



S E A T T L E S T R E E T C A R
Network Development Report
Appendix B

Seattle Department of Transportation
May 2008

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METHODOLOGY-PRELIMINARY RIDERSHIP & OPERATING COST ESTIMATES

The preliminary operating cost estimates for the most promising routes for expansion of the Seattle Streetcar were developed by a project team with extensive experience with both start-up and operation of the South Lake Union Line, other streetcar systems, and other transit operations in Seattle. The team included LTK Engineering and staff from SDOT's Major Projects and Policy and Planning divisions.

Operating Cost Estimates

Operating cost estimates were developed for each route by estimating the travel times and vehicle requirements and applying a cost per hour factor to the planned operations (frequency and span of service). The detailed steps included:

- A. Estimating average peak-period travel speeds by route segment, by timing drive times and adding an allowance for station stops (with average dwell times of 20 seconds each).
- B. Validating estimated travel speeds by comparing the estimates to existing King County Metro data for average bus travel speeds on overlapping route segments.
- C. Identifying a minimum layover time for schedule recovery, and calculating a total "cycle time" (one-way travel time plus minimum layover) per trip.
- D. Identifying a desired headway (time between streetcar arriving at each stop), or several headway options, and calculating the number of vehicles required to accomplish the headway.
- E. Identifying a span of service (hours of operation per day).
- F. Calculating operating costs as a factor of vehicle requirements and span of service, based on 365 days of operation. \$160/hour (2010) was the assumed fully loaded operating cost. This hourly cost assumption reflects data from the South Lake Union Line operations and economies of scale that are anticipated with extension of the network.

The cost estimates are conservative (i.e., likely to trend toward higher than the actual cost) because the vehicle and layover requirements were calculated based on peak periods; faster off-peak travel times may allow for a reduction of vehicles in service during off peak times. In addition, headways were kept constant throughout the service day in most instances. There may be opportunities to reduce costs by slightly increasing headways during certain periods, such as the last 3 hours of a service day, while still maintaining at least 15 minute frequency.

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Operating Funds

Operating funds were estimated by identifying the likely service restructuring that could make existing transit funds available to the new routes, estimating ridership and farebox recovery, and estimating other sources of funds such as expansion of the Seattle Streetcar sponsorship program and funding proposed in the Sound Transit "ST2" plan.

Service Restructuring Opportunities

Service restructuring opportunities include opportunities to incorporate South Lake Union line operations into an extension, and opportunities to replace or modify bus service that overlaps with a portion of the new streetcar routes. Restructuring of existing bus service would occur only after an extensive analysis and outreach process by King County Metro, but any savings from restructuring would be available for re-allocation only within the "West Sub Area" of the King County Metro service area.

Examples of the savings and restructuring opportunities include:

- The U-Line would extend the existing South Lake Union Line; therefore all funds currently dedicated to the South Lake Union line would be available to support the total cost of operation of the line.
- The U-Line would provide service parallel to the existing Metro Route 70; the U-Line could replace the Route 70, and the savings re-allocated to the U-Line.
- The Fremont-Ballard Line, if operated independently of a possible U-Line, would overlap existing South Lake Union Line operations; an estimated 50% of the funds currently dedicated to the South Lake Union line would be available to support the total cost of operation of the line.
- The Fremont-Ballard Line would provide service parallel to some portions of the Route 17 and 28, and an alternative to portions of the Route 18. Some of the trips on these routes could be modified such that they terminated in a transfer connection to the Fremont-Ballard line in Fremont or Ballard, with the streetcar providing the local service on the remainder of the route. These route changes would generate savings that could support the total cost of operation of the line.
- The Central Line would provide very frequent service parallel to the existing Route 99. The Central Line could replace the Route 99, and the savings re-allocated to the U-Line. Additionally, the Central Line would provide very

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frequent service in portions of the corridors served by Routes 1 and 2/2 Express. Some of the Route 1 and 2 trips could be terminated at Uptown/Queen Anne, with the streetcar providing the local service on the remainder of the route. These route changes would generate savings that could support the total cost of operation of the line.

Ridership and Farebox Revenues

Operating revenues were forecast by estimating ridership for each of the most promising routes, and estimating the average fare that would be generated by each trip.

Ridership estimates were developed by comparing the most promising routes to *peer systems* (streetcar systems in Portland, Tacoma, San Francisco, and Toronto) and *peer routes* (King County Metro bus routes that provide service in corridors similar to the proposed streetcar routes.) Metro's **2006 Route Performance Report** provided data about average peak and off-peak riders per hour on peer routes. Average trips per hour were then assigned to the proposed streetcar routes based on the data for those peer systems and routes that were viewed as most comparable to the proposed streetcar route. For example, the Central Line was assigned 85 trips per hour. This compares to more than 90 trips per hour in Portland and Toronto, and more than 80 trips per hour on peer bus routes including Metro Routes 10, 15, 18 and 18 Express.

The average fare per trip in 2010 was assumed to be \$1. This assumes a flat, all-day adult fare of \$2, and allocation of fare revenue from trips made using the anticipated smart card system as proposed in the Regional Fare Collection Agreement.

Sponsorship Program Revenues

The South Lake Union Line generates revenues from a sponsorship program including sponsorship of vehicles and stations, participation in a Streetcar Amenities Guide, and bulk ticket pre-sales. The sponsorship program potential of the most promising routes was estimated based on the number of vehicles and stations that would be available for sponsorship on those routes, at sponsorship levels similar to those currently achieved on the South Lake Union line.