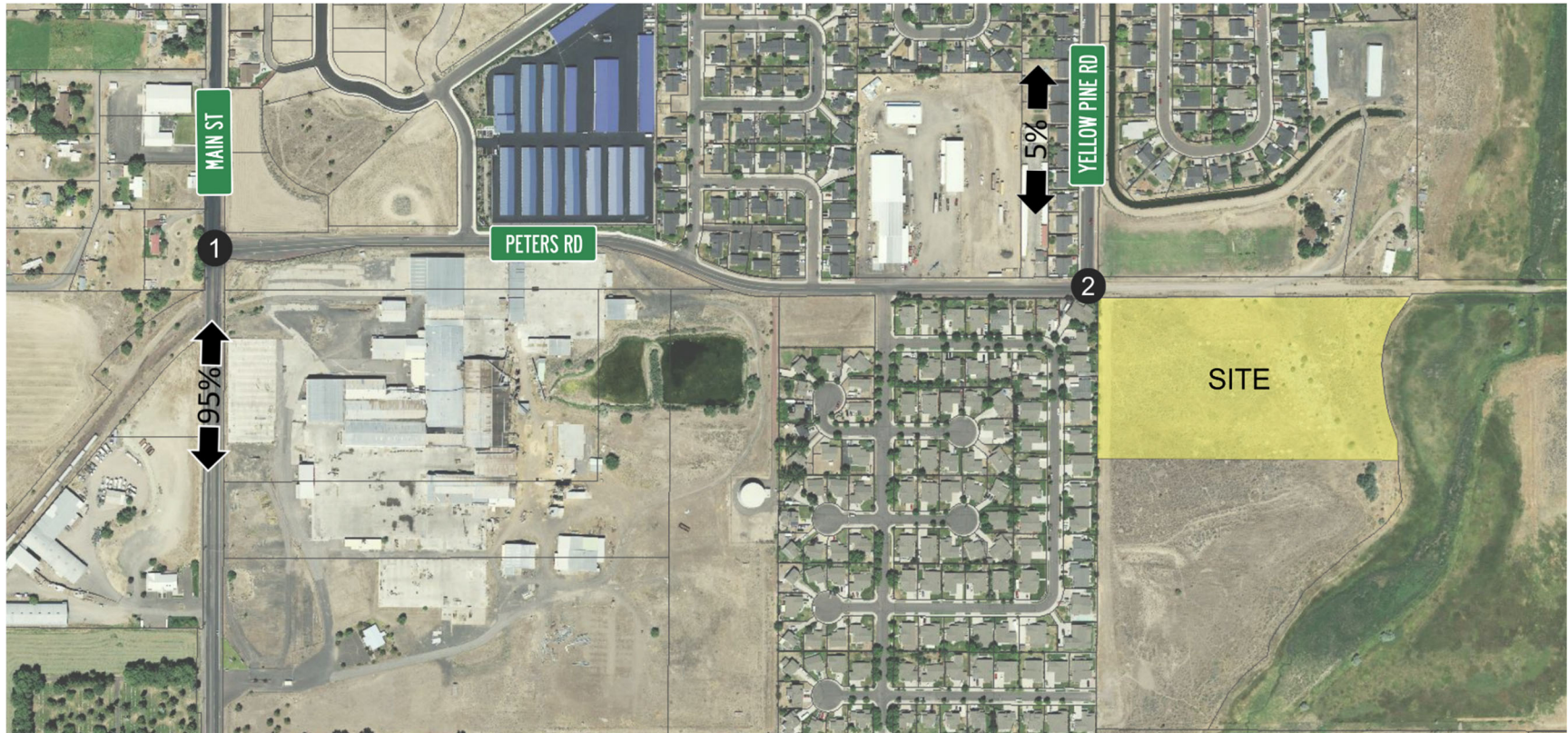
The preliminary development plans includes all two-story townhomes, so *Multifamily Housing (Low-Rise)* is the category that was applied to the proposed 44-unit development. Table 2 summarizes the resultant trip generation estimates.

Table 2. Trip Generation Estimates (ITE 10th Edition)

Land Use	ITE Code	Size	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Multifamily Housing (Low-Rise)	220	44 Units	322 <i>7.32/Unit</i>	20 <i>0.46/Unit</i>	4 <i>23%</i>	16 <i>77%</i>	25 <i>0.56/Unit</i>	16 <i>63%</i>	9 <i>37%</i>

TRIP DISTRIBUTION AND ASSIGNMENT

Trips from the new multifamily development are expected to primarily route onto NE Peters Road and travel west to N Main Street toward area employment and services. The distribution is expected to mimic the current travel patterns, which show that approximately 95 percent of all trips are destined to and from the south. Figure 3 illustrates the site-generated trip distribution and assignment at the primary intersections.



WEEKDAY AM PEAK HOUR

WEEKDAY PM PEAK HOUR

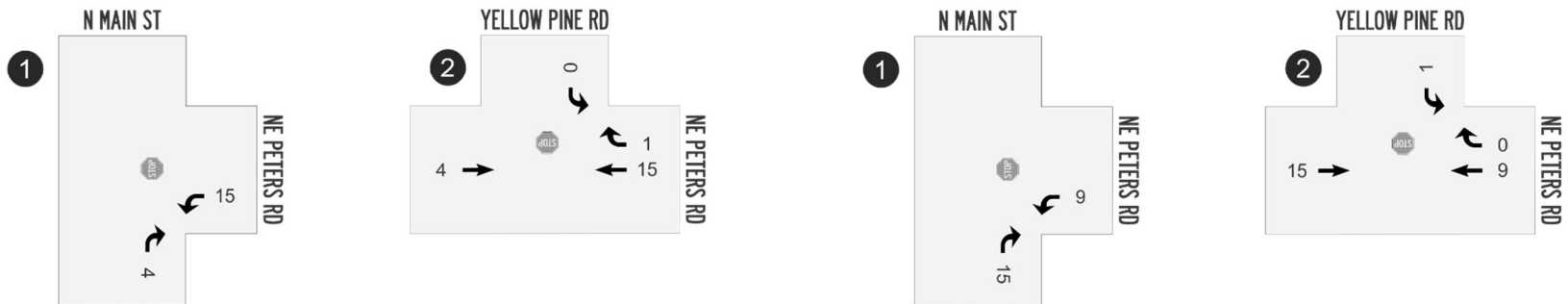


Figure 3. Estimated Trip Distribution and Assignment, Weekday AM and PM Peak Hours.

SAFETY REVIEW

Crash records were obtained for all of Crook County from the ODOT crash database between January 2013 and December 2017. Crashes required for reporting during this period include those involving any level of personal injury or property damage exceeding \$1,500. This review identified four crashes at the nearby N Main Street/NE Peters Road intersection and a single crash on the NE Peters Road corridor. Additional details on these crashes are provided below. Table 3 summarizes the reported crash types.

Table 3. Crash History (January 2013 through December 2017)

Intersection	# of Crashes	Severity		Crash Type		Intersection Crash Rate per MEV*
		Injury	Non-Injury	Turning/Angle	Fixed Object	
N Main Street/ NE Peters Road	4	2	2	4	0	0.30
Yellow Pine Road/ NE Peters Road	0	0	0	0	0	
NE Peters Road (Main Street to Yellow Pine Road)	1	0	1	0	1	

*Million Entering Vehicles

Review of the crashes at the N Main Street/NE Peters Road intersection shows that all four were classified as turning movement collisions and each crash involved northbound through vehicles and westbound left-turns.

- The first crash occurred on November 12, 2013 at 4:00 p.m. and involved a westbound left-turning motorist that was struck by a northbound vehicle. The crash records indicate that a vehicle obscured the view, but it was unclear what this notation referenced.
- The second reported collision occurred on January 22, 2014 at 5:00 p.m., during dark conditions on a clear and dry day. The collision again involved a northbound motorist and a westbound to southbound left-turn, and was cited as failure to yield right-of-way.
- The third crash occurred on December 5, 2014 at 7:00 a.m. during icy conditions. The crash records cited careless driving and failure to yield right-of-way as the cause of the crash.
- The fourth collision occurred on July 26, 2017 at 4:00 p.m. on a cloudy and dry day. This crash also involved a westbound left-turning vehicle and northbound vehicle and indicated that a vehicle obscured the view.

The N Main Street/NE Peters Road intersection was recently restriped to provide a consistent three-lane cross-section along Main Street. It is anticipated that with the restriping overall crashes along the corridor will be lower as movements are now separated into their own lane. As most of the crashes occurred in 2014 or earlier it is recommended that the City continue to monitor this location. No crashes were reported in 2015 and 2016 at this location.

The single crash reported on NE Peters Road between N Main Street and Yellow Pine Road occurred approximately 300 feet west of Elk Street. Crash records indicate that it was a fixed object crash involving a tree, stump, or shrubs and was attributed to the driver being drowsy. This crash occurred at 2:00 a.m. on October 17, 2015. No safety issues were identified on NE Peters Road based on the crash history.

Intersection Sight Distance

Intersection sight distance was field reviewed along the proposed extension of NE Peters Road where both accesses to the townhomes are proposed, at the NE Peters Road/Yellow Pine Road intersection, and at the N Main Street/NE Peters Road intersection. The purpose of sight distance is to ensure an adequate view of conflicting traffic is provided to drivers along the primary access route.

The City of Prineville typically applies the minimum recommended sight distance criteria based on the standard reference *A Policy on Geometric Design of Highways and Streets, 6th Edition* published by the American Association of State Highway and Transportation Officials (AASHTO) in 2011 (commonly referred to as the *Green Book*). This reference provides the recommended sight distances as measured from a height of 3.5 feet 14.5 feet from the edge of travel way, based on the speed of the roadway (see Figure 4). The AASHTO reference is based on conflicts between motorists traveling along the roadway and motorists completing movements at the intersection.

For intersections on NE Peters Road, this requires approximately 240 feet looking to the left and 280 feet to the right based on the posted speed of 25 mph. Field review showed that these sight lines will be attainable on the Peters Road extension, as shown in Figure 4.



Figure 4. Existing view along Peters Road facing east along the site frontage.

Discussions with staff highlighted more critical concerns at the intersection of Main Street/Peters Road. Staff indicated that views at this intersection are more constrained due to private fencing on the east side of the street. Field review confirmed this issue, with the available sight line from the stop bar shown in Figure 5. It appears that removal/relocating the chain link fencing and removal of some of the overgrown brush could help improve the sight lines considerably. Adequate sight lines are available for motorists without entering the travel way by pulling slightly forward.



Figure 5. NE Peters Road/N Main Street facing toward the south.

TRAFFIC OPERATIONS

Traffic operations analysis was prepared at the N Main Street/NE Peters Road intersection. Traffic counts were obtained on November 21, 2019 during the weekday a.m. peak hour and due to the recent snow historical counts were applied from October 11th, 2018 during the weekday p.m. peak hour to capture typical conditions with area schools in session. The traffic count shows that traffic volumes in the area near the site peak during the morning commute period between 7:15 a.m. and 8:15 a.m. and during the evening commute period between 4:45 p.m. and 5:45 p.m. The existing travel patterns reflect the residential land uses that surround the property and mimic the trip distribution patterns provided in Figure 3. A two-percent growth rate was applied to the weekday p.m. counts to reflect 2019 volumes.

The existing traffic conditions were analyzed using Synchro analysis software with the Highway Capacity Manual 6th Edition methodology. The following scenarios were analyzed:

- Existing Conditions: This analysis reflects traffic conditions during the peak fifteen-minutes of the peak morning and evening commute hour. This scenario is used to calibrate the analysis models to current conditions.
- Year 2021 “Without Project” Conditions: This analysis identifies how the area transportation system will operate in the build-out year of the proposed townhomes without the project. This

includes a two-percent annual growth rate to account for area development that is likely to occur within the next two years, as well as inclusion of trips from the Smith Landing property and the multifamily development on NE Blackbear Street that is currently under construction.

- Year 2021 “With Project” Conditions: This analysis includes area growth and adds estimated trips from the proposed townhomes.

The City’s 2013 Transportation System Plan identifies the City’s adopted performance standards. As identified within the TSP, for roadways within City jurisdiction the City of Prineville considers intersections to operate acceptably if they operate at Level of Service “E” or better during the peak hour, if they remain below their carrying capacity, and if the 95th percentile vehicular queues can be contained within the available storage.

Table 4 summarizes the results of the transportation analysis and shows that the N Main Street/NE Peters Road intersection currently operates acceptably and is expected to continue to operate acceptably in the future year 2021 conditions with or without the proposed townhomes. The intersection operates at a Level of Service “B” today and a “C” in the future, with slightly higher morning delays as the residential trips are generally “outbound” left-turns toward the City Center. In the horizon year 2021 with the approved apartments, Smith Landing project, and the new townhomes the intersection still retains half its carrying capacity, with the average vehicle experiencing about 15 seconds of delay.

Table 4. Summary of Intersection Operations Analysis, Weekday AM and PM Peak Hours

Intersection	Existing Conditions			Without Project Conditions			With Project Conditions			Acceptable?
	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	
Weekday AM Peak Hour										
N Main St/ NE Peters Rd	WB LT LOS B	14.2 s	0.35	WB LT LOS C	16.0 s	0.44	WB LT LOS C	16.6 s	0.48	Yes
Weekday PM Peak Hour										
N Main St/ NE Peters Rd	WB LT LOS B	13.8 s	0.23	WB LT LOS B	14.8 s	0.30	WB LT LOS C	15.1 s	0.32	Yes

LOS: Level of Service; Delay: Critical Movement Delay; v/c: Volume-to-Capacity Ratio
WB: Westbound; LT: Left-turn

The 95th percentile queues on NE Peters Road at N Main Street are forecast to reach three vehicles during the weekday a.m. and p.m. peak hours in year 2021 with the townhomes. There is more than adequate storage for three vehicles for the westbound left-turn movement. Accordingly, no improvements are recommended at this time.

ON-SITE PARKING

The proposed development will include 85 total parking stalls, including 81 standard stalls and 4 Handicap stalls. Review of available data within the ITE Parking Generation Manual, 4th Edition identifies that of the 22 Low/Mid-Rise Apartment sites surveyed nationally the measured parking demand varied between 0.59 parking stalls per residential unit to as high as 1.94 stalls per unit, with 95 percent of the sites requiring between 1.10 and 1.37 stalls per apartment unit. The proposed on-site parking ratio of 1.93 far exceeds the 95th percentile demand and equates to the same demand at the most intense use of the 21 sites surveyed. Table 5 summarizes the survey data as applied to the proposed development.

Table 5. Applied Parking Survey Data

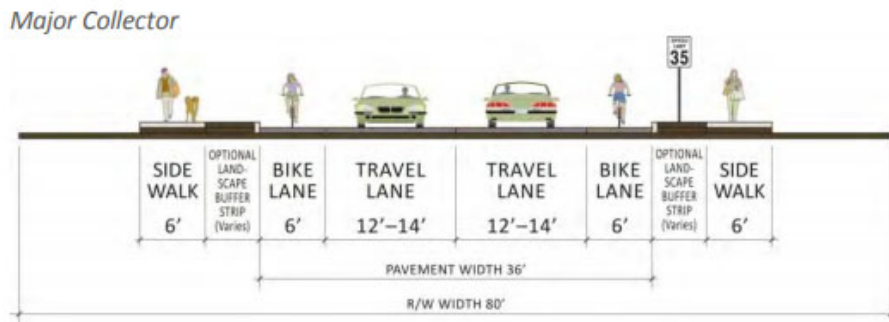
Survey Data	Range of Parking Stalls Required (44 Dwelling Units)
ITE Overall Observed Demand	26 - 85 <i>(0.59- 1.94 Stalls per Dwelling Unit)</i>
ITE 95 th Percentile Demand	48 - 60 <i>(1.10 - 1.37 Stalls per Dwelling Unit)</i>
Central Oregon Demand	36 - 68 <i>(0.82-1.54 Stalls per Dwelling Unit)</i>
Proposed Parking Stalls	85 Stalls

FINDINGS AND RECOMMENDATIONS

Based on this review, the proposed 44 townhome development is forecast to generate 322 daily trips (including 20 trips during the weekday a.m. peak hour and 25 trips during the weekday p.m. peak hour). The majority of these trips are expected to travel south along Main Street toward the City’s commercial and employment areas. Two accesses are proposed on the extension of NE Peters Road east from the Yellow Pine Road/NE Peters Road intersection. These accesses can be provided clear sight lines in both directions. Major intersections along the primary access route can accommodate the additional trips, and there are no historical safety needs in the site vicinity.

The following is recommended to support this development:

- NE Peters Road should be extended along the portion of the site frontage being developed. Based on its classification as a *Major Collector*, the City’s 2013 Transportation System Plan specifies that NE Peters Road should ultimately have a minimum of two twelve-foot travel lanes, two 6-foot bicycle lanes, and six-foot sidewalks as shown below.



To be consistent with the surrounding streets, curb tight sidewalks are recommended along the site frontage along with a paved section to accommodate two travel lanes and bicycle lane on the south side.

- Traffic control at the Peters Road/Yellow Pine Road intersection should be revised so that east-west traffic is uncontrolled on Peters Road and southbound traffic on Yellow Pine should include a stop sign (with removal of “Right Turns Permitted without Stopping Sign”). With this reflecting a traffic control change notice should be provided via temporary “Traffic Control Change Ahead” signs and/or supplemental advisory flags on the stop sign. Painting of a southbound stopbar would also help to highlight the change.
- Access into the townhome development from the extension of NE Peters Road should be provided with a concrete “dustpan” apron design. The access intersections should include stop-control.

- The multifamily project will require payment of Transportation System Development Charges to mitigate regional system impacts.
- While intersection sight distance at the Main Street/Peters Road intersection complies with AASHTO requirements, if possible the City could consider working with the mill to remove and/or relocate the chain link fencing and remove adjacent vegetation. These changes would improve sight lines toward the south.

Please let me know if you have any questions on this analysis at (503) 997-4473 or via email at joe@transightconsulting.com.

Attachments:

- Traffic Count Worksheets
- Existing Conditions LOS Worksheets
- Year 2021 Without Project LOS Worksheets
- Year 2021 With Project LOS Worksheets