

APPENDIX G: OPERATING AND MAINTENANCE COST ESTIMATES

OPERATING AND MAINTENANCE COSTS

Introduction

Annual operating and maintenance costs include the ongoing costs to operate and maintain the transit system. These costs typically include administration, labor (operations and maintenance), vehicle maintenance, fuel, and insurance. For purposes of this study, the annual operating and maintenance costs were estimated in year 2003, current year, dollars and then escalated to year 2010, the anticipated year of expenditure. An escalation rate of 4.0 percent per year was used, which is consistent with the escalation rate used in *Central Corridor 2002 Draft Environmental Impact Statement (DEIS)*.

The total estimated annual operating and maintenance cost is the sum of the feeder bus costs, rail costs and, in the case of DMU the lease payment to the private railroad companies.

Feeder Bus

The operating and maintenance cost estimate for the feeder bus system is a calculation of the estimated change in platform hours (i.e., revenue hours, deadhead hours, and vehicle preparation hours) over the existing service provided by the existing bus system. A unit cost of \$89.96 (year 2003) per platform hour is the regional standard for estimating the cost per platform hour. This \$89.96 figure includes the cost of labor, materials, fuel, utilities, insurance, taxes and benefits.

Light Rail Transit

The model used to estimate LRT operating and maintenance costs for the Southwest rail transit line was originally developed for the Hiawatha LRT line. It is based on actual financial and operating data for the following eight LRT systems: Baltimore, Dallas, Denver, Portland, Sacramento, San Jose, San Diego, and St. Louis.

The model includes the following categories:

Rail Transportation – This applies to operations personnel such as the director, assistant manager, clerk, train operators, fare inspector, police officers, materials and supplies, and propulsion power.

Rail Vehicle Maintenance – This applies to vehicle maintenance personnel such as the director, clerks, mechanics, materials and supplies, and fuel and lubrication.

Rail Facilities Maintenance – This applies to facility maintenance personnel such as the director, manager, technicians as well as the costs for maintenance of the tracks, power, signals, station platforms and yards and shop.

Rail Administration and Support – This applies to administrative personnel such as the assistant general manager of rail operations, director of bus/rail safety, budget analysts, engineers, marketing, customer service, taxes, insurance and utilities.

In addition, the model also factors in the operating characteristics (i.e., the number of vehicles, the service frequency, the system miles, the number of maintenance facilities and stations) to calculate the annual operating and maintenance costs.

To reflect potential LRT costs in this region, the model uses Metro Transit's current annual average earnings for comparable job positions and fringe benefit rates. The model also reflects Metro Transit's allocation of labor overhead, as reported in the National Transit Database. The

APPENDIX G: OPERATING AND MAINTENANCE COST ESTIMATES

overhead allocation is intended to represent functions not directly associated with operations, such as marketing and customer service.

Diesel Multiple Unit

Since the Colorado Rail Car Company's Aero DMU vehicle is not currently in operation there is no system data upon which to base an annual operating and maintenance cost estimate. To develop an operations and maintenance cost estimate, the LRT model was modified slightly for application to the Diesel Multiple Unit system.

Information provided by DMU manufacturers and from European experience indicates that DMU costs are likely to differ from LRT costs in the following areas:

Vehicle Maintenance – Operating and maintenance costs for DMUs are similar to LRV costs for items such as axles, wheels, body and paint. However, the cost to maintain the power train is comparable to a transit bus. Each powered DMU typically contains two diesel engines, each with the power output (horsepower) similar to a diesel engine of one standard transit coach. This results in the need for a greater number of diesel engine mechanics than the number of electro mechanics required for LRT. The cost to maintain power-related elements of DMUs will also be higher. Based on prior research conducted for Denver's Regional Transit District, vehicle maintenance labor and material costs for two diesel engines¹ are expected to be approximately 20 percent higher than comparable LRT costs, on a vehicle-mile basis.

Facility Maintenance – Costs for overhead catenary maintenance are not required by DMUs. The cost of labor, materials and contracted services for the catenary expense category in the LRT cost model have been removed from the DMU cost model.

Fuel – Another major area of difference is fuel cost. The Colorado Rail Car Company provided an average fuel consumption rate of 1.2 miles per gallon per car for their Aero DMU vehicle. This information is used in the DMU cost model.

Track Maintenance – Track maintenance costs have been assumed to be 20 percent higher than those identified in the LRT cost model. This is based on the assumption that shared use with freight trains will result in higher maintenance costs.

Annual Lease Payment

In addition to the annual operating and maintenance costs, the DMU option also requires an annual lease payment to the private freight rail companies for use of their tracks.

Typically, the transit agency would purchase rights to operate passenger rail transit service on the private railroads tracks. In return, the private rail companies generally require capital improvements to the existing rail tracks and a long-term lease agreement that includes payment for access fees, real estate taxes, track retention, special or extra train service fees, incentives (e.g. to maintain passenger rail service reliability/on-time performance) and contingencies.

For purposes of this study, the following two methods of estimating the annual lease agreement costs were used:

Method 1: Payments to railroads based on cost per Directional Route Mile (DRM = the number of route miles of revenue track, excluding yard and tail track). One route-mile of double track equals two directional route-miles.

¹ Each Colorado Railcar DMU powered car includes two Detroit Diesel Series 60 engines.

APPENDIX G: OPERATING AND MAINTENANCE COST ESTIMATES

Method 2: Payments to railroads based on Daily Hours of Track Use. This method is based on what portion of the service day the agency intends to utilize the track, and what portion of the day remains for the railroad to utilize the track. These costs can be low or high depending on how active existing freight service is on the host railroad.

Historically, existing railroads have been used (track lease agreement) to operate commuter rail type service versus a more frequent passenger rail service, like LRT or DMU. Because commuter rail service typically operates less frequently (peak hours only or very limited midday service), railroads have been willing to sell or lease use (time) of their tracks, provided they can still maintain their existing and planned use of the railroad line.

