

APPENDIX D: OPERATIONAL COST ESTIMATES

The operations and maintenance costs for the study options were developed in the AVL Study and the methodology is summarized here. Please refer to the full Antelope Valley Line Study for a complete project analysis.

L.A. Metro Antelope Valley Line Study

Draft Final Report Section 5.1.3

Operations and Maintenance Costs

Increasing the number of Metrolink trains operating on the AVL will increase costs for operations and maintenance. These costs will be partially offset by fare revenues generated from increased ridership. Estimates of annual operations and maintenance (O&M) costs for Metrolink service on the AVL were prepared for six rail service scenarios. These estimates consider the expected incremental cost associated with increasing train service, over and above the cost of delivering the existing AVL service. The incremental costs are primarily associated with train crews and train operations, fuel, and rolling stock maintenance.

Two different methods were used, to generate a range of estimated incremental costs for each service scenario. Using a range of costs reflects the underlying uncertainty of estimating costs in the early phase of planning, uncertainties about how operations and maintenance will be contracted by Metrolink in the future, and uncertainties about how operational characteristics will change in the future as service grows.

The two methods were:

- (1) Estimates of costs for diesel fuel, train crews and equipment maintenance based on operations data, using unit cost factors derived by Metrolink, similar to a method used in a recent Metrolink study of the San Bernardino Line
- (2) Estimate of incremental cost based on incremental change in the level of revenue service hours, using high-level unit costs per service hour derived from cost line items presented in Metrolink's budgets and comprehensive annual financial reports (CAFRs), deemed to represent costs that vary based on the level of service provided

NOTE: Final Report main volume will include estimates only using Method #1.

The second method generated incremental costs that were higher than the first method for all scenarios. With the high-level factoring approach used in the second method, it can be difficult to separate elements of fixed costs from purely variable costs, which may be one reason the estimates using this method resulted in relatively higher costs.

The first method produces estimates closer to what Metrolink would expect in terms of the incremental cost of adding trains to an existing line. Metrolink, however, is in the process of changing the way it contracts for its operations, moving towards a single contract covering all operations and maintenance activities. This will affect how Metrolink estimates operations cost in the future, and could move the incremental cost per hour closer to the high-end range figure. For purposes of this high-level study of the AVL, the two methods generate a reasonable low-to-high range of incremental costs that can be used for evaluating the cost-effectiveness and financial feasibility of increasing service according to any of the six scenarios that were analyzed.

Methodology: Low End of Cost Range [FINAL REPORT WILL INCLUDE ESTIMATES USING THIS METHOD]

The low end of the cost range was developed by applying unit cost factors to service quantities derived from the service plans for each scenario. The cost categories and cost drivers included:

- Diesel fuel, based on train-miles
- Other transportation costs, based on the number of train crews utilized, with different cost factors for crews that operate on a regular shift versus those that operate on a split shift (with mid-day layover period)
- Rolling stock maintenance, based on the number of revenue trainsets in operation on the line

Unit costs were provided by Metrolink based on historical experience. The unit costs for each cost driver are shown in Table 5-1. Train-miles are taken directly from the scenario timetables. The number of required train crews also was derived from the timetables, making reasonable assumptions about crew assignments, layovers and overtime. A contingency of 20 percent was applied to the total incremental O&M cost to reflect elements of variable cost not included in the estimates generated by the four primary cost drivers.

Table Error! No text of specified style in document.-1: Unit Costs for Operations and Maintenance, Method #1

Cost Driver	Unit Cost
Fuel	\$6.75 per train-mile
Train crew – straight shift	\$1,752 per crew per day
Train crew – split shift	\$2,134 per crew per day
Equipment maintenance	\$2,000 per revenue trainset per day

Source: SCRRRA

Methodology: High End of Cost Range [FOR INFORMATION ONLY]

To develop the high-end of the cost estimate range, WSP obtained a line-item budget for “Operations & Services” and “Administration & Services” from the Southern California Regional Rail Authority Fiscal Year 2018-19 Adopted Budget. That line item budget is provided in Exhibit 3.6, page 41 of the Adopted Budget.

WSP then recreated that line item budget, for FY18-19, in Table 5-2 below. As shown in Table 2, the total of Operations and Administration Services for FY18-19 is \$193.2 million. When that number is divided into the estimated 84,838 Estimated Service Hours (based on the FY18 Comprehensive Annual Financial Report, page 65), the resulting unit cost figure is \$2,278 per revenue service hour.

Next, the team used the concept of “fixed” vs. “variable” costs to identify only those cost categories that mostly vary with the amount of service provided. Under this approach, costs which are fixed or not directly related to the quantity of train service are assumed to not vary with service levels and were therefore excluded from the calculation of incremental costs. After excluding the mostly fixed costs, and also excluding all Administration costs (which are assumed to be fixed regardless of relatively minor changes in overall service levels), the resulting unit cost figure was \$1,232 per revenue service hour, as shown in the second column of Table 2. This unit cost was applied to each of the service scenarios developed for the AVL study to arrive at an estimated incremental increase in operating and maintenance cost for each scenario, over existing service levels.

Table Error! No text of specified style in document.-2: Calculation of Operations and Maintenance Cost per Service Hour for “High-End” Cost Range, Method #2

Antelope Valley Study
Estimated Cost Allocation per Service Hour
Metrolink FY 2018-19 Operating Budget

Cost Category (000's)	FY 18-19 Budget	Include in Refined Op Cost/Service Hour? (Y/N)	Refined Op Cost	Comment
Operations & Services				
Train Operations	\$46,872	Y	\$46,872	
Equipment Maintenance	\$38,133	Y	\$38,133	
Contingency (Train Ops)				
Fuel	\$18,744	Y	\$18,744	
Non-Scheduled Rolling Stock Repairs	\$260	Y	\$260	
Operating Facilities Maintenance	\$1,684			Fixed cost
Other Operating Train Services	\$482	Y	\$482	
Rolling Stock Lease	\$336			Fixed cost
Security - Sheriff	\$5,889	Y	\$0	
Security - Guards	\$2,450	Y	\$0	
Supplemental Additional Security	\$690	Y	\$0	
Public Safety Program	\$389			Fixed cost
Passenger Relations	\$1,732			Fixed cost
Holiday Trains - - - - - N/A				
TVM Maintenance/Revenue Collection	\$9,055			Fixed cost
Marketing	\$5,380			Fixed cost
Media & External Communications	\$458			Fixed cost
Utilities/Leases	\$3,473			Fixed cost
Transfers to Other Operators	\$6,496			Assumes this is reimbursement to other Operators for transferring pax as a reduction on revenue
Amtrak Transfers	\$2,400			Assumes this is reimbursement to other Operators for transferring pax as a reduction on revenue
Station Maintenance	\$1,806			Fixed cost
Rail Agreements	\$5,400			Fixed cost
Subtotal Operations & Services	\$152,129		\$104,491	
Administration & Services				
Ops Salaries & Fringe Benefits	\$13,782			All admin cost assumed to be fixed costs
Ops Non-Labor Expenses	\$7,635			
Indirect Administrative Expenses	\$17,096			
Ops Professional Services	\$2,579			
Subtotal Admin & Services	\$41,092		\$0	
Contingency (Non-Train Ops)				
Total Train Operating Expenses	\$193,221		\$104,491	
Total Estimated Service Hours for FY19	84,838		84,838	
Total Estimated Train Operating Cost per Service Hour	\$ 2,278		\$ 1,232	

Source: SCRRRA FY2018-19 Operating Budget

Round Trips per Day, by Scenario

Days	Existing	Scenario 1	Scenario 2	Scenario 3*	Scenario 4*	Scenario 5*	Scenario 6*
Mon-Thu	15	15	17	26	33	33	33
Fri	15	16	18	26	34	34	34
Sat	6	7	7	12	13	13	13
Sun & Hol	6	6	6	7	7	7	7

* Assumes reduced level of service with 2-3 daily round trip slots not filled with trains.

Operating Days per Year

Days	Existing
Mon-Thu	203
Fri	52
Sat	52
Sun & Hol	58
Total	365

Round Trips, Revenue Hours and Incremental Operations and Maintenance Costs, by Scenario

Days	Existing	Scenario 1	Scenario 2	Scenario 3*	Scenario 4*	Scenario 5*	Scenario 6*
Total Annual Round Trips	4,485	4,589	5,099	7,660	9,549	9,549	9,549
Total Annual Revenue Hours	16,781	17,221	20,038	25,890	31,017	31,372	27,587
Incremental Annual Round Trips	--	104	614	3,175	5,064	5,064	5,064
Incremental Annual Revenue Hours	--	440	3,257	9,109	14,236	14,591	10,806
Incremental Annual O&M Cost (\$M 2018)	--	\$0.41	\$3.30	\$6.23	\$10.98	\$10.98	\$7.02

* Assumes reduced level of service with 2-3 daily round trip slots not filled with trains.

Incremental Annual O&M Costs by Scenario

<u>LAGB Scenarios</u>	<u>AVL Study Scenario</u>	Additional O&M Costs	Total Scenario O&M Costs
Existing Conditions	Existing	\$ 34,500,000	\$ 34,500,000
M Option 1 Add 1 late night trip	Scenario 1	\$ 410,000	\$ 34,910,000
M Option 2 Add 2 new stations		\$ 200,000	\$ 34,700,000
M Option 3 60-min bi-directional	Scenario 2	\$ 3,300,000	\$ 37,800,000
M Option 4 30-min bi-directional	Scenario 3	\$ 6,230,000	\$ 40,730,000
	Scenario 4	\$ 10,980,000	\$ 45,480,000
	Scenario 5	\$ 10,980,000	\$ 45,480,000
	Scenario 6	\$ 7,020,000	\$ 41,520,000
M Option 5 15-min bi-directional		\$ 34,300,000	\$ 68,800,000
RMU Option 15-min bi-directional	ML	\$ 16,900,000	
	RMU	\$ 12,600,000	
		\$ 29,500,000	
L Option 1 in Metrolink corridor	ML	\$ 19,100,000	
	LRT	\$ 5,700,000	
		\$ 24,800,000	
L Option 2 DT Glendale/Burbank	ML	\$ 19,100,000	
	LRT	\$ 9,900,000	
		\$ 29,000,000	