



Date:	August 27, 2019
To:	Tony Martin, PE, City of Salem
From:	Joe Bessman, PE
Project Reference No.:	1040
Project Name:	Pictsweet Greencrest Street Alignment



The purpose of this memorandum is to provide additional justification regarding the proposed realignment of Greencrest Street at its terminus at State Street as part of the Pictsweet Master Plan.

BACKGROUND

The City of Salem's 2013 Transportation System Plan includes a proposed alignment for Greencrest Street from Auburn Road to State Street. Figure 1 depicts the alignment from the TSP, which shows Greencrest Street extending from Auburn Road to State Street in the approximate alignment with Cougar Court on the western edge of the Pictsweet Site. This facility is classified as a "Collector" and does not continue south beyond State Street.

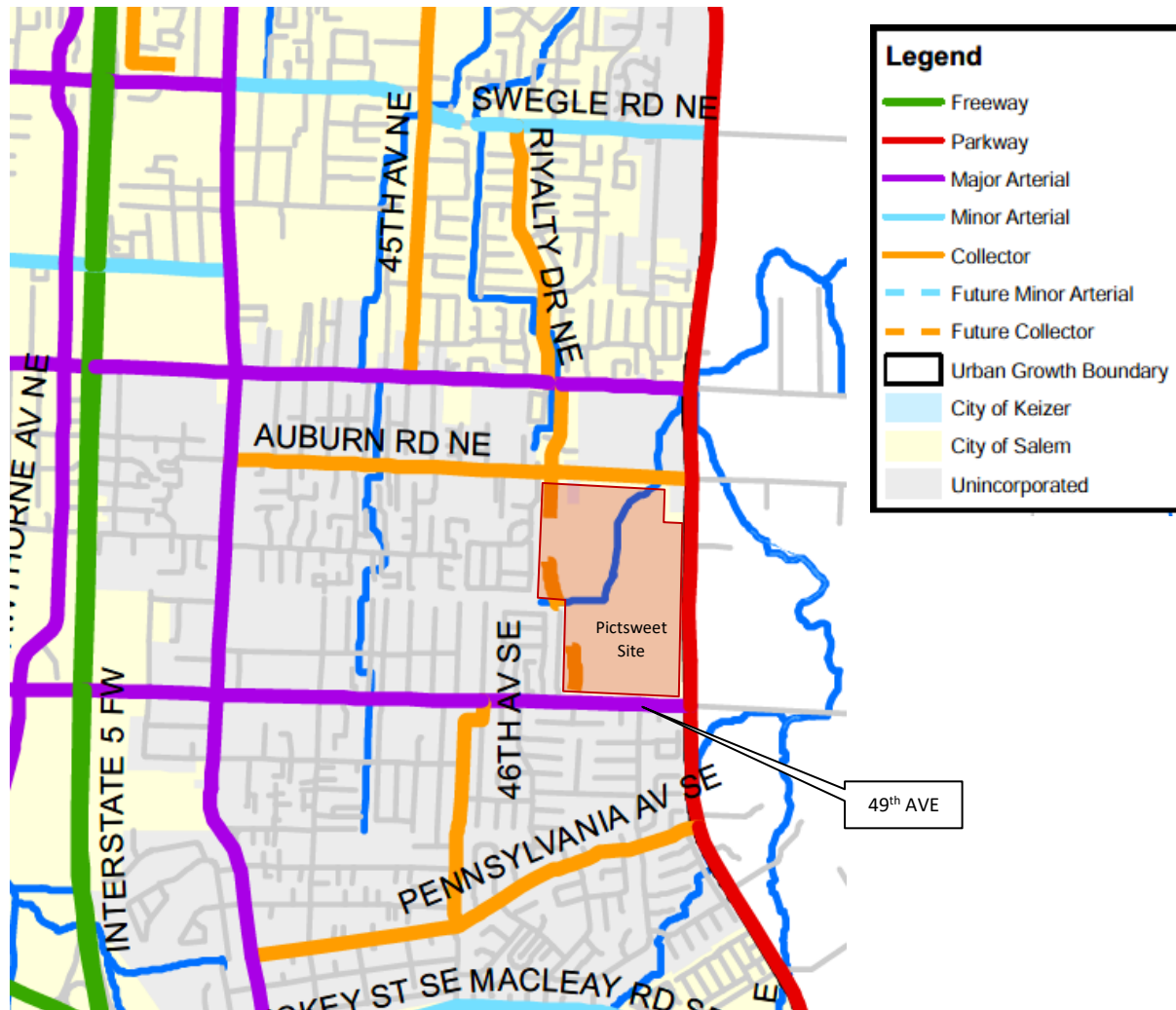


Figure 1. City of Salem Functional Classification Map. Source: 2013 Salem Transportation System Plan, "Street Map" Map 3-1.

As was discussed within the Pictsweet Master Plan Transportation Impact Analysis (TIA), an ideal alignment for a new Greencrest Street connection from a system connectivity perspective would be to align the facility with 49th Avenue. This connection would allow the route to provide a benefit south of State Street and would extend the benefit of this overall route between Swegle Road and Pennsylvania Avenue. The TIA identified several issues with this alignment, primarily:

- 49th Avenue is classified as a *local street* and is not intended to serve the volume and types of traffic that an alignment with Greencrest Street (a *collector*) would provide.
- Although adequate queue storage is available in the future year 2039 between 49th Avenue and Cordon Road, the queues are projected to extend nearly to 49th Avenue until State Street is widened to five-lanes.

The TIA concluded that the Greencrest Street connection to State Street should be located across from Oakmont Court or further west along the site frontage. This would support the near- and long-term configurations of State Street and provide the same general function as the TSP alignment, which is to serve the lands to the north of State Street.

GREENCREST STREET ALIGNMENT CONSIDERATIONS

The question of whether Greencrest Street should be located across from Oakmont Court or Cougar Court, (or somewhere in between) was further reviewed by our team. From a transportation perspective, there are several considerations on the location of a collector street connection to State Street. Ideally, the new intersection would improve the connectivity of the street system in the overall area, would be adequately spaced from other intersections, have adequate sight distance, and encourage good site circulation. As the connection is planned for signalization, the intersection should also support the signal hardware and operational/queuing needs. Distinguishing characteristics of the alignment is summarized below.

TRAFFIC OPERATIONS

Traffic signals that are located in close proximity of each other should be operated in coordination to prevent multiple stops by the same vehicles. Within this area priority for coordination is through movements along Cordon Road, and the ability to progress State Street traffic will be limited. For this reason the better the spacing the more the two traffic signals can operate independently. For a new signal between Cougar Court and Oakmont Court the importance of this metric is low, as the spacing of all the connections shown between Cougar Court and Oakmont Court will be adequate to support queuing even if no signal coordination was provided. Marion County staff indicated significant concerns if the 49th Avenue connection were to be signalized, as this spacing could become problematic in the long-range planning years with the transitions needed to provide back-to-back left-turn lanes. Accordingly, for signalization at 49th Avenue this criterion would weight heavily.

SYSTEM CONNECTIVITY

Both Oakmont Court and Cougar Court are cul-de-sac roads that do not provide connections to other local streets (or pedestrian routes) that extend south of State Street. A signalized Greencrest Street connection at either of these intersections would only serve a small number of houses with very limited benefit to the overall transportation system. Additionally, there are no other streets between Oakmont Court and Cougar Court that Greencrest Street could connect to that would provide a higher level of system benefit. Accordingly, connectivity is not a distinguishing characteristic of the alignment unless connection with 49th Avenue was pursued.

QUEUING IMPACTS

The queuing impacts of the signalized Greencrest Street alignment should not extend past other driveways or intersections, as this can block driveways or encourage motorists to edge into traffic without clear sight lines. The TIA that was prepared for the Pictsweet site shows that both Oakmont Court and Cougar Court are located far enough from the signalized intersection with Cordon Avenue that queue spillover between the two signalized intersections is not expected to occur, regardless of whether State Street contains a three-lane or five-lane cross-section. The intersection spacing and forecast queues are shown in Figure 2.

If the signalized intersection was located at Cougar Court, the 95th percentile queues during the weekday p.m. peak hour would block the driveway to the adjacent manufactured home park. Any other signalized location would not result in queue blockages.

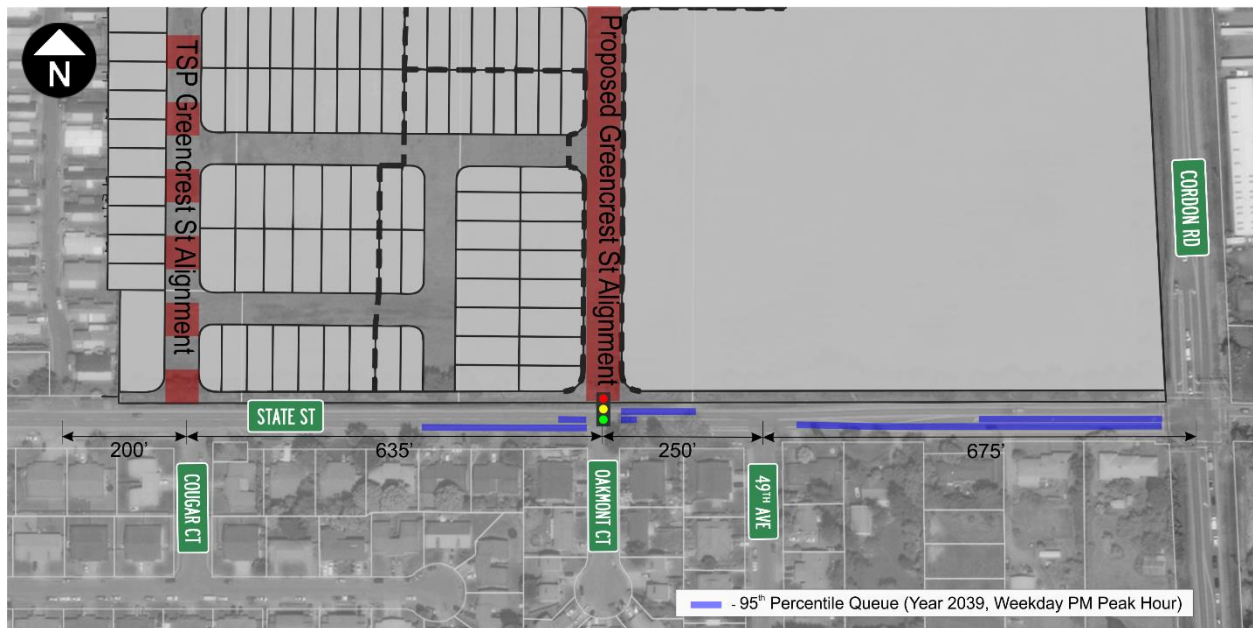


Figure 2. Street Spacing and Projected 95th Percentile Queues on State Street.

SIGHT DISTANCE

Sight distance at signalized intersections should be adequate to view the signal hardware from the various approaches. State Street is flat and straight within the vicinity of the site and will provide clear views in all approaching directions. With the planned frontage improvements in place adequate sight distance will also be available to support right-turn movements on red signal indications. With the straight roadway and flat topography this criterion can be met with any of the alternatives.

SITE CIRCULATION

The commercial portion of the site is zoned and planned for the southeast corner of the Pictsweet site. Most trips to and from the commercial area will utilize the street connection closest to the site, making this new collector a higher volume roadway relative to the other roadways within the site. Should Greencrest Street be signalized across from Cougar Court, trips leaving the commercial development (particularly those making left-turns) will through the local streets to reach the signalized Greencrest Street connection. This will increase traffic volumes on the residential local streets in a manner that would be detrimental to the adjacent residents. An ideal location for the collector would be at the dividing line between the various zones or where it would instead pull the residential trips into the commercial area. This occurs with an alignment at Oakmont Court or at 49th Avenue.

MULTIMODAL TRIPS

A new traffic signal will provide accessible and enhanced pedestrian crossings on each approach that will benefit multimodal trips. The most ideal location to support pedestrian crossings would be the alignment with 49th Avenue as it would serve the most homes to the south. Comparison of the other alternatives relate how much out of direction travel is provided from 49th Avenue; the proximity of the crossing at Oakmont Court would be the best remaining option and would only require 250 feet of additional travel.

The farther west the new traffic signal is located results in increased out of direction travel from the residential lands to the south.

The impact of the traffic signal on cyclists depends on the travel direction. For southbound cyclists that want to continue onto 49th Avenue the location of the intersection provides little difference in conditions. The farther west the signal is located the longer cyclists will be on the higher-volume State Street, but the maneuver to 49th Avenue is a right-turn allowing cyclists to remain in the bicycle lane. Northbound cyclists will have a more difficult connection, with only more experienced riders turning left directly onto State Street, and less experienced riders using the sidewalk system to access the signalized crossing. Direct alignment with 49th Avenue is ideal for cyclists and pedestrians, but the closer the signal is to 49th Avenue the more ideal its location will be for multimodal travel.

Fixed-route transit service is provided along State Street through Cherriots' Route 4. This service is provided in the eastbound direction along State Street, and includes a stop east of Cougar Court and west of Oakmont Court. A transit stop near a traffic signal is ideal as it will allow transit users to cross State Street at a protected location. As the highest site density is located in the southeast corner of the Pictsweet property a protected crossing to the Oakmont transit stop would be most ideal.

OTHER CONSIDERATIONS

Non-transportation elements should also be considered in the ultimate alignment of Greencrest Street. It is understood that there is a grouping of oak trees that requires preservation on the site and that the alignment of Greencrest Street across from Oakmont Court is more conducive to this alignment. Consideration should also be given to sewer, water, and other design elements. The table below provides a summary of the transportation elements as described above.

Greencrest Connection	Cougar Court Alignment	Mid-Block Alignment	Oakmont Court Alignment	49 th Avenue Alignment
Traffic Operations				
Connectivity to South	Neutral	Neutral	Neutral	Good
Queuing Impacts	Poor	Good	Good	Fair
Sight Distance	Good	Good	Good	Good
Site Circulation	Poor	Poor	Good	Good
Multimodal Trips	Poor	Poor	Fair	Good

As the comparison summary table shows, the only benefit provided with the Cougar Court alignment is better system traffic operations due to the increased spacing of the traffic signal from the nearby signalized intersection with Cordon Street. Otherwise, this location provides disadvantages to multimodal travel and queues will block the nearby manufactured home park entrance. Conversely, while the alignment with Oakmont is closer to Cordon Road this provides only a minor disadvantage, and all other metrics show better results. Based on this assessment it is recommended that the Oakmont Court alignment be pursued.

RECOMMENDATIONS

Based on a review of the transportation elements, building Greencrest Street across from Oakmont Court is recommended for the following reasons:

- Eastbound queue storage is adequate at the Oakmont Court intersection, whereas a traffic signal at a Cougar Court alignment would have 95th percentile queues that would block the adjacent manufactured home park access.
- Greencrest Street can better serve the higher-intensity commercial portion of the site and prevent cut-through traffic through the new neighborhoods with a location adjacent to the commercial development and across from Oakmont Court.
- Multimodal benefits are provided with signalization at 49th Avenue as it most closely links the neighborhoods to the south with the commercial area.

Other non-transportation design elements should also be reviewed to ensure there are no other non-transportation related issues with an alignment across from Oakmont Court. Please let me know if you have any questions or comments on the additional information regarding the Greencrest Street alignment. I can be reached at (503) 997-4473 or via email at joe@transightconsulting.com.