



Convertibility of BRT to Light Rail

Sound Transit Long-Range Plan – Time for an Update

Sound Transit’s Long-Range Plan update is being supported by two efforts: a Supplemental Environmental Impact Statement (SEIS), which updates the 1993 EIS, and several issue papers addressing specific long-range planning issues. These issue papers provide a level of detail beyond what is considered in the EIS, and are designed to help the Sound Transit Board and the region identify any needed additions to the existing Long-Range Plan. All of this information will be reflected in a draft Long-Range Plan, scheduled for public review in late spring this year. For a list of all the Long-Range Plan issue papers, please see the reverse.

What is the question?

Bus Rapid Transit or BRT is sometimes seen as a less-expensive alternative to rail investments and a better choice for growing corridors not yet ready for higher-capacity rail. This issue paper examines these questions: Could a BRT system be built first, then converted to light rail as population and demand increase? Is interim investment in BRT infrastructure worthwhile even if eventual buildout includes rail in the same corridors? Is it feasible to establish BRT corridors with exclusive right of way that could transition to a rail system? Answers to those questions are policy decisions still to come. This issue paper provides information to start the discussion.

What was studied?

Surveying current industry practice in the U.S. and abroad, the paper examines more than 15 existing and proposed BRT projects where provisions may have been included for future LRT conversion. The paper reviews the space needs



BRT= Bus Rapid Transit is a system of frequent bus service operated in dedicated running ways or HOV lanes.



LRT= Light Rail Transit – electrically powered high capacity rail transit that can operate in both separate rights-of-way and mixed traffic.

for a variety of operating options for BRT:

- busway, with a bus lane in either direction and passing lanes through the station areas;
- guided busway, where the track width is only slightly greater than the vehicle width;
- busway with a wide median, allowing a bus to pass without crossing into the opposing lane; and,
- barrier-separated busway with bus and HOV shared right of way.

The paper compares those operating options with typical light rail configurations to see if they would be compatible. It also compares LRT and BRT vehicles and design options. It considers the issues that would be most important in deciding on conversion: capacity and demand, station layout, capital costs, operating costs and actual conversion steps. Costs of conversion are not considered due to the fact that costs would be specific to the characteristics of a particular BRT project.

What are the key findings?

- **Most BRT projects to date have included some provisions for future LRT conversions. However, no conversions have actually been made.** The Downtown Seattle Transit Tunnel is the closest, with conversion getting underway this fall. As a result, cost estimates and technology assumptions are based on conceptual models not on industry experience.
 - **LRT design requirements must drive BRT design to build in future flexibility.** The horizontal and vertical clearances for LRT vehicles, along with vehicle and station design for both BRT and LRT systems, are the most critical elements in planning for future conversion. BRT right of way is typically wider than light rail.
 - **Construction costs for conversion rise if LRT needs are not in the original BRT design.** Higher costs can result from differences in such things as grades (buses can handle steeper inclines than light rail, so grades should be considered from the outset), platform dimensions (BRT and LRT can have compatible platform design, though LRT typically requires longer platforms than BRT), pavement strength (LRT vehicles are heavier than buses), and placement of utilities.
- **Factors to consider on a case-by-case basis when contemplating BRT to LRT conversion.**
 - How well do BRT and LRT meet existing and future demand?
 - What are the steps necessary to complete BRT to LRT conversion?
 - How can BRT be kept in operation while conversion to LRT is occurring?
 - What are the capital costs of conversion and operating costs to provide needed capacity and convenience?
 - What facilities are needed at the end of each line?

As issue papers are presented to the Sound Transit Board, they will be available at: www.soundtransit.org/projects/longrange/issuepapers.asp

See other Long-Range Plan Issue Papers

- I-90 Corridor/East King County High Capacity Transit Analysis
- SR-522 Corridor HCT Assessment
- I-5 Corridor Northgate to Evertett HCT Assessment
- BRT in SR-99 Corridor
- Seattle Streetcar Options
- Rail between Burien and Renton
- HCT System Development Issues in the South Corridor
- Potential Rail Extensions to Frederickson and Orting
- Potential Tacoma Link Extensions – East
- Potential Tacoma Link Extensions – West
- Tacoma Link Integration with Central Link