



Alternatives Analysis Report

Executive Summary

November 2019

INTRODUCTION

Pierce Transit is evaluating the feasibility of implementing high capacity transit (HCT) on the Pacific Avenue/SR 7 Corridor between downtown Tacoma and Spanaway. Pierce Transit currently serves this corridor via its Route 1 bus line, which is one of the transit system's four trunk routes and the route with the highest ridership in the Pierce Transit system, carrying almost two million passengers annually, or 20 percent of Pierce Transit's fixed-route ridership. Pierce Transit's Destination 2040 Long Range Plan, Sound Transit's ST3 Plan, and Puget Sound Regional Council's Transportation 2040 Long Range Plan all identify the Pacific Avenue/SR 7 corridor for potential HCT service.




The alignment for the Pacific Avenue/SR 7 HCT is a 14.4-mile segment of Pacific Avenue S/SR 7 between the Commerce Street Transfer Center in downtown Tacoma and 204th Street E in Spanaway, entirely within Pierce County. This alignment would serve the Tacoma Dome Station, which is a major transfer point for bus and rail service to locations throughout the Puget Sound area. The Study Corridor is shown on the following page.

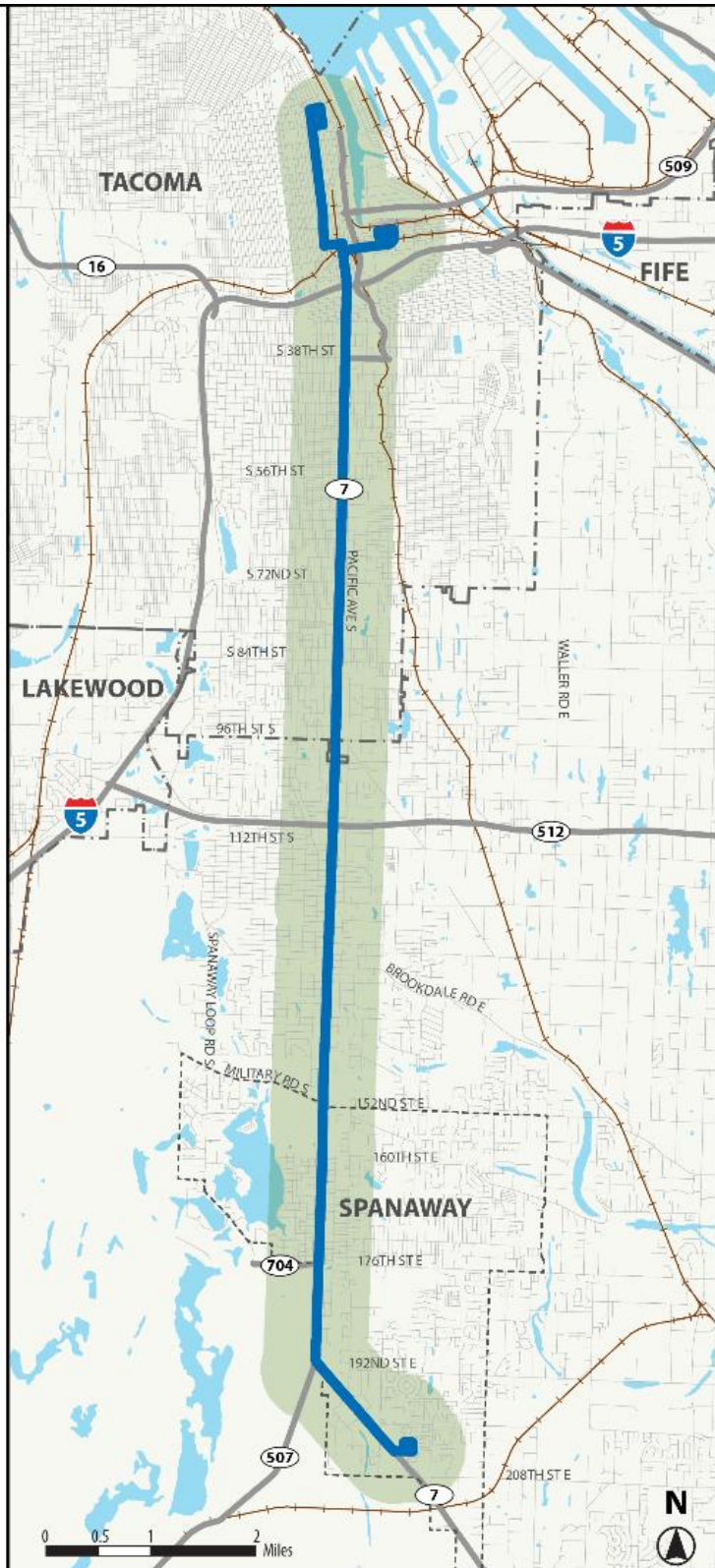
This Executive Summary is intended to provide an overview of the HCT Study and a summary of the primary conclusions from that study, including the recommended Locally Preferred Alternative. For more detail on the study, including the analysis behind each of the recommendations, please refer to the complete Alternatives Analysis Report.



PACIFIC AVENUE | SR 7 BRT CORRIDOR MAP

LEGEND

-  BRT Corridor Alignment
-  Half-mile Study Area
-  City Limits
-  Census-Designated Place



EXISTING AND FUTURE CONDITIONS

Transit

Pierce Transit provides frequent bus service on Pacific Avenue/SR 7 via fixed Route 1. This route is referred to by Pierce Transit as a “trunk line” and is the bus route with the highest ridership in the agency’s system. Route 1 travels 19.6 miles on Pacific Avenue/SR 7 between Tacoma Community College (TCC), downtown Tacoma, and the Walmart in Spanaway at 8th Avenue, operating every 15 minutes between 5:30 a.m. and 11:30 p.m. on weekdays. Weekend service operates approximately every 20 minutes between 6:30 a.m. and 9:30 p.m.

In October 2016, there were more than 5,500 average daily weekday boardings on Pierce Transit’s Route 1 (2,800 northbound and 2,760 southbound). Boardings per stop tend to be higher at the northern end of the corridor within the City of Tacoma, but there is a consistent level of activity through the length of the route.

Transit travel time along the portion of Route 1 that is within the HCT study area varies depending on the time of day, the direction of travel, and the location along the corridor. The northbound direction experiences very little travel time variability between the average AM Peak, Midday, and PM Peak periods. Overall, travel speeds tend to be the highest toward the start of the northbound route and the route experiences the highest delay between Pacific Avenue/S. 38th Street and Pacific Avenue/S. 14th Street in downtown Tacoma. In contrast, the southbound direction of Route 1 experiences a high degree of travel time variability between times of day with a general degradation of speeds from AM Peak to Midday to PM Peak—reflecting higher congestion levels, and thus, more volatility in roadway operations during the PM Peak in the southbound direction. This impact is greatest between Pacific Avenue/S. 14th Street and Pacific Avenue/S. 38th Street and between Pacific Avenue/S. 64th Street and Pacific Avenue S./Military Road S.

Future ridership on the Pierce Transit Route 1 was estimated using the Sound Transit 3 regional ridership model. Overall, ridership along the Route 1 alignment is expected to increase between 27 percent (low estimate) and 60 percent (high estimate) by 2040.

Bicycle and Pedestrian

The built environment and associated conditions for people walking and bicycling varies greatly across the 14.4-mile Study Corridor. In general, the northern portion within downtown Tacoma and 6th Avenue is more pedestrian- and bicyclist-friendly compared to the remainder of the Study Corridor. The corridor transitions to a more automobile-oriented arterial environment as you move south away from downtown Tacoma, with more dispersed land use patterns and a degradation of the pedestrian environment. Downtown Tacoma presents a friendlier environment for bicycling with generally lower travel speeds on roadway and a much higher density of land uses.

Traffic

Traffic volumes on Pacific Avenue are forecast to grow approximately 1 to 2 percent annually through 2025, except for lower traffic volume growth south of the Roy Y Park-and-Ride. Growth rates slow when forecasting from 2025 to 2045, ranging between 0.5 percent and 1.7 percent annual growth. The largest

growth rates in traffic are projected for the north end of the corridor. The forecast Average Daily Traffic (ADT) volumes for Pacific Avenue in 2045 range from 25,000 to 44,000 vehicles along the corridor.

General traffic congestion trends are not forecasted to change dramatically by 2025 or 2045. The major traffic flow along Pacific Avenue is expected to remain mostly directional, heading northbound in the AM Peak and southbound in the PM Peak. The AM Peak continues to exhibit relatively consistent volume to capacity (v/c) ratios in the off-peak direction with the peak direction exhibiting volumes approaching or exceeding the roadway's capacity—indicating the potential for high levels of congestion.

Land Use

Downtown Tacoma is heavily developed, although vacant and underutilized parcels and buildings remain. There are currently 45,000 jobs in the downtown area, including employment in financial, health and professional services. Current zoning allows heights ranging from 90 feet in the Downtown Residential District to 400 feet in the Downtown Commercial Core. The Downtown Regional Center zoning capacity is sufficient to accommodate planned growth of 76,200 new residents and 67,900 new jobs by 2040.

The Tacoma Comprehensive Plan has designated two areas along Pacific Avenue as “Crossroads Centers,” defined as a concentration of commercial and/or institutional development that serves many nearby neighborhoods and generally includes a unique attraction that draws people from throughout the city. Some residential development may already be present, and there is a goal to have more residential development at these centers. Lower Pacific Crossroads Center straddles Pacific Avenue between I-5 and S. 40th Street with the major intersecting arterial of S. 38th Street. Upper Pacific Crossroads Center is the area centered around the intersection of Pacific Avenue at S. 72nd Street and is zoned Mixed-Use Center. The Minimum Allowable Development Density in these centers is 25 dwelling units per net acre.

Extensive areas along Pacific Avenue/SR 7 are targeted for rezoning, primarily along the arterial frontage for multi-family and neighborhood commercial.

Within unincorporated Pierce County, the Parkland-Spanaway-Midland (PSM) area encompasses 20 square miles from the Tacoma City boundary in the north to Joint Base Lewis-McChord (JBLM) in the south. The zoning throughout the PSM planning area is predominantly single-family, but the zoning abutting Pacific Avenue/SR 7 is primarily mixed-used and “center” designations, with the exception of some stretches of multi-family zoning.

PROJECT PURPOSE AND NEED

The Purpose and Need Statement documents what Pierce Transit intends to accomplish with the project (Purpose) and the problems with the current service that the project would address (Need).

Purpose Statement

The purpose of the Pacific Avenue/SR 7 HCT project is to establish a north/south HCT link in the heart of Pierce County and serving Pierce Transit's busiest transit corridor. The project will:

- Increase transit ridership through enhanced transit service.
- Deliver cost-effective service that provides capacity to meet future demand.
- Promote transportation equity in the corridor by ensuring that transit service is accessible to all populations.
- Improve multi-modal access and connectivity.
- Support a regional vision for the community as documented in land use and transportation plans.
- Enhance safety and security for transit patrons and public health overall.
- Support existing economic activity and be a catalyst for sustainable economic growth and corridor redevelopment.
- Promote environmental stewardship and sustainability.

The need for the project results from:

- High Transit Demand. In October 2016, there were more than 5,500 average daily weekday boardings on the Pierce Transit Route 1 (2,800 northbound and 2,760 southbound).
- Decreasing Transit Travel Speeds. Average bus speeds in the Study Corridor are relatively slow and have been decreasing.
- Poor Service Reliability. Buses often run eight to 10 minutes late in the AM peak period and midday, and about 15 minutes late in the PM Peak.
- High Corridor Population and Population Density. The population in the Study Corridor is projected to grow by nearly 25 percent between 2010 and 2040.
- Increased Employment. The Study Corridor had nearly 31,500 jobs in 2010. In 2040, jobs in the Study Corridor are forecasted to increase to just over 59,000.
- Transit Dependency. Approximately 11 percent of the households in the study do not have a motor vehicle and the 2015 median household income in the Study Corridor is \$12,000 less than the median household income in Pierce County overall.
- Safety Concerns. There were 2,967 recorded crashes over a five-year period between 2012 and 2016, including 13 fatal crashes, five involving pedestrians, and one involving a bicyclist.
- Growing Transit Communities (GTC) Designation. Within the Study Corridor, five nodes have GTC designation: Theater District; Convention Center; Union Station; S. 25th Street Station; and Tacoma Dome

The project goals are as follows:

1. The project will increase transit ridership by reducing transit travel time; improving trip reliability; increasing service frequency; and enhancing transit's comfort, convenience and image.
2. The project will provide cost-effective transit service in the Study Corridor.
3. The project will increase transit capacity to meet current and projected transit travel demand.
4. The transit service will be accessible to all populations, including minorities, people with low-income levels, and those that are transit dependent.
5. The project will promote environmental stewardship and sustainability by reducing greenhouse gas emissions and supporting smart growth.
6. The project will improve access to the Study Corridor transit service by pedestrians and bicyclists.
7. The project will provide improved connections with other local or regional travel modes.
8. The project will have a high likelihood of funding through identified grant programs and funding sources.
9. The project will enhance safety and security for transit patrons and public health overall.
10. The project will support planned local and regional growth and corridor revitalization efforts.
11. The project will be consistent with adopted local and regional transportation plans.
12. The project will minimize adverse impacts to other travel modes and adjacent property.

PUBLIC OUTREACH

Public engagement and participation was a critical element of the BRT planning process and will continue as the project moves forward. Its purpose is to ensure Pierce Transit uses effective means of providing information about and receiving input on transportation decisions from the public.

The success of the Pierce Transit Pacific Avenue/SR 7 Corridor High Capacity Transit Feasibility Study has depended largely on participation and input from agency and institutional stakeholders, transit riders and other commuters, businesses and residents within the study area, and the public. Thus, the methods used to engage and involve these stakeholders are an important part of the overall study. A Public Involvement Plan was developed to ensure that the public is both aware of and well-informed about the project study and its potential impacts, and that the public is provided with opportunities for meaningful participation in the process.

Public comments helped build an understanding of community issues and needs that informed key study elements. Comments were received through a variety of means, including comment forms, cards, letters, email or website contact, phone calls, as well as personal contacts with stakeholders at public meeting events or face-to-face interactions.

MODE EVALUATION

The study team analyzed the following potential modes, in addition to the No Build (existing service) option:

- Enhanced Bus Service – improves on current service with addition of some mix of traffic signal priority, station improvements, and increased frequency.
- Bus Rapid Transit (BRT) – is a high-capacity bus-based transit system that generally includes some or all the following features: unique branding, dedicated lanes, traffic signal priority, off-board fare collection, elevated platforms for level boarding, and enhanced stations (including high-quality shelters, seating, real-time bus arrival information, and other passenger amenities).
- Streetcar – is a high-capacity fixed-rail transit system that is typically operated with single car trains powered by overhead catenaries and more frequent stops than LRT. Streetcar is assumed to operate in mixed-traffic or Business Access and Transit (BAT) lanes for a large portion of the alignment.
- Light Rail Transit (LRT) – is a high-capacity fixed-rail transit system that typically operates in a separate right-of-way (ROW), powered by overhead catenaries, and has less frequent stops and higher travel speeds than Streetcar.

Each travel mode was rated by how effectively use of that mode would advance each of the project goals. Based on the analysis, as well as the partnering agency and public or stakeholder input, it was determined that BRT is the HCT mode that best meets the project goals. BRT is the most appropriate mode given the current and expected level of ridership and best meets the nexus of existing land use and population distribution with the goals for improved transit speed and reliability and future investment along the corridor.

BRT service options were evaluated to determine whether the BRT service should replace or be in addition to local service on the corridor, and to evaluate various service frequencies by time of day. Based on financial constraints, it was determined that BRT service should replace the local service. It was also determined that the service should operate every 10 minutes during peak periods and every 15 minutes during the midday period. Service on evenings and weekends would be every 20 or 30 minutes.

VEHICLE ASSESSMENT

Motorbus options for the Pacific Avenue/SR 7 BRT project considered 40-foot standard buses, double-decker buses, and 60-foot articulated buses. Other characteristics that were assessed included door configurations and vehicle propulsion. It was determined that the following vehicle type best met the project's needs:

- Branded 60-foot articulated coaches.
- Three doors one side of the bus, though doors on both sides of the bus (i.e., 5-door coaches) will be reconsidered during the next design phase.
- CNG propulsion, with continued consideration of battery-powered buses for future purchases.

CONCEPTUAL DESIGNS

The BRT design for the corridor considered five different lane configurations.

Mixed Traffic: Right Lane. This option is similar to conventional bus service, with the bus using the right travel lane and accessing curbside stations.



Mixed Traffic: Left Lane. The Mixed Traffic: Left Lane alternative allows the BRT service to use the left travel lane and access median stations.



Business Access and Transit (BAT) Lane: BAT lanes are curbside transit lanes that are also used by vehicles making right turn into driveways or the next cross street.



Median Lane: Right-Side Boarding. The Median Lane: Right-Side Boarding option features exclusive transit lanes in the middle of the road. Buses would pull to the left of the platform to serve the station.



Median Lane: Left Side Boarding. This option is similar to the Median Lane: Right-Side Boarding except that passengers can board the buses on the left side of the vehicle rather than just the right side.



A significant benefit of BRT is design flexibility, which allows lane configurations to be tailored to the specific needs, opportunities, or constraints of a corridor segment (i.e., a “mix and match” approach). For this reason, it was determined that all these lane configurations should be made available for the Pacific Avenue/SR 7 corridor, with the specific application dependent on the characteristics of the corridor segment.

LOCALLY PREFERRED ALTERNATIVE (LPA)

The Pierce Transit Board of Commissioners, in collaboration with the City of Tacoma and Pierce County, adopted an LPA on July 9, 2018. This action specified the mode, route alignment, and project termini. On April 8, 2019, the Pierce Transit Board refined the LPA by identifying a preferred concept design and station locations.

The Board selected as the LPA an option known as the Hybrid Alternative, which is a combination of curbside and median lanes, as well as mixed-traffic bus operation using both the right lane and the left lane. This alternative is shown on the map below.

Intersection Control Evaluation (ICE)

On Washington State facilities with proposed modifications, WSDOT policy requires an Intersection Control Evaluation (ICE) to select the most appropriate intersection control type between a signalized intersection and a roundabout. The ICE process resulted in the potential for roundabouts at the four following locations (from north to south): S. 76th Street, 121 Street S, 138th Street S, and 146th Street S.

As the report began, 19 intersections were evaluated (nine in the City of Tacoma section and 10 in the unincorporated Pierce County section of the corridor) and modeled for performance. For seven intersections, consensus was reached between Pierce Transit, WSDOT and local agencies that roundabouts are not feasible and that the project should move forward with rebuilding traffic signals.

Of the 19 intersections that were affected, the ICE analysis recommends rebuilding 15 intersections with traffic signals. For the remaining four intersections, as listed above, the ICE report recommends rebuilding the intersections with roundabouts.

Stations

There are 29 planned station pairs along the route as well as a stop at the Tacoma Dome Station and at the route termini in Spanaway and the Commerce Street Transit Center downtown, for a total of 32 stations in each direction. This compares to 65 stations served by the existing Route 1 service. The average distance between stations is approximately 0.46 miles.

BRT Stations and Lane Configurations

