



Puget Sound Regional Council

Funding Application

Competition	Pierce Countywide
Application Type	Roadway
Status	submitted
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Prepopulated with screening form?	No

Project Information

- Project Title**
Puyallup Ave Transit/Complete Street Improvements
- Regional Transportation Plan ID**
5579
- Sponsoring Agency**
Tacoma
- Cosponsors**
N/A
- Does the sponsoring agency have "Certification Acceptance" status from WSDOT?**
Yes
- If not, which agency will serve as your CA sponsor?**
N/A

Contact Information

- Contact name**
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Project Description

- Project Scope**
The Puyallup Ave project is 1.2 miles extending from Portland Ave to S. C Street, including the Portland Avenue intersection. The project scope includes a complete reconstruction of the roadway with concrete pavement, complete street elements including bike lanes, sidewalks/curb ramps, bulbouts, crosswalks, signals/APS and other ITS elements, lighting, landscaping, bus stops, parking, other street amenities, improved connections to regional transit services and active transportation facilities, upgraded utilities, and a shared HOV/transit lane.
- Project Justification, Need, or Purpose**
Puyallup Avenue is a significant transportation corridor in the City, with direct access to the Tacoma Dome Station, one of the largest multimodal hubs in the state of Washington serving three transit agencies, three different transit modes, and access to the largest transit-related parking supply in the Puget Sound region. The current street configuration, however, a sea of asphalt nearly 70 ft. wide, is a holdover from when the street was the State Highway from

Tacoma to Seattle and does not currently support pedestrian and bicycle accessibility and the increasing transit and transit-oriented development planned for the area. Developing this corridor to better serve pedestrians, bicyclists, transit and transit users, vehicular traffic, truck traffic (as it is a designated a T-3 freight corridor), large events at the Tacoma Dome, and stake holder needs, is in the best interest of the City and the region.

3. **Project length**
1.2 miles
4. **Federal Route Number**
3246
5. **Posted speed limit**
30 mph
6. **Average daily traffic volume**
15,000 vehicles per day
7. **Describe any ineligible project elements for this funding (to be paid by other funds) (e.g. HMA overlay not eligible for CMAQ funding; utility undergrounding).**
The construction of any utility upgrades (water, power, storm and sanitary sewers) will be funded by the respective City Utility Divisions.
8. **Cross-section description of the project (or upload a cross-section detail below)**
The City recently invested \$255,000 in public/stakeholder outreach and the development of a number of alternatives for the roadway which support all modes of travel. At this time the final alternative, Alternative 4, includes 2-lanes eastbound, one of which is a transit/HOV lane, a center turn lane, 1-2 lanes westbound depending on where you are along the corridor (2-lanes in the high-demand area of the transit hub, 1-lane in all other areas), bike facilities, on-street parking, landscaping and street lighting, public amenities/gathering areas, signage, sidewalks, and signal/ITS improvements. Proposed improvements will be confirmed with additional outreach during the design process. Cross sections and plan views of Alternative 4 are attached for reference.
9. **Pierce cross section document**
Puyallup_Alt_4_X-Sections___Plan_Views.pdf

Project Location

1. **Project Location**
Puyallup Avenue
2. **Please identify the county(ies) in which the project is located.**
Pierce
3. **Crossroad/landmark nearest the beginning of the project**
S. C Street
4. **Crossroad/landmark nearest the end of the project**
Portland Avenue
5. **Map and project graphics**
Puyallup_Ave_Vicinity.pdf, Puyallup_Map_Centers_of_Local_Importance.pdf, Trail_Connections_2018_T18017.pdf
6. **Or, other appropriate locating information**
N/A

Plan Consistency

1. **Is the project specifically identified in a local comprehensive plan?**
Yes
2. **If yes, please indicate the (1) plan name, (2) relevant section(s), and (3) page number where it can be found.**
Puyallup Avenue is presented as Capital Project 5.2, page 179, of Tacoma's South Downtown Subarea Plan, which is contained in Book 2 of the City's Comprehensive Plan. It is also located in the City's Transportation Master Plan, Project ID No. 67, Appendix B. These plans can be found at <http://www.cityoftacoma.org/cms/one.aspx?portalId=169&pageId=15801>.
3. **If no, please describe how the project is consistent with the applicable local comprehensive plan, including specific local policies and provisions the project supports. In addition, please describe how the project is consistent with a transit agency plan or state plan, if applicable.**
N/A

Federal Functional Classification

1. **Functional class name**
14 Urban Principal Arterial

Support for Centers

1. **Describe the relationship of the project to the center(s) it is intended to support. For example, is it located within a designated regional, countywide or local center, or is it located along a corridor connecting to one of these areas?**

The PSRC has designated downtown Tacoma as a Regional Growth Center. This Center is broken up into the North Downtown, South Downtown, and Hilltop subareas. Puyallup Avenue is a central transportation corridor in the Southdown Subarea of this Regional Growth Center, which includes the University of Washington Tacoma, several museums, a convention center, the Thea Foss Waterway, the Tacoma Dome entertainment venue, and the Tacoma Dome Station, one of the region's largest multi-modal transportation hubs.

The location of the Puyallup Avenue project in this Regional Growth Center is shown on the 'Puyallup Map_Centers of Local Importance' file attached under the 'Project Location' section.

2. **Please describe how the project supports the development of centers and the transportation corridors that serve them.**

Describe how the project will support the existing and planned housing/employment densities in the regional and/or local growth center(s).

The ability to strengthen and diversify Tacoma's housing/employment centers is directly related to the city's land use policy and infrastructure investments.

Through its economic development efforts, the City works to retain, grow and attract employers. Strengthening employment centers through sound land use policy will result in a stronger and more diverse economic base for the City. In addition, concentrating employment supports development of mixed use districts where people can live, work, shop and play such as in the transit-oriented South Downtown Subarea of Tacoma's Downtown Growth Center. Creating a corridor that is heavily transit supported (through Tacoma Link, Sounder, HOV prioritized access, and Pierce Transit's planned rapid transit system that will access the Tacoma Dome Station) will allow higher density housing as there will be less need for personal vehicles and parking. Further, the abundance of transit activity/choices from the Tacoma Dome Station Transit Center along Puyallup Avenue will also support existing housing as people will want to live where they can walk/bike to access regional and local transit, encouraging the support of existing and planned housing/employment both in the Dome district as well as in the destination centers (adjacent MIC, Downtown Growth, Convenience and Regional centers).

Describe how the project will support the development/redevelopment plans and activities (objectives and aims) of the center(s). Please provide a citation of the corresponding policies and/or specific project references in a subarea plan or in the comprehensive plan

The project will support the development/redevelopment of the downtown Tacoma Regional Growth Center, and more specifically, the South Downtown Subarea, through preserving and reusing existing warehouses/structures, prioritizing the location of affordable housing close to high capacity transit areas, encouraging the expansion of the arts, urban recreation, and small businesses, changing zoning allowing for more flexibility leading to increased public benefit, improving and prioritizing transit service to the area, encouraging active transportation and better connections to adjacent facilities/recreation centers/neighborhoods, and constructing a complete street serving all modes of travel by better utilizing the available right-of-way.

Applicable Policies included in the South Downtown Subarea Plan include:

Policy 2.1: Leverage South Downtown's assets by preserving, renovating, repurposing, and reusing existing structures. The South Downtown has numerous historic/industrial/warehouse structures that could be renovated and converted to loft-style, non-profit student, affordable artist, and economical live-work housing. This is further supported by recommendation AH-4: Consider geographically prioritizing affordable housing loans to areas adjacent to high capacity transit stations, including the Tacoma Dome Station and the LINK stations in South Downtown.

Policy 2.4: Continue to encourage the expansion of South Downtown's concentration of create arts and design, urban recreation, business incubators, and other small scale businesses.

Recommendation LU-1: Convert the UCX-TD (mixed use) in the Dome District to Downtown Mixed Use. The UCX-TD district is less flexible regarding allowed uses and will make the district less attractive for development compared to neighboring districts. Converting this to a Downtown Mixed Use district will allow developers to achieve an increase in allowed floor-area-ratio in exchange for the inclusion of design features that provide public benefit.

Policy 1.3: Coordinate with transit agencies to prioritize future high-frequency transit service allocation that will help catalyze redevelopment and the creation of complete communities.

Policy 3.2: Build a legible system of public walkways, trail corridors, and active street linkages that connect South Downtown Neighborhoods, waterfronts and key destinations.

Policy 3.3: Leverage the open space and connectivity potential of the right-of-way through continued improvements to the pedestrian and cycling environment on streets.

Describe how the project will support the establishment of new jobs/businesses or the retention of existing jobs/businesses.

Transit opportunities in this area, like no other in the State, will support/retain current businesses, as well as help create new business by providing a wide range of transit access to the Tacoma Dome Station Transit Center which connects to other Manufacturing Industrial Centers (access to the Port and Center Street/So. Tacoma Way centers), Convenience Centers (along Pacific Ave), and Regional Centers farther north (Seattle, etc.) via established bus routes, Pierce Transit's planned bus rapid transit system, the Sounder system, and the future light rail connection to SeaTac and points north. This abundance of transit activity/choices will allow HOV/active/SOV commuters to efficiently access the Transit Center along Puyallup Avenue and transfer to other means of travel to destinations in these other Centers. This ease of travel will drive transit ridership supporting new jobs and businesses in these destination areas. The abundance of transit activity/choices at the Transit Center will also encourage the development of housing in the Dome District, again supporting existing businesses and driving the creation of new businesses to support the growing district.

Describe how the project improves safe & convenient access to major destinations within the center, such as by completing a physical gap or providing an essential link in the transportation network for people and/or goods.

The project improves safe & convenient access to major destinations with the center by providing dedicated bicycle facilities (bike lanes or separated path) where none exists today and riders are forced to bike on the sidewalk with pedestrians or share the roadway with freight, transit and other vehicles to access the transit center or to access local businesses. These new facilities will also support families/young cyclists who never would have considered Puyallup Avenue a safe place to bicycle.

Wide, more consistent, and well illuminated buffered sidewalks (with landscaping, street furniture/amenities, pedestrian scale lighting, crosswalk striping, accessible pedestrian signals, etc.) will encourage new pedestrian activity and will provide a safe and inviting environment for pedestrians to access other destinations along and/or adjacent to the corridor.

Signal improvements (upgraded and interconnected signals with emergency preemption) will allow for the more efficient movement/timing of traffic and provide improved access to major destinations (Tacoma Dome, Transit Center, Downtown Tacoma, Port, etc.), as well as better emergency vehicle access/response times to and through the corridor (to adjacent centers). Signal timing will also be coordinated with bicycle signals/signage, where required.

Describe how the project will improve circulation and enhanced opportunities for active transportation within the center regarding (address each relevant area): walkability, public transit, bicycle mobility, streetscape improvements, traffic calming, etc.

Puyallup Avenue is a key spine running east-west in the downtown area connecting businesses, bus stops along the corridor, the transit center, the Foss Waterway Esplanade via E. D St., a high school, the University of Washington-Tacoma on its west end via the S. C St. connection to the Prairie Line Trail, the future Trail to the Mountains (also on the project's west end), and the future Puyallup Levee and Tahoma-to-Tacoma Trails (to Fife/Pierce County) on its east end (see attached trail map). This project is critical to the walkability and active transportation connections in the City and region. With the addition of a dedicated bicycle facility (bike lanes or a separated bike path), lane reductions and/or conversions to an HOV/transit lane, wide sidewalks, compliant curb ramps, crosswalk striping, landscaping, pedestrian scale lighting, signal upgrades/interconnections, and accessible pedestrian signals along Puyallup Avenue will make significant strides towards improving circulation/walkability, traffic calming, accessibility, bicycle mobility, transit efficiency, and general circulation and multi-modal opportunities.

Technical Criteria

1. **Describe the user groups that will benefit from the project, including commuters, residents, commercial users, highly impacted communities and those groups identified in the President's Order for Environmental Justice, seniors, people with disabilities and/or areas experiencing high levels of unemployment or chronic underemployment.**

The Puyallup Ave Transit/Complete Street Improvement project has convened key stakeholders including transit providers, business and property owners, key institutions and the broader community to develop a plan that meets the goals for this corridor. Community outreach is documented in the Puyallup Ave Corridor Conceptual Design Tech Memo #2, Community Input. This effort resulted in a vision and plan that safely and comfortably balances access for all travel modes, including pedestrians (the elderly, high school students, those with disabilities, and homeless) using the sidewalks and crosswalks, bicyclists/commuters utilizing designated facilities, transit operators and users/commuters via lane priority, transit facility users/parking, commercial businesses, freight operators, and current and expected residents, as this project will increase corridor safety, improve air quality, and help catalyze development in this transit oriented district.

Further, with 90% of the project being in Tacoma's state designated Community Empowerment Zone, the western portion of the project in an area designated as 51-60% low/moderate income, and with the eastern end of the project serving Tacoma's first homelessness site, as well as providing access to Tacoma's East Side (via Portland Avenue where the population has been identified as 51-90% low/moderate income), improving transit/transit choices and walking and bicycling choices along the corridor will provide a means to more efficiently commute/travel to access employment, health care, and other service/opportunity destinations. See the attached 'Puyallup Ave Zoning' file under the 'Other Considerations' section of this grant for a figure documenting the project location in the Community Empowerment Zone/Income Limits.

Specific improvements that will affect these groups include improved accessibility and mobility through the installation of new and wide sidewalks, new curb ramps, bulbouts, the installation of accessible pedestrian signals, new crosswalk striping, improved street lighting, dedicated bike facilities (bike lanes or separated bike path), a new traffic signal and the upgrading and interconnection of existing signals, emergency preemption technology, lane reductions and/or conversions to an HOV/transit lane, an improved driving surface, an upgraded railroad crossing, and improved vehicular and pedestrian accessibility to the Tacoma Dome Transit Station which will benefit regional rail (Amtrak, Sounder, and the future light rail connection to SEATAC airport), local streetcar/LINK light rail, and regional (Greyhound, Intercity, Sound Transit) and local (Pierce Transit) bus service.

2. **Is the project on a transit route? (Transit routes that "intersect" are okay only when the project improves the intersection)**

Yes, full project length

3. **If yes, provide route number(s)**

574, 586, 590, 594, 12, 14, 41, 102, 400, 500, 501, 603, 612 and Greyhound Services

4. **Does this project specifically improve non-motorized access for trips to any of the following (check all that apply).**

Transit locations (1+ trip per day), Schools, Cultural Facilities (museums, libraries, etc.), Commercial Access, Civic, Parks and Recreation, Other

5. **If you chose "other" in the preceding question, please describe.**

City developed and managed Homelessness Encampment at the east end of Puyallup Avenue

6. **Non motorized access improvements map**

Puyallup_Ave_Access_.pdf

7. **Does the project provide contiguous gap-closure?**

Yes, Next Section

8. **If yes, please name adjacent segments; provide their funding source, and completion date.**

The project's eastern terminus, S. C Street, was purposely selected to provide connectivity to the Prairie Line Trail and the Water Flume Trail (with access to University of Washington Tacoma/Foss Waterway Esplanade and south Tacoma, respectively). Providing reasonable connections to trail systems is an important goal of the City's Comprehensive Plan, including the South Downtown Subarea Plan and the Transportation Master Plan. Additionally, the western terminus of the project will provide future connectivity to the Tahoma to Tacoma Trail and the Puyallup Levee Trail. Upgrading Puyallup Avenue will provide a consistent pedestrian/cycling environment to access trails within the City, as well to the county/regionally.

A current City of Tacoma Trail map is attached under the 'Project Location' section of this grant application.

Pierce Countywide Competition: Roadway 1

1. **Federal Functional Classification of 50% or more of the project:**
principal

2. **Does the project include signal interconnection, pre-empt, or other ITS improvements?**

There are nine (9) existing signals along the proposed corridor. The technology associated with these signals is not current, making signal coordination difficult without significant hardware and wiring upgrades. The existing signals are programmed to operate the same all day regardless of changing conditions. The existing Level of Service is "D" and "C", eastbound and westbound, respectively, with an ADT of 15,000 VPD.

The proposed ITS improvements will include the installation of new underground fiber the full length of the corridor, the replacement and interconnection of all signals, including the use of emergency preemption technology. New signal controllers with the latest firmware and communications equipment will allow for peer-to-peer networking even outside of time-of-day coordination. This new system will provide better corridor control with respect to overall signal timing and traffic flow, improved coordination with the LINK light rail system (that crosses the corridor at Pacific Avenue), enhanced HOV/transit lane flow, improved access by both transit and general occupancy vehicles to the Tacoma Dome Station, and improved freight movement, particularly at the E. D Street and Portland Avenue signals which provide access to industry in the Tacoma Tideflats, the City of Fife, and access SR 509 and I-5. The new signal proposed at E. L St. will be included in the corridor's planned ITS improvements.

As this is a complete street project designed to accommodate all modes of travel, including pedestrian, bicycle, and HOV/transit, it is anticipated that there will only be minimal reductions in Level of Service across the corridor (2040 NO BUILD East and westbound level of service for the Puyallup Avenue would be "D" and "D" respectively, and the 2040 BUILD East and westbound level of service for the Puyallup Avenue would be "E" and "D" respectively). The ITS improvements, in this case, however, will allow the right-of-way to be better utilized to serve all modes of travel without significant impacts to Level of Service, and will better coordinate traffic flow which will limit idling, reduce accidents (through signal timing, flashing yellow arrows, modifications to permitted phasing, upgrading of signal lenses, etc.), and with mode shifts, significantly reduce VMT (182,410 hours).

3. **Does the project include horizontal or vertical roadway adequacy improvements? (Include a map, design drawing, or narrative statement specifically addressing the horizontal/vertical improvements.) Please describe.**

There are no planned horizontal or vertical adequacy improvements planned.

4. **Roadway adequacy documents**

Puyallup_Signal_Warrant_Analysis_-_Final_E_L_St..pdf

5. **Does this project add a new illumination system?**

Yes, full project corridor length

6. **Does the project include new intersection traffic control that satisfies two or more traffic warrants? If so, please describe (e.g. adding protected left turn , flashing-yellow arrow, stop-control).**

A traffic signal is recommended at Puyallup Ave. and E. L St. as per warrants 6 and 7. This recommendation is documented in the attached 'Puyallup Signal Warrant Analysis - Final E L St.' file.

7. **Does the project include new intersection traffic control that satisfies two or more traffic warrants?**

Yes, a traffic signal will be installed

Pierce Countywide Competition: Roadway 2

1. **Describe how this project improves the efficiency and reliability of a designated Washington State Truck Freight Economic Corridor.**

Puyallup Avenue is classified as a T3 freight corridor (300,000-4,000,000 tons per year), however based on a recent traffic study, the truck percentage is approximately 9.5%, with a ADT of 15,000 VPD, and utilizing the truck tonnage formula of the 'Roadway 3' grant page, the tonnage calculates to more of a T2 corridor at 6,056,250 tons annually . Therefore, improving the efficiency and reliability of freight movement is an important project goal.

As Puyallup Avenue is an asphalt road and not designed to heavy haul standards, this grant will provide the means to replace this pavement with concrete constructed to heavy haul

requirements. This will also support transit and the over 500 daily bus trips on the corridor. Also beneficial to the movement of freight along the corridor will be the ITS improvements, including the installation of new fiber and the upgrading and interconnecting of all traffic signals. This will allow real-time traffic management which could direct/detour freight movement off the corridor should there be rail crossing blockages or accidents. These ITS system upgrades will be consistent with what is being installed at various locations in the Port in conjunction with the Tideflats Intelligent Transportation System Engineering and Implementation Plan assembled by DKS in January 2017.

2. **Will this project correct a significant safety problem by implementing a seismic retrofit, guardrail, attenuator and barriers, or other solution?**

WSDOT crash data from 2012-2016 indicates there have been 52 crashes along the project corridor. The crash results indicate that a single solution will not address the causes of all 52 crashes. Therefore, the attached summary, "Puyallup Ave Safety Improvements" recommends a number of improvements/counter measures at both signalized and uncontrolled/midblock intersections to improve safety across the corridor. These range from pavement markings, wayfinding signage and bulbouts, to an improved and interconnected signal system utilizing flashing yellow arrows, larger signal lenses, more efficient signal timing, and modifications to signal phasing.

The 2012-2016 WSDOT Crash Data file for this corridor is added to this grant application under the 'Other Considerations' tab. The software will not allow more than one file to be added to this section.

3. **Accident reports**

Puyallup_Ave_Safety_Improvements.pdf

4. **Does the project include a new bicycle lane or separated bicycle facility for the full length of the project?**

Yes striped lane 5 feet or greater

5. **Does this project include a new pedestrian facility for the full length of the project?**

Yes, a separated pedestrian facility

6. **Does this project include a vertical grade separation?**

No

7. **Please explain. Enter "N/A" if not applicable.**

Note: The project will include either dedicated bike lanes on each side of the road, or a separated two-way bike facility on one side of the road (likely north side per the preliminary alternative development process), each of which has received positive feedback from the public and the cycling community. Although the final alternative in our preliminary design process, Alternative 4, shows bike lanes, the cycling facility ultimately selected will be determined following additional design related to driveway access, freight movement, signal improvements, on-street parking, Tacoma Dome Transit Station boarding and operational procedures, and HOV/transit lane placement.

Pierce Countywide Competition: Roadway 3

1. **Existing Truck Route Classification**

N/A

2. **Annual Truck Tonnage Calculation**

4 million to 10 million tons per year

3. **Average daily traffic (trucks)**

15,000

4. **Truck percentage**

9.5%

5. **Does this project add a dedicated right turn pocket or a left turn lane at one or more intersections?**

Yes, adds multiple

6. **Does this project add new HOV lanes or transit queue jump lanes? Applicants need to provide a letter of support for queue jump lanes from the affected transit agency.**

Yes

7. **Letter of support**

N/A

8. **Does the project widen or construct the road to add general purpose lanes to increase capacity?**

No

Air Quality and Climate Change: Element Selection

- Please select one or more elements in the list below that are included in the project's scope of work, and provide the requested information in the pages to follow.**

Roadway Improvement, Bicycle and Pedestrian Facilities, Intelligent Transportation Systems

Air Quality and Climate Change: Roadway Improvement

- What is the length of the project?**
1.2 miles
- What is the average daily traffic before and after the project?**
The current daily traffic varies along the corridor from a high of 17,700 VPD in the vicinity of the transit center, to approximately 11,592 VPD just east of Pacific Avenue, for an average of approximately 15,000 VPD along the corridor. With the design year of 2040, and with various land use and mode shift options, expecting a practical growth scenario, we expect the ADT along the corridor to be 17,500 VPD.
- What is the average speed before and after the project?**
The Puyallup Ave project is a complete street project designed to accommodate all modes of travel, including the incorporation of dedicated pedestrian, bicycle and HOV/transit facilities. As a result of these improvements, it is expected the build scenario will experience minimal reductions in vehicle speed across the corridor. Specifically, The existing PM peak hour average speed is 18 mph. The estimated PM peak hour average speed for the 2040 No-Build scenario will be 16 mph. The estimated PM peak hour average speed for the 2040 Build scenario will be 14 mph (as modeled in Alternative 2).
- What is the average daily transit ridership along the corridor?**
3,400
- How many daily peak period transit trips serve the corridor?**
Pierce Transit reports 283 peak hour trips. Daily peak period transit trips via Sound Transit, Greyhound and Intercity Transit are not included in this number.
- What is the expected increase in transit speed due to the BAT/HOV lanes?**
Advanced traffic operational analysis is required to estimate the transit speed. Transit speeds due to proposed BAT/HOV lanes were not estimated. However, Pierce Transit analyzed transit treatment benefits along Puyallup Avenue; the study reported that three minutes eight seconds (3:08) transit delay would be reduced due to proposed eastbound BAT/HOV lane which includes Q-Jump and TSP (i.e., Transit Signal Priority).
- What is the expected increase in transit ridership due to the BAT/HOV lanes?**
To achieve the Climate Action Plan (CAP) goal of reducing GHGs from transportation sources by increasing the non-single occupant vehicle the City of Tacoma is expected that the transit users will be doubled (existing transit mode split 5% vs. 10% in 2030) in 2030. The proposed Pacific Ave. BRT and the Tacoma Link extension are the two significant transit improvements that City is expected to build by 2020. These two major local transit routes will be connected to the regional transit network at the Tacoma Dome station. The proposed BAT/HOV lane on Puyallup Avenue (proposed Pacific Ave. BRT route) will decrease transit travel time, and the transit ridership is expected to be increased significantly.
- What is the percentage of freight truck traffic on the facility?**
The percentage of the freight traffic on the Puyallup Avenue varies between 7% and 12.5%. The average daily truck traffic (ADTT) on Puyallup between Pacific and Portland Ave. is approximately 9.5%.
- Will the project result in shorter trips and reduced VMT? If so, please explain.**
The project will promote or increase transit and other non-motorized trips and reduce VMT approximately 182,410 miles. Please find the detailed VMT calculation in the Puyallup Ave VMT Calculation file attached under the 'Other Considerations' section.
- Please describe the source of the project data provided above (e.g., Environmental Impact Statement, EPA/DOE data, traffic study, survey, previous projects, etc.).**
 - Puyallup Avenue Corridor Conceptual Design
 - Puyallup Ave Transit Treatment Benefit Analysis
 - Information provided by Pierce Transit

Air Quality and Climate Change: Bicycle and Pedestrian Facilities

1. Describe the facilities being added or improved

New sidewalks will be added along the corridor on both sides of the street and these will generally be 6-15 feet wide (possibly wider if parking is removed in select areas). Bulbouts will be added at select intersections to improve pedestrian visibility and shorten crossing distances. The sidewalk will be intermixed with street trees/landscaping, and other pedestrian amenities including bike racks, garbage cans, pedestrian scale lighting, signage, and may offer gathering places. Curb ramps will be added and/or upgraded to meet current ADA standards, driveways will be replaced to meet these same standards. Crosswalks and APS push buttons will be added at all signalized crossings.

There are currently no bicycle facilities along the corridor. Between Pacific Avenue and Portland Ave, the project will either contain dedicated bike lanes on each side of the road or a separated two-way bike facility (likely on the north side of the road), each of which has received positive feedback from the public and the cycling community. Although the final alternative in our preliminary design process, Alternative 4, shows bike lanes, the cycling facility ultimately selected will be determined following additional design related to driveway access, freight movement, signal improvements, on-street parking, Tacoma Dome Transit Station boarding and operational procedures, and HOV/transit lane placement.

2. What is the length of the proposed facility?

Approximately 1.2 miles

3. Describe the connections to existing bicycle/pedestrian facilities and transit.

There are no existing dedicated bicycle facilities along the corridor, cyclists therefore share the roadway with freight/general traffic or use the sidewalks which are in place on both sides of the roadway for the majority of the corridor. From these existing facilities, users may access the transit center for both local and regional rail (Amtrak, LINK, Sounder and the future Sound Transit connection to SEATAC airport and points farther north), as well as local and regional bus service, and bus stops all along the corridor. Users will be able to make connection to the Prairie Line Trail on the west side of the project via S. C Street, and eventually be able to access the Tahoma to Tacoma and Puyallup Levee trails on the east side of the project (once constructed). Connection to the Foss Waterway and the Esplanade can be via E. D Street, and access to museums and other civic buildings can be made via Pacific Avenue.

4. Describe the current bicycle/pedestrian usage in the project area. If known, provide information on the shift from single occupancy vehicles.

From our public outreach and discussions with our Bike, Pedestrian Technical Advisory Group and our Transportation Commission, there is a great desire to improve bicycle access to the transit center, as well as to provide safer access across the entire corridor. Due to lack of supporting infrastructure, there is limited bicycle use on the corridor today as users are forced to share lanes with freight and other vehicles or ride on the existing sidewalks. The actual number of current users is not known.

Pedestrians have access the existing sidewalks on both sides of the roadway, where present (there are long driveway sections where there is no designated sidewalk). The sidewalks also vary in width 6-15', with condition ranging from poor to good condition.

5. What is the expected increase in bicycle/pedestrian usage from the project? If known, provide information on the shift from single occupancy vehicles

Bicycle and pedestrian usage across the corridor is expected to significantly increase once safer and more accessible routes are provided. This increase will be due to riders accessing the transit center for both local and regional rail (Amtrak, LINK, Sounder and the future Sound Transit connection to SEATAC airport and points farther north), as well as local and regional bus service. Additionally, with the charter high school adding grades over the next few years, with additional transit-oriented development (with limited or no parking), expanding businesses, foot and bicycle traffic in this area is only expected to grow. The current traffic forecast completed for Puyallup Avenue identifies a 3% mode split increase in pedestrian and bicycle activity, with a 6% reduction in single occupancy vehicle use.

6. What is the average bicycle trip length?

1.3 miles

7. What is the average pedestrian trip length?

1.3 miles

8. Please describe the source of the project data provided above (e.g., Environmental Impact Statement, EPA/DOE data, traffic study, survey, previous projects, etc.)

Traffic counts and a transportation forecasting and operational analysis was completed as part of Puyallup Avenue Corridor Conceptual Design (Technical Memo #3, attached).

Bicycle and Pedestrian Trip Length were taken from the attached VMT calculation which references the Comparison of Household Surveys for 1985-1988, 1999, and 2006 in the Puget Sound Region.

Air Quality and Climate Change: Intelligent Transportation Systems and Corridor Efficiency

1. **What is the existing level of service?**
The existing East and westbound level of service for the Puyallup Avenue is "D" and "C" respectively.
2. **What are the existing number of lanes (in one direction)?**
There are two travel lanes in each direction. The roadway also has a parking lane on each side and a center turn lane.
3. **What is the existing average daily traffic?**
15,000 VPD
4. **What is the existing average speed?**
30 mph
5. **What are the ITS improvements being provided?**
The project includes fiber optics for the implementation of an intelligent transportation system planned for the ten (10) traffic signals (nine existing, one proposed) along the coordinated corridor and connecting into the Port of Tacoma Tidelands area. All new and rebuilt signal systems will include equipment for transit priority and emergency vehicle pre-emption. Each signal cabinet will receive a new signal controller with the latest firmware and communications equipment to allow for peer-to-peer networking even outside of time-of-day coordination. The combination of these will improve the overall functionality, capacity, and safety of the Puyallup Ave. corridor. They will also reduce idling and the environmental impacts related to greenhouse gases; all while improving safety and corridor efficiency. The new traffic signal at E. L Street will assist the management of peak hour traffic flows, including access over the L Street Bridge which serves Tacoma's Eastside.
6. **How many intersections are being improved?**
Ten (10) intersections will have signal/ITS improvements constructed as part of this project.
7. **What is the length of the project?**
1.2 miles
8. **What is the percentage of freight truck traffic in the project area?**
The percentage of freight on Puyallup Ave varies from 7% to 12.5%. The average daily truck traffic (ADTT) on Puyallup Ave between Pacific and Portland Ave is approximately 9.5%.
9. **What is the expected improvement to level of service?**
The Puyallup Ave project is a complete street project designed to accommodate all modes of travel, including the incorporation of dedicated pedestrian, bicycle and HOV/transit facilities. As a result of these improvements, it is expected the build scenario will experience minimal reductions in levels of service across the corridor. Specifically, the 2040 No-Build East and westbound level of service for the Puyallup Avenue would be "D" and "D" respectively. The 2040 Build East and westbound level of service for the Puyallup Avenue would be "E" and "D" respectively.
10. **What is the expected improvement to average speed?**
The Puyallup Ave project is a complete street project designed to accommodate all modes of travel, including the incorporation of dedicated pedestrian, bicycle and HOV/transit facilities. As a result of these improvements, it is expected the build scenario will experience minimal reductions in average speed across the corridor. Specifically, the 2040 No-Build East and westbound average speed for the Puyallup Avenue would be 15.6 mph and 15.9 mph respectively. The 2040 Build East and westbound level of service for the Puyallup Avenue would be 12.7 mph and 15.2 mph respectively.
11. **What is the expected improvement to average vehicle delay?**
The Puyallup Ave project is a complete street project designed to accommodate all modes of travel, including the incorporation of dedicated pedestrian, bicycle and HOV/transit facilities. As a result of these improvements, it is expected the build scenario will experience minimal reductions in vehicle delay across the corridor. Specifically, the 2040 No-Build East and westbound average vehicle delay for the Puyallup Avenue would be 120.9 sec and 115.5 sec respectively. The 2040 Build East and westbound level of service for the Puyallup Avenue would be 179.3 sec and 122.7 sec respectively.
12. **Please describe the source of the project data provided above (e.g., Environmental Impact Statement, EPA/DOE data, traffic study, survey, previous projects, etc.)**
The Transportation Forecasting and Operations Analysis contained in the Puyallup Avenue Corridor Conceptual Design Tech Memo #3, Alternatives Evaluation Report.

1. **What is the PSRC funding source being requested?**
STP
2. **Has this project received PSRC funds previously?**
No
3. **If yes, please provide the project's PSRC TIP ID**
N/A

Phase	Year	Alternate Year	Amount
PE	2021	2022	\$2,100,000.00

Total Request: \$2,100,000.00

Total Estimated Project Cost and Schedule

Planning

Funding Source	Secured/Unsecured	Amount
Local	Secured	\$255,000.00
		<u>\$255,000.00</u>

Expected year of completion for this phase: 2018

PE

Funding Source	Secured/Unsecured	Amount
Local	Secured	\$400,000.00
STP(U)	Unsecured	\$2,100,000.00
		<u>\$2,500,000.00</u>

Expected year of completion for this phase: 2023

ROW

Funding Source	Secured/Unsecured	Amount
Local	Unsecured	\$16,000.00
STP(U)	Unsecured	\$84,000.00
		<u>\$100,000.00</u>

Expected year of completion for this phase: 2023

Construction

Funding Source	Secured/Unsecured	Amount
Local	Unsecured	\$3,557,376.00
STP(U)	Unsecured	\$18,676,224.00
		<u>\$22,233,600.00</u>

Expected year of completion for this phase: 2025

Summary

1. **Estimated project completion date**
December 2025
2. **Total project cost**
\$25,088,600.00

Funding Documentation

1. **Documents**

Streets_Initiative_Documents_for_Grant_Match.pdf, Streets_Initiative_Tracking_-_Arterial.pdf, Attachment_C2_-_2018CapitalTimeline.pdf

2. **2. Please describe the secure or reasonably expected funds identified in the supporting documentation. For funds that are reasonably expected, an explanation of procedural steps with milestone dates for completion which will be taken to secure the funds for the project or program should also be included.**

Tacoma City Council approved Resolution #28344 (attached) on February 9, 2016 authorizing a new fund for the dedication and segregation of funds received from voter-approved Proposition A and Proposition No. 3 which includes funding for motorized and non-motorized facilities. More specifically, these funds are intended to be used as grant match to further the work on these facilities. Grant match dollars are available from this newly created fund for this project.

On January 20, 2016, the City's Transportation Commission supported moving forward with this project and applying for grant funding with match allocated from the approved Propositions. The funding from this proposition is identified as Streets Initiative Funds. The funding match is available now and has been assigned through the City's biennial budget process. The "Streets Initiative Tracking- Arterial" attachment documents the allocation of this funding for Puyallup Ave Transit/Complete Street project.

The project is shown in the City's Six Year Plan and once the grant is received the funding will be transferred to the project from the Street's Initiative Funding via the Capital Facilities Plan CFP process. Current key dates for the CFP this are shown in attachment C2.

3. **Cooperating Jurisdictions and Private Sector Support, if any:**

Cooperating Jurisdiction	Phase	Dollar Amount of Participation	Percentage of Current Application
N/A	N/A	N/A	N/A
Private Sector Support	Phase	Dollar Amount of Participation	Percentage of Current Application
N/A	N/A	N/A	N/A

4. **Letters of commitment**

N/A

5. **Over Match Incentive**

15% to 25% of total phase(s) requested costs

6. **Is the project or phase ready for implementation?**

Yes, the City is ready to begin PE on this project.

7. **Will other secured or reasonably secured funding benefits be missed if the project remains unfunded in 2021 or 2022?**

No

8. **If so, please explain**

N/A

Has the jurisdiction secured/obligated state or federal funding for any of the project's phases, or has it completed a phase of the project using local funds only? Please respond for each of the phases below. Enter the funding sources and grant numbers as appropriate:

9. **Planning**

The City recently invested \$255,000 in public/stakeholder outreach and the development of alternatives for Puyallup Avenue from S. C St. to Portland Avenue, the full length of this project's PE phase. The study was conducted by Nelson/Nygaard Consulting Associates, Inc. Three technical reports were issued and are presented on the City's website at: <http://www.cityoftacoma.org/cms/One.aspx?portalId=169&pageId=110507>. The final alternative technical report is attached to this grant.

Funding for this phase is documented in the attached "Streets Initiative Tracking- Arterial" file which identifies Arterial & Freight Mobility Commitments from the voter approved funding.

0. **PE/Design**

No other state or federal funding has been secured for this phase. The City has identified local funds to be used as match which will come from a voter approved fund, Proposition A and Proposition No. 3, which includes funding for motorized and non-motorized facilities.

Funding match for this phase is documented in the attached "Streets Initiative Tracking- Arterial" file which identifies Arterial & Freight Mobility Commitments from the voter approved funding.

1. **Right of Way**

No other state or federal funding has been secured for this phase.

2. **Construction**

No other state or federal funding has been secured for this phase.

Project Readiness: PE

1. **Are you requesting funds for ONLY a planning study or preliminary engineering?**

Yes

2. **Is preliminary engineering complete?**

N/A

3. **What was the date of completion (month and year)?**

N/A

4. **Have preliminary plans been submitted to WSDOT for approval?**

N/A

5. **Are there any other PE/Design milestones associated with the project? Please identify and provide dates of completion. You may also use this space to explain any dates above.**

N/A

6. **When are preliminary plans expected to be complete?**

N/A

Other Considerations

1. **Describe any additional aspects of your project not requested in the evaluation criteria that could be relevant to the final project recommendation and decision-making process.**

The Tacoma Dome Station is one of the largest transit hubs in the State of Washington. The majority of the access to this center, and to other transit modes associated with this center, is via Puyallup Avenue. Constructing a first class transit corridor will increase use and efficiency of this center, further encouraging future mode shifts.

2. **Describe any innovative components included in your project: these could include design elements, cost saving measures, or other innovations.**

The project will construct a transit/HOV lane, the first such facility in the City of Tacoma.

A concrete roadway section was selected over asphalt roadway due to its long-term durability for freight and transit use, and therefore, lower life cycle maintenance costs.

3. **Describe the process that your agency uses to determine the benefits of projects; this could include formal cost-benefit analysis, practical design, or some other process by which the benefits of projects are determined.**

It is rare in Tacoma to have a generally straight 100 foot wide right-of-way for more than a mile in length that is prime for reconstruction. The benefits, or outcomes, of this project need to serve a diverse group of users (low income, business/property owners, developers, transit users/operators, Tacoma/Dome visitors, disabled, the homeless, school-age children, etc.). The City determined the only way to identify those outcomes, and ultimately the benefits of the project, was to have an extensive public outreach process. This process began in August 2016 and included in-person on-the-street surveys, web surveys, stakeholder meetings, a technical advisory group, public open houses, and design charrettes. This outreach shaped our initial alternatives, as well as our final outcome.

Additionally, practical design considerations were used to select the pavement type for the roadway surface. A concrete roadway section was selected over asphalt roadway due to the design loads needed for heavy haul operations and the desire for lower maintenance costs long-term.

4. **Final documents**

Letter of Support Puyallup Avenue Corridor Improvements.pdf, WSDOT Accident Data 2012-2016 Puyallup Ave.xlsx, Puyallup Ave_VMT_Calculation.pdf, 4-20-18-Meyer-to-Kingsover-Puy Ave_Ltr of Spt.pdf, TM_3_AlternativesEvaluationReport_Feb2018.pdf, Puyallup Ave_Zoning.pdf

5. **Will this project include additional ADA improvements over and above by the current and adopted Design Standards (LAG Manual)? Example: Construction of a sidewalk that is wider than the minimum requirements.**

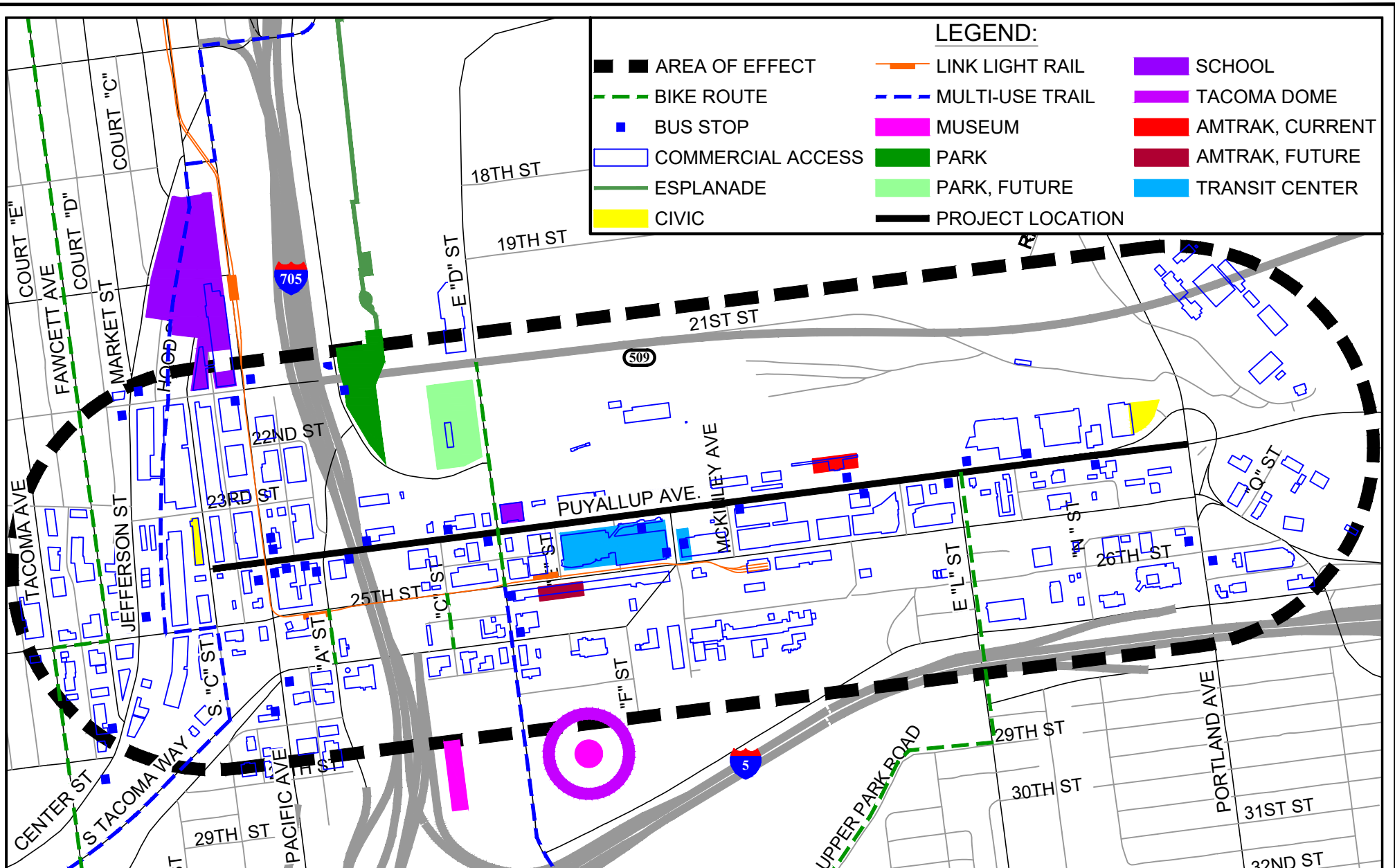
Sidewalk widths will exceed the WSDOT design requirement of 5'. In most instances the

sidewalk will be 6'-15' in width.

Directional ADA ramps will be constructed wider than the 4' minimum in the design manual, the City standard is 5' wide, however these are generally constructed 6' wide whenever possible.

6. **Explain your resolution(s) to issues noted through the screening form process.**

A transit/HOV lane is included in the project. Additional documentation is attached documenting the revenues and expenditures associated with Tacoma Streets Initiative funds that will be used as match for this project.



CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS
Non-Motorized Access Improvements Map
Puyallup Ave. From S. 'C' St. to Portland Ave.
Puyallup Ave Transit/Complete Street Improvements



2. Will this project correct a significant safety problem by implementing a seismic retrofit, guardrail, attenuator and barriers, or other solution?

If so, explain the existing problem with supporting data and associated corrective action (e.g. accident summary):

WSDOT provided the citywide crash data from 2012-2016. The data was initially processed using the street name variants (including possible misspellings) and iterations of the associated roadways in the primary traffic way, intersecting traffic way, or reference point fields of the database. The analysis revealed that fifty two (52) crashes occurred along the project corridor. However, there was no driver contributing circumstance information recorded. The following is a summary of the additional findings of the crashes. **See the attached Crash Data.**

1. **Entering at angle:** Sixteen (16) crashes occurred as Vehicle At-Fault was maneuvering a left turn and vehicle turning left failed to yield to oncoming traffic.
2. **From same direction-both going straight-one stopped-rear-end:** Fourteen (14) rear-end crashes occurred while two vehicles were traveling straight and in the same direction.
3. **From same direction - both going straight - both moving - sideswipe:** Seven (7) sideswipe crashes occurred while two vehicles were traveling straight and in the same direction.
4. **Vehicle going straight hits pedestrians:** Four (4) crashes involved vehicles hitting pedestrians. Vehicle At-Fault failed to provide right-of-way to the pedestrian to complete the crossing.
5. **From opposite direction-one left turn-one straight:** Two (2) crashes occurred when the vehicle turning left failed to yield to oncoming traffic.

Summary and Recommendations: The crash investigation results clearly indicate that a single solution will not address all 52 crashes that occurred between 2012 and 2016 along Puyallup Avenue. The 52 crashes occurred at multiple locations for various reasons, and therefore multiple solutions are warranted to improve the safety of these intersections. *In addition, 17 crashes (1/3 of the total number of crashes) occurred at the controlled intersection.* The proposed project will implement the following counter measures and improve the safety of the project corridor.

Controlled Intersections:

- Several crashes were attributed to pedestrians crossing at signalized intersection. This indicates the need to improve the safety of pedestrian crossings at signalized intersections through the use of pavement markings, accessible pedestrian signal systems, bulbouts to shorten the crossing distance and improve visibility, signage, implementation of a leading pedestrian interval, and/or other means.
- An improved signal system (i.e. flashing yellow arrow signal) will eliminate conflicts between traffic going through and traffic turning left, and prevent left turn related crashes.
- Several crashes occurred because drivers' disregarded the stop light. This indicates the need to improve the visibility of the intersection's signal system to assist with improving driver's awareness.
- More efficient signal timing will minimize corridor delays, improve mobility and encourage drivers to maintain a safe speed and adhere to speed limits.
- Converting several existing permitted phasing to protected/permitted with flashing yellow left turn arrows would allow drivers to find a safe gap to maneuver a left turn.
- Several crashes occurred due to distraction and inattention, meaning that something in the vicinity of the intersection may be causing drivers to lose focus or the signal system may not be visible. Upgrading the signal lenses to 12" and adding retroreflective backplates would improve the visibility of the signal system and assist in reducing crashes.

- An improved signal coordination timing plan will minimize corridor delays, improve mobility and allow traffic at the unsignalized intersection to find a safe gap to maneuver a left turn and enable pedestrian at the mid-block crossing to cross a five lane arterial respectively.
- The signal retiming will also reflect the 2009 MUTCD recommended walking speed for calculating the Pedestrian Clearance Time from 4.0 ft/sec to 3.5 ft/sec. Improved signal timing will ensure adequate time to cross a five-lane section roadway safely at the controlled intersections.

Uncontrolled Intersections/Midblock:

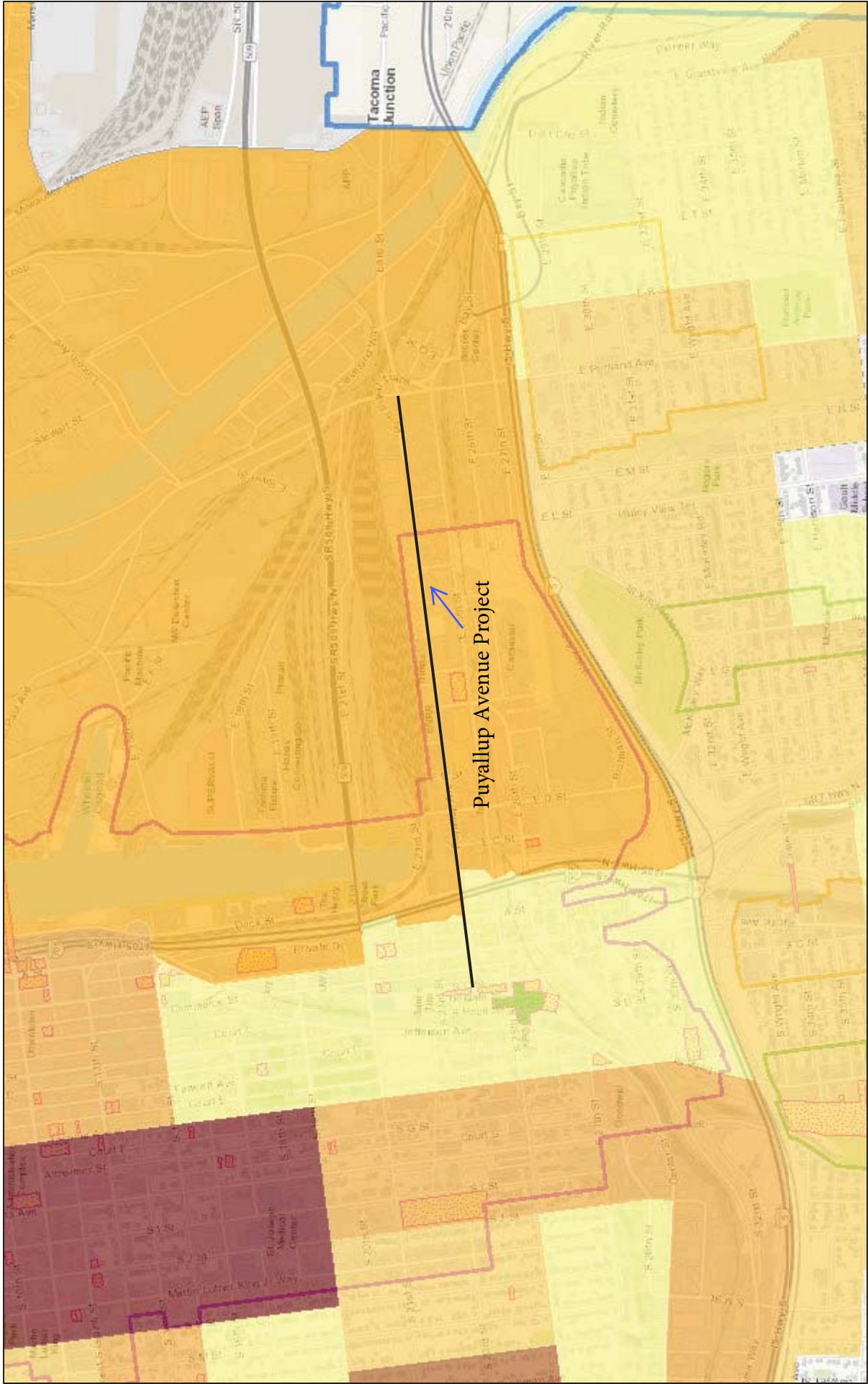
- Several crashes were attributed to the pedestrian crossing at an uncontrolled intersection and in the midblock. The controlled intersections and the midblock crossing are appropriately spaced in the high pedestrian activity areas. However, pedestrians were found crossing five (5) lane roadway sections in the midblock of the corridor during the field visit instead of using the nearest pedestrian crossing facilities located at the controlled intersection. Several reasons are attributed to the crashes that occurred at uncontrolled intersections or at the midblock.
 - The pedestrian crossing facilities are not visible as unmarked crosswalks at all controlled intersections. Marked pedestrian crosswalks may be used to delineate preferred pedestrian paths across roadways.
 - The pedestrian crossing options at the controlled intersection and in the midblock are not visible enough to encourage pedestrians to use the facilities. Pedestrian crossing and pedestrian wayfinding signs need to be installed at appropriate locations along the corridor to inform and guide pedestrians to cross at a controlled intersection.
 - The long crossing distance at uncontrolled intersections. Curb extensions can be built to shorten crossing distances, which will also enhance pedestrian safety by increasing pedestrian visibility, slowing turning vehicles, and visually narrowing the roadway.
 - The long crossing distance in the midblock. Staggered crosswalks (or Z-crossings) can be built in which the crosswalk is split by a median and is offset on either side of the median. This configuration forces pedestrians to turn in the median and face oncoming traffic before turning again to cross the second half of the crosswalk.

Estimated Vehicle Miles Travel (VMT)					
Trip Rate Daily					
Trips Per Person	3.34				
Trips Per Employee	6.25				
Ref: Table 6.21: PSRC Travel Model Documentation (for Version 1.0)					
Scenarios	Population	Employees	Population-Trips	Employee Trips	
2018 - Existing	1,201	3,906	4,011	24,413	
2024 - Future	17,544	15,182	58,597	94,888	
Trips By Mode ¹	Existing - City of Tacoma	Future - City of Tacoma	Existing Population Trips	Future Population Trips W/	Future Population Trips W/O
SOV (Single Occupancy Vehicle)	76%	55%	3,049	32,228	44,534
HOV (High Occupancy Vehicle)	10%	23%	401	13,477	5,860
Walk	5%	8%	201	4,688	2,930
Bicycle	4%	4%	160	2,344	2,344
Transit	5%	10%	201	5,860	2,930
		Total	4,011	58,597	58,597
	Future - City of Tacoma	Existing - City of Tacoma	Existing Employee Trips	Future Employee Trips W/ Improvements	Future Employee Trips W/O Improvements
SOV (Single Occupancy Vehicle)	55%	76%	18,554	52,188	72,115
HOV (High Occupancy Vehicle)	23%	10%	2,441	21,824	9,489
Walk	8%	5%	1,221	7,591	4,744
Bicycle	6%	4%	977	5,693	3,796
Transit	10%	5%	1,221	9,489	4,744
		Total	24,412.50	96,785	94,888
Estimated VMT - Population Trips	Trip Length (miles) ²	Occupancy Rate	VMT Existing	VMT Future W/ Improvements	VMT Future W/O Improvements
SOV (Single Occupancy Vehicle)	7.8	1	23,779.22	251,381	347,363
HOV (High Occupancy Vehicle)	6	2.24	1,074.47	36,100	15,696
Walk	1.3	1	260.74	6,094	3,809
Bicycle	1.3	1	208.59	3,047	3,047
Transit	11.1	12	185.52	5,420	2,710
		Sub-Total	25,508.54	302,042	372,624
Estimated VMT - Employee Trips					
SOV (Single Occupancy Vehicle)	7.8	1	144,717.30	407,067	562,493
HOV (High Occupancy Vehicle)	6	2.24	6,539.06	58,457	25,416
Walk	1.3	1	1,586.81	9,868	6,168
Bicycle	1.3	1	1,269.45	7,401	4,934
Transit	11.1	12	1,129.08	8,777	4,389
		Sub-Total	155,241.70	491,571	603,400
		Total	180,750.24	793,613.69	976,024.13
		Reduction In VMT W/ Improvements (Miles)			182,410

1. https://www.cityoftacoma.org/government/city_departments/public_works/engineering/transportation_master_plan

2. Comparison of Household Travel Surveys for 1985-1988, 1999, and 2006 in the Puget Sound Region: Figure 4-15. Average Trip Length by Trip Type and Mode:

Puyallup Ave Transit/Complete Street Improvement



April 19, 2018

Low/Moderate Income

- >=51 - 60 %
- >60 - 70%

- >70 - 80%
- >80 - 90%
- >90 - 100%

Community Empowerment Zone

1:18,056

0 0.15 0.3 0.5 0.6 mi

0 0.25 0.5 1 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri

Puyallup Avenue /E L St.

Traffic Study

Traffic Engineering- Public Works

City of Tacoma

Contents

Project Understanding:	2
Signal Warrant Analysis:	2
Crash Analysis:	3
Engineering Study:	4
Summary and Recommendations:	4

Project Understanding:

Puyallup Ave./ E L St. is a Two-Way Stop Controlled (TWSC) intersection (see Graphic 01) which is located between two signalized intersections, one at E G St. & Puyallup Ave. the other at E Portland Ave. & Puyallup Ave. These two signalized intersections are separated by more than 3600 feet. Pedestrian crossing facilities are not available between these two controlled intersections. The purpose of this study is to utilize the signal warrant analysis criteria set up in the Manual on Uniform Traffic Control Devices (MUTCD) to justify the installation of a traffic signal at the Puyallup Ave./ E L St. intersection. The City of Tacoma (COT) analyzed the signal warrants using the available data to determine whether any warrants were met. Using signal warrant analysis along with engineering judgment, COT made a determination that a signal should be installed at the Puyallup Ave./ E L St. intersection.



Signal Warrant Analysis:

The Manual on Uniform Traffic Control Devices (MUTCD) recommends nine (9) different traffic signal warrants to assess and justify the need for a traffic signal. The City of Tacoma reviewed all nine warrants and "Warrant 6, Coordinated Signal System" and "Warrant 7, Crash Experience" were analyzed to evaluate the need for a traffic signal at the Puyallup Ave./ E L St. intersection. The other warrants were not included due to limited traffic data. Outlined below is the analysis for Warrant 6 and 7.

Warrant 6, Coordinated Signal System

Standard:

02 The need for a traffic control signal shall be considered if an engineering study finds that one of the following criteria is met:

- A. On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.**
- B. On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.**

Puyallup Ave./ E L St. - Puyallup Ave./ E L St. is a Two-Way Stop Controlled (TWSC) intersection which is located between two signalized intersections, one at E G St. & Puyallup Ave. the other at E Portland Ave. & Puyallup Ave. These two signalized intersections are separated by more than 3600 feet. The proposed traffic signal at this location will assist building necessary degree of platooning which would improve the overall traffic operation of the Puyallup Avenue corridor. Adding a traffic signal will also ensure an overall safe and efficient traffic operation at this intersection by eliminating other potential conflicts between vehicle and non-motorized travelers.

Warrant 7, Crash Experience

Standard:

02 The need for a traffic control signal shall be considered if an engineering study finds that all of the following criteria are met:

A. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency;

Puyallup Ave./ E L St. – Due to heavy truck traffic and transit, no other enforcement is applicable at the location.

B. Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash;

Puyallup Ave./ E L St. – Three (3) crashes occurred in 2016. See the details in Table 01.

C. For each of any 8 hours of an average day, the vehicles per hour (vph) given in both of the 80 percent columns of Condition A in [Table 4C-1](#) (see [Section 4C.02](#)), or the vph in both of the 80 percent columns of Condition B in [Table 4C-1](#) exists on the major-street and the higher-volume minor-street approach, respectively, to the intersection, or the volume of pedestrian traffic is not less than 80 percent of the requirements specified in the Pedestrian Volume warrant. These major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.

Puyallup Ave./ E L St. – The average daily traffic at this intersection is approximately 17,000. Due to lack of traffic counts the analysis was not performed.

Crash Analysis:

WSDOT provided the citywide crash data from 2012-2016. The data was initially processed using the street name variants (including possible misspellings) and iterations of the associated roadways in the primary traffic way, intersecting traffic way, or reference point fields of the database. The analysis revealed that three (3) crashes occurred at the Puyallup Ave./ E L St. intersection. The following is a summary of the additional findings about the crashes. See the details in Table 01.

PRIMARY TRAFFICWAY	REFERENCE POINT NAME	DATE	MOST SEVERE SOBRIETY TYPE	MOST SEVERE INJURY TYPE	FIRST COLLISION TYPE
PUYALLUP AVE	E L ST	7/9/2016	Unknown	Serious Injury	Vehicle going straight hits pedestrian
PUYALLUP AVE	E L ST	4/1/2016	Had NOT Been Drinking	No Injury	Entering at angle
PUYALLUP AVE	E L ST	11/21/2016	Had NOT Been Drinking	Possible Injury	Vehicle - Pedalcyclist

Table 01

1. **Entering at angle:** One (1) crashes occurred as Vehicle At-Fault was maneuvering a turn (i.e., left, right or through) from a stopped controlled approach, and the turning vehicle failed to yield to oncoming traffic.

- a. **Adding a traffic signal** will create a gap which would allow cross-street traffic to maneuver a safe turn. An improved signal system (i.e., flashing yellow arrow signal) will eliminate conflicts between traffic going through and traffic turning left, and prevent left turn related crashes.
2. **Vehicle going straight hits pedestrians:** One (1) crash involved a vehicle hitting a pedestrian. Vehicle At-Fault failed to provide right-of-way to the pedestrian to complete the crossing.
 - a. **Adding a pedestrian signal** will improve safety for pedestrians by providing improved crossing opportunities between two widely spaced controlled intersections (i.e., E G St. and E Portland Avenue). Pedestrians will be able to cross the five-lane section of the roadway safely.
3. **Vehicle-Pedalcyclist:** The cause of this incident was recorded "None".
 - a. **Adding a traffic signal** will ensure an overall safe and efficient traffic operation at this intersection by eliminating other potential conflicts between vehicle and non-motorized travelers.

Engineering Study:

The City of Tacoma completed Puyallup Avenue Corridor Conceptual Design Study in 2018. The corridor study followed a comprehensive approach and identified transportation deficiencies and proposed improvements to accommodate future growth. The Puyallup Ave./ E L St. intersection is located at the west of the corridor. The corridor study identified that a traffic signal need to build at this TWSC intersection (i.e., Puyallup Ave./ E L St.) to improve the overall traffic operation and accommodate future growth. Please find the study details at the following link: <http://www.cityoftacoma.org/cms/One.aspx?portalId=169&pageId=110507>

Summary and Recommendations:

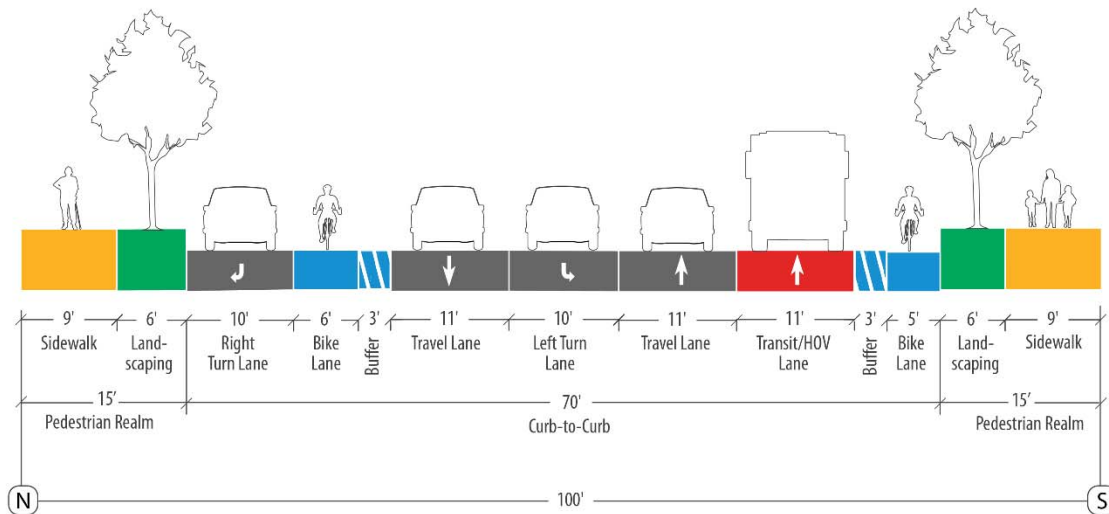
A traffic signal is recommended at the study area intersection as per Warrant 6 & 7, crash analysis data and the engineering study.

CROSS-SECTIONS

Alternative 4 is illustrated in the following cross-sections.

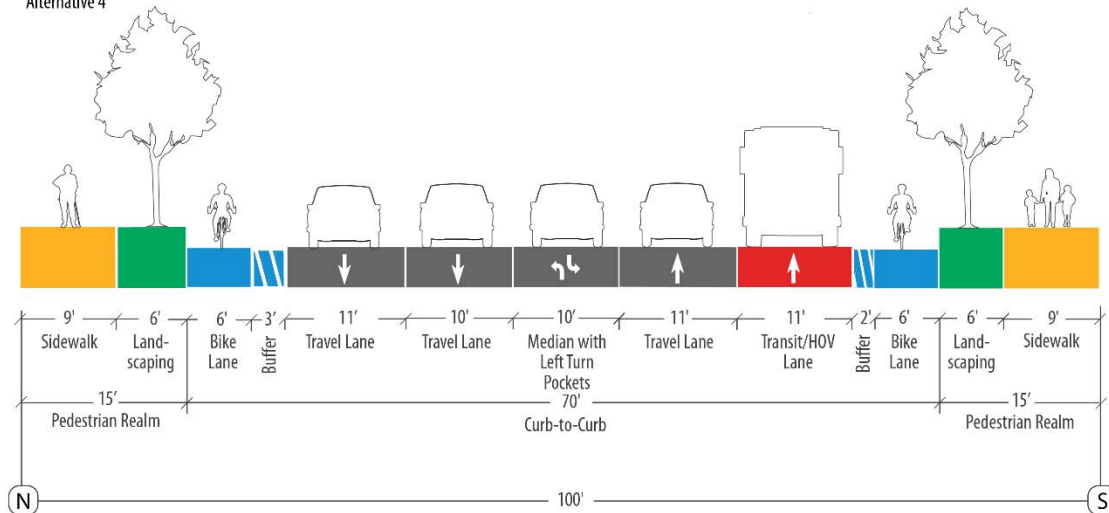
Neighborhood District Cross-Section – Alternative 4

Puyallup Avenue between Pacific Ave and A St facing East
Alternative 4

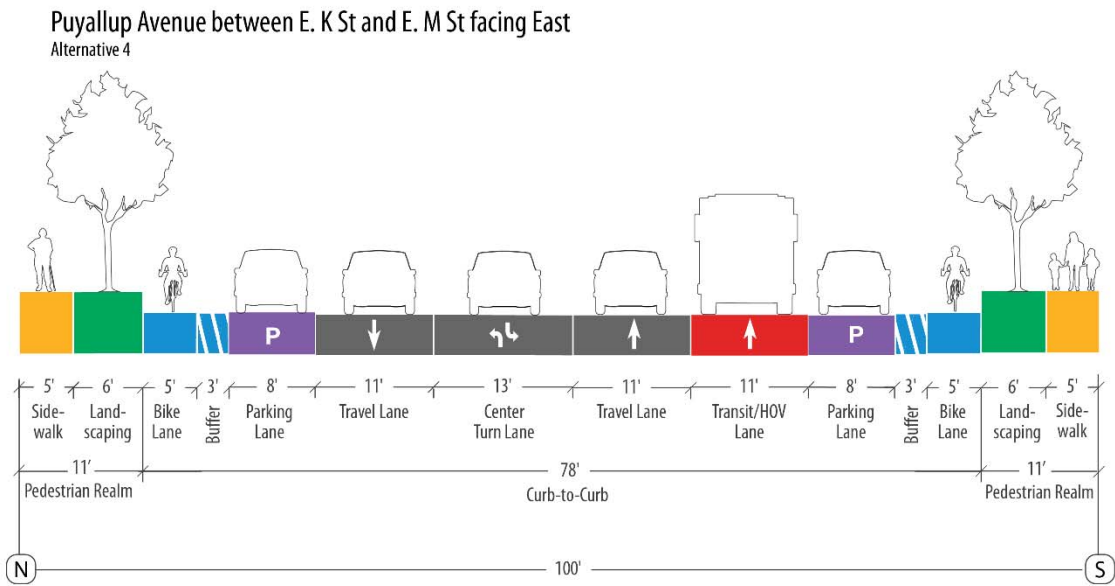


TOD District Cross-Section – Alternative 4

Puyallup Avenue between E. D St and E. E St facing East
Alternative 4



Industrial District Cross-Section – Alternative 4



PLAN VIEWS

Figure 7-7 Puyallup Avenue from East C Street to East D Street Plan View – Alternative 4

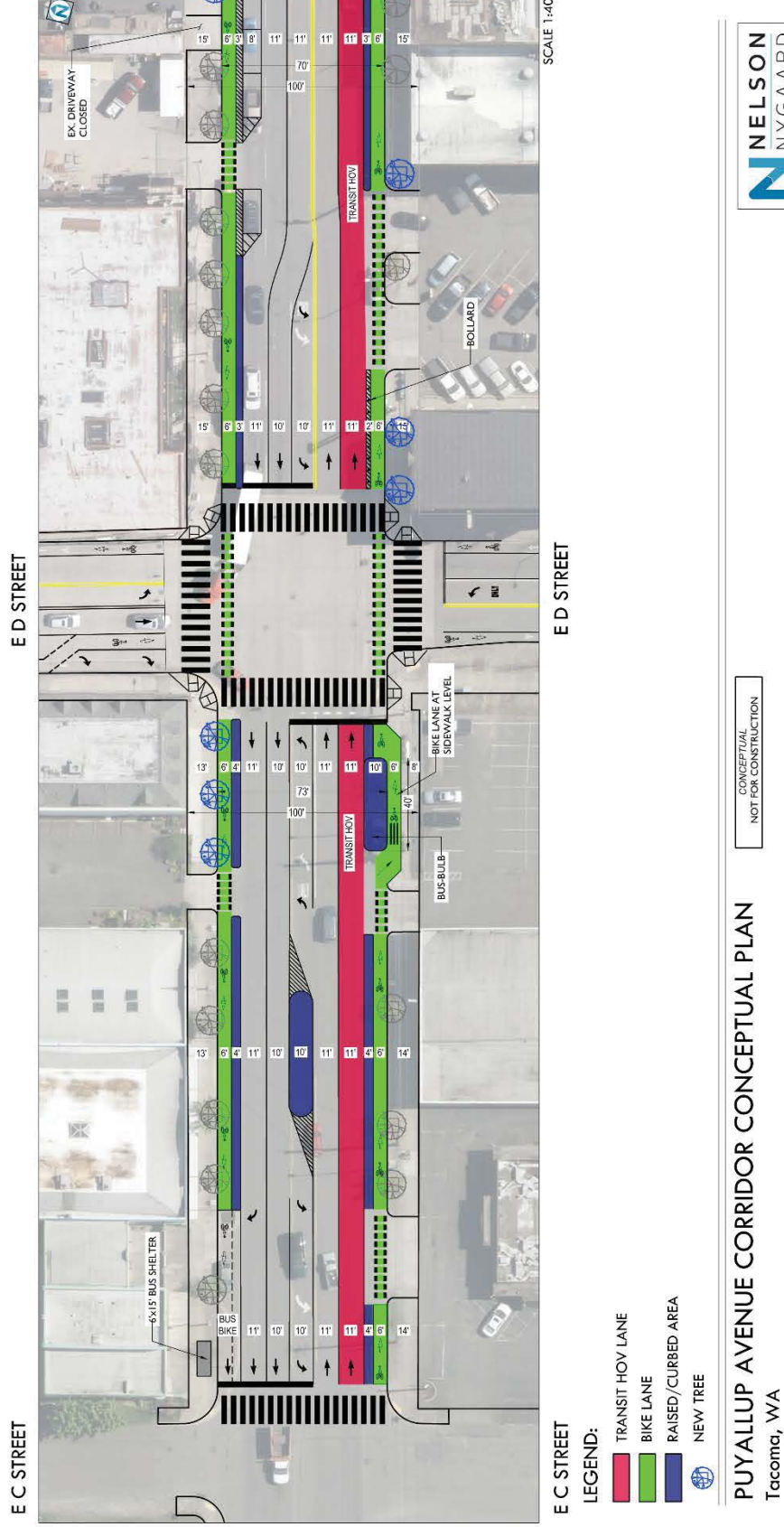
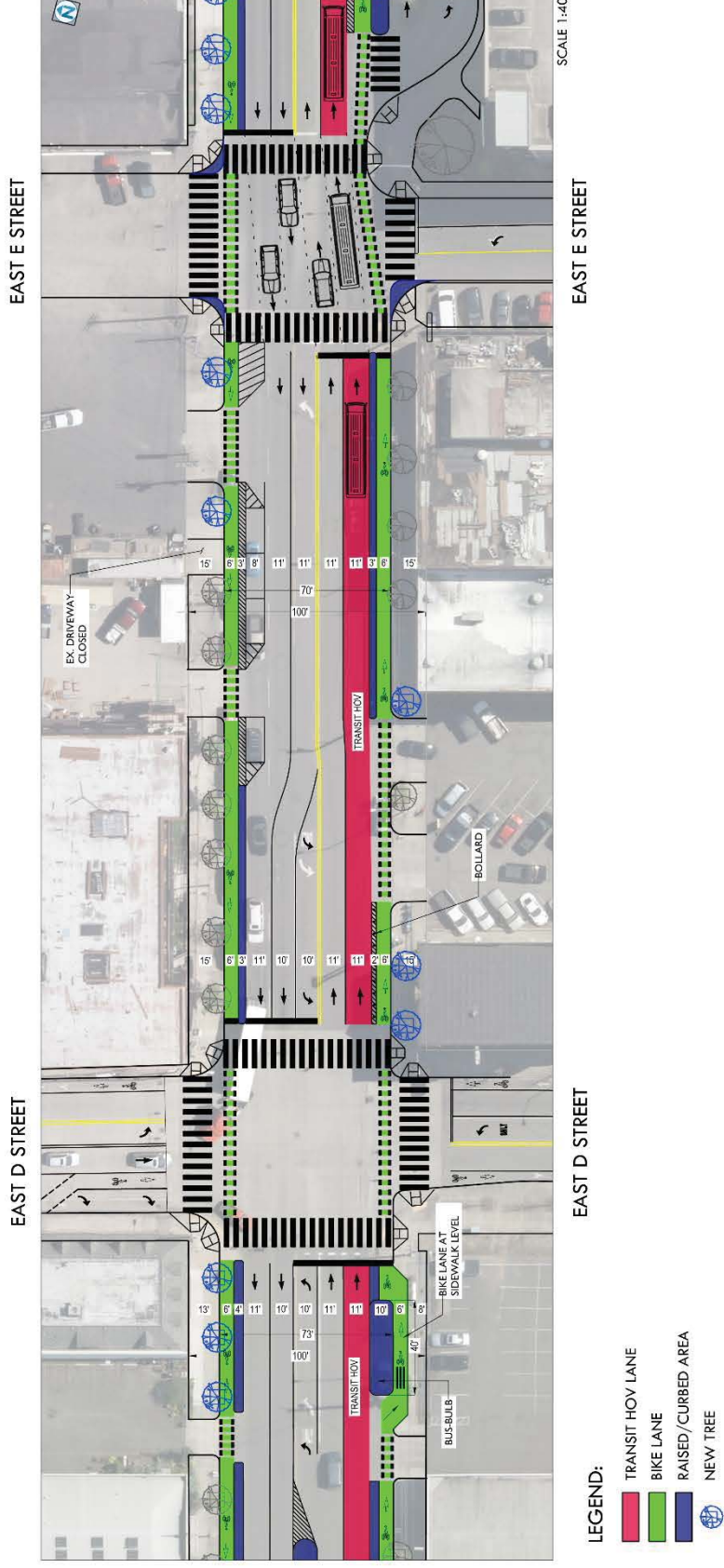


Figure 7-8 Puyallup Avenue from East D Street to East E Street Plan View – Alternative 4



PUYALLUP AVENUE CORRIDOR CONCEPTUAL PLAN

Tacoma, WA

F-G STREET PLAN VIEW



19 October 2017

Figure 7-9 Puyallup Avenue from East E Street to East F Street Plan View – Alternative 4

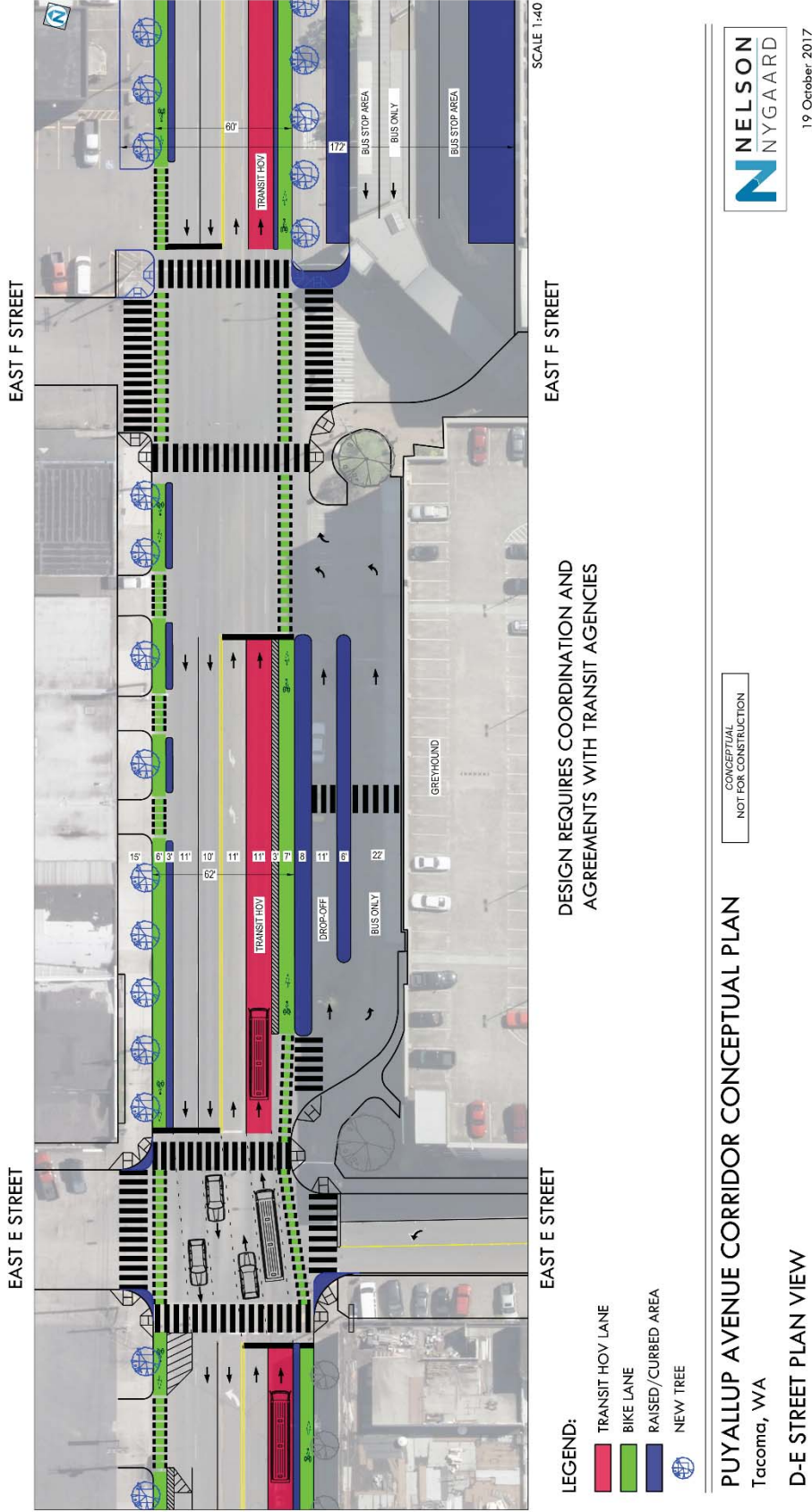
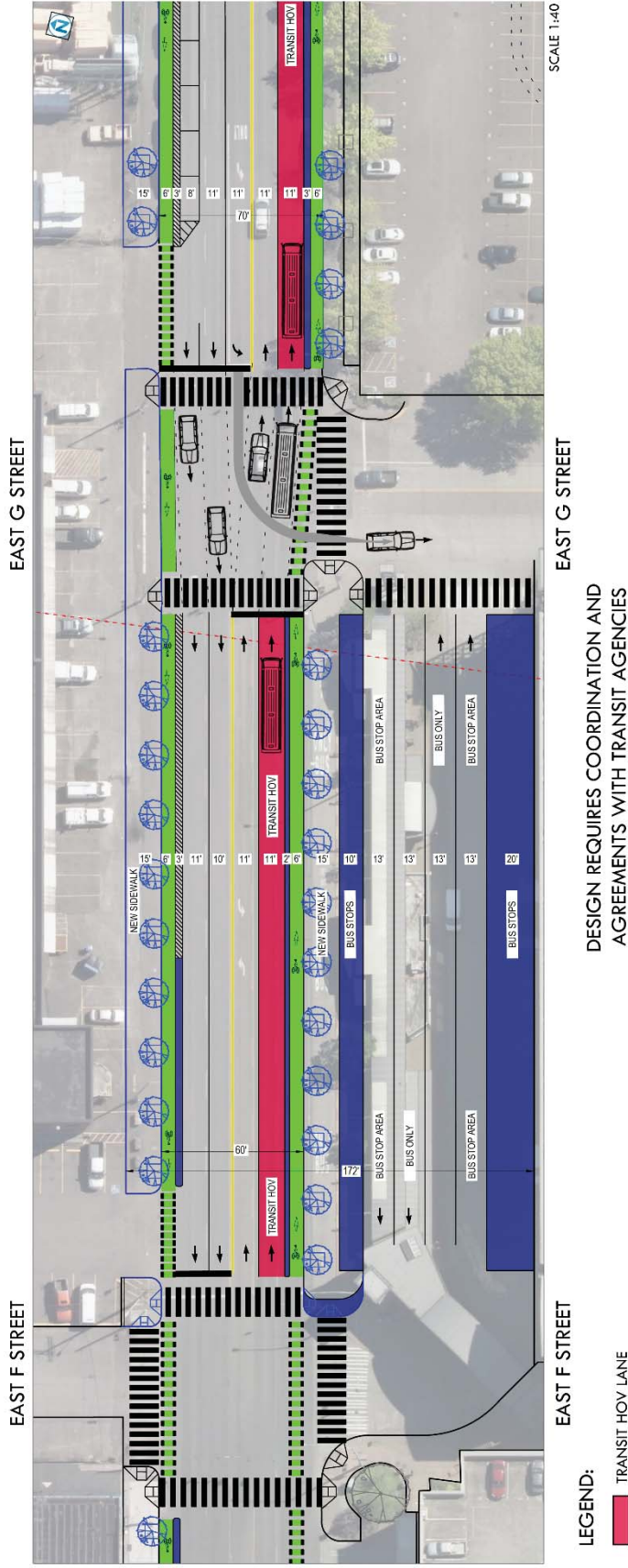


Figure 7-10 Puyallup Avenue from East F Street to East G Street Plan View – Alternative 4



PUYALLUP AVENUE CORRIDOR CONCEPTUAL PLAN

Tacoma, WA

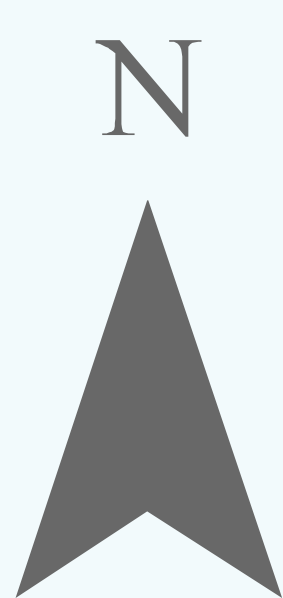
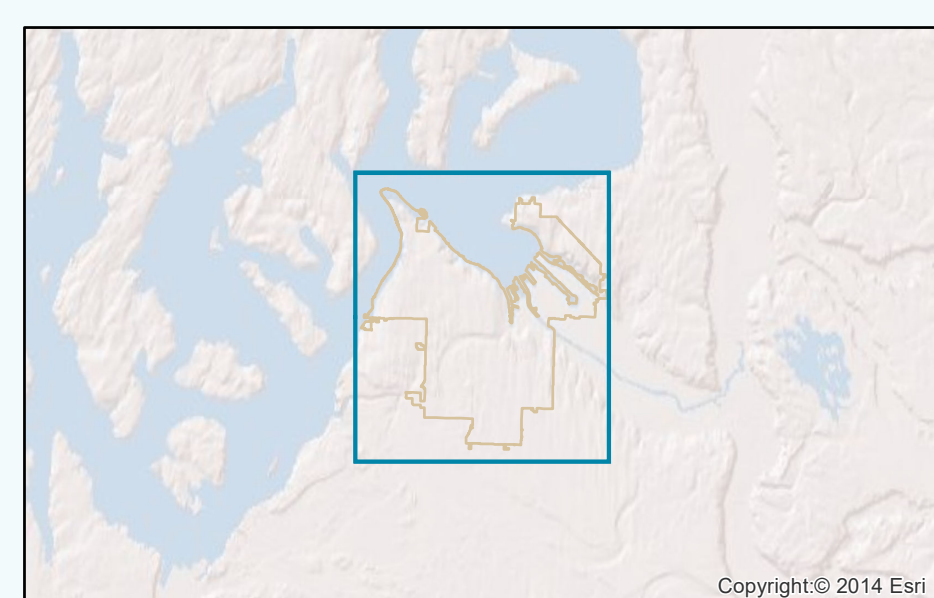
E-F STREET PLAN VIEW

CONCEPTUAL
NOT FOR CONSTRUCTION



19 October 2017

City of Tacoma - Trail Projects 2018



City of Tacoma
Public Works Department

0 0.5 1 2 3 Miles

This drawing is neither a legally recorded map nor a survey and is not intended to be used as one. It is to be used for reference purposes only.

