Section 7
Long Term Vision

Overview

The SR 305 Corridor Vision addresses the growing transportation demands of the region and the need for future development of high capacity transit (HCT) service to achieve the following long term transportation and land use goals.

- Increase corridor capacity without adding auto travel lanes.
- Encourage transportation efficient land use.
- Protect the scenic value of SR 305 corridor and surrounding areas.
- Provide an environmentally and community friendly travel option.
- Limit the impacts of traffic and parking.

In addition to the interim improvements identified in Section 6, a critical outcome of this project is a vision for a future (up to 50 years from now) high capacity transit system connecting Winslow and Poulsbo via the SR 305 corridor. This study process carefully evaluated technologies such as bus rapid transit, light rail transit, and fixed guideway transit among others through a technical study and an extensive public outreach process. Decision making and outreach was directed by an executive steering committee of leadership representatives from Kitsap Transit, Kitsap County, the Suquamish Tribe, the cities of Bainbridge Island and Poulsbo, and the Washington State Department of Transportation. This project leadership team has been committed to a strong partnership and fostering a regional perspective and approach to the development of alternatives.

This section describes the long term vision for HCT in the SR 305 corridor developed through this process. The long term HCT vision builds on interim improvements recommended in Section 6 and provides a conceptual framework that will allow Kitsap Transit and its partners to pursue funding for additional study of HCT in the SR 305 corridor.

Long Term HCT Vision

The agencies and community members involved throughout the study envision an innovative and practical system of fixed guideway transit as part of the long term future for the SR 305 corridor. In part, this is because an emerging transportation technology, LEVX®, has captured the imaginations of local policy makers and citizens alike. These corridor stakeholders have formed a strong vision of a flexible, cost effective, and rapid transit system that would serve corridor travelers, separating them from the increasingly congested traffic on SR 305. An evaluation of future baseline traffic conditions produced for this study suggests that within the 50-year planning horizon, the corridor likely could merit investment in a fully grade separated high capacity transit system, such as LEVX® or another type of fixed guideway transit.

LEVX® technology is under development and is not yet proven in passenger operations. (Refer to the developer's website for more information about this technology and prototype projects under development and soon to be developed: www.levx.com). Therefore, the long-range

vision presented in this study refers to LEVX® in concept or to other current or future fixed guideway technologies that can meet important objectives for corridor operations. Some of these technologies may be driverless or automated (like LEVX®), and some may require drivers.

By 2020, it is envisioned that the BRT service presented in Section 6 will be able to accommodate the demand for service in the corridor. However, over the long term, demand for service in the SR 305 corridor is expected to justify a higher level of transit service – one that can be more competitive with the automobile and maintain or improve traffic volumes in the corridor.

At some point within the planning horizon (over the next 50 years), the HCT system is envisioned to transition from bus rapid transit (BRT) to fixed guideway transit such as LEVX® or another type of system. While this plan does not recommend a specific timeline for this transition, the following conditions could trigger this decision.

- **HCT Travel Times**
  In order to maintain (or improve) traffic volumes and transit ridership in the corridor, transit travel times must be better (or at least competitive) with driving. While BRT will resolve some of these issues, congestion in the corridor will likely slow this service down and introduce increasing levels of unreliability. A fixed guideway system would provide a more reliable service because it is not susceptible to variations in traffic volumes in the corridor. Also, end-to-end travel times on a fixed guideway system would likely be faster than BRT because it could be entirely grade separated and would allow for higher average speeds between stops. A service that is both reliable and fast also enables local users to rely on transit for many types of trips in the corridor. The proposed BRT system would result in a time savings of 28 minutes compared to general auto travel at the peak hour traveling in the peak direction, or a 45 percent time savings. When BRT travel times result in a time savings of 20 percent or less over general auto travel (due to more congestion in the northern part of the corridor), Kitsap Transit should evaluate the benefits of additional BRT investment versus major investment in a new fixed guideway system.

- **Higher Passenger Loads**
  Walk on passenger volumes on the ferry are expected to increase significantly by 2030 (as presented in Section 3) and beyond. It is assumed that a fixed guideway system such as LEVX® would be able to chain cars together and accommodate higher passenger volumes than BRT. In a bus-based approach, higher passenger volumes would require more bus operators, which ultimately would increase the total annual operating costs. A fixed guideway system could have a higher initial capital investment, but much lower operating costs because the vehicles may not require operators if the system is automated (like LEVX®). At such point that the annual capital cost of the fixed guideway system over a 30 year period is equal to or less than the estimated annual operating costs, Kitsap Transit should evaluate further the benefits of a fixed guideway system.

- **Land Use Decisions**
  As the population and employment density in the SR 305 corridor increases (especially north of Bainbridge Island), transit can play a vital role in organizing this new development. A fixed guideway system represents a permanent commitment to a particular transit mode or alignment, and has been shown to have a greater impact on land use than traditional bus service. Because it is permanent, a fixed guideway system (such as LEVX®) could serve as a catalyst for higher-density, transit-oriented development at stations.

- **Energy Costs / Environmental Concerns**
  A fixed guideway system using LEVX® technology would be frictionless and operate on a small diesel or electric motor, thus reducing energy costs and improving energy efficiency. Many experts predict fossil fuel prices will rise dramatically over the next 20 to 30 years. This has tremendous implications for passenger transportation and could dramatically shift the cost components of transit operations for Kitsap Transit. This may cause a paradigm shift in the formulas used today to assess affordability of transit. The low-friction, small engine drive technology proposed by LEVX® offers a vision for a passenger transport system that can keep operating costs low, regardless of the world energy market. Kitsap Transit tracks operating expense components and should continue to monitor the impact of fuel costs on its long term operations. Once more realistic operating cost estimates for LEVX® are available, a cost/benefit analysis should be completed to help determine the proper timing for the transition from bus-based service.

- **Capital Costs**
  Although a full-scale commercial application of LEVX® is unavailable at this time, this technology uses permanent magnets instead of traditional electromagnetic levitation systems. Because of these differences, the developer of the LEVX® system estimates that capital costs will be significantly lower than other magnetic levitation systems. Although capital costs for LEVX® have not been estimated at this point, a fixed guideway system capable of carrying high passenger loads with significantly lower capital costs may be a compelling reason to introduce this technology in the SR 305 corridor. Once costs are available from pilot projects, they should be compared to BRT investments and be judged based on the ability to achieve a comparable level of service (i.e. corridor travel time, passenger comfort, safety, etc).

- **Lower Operating Costs**
  Because LEVX® or an automated guideway system would not have operators in each vehicle, labor costs are expected to be significantly lower than BRT or other traditional transit service. Likewise, because there would be minimal friction, maintenance costs for LEVX® or another type of fixed guideway system would likely be lower than other modes that have more complicated propulsion systems. When LEVX® technology comes on line, Kitsap Transit should estimate the operating cost per passenger mile and evaluate against BRT. A target should be established at which the investment in fixed guideway transit, such as LEVX® makes sense.

- **Model / Demonstration Project**
  Because there is no full-scale, commercial example of a LEVX® operation, there are a number of uncertainties related to this technology. These include capital costs, safety, and the necessary approval to build and operate the system by state and federal authorities. In addition, this technology would have to be elevated along many sections of the corridor, introducing a visual impact that BRT or other modes would not introduce. Assuming these uncertainties are worked out, Kitsap Transit could implement LEVX® or another type of fixed guideway technology as a model for other transit providers in the region and the country.

- **Funding Opportunities/Federal Certification**
  The availability of funding to implement the long term HCT vision may dictate when it is feasible to transition to a fixed guideway system, which may include LEVX® technology. The region and state occasionally make funding available as part of major transportation investment programs. These are often in response to severe levels of congestion and typically require voter-supported tax increases. Federal programs may also create funding opportunities. Congress authorizes

federal transportation funding every six years. These authorizations allocate project funding, such as that currently available from the federal Transit Administration (FTA) under programs such as New Starts, Small Starts, and Very Small Starts. Congressional earmarks have also been used to fund transit projects and opportunities for similar investments may come and go over the next 50 years.

For transit projects to be eligible for FTA funding, they need to go through a specific certification process that evaluates suitability, safety, and security considerations of the transit technology. In order for any transit system to be federally funded and authorized, it must demonstrate compliance with all applicable public safety standards.

Fixed Guideway Transit Conceptual Operating Concept

As noted in Section 5, automated fixed guideway (AFG) transit or fixed guideway transit (FGT) - terms used interchangably in this study - would have different characteristics depending on the segment of the corridor. While select sections of the system may be appropriate at-grade, the majority of the corridor would need to be fully elevated. As with the interim concept, the AFG/FGT concept is discussed for each of the following segments in the corridor:

- Segment A: Bainbridge Island Ferry Terminal to Suquamish Way
- Segment B: Suquamish Way to Hostmark Street
- Segment C: Hostmark Street to Bond Road
- Segment D: Bond Road to College Marketplace Park & Ride

Segment A: Bainbridge Island Ferry Terminal to Suquamish Way.

The AFG/FGT station platform would be located as close as possible to the primary ferry terminal entrance/exit. The station platform would be elevated to maintain an even grade and provide a direct connection to the terminal entrance/exit. Several branches of track would need to be constructed to accommodate the high number of AFG/FGT vehicles required, especially during peak periods (see the HCT Transit Demand section on page 7-6).

The alignment would then utilize the center median transit lane (preserved from BRT operations) from Winslow Way to the Agate Passage bridge. This alignment would require approximately 24 feet of right-of-way, or approximately 8-10 feet of additional right-of-way over the interim direction, for safe operation. Stations in this segment of the corridor may require additional right-of-way at or near the intersection. As discussed in Section 5, advantages of a median AFG/FGT operation include:

- Limited roadway widening
- Limited impact on scenic views from highway
- Left turn lanes can be accommodated under elevated running way
- Ability to be constructed on stable, improved right-of-way avoiding significant grade issues
- The potential to be phased in using right-of-way set aside for interim BRT

Because AFG and FGT require a dedicated right-of-way, and WSDOT has indicated that it is not possible to accommodate AFG or FGT on top of the existing Agate Passage bridge, a new structure likely would be required over Agate Passage. This new bridge could be located on either side of the current bridge, but most likely the west side to have direct service to the Suquamish Way/ Casino Park & Ride.

Segment B: Suquamish Way to Hostmark Street

AFG/FGT in this segment would travel from the Suquamish Way/Casino Park & Ride to Hostmark Street in Poulsbo with the alignment on the east side of the SR 305 corridor. Because BRT in the interim would operate in existing general purpose traffic lanes, an additional 24 feet of right-of-way may need to be set aside for AFG/FGT in this segment unless the highway could be shifted. Although no stations are planned for this segment of the corridor at this time, a station could be added if necessary. Due to the number of driveways and curb-cuts, this service would likely need to be elevated along the entire segment.

Segment C: Hostmark Street to Bond Road

As with Segment B, AFG/FGT service along this segment of the corridor likely would require 24 feet of right-of-way, on the east side of SR 305 unless the highway could be shifted in the current right-of-way. Due to the number of intersections and curb cuts, the majority of this section would need to be elevated to allow access to adjacent property.

The station in this segment would be near the south of Hostmark Park & Ride and the Poulsbo Transfer Center Park & Ride. Pedestrian access to this station would be an integral component of the station design.

Segment D: Bond Road to College Marketplace Park & Ride

Service along this segment could be located on either side of the SR 305 corridor, but would need to be elevated so as not to preclude access to adjacent property. Rather than traveling entirely via SR 305, the AFG/FGT alignment would turn west across SR 3 before terminating at the College Marketplace Park & Ride.

Stations along this segment would include Bond Road and the College Marketplace Park & Ride.

Stations and Park & Ride Strategy

All stops proposed for the AFG/FGT system would be located at or near stations proposed in the interim BRT concept. The long term strategy reduces the number of stations along the corridor to six, focusing on stations with large Park & Ride facilities.

- **Bainbridge Island Ferry Terminal (Terminus)**
  Although this station would not include a Park & Ride for HCT users, the terminal itself would provide a high level of passenger comfort and amenities. As noted earlier, this terminal station would require several branches in order to accommodate passenger loads during peak periods.
- **Day Road / SR 305**
  This station would include a Park & Ride that can accommodate up to 580 vehicles.
- **Suquamish Way and SR 305.** This station would be in the same location as the interim concept, but be expanded over time to accommodate 475 vehicles.
- **South of Hostmark and SR 305 (Poulsbo)**
  This station would be in the same location as the interim concept, but be expanded to accommodate additional demand for Park & Ride users in Poulsbo. The total Park & Ride demand in Poulsbo would be 915 spaces. If space is available, all of these additional spaces could be accommodated at this location, or split between this location and the Poulsbo Transfer Center or other nearby locations (discussed below).
- **Poulsbo Transfer Center (SR 305 west of Lincoln)**
  If it is determined that another station is needed in Poulsbo, this station could be provided and could include a Park & Ride facility depending on available capacity in this area. Smaller Park & Ride facilities in Poulsbo could be consolidated into this facility and

the south of Hostmark facility. However, there is the potential to retain several Park & Ride locations within walking distance to the station, minimizing the need for a single large-scale parking area/structure in the vicinity.

- **College Marketplace Park & Ride (Terminus)** This station would be in the same location as the interim HCT concept, but the Park & Ride facility would be expanded to accommodate 500 spaces.

Station and Park & Ride Design

The stations and adjoining Park & Ride facilities need to be carefully designed to incorporate the AFG/FGT system. Without a prototype, it is assumed that the station design would be similar to other automated guideway/fixed guideway systems in operation around the world. Key elements of these stations would include a completely elevated platform, vertical circulation (elevators and escalators), passenger waiting areas, fare vending machines, and a level boarding platform that facilitates boarding and alighting with limited dwell time.

In addition to the station itself, the area surrounding the station must be designed to facilitate pedestrian movement between the station and the Park & Ride facility, as well as from the surrounding neighborhoods to the station. Because the platforms would be elevated, pedestrian walkways would be required to ensure safe access to and from the station from the Park & Ride or surrounding neighborhoods. Urban design elements around the station would also need to be incorporated to minimize the visual impact of the AFG/FGT line.

Figure 7-1 presents a map of the long term AFG/FGT concept for the SR 305 corridor.

HCT Transit Demand

As presented in Section 3, the estimated transit ridership by 2030 is approximately 1,270 passengers per ferry landing during the PM peak period. Using the same set of assumptions as the interim BRT concept, approximately 74 percent (940) of those passengers would use transit in the SR 305 corridor, while 26 percent (330) passengers would travel locally on Bainbridge Island.

Based on information available from the LEVX® developer, individual vehicles would be designed to accommodate approximately 25 seated passengers. LEVX® vehicles could be chained together to increase total capacity and operational flexibility. Assuming 940 HCT passengers per ferry landing, and an average occupancy per vehicle of 90 percent, a total of 41 vehicles are required per ferry landing in 2030.

Although ferry ridership estimates have not been developed past 2030, it is anticipated that demand for HCT service would continue at a similar rate over the 50 year planning horizon. Therefore, the AFG system should be designed to accommodate demand beyond 2030.

Table 7-1 presents a summary of HCT ridership demand in 2030 and shows the estimated number of AFG vehicles per ferry landing during the PM peak period.

Other Considerations

Although operations of the AFG/FGT system likely would be similar to the interim BRT concept (with a long line, mid line and short line), bus operations and elevated fixed guideway operations have very different characteristics. Buses are able to take advantage of existing road right-of-way, while fixed guideway systems may require special facilities for all possible movements. Although further study is recommended, and other considerations are likely, the following major items would need to be considered when developing an operating plan for the AFG/FGT system:

- **Terminal capacity**
  Both at the Bainbridge Island ferry terminal and the College Marketplace Park & Ride, additional guideway would be required to accommodate higher passenger volumes

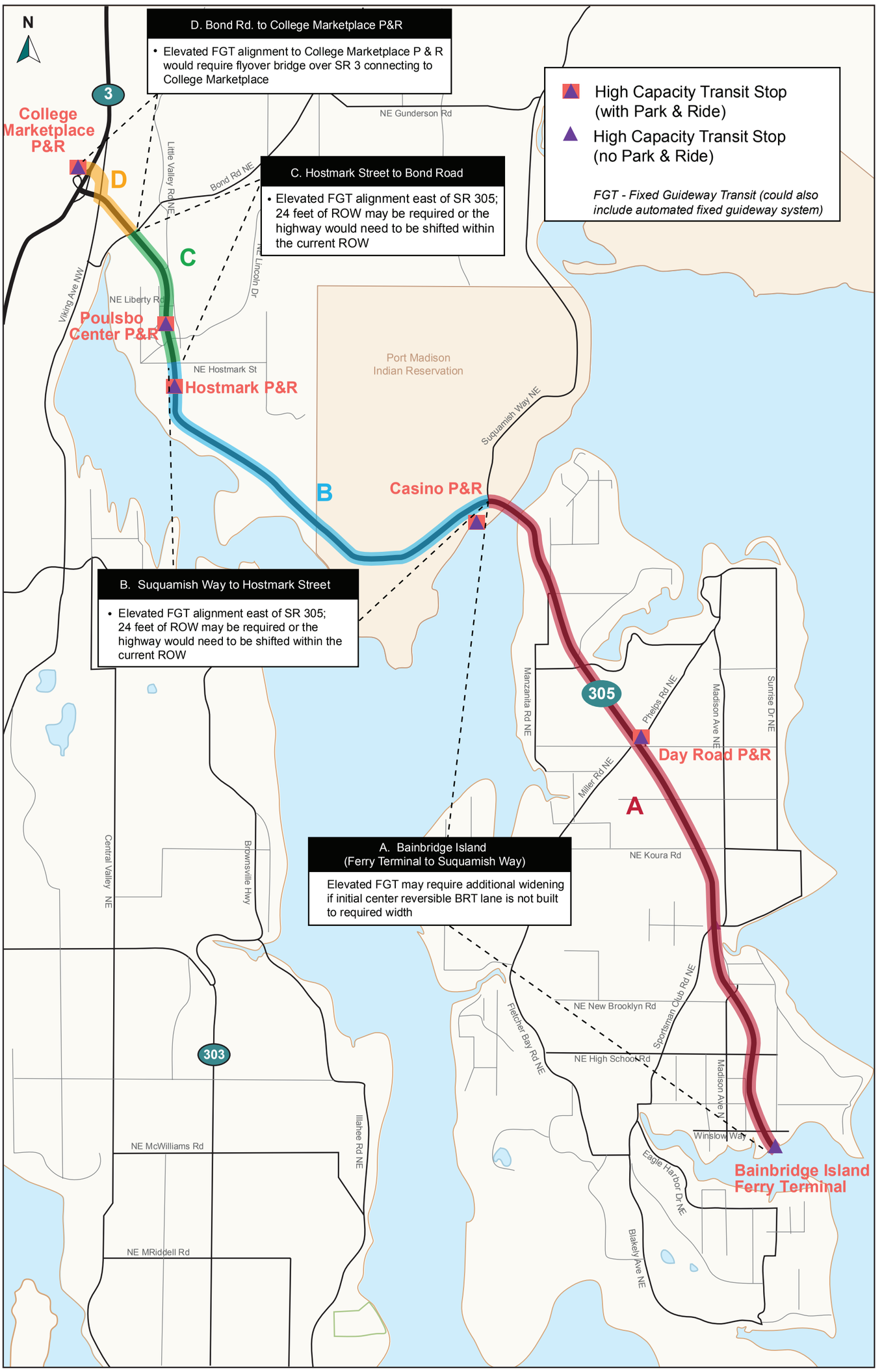

Figure 7-1 Long Term Vision (2020-2050)

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and to get off of the mainline guideway. In addition, long platforms would be necessary to accommodate the number of vehicles required during peak periods.

- **Passing guideway**
  Especially at major stations, it may be necessary to have sections of guideway that would allow some vehicles to stop while others do not. This would require a separate guideway adjacent to the mainline guideway.
- **Mid-corridor cross-over guideway**
  Most fixed guideway systems require a special cross-over section of guideway that allows the vehicle to reverse direction or bypass a mainline segment. This configuration is important if a long line, mid line, short line configuration is used or for other situations where the mainline is unavailable. Special switches are required to ensure the vehicles reverse direction safely.
- **Storage and maintenance**
  Special storage and maintenance facility would be required at some point along the corridor. Segments B, C and D (north of Agate Passage) would be the most likely location for this facility.
- **Transfers to local transit**
  At all stations, it will be important to offer convenient connections to and from local feeder transit lines. Assuming the AFG/FGT stations are elevated, local bus transit platforms could be located underneath the station platform. Also, developing a fare policy that allows for convenient transfers between different modes in the system would be an important consideration for an AFG/FGT system.

Table 7-1 Summary of SR 305 HCT Ridership Demand (2030)

Existing (2003) Walk On Passengers and Transit Ridership		
A	**Total Walk On Passengers (2003)** – per ferry landing during the PM peak period*	648
B	**Existing Transit Ridership (2003)** – per ferry landing during the PM peak period [A x 34% (transit mode share)]	220

* This figure is based on 3,045 total walk on passengers during the 4-hour PM peak period. This figure is then divided by 4.7 ferry landings per 4-hour period to arrive at 648 passengers per ferry landing. Source: Washington State Ferries Long-Range Strategic Plan.

Projected (2030) Walk On Passengers and Transit Ridership		
C	**Projected Total Walk On Passengers (2030)** – per ferry landing during the PM peak period	1,702
D	**Additional Walk On Passengers (2003 - 2030)** – per ferry landing during the PM peak period [C-A]	1,054
E	**Estimated Transit Ridership (2030)** – per ferry landing during the PM peak period [B+D] **	1,274

** Not all projected walk on passengers would necessarily ride transit. However, in the future, there likely will be less parking and Kiss and Ride capacity than under existing conditions.

Estimated HCT Ridership and Required Vehicles (2030)		
F	**Estimated HCT Ridership (2020)** – per ferry landing during the PM peak period [E * 74% (percent of transit ridership users)]	943
G	**Estimated HCT Vehicles Required (2020)** – per ferry landing during the PM peak period [F÷ 23 (seats per vehicle)]	41