

APPENDIX C: CAPITAL COST ESTIMATES

C.1 METHODOLOGY

In order to estimate project capital cost quantities, a breakdown of the conceptual engineering design elements was necessary. Each cost option was developed using the 1% to 5% conceptual alignment drawings, typical tunnel sections, potential station locations and/or written descriptions providing the definition for each of the major cost components. These documents form the basis for the identification of various composite cost elements that will be used to prepare the capital cost estimates.

Cost take offs were developed using similar projects and studies including Vermont BRT to Rail Conversion Study, Metro Purple Line, TexRail, Redlands Passenger Rail Project, Metrolink, and others, and are presented in 2018 USD. In addition, a 50 percent contingency for allocated and unallocated contingencies and soft costs were added to each improvement item's base construction cost.

The cost elements can be classified into one of two broad groups, either non-typical, unique rail guideway or typical composite cost elements. A unique rail guideway cost was developed based on specific conceptual engineering and design of the rail corridor under consideration. One example used was for the storage and maintenance facility. The cost for the maintenance facility was highly dependent on the operational and maintenance requirements for that particular location in addition to the site's geographical constraints. The number of vehicles to be stored, type of heavy or light maintenance to be performed for partial or full build out, the topographical conditions and the "typical" per-square-foot cost approach was used for this level of estimate.

The total cost estimate is summarized on the following page.

| Improvement | Total Unit Cost including Contingency and Soft Costs | existing conditions | M Option 1 | M Option 2 | M Option 60 | M Option 30 | M Option 15 | DMU Option | L Option 1 | L Option 2 |
|--|--|---------------------|--------------------|----------------|---------------|----------------|----------------|------------------|--------------------|-------------------------|
| | | | 1 late night train | 2 new stations | 60-min | 30-min | 15-min | 15-min blended | Metrolink Corridor | DT Glendale and Burbank |
| Rolling Stock - Metrolink LHC + 4-cars | \$ 41,410,144.62 | | | | | | | \$ 82,820,289 | | |
| Rolling Stock - DMU (5 consists) | \$ 102,187,500 | | | | | | | \$ 102,187,500 | | |
| Rolling Stock - LRT | \$ 7,474,457.14 | | | | | | | | \$ 269,080,457 | \$ 493,314,171 |
| Triple Track (5mi) | \$ 102,047,276 | | | | | | \$ 102,047,276 | \$ 102,047,276 | | |
| Glendale Station Mods - from Triple Track | \$ 59,640,000 | | | | | | \$ 59,640,000 | \$ 59,640,000 | \$ 59,640,000 | \$ 59,640,000 |
| Glendale Station Mods - ROW | \$ 13,764,600 | | | | | | \$ 13,764,600 | \$ 13,764,600 | \$ 13,764,600 | \$ 13,764,600 |
| Burbank Station Mods - from Triple Track | \$ 59,640,000 | | | | | | \$ 59,640,000 | \$ 59,640,000 | \$ 59,640,000 | \$ 59,640,000 |
| New River Park Metrolink Station | \$ 52,490,534 | | | \$ 52,490,534 | | | | | | |
| New Grandview/Sonora Metrolink Station | \$ 23,565,048 | | | \$ 23,565,048 | | | | | | |
| MSF (Metrolink) (per consist) | \$ 4,602,000 | | | | | | \$ 13,806,000 | | | |
| MSF (DMU) | \$ 65,133,608 | | | | | | | \$ 65,133,608 | | |
| MSF (LRT) | \$ 137,959,847 | | | | | | | | \$ 1,379,598,465 | \$ 2,345,317,391 |
| DMU Platform Mods - Glendale, Burbank, Burbank Airport North, LAUS | \$ 871,056 | | | | | | | \$ 871,056 | | |
| New DMU Stations (River Park, Grandview/Sonora, Fletcher, Colorado/Broadway) | \$ 17,368,000 | | | | | | | \$ 34,736,000 | | |
| LRT Alignment (at-grade) | \$ 9,249,563 | | | | | | | | \$ 118,394,407 | \$ 137,818,490 |
| LRT Alignment (below-grade) | \$ 198,959,716 | | | | | | | | \$ 258,647,630 | \$ 172,431,754 |
| LRT Station (at-grade) | \$ 77,033,291 | | | | | | | | \$ 693,299,615 | \$ 847,366,196 |
| LRT Station (below-grade) | \$ 257,357,262 | | | | | | | | \$ 343,143,016 | \$ 343,143,016 |
| LRT Bridge over LA River | \$ 72,517,696 | | | | | | | | \$ 72,517,696 | \$ 72,517,696 |
| LRT Bridge over I-5 | \$ 58,840,266 | | | | | | | | | \$ 58,840,266 |
| LRT alignment ROW | \$ 52,098,633 | | | | | | | | | \$ 52,098,633 |
| Lancaster Terminal Improvements | \$ 27,300,000 | | | | | \$ 27,300,000 | | | | |
| Lancaster Terminal Improvements | \$ 30,100,000 | | | | | | \$ 30,100,000 | \$ 30,100,000 | | |
| Palmdale North Double Track | \$ 127,300,000 | | | | | | \$ 127,300,000 | \$ 127,300,000 | | |
| Ravenna South Double Track | \$ 56,300,000 | | | | | | \$ 56,300,000 | \$ 56,300,000 | | |
| Canyon-Santa Clarita Siding | \$ 48,800,000 | | | | | \$ 48,800,000 | \$ 48,800,000 | \$ 48,800,000 | | |
| Balboa Double Track Extension | \$ 41,800,000 | | | | \$ 41,800,000 | \$ 41,800,000 | \$ 41,800,000 | \$ 41,800,000 | | |
| Sheldon-Van Nuys Blvd Double Track | \$ 67,000,000 | | | | | | \$ 67,000,000 | \$ 67,000,000 | | |
| Brighton-McGinley Double Track | \$ 57,300,000 | | | | | \$ 57,300,000 | \$ 57,300,000 | \$ 57,300,000 | | |
| Total (low) | | \$ - | \$ - | \$ 76,055,582 | \$ 41,800,000 | \$ 175,200,000 | \$ 760,318,165 | \$ 866,620,039 | \$ 3,267,725,886 | \$ 4,655,892,212 |
| Total (high) | | | \$ - | | | \$ 227,760,000 | \$ 988,413,614 | \$ 1,126,606,051 | \$ 4,248,043,652 | \$ 6,052,659,875 |