

## **Support Material Agenda Item No. 19**

### **Board of Directors Meeting**

**June 1, 2022**

**10:00 AM**

#### **Location:**

San Bernardino County Transportation Authority  
First Floor Lobby Board Room  
Santa Fe Depot, 1170 W. 3rd Street  
San Bernardino, CA 92410

### **CONSENT CALENDAR**

#### **Transit**

**19. Southern California Regional Rail Authority Preliminary Budget Request for Fiscal Year 2022/2023**

That the Board, acting as the San Bernardino County Transportation Authority (SBCTA):

A. Approve the Southern California Regional Rail Authority Preliminary Budget Request for Fiscal Year (FY) 2022/2023, with a total SBCTA annual subsidy totaling \$39,149,420 for: Operating assistance in the amount of \$25,742,176, Rehabilitation assistance in the amount of \$10,900,080, and New Capital assistance in the amount of \$2,507,164.

B. Approve the funding allocations to support funding for Recommendation A, totaling \$39,149,420, to fund SBCTA's annual subsidy of the FY 2022/2023 Budget: \$17,798,962 of Coronavirus Aid, Relief and Economic Security Act funds, \$11,380,291 of Federal Transit Administration Section 5337 funds, \$7,233,705 of Valley Local Transportation Funds (LTF), \$1,742,400 of State Transit Assistance – Operator (STA-Op) funds, \$709,509 of American Rescue Plan Act funds, and \$284,553 of Senate Bill 1 State of Good Repair – Operator (SB1 SGR-Op) funds.

C. Allocate an additional \$4,237,902 of Measure I Metrolink/Rail Service Program funds for Arrow Service through October 2022 for continued testing and pre-revenue operation.

D. Allocate an additional \$2,590,645 of Valley LTF funds for the FY 2021/2022 Operations Budget to replace the surplus carry-over funds that were allocated previously, but that have been determined to be unavailable, for a zero net increase in total operating assistance allocation for FY 2021/2022.

E. Approve swapping previously allocated SB1 SGR-Op and STA-Op dollars that funded the FY 2021/2022 Budget subsidy between the Operating assistance and Rehabilitation assistance categories, resulting in no net increase to the FY 2021/2022 Budget subsidy, and maintaining the overall allocation amounts by fund source.

***The Southern California Regional Rail Authority Request for Adoption of the Authority's FY 2022/23 Budget is being provided as a separate attachment.***

May 27, 2022

**TO:** Martin Erickson, *Executive Director, VCTC*  
Darrell Johnson, *Chief Executive Officer, OCTA*  
Anne Mayer, *Executive Director, RCTC*  
Stephanie N. Wiggins, *Chief Executive Officer, Metro*  
Dr. Raymond Wolfe, *Executive Director, SBCTA*

**FROM:** Darren M. Kettle, *Chief Executive Officer, SCRRA*

**SUBJECT:** SCRRA Request for Adoption of the Authority's FY 2022-23 (FY23)  
Budget

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On May 27, 2022, the SCRRA Board approved the transmission of the Proposed FY23 Budget for your consideration and adoption. The Board further approved the transmission of the Forecast Operating Statement for years FY24, FY25, FY26 and FY27 for your review and programming.

The FY23 Budget Operating Revenue is projected to be \$64.0M while the Operating Expenses are projected to be \$296.6M. The total Operating Support requested from Member Agencies is \$232.6M. Operating expenses will continue to be supported by CARES/ARPA/CRRSAA as funding is available. The FY23 Capital Program includes \$94.4M for Rehabilitation, \$12.1M for New Capital, and \$102.5M (\$5.9M of which is expected from Member Agencies) for Rolling Stock replacement.

As we navigate through the financial challenges presented by the pandemic and continue our ridership recovery efforts in the post-COVID "new normal", and the changes to work patterns, staff will be monitoring Ridership recovery, Farebox Revenues and Expenses very closely. The first quarter financial report will provide a thorough analysis of the current situation and our estimates of near-term performance, with recommendations for actions to deal with real-time conditions.

The Proposed FY23 Budget documentation, which was presented at the AFCOM Committee on May 13, 2022, and at the Board of Directors Meeting on May 27, 2022, is attached for your review. It includes:

- Board Item # 7A Approved at the Board of Director's Meeting on May 27, 2022
- Board item # 7A attachments, which includes:
  - Attachment A - Ridership Recovery Forecast

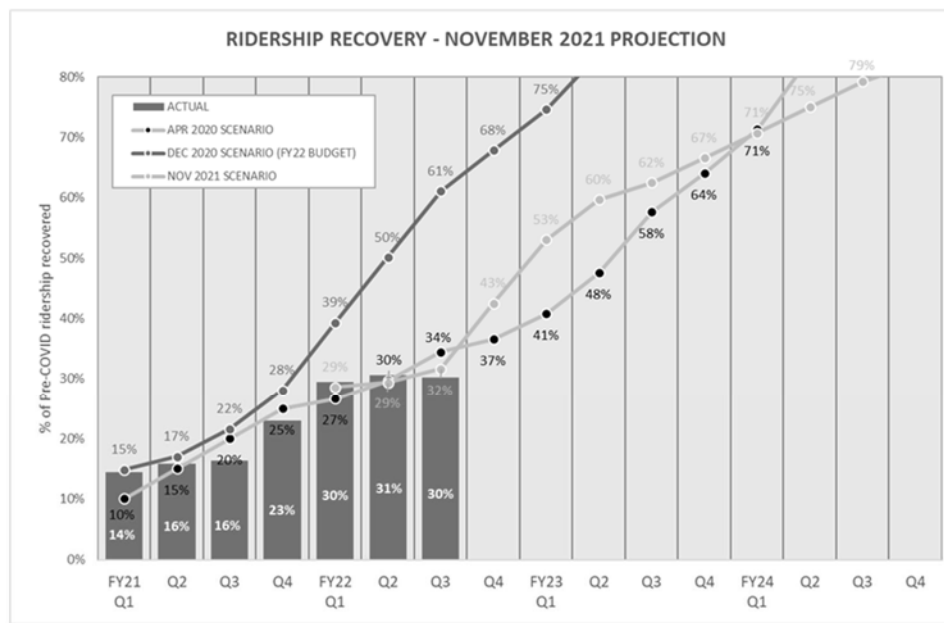
- Attachment B - FY23 Proposed Operating Budget with Comparison to FY22
- Attachment C - Historical Actual and Budgeted Operating Statements
- Attachment D - FY23 Proposed Operating Budget by Member Agency
- Attachment E - FY23 Proposed Operating Budget by Line
- Attachment F - History of Actual and Budgeted Operating Subsidy by Member Agency
- Attachment G - FY23 Proposed Rehabilitation Projects by Member Agency, Line, and Project Detail List
- Attachment H - FY23 Proposed New Capital by Member Agency, Line, and Project Detail List
- Attachment I - FY23 Proposed Capital Program Cashflow
- Attachment J - FY24 Forecasted Operating Budget
- Attachment K - FY25 Forecasted Operating Budget
- Attachment L - FY26 Forecasted Operating Budget
- Attachment M - FY27 Forecasted Operating Budget Detail List
- Attachment N - FY23 Proposed Operating Budget for ARROW Service for 4 Months (July-October)

### **Next Steps**

May – June 2022	Staff present at Member Agencies' Committee and Board meetings as requested
June, 2022	FY23 Proposed Budget to SCRRA Board for Adoption

Thank you for your ongoing support and active participation in the development of the FY23 Proposed Budget. If you have any comments or concerns, please do not hesitate to contact me directly at (213) 452-0405. You may also contact Arnold Hackett, Chief Financial Officer at 213-452-0345.

# Ridership Recovery Forecast





# FY23 Proposed Operating Budget

(\$000s)	FY 21-22 Amended Budget	FY 22-23 Proposed Budget	Variance FY23 Proposed vs FY22 Amended	
			\$ Variance	% Variance
<b>Operating Revenue</b>				
Farebox Revenue	42,604	44,585	1,980	4.65%
Fare Reduction Subsidy	1,126	1,511	385	34.21%
Other Train Subsidies	2,352	2,500	148	6.30%
Special Trains	150	-	(150)	-100.00%
<b>Subtotal-Pro Forma FareBox</b>	<b>46,232</b>	<b>48,595</b>	<b>2,364</b>	<b>5.11%</b>
Dispatching	2,054	2,777	723	35.20%
Other Revenues	575	773	198	34.35%
MOW Revenues	11,556	11,879	323	2.80%
<b>Total Operating Revenue</b>	<b>60,416</b>	<b>64,023</b>	<b>3,607</b>	<b>5.97%</b>
<b>Operating Expenses</b>				
<b><u>Operations &amp; Services</u></b>				
Train Operations	46,202	51,311	5,108	11.06%
Equipment Maintenance	37,594	41,054	3,460	9.20%
Fuel	20,686	32,524	11,838	57.22%
Non-Scheduled Rolling Stock Repairs	100	100	-	0.00%
Operating Facilities Maintenance	1,654	2,218	564	34.08%
Other Operating Train Services	916	934	18	1.94%
Rolling Stock Lease	-	-	-	n/a
Security	13,533	15,738	2,205	16.30%
Public Safety Program	102	103	1	1.13%
Passenger Relations	1,870	1,911	41	2.19%
TVM Maintenance/Revenue Collection	4,614	5,365	752	16.29%
Marketing	2,868	3,097	230	8.02%
Media & External Communications	362	372	10	2.89%
Utilities/Leases	2,965	3,914	949	32.00%
Transfers to Other Operators	3,276	3,276	-	0.00%
Amtrak Transfers	824	824	-	0.00%
Station Maintenance	2,065	2,185	120	5.80%
Rail Agreements	4,218	5,305	1,087	25.78%
Holiday Trains	265	-	(265)	-100.00%
Special Trains	92	500	408	443.48%
<b>Subtotal Operations &amp; Services</b>	<b>144,206</b>	<b>170,732</b>	<b>26,526</b>	<b>18.39%</b>
<b><u>Maintenance-of-Way</u></b>				
MoW - Line Segments	49,034	51,480	2,446	4.99%
MoW - Extraordinary Maintenance	697	1,048	350	50.23%
<b>Subtotal Maintenance-of-Way</b>	<b>49,731</b>	<b>52,527</b>	<b>2,796</b>	<b>5.62%</b>
<b><u>Administration &amp; Services</u></b>				
Ops Salaries & Benefits	16,817	18,066	1,250	7.43%
Ops Non-Labor Expenses	8,654	11,983	3,329	38.47%
Indirect Administrative Expenses	19,889	21,546	1,656	8.33%
Ops Professional Services	2,398	2,685	287	11.97%
<b>Subtotal Admin &amp; Services</b>	<b>47,758</b>	<b>54,280</b>	<b>6,522</b>	<b>13.66%</b>
<b>Contingency</b>	<b>90</b>	<b>90</b>	<b>-</b>	<b>0.00%</b>
<b>Total Operating Expenses</b>	<b>241,785</b>	<b>277,629</b>	<b>35,844</b>	<b>14.82%</b>
<b>Insurance and Legal</b>				
Liability/Property/Auto	14,677	16,088	1,411	9.61%
Net Claims / SI	990	1,000	10	1.01%
Claims Administration	1,172	1,856	684	58.30%
<b>Total Net Insurance and Legal</b>	<b>16,840</b>	<b>18,944</b>	<b>2,104</b>	<b>12.50%</b>
<b>Total Expense</b>	<b>258,625</b>	<b>296,573</b>	<b>37,948</b>	<b>14.67%</b>
<b>Loss / Member Support Required</b>	<b>(198,209)</b>	<b>(232,550)</b>	<b>(34,341)</b>	<b>17.33%</b>

Numbers may not foot due to rounding

# Historical Actual and Budgeted Operating Statements

(\$000s)	FY 18-19 Actual	FY 19-20 Actual	FY 20-21 Actual	FY 21-22 Amended Budget	FY 22-23 Proposed Budget	Variance FY23 Proposed vs FY22 Amended	
						\$ Variance	% Variance
<b>Operating Revenue</b>							
Farebox Revenue	79,007	61,843	13,811	42,604	44,585	1,980	4.65%
Fare Reduction Subsidy	3,147	1,090	164	1,126	1,511	385	34.21%
Other Train Subsidies	-	-	2,306	2,352	2,500	148	6.30%
Special Trains	-	171	-	150	-	(150)	-100.00%
<b>Subtotal-Pro Forma FareBox</b>	<b>82,154</b>	<b>63,104</b>	<b>16,256</b>	<b>46,232</b>	<b>48,595</b>	<b>2,364</b>	<b>5.11%</b>
Dispatching	2,136	2,300	2,079	2,054	2,777	723	35.20%
Other Revenues	790	254	345	575	773	198	34.35%
MOW Revenues	13,017	13,301	11,545	11,556	11,879	323	2.80%
<b>Total Operating Revenue</b>	<b>98,097</b>	<b>78,958</b>	<b>30,225</b>	<b>60,416</b>	<b>64,023</b>	<b>3,607</b>	<b>5.97%</b>
<b>Operating Expenses</b>							
<b><u>Operations &amp; Services</u></b>							
Train Operations	43,093	45,701	42,885	46,202	51,311	5,108	11.06%
Equipment Maintenance	36,642	36,861	37,041	37,594	41,054	3,460	9.20%
Fuel	23,582	21,150	18,640	20,686	32,524	11,838	57.22%
Non-Scheduled Rolling Stock Repairs	87	92	112	100	100	-	0.00%
Operating Facilities Maintenance	1,683	1,569	2,130	1,654	2,218	564	34.08%
Other Operating Train Services	1,069	863	945	916	934	18	1.94%
Rolling Stock Lease	230	231	230	-	-	-	n/a
Security	8,715	9,367	13,597	13,533	15,738	2,205	16.30%
Public Safety Program	209	55	64	102	103	1	1.13%
Passenger Relations	1,769	1,786	1,787	1,870	1,911	41	2.19%
TVM Maintenance/Revenue Collection	7,871	7,594	3,503	4,614	5,365	752	16.29%
Marketing	4,304	1,359	2,092	2,868	3,097	230	8.02%
Media & External Communications	348	410	219	362	372	10	2.89%
Utilities/Leases	2,775	2,762	2,899	2,965	3,914	949	32.00%
Transfers to Other Operators	5,608	5,394	662	3,276	3,276	-	0.00%
Amtrak Transfers	1,497	1,166	41	824	824	-	0.00%
Station Maintenance	1,847	1,980	1,960	2,065	2,185	120	5.80%
Rail Agreements	5,696	5,159	4,812	4,218	5,305	1,087	25.78%
Holiday Trains	-	57	-	265	-	(265)	-100.00%
Special Trains	-	524	-	92	500	408	443.48%
<b>Subtotal Operations &amp; Services</b>	<b>147,026</b>	<b>144,081</b>	<b>133,621</b>	<b>144,206</b>	<b>170,732</b>	<b>26,526</b>	<b>18.39%</b>
<b><u>Maintenance-of-Way</u></b>							
MoW - Line Segments	43,112	43,375	43,756	49,034	51,480	2,446	4.99%
MoW - Extraordinary Maintenance	801	864	599	697	1,048	350	50.23%
<b>Subtotal Maintenance-of-Way</b>	<b>43,913</b>	<b>44,239</b>	<b>44,355</b>	<b>49,731</b>	<b>52,527</b>	<b>2,796</b>	<b>5.62%</b>
<b><u>Administration &amp; Services</u></b>							
Ops Salaries & Benefits	13,484	15,497	15,578	16,817	18,066	1,250	7.43%
Ops Non-Labor Expenses	6,725	7,645	7,334	8,654	11,983	3,329	38.47%
Indirect Administrative Expenses	16,151	18,254	17,695	19,889	21,546	1,656	8.33%
Ops Professional Services	2,423	3,019	2,311	2,398	2,685	287	11.97%
<b>Subtotal Admin &amp; Services</b>	<b>38,784</b>	<b>44,415</b>	<b>42,917</b>	<b>47,758</b>	<b>54,280</b>	<b>6,522</b>	<b>13.66%</b>
<b>Contingency</b>	<b>-</b>	<b>11</b>	<b>-</b>	<b>90</b>	<b>90</b>	<b>-</b>	<b>0.00%</b>
<b>Total Operating Expenses</b>	<b>229,723</b>	<b>232,745</b>	<b>220,893</b>	<b>241,785</b>	<b>277,629</b>	<b>35,844</b>	<b>14.82%</b>
<b>Insurance and Legal</b>							
Liability/Property/Auto	9,429	9,870	12,447	14,677	16,088	1,411	9.61%
Net Claims / SI	1,212	2,303	1	990	1,000	10	1.01%
Claims Administration	682	367	682	1,172	1,856	684	58.30%
<b>Total Net Insurance and Legal</b>	<b>11,324</b>	<b>12,540</b>	<b>13,129</b>	<b>16,840</b>	<b>18,944</b>	<b>2,104</b>	<b>12.50%</b>
<b>Total Expense</b>	<b>241,046</b>	<b>245,285</b>	<b>234,023</b>	<b>258,625</b>	<b>296,573</b>	<b>37,948</b>	<b>14.67%</b>
<b>Non-Recurring Settlement Expense 1</b>	<b>-</b>	<b>-</b>	<b>3,234</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>n/a</b>
<b>Non-Recurring Settlement Expense 2</b>	<b>-</b>	<b>-</b>	<b>2,370</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>n/a</b>
<b>Loss / Member Support Required</b>	<b>(142,949)</b>	<b>(166,327)</b>	<b>(209,402)</b>	<b>(198,209)</b>	<b>(232,550)</b>	<b>(34,341)</b>	<b>17.33%</b>
<b>Member Support Payments</b>	<b>150,550</b>	<b>156,578</b>	<b>163,176</b>	<b>TBD</b>	<b>TBD</b>	<b>TBD</b>	<b>TBD</b>
<b>CARES Funding Utilized</b>	<b>-</b>	<b>9,748</b>	<b>46,226</b>				
<b>Surplus / (Deficit)</b>	<b>7,600</b>	<b>-</b>	<b>-</b>				

Numbers may not foot due to rounding

# FY23 Proposed Operating Budget by Member Agency

(\$000s)	METRO	OCTA	RCTC	SBCTA	VCTC	TOTAL
<b>Operating Revenue</b>						
Farebox Revenue	19,838	11,721	4,926	6,313	1,788	44,585
Fare Reduction Subsidy	904	-	-	607	-	1,511
Other Train Subsidies	2,500	-	-	-	-	2,500
Special Trains	-	-	-	-	-	-
<b>Subtotal-Pro Forma FareBox</b>	<b>23,241</b>	<b>11,721</b>	<b>4,926</b>	<b>6,920</b>	<b>1,788</b>	<b>48,595</b>
Dispatching	1,318	1,040	15	99	304	2,777
Other Revenues	395	171	72	111	24	773
MOW Revenues	6,206	3,041	729	1,473	430	11,879
<b>Total Operating Revenue</b>	<b>31,160</b>	<b>15,973</b>	<b>5,741</b>	<b>8,603</b>	<b>2,546</b>	<b>64,023</b>
<b>Operating Expenses</b>						
<b><u>Operations &amp; Services</u></b>						
Train Operations	28,085	10,575	4,721	5,852	2,077	51,311
Equipment Maintenance	19,280	9,771	5,153	4,996	1,854	41,054
Fuel	17,492	7,112	2,975	3,741	1,203	32,524
Non-Scheduled Rolling Stock Repairs	49	25	10	12	3	100
Operating Facilities Maintenance	1,082	559	232	270	75	2,218
Other Operating Train Services	464	128	111	156	74	934
Rolling Stock Lease	-	-	-	-	-	-
Security	7,688	3,207	2,338	1,742	764	15,738
Public Safety Program	49	18	15	11	10	103
Passenger Relations	965	464	168	271	44	1,911
TVM Maintenance/Revenue Collection	2,232	1,245	944	601	343	5,365
Marketing	1,603	694	278	447	75	3,097
Media & External Communications	177	64	55	39	37	372
Utilities/Leases	1,857	674	582	411	389	3,914
Transfers to Other Operators	1,824	752	235	398	69	3,276
Amtrak Transfers	276	504	-	-	44	824
Station Maintenance	1,358	326	127	282	92	2,185
Rail Agreements	2,345	996	1,349	345	269	5,305
Holiday Trains	-	-	-	-	-	-
Special Trains	238	99	56	72	36	500
<b>Subtotal Operations &amp; Services</b>	<b>87,062</b>	<b>37,214</b>	<b>19,350</b>	<b>19,647</b>	<b>7,460</b>	<b>170,732</b>
<b><u>Maintenance-of-Way</u></b>						
MoW - Line Segments	28,546	10,187	3,308	6,501	2,937	51,480
MoW - Extraordinary Maintenance	614	150	100	112	73	1,048
<b>Subtotal Maintenance-of-Way</b>	<b>29,159</b>	<b>10,337</b>	<b>3,408</b>	<b>6,613</b>	<b>3,009</b>	<b>52,527</b>
<b><u>Administration &amp; Services</u></b>						
Ops Salaries & Benefits	8,570	3,126	2,680	1,899	1,791	18,066
Ops Non-Labor Expenses	6,041	2,499	1,397	1,328	719	11,983
Indirect Administrative Expenses	10,221	3,712	3,206	2,262	2,144	21,546
Ops Professional Services	1,274	463	400	282	267	2,685
<b>Subtotal Admin &amp; Services</b>	<b>26,106</b>	<b>9,800</b>	<b>7,682</b>	<b>5,771</b>	<b>4,921</b>	<b>54,280</b>
<b>Contingency</b>	<b>43</b>	<b>16</b>	<b>13</b>	<b>9</b>	<b>9</b>	<b>90</b>
<b>Total Operating Expenses</b>	<b>142,370</b>	<b>57,366</b>	<b>30,454</b>	<b>32,040</b>	<b>15,399</b>	<b>277,629</b>
<b>Insurance and Legal</b>						
Liability/Property/Auto	7,850	4,054	1,684	1,958	541	16,088
Net Claims / SI	488	252	105	122	34	1,000
Claims Administration	906	468	194	226	62	1,856
<b>Total Net Insurance and Legal</b>	<b>9,244</b>	<b>4,774</b>	<b>1,983</b>	<b>2,306</b>	<b>637</b>	<b>18,944</b>
<b>Total Expense</b>	<b>151,614</b>	<b>62,140</b>	<b>32,437</b>	<b>34,346</b>	<b>16,036</b>	<b>296,573</b>
<b>Loss / Member Support Required</b>	<b>(120,455)</b>	<b>(46,167)</b>	<b>(26,696)</b>	<b>(25,742)</b>	<b>(13,490)</b>	<b>(232,550)</b>

Numbers may not foot due to rounding

## FY23 Proposed Operating Budget by Line

((\$000s))	San Bernardino	Ventura County	Antelope Valley	Riverside	Orange County	IEOC	91/PVL	TOTAL
<b>Operating Revenue</b>								
Farebox Revenue	12,352	4,201	5,453	2,524	8,831	6,448	4,775	44,585
Fare Reduction Subsidy	1,511	-	-	-	-	-	-	1,511
Other Train Subsidies	798	99	969	318	194	-	123	2,500
Special Trains	-	-	-	-	-	-	-	-
<b>Subtotal-Pro Forma FareBox</b>	<b>14,660</b>	<b>4,299</b>	<b>6,422</b>	<b>2,842</b>	<b>9,026</b>	<b>6,448</b>	<b>4,898</b>	<b>48,595</b>
Dispatching	336	587	341	2	1,485	6	21	2,777
Other Revenues	228	57	150	47	130	101	60	773
MOW Revenues	3,348	1,285	3,032	183	1,942	1,322	767	11,879
<b>Total Operating Revenue</b>	<b>18,571</b>	<b>6,228</b>	<b>9,945</b>	<b>3,074</b>	<b>12,582</b>	<b>7,877</b>	<b>5,746</b>	<b>64,023</b>
<b>Operating Expenses</b>								
<b><u>Operations &amp; Services</u></b>								
Train Operations	12,285	5,503	11,580	3,400	8,020	5,524	4,999	51,311
Equipment Maintenance	9,554	4,230	7,022	2,616	7,302	5,586	4,744	41,054
Fuel	7,434	3,146	6,824	2,230	6,026	3,931	2,933	32,524
Non-Scheduled Rolling Stock Repairs	25	8	17	6	19	14	10	100
Operating Facilities Maintenance	552	186	386	128	431	314	220	2,218
Other Operating Train Services	298	124	135	112	71	91	104	934
Rolling Stock Lease	-	-	-	-	-	-	-	-
Security	3,283	1,497	3,327	1,207	2,254	1,977	2,194	15,738
Public Safety Program	15	17	19	15	10	13	14	103
Passenger Relations	575	108	391	88	334	270	145	1,911
TVM Maintenance/Revenue Collection	951	780	865	422	758	865	723	5,365
Marketing	954	189	621	155	519	403	258	3,097
Media & External Communications	54	62	67	56	35	46	52	372
Utilities/Leases	571	650	707	586	372	479	548	3,914
Transfers to Other Operators	867	196	757	173	817	166	301	3,276
Amtrak Transfers	-	123	-	-	700	-	-	824
Station Maintenance	606	373	452	165	397	14	177	2,185
Rail Agreements	-	728	-	2,044	758	878	898	5,305
Holiday Trains	-	-	-	-	-	-	-	-
Special Trains	110	76	80	69	84	67	15	500
<b>Subtotal Operations &amp; Services</b>	<b>38,135</b>	<b>17,996</b>	<b>33,249</b>	<b>13,471</b>	<b>28,907</b>	<b>20,637</b>	<b>18,336</b>	<b>170,732</b>
<b><u>Maintenance-of-Way</u></b>								
MoW - Line Segments	14,962	8,183	11,853	1,109	7,180	4,558	3,635	51,480
MoW - Extraordinary Maintenance	230	158	167	145	177	141	31	1,048
<b>Subtotal Maintenance-of-Way</b>	<b>15,192</b>	<b>8,341</b>	<b>12,019</b>	<b>1,254</b>	<b>7,357</b>	<b>4,698</b>	<b>3,666</b>	<b>52,527</b>
<b><u>Administration &amp; Services</u></b>								
Ops Salaries & Benefits	2,646	2,991	3,271	2,696	1,732	2,209	2,522	18,066
Ops Non-Labor Expenses	2,384	1,500	2,312	1,184	1,841	1,432	1,329	11,983
Indirect Administrative Expenses	3,144	3,581	3,891	3,228	2,049	2,635	3,019	21,546
Ops Professional Services	392	446	485	402	255	328	376	2,685
<b>Subtotal Admin &amp; Services</b>	<b>8,565</b>	<b>8,518</b>	<b>9,959</b>	<b>7,510</b>	<b>5,877</b>	<b>6,605</b>	<b>7,245</b>	<b>54,280</b>
<b>Contingency</b>	<b>13</b>	<b>15</b>	<b>16</b>	<b>13</b>	<b>9</b>	<b>11</b>	<b>13</b>	<b>90</b>
<b>Total Operating Expenses</b>	<b>61,905</b>	<b>34,870</b>	<b>55,244</b>	<b>22,249</b>	<b>42,150</b>	<b>31,951</b>	<b>29,260</b>	<b>277,629</b>
<b>Insurance and Legal</b>								
Liability/Property/Auto	4,007	1,353	2,797	930	3,123	2,278	1,599	16,088
Net Claims / SI	249	84	174	58	194	142	99	1,000
Claims Administration	462	156	323	107	360	263	185	1,856
<b>Total Net Insurance and Legal</b>	<b>4,718</b>	<b>1,593</b>	<b>3,293</b>	<b>1,095</b>	<b>3,678</b>	<b>2,683</b>	<b>1,883</b>	<b>18,944</b>
<b>Total Expense</b>	<b>66,623</b>	<b>36,463</b>	<b>58,537</b>	<b>23,345</b>	<b>45,828</b>	<b>34,634</b>	<b>31,143</b>	<b>296,573</b>
<b>Loss / Member Support Required</b>	<b>(48,052)</b>	<b>(30,236)</b>	<b>(48,592)</b>	<b>(20,271)</b>	<b>(33,246)</b>	<b>(26,757)</b>	<b>(25,397)</b>	<b>(232,550)</b>

Numbers may not foot due to rounding

# History of actual and budgeted Operating Subsidy with variances of FY23 vs FY22

## Support by Member Agency

	<b>Total Support</b>	<b>METRO Share</b>	<b>OCTA Share</b>	<b>RCTC Share</b>	<b>SBCTA Share</b>	<b>VCTC Share</b>
<b>FY22 Amended Budget</b>	\$198,208,745	\$101,451,894	\$39,084,641	\$21,923,093	\$23,181,207	\$12,567,910
<b>FY23 Proposed Budget</b>	\$232,549,743	\$120,454,841	\$46,167,104	\$26,695,637	\$25,742,176	\$13,489,985

<b>Year-Over-Year Change</b>	<b>Total Support</b>	<b>METRO Share</b>	<b>OCTA Share</b>	<b>RCTC Share</b>	<b>SBCTA Share</b>	<b>VCTC Share</b>
<b>FY23 vs FY22</b>						
\$ increase	\$34,340,998	\$19,002,947	\$7,082,463	\$4,772,545	\$2,560,969	\$922,074
% increase	17.3%	18.7%	18.1%	21.8%	11.0%	7.3%

*Whole numbers are provided as requested by Member Agencies for their board approval and budget adoption.*



## REHABILITATION PROJECT PROPOSALS FOR FY2023 BUDGET

Attachment G

REVISED: 02/11/22																	
#ROW	CREATOR	PROJECT #	TYPE	ROUTE LINE	SUB DIVISION	MILE POSTS	CONDITI ON	IMPACT	ASSET TYPE	PROJECT	SCOPE	TOTAL REQUEST	METRO	OCTA	RCTC	SBCTA	VCTC
1	HOLMANS	2417	Rehab	ALL	ALL	NA	Worn	High	Rolling Stock	BOMBARDIER RAILCAR REBUILD	Bombardier Railcar Rebuild and rehabilitation addresses the revenue fleet of railcars and cab cars.  Specific work includes: Bombardier Railcar Rebuild - Option order for 38 Generation 1 cars Facilities rehabilitation addresses components and subcomponents that support the maintenance of rolling stock and offices for staff duties. Specific work to include: - Phase 2: MOW health and welfare facilities installation, rehab and utility connections. Designs and replace rented crew trailer including furniture, equipment and repositioning to meet CPUC mandated clearances as well as connect to utilities. - Automate and install predictive failure notifications to some of the facilities equipment to detect and repair failures before they become impact to rail operation. Include some title 24 upgrades. - Add and update ground power at yards and Laguna Niguel siding. - Rehab ground air in the yards. - Fall protection/roof platform rehab CMF. - Phase 1: Replacement of 30 year old south electrical switchgear at CMF. - Install permanent power at Lang Yard. - Systemwide facilities and yard paving, striping, fencing, access carts, signage, paint rehab.	30,000,000	14,250,000	5,940,000	3,330,000	4,320,000	2,160,000
2	HOLMANS	2556	Rehab	ALL	ALL	NA	Worn	High	Facilities	FACILITIES REHABILITATION		5,200,000	2,470,000	1,029,600	577,200	748,800	374,400
3	HOLMANS	2557	Rehab	ALL	ALL	NA	Worn	High	Non-Revenue Fleet	MAINTENANCE-OF-WAY (MOW) VEHICLES & EQUIPMENT - REPLACEMENT & OVERHAUL	MOW vehicles and equipment major overhaul and replacement via new acquisition or lease-to-purchase addresses the fleet of specialized & operations vehicles, equipment and tools that support the timely repair and rehabilitation of the overall rail corridor right-of-way. Replacement of MOW equipment and vehicles; Rehabilitation of MOW equipment. Project budget to cover cost of zero emission light and potentially medium duty vehicles (subject to manufacture production schedules).  Heavy - 2 Medium - 4 Light Duty - 25 Equipment - 4	3,510,000	1,667,250	694,980	389,610	505,440	252,720
4	HOLMANS	2558	Rehab	ALL	ALL	NA	Worn	High	Train Control	SYSTEMWIDE TRAIN CONTROL SYSTEMS REHABILITATION	Systemwide Train Control Systems Rehabilitation addresses PTC, Centralized Train Control systems and equipment to sufficiently rehabilitate aging infrastructure and growing backlog. See the justification section for discussion on aged assets and standard life. Train Control Back Office: 1) DOC/MOC Backup Systems 2) Workstations/Laptops 3) CAD/BOS/MDM/IC3 4) Routers/Switches 5) On-Board Train Control Systems 6) Software/Hardware for Locomotives & Cab Cars	5,000,000	2,375,000	990,000	555,000	720,000	360,000
5	HOLMANS	2559	Rehab	ALL	ALL	NA	Worn	High	Track	SYSTEMWIDE TRACK REHABILITATION	Systemwide Track Rehabilitation addresses the following recurring requirements to sufficiently rehabilitate aging infrastructure and growing backlog: - Rail Grinding: ongoing systemwide program - Surfacing Program to restore track profiles and cross sections - Infrastructure planning and data collection for condition assessments	5,000,000	2,375,000	990,000	555,000	720,000	360,000
6	HOLMANS	2597	Rehab	ALL	ALL	NA	Worn	High	Rolling Stock	ROLLING STOCK DAMAGE REPAIR	Rolling Stock Damage Repair – Onward accident cars – see attached STV report. The cost estimate includes the following considerations and assumptions: 1) The estimated costs to repair are based solely on visible damages during the inspection and engineering estimations made accounted for anticipated hidden damages. 2) The estimated costs to repair is to restore the cars to an “as-new condition” for revenue service. 3) The estimated costs to repair do not consider internal structural, air piping, cabling damages due to inaccessibility during the visual inspection, however, engineering assumptions were made to estimate likely hidden damages. 4) The estimate costs to repair do not consider underfloor air piping and cabling damages due to inaccessibility during the visual inspection, however, engineering assumptions were made to estimate likely hidden damages. 5) The estimated costs to repair does not include “non-recurring engineering cost” and production setup cost. 6) Engineering costs are a rough order of magnitude and do not account for influences such as market forces. 7) Market Adjustments: STV report says \$5M but it is almost 5 years old. Considering 7% of market price increase for 7 years, it is \$5.35M. 8) Additional Adjustments: STV report does not include structural inspection and repair. Due to the heavy accident, it will require engineering analysis on the structural integrity to ensure its road-worthy – estimation is \$2M, including engineering consultant and actual repair. 10% for internal costs.	8,000,000	3,800,000	1,584,000	888,000	1,152,000	576,000

#	CREATOR	PROJECT #	TYPE	ROUTE LINE	SUB DIVISION	MILE POSTS	CONDITI ON	IMPACT	ASSET TYPE	PROJECT	SCOPE	TOTAL REQUEST	METRO	OCTA	RCTC	SBCTA	VCTC
7	HOLMANS	2598	Rehab	ALL	All	NA	Worn	High	Rolling Stock	ROLLING STOCK REHABILITATION	<p>Rolling Stock rehabilitation addresses the revenue fleet of locomotives, railcars and cab cars. Specific work includes:</p> <ol style="list-style-type: none"> <li>1) Rotem HVAC Overhaul/Rebuild - \$2M <ol style="list-style-type: none"> <li>a. Continuous cashflow for 4 rebuilt HVAC units every 30 days</li> <li>b. Risk - termination of equipment for faulty HVAC units - this is already an issue</li> <li>c. This is an ongoing program with funding to be requested in future budget years</li> </ol> </li> <li>2) Fleetwide Condition-based Maintenance Program (CBM) - \$3M <ol style="list-style-type: none"> <li>a. Program targeting a proactive approach to identify, plan and perform repair/replacement of parts prior to failure and a tailored schedule to each component.</li> <li>1. Document the CBM program for user manuals, process, flow-chart, training and support algorithm.</li> <li>2. Develop the reliability and availability algorithm along with RBA process.</li> <li>3. Deliver on-hand tools and add-on sensors to the maintenance end-users and rolling stocks.</li> <li>4. Re-structure the maintenance process and facility support for CBM.</li> <li>5. Analysis and develop the daily maintenance onsite process to accommodate the best efficiency in CBM program.</li> <li>6. Code the algorithm and process for an application to Metrolink configurational management tool.</li> <li>7. Code the system for an automatic notification, RBA alert and predictive failure warning.</li> <li>8. Send notification of resolution to reporting source of any issues or failures.</li> <li>9. Run development for the supply quality assurance.</li> </ol> </li> <li>3) Communication System Overhaul - \$640K <ol style="list-style-type: none"> <li>a. Upgrade the communication control system for wireless control, onboard Ethernet network.</li> <li>b. Upgrade the destination panel.</li> <li>c. Overhaul the minor components such as speakers, microphone, etc.</li> <li>d. This is an ongoing program with funding to be requested next year to complete</li> </ol> </li> <li>4) HVAC Air Quality Solution - COVID-19 - \$2.3M <ol style="list-style-type: none"> <li>a. Mitigation for COVID-19.</li> <li>b. F125 &amp; MP36 locomotive and Rotem passenger car.</li> <li>c. This is already underway for Bombardier cars.</li> <li>d. This is an ongoing program with funding to be requested in future budget years.</li> </ol> </li> <li>5) MP36 Loco lifecycle management - \$3.6M <ol style="list-style-type: none"> <li>a. MP36s are approaching their midlife in 2023.</li> <li>b. Highest priority systems to be addressed in order to keep these locomotives serviceable.</li> <li>c. This is an ongoing program with funding to be requested in future budget years.</li> </ol> </li> </ol>	11,600,000	5,510,000	2,296,800	1,287,600	1,670,400	835,200
8	WONGS	2631	Rehab	ALL	All	NA	Worn	Low	Information Technology	GENERAL INFORMATION TECHNOLOGY EQUIPMENT AND SYSTEM REHABILITATION	<p>The Metrolink IT environment is in need of rehabilitation. The scope involves the replacement of end-user equipment and systems (e.g. laptops, desktops, tablets, monitors, cellphones, software systems), office equipment (e.g. multifunction printers, plotters, audio/video conferencing systems), and infrastructure equipment.</p>	485,000	230,375	96,030	53,835	69,840	34,920
<b>ALL SHARE PROJECT PROPOSAL REQUEST</b>												<b>68,795,000</b>	<b>32,677,625</b>	<b>13,621,410</b>	<b>7,636,245</b>	<b>9,906,480</b>	<b>4,953,740</b>
9	HOLMANS	2386	Rehab	ALL	River Sub - West Bank	0 - 485.20	Worn	High	Structures	RIVER SUBDIVISION STRUCTURES REHABILITATION - WEST BANK	<p>River Sub Structures Rehabilitation addresses three major subcomponents to sufficiently rehabilitate aging infrastructure and growing backlog:</p> <ul style="list-style-type: none"> <li>- Bridges</li> <li>- Culverts</li> <li>- Tunnels</li> </ul> <p>Specific work for this request is for rehabilitation of the Arroyo Seco Bridge.</p>	6,900,000	3,277,500	1,366,200	765,900	993,600	496,800
<b>RIVER SUBDIVISION-WEST BANK PROJECT PROPOSAL REQUEST</b>												<b>6,900,000</b>	<b>3,277,500</b>	<b>1,366,200</b>	<b>765,900</b>	<b>993,600</b>	<b>496,800</b>

ROW #	CREATOR	PROJECT #	TYPE	ROUTE LINE	SUB DIVISION	MILE POSTS	CONDITI ON	IMPACT	ASSET TYPE	PROJECT	SCOPE	TOTAL REQUEST	METRO	OCTA	RCTC	SBCTA	VCTC	
10	HOLMANS	2617	Rehab	Antelope Valley Line	Valley	3.67 - 76.63	Worn	High	Track	VALLEY SUBDIVISION TRACK REHABILITATION	Valley Sub Track Rehabilitation addresses five major subcomponents to sufficiently rehabilitate aging infrastructure and growing backlog:  - Rail - Ties - Crossings - Special Trackwork - Ballast  Specific work includes Tunnel 25 Rehabilitation: Option 1: Partial funding necessary for the complete track rehabilitation of Track in the Tunnel. (Additional \$8M would need to be secured elsewhere).  Option 2: Take advantage of economies of scale and perform major maintenance in the Tunnel by combining scope, equipment and labor forces with the work coming on Tunnel 26 which is funded through separate outside FRA Grant. Work would remove & replace approximately 20% of ties and ballast.	4,000,000	4,000,000	-	-	-	-	
11	HOLMANS	2627	Rehab	Antelope Valley Line	Valley	3.67 - 76.63	Worn	High	Train Control	VALLEY SUBDIVISION TRAIN CONTROL SYSTEMS REHABILITATION	Valley Sub Train Control Systems Rehabilitation addresses major subcomponents to sufficiently rehabilitate aging infrastructure and growing backlog:  - Signal systems - Crossing systems - Communication systems  COMMUNICATIONS: WMS-UPGRADE, AC REHAB, BATTERY REHAB, FIBER - REHAB, RADIO REHAB - PTC/VHF/UHF, CIS REHAB  SIGNALS WORK WILL BE REASSESSED FOR CHANGE CONDITIONS IN THE YEAR OF APPROVED FUNDING WITH PRIORITIES LISTED: 1) CP Courier MP 6.4 - Replace CP House, internal control equipment, and power switch machine \$550,000 2) EC Repeater & Switch Leaving Signal MP 7.51 - Replace house, internal control equipment and battery back-up - \$250,000 3) Int Signal 71-73 MP 7.9 Replace Signal House, internal control equipment - \$350,000 4) Int Signal 141-142 MP 14.2 Replace Signal House, internal control equipment - \$350,000 5) DED MP 15.10 - Replace detector and control equipment - \$250,000 6) Int Signal 191-192 MP 19.22 Replace Signal House, internal control equipment - \$350,000 7) Int Signal 201-202 MP 20.8 Replace Signal House, internal control equipment - \$350,000 8) EC4 Repeater MP 21.8 Replace Signal House, internal control equipment - \$350,000 9) EC4 Repeater MP 22.6 Replace Signal House, internal control equipment - \$350,000	2,500,000	2,500,000	-	-	-	-	-
												6,500,000	6,500,000	-	-	-	-	-
12	HOLMANS	2620	Rehab	Orange County Line	Orange	NA	Worn	High	Track	ORANGE SUBDIVISION TRACK REHABILITATION	Orange Sub Track Rehabilitation addresses five major subcomponents to sufficiently rehabilitate aging infrastructure and growing backlog:  - Rail - Ties - Crossings - Special Trackwork - Ballast  Specific work includes Metrolink Share of NCTD Turnout at Basiline Spur  Rail replacement, and upgrade from 115 lb rail to 136 lb rail from Beach Rd to CP Serra (Scope removed from 2021 due to SCORE coordination issues).	6,700,000	-	6,700,000	-	-	-	-
13	HOLMANS	2626	Rehab	Orange County Line	Orange	165.08 - 207.4	Worn	High	Structures	ORANGE SUBDIVISION STRUCTURES REHABILITATION	Riprap and track protection along the coast.  Orange Sub Structures Rehabilitation addresses three major subcomponents to sufficiently rehabilitate aging infrastructure and growing backlog: - Bridges - Culverts - Tunnels  Specific work includes construction funding for Culverts designed and environmentally cleared in FY20, but do not have sufficient construction funding. Culverts MP 205.8 and 207.2 Orange Sub, and Olive Sub MP 5.4.	2,220,000	-	2,220,000	-	-	-	-



ROW#	CREATOR	PROJECT #	TYPE	ROUTE LINE	SUB DIVISION	MILE POSTS	CONDITI ON	IMPACT	ASSET TYPE	PROJECT	SCOPE	TOTAL REQUEST	METRO	OCTA	RCTC	SBCTA	VCTC
14	HOLMANS	2630	Rehab	Orange County Line	Orange	NA	Worn	High	Train Control	ORANGE SUBDIVISION TRAIN CONTROL SYSTEMS REHABILITATION	Orange Sub Train Control Systems Rehabilitation addresses major subcomponents to sufficiently rehabilitate aging infrastructure and growing backlog: - Signal systems - Crossing systems - Communication systems  COMMUNICATIONS: WMS-UPGRADE, AC REHAB, BATTERY REHAB, FIBER - REHAB, RADIO REHAB - PTC/VHF/UHF, CIS REHAB  SIGNALS WORK WILL BE REASSESSED FOR CHANGE CONDITIONS IN THE YEAR OF APPROVED FUNDING WITH PRIORITIES LISTED: 1) CP La Palma MP 167.3 - Replace CP House, internal control equipment, and power switch machine \$600,000 2) CP College MP 169.8 - Replace CP House, internal control equipment, and power switch machine \$550,000 3) CP Maple MP 172.4 - Replace CP House, internal control equipment, and power switch machine \$600,000 4) CP Lincoln MP 174.7 - Replace CP House, internal control equipment, and power switch machine \$600,000 5) CP Aliso MP 178.9 - Replace CP House, internal control equipment, and power switch machine \$550,000 6) CP Tinkham MP 184.5 - Replace CP House, internal control equipment, and power switch machine \$600,000	3,330,000	-	3,330,000	-	-	-
OCTA PROJECT PROPOSAL REQUEST												12,250,000	-	12,250,000	-	-	-
FY2023 PROPOSED REHABILITATION REQUEST												94,445,000	42,455,125	27,237,610	8,402,145	10,900,080	5,450,040



# PROJECT PROPOSAL

**FY23**

HOLMANS PROJECT# 2417.00

## PROJECT : BOMBARDIER RAILCAR REBUILD

SCOPE				TYPE: REHAB   MRP					
Bombardier Railcar Rebuild and rehabilitation addresses the revenue fleet of railcars and cab cars.									
Specific work includes: Bombardier Railcar Rebuild - Contract Option #1 order originally written for 38 Generation 1 cars: This \$30M project proposal will fund 18 of those Option 1 cars.									
Mile Posts: NA				Division: All    County: ALL    Asset Type: Rolling Stock					
OBJECTIVES				RISKS CAUSING PROJECT DELAY					
1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair 2. (Goal 4: Retain and Grow Ridership) Improve service reliability 3. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost 4. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents				1. Condition of Asset..... Worn 2. System Impact..... High					
JUSTIFICATION									
This equipment has reached the end of its lifecycle - the Gen 1 cars are about 30 years old (the age of retirement) today and have never received a midlife overhaul. This work is critical to reliability as well as passenger experience. Rolling Stock rehabilitation identified by the Metrolink Rehabilitation Plan (MRP) includes Locomotives, Rail Cars and Cab Cars. The need has been identified because the assets have fallen below a State of Good Repair and are in need of rehabilitation based on limits set by SCRRA staff and industry standards. The useful life for rolling stock is 30 years inclusive of a mid-life overhaul. Many rolling stock assets are past due for their mid-life overhaul.									
RISK CREATED BY NON-IMPLEMENTATION									
If the program is not implemented in full, the remaining work that is beyond the rehabilitation limits will be added to the backlog in future years. Ages of particular fleets, and components within fleets, vary within the rolling stock asset category, with a range of conditions that include marginal and poor ratings.									
Current Age: 32 Year(s)    Standard Lifespan: 30 Year(s)									
BUDGET				CASH FLOW					
AMOUNT	START	END		FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING	\$0			2023	\$0	\$0	\$0	\$1,500,050	\$1,500,050
DESIGN	\$0								
ENVIRONMENTAL	\$0								
ROW ACQUISITION	\$0			2024	\$2,625,088	\$2,625,088	\$2,625,088	\$2,625,086	\$10,500,350
MATERIAL	\$0								
CONSTRUCTION	\$23,373,000								
SPECIAL RAIL EQUIP	\$0			2025	\$2,250,075	\$2,250,075	\$2,250,075	\$2,250,075	\$9,000,300
FLAGGING	\$0								
BUS BRIDGES	\$0								
CLOSE OUT	\$0			2026	\$2,250,075	\$2,250,075	\$2,250,075	\$2,250,075	\$9,000,300
DBE/LABOR	\$0								
PROJECT MANAGEMENT									
* SCRRA STAFF	\$1,000,000			2027	\$0	\$0	\$0	\$0	\$0
* PROCUREMENT STAFF	\$150,000								
* CONSULTANT	\$3,000,000								
CONTINGENCY	\$2,478,000			2028	\$0	\$0	\$0	\$0	\$0
TOTAL	\$30,001,000								
Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%									



# PROJECT PROPOSAL

**FY23**

HOLMANS PROJECT# 2556.00

## PROJECT : FACILITIES REHABILITATION

SCOPE				TYPE: REHAB   MRP					
Facilities rehabilitation addresses components and subcomponents that support the maintenance of rolling stock and offices for staff duties. Specific work to include: - Phase 2: MOW health and welfare facilities installation, rehab and utility connections. Designs and replace rented crew trailer including furniture, equipment and repositioning to meet CPUC mandated clearances as well as connect to utilities. - Automate and install predictive failure notifications to some of the facilities equipment to detect and repair failures before they become impact to rail operation. Include some title 24 upgrades. - Add and update ground power at yards and Laguna Niguel siding. - Rehab ground air in the yards. - Fall protection/roof platform rehab CMF. - Phase 1: Replacement of 30 year old south electrical switchgear at CMF. - Install permanent power at Lang Yard. - Systemwide facilities and yard paving, striping, fencing, access carts, signage, paint rehab.									
Mile Posts: NA				Division: All    County: ALL    Asset Type: Facilities					
OBJECTIVES				RISKS CAUSING PROJECT DELAY					
1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair 2. (Goal 4: Retain and Grow Ridership) Improve service reliability 3. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost 4. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents									
JUSTIFICATION				RANKING // PROJECT READINESS					
Facilities rehabilitation identified by the Metrolink Rehabilitation Plan (MRP) includes components and subcomponents in use at maintenance facilities, layover facilities, and the Pomona campus. The need has been identified because the assets have fallen below a State of Good Repair and are in need of rehabilitation based on limits set by SCRRA staff, industry standards and regulations.				1. Condition of Asset..... Worn 2. System Impact..... High					
RISK CREATED BY NON-IMPLEMENTATION									
If the program is not implemented in full, the remaining work that is beyond the rehabilitation limits will be added to the backlog in future years. Ages of particular assets and components vary within each facility, with a range of conditions that include marginal and poor ratings. Current Age: 32 Year(s)      Standard Lifespan: 30 Year(s)									
BUDGET				CASH FLOW					
	AMOUNT	START	END	FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING	\$0			2023	\$0	\$0	\$0	\$260,000	\$260,000
DESIGN	\$0								
ENVIRONMENTAL	\$0			2024	\$455,000	\$455,000	\$455,000	\$455,000	\$1,820,000
ROW ACQUISITION	\$0								
MATERIAL	\$0			2025	\$390,000	\$390,000	\$390,000	\$390,000	\$1,560,000
CONSTRUCTION	\$4,200,000								
SPECIAL RAIL EQUIP	\$0			2026	\$390,000	\$390,000	\$390,000	\$390,000	\$1,560,000
FLAGGING	\$0								
BUS BRIDGES	\$0			2027	\$0	\$0	\$0	\$0	\$0
CLOSE OUT	\$0								
DBE/LABOR	\$0			2028	\$0	\$0	\$0	\$0	\$0
PROJECT MANAGEMENT									
* SCRRA STAFF	\$525,000								
* PROCUREMENT STAFF	\$475,000								
* CONSULTANT	\$0								
CONTINGENCY	\$0			Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%					
TOTAL	\$5,200,000								



# PROJECT PROPOSAL

**FY23**

HOLMANS PROJECT# 2557.00

## PROJECT : MAINTENANCE-OF-WAY (MOW) VEHICLES & EQUIPMENT - REPLACEMENT & OVERHAUL

SCOPE				TYPE: REHAB   MRP					
<p>MOW vehicles and equipment major overhaul and replacement via new acquisition or lease-to-purchase addresses the fleet of specialized &amp; operations vehicles, equipment and tools that support the timely repair and rehabilitation of the overall rail corridor right-of-way. Replacement of MOW equipment and vehicles; Rehabilitation of MOW equipment. Project budget to cover cost of zero emission light and potentially medium duty vehicles (subject to manufacture production schedules).</p> <p>Heavy - 2 Medium - 4 Light Duty - 25 Equipment - 4</p> <p>Mile Posts: NA</p> <p>Division: All    County: ALL    Asset Type: Non-Revenue Fleet</p>									
OBJECTIVES				RISKS CAUSING PROJECT DELAY					
<p>1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair</p> <p>2. (Goal 4: Retain and Grow Ridership) Improve service reliability</p> <p>3. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost</p> <p>4. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents</p>									
JUSTIFICATION				RANKING // PROJECT READINESS					
<p>MOW vehicle and equipment replacement and overhaul identified by the Metrolink Rehabilitation Plan (MRP) includes specialized vehicles and equipment. The need has been identified because the assets have fallen below a State of Good Repair and are in need of rehabilitation based on limits set by SCRRRA staff and industry standards.</p>				<p>1. Condition of Asset..... Worn</p> <p>2. System Impact..... High</p>					
RISK CREATED BY NON-IMPLEMENTATION									
<p>If the program is not implemented in full, the remaining work that is beyond the rehabilitation limits will be added to the backlog in future years</p> <p>Current Age: 22 Year(s)    Standard Lifespan: 30 Year(s)</p>									
BUDGET				CASH FLOW					
	AMOUNT	START	END	FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING	\$0			2023	\$0	\$0	\$0	\$175,500	\$175,500
DESIGN	\$0			2024	\$307,125	\$307,125	\$307,125	\$307,125	\$1,228,500
ENVIRONMENTAL	\$0			2025	\$263,250	\$263,250	\$263,250	\$263,250	\$1,053,000
ROW ACQUISITION	\$0			2026	\$263,250	\$263,250	\$263,250	\$263,250	\$1,053,000
MATERIAL	\$0			2027	\$0	\$0	\$0	\$0	\$0
CONSTRUCTION	\$3,000,000			2028	\$0	\$0	\$0	\$0	\$0
SPECIAL RAIL EQUIP	\$0								
FLAGGING	\$0								
BUS BRIDGES	\$0								
CLOSE OUT	\$0								
DBE/LABOR	\$0								
PROJECT MANAGEMENT									
* SCRRRA STAFF	\$175,000								
* PROCUREMENT STAFF	\$167,000								
* CONSULTANT	\$0								
CONTINGENCY	\$168,000								
TOTAL	\$3,510,000								
				Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%					



# PROJECT PROPOSAL

**FY23**

HOLMANS PROJECT# 2558.00

**PROJECT : SYSTEMWIDE TRAIN CONTROL SYSTEMS REHABILITATION**

SCOPE				TYPE: REHAB   MRP					
<p>Systemwide Train Control Systems Rehabilitation addresses PTC, Centralized Train Control systems and equipment to sufficiently rehabilitate aging infrastructure and growing backlog. See the justification section for discussion on aged assets and standard life.</p> <p>Train Control Back Office:</p> <ol style="list-style-type: none"><li>1) DOC/MOC Backup Systems</li><li>2) Workstations/Laptops</li><li>3) CAD/BOS/MDM/IC3</li><li>4) Routers/Switches</li><li>5) On-Board Train Control Systems</li><li>6) Software/Hardware for Locomotives &amp; Cab Cars</li></ol> <p>Mile Posts: NA</p> <p>Division: All    County: ALL    Asset Type: Train Control</p>									
<b>OBJECTIVES</b>				<b>RISKS CAUSING PROJECT DELAY</b>					
<p>1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair</p> <p>2. (Goal 4: Retain and Grow Ridership) Improve service reliability</p> <p>3. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost</p> <p>4. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents</p>									
<b>JUSTIFICATION</b>				<b>RANKING // PROJECT READINESS</b>					
<p>Train Control Systems rehabilitation identified by the Metrolink Rehabilitation Plan (MRP) includes PTC and Centralized train control systems and equipment. The need has been identified because the assets have fallen below a State of Good Repair and are in need of rehabilitation based on limits set by SCRRA staff and industry standards. Some of the PTC hardware is already 10 years old and some of the design was 5 years earlier than that. The office element consists mainly of computers (servers, field laptops, etc.) that date back to 2011, 2012. Mission critical computers are usually rehabbed every 5 years. Our onboard and wayside cellular systems that were implemented back in 2012 were state of the art 3G systems that will be unsupported and completely sun-setted by the Telco companies at the end of last year.</p>				<p>1. Condition of Asset..... Worn</p> <p>2. System Impact..... High</p>					
<b>RISK CREATED BY NON-IMPLEMENTATION</b>									
<p>If the program is not implemented in full, the remaining work that is beyond the rehabilitation limits will be added to the backlog in future years.</p> <p>Current Age: 13 Year(s)    Standard Lifespan: 5 Year(s)</p>									
<b>BUDGET</b>				<b>CASH FLOW</b>					
	AMOUNT	START	END	<b>FY</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>TOTAL</b>
CONTRACT PACKAGING	\$0			<b>2023</b>	\$0	\$0	\$0	\$250,000	\$250,000
DESIGN	\$0								
ENVIRONMENTAL	\$0			<b>2024</b>	\$437,500	\$437,500	\$437,500	\$437,500	\$1,750,000
ROW ACQUISITION	\$0								
MATERIAL	\$0			<b>2025</b>	\$375,000	\$375,000	\$375,000	\$375,000	\$1,500,000
CONSTRUCTION	\$4,000,000								
SPECIAL RAIL EQUIP	\$0			<b>2026</b>	\$375,000	\$375,000	\$375,000	\$375,000	\$1,500,000
FLAGGING	\$0								
BUS BRIDGES	\$0			<b>2027</b>	\$0	\$0	\$0	\$0	\$0
CLOSE OUT	\$0								
DBE/LABOR	\$0			<b>2028</b>	\$0	\$0	\$0	\$0	\$0
PROJECT MANAGEMENT									
* SCRRA STAFF	\$525,000								
* PROCUREMENT STAFF	\$475,000								
* CONSULTANT	\$0								
CONTINGENCY	\$0								
TOTAL	\$5,000,000								
				<p>Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%</p>					



# PROJECT PROPOSAL

**FY23**

HOLMANS PROJECT# 2559.00

## PROJECT : SYSTEMWIDE TRACK REHABILITATION

SCOPE				TYPE: REHAB   MRP					
Systemwide Track Rehabilitation addresses the following recurring requirements to sufficiently rehabilitate aging infrastructure and growing backlog: - Rail Grinding: ongoing systemwide program - Surfacing Program to restore track profiles and cross sections - Infrastructure planning and data collection for condition assessments									
Mile Posts: NA				Division: All    County: ALL    Asset Type: Track					
OBJECTIVES				RISKS CAUSING PROJECT DELAY					
1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair 2. (Goal 4: Retain and Grow Ridership) Improve service reliability 3. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost 4. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents									
JUSTIFICATION				RANKING // PROJECT READINESS					
Track rehabilitation is identified by the Metrolink Rehabilitation Plan (MRP) and aligns with the combined track & signals maintenance RFP scope and implementation. Rail Grinding and surfacing addresses "rolling contact fatigue" (RCF) resulting in rail life savings. This work also addresses noise concerns and positively impacts ride quality.				1. Condition of Asset..... Worn 2. System Impact..... High					
RISK CREATED BY NON-IMPLEMENTATION									
If the program is not implemented in full, the remaining work that is beyond the rehabilitation limits will be added to the backlog in future years. Per FRA CFR 213 standards would require slow orders with potential delays to passenger service.									
Current Age: 122 Year(s)      Standard Lifespan: 0 Year(s)									
BUDGET				CASH FLOW					
	AMOUNT	START	END	FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING	\$0			2023	\$0	\$0	\$0	\$250,000	\$250,000
DESIGN	\$0								
ENVIRONMENTAL	\$0			2024	\$437,500	\$437,500	\$437,500	\$437,500	\$1,750,000
ROW ACQUISITION	\$0								
MATERIAL	\$0			2025	\$375,000	\$375,000	\$375,000	\$375,000	\$1,500,000
CONSTRUCTION	\$4,000,000								
SPECIAL RAIL EQUIP	\$0			2026	\$375,000	\$375,000	\$375,000	\$375,000	\$1,500,000
FLAGGING	\$0								
BUS BRIDGES	\$0			2027	\$0	\$0	\$0	\$0	\$0
CLOSE OUT	\$0								
DBE/LABOR	\$0			2028	\$0	\$0	\$0	\$0	\$0
PROJECT MANAGEMENT									
* SCRRRA STAFF	\$525,000								
* PROCUREMENT STAFF	\$475,000								
* CONSULTANT	\$0								
CONTINGENCY	\$0			Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%					
TOTAL	\$5,000,000								



# PROJECT PROPOSAL

**FY23**

HOLMANS PROJECT# 2597.00

## PROJECT : ROLLING STOCK DAMAGE REPAIR

SCOPE			TYPE: REHAB   NON-MRP						
<p>Rolling Stock Damage Repair – Oxnard accident cars – see attached STV report.</p> <p>The cost estimate includes the following considerations and assumptions:</p> <ol style="list-style-type: none"> <li>1) The estimated costs to repair are based solely on visible damages during the inspection and engineering estimations made accounted for anticipated hidden damages.</li> <li>2) The estimated costs to repair is to restore the cars to an "as-new condition" for revenue service.</li> <li>3) The estimated costs to repair do not consider internal structural, air piping, cabling damages due to inaccessibility during the visual inspection, however, engineering assumptions were made to estimate likely hidden damages.</li> <li>4) The estimate costs to repair do not consider underfloor air piping and cabling damages due to inaccessibility during the visual inspection, however, engineering assumptions were made to estimate likely hidden damages.</li> <li>5) The estimated costs to repair does not include "non-recurring engineering cost" and production setup cost.</li> <li>6) Engineering costs are a rough order of magnitude and do not account for influences such as market forces.</li> <li>7) Market Adjustments: STV report says \$5M but it is almost 5 years old. Considering 7% of market price increase for 7 years, it is \$5.35M.</li> <li>8) Additional Adjustments: STV report does not include structural inspection and repair. Due to the heavy accident, it will require engineering analysis on the structural integrity to ensure its road-worthy – estimation is \$2M, including engineering consultant and actual repair. 10% for internal costs.</li> </ol> <p>Mile Posts: NA</p> <p>Division: All County: ALL Asset Type: Rolling Stock</p>									
OBJECTIVES			RISKS CAUSING PROJECT DELAY						
<ol style="list-style-type: none"> <li>1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair</li> <li>2. (Goal 4: Retain and Grow Ridership) Improve service reliability</li> <li>3. (Goal 4: Retain and Grow Ridership) Increase system utilization</li> </ol>									
JUSTIFICATION			RANKING // PROJECT READINESS						
<p>On February 24, 2015, Southern California Regional Rail Authority (SCRRA) commuter train #102 collided with an unoccupied 2005 Ford F450 utility truck towing a utility trailer in Oxnard, CA. The train consist in the direction of travel was as follows:</p> <ol style="list-style-type: none"> <li>1. Cab/coach car #645 – Hyundai-Rotem</li> <li>2. Coach car #206 – Bombardier</li> <li>3. Coach car #211 – Hyundai-Rotem</li> <li>4. Coach car #263 – Hyundai-Rotem</li> <li>5. Locomotive #870 – Electro-Motive Division of General Motors Corporation</li> </ol>			<ol style="list-style-type: none"> <li>1. Condition of Asset..... Worn</li> <li>2. System Impact..... High</li> </ol>						
RISK CREATED BY NON-IMPLEMENTATION									
<p>If the program is not implemented in full, the assets will continue to remain unused, not in revenue service, posing challenges to meeting daily service as well as risking future audit findings in the area of Oversight of Grant Funded Assets, Satisfactory Continuing Control.</p>									
Current Age: 20 Year(s) Standard Lifespan: 30 Year(s)			Additional support document was submitted						
BUDGET			CASH FLOW						
	AMOUNT	START	END	FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING	\$0			2023	\$0	\$0	\$0	\$400,000	\$400,000
DESIGN	\$0			2024	\$700,000	\$700,000	\$700,000	\$700,000	\$2,800,000
ENVIRONMENTAL	\$0			2025	\$600,000	\$600,000	\$600,000	\$600,000	\$2,400,000
ROW ACQUISITION	\$0			2026	\$600,000	\$600,000	\$600,000	\$600,000	\$2,400,000
MATERIAL	\$0			2027	\$0	\$0	\$0	\$0	\$0
CONSTRUCTION	\$6,400,000			2028	\$0	\$0	\$0	\$0	\$0
SPECIAL RAIL EQUIP	\$0								
FLAGGING	\$0								
BUS BRIDGES	\$0								
CLOSE OUT	\$0								
DBE/LABOR	\$0								
PROJECT MANAGEMENT									
* SCRRA STAFF	\$700,000								
* PROCUREMENT STAFF	\$519,000								
* CONSULTANT	\$0								
CONTINGENCY	\$381,000								
TOTAL	\$8,000,000								

Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%



# METROLINK®

CONTRACT 738-11

ROLLING STOCK ENGINEERING SUPPORT

CONTRACT TASK ORDER: 028

OXNARD WRECK REPAIR COST ESTIMATE

## OXNARD WRECK REPAIR COST ESTIMATE

Prepared by





**Revision History**

<b>Rev</b>	<b>Issue Date</b>	<b>Author</b>	<b>Change Details</b>	<b>Approved</b>	<b>Approved Date</b>
--	3/7/16	H. Lim	Revision -- created.	M. Cook	3/7/16

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## 1.0 Scope of Work

The scope of work includes the following tasks:

1. Visual inspection of cars #645, #206, #211, and #263 located at the Moorpark Yard.
2. Provide a preliminary cost estimate for the review by SCRRA.
3. Provide an itemized estimate for repair of each car based on the visual inspection. The cost estimate report shall include narrative of the damage, photographs and details of any estimated visual damage.

## 2.0 Background

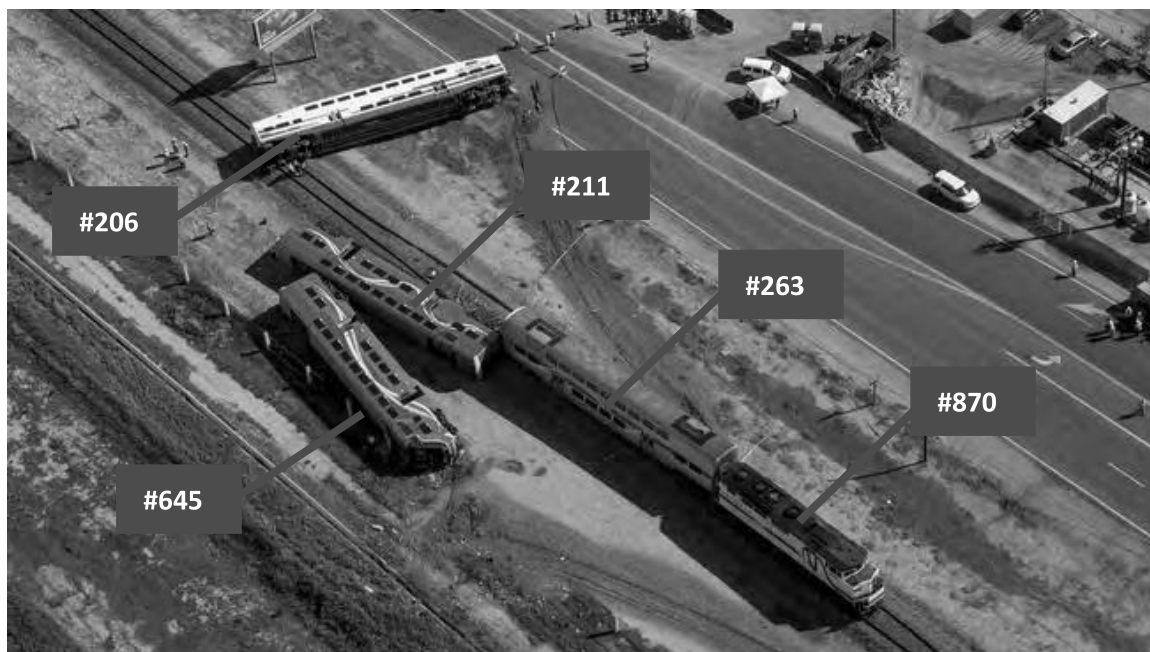
On February 24<sup>th</sup>, 2015, Southern California Regional Rail Authority (SCRRA) commuter train #102 collided with an unoccupied 2005 Ford F450 utility truck towing a utility trailer in Oxnard, CA. The train consist in the direction of travel was as follows:

1. Cab/coach car #645 – Hyundai-Rotem
2. Coach car #206 – Bombardier
3. Coach car #211 – Hyundai-Rotem
4. Coach car #263 – Hyundai-Rotem
5. Locomotive #870 – Electro-Motive Division of General Motors Corporation

The photograph below shows the train consist after the accident.

The truck and trailer were lodged on the rail and parallel to the track during the accident. The cab car collided with the truck first then the utility trailer. The Hyundai-Rotem Cab Car (#645) derailed and rolled onto its right side and struck a brick wall adjacent to the railroad. The Bombardier trailer car (#206) derailed and rolled onto its left side and skidded on the railroad. The Hyundai-Rotem trailer car (#211) derailed and rolled onto its left side and the #645 cab car struck the HVAC unit on the roof. Hyundai-Rotem trailer car #263 derailed but stayed upright.

The incident is being investigated by National Transportation Safety Board (NTSB), and the cause of the accident has not yet been reported.



<Courtesy of latimes.com>

**Figure 2.1 - Aerial View of After Collision**

### 3.0 Estimate

The cost estimate includes the following considerations and assumptions:

1. The estimated costs to repair are based solely on visible damages during the inspection and engineering estimations made accounted for anticipated hidden damages.
2. The estimated costs to repair is to restore the cars to an “as-new condition” for revenue service.
3. The estimated costs to repair do not consider internal structural, air piping, cabling damages due to inaccessibility during the visual inspection, however, engineering assumptions were made to estimate likely hidden damages.
4. The estimate costs to repair do not consider underfloor air piping and cabling damages due to inaccessibility during the visual inspection, however, engineering assumptions were made to estimate likely hidden damages.
5. The estimated costs to repair does not include “non-recurring engineering cost” and production setup cost.
6. Engineering costs are a rough order of magnitude and do not account for influences such as market forces.

The following table shows the total estimated cost for each cars:

Car Number	Labor Hrs	Labor Cost	Material	MAT' TRANSP. (7% Material & Carbody \$100,000)	OVERHEAD (15% Labor & Material)	Cost
#645	7900.5	\$823,342.50	\$640,000.18	\$144,800.01	\$219,501.40	\$1,827,644.10
#206	6951.6	\$742,681.75	\$295,825.50	\$120,707.79	\$155,776.09	\$1,314,991.12
#211	7895.6	\$822,926.00	\$579,283.25	\$140,549.83	\$210,331.39	\$1,753,090.47
#263	185.9	\$19,922.25	\$9,329.13	\$653.04	\$4,387.71	\$34,292.12
<b>TOTAL</b>	<b>22933.5</b>	<b>\$2,408,872.50</b>	<b>\$1,524,438.06</b>	<b>\$406,710.66</b>	<b>\$589,996.58</b>	<b>\$4,930,017.81</b>

\* Labor Hrs includes repair management oversight hours

\* Labor Cost includes repair management oversight labor cost

**Table 3.0.1 – Total Damage Repair Cost Estimate**

## 4.0 Detailed Estimate

### 4.1 #645 ROTEM CAB CAR

#### 4.1.1 #645 ROTEM CAB CAR (F-END)

F-END								
Item	Part	Qty.	Drawing No.	Repair	Replace	Hrs.	Material	Total
1	F-END Fiberglass mid/lower nose piece	1	FCP04301		X	150	\$25,623	<b>\$38,373</b>
2	F-END stainless steel upper nose piece	1	SAP00921 FCP04302 FCP04305		X	75	\$18,113	<b>\$24,488</b>
	F-END Handholds		FCP04382					
3	F-END RH side handholds	2	FCP04436 (N/A)		X	14	\$604	<b>\$1,777</b>
4	F-END front handholds	2	FCP04383		X	14	\$604	<b>\$1,777</b>
	Floor structure assembly		SUP03082					
5	Underframe	1	SUP03082 Detail "C"		X	200	\$5,250	<b>\$22,250</b>
6	F-END CEM structure	1	SCP00850 SCP00871		X	60	\$1,208	<b>\$6,308</b>
	Underfloor equip.		MUP01986					
7	Stainless Sill Step F-END RH	1	FOP01887		X	6	\$302	<b>\$790.63</b>
8	Stainless Sill Step F-END LH	1	FOP01887		X	6	\$302	<b>\$791</b>
9	Stainless sill step bracket	2	SAP00976	X		23		<b>\$1,955</b>
10	Uncoupling lever bracket	1	FOP01887 Detail "B"	X		14		<b>\$1,173</b>
11	Uncoupling coupler	1	COP00857		X	17	\$1,208	<b>\$2,674</b>
12	TLJB Box RH	1	MUP01986 Section B-B		X	12	\$1,147	<b>\$2,125</b>
13	TLJB Box LH	1	MUP01986 Section B-B		X	12	\$1,147	<b>\$2,125</b>
14	TLJB Box bracket	6	MLP04087		X	35	\$483	<b>\$3,416</b>
15	27 Conductor Recep	2	EJP00545		X	12	\$1,389	<b>\$2,366</b>
16	27 Conduc Rece Assy	2	EJP00548		X	12	\$1,389	<b>\$2,366</b>
17	480 HEP REC	2	EJP00542		X	12	\$1,389	<b>\$2,366</b>

18	480 HEP Cable	2	EJP00550		X	12	\$1,389	<b>\$2,366</b>
19	Snow plow assembly	1	MUP01905		X	29	\$4,685	<b>\$7,129</b>
20	Coupler carrier	1	COP01287	X		29		<b>\$2,444</b>
21	Coupler assembly	1	COP01304	X		29		<b>\$2,444</b>
22	ATS coil installation	1	TRP07989		X	21	\$9,056	<b>\$10,816</b>
23	Electric Bell	1	ESP01314		X	6	\$3,685	<b>\$4,174</b>

\* Rate per hour is \$85 unless otherwise noted

**Total F-END Repair Estimate = \$146,490**

**Table 4.1.1. 1 - #645 ROTEM CAB CAR F-END**



**Figure 4.1.1. 1 - #645 ROTEM CAB F-END (Right Side View)**



Figure 4.1.1.1. 2 - #645 ROTEM CAB CAR F-END (Lower Cab view)





Figure 4.1.1.1.3 - #645 ROTEM CAB CAR F-END (Underfloor Equipment View)

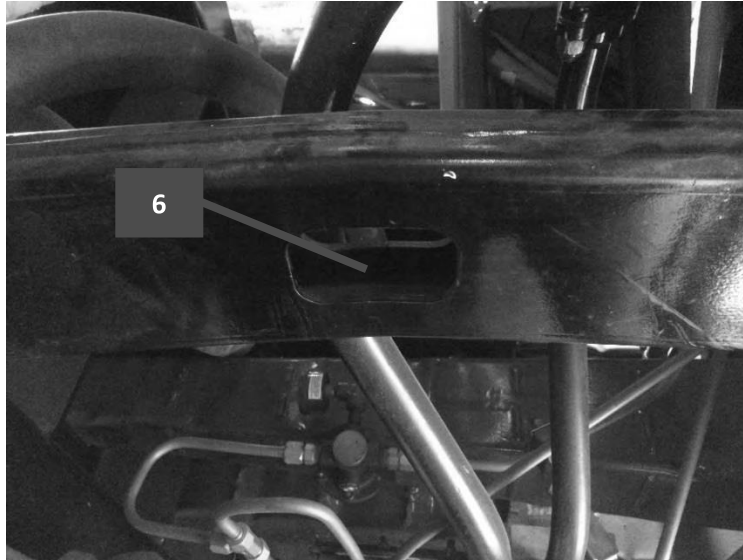


Figure 4.1.1. 4 - #645 ROTEM CAB CAR F-END (Crash Energy Management)

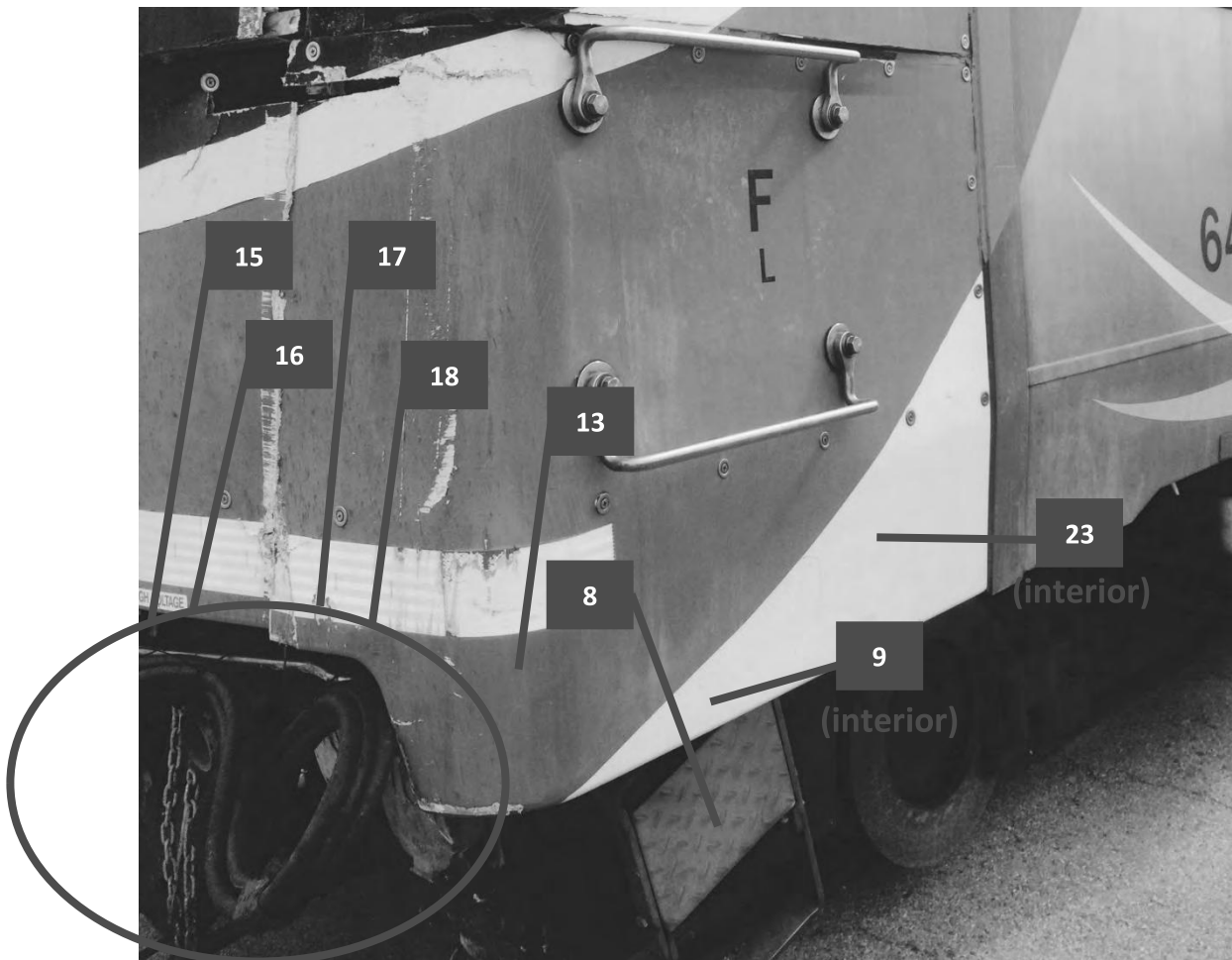


Figure 4.1.1. 5 - #645 ROTEM CAB CAR F-END (Left Side View)

## 4.1.2 #645 ROTEM CAB CAR (B-END)

B-END								
Item	Part	Qty.	Drawing No.	Repair	Replace	Hrs	Material	Total
	Underfloor equipment		MUP01986					
1	Stainless Sill Step B-END RH	1	FOP01887 FOP01926		X	6	\$302	<b>\$791</b>
2	Stainless Sill Step B-END LH	1	FOP01886		X	6	\$302	<b>\$791</b>
3	Stainless sill step bracket	2		X		17		<b>\$1,466</b>
4	Uncoupling lever bracket	1	FOP01887 Detail "C"	X		17		<b>\$1,466</b>
5	Uncoupling coupler	1	COP00857		X	17	\$1,208	<b>\$2,674</b>
6	TLJB Box RH	1	MUP01986 Section G-G		X	8	\$1,147	<b>\$1,831</b>
7	TLJB Box LH	1	MUP01986 Section G-G		X	8	\$1,147	<b>\$1,831</b>
8	TLJB Box brackets	6	MLP04087		X	29	\$483	<b>\$2,927</b>
9	27 Conductor Recep	2	EJP00545		X	8	\$1,389	<b>\$2,073</b>
10	27 Conduc Rece Assy	2	EJP00548		X	8	\$1,389	<b>\$2,073</b>
11	480 HEP REC	2	EJP00542		X	8	\$1,389	<b>\$2,073</b>
12	480 HEP Cable	2	EJP00550		X	8	\$1,389	<b>\$2,073</b>
13	Coupler carrier	1	COP01287	X		29		<b>\$2,444</b>
14	Horizontal handhold	1	FOP01903		X	14	\$483	<b>\$1,656</b>
15	Underframe	1	SUP03288	X		50		<b>\$4,250</b>
16	Diaphragms and buffer	1	FOP01890	X		40		<b>\$3,421</b>

\* Rate per hour is \$85 unless otherwise noted

**Total B-END Repair Estimate = \$33,840****Table 4.1.2. 1 - #645 ROTEM CAB CAR B-END**



Figure 4.1.2. 1 - #645 ROTEM CAB CAR B-END (Left Side)



Figure 4.1.2. 2- #645 ROTEM CAB CAR B-END (Right Side)

## 4.1.3 #645 ROTEM CAB CAR (RH SIDE)

RH SIDE								
Item	Part	Qty.	Drawing No.	Repair	Replace	Hrs	Material	Total
1	Side Panel (+manufacturing)	1	SSP02081		X	1000	\$6,038	<b>\$91,038</b>
2	Side structure assy	1	SSP02079		X	800	\$5,250	<b>\$73,250</b>
3	Exterior handholds	3	FOP01900		X	17	\$1,449	<b>\$2,915</b>
4	Air grille	1	FHP04443		X	17	\$906	<b>\$2,372</b>
5	Side door step	2	FOP01888		X	29	\$2,415	<b>\$4,859</b>
	Door arrangement		FDP02134					
6	Side door arrangement	2	FDP02131		X	173	\$214,935	<b>\$229,598</b>
	Window Arrangement		FWP00882					
7	Emerg. Window	7	FWP00885		X	40	\$13,186	<b>\$16,607</b>
8	Destination window	1	FWP00895		X	6	\$1,575	<b>\$2,063</b>
9	Side small emerg. window	1	FWP00900		X	6	\$1,473	<b>\$1,962</b>
10	Standard large window	8	FWP00910		X	46	\$13,856	<b>\$17,766</b>
11	RH Cab window	1	FWP00924		X	6	\$2,850	<b>\$3,338</b>
12	RH Cab window mask	1	FCP04312		X	14	\$1,208	<b>\$2,381</b>
13	LH Cab window	1	FWP00925		X	6	\$181	<b>\$670</b>

\* Rate per hour is \$85 unless otherwise noted

**Total RH Side Repair Estimate = \$448,818****Table 4.1.3. 1 - #645 ROTEM CAB CAR RH Side**





Figure 4.1.3. 1 - #645 ROTEM CAB CAR RH Side



Figure 4.1.3. 2 - #645 ROTEM CAB CAR RH Side





Figure 4.1.3. 3 - #645 ROTEM CAB CAR RH Side



Figure 4.1.3. 4 - #645 ROTEM CAB CAR RH Side



Figure 4.1.3. 5 - #645 ROTEM CAB CAR RH Side



Figure 4.1.1.3. 6 - #645 ROTEM CAB CAR LH Side Window

## 4.1.4 #645 ROTEM CAB CAR (ADDITIONAL ASSUMPTIONS)

ADDITIONAL ASSUMPTIONS								
Item	Part	Qty.	Drawing No.	Repair	Replace	Hrs	Material	Total
1	Roof structure	20%	SRP01212	X	X	300	\$3,150	<b>\$28,650</b>
2	Roof panel	20%	SRP01391	X	X	345	\$3,150	<b>\$32,475</b>
3	HVAC assembly	1	FHP03213		X	69	\$68,224	<b>\$74,089</b>
4	F-END Truck arrangement	1	TRP08011		X	58	\$77,280	<b>\$82,168</b>
5	B-END Truck arrangement	1	TRP08012		X	58	\$77,280	<b>\$82,168</b>
6	Interior arrangement	75%	FPP09825 FPP10010 FHP03225 FPP09894 FPP09892 FPP09902		X	1500	\$26,250	<b>\$153,750</b>
7	Underfloor air piping	50%	MPP01803		X	350	200 ft \$11.50/ft	<b>\$32,050</b>
8	Underfloor cabling	50%	MDP02464		X	575	500 ft \$25.00/ft	<b>\$61,375</b>
9	Exterior color graphic/signage	75%	FMP02305 FMP01452		X	500	\$13,000	<b>\$57,471</b>
10	Tooling	100%				345	\$250/hr	<b>\$86,250</b>
11	Dimensional Check Test	100%				230	\$250/hr	<b>\$57,500</b>
12	Repair Management Oversight	100%				345	\$250/hr	<b>\$86,250</b>

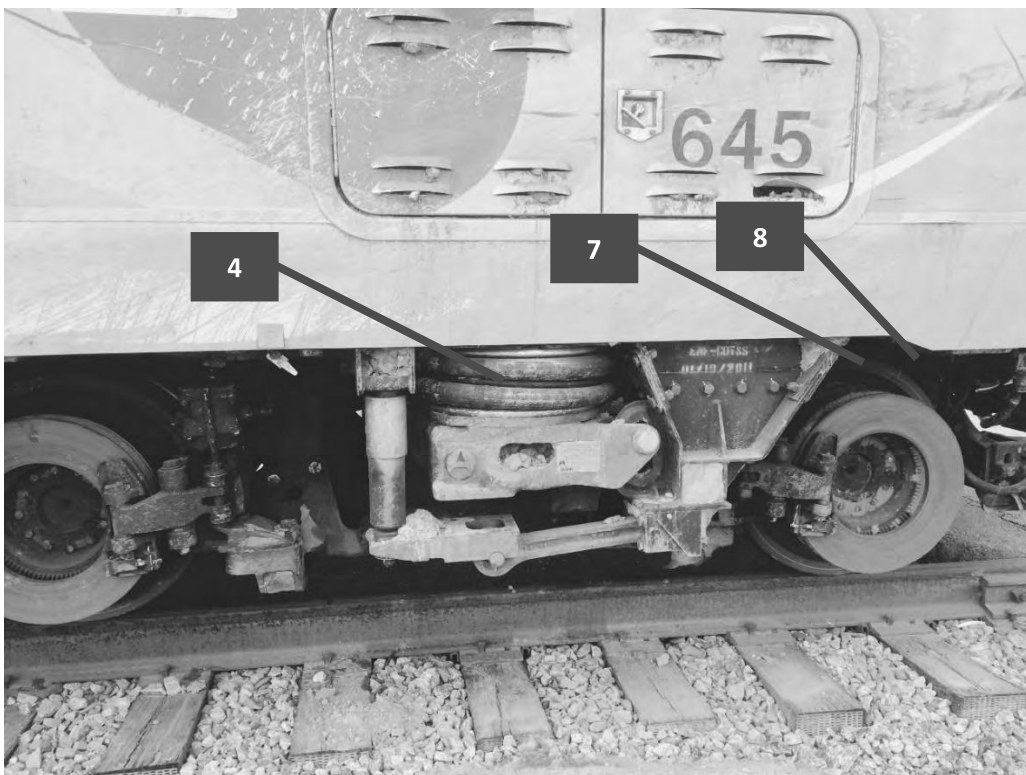
\* Rate per hour is \$85 unless otherwise noted      **Total Additional Assumption Repair Estimate = \$834,195**

**Table 4.1.4. 1 - #645 ROTEM CAB CAR Additional Assumptions**



<Courtesy of nbclosangeles.com>

**Figure 4.1.4. 1 - #645 ROTEM CAB CAR**



**Figure 4.1.4. 2 - #645 ROTEM CAB CAR**

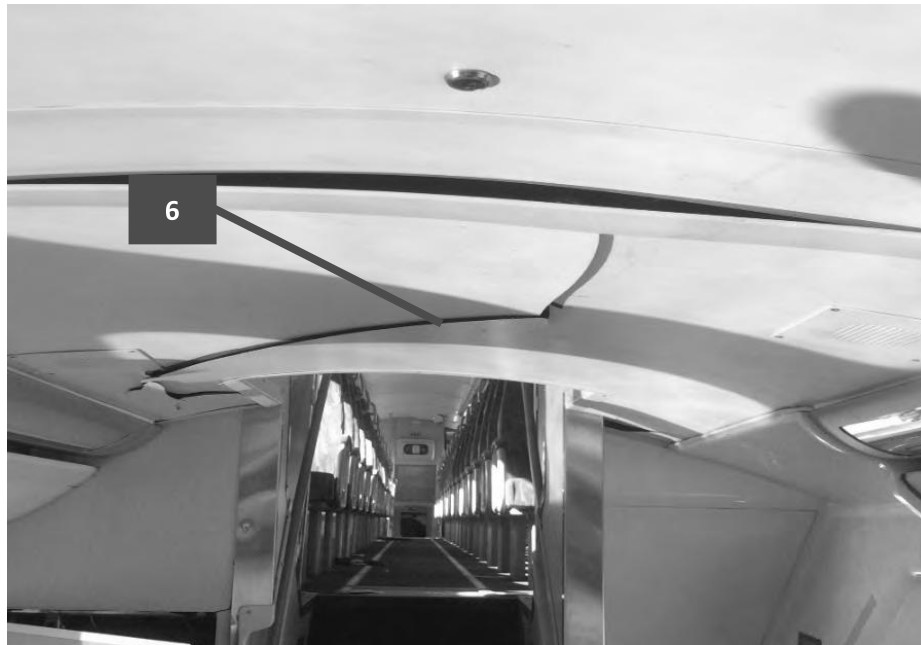


Figure 4.1.4. 3 - #645 ROTEM CAB CAR



Figure 4.1.4. 4 - #645 ROTEM CAB CAR Interior





**Figure 4.1.4. 5 - #645 ROTEM CAB CAR Interior**



**Figure 4.1.4. 6 - #645 ROTEM CAB CAR**



## 4.1.5 #645 ROTEM CAB CAR (SUMMARY ESTIMATE)

SUMMARY ESTIMATE					
Item	Sections	Labor Hrs.	Labor	Material	Cost
1	F-END	794	\$67,520	\$78,970	\$146,490
2	B-END	273	\$23,214	\$10,626	\$33,840
3	RH SIDE	2159	\$183,498	\$265,320	\$448,818
4	ADDITIONAL ASSUMPTIONS	4674	\$549,111	\$285,083.75	\$834,195
		<b>7900.5</b>	<b>\$823,342.50</b>	<b>\$640,000.18</b>	<b>\$1,463,342.68</b>
5	MAT' TRANSPORTATION	7% of MAT' & CARBODY (\$100,000)			\$144,800.01
6	OVERHEAD (15%)	15% of TOTAL COST			\$219,501.40
	<b>TOTAL</b>	<b>7900.5</b>	<b>\$823,342.50</b>	<b>\$640,000.18</b>	<b>\$1,827,644.10</b>

\* Labor Hrs. includes repair management oversight hours

\* Labor Cost includes repair management oversight labor cost

**Table 4.1.5. 1 - #645 ROTEM CAB CAR Summary Estimate**

## 4.2 #206 BOMBARDIER TRAILER

## 4.2.1 #206 BOMBARDIER TRAILER (A-END)

A-END								
Item	Part	Qty.	Drawing No.	Repair	Replace	Hrs.	Material	Total
1	Side sill step	2	BL-891-0124-2		X	6	\$575	<b>\$1,064</b>
2	Uncoupling lever brkt	1	BL-891-0124-2	X		35		<b>\$2,933</b>
3	Uncoupling lever rod	1	BL-891-0124-2		X	17	\$1,150	<b>\$2,616</b>
4	Trainline junction box	2	BL-471-0075-1		X	35	\$2,185	<b>\$5,118</b>
5	Pull box assembly	2	BL-471-0075-1		X	35	\$2,185	<b>\$5,118</b>
6	Receptacle Inst.	2	BL-444-0045-1		X	69	\$5,290	<b>\$11,155</b>
7	Coupler assembly	1	BL-461-0006-1	X		40		<b>\$3,421</b>
8	Horizontal handhold	2	BL-891-0124-2		X	6	\$575	<b>\$1,064</b>
9	Underframe	1	BL-299-0018-2		X	115	\$6,038	<b>\$15,813</b>
10	A-END panel	1	BL-322-0022-1		X	115	\$24,403	<b>\$34,178</b>
11	A-END structure	1	BL-321-0020-1	X		115		<b>\$9,775</b>
12	Diaphragm assembly	1	BL-843-0008-1		X	58	\$5,750	<b>\$10,638</b>

\* Rate per hour is \$85 unless otherwise noted

**Total A-END Repair Estimate = \$102,891**

**Table 4.2.1. 1 - #206 BOMB TRAILER CAR A-END**



**Figure 4.2.1. 1 - #206 BOMB TRAILER CAR A-END (Right Side View)**



Figure 4.2.1. 2 - #206 BOMB TRAILER CAR A-END (Right Side View)



Figure 4.2.1. 3 - #206 BOMB TRAILER CAR A-END



**Figure 4.2.1. 4 - #206 BOMB TRAILER CAR A-END**



**Figure 4.2.1. 5 - #206 BOMB TRAILER CAR A-END (Left side view)**

## 4.2.2 #206 BOMBARDIER TRAILER (B-END)

B-END								
Item	Part	Qty.	Drawing No.	Repair	Replace	Hrs.	Material	Total
1	Side sill step	2	BL-891-0124-2		X	12	\$575	<b>\$1,553</b>
2	Uncoupling lever brkt	1	BL-891-0124-2	X		35		<b>\$2,933</b>
3	Uncoupling lever rod	1	BL-891-0124-2		X	17	\$1,150	<b>\$2,616</b>
4	Receptacle Inst.	2	BL-444-0280-1 BL-444-0045-1		X	69	\$5,290	<b>\$11,155</b>
5	Coupler assembly	1	BL-461-0006-1	X		40		<b>\$3,421</b>
6	Horizontal handhold	2	BL-891-0124-2		X	6	\$575	<b>\$1,064</b>
7	Underframe	1	BL-299-0018-2	X		58		<b>\$4,888</b>
8	B-END panel	1	BL-322-0022-1	X		58		<b>\$4,888</b>
9	B-END structure	1	BL-321-0020-1	X		75		<b>\$6,354</b>
10	Battery box RH	1	BL-445-0077-1		X	29	\$3,738	<b>\$6,181</b>
11	Battery box LH	1	BL-445-0078-1		X	29	\$3,738	<b>\$6,181</b>

\* Rate per hour is \$85 unless otherwise noted

**Total B-END Repair Estimate = \$51,233**

**Table 4.2.2. 1 - #206 BOMB TRAILER CAR B-END**



**Figure 4.2.2. 1 - #206 BOMB TRAILER CAR B-END (Right side view)**





**Figure 4.2.2. 2 - #206 BOMB TRAILER CAR B-END (Left side view)**





Figure 4.2.2. 3 - #206 BOMB TRAILER CAR B-END

## 4.2.3 #206 BOMBARDIER TRAILER (LH SIDE)

LH SIDE								
Item	Part	Qty.	Drawing No.	Repair	Replace	Hrs.	Material	Total
1	Horizontal handhold	2	BL-891-0124-1		X	9	\$575	<b>\$1,357</b>
2	Vertical handhold	1	BL-891-0124-1		X	5	\$288	<b>\$679</b>
3	Side panel	1	BL-319-0022-1		X	1000	\$4,025	<b>\$89,025</b>
4	Side structure assy	1	BL-311-0066-1	X	X	500	\$5,750	<b>\$48,250</b>
	Window arrangement		BL-832-0025-1					
5	Emergency window	8	BL-832-0025-1		X	46	\$14,352	<b>\$18,262</b>
6	Side small window	4	BL-832-0025-1		X	23	\$5,612	<b>\$7,567</b>
7	Side large window	7	BL-832-0025-1		X	40	\$11,546	<b>\$14,967</b>
8	Side door trim B-END	1	BL-872-0180-1	X		29		<b>\$2,444</b>
9	Skirts installation A-END	1	BL-499-0005-1 BL-313-0020-1	X		15		<b>\$1,275</b>
10	Skirts installation B-END	1	BL-499-0050-1 BL-313-0021-1		X	25	\$5,175	<b>\$7,300</b>

\* Rate per hour is \$85 unless otherwise noted

**Total LH Side Repair Estimate = \$191,126****Table 4.2.3. 1 - #206 BOMB TRAILER CAR LH Side**

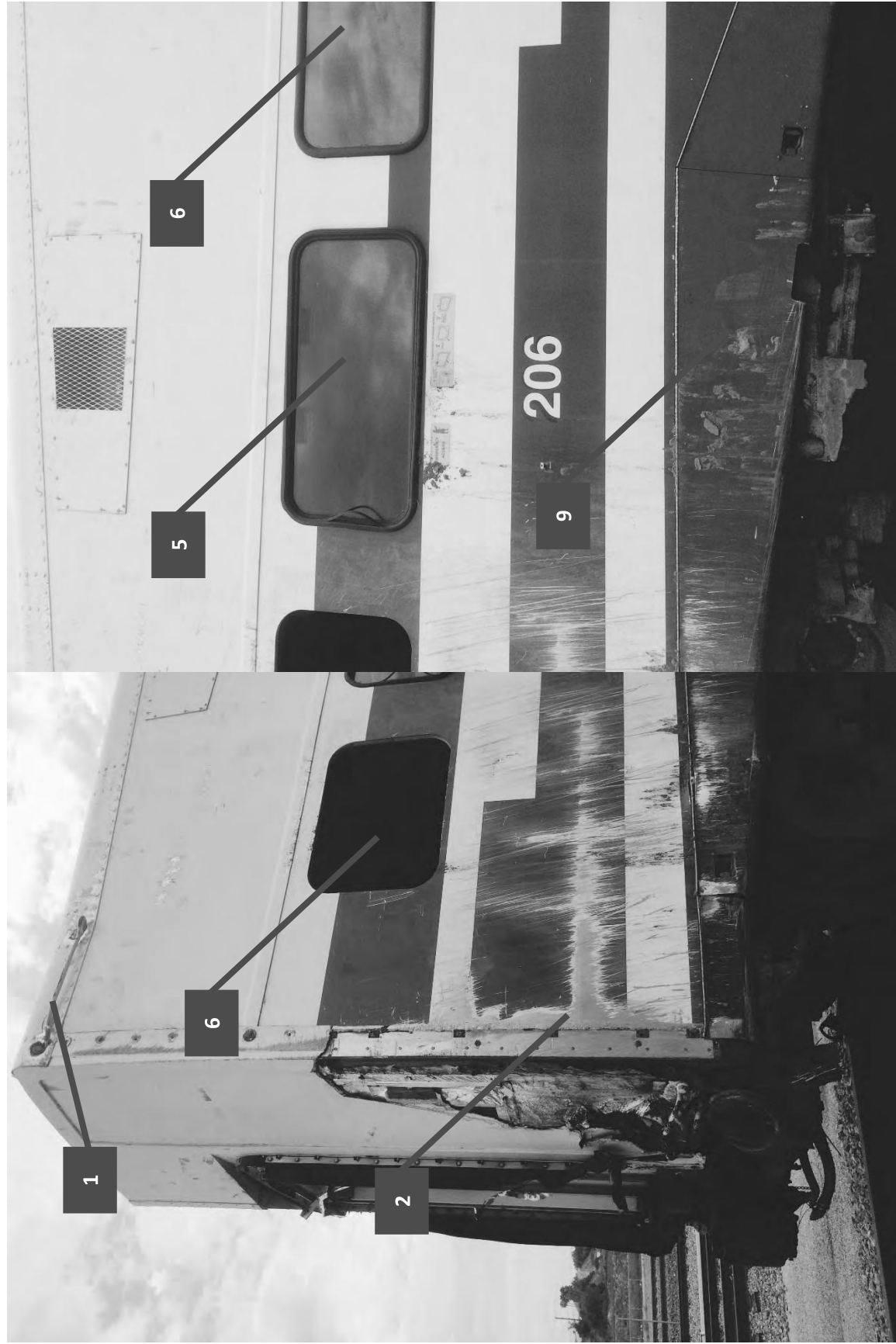


Figure 4.2.3. 1 - #206 BOMB TRAILER CAR LH Side

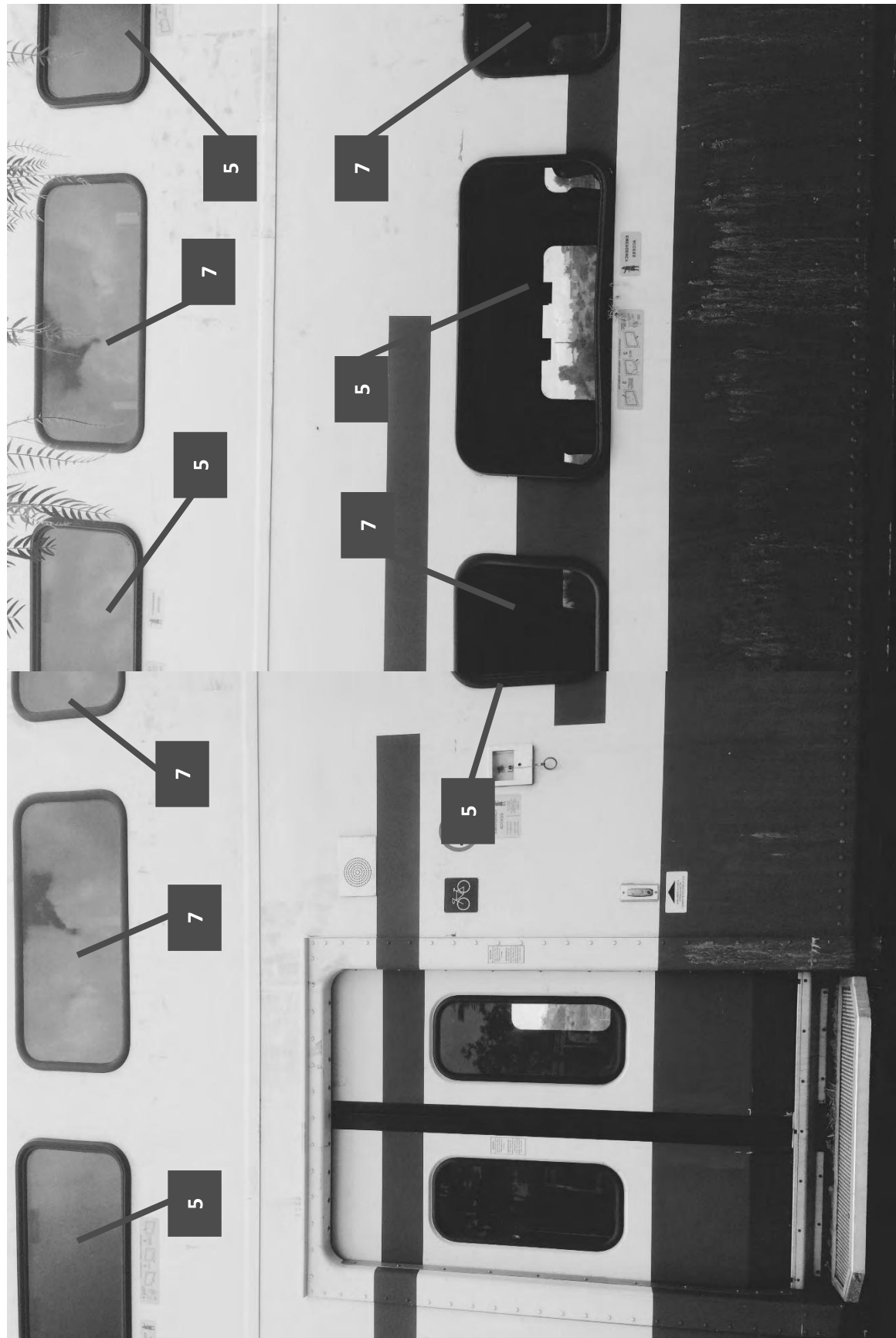


Figure 4.2.3. 2 - #206 BOMB TRAILER CAR LH Side



Figure 4.2.3. 3 - #206 BOMB TRAILER CAR LH Side



**Figure 4.2.3. 4 - #206 BOMB TRAILER CAR LH Side**

## 4.2.4 #206 BOMBARDIER TRAILER (ADDITIONAL ASSUMPTIONS)

ADDITIONAL ASSUMPTIONS								
Item	Part	Qty.	Drawing No.	Repair	Replace	Hrs.	Material	Total
1	Truck arrangement A-END	1	BL-129-0033-1		X	58	\$73,600	<b>\$78,488</b>
2	Truck arrangement B-END	1	BL-129-0033-1		X	58	\$73,600	<b>\$78,488</b>
3	Roof panel	10%	BL-331-0008-1	X		115		<b>\$9,775</b>
4	Roof structure	10%	BL-331-0008-1	X		115		<b>\$9,775</b>
5	Interior finish	75%	BL-699-0005-1 BL-899-0006-1		X	1500	\$6,900	<b>\$134,400</b>
6	Underfloor air piping	40%	BL-444-0264-1		X	350	200 ft \$11.50/ft	<b>\$33,488</b>
7	Underfloor cabling	40%	BL-429-0041-1		X	575	500 ft \$25.00/ft	<b>\$61,375</b>
8	Exterior color graphic/signage	75%	BL-699-0005-1		X	500	\$14,950	<b>\$57,471</b>
9	Tooling	100%				345	\$250/hr	<b>\$86,250</b>
10	Dimensional Check Test	100%				230	\$250/hr	<b>\$57,500</b>
11	Repair Management Oversight	100%				345	\$250/hr	<b>\$86,250</b>

\* Rate per hour is \$85 unless otherwise noted

**Total Additional Assumptions Repair Estimate = \$693,259**

**Table 4.2.4. 1 - #206 BOMB TRAILER CAR Additional Assumptions**



**Figure 4.2.4. 1 - #206 BOMB TRAILER CAR Truck Arrangement**





<Courtesy of nbcnews.com>

Figure 4.2.4. 2 - #206 BOMB TRAILER CAR Roof View



<Courtesy of wtop.com>

Figure 4.2.4. 3 - #206 BOMB TRAILER CAR A-END View



Figure 4.2.4. 4 - #206 BOMB TRAILER CAR Interior View



Figure 4.2.4. 5 - #206 BOMB TRAILER CAR Interior View

## 4.2.5 #206 BOMBARDIER TRAILER (SUMMARY ESTIMATE)

SUMMARY ESTIMATE					
Item	Sections	Hrs.	Labor	Material	Cost
1	A-END	644.0	\$54,740	\$48,151	\$102,891
2	B-END	425.5	\$36,168	\$15,065	\$51,233
3	LH SIDE	1691.8	\$143,803	\$47,323	\$191,126
4	ADDITIONAL ASSUMPTIONS	4190.3	\$507,971	\$185,288	\$693,259
		<b>6951.6</b>	<b>\$742,681.75</b>	<b>\$295,825.50</b>	<b>\$1,038,507.25</b>
5	MAT' TRANSPORTATION	7% of MAT' & CARBODY (\$100,000)			\$120,707.79
6	OVERHEAD (15%)	15% of TOTAL COST			\$155,776.09
	<b>TOTAL</b>	<b>6951.6</b>	<b>\$742,681.75</b>	<b>\$295,825.50</b>	<b>\$1,314,991.12</b>

\* Labor Hrs. includes repair management oversight hours

\* Labor Cost includes repair management oversight labor cost

**Table 4.2.5. 1 - #206 BOMB TRAILER CAR Summary Estimate**

## 4.3 #211 ROTEM TRAILER

## 4.3.1 #211 ROTEM TRAILER (A-END)

A-END								
Item	Part	Qty.	Drawing No.	Repair	Replace	Hrs	Material	Total
1	Stainless Sill Step A-END RH	1	FOP01886		X	6	\$302	<b>\$791</b>
2	Sill step mounting bracket RH	1	FOP01887 Detail "C"	X		23		<b>\$1,955</b>
3	Uncoupling lever bracket A-END RH	1	FOP01887 Detail "C"	X		14		<b>\$1,173</b>
4	Uncoupling coupler	1	COP00857		X	17	\$1,208	<b>\$2,674</b>
5	TLJB Box	1	MUP01987 Section A-A		X	12	\$1,147	<b>\$2,125</b>
6	TLJB box bracket	6	MLP04088		X	35	\$483	<b>\$3,416</b>
7	27 Conductor Recep	1	EJP00545		X	6	\$694	<b>\$1,183</b>
8	27 Conduc Rece Assy	1	EJP00548		X	6	\$694	<b>\$1,183</b>
9	480 HEP REC	1	EJP00542		X	6	\$694	<b>\$1,183</b>
10	480 HEP Cable	1	EJP00550		X	6	\$694	<b>\$1,183</b>
11	Side panel	1	SSP02095	X		58		<b>\$4,888</b>
12	Side frame assembly	1	SSP02080	X		58		<b>\$4,888</b>
13	Side lower panel	1	SSP02095	X		29		<b>\$2,444</b>
14	End frame assembly	1	SEP00850	X		58		<b>\$4,888</b>
15	End frame panel	1	SAP00981	X		29		<b>\$2,444</b>
16	Horizontal handhold	1	FOP01903		X	14	\$483	<b>\$1,656</b>
17	CEM zone frame	1	SAP00977	X		29		<b>\$2,444</b>
18	Coupler carrier	1	COP01288	X		29		<b>\$2,444</b>
19	Vertical handhold	1	FOP01902		X	5	\$483	<b>\$874</b>
20	Sill step mounting bracket LH	1	FOP01887 Detail "D"	X		17		<b>\$1,466</b>
21	End cab head	1	FOP01907		X	81	\$6,038	<b>\$12,880</b>

\* Rate per hour is \$85 unless otherwise noted

**Total A-END Repair Estimate = \$58,179****Table 4.3.1. 1 - #211 ROTEM TRAILER CAR A-END**



Figure 4.3.1. 1 - #211 ROTEM TRAILER CAR A-END (Right Side View)





Figure 4.3.1. 2 - #211 ROTEM TRAILER CAR A-END (Rear View)





Figure 4.3.1. 3 - #2111 ROTEM TRAILER CAR A-END (Coupler Carrier)



**Figure 4.3.1. 4 - #211 ROTEM TRAILER CAR A-END (Left Side View)**



**Figure 4.3.1. 5 - #211 ROTEM TRAILER CAR A-END (Left Side View)**

## 4.3.2 #211 ROTEM TRAILER (B-END)

B-END			Drawing No.	Repair	Replace	Hrs	Material	Total
Item	Part	Qty.						
1	Stainless sill step B-END LH	1	FOP01886		X	6	\$347	<b>\$836</b>
2	Sill step mounting bracket B-END LH	1	FOP01887 Detail "C"	X		12		<b>\$978</b>
3	Uncoupling lever bracket B-END LH	1	FOP01887 Detail "C"	X		14		<b>\$1,173</b>
4	Uncoupling coupler	1	COP00857		X	17	\$1,389	<b>\$2,855</b>
5	TLJB Box	1	MUP01987 Section C-C		X	12	\$1,319	<b>\$2,297</b>
6	Vertical handhold	1	FOP01902		X	5	\$555	<b>\$946</b>
7	Coupler carrier	1	COP01288	X	X	58	\$4,166	<b>\$9,053</b>
8	Coupler assembly	1	COP01304		X	115	\$41,659	<b>\$51,434</b>

\* Rate per hour is \$85 unless otherwise noted

**Total B-END Repair Estimate = \$69,572**

**Table 4.3.2. 1 - #211 ROTEM TRAILER CAR B-END**



**Figure 4.3.2. 1 - #211 ROTEM TRAILER CAR B-END (Left Side View)**



**Figure 4.3.2. 2 - #211 ROTEM TRAILER CAR B-END (Left Side View)**



**Figure 4.3.2. 3 - #211 ROTEM TRAILER CAR B-END**

## 4.3.3 #211 ROTEM TRAILER (LH SIDE)

LH SIDE								
Item	Part	Qty.	Drawing No.	Repair	Replace	Hrs	Material	Total
1	Side door step	2	FOP01888		X	29	\$2,415	<b>\$4,859</b>
2	Side panel	1	SSP02095		X	1000	\$6,038	<b>\$91,038</b>
3	Side frame assembly	1	SSP02080	X		500		<b>\$42,500</b>
4	Air duct grill	1	FHP04443		X	17	\$906	<b>\$2,372</b>
5	Horizontal handhold	2	FOP01904		X	6	\$483	<b>\$972</b>
	Door arrangement		FDP02134					
6	Side door arrangement	2	FDP02131		X	173	\$214,935	<b>\$229,598</b>
	Window Arrangement		FWP00883					
7	Emerg. Window	8	FWP00885		X	46	\$15,070	<b>\$18,980</b>
8	Large stand window	8	FWP00910		X	46	\$13,856	<b>\$17,766</b>
9	Destination Window	1	FWP00895		X	6	\$1,576	<b>\$2,065</b>

\* Rate per hour is \$85 unless otherwise noted

**Total LH Side Repair Estimate = \$410,148**

**Table 4.3.3. 1 - #211 ROTEM TRAILER CAR (LH Side)**





Figure 4.3.3. 1 - #211 ROTEM TRAILER CAR (Left Side View)



Figure 4.3.3. 2 - #2111 ROTEM TRAILER CAR (Left Side View)





Figure 4.3.3.3 - #2111 ROTEM TRAILER CAR (Left Side View)



Figure 4.3.3. 4 - #211 ROTEM TRAILER CAR (Left Side View)

## 4.3.4 #211 ROTEM TRAILER (ROOF ASSEMBLY)

ROOF ASSEMBLY								
Item	Part	Qty.	Drawing No.	Repair	Replace	Hrs.	Material	Total
1	Roof structure	50%	SRP01393	X		575		\$48,875
2	Roof panel	1	SRP01389		X	700	\$1,872	\$61,372
3	HVAC assembly	1	FHP03214 FHP03216		X	69	\$68,224	\$74,089

\* Rate per hour is \$85 unless otherwise noted

**Total Roof Assembly Repair Estimate = \$184,335**

**Table 4.3.4. 1 - #211 ROTEM TRAILER CAR (Roof Assembly)**

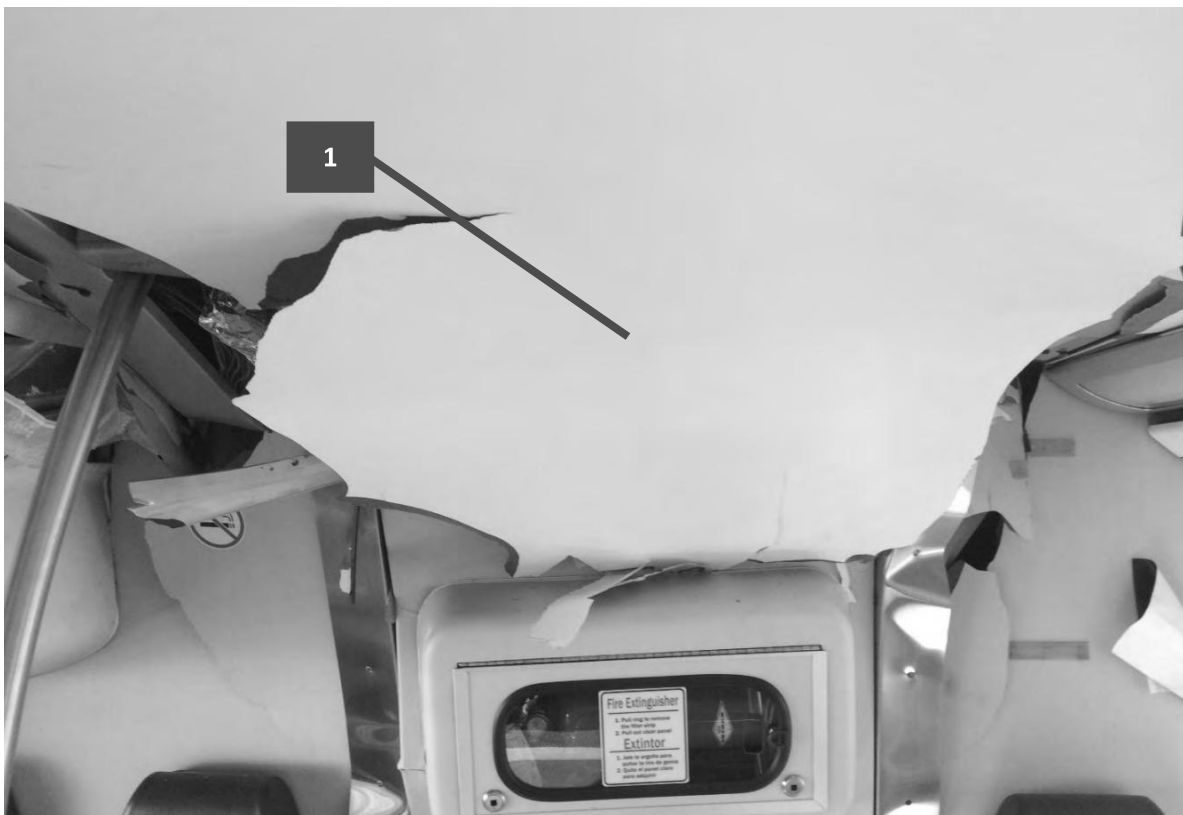


**Figure 4.3.4. 1 - #211 ROTEM TRAILER CAR (Left Side Roof)**



<Courtesy of nbclosangeles.com>

**Figure 4.3.4. 2 - #211 ROTEM TRAILER CAR (A-END HVAC Roof Assembly)**



**Figure 4.3.4. 3 - #211 ROTEM TRAILER CAR (A-END HVAC Roof Assembly)**



**Figure 4.3.4. 4 - #211 ROTEM TRAILER CAR (A-END HVAC Roof Structure)**



**Figure 4.3.4. 5 - #211 ROTEM TRAILER CAR (Fluorescent lights)**



**Figure 4.3.4. 6 - #211 ROTEM TRAILER CAR (A-END HVAC Roof Structure)**

## 4.3.5 #211 ROTEM TRAILER (ADDITIONAL ASSUMPTIONS)

ADDITIONAL ASSUMPTIONS								
Item	Part	Qty.	Drawing No.	Repair	Replace	Hrs.	Material	Total
1	Truck arrangement A-END	1	TRP08013		X	58	\$77,280	<b>\$82,168</b>
2	Truck arrangement B-END	1	TRP08012		X	58	\$77,280	<b>\$82,168</b>
3	Interior arrangement	75%	GAP00521 FPP09826 FPP10011 FHP03226 FPP09895 FPP09893 FPP09903		X	1500	\$7,245	<b>\$134,745</b>
4	Underfloor air piping	50%	MPP01803		X	350	200 ft \$11.50/ft	<b>\$32,050</b>
5	Underfloor cabling	50%	MDP02464		X	575	500 ft \$25.00/ft	<b>\$61,375</b>
6	Exterior color graphic/signage	75%	FMP02306 FMP01453		X	500	\$14,950	<b>\$57,471</b>
7	Tooling	100%				345	\$250/hr	<b>\$86,250</b>
8	Dimensional Check Test	100%				230	\$250/hr	<b>\$57,500</b>
9	Repair Management Oversight	100%				345	\$250/hr	<b>\$86,250</b>

\* Rate per hour is \$85 unless otherwise noted

**Total Repair Estimate = \$679,976**

**Table 4.3.5. 1 - #211 ROTEM TRAILER CAR (Additional assumptions)**





**Figure 4.3.5. 1 - #211 ROTEM TRAILER CAR (Truck arrangement)**



**Figure 4.3.5. 2 - #211 ROTEM TRAILER CAR (Truck arrangement)**





<Courtesy of abc7chicago.com>

**Figure 4.3.5. 3 - #211 ROTEM TRAILER CAR (Underfloor air piping and cabling)**



**Figure 4.3.5. 4 - #211 ROTEM TRAILER CAR (Underfloor cabling)**

## 4.3.6 #211 ROTEM TRAILER (SUMMARY ESTIMATE)

SUMMARY ESTIMATE					
Item	Sections	Hrs.	Labor	Material	Cost
1	A-END	532	\$45,258	\$12,920	\$58,179
2	B-END	237	\$20,137	\$49,435	\$69,572
3	LH SIDE	1822	\$154,870	\$255,278	\$410,148
4	ROOF ASSEMBLY	1344	\$114,240	\$70,095	\$184,335
5	ADDITIONAL ASSUMPTIONS	3960	\$488,421	\$191,555	\$679,976
		<b>7895.6</b>	<b>\$822,926.00</b>	<b>\$579,283.25</b>	<b>\$1,402,209.25</b>
6	MAT' TRANSPORTATION	7% of MAT' & CARBODY (\$100,000)			\$140,549.83
7	OVERHEAD (15%)	15% of TOTAL COST			\$210,331.39
	<b>TOTAL</b>	<b>7895.6</b>	<b>\$822,926.00</b>	<b>\$579,283.25</b>	<b>\$1,753,090.47</b>

\* Labor Hrs. includes repair management oversight hours

\* Labor Cost includes repair management oversight labor cost

**Table 4.3.6. 1 - #211 ROTEM TRAILER CAR Summary Estimate**

## 4.4 #263 ROTEM TRAILER

## 4.4.1 #263 ROTEM RAILER (A-END &amp; LH/RH SIDES)

A-END & LH/RH SIDES								
Item	Part	Qty.	Drawing No.	Repair	Replace	Hrs.	Material	Total
1	Stainless Sill Step	1	FOP01886		X	4	\$302	<b>\$642</b>
2	Sill Step Mounting Bracket	1	FOP01887 Detail "C"	X		12		<b>\$978</b>
3	Bracket for uncoupling lever	1	FOP01887 Detail "C"	X		10		<b>\$880</b>
4	27 Conductor Recep	1	EJP00545		X	5	\$694	<b>\$1,119</b>
5	27 Conduc Rece Assy	1	EJP00548		X	5	\$694	<b>\$1,119</b>
6	480 HEP REC	1	EJP00542		X	5	\$694	<b>\$1,119</b>
7	480 HEP Cable	1	EJP00550		X	5	\$694	<b>\$1,119</b>
8	Underfloor cable	10%	MDP02464		X	29	250 ft \$25.00/ft	<b>\$8,694</b>
9	LH & RH Side panels	4	SSP02095	X		86		<b>\$7,331</b>
10	Repair Management Oversight	100%				25	\$250/hr	<b>\$6,250</b>

\* Rate per hour is \$85 unless otherwise noted

**Total A-END Repair Estimate = \$29,251**

**Table 4.4.1. 1 - #263 ROTEM TRAILER CAR A-END (LH & RH Side)**



**Figure 4.4.1. 1 - #263 ROTEM TRAILER CAR A-END (Right Side View)**



**Figure 4.4.1. 2 - #263 ROTEM TRAILER CAR A-END (Right Side View)**



**Figure 4.4.1. 3 - #263 ROTEM TRAILER CAR Underfloor**



**Figure 4.4.1. 4 - #263 ROTEM TRAILER CAR B-END Right Side.**



**Figure 4.4.1. 5 - #263 ROTEM TRAILER CAR B-END Left Side**



**Figure 4.4.1. 6 - #263 ROTEM TRAILER CAR A-END Right Side**



**Figure 4.4.1. 7 - #263 ROTEM TRAILER CAR A-END Left Side**

## 4.4.2 #263 ROTEM RAILER (SUMMARY ESTIMATE)

SUMMARY ESTIMATE					
Item	Sections	Hrs	Labor Cost	Mat Cost	Total Cost
1	A-END & LH/RH SIDES	185.85	\$19,922	\$9,329	\$29,251
		<b>185.85</b>	<b>\$19,922.25</b>	<b>\$9,329.13</b>	<b>\$29,251.38</b>
2	MAT' TRANSPORTATION	7% of MAT'			\$653.04
3	OVERHEAD (15%)	15% of TOTAL COST			\$4,387.71
	<b>TOTAL</b>	<b>185.9</b>	<b>\$19,922.25</b>	<b>\$9,329.13</b>	<b>\$34,292.12</b>

\* Labor Hrs. includes repair management oversight hours

\* Labor Cost includes repair management oversight labor cost

**Table 4.4.2. 1 - #263 ROTEM TRAILER CAR Summary Estimate**



# PROJECT PROPOSAL

**FY23**

HOLMANS PROJECT# 2598.00

## PROJECT : ROLLING STOCK REHABILITATION

SCOPE				TYPE: REHAB   MRP					
Rolling Stock rehabilitation addresses the revenue fleet of locomotives, railcars and cab cars. Specific work includes: 1. Rotem HVAC Overhaul/Rebuild - \$2M a. Continuous cashflow for 4 rebuilt HVAC units every 30 days b. Risk - termination of equipment for faulty HVAC units - this is already an issue. c. This is an ongoing program with funding to be requested in future budget years 2. Fleetwide Condition-based Maintenance Program (CBM) - \$3M a. Program targeting a proactive approach to identify, plan and perform repair/replacement of parts prior to failure and a tailored schedule to each component. 1. Document the CBM program for user manuals, process, flow-chart, training and support algorithm. 2. Develop the reliability and availability algorithm along with RBA process. 3. Deliver on-hand tools and add-on sensors to the maintenance end-users and rolling stocks. 4. Re-structure the maintenance process and facility support for CBM. 5. Analysis and develop the daily maintenance onsite process to accommodate the best efficiency in CBM program. 6. Code the algorithm and process for an application to Metrolink configurational management tool. 7. Code the system for an automatic notification, RBA alert and predictive failure warning. 8. Send notification of resolution to reporting source of any issues or failures. 9. Run development for the supply quality assurance. 3. Communication System Overhaul - \$640K a. Upgrade the communication control system for wireless control, onboard Ethernet network. b. Upgrade the destination panel. c. Overhaul the minor components such as speakers, microphone, etc. d. This is an ongoing program with funding to be requested next year to complete 4. HVAC Air Quality Solution - COVID-19 - \$2.3M a. Mitigation for COVID-19. b. F125 & MP36 locomotive and Rotem passenger car. c. This is already underway for Bombardier cars. d. This is an ongoing program with funding to be requested in future budget years. 5. MP36 Loco lifecycle management - \$3.6M a. MP36s are approaching their midlife in 2023. b. Highest priority systems to be addressed in order to keep these locomotives serviceable. c. This is an ongoing program with funding to be requested in future budget years									
Mile Posts: NA				Division: All    County: ALL    Asset Type: Rolling Stock					
OBJECTIVES				RISKS CAUSING PROJECT DELAY					
1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair 2. (Goal 4: Retain and Grow Ridership) Improve service reliability 3. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost 4. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents				1. Condition of Asset..... Worn 2. System Impact..... High					
JUSTIFICATION									
Rolling Stock rehabilitation identified by the Metrolink Rehabilitation Plan (MRP) includes Locomotives, Rail Cars and Cab Cars. The need has been identified because the assets have fallen below a State of Good Repair and are in need of rehabilitation based on limits set by SCRRA staff and industry standards. The useful life for rolling stock is 30 years inclusive of a mid-life overhaul. Many rolling stock assets are past due for their mid-life overhaul.									
RISK CREATED BY NON-IMPLEMENTATION									
If the program is not implemented in full, the remaining work that is beyond the rehabilitation limits will be added to the backlog in future years. Ages of particular fleets, and components within fleets, vary within the rolling stock asset category, with a range of conditions that include marginal and poor ratings.  Current Age: 32 Year(s)    Standard Lifespan: 0 Year(s)									
BUDGET				CASH FLOW					
AMOUNT		START	END	FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING		\$0		2023	\$0	\$0	\$0	\$580,000	\$580,000
DESIGN		\$0							
ENVIRONMENTAL		\$0		2024	\$1,015,000	\$1,015,000	\$1,015,000	\$1,015,000	\$4,060,000
ROW ACQUISITION		\$0							
MATERIAL		\$0		2025	\$870,000	\$870,000	\$870,000	\$870,000	\$3,480,000
CONSTRUCTION		\$10,000,000							
SPECIAL RAIL EQUIP		\$0		2026	\$870,000	\$870,000	\$870,000	\$870,000	\$3,480,000
FLAGGING		\$0							
BUS BRIDGES		\$0		2027	\$0	\$0	\$0	\$0	\$0
CLOSE OUT		\$0							
DBE/LABOR		\$0		2028	\$0	\$0	\$0	\$0	\$0
PROJECT MANAGEMENT									
* SCRRA STAFF		\$700,000		Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%					
* PROCUREMENT STAFF		\$347,000							
* CONSULTANT		\$0							
CONTINGENCY		\$553,000							
TOTAL		\$11,600,000							





# PROJECT PROPOSAL

**FY23**

WONGS PROJECT# 2631.00

## PROJECT : GENERAL INFORMATION TECHNOLOGY EQUIPMENT AND SYSTEM REHABILITATION

SCOPE				TYPE: REHAB   NON-MRP					
<p>The Metrolink IT environment is in need of rehabilitation. The scope involves the replacement of end-user equipment and systems (e.g. laptops, desktops, tablets, monitors, cellphones, software systems), office equipment (e.g. multifunction printers, plotters, audio/video conferencing systems), and infrastructure equipment.</p> <p>Mile Posts: NA Division: All County: ALL Asset Type: Information Technology</p>									
OBJECTIVES				RISKS CAUSING PROJECT DELAY					
<p>1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair</p>									
JUSTIFICATION				RANKING // PROJECT READINESS					
<p>To ensure equipment remain in warranty, in support of standard changes in the tech industry, current for cybersecurity, and routine replacement as a best practice to ensure optimal performance, IT will need to replace aging hardware. The IT Department estimates 50% of laptops and desktops in circulation are more than 3 years old and no longer in warranty. Aging equipment is also prone to failure. Further, this population of computers also will not support the new Windows 11 OS. IT should start procuring newer hardware and begin deployment plans with hardware that is future-proof for Windows 11. Metrolink IT also has about 30 multifunction printers placed throughout different facilities (offices, crew bases, yards, etc.) that should be replaced as they are nearing end of life with vendor. Metrolink Headquarter has selective AV equipment needing replacement for security and support purposes. Various software systems are also end of life that ought to be either upgraded or replaced.</p>				<p>1. Condition of Asset..... Worn 2. System Impact..... Average</p>					
RISK CREATED BY NON-IMPLEMENTATION									
<p>Metrolink successfully implemented remote work as soon as the stay-at-home order was issued as a result of the COVID pandemic. More than ever, the agency is heavily reliant on technology and eliminating or avoiding downtime is critical to Metrolink's daily operations. With most employees and contracted employees working remotely, any downtime for users is problematic and remediation is prolonged just due to users being remote. Proactively replacing aging hardware will ensure optimal uptime for users. Further, there continues to be hardware shortage that makes any unplanned purchases to take much longer time than usual, hence planned purchases ensures IT stability. Office equipment such as printers being replaced will be necessary to ensure we are under proper maintenance with our vendor, especially printers that are critical to operations such as Dispatch. Some AV equipment must be replaced for cybersecurity reasons due to end of life software and/or operating systems. Overall, replacing aging equipment will further improve Metrolink's cybersecurity posture and ensuring users and environment have optimal uptime.</p> <p>Current Age: 9 Year(s) Standard Lifespan: 3 Year(s)</p>									
BUDGET				CASH FLOW					
	AMOUNT	START	END	FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING	\$0			2023	\$0	\$0	\$0	\$0	\$0
DESIGN	\$0			2024					\$0
ENVIRONMENTAL	\$0			2025					\$0
ROW ACQUISITION	\$0			2026					\$0
MATERIAL	\$360,000			2027					\$0
CONSTRUCTION	\$0			2028	\$0	\$0	\$0	\$0	\$0
SPECIAL RAIL EQUIP	\$0								
FLAGGING	\$0								
BUS BRIDGES	\$0								
CLOSE OUT	\$0								
DBE/LABOR	\$0								
PROJECT MANAGEMENT									
* SCRRRA STAFF	\$0								
* PROCUREMENT STAFF	\$0								
* CONSULTANT	\$125,000								
CONTINGENCY	\$0								
TOTAL	\$485,000								

Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%



# PROJECT PROPOSAL

**FY23**

HOLMANS PROJECT# 2386.00

## PROJECT : RIVER SUBDIVISION STRUCTURES REHABILITATION - WEST BANK

SCOPE				TYPE: REHAB   MRP					
River Sub Structures Rehabilitation addresses three major subcomponents to sufficiently rehabilitate aging infrastructure and growing backlog: - Bridges - Culverts - Tunnels Specific work for this request is for rehabilitation of the Arroyo Seco Bridge.  Mile Posts: 0 - 485.20  Division: River Sub - West Bank    County: LA    Asset Type: Structures									
OBJECTIVES				RISKS CAUSING PROJECT DELAY					
1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair 2. (Goal 4: Retain and Grow Ridership) Improve service reliability 3. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost 4. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents									
JUSTIFICATION				RANKING // PROJECT READINESS					
Track rehabilitation identified by the Metrolink Rehabilitation Plan (MRP) includes rail, ties, crossings, special trackwork and ballast. The need has been identified because the assets have fallen below a State of Good Repair and are in need of rehabilitation based on limits set by SCRRRA staff and industry standards.				1. Condition of Asset..... Worn 2. System Impact..... High					
RISK CREATED BY NON-IMPLEMENTATION									
If the program is not implemented in full, the remaining work that is beyond the rehabilitation limits will be added to the backlog in future years. Per FRA CFR 213 standards would require slow orders with potential delays to passenger service.  Current Age: 122 Year(s)    Standard Lifespan: 0 Year(s)									
BUDGET				CASH FLOW					
	AMOUNT	START	END	FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING	\$0			2023	\$0	\$0	\$0	\$345,000	\$345,000
DESIGN	\$0								
ENVIRONMENTAL	\$0			2024	\$603,750	\$603,750	\$603,750	\$603,750	\$2,415,000
ROW ACQUISITION	\$0								
MATERIAL	\$1,300,000			2025	\$517,500	\$517,500	\$517,500	\$517,500	\$2,070,000
CONSTRUCTION	\$4,670,000								
SPECIAL RAIL EQUIP	\$0			2026	\$517,500	\$517,500	\$517,500	\$517,500	\$2,070,000
FLAGGING	\$150,000								
BUS BRIDGES	\$100,000			2027	\$0	\$0	\$0	\$0	\$0
CLOSE OUT	\$25,000								
DBE/LABOR	\$25,000			2028	\$0	\$0	\$0	\$0	\$0
PROJECT MANAGEMENT									
* SCRRRA STAFF	\$350,000			Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%					
* PROCUREMENT STAFF	\$280,000								
* CONSULTANT	\$0								
CONTINGENCY	\$0								
TOTAL	\$6,900,000								



# PROJECT PROPOSAL

**FY23**

HOLMANS PROJECT# 2617.00

## PROJECT : VALLEY SUBDIVISION TRACK REHABILITATION

SCOPE				TYPE: REHAB   MRP					
Valley Sub Track Rehabilitation addresses five major subcomponents to sufficiently rehabilitate aging infrastructure and growing backlog: - Rail - Ties - Crossings - Special Trackwork - Ballast									
Specific work includes Tunnel 25 Rehabilitation: Option 1: Partial funding necessary for the complete track rehabilitation of Track in the Tunnel. (Additional \$8M would need to be secured elsewhere).									
Option 2: Take advantage of economies of scale and perform major maintenance in the Tunnel by combining scope, equipment and labor forces with the work coming on Tunnel 26 which is funded through separate outside FRA Grant. Work would remove & replace approximately 20% of ties and ballast.									
Mile Posts: 3.67 - 76.63				Division: Valley    County: LA    Asset Type: Track					
OBJECTIVES				RISKS CAUSING PROJECT DELAY					
1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair									
2. (Goal 4: Retain and Grow Ridership) Improve service reliability									
3. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost									
4. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents									
JUSTIFICATION				RANKING // PROJECT READINESS					
Track rehabilitation identified by the Metrolink Rehabilitation Plan (MRP) includes rail, ties, crossings, special trackwork and ballast. The need has been identified because the assets have fallen below a State of Good Repair and are in need of rehabilitation based on limits set by SCRRRA staff and industry standards.				1. Condition of Asset..... Worn					
				2. System Impact..... High					
RISK CREATED BY NON-IMPLEMENTATION									
If the program is not implemented in full, the remaining work that is beyond the rehabilitation limits will be added to the backlog in future years. Per FRA CFR 213 standards would require slow orders with potential delays to passenger service.									
Current Age: 122 Year(s)      Standard Lifespan: 0 Year(s)									
BUDGET				CASH FLOW					
	AMOUNT	START	END	FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING	\$0			2023	\$0	\$0	\$0	\$200,000	\$200,000
DESIGN	\$0			2024	\$350,000	\$350,000	\$350,000	\$350,000	\$1,400,000
ENVIRONMENTAL	\$0								
ROW ACQUISITION	\$0			2025	\$300,000	\$300,000	\$300,000	\$300,000	\$1,200,000
MATERIAL	\$0								
CONSTRUCTION	\$3,300,000			2026	\$300,000	\$300,000	\$300,000	\$300,000	\$1,200,000
SPECIAL RAIL EQUIP	\$0								
FLAGGING	\$0			2027	\$0	\$0	\$0	\$0	\$0
BUS BRIDGES	\$0								
CLOSE OUT	\$0			2028	\$0	\$0	\$0	\$0	\$0
DBE/LABOR	\$0								
PROJECT MANAGEMENT				Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%					
* SCRRRA STAFF	\$350,000								
* PROCUREMENT STAFF	\$350,000								
* CONSULTANT	\$0								
CONTINGENCY	\$0								
TOTAL	\$4,000,000								



# PROJECT PROPOSAL

**FY23**

HOLMANS PROJECT# 2627.00

**PROJECT : VALLEY SUBDIVISION TRAIN CONTROL SYSTEMS REHABILITATION**

SCOPE			TYPE: REHAB   MRP																																																																													
<p>Valley Sub Train Control Systems Rehabilitation addresses major subcomponents to sufficiently rehabilitate aging infrastructure and growing backlog:</p> <ul style="list-style-type: none"><li>- Signal systems</li><li>- Crossing systems</li><li>- Communication systems</li></ul> <p>COMMUNICATIONS: WMS-UPGRADE, AC REHAB, BATTERY REHAB, FIBER - REHAB, RADIO REHAB - PTC/VHF/UHF, CIS REHAB</p> <p>SIGNALS WORK WILL BE REASSESSED FOR CHANGE CONDITIONS IN THE YEAR OF APPROVED FUNDING WITH PRIORITIES LISTED:</p> <ol style="list-style-type: none"><li>1) CP Courier MP 6.4 - Replace CP House, internal control equipment, and power switch machine \$550,000</li><li>2) EC Repeater &amp; Switch Leaving Signal MP 7.51 - Replace house, internal control equipment and battery back-up - \$250,000</li><li>3) Int Signal 71-73 MP 7.9 Replace Signal House, internal control equipment - \$350,000</li><li>4) Int Signal 141-142 MP 14.2 Replace Signal House, internal control equipment - \$350,000</li><li>5) DED MP 15.10 - Replace detector and control equipment - \$250,000</li><li>6) Int Signal 191-192 MP 19.22 Replace Signal House, internal control equipment - \$350,000</li><li>7) Int Signal 201-202 MP 20.8 Replace Signal House, internal control equipment - \$350,000</li><li>8) EC4 Repeater MP 21.8 Replace Signal House, internal control equipment - \$350,000</li><li>9) EC4 Repeater MP 22.6 Replace Signal House, internal control equipment - \$350,000</li></ol> <p>Mile Posts: 3.67 - 76.63</p> <p>Division: Valley County: LA Asset Type: Train Control</p>																																																																																
OBJECTIVES			RISKS CAUSING PROJECT DELAY																																																																													
<ol style="list-style-type: none"><li>1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair</li><li>2. (Goal 4: Retain and Grow Ridership) Improve service reliability</li><li>3. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost</li><li>4. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents</li></ol>																																																																																
JUSTIFICATION			RANKING // PROJECT READINESS																																																																													
<p>Train Control Systems rehabilitation identified by the Metrolink Rehabilitation Plan (MRP) includes PTC and signal systems, Crossing systems, and Communications systems. The need has been identified because the assets have fallen below a State of Good Repair and are in need of rehabilitation based on limits set by SCRRA staff and industry standards.</p> <p><b>RISK CREATED BY NON-IMPLEMENTATION</b></p> <p>If the program is not implemented in full, the remaining work that is beyond the rehabilitation limits will be added to the backlog in future years.</p> <p>Current Age: 31 Year(s) Standard Lifespan: 20 Year(s)</p>			<ol style="list-style-type: none"><li>1. Condition of Asset..... Worn</li><li>2. System Impact..... High</li></ol>																																																																													
BUDGET			CASH FLOW																																																																													
<table border="1"><thead><tr><th></th><th>AMOUNT</th><th>START</th><th>END</th></tr></thead><tbody><tr><td>CONTRACT PACKAGING</td><td>\$0</td><td></td><td></td></tr><tr><td>DESIGN</td><td>\$0</td><td></td><td></td></tr><tr><td>ENVIRONMENTAL</td><td>\$0</td><td></td><td></td></tr><tr><td>ROW ACQUISITION</td><td>\$0</td><td></td><td></td></tr><tr><td>MATERIAL</td><td>\$0</td><td></td><td></td></tr><tr><td>CONSTRUCTION</td><td>\$1,800,000</td><td></td><td></td></tr><tr><td>SPECIAL RAIL EQUIP</td><td>\$0</td><td></td><td></td></tr><tr><td>FLAGGING</td><td>\$0</td><td></td><td></td></tr><tr><td>BUS BRIDGES</td><td>\$0</td><td></td><td></td></tr><tr><td>CLOSE OUT</td><td>\$0</td><td></td><td></td></tr><tr><td>DBE/LABOR</td><td>\$0</td><td></td><td></td></tr><tr><td>PROJECT MANAGEMENT</td><td></td><td></td><td></td></tr><tr><td>* SCRRA STAFF</td><td>\$350,000</td><td></td><td></td></tr><tr><td>* PROCUREMENT STAFF</td><td>\$350,000</td><td></td><td></td></tr><tr><td>* CONSULTANT</td><td>\$0</td><td></td><td></td></tr><tr><td>CONTINGENCY</td><td>\$0</td><td></td><td></td></tr><tr><td>TOTAL</td><td>\$2,500,000</td><td></td><td></td></tr></tbody></table>				AMOUNT	START	END	CONTRACT PACKAGING	\$0			DESIGN	\$0			ENVIRONMENTAL	\$0			ROW ACQUISITION	\$0			MATERIAL	\$0			CONSTRUCTION	\$1,800,000			SPECIAL RAIL EQUIP	\$0			FLAGGING	\$0			BUS BRIDGES	\$0			CLOSE OUT	\$0			DBE/LABOR	\$0			PROJECT MANAGEMENT				* SCRRA STAFF	\$350,000			* PROCUREMENT STAFF	\$350,000			* CONSULTANT	\$0			CONTINGENCY	\$0			TOTAL	\$2,500,000			FY	Q1	Q2	Q3	Q4	TOTAL
	AMOUNT	START	END																																																																													
CONTRACT PACKAGING	\$0																																																																															
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* CONSULTANT	\$0																																																																															
CONTINGENCY	\$0																																																																															
TOTAL	\$2,500,000																																																																															
	2023	\$0	\$0	\$0	\$125,000	\$125,000																																																																										
	2024	\$218,750	\$218,750	\$218,750	\$218,750	\$875,000																																																																										
	2025	\$187,500	\$187,500	\$187,500	\$187,500	\$750,000																																																																										
	2026	\$187,500	\$187,500	\$187,500	\$187,500	\$750,000																																																																										
	2027	\$0	\$0	\$0	\$0	\$0																																																																										
	2028	\$0	\$0	\$0	\$0	\$0																																																																										

|  | | | Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30% | | | | | |



# PROJECT PROPOSAL

**FY23**

HOLMANS PROJECT# 2620.00

## PROJECT : ORANGE SUBDIVISION TRACK REHABILITATION

SCOPE				TYPE: REHAB   MRP					
Orange Sub Track Rehabilitation addresses five major subcomponents to sufficiently rehabilitate aging infrastructure and growing backlog: - Rail - Ties - Crossings - Special Trackwork - Ballast Specific work includes Metrolink Share of NCTD Turnout at Basilone Spur									
Rail replacement, and upgrade from 115 lb rail to 136 lb rail from Beach Rd to CP Serra (Scope removed from 2021 due to SCORE coordination issues).									
Riprap and track protection along the coast.									
Mile Posts: 165.08 - 207.4				Division: Orange    County: OC    Asset Type: Track					
OBJECTIVES				RISKS CAUSING PROJECT DELAY					
1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair 2. (Goal 4: Retain and Grow Ridership) Improve service reliability 3. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost 4. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents									
JUSTIFICATION				RANKING // PROJECT READINESS					
Track rehabilitation identified by the Metrolink Rehabilitation Plan (MRP) includes rail, ties, crossings, special trackwork and ballast. The need has been identified because the assets have fallen below a State of Good Repair and are in need of rehabilitation based on limits set by SCRRRA staff and industry standards.				1. Condition of Asset..... Worn 2. System Impact..... High					
RISK CREATED BY NON-IMPLEMENTATION									
If the program is not implemented in full, the remaining work that is beyond the rehabilitation limits will be added to the backlog in future years. Per FRA CFR 213 standards would require slow orders with potential delays to passenger service.									
Current Age: 122 Year(s)      Standard Lifespan: 0 Year(s)									
BUDGET				CASH FLOW					
	AMOUNT	START	END	FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING	\$0			2023	\$0	\$0	\$0	\$335,000	\$335,000
DESIGN	\$0			2024	\$586,250	\$586,250	\$586,250	\$586,250	\$2,345,000
ENVIRONMENTAL	\$0			2025	\$502,500	\$502,500	\$502,500	\$502,500	\$2,010,000
ROW ACQUISITION	\$0			2026	\$502,500	\$502,500	\$502,500	\$502,500	\$2,010,000
MATERIAL	\$0			2027	\$0	\$0	\$0	\$0	\$0
CONSTRUCTION	\$5,700,000			2028	\$0	\$0	\$0	\$0	\$0
SPECIAL RAIL EQUIP	\$0								
FLAGGING	\$0								
BUS BRIDGES	\$0								
CLOSE OUT	\$0								
DBE/LABOR	\$0								
PROJECT MANAGEMENT									
* SCRRRA STAFF	\$525,000								
* PROCUREMENT STAFF	\$475,000								
* CONSULTANT	\$0								
CONTINGENCY	\$0								
TOTAL	\$6,700,000								
				Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%					



# PROJECT PROPOSAL

**FY23**

HOLMANS PROJECT# 2626.00

## PROJECT : ORANGE SUBDIVISION STRUCTURES REHABILITATION

SCOPE				TYPE: REHAB   MRP					
Orange Sub Structures Rehabilitation addresses three major subcomponents to sufficiently rehabilitate aging infrastructure and growing backlog: - Bridges - Culverts - Tunnels Specific work includes construction funding for Culverts designed and environmentally cleared in FY20, but do not have sufficient Construction funding. Culverts MP 205.8 and 207.2 Orange Sub, and Olive Sub MP 5.4. Mile Posts: 165.08 - 207.4 Division: Orange    County: OC    Asset Type: Structures									
OBJECTIVES				RISKS CAUSING PROJECT DELAY					
1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair 2. (Goal 4: Retain and Grow Ridership) Improve service reliability 3. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost 4. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents				1. Condition of Asset..... Worn 2. System Impact..... High					
JUSTIFICATION									
Structures rehabilitation identified by the Metrolink Rehabilitation Plan (MRP) includes Bridges, Culverts and Tunnels. The need has been identified because the assets have fallen below s State of Good Repair and are in need of rehabilitation based on limits set by SCRRA staff and industry standards.									
RISK CREATED BY NON-IMPLEMENTATION									
If the program is not implemented in full, the remaining work that is beyond the rehabilitation limits will be added to the backlog in future years.									
Current Age: 122 Year(s)      Standard Lifespan: 0 Year(s)									
BUDGET				CASH FLOW					
	AMOUNT	START	END	FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING	\$0			2023	\$0	\$0	\$0	\$111,000	\$111,000
DESIGN	\$0			2024	\$194,250	\$194,250	\$194,250	\$194,250	\$777,000
ENVIRONMENTAL	\$0								
ROW ACQUISITION	\$0			2025	\$166,500	\$166,500	\$166,500	\$166,500	\$666,000
MATERIAL	\$0								
CONSTRUCTION	\$1,720,000			2026	\$166,500	\$166,500	\$166,500	\$166,500	\$666,000
SPECIAL RAIL EQUIP	\$0								
FLAGGING	\$0			2027	\$0	\$0	\$0	\$0	\$0
BUS BRIDGES	\$0								
CLOSE OUT	\$0			2028	\$0	\$0	\$0	\$0	\$0
DBE/LABOR	\$0								
PROJECT MANAGEMENT				Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%					
* SCRRA STAFF	\$350,000								
* PROCUREMENT STAFF	\$150,000								
* CONSULTANT	\$0								
CONTINGENCY	\$0								
TOTAL	\$2,220,000								



# PROJECT PROPOSAL

**FY23**

HOLMANS PROJECT# 2630.00

## PROJECT : ORANGE SUBDIVISION TRAIN CONTROL SYSTEMS REHABILITATION

SCOPE				TYPE: REHAB   MRP					
Orange Sub Train Control Systems Rehabilitation addresses major subcomponents to sufficiently rehabilitate aging infrastructure and growing backlog: - Signal systems - Crossing systems - Communication systems									
COMMUNICATIONS: WMS-UPGRADE, AC REHAB, BATTERY REHAB, FIBER - REHAB, RADIO REHAB - PTC/VHF/UHF, CIS REHAB									
SIGNALS WORK WILL BE REASSESSED FOR CHANGE CONDITIONS IN THE YEAR OF APPROVED FUNDING WITH PRIORITIES LISTED: 1) CP La Palma MP 167.3 - Replace CP House, internal control equipment, and power switch machine \$600,000. 2) CP College MP 169.8 - Replace CP House, internal control equipment, and power switch machine \$550,000. 3) CP Maple MP 172.4 - Replace CP House, internal control equipment, and power switch machine \$600,000. 4) CP Lincoln MP 174.7 - Replace CP House, internal control equipment, and power switch machine \$600,000. 5) CP Aliso MP 178.9 - Replace CP House, internal control equipment, and power switch machine \$550,000. 6) CP Tinkham MP 184.5 - Replace CP House, internal control equipment, and power switch machine \$600,000.									
Mile Posts: 165.08 - 207.4				Division: Orange    County: OC    Asset Type: Train Control					
OBJECTIVES				RISKS CAUSING PROJECT DELAY					
1. (Goal 3: Invest in People and Assets) Maintain State of Good Repair 2. (Goal 4: Retain and Grow Ridership) Improve service reliability 3. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost 4. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents				1. Condition of Asset..... Worn 2. System Impact..... High					
JUSTIFICATION									
Train Control Systems rehabilitation identified by the Metrolink Rehabilitation Plan (MRP) includes PTC and signal systems, Crossing systems and Communication systems. The need has been identified because the assets have fallen below a State of Good Repair and are in need of rehabilitation based on limits set by SCRRRA staff and industry standards.									
RISK CREATED BY NON-IMPLEMENTATION									
If the program is not implemented in full, the remaining work that is beyond the rehabilitation limits will be added to the backlog in future years.  Current Age: 31 Year(s)    Standard Lifespan: 20 Year(s)									
BUDGET				CASH FLOW					
<div>AMOUNT                      START                      END</div>				FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING                      \$0				2023	\$0	\$0	\$0	\$166,500	\$166,500
DESIGN                      \$0									
ENVIRONMENTAL                      \$0				2024	\$291,375	\$291,375	\$291,375	\$291,375	\$1,165,500
ROW ACQUISITION                      \$0									
MATERIAL                      \$0				2025	\$249,750	\$249,750	\$249,750	\$249,750	\$999,000
CONSTRUCTION                      \$2,630,000									
SPECIAL RAIL EQUIP                      \$0				2026	\$249,750	\$249,750	\$249,750	\$249,750	\$999,000
FLAGGING                      \$0									
BUS BRIDGES                      \$0				2027	\$0	\$0	\$0	\$0	\$0
CLOSE OUT                      \$0									
DBE/LABOR                      \$0				2028	\$0	\$0	\$0	\$0	\$0
PROJECT MANAGEMENT									
* SCRRRA STAFF                      \$525,000				2028	\$0	\$0	\$0	\$0	\$0
* PROCUREMENT STAFF                      \$175,000									
* CONSULTANT                      \$0									
CONTINGENCY                      \$0				Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%					
TOTAL                      \$3,330,000									



## NEW CAPITAL PROJECTS PROPOSALS FOR FY2023 BUDGET

Attachment H

ROW#	CREATOR	PROJECT #	TYPE	ROUTE LINE	SUB DIVISION	MILE POSTS	CONDITION	IMPACT	ASSET TYPE	PROJECT	SCOPE	TOTAL REQUEST	METRO	OCTA	RCTC	SBCTA	VCTC	OTHER	PURSUING RAISE GRANT	OTHER-SECURED CARL MOYER GRANT	REVISED: 03/22/2022
1	CHAKLADARA	2456	Capital	ALL	ALL	NA	NA	NA	Information Technology	AGENCY-WIDE CYBERSECURITY IMPLEMENTATION	Cyber threats have proliferated and have become more sophisticated over the years. Most organizations have a dedicated cybersecurity team led by a CISO (Chief Information Security Officer). A Cybersecurity Manager was approved in the FY22 budget, however the position once hired, will not have a dedicated team of cybersecurity experts. Instead, the Cybersecurity Manager will have to rely on several part-time resources from the Infrastructure, Networking and HelpDesk teams in the ITS team. This project aims to build a cybersecurity framework, monitor evolving security threats, build a mitigation strategies for incident management, and proactively harden the security posture of the agency from cyberthreats. The project envisions deploying contract services and software and hardware products.	439,000	208,525	86,922	48,729	63,216	31,608				
2	STEWART	2476	Capital	ALL	ALL	NA	NA	NA	Facilities	CENTRAL MAINTENANCE FACILITY (CMF) MODERNIZATION PHASE I DESIGN & ENVIRONMENTAL	Improvements to the CMF have a system-wide impact through improving the functionality, productivity, and overall demand for fleet inspection, service, repair, storage and rehabilitation. Additionally, Metrolink has committed to the CMF Action Plan, which promises continuous improvements to ensure Metrolink is a good neighbor. This budget request will allow Metrolink to design the CMF projects identified in the CMF Modernization Study effort.  Modernizing the 30-year-old CMF will increase the operational efficiency of the facility because the improvements identified through the CMF Modernization Study effort will bring the facility up to date with safety, technological improvements, addition work platforms, cranes, tables use of Wi-Fi and improve layouts for warehousing parts. Many of the projects that would increase operational efficiency of maintenance activities also contribute to addressing the community concerns by reducing the number of idling locomotives in the yard and the duration of their idling reducing the noise and emissions from locomotives. Due to the limitations of the property situated between San Fernando Road and the LA River which is built out with the current buildings and tracks and the need to maintain service while any project is constructed there are some limitations to the improvements that can be made and any construction to the existing site and buildings needs carefully planned staging plans.	3,721,000	1,767,475	736,758	413,031	535,824	267,912				
3	STEWART	2477	Capital	ALL	ALL	NA	NA	NA	Facilities	CENTRAL MAINTENANCE FACILITY (CMF) MODERNIZATION EARLY ACTION TO ADDRESS COMMUNITY CONCERNS	Improvements to the CMF have a system-wide impact through improving the functionality, productivity, and overall demand for fleet inspection, service, repair, storage and rehabilitation. Metrolink has committed to the CMF Action Plan, which promises continuous improvements to ensure Metrolink is a good neighbor. This budget request will allow Metrolink to advance an additional sound barrier at CMF. Following a successful demonstration of steel sound barriers at the service and inspection track (pilot barriers face the Elysian Valley community), additional sound barriers will be installed on the other side of the servicing area to dampen the noise generated by idling locomotives. This investment has been repeatedly requested by the Cypress Park community.	515,000							515,000		







# PROJECT PROPOSAL

**FY23**

CHAKLADARA PROJECT# 2456.00

## PROJECT : AGENCYWIDE CYBERSECURITY IMPLEMENTATION

SCOPE			TYPE: CAPITAL   NON-MRP					
<p>Cyber threats have proliferated and have become more sophisticated over the years. Most organizations have a dedicated cybersecurity team led by a CISO (Chief Information Security Officer). A Cybersecurity Manager was approved in the FY22 budget, however the position once hired, will not have a dedicated team of cybersecurity experts. Instead, the Cybersecurity Manager will have to rely on several part-time resources from the Infrastructure, Networking and HelpDesk teams in the IDTS team. This project aims to build a cybersecurity framework, monitor evolving security threats, build a mitigation strategies for incidence management, and proactively harden the security posture of the agency from cyberthreats. The project envisions deploying contract services and software and hardware products.</p> <p>Mile Posts: NA</p> <p>Division: All    County: ALL    Asset Type: Information Technology</p>								
OBJECTIVES			RISKS CAUSING PROJECT DELAY					
1. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents 2. (Goal 3: Invest in People and Assets) Maintain State of Good Repair 3. (Goal 7: Improve Organizational Efficiency) Clearly define staff roles and responsibilities								
JUSTIFICATION			RANKING // PROJECT READINESS					
This project aims to build a cybersecurity framework, monitor evolving security threats using an external service, build a mitigation strategies for incidence management, install additional hardware and software defenses and proactively harden the security posture of the agency from cyberthreats. The project will reduce the likelihood of a cyber attack and lay out processes to enable the integrity of our infrastructure after a cyberattack.			1. System Reliability..... High 2. Ridership Increase..... Low 3. Capacity Improvements..... High 4. Safety & Security..... High 5. Environmental..... Low					
RISK CREATED BY NON-IMPLEMENTATION			The impact of not doing this project is across the agency - both train operations and business systems will be impacted.					
The risks of not doing this project are: 1) Trains not running with PTC enablement due to PTC systems being compromised; 2) Extended system outages for business systems because systems are compromised; and 3) Not being able to pay vendors or initiate new projects.								
Current Age: New      Standard Lifespan: 5 Year(s)								
BUDGET			CASH FLOW					
AMOUNT	START	END	FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING	\$0		2023	\$0	\$0	\$0	\$21,950	\$21,950
DESIGN	\$20,000		2024	\$38,412	\$38,412	\$38,412	\$38,414	\$153,650
ENVIRONMENTAL	\$0		2025	\$32,925	\$32,925	\$32,925	\$32,925	\$131,700
ROW ACQUISITION	\$0		2026	\$32,925	\$32,925	\$32,925	\$32,925	\$131,700
MATERIAL	\$120,000		2027	\$0	\$0	\$0	\$0	\$0
CONSTRUCTION	\$125,000		2028	\$0	\$0	\$0	\$0	\$0
SPECIAL RAIL EQUIP	\$0							
FLAGGING	\$0							
BUS BRIDGES	\$0							
CLOSE OUT	\$20,000							
DBE/LABOR	\$0							
PROJECT MANAGEMENT								
* SCRRRA STAFF	\$14,000							
* PROCUREMENT STAFF	\$0							
* CONSULTANT	\$100,000							
CONTINGENCY	\$40,000		Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%					
TOTAL	\$439,000							



# PROJECT PROPOSAL

**FY23**

STEWARTM PROJECT# 2476.00

## PROJECT : CENTRAL MAINTENANCE FACILITY (CMF) MODERNIZATION - PHASE I DESIGN AND ENVIRONMENTAL

SCOPE				TYPE: CAPITAL   NON-MRP					
Improvements to the CMF have a system-wide impact through improving the functionality, productivity, and overall demand for fleet inspection, service, repair, storage and rehabilitation. Additionally, Metrolink has committed to the CMF Action Plan, which promises continuous improvements to ensure Metrolink is a good neighbor. This budget request will allow Metrolink to design the CMF projects identified in the CMF Modernization Study effort.									
Modernizing the 30-year-old CMF will increase the operational efficiency of the facility because the improvements identified through the CMF Modernization Study effort will bring the facility up to date with safety, technological improvements, addition work platforms, cranes, tables use of Wi-Fi and improve layouts for warehousing parts. Many of the projects that would increase operational efficiency of maintenance activities also contribute to addressing the community concerns by reducing the number of idling locomotives in the yard and the duration of their idling reducing the noise and emissions from locomotives. Due to the limitations of the property situated between San Fernando Road and the LA River which is built out with the current buildings and tracks and the need to maintain service while any project is constructed there are some limitations to the improvements that can be made and any construction to the existing site and buildings needs carefully planned staging plans.									
Mile Posts: NA				Division: All    County: ALL    Asset Type: Facilities					
OBJECTIVES				RISKS CAUSING PROJECT DELAY					
1. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost 2. (Goal 3: Invest in People and Assets) Maintain State of Good Repair 3. (Goal 4: Retain and Grow Ridership) Improve service reliability 4. (Goal 4: Retain and Grow Ridership) Increase system utilization				1. System Reliability..... High 2. Ridership Increase..... Average 3. Capacity Improvements..... High 4. Safety & Security..... High 5. Environmental..... High					
JUSTIFICATION									
Improvements to the CMF have a system-wide impact through improving the functionality, productivity, and overall demand for fleet inspection, service, repair, storage and rehabilitation. Additionally, Metrolink has committed to the CMF Action Plan, which promises continuous improvements to ensure Metrolink is a good neighbor. Modernizing the 30-year-old CMF will increase the operational efficiency of the facility because the improvement identified through the CMF Modernization Study effort will bring the facility up to date with safety, technological improvements, addition work platforms, cranes, tables use of Wi-Fi and improve layouts for warehousing parts. Many of the projects that would increase operational efficiency of maintenance activities also contribute to addressing the community concerns by reducing the number of idling locomotives in the yard and the duration of their idling reducing the noise and emissions from locomotives and are found in the next category. Due to the limitations of the property situated between San Fernando Road and the LA River which is built out with the current buildings and tracks and the need to maintain service while any project is constructed there are some limitations to the improvements that can be made and any construction to the existing site and buildings needs carefully planned staging plans.									
RISK CREATED BY NON-IMPLEMENTATION									
Funding for the design of CMF is critical to ensure this vital project which will address both community concerns and operation efficiency improvements is "shovel ready" for future grant funding that will become available.				Additional support document was submitted					
Current Age: New    Standard Lifespan: 30 Year(s)									
BUDGET				CASH FLOW					
	AMOUNT	START	END	FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING	\$150,000			2023	\$0	\$0	\$0	\$186,050	\$186,050
DESIGN	\$2,500,000								
ENVIRONMENTAL	\$500,000			2024	\$325,588	\$325,588	\$325,588	\$325,586	\$1,302,350
ROW ACQUISITION	\$0								
MATERIAL	\$0			2025	\$279,075	\$279,075	\$279,075	\$279,075	\$1,116,300
CONSTRUCTION	\$0								
SPECIAL RAIL EQUIP	\$0			2026	\$279,075	\$279,075	\$279,075	\$279,075	\$1,116,300
FLAGGING	\$0								
BUS BRIDGES	\$0			2027	\$0	\$0	\$0	\$0	\$0
CLOSE OUT	\$0								
DBE/LABOR	\$0			2028	\$0	\$0	\$0	\$0	\$0
PROJECT MANAGEMENT									
* SCRRA STAFF	\$210,000			Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%					
* PROCUREMENT STAFF	\$53,000								
* CONSULTANT	\$0								
CONTINGENCY	\$308,000								
TOTAL	\$3,721,000								

Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%



# PROJECT PROPOSAL

**FY23**

STEWARTM PROJECT# 2477.00

## PROJECT : CENTRAL MAINTENANCE FACILITY (CMF) MODERNIZATION SOUND BARRIER TO ADDRESS COMMUNITY CONCERNS

SCOPE			TYPE: CAPITAL   NON-MRP						
<p>Improvements to the CMF have a system-wide impact through improving the functionality, productivity, and overall demand for fleet inspection, service, repair, storage and rehabilitation. Metrolink has committed to the CMF Action Plan, which promises continuous improvements to ensure Metrolink is a good neighbor. This budget request will allow Metrolink to advance an additional sound barrier at CMF. Following a successful demonstration of steel sound barriers at the service and inspection track (pilot barriers face the Elysian Valley community), additional sound barriers will be installed on the other side of the servicing area to dampen the noise generated by idling locomotives. This investment has been repeatedly requested by the Cypress Park community.</p> <p>Mile Posts: NA</p> <p>Division: All County: ALL Asset Type: Facilities</p>									
OBJECTIVES			RISKS CAUSING PROJECT DELAY						
<p>1. (Goal 6: Improve Communications to Customers and Stakeholders) Reduce customer complaints about Metrolink communications</p> <p>2. (Goal 6: Improve Communications to Customers and Stakeholders) Improve communication and partnership with stakeholders</p>									
JUSTIFICATION			RANKING // PROJECT READINESS						
<p>Improvements to the CMF have a system-wide impact through improving the functionality, productivity, and overall demand for fleet inspection, service, repair, storage and rehabilitation. Metrolink has committed to the CMF Action Plan, which promises continuous improvements to ensure Metrolink is a good neighbor. This budget request will allow Metrolink to advance an additional sound barrier at CMF. Following a successful demonstration of steel sound barriers at the service and inspection track (pilot barriers face the Elysian Valley community), additional sound barriers will be installed on the other side of the servicing area to dampen the noise generated by idling locomotives. This investment has been repeatedly requested by the Cypress Park community.</p>			<p>1. System Reliability..... Low</p> <p>2. Ridership Increase..... Low</p> <p>3. Capacity Improvements..... Average</p> <p>4. Safety &amp; Security..... Low</p> <p>5. Environmental..... Low</p> <p>Though a sound wall does not impact the categories described above, it does comply with the agreed upon CMF Action Plan.</p>						
RISK CREATED BY NON-IMPLEMENTATION									
<p>The improvements are critical to address community concerns with operations at CMF.</p> <p>Current Age: 30 Year(s) Standard Lifespan: 30 Year(s)</p>			<p>Additional support document was submitted</p>						
BUDGET			CASH FLOW						
	AMOUNT	START	END	FY	Q1	Q2	Q3	Q4	TOTAL
CONTRACT PACKAGING	\$0			2023	\$0	\$0	\$0	\$25,750	\$25,750
DESIGN	\$0			2024	\$45,062	\$45,062	\$45,062	\$45,064	\$180,250
ENVIRONMENTAL	\$0			2025	\$38,625	\$38,625	\$38,625	\$38,625	\$154,500
ROW ACQUISITION	\$0			2026	\$38,625	\$38,625	\$38,625	\$38,625	\$154,500
MATERIAL	\$0			2027	\$0	\$0	\$0	\$0	\$0
CONSTRUCTION	\$450,000			2028	\$0	\$0	\$0	\$0	\$0
SPECIAL RAIL EQUIP	\$0								
FLAGGING	\$0								
BUS BRIDGES	\$0								
CLOSE OUT	\$0								
DBE/LABOR	\$0								
PROJECT MANAGEMENT									
* SCRRRA STAFF	\$14,000								
* PROCUREMENT STAFF	\$4,000								
* CONSULTANT	\$0								
CONTINGENCY	\$47,000								
TOTAL	\$515,000								

Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%



# PROJECT PROPOSAL

**FY23**

VEGAR PROJECT# 2576.00

## PROJECT : ENTERPRISE ASSET MANAGEMENT (EAM) IMPROVEMENT PROJECT - PHASE II

### SCOPE

TYPE: CAPITAL | MRP |

Metrolink is building out the use of Trapeze Enterprise Asset Management System (EAM) as part of an effort to consolidate a series of standalone asset management systems into a single repository in a phased approach. The Metrolink Board approved a single source procurement back in May 2021 with Trapeze Software Group to add 2 new modules, optimization, implementation services, and Organizational Change Management as part of Phase I for \$1.5M. While Phase I (Project No. 519093) has been launched in FY2022, staff anticipates the project timeline will extend beyond the current fiscal year and into FY2023. As staff works to deliver Phase I of this EAM Improvement Project, there is a possibility of potential change orders that will be needed. Approximately \$200K of this budget request would be a placeholder in the capital budget for any unexpected consulting services, interfaces, customization, and configuration needs. Furthermore, Phase II would include the purchase of additional licenses and modules, implementation services, additional Organizational Change Management support, and other expenses as needed. The modules included in Phase II include: Application Interface Programming (API), Telematics, Mobile Focus Enterprise, Network Restrictions, Linear Visualization, and Illustrated Parts Catalog. This new phase will also require the support of a project management consultant, agency staff time, and project reserve at a similar percentage as budgeted for Trapeze EAM Phase I.

In addition to building out the use of its prominent EAM System; Metrolink staff is also exploring software solutions that can be integrated in its EAM system to support prescriptive rail maintenance and allow the agency to measure the life extension and cost savings from rail grinding, milling and friction management allowing Metrolink to make well-informed investment decisions. The agency is seeking a software solution that will provide track engineering data, economics, and physics-based models that can be easily integrated into capital planning, budgeting and work execution processes. A prescriptive rail maintenance solution will enhance the agency's ability to develop the business case and identify the optimal rail maintenance strategy. This will allow Metrolink to more easily plan, approve, and fund rail maintenance, ultimately reducing maintenance costs and extending rail life and support the agency's State of Good Repair objectives. This effort combined with the investment in new modules and interfaces as part of Phase II of the EAM Improvement Project is anticipated to cost approximately \$1.7M.

Mile Posts: NA

Division: All County: ALL Asset Type: Business Systems

### OBJECTIVES

1. (Goal 1: Ensure a Safe Operating Environment) Reduce train accidents
2. (Goal 2: Maintain Fiscal Sustainability) Reduce operating cost
3. (Goal 3: Invest in People and Assets) Maintain State of Good Repair
4. (Goal 4: Retain and Grow Ridership) Improve service reliability
5. (Goal 4: Retain and Grow Ridership) Increase system utilization

### RISKS CAUSING PROJECT DELAY

### JUSTIFICATION

Metrolink is building out the use of Trapeze Enterprise Asset Management System (EAM) as part of an effort to consolidate a series of stand-alone asset management systems into a single repository in a phased approach. The Metrolink Board approved a single source procurement back in May 2021 with Trapeze Software Group to add 2 new modules, optimization, implementation services, and Organizational Change Management as part of Phase I for \$1.5M. While Phase I (Project No. 519093) has been launched in FY2022, staff anticipates the project timeline will extend beyond the current fiscal year and into FY2023. As staff works to deliver Phase I of this EAM Improvement Project, there is a possibility of potential change orders that will be needed. Approximately \$200K of this budget request would help address this potential need. Furthermore, Phase II will continue to expand the use of Trapeze EAM and include the purchase of additional licenses and modules, implementation services, additional Organizational Change Management support, and other expenses as needed. The modules included in Phase II include: Application Interface Programming (API), Telematics, Mobile Focus Enterprise, Network Restrictions, Linear Visualization, and Illustrated Parts Catalog. This new phase will also require the support of a project management consultant, Metrolink staff time, project reserve at similar percentages as budgeted during Phase I.

As noted previously, Metrolink is building out the use of its prominent EAM System and also exploring software solutions that can be integrated in its system to support prescriptive rail maintenance and allow the agency to measure the life extension and cost savings from rail grinding, milling and friction management allowing Metrolink to make well-informed investment decisions. A software solution will provide track engineering data, economics, and physics-based models that can be easily integrated into capital planning, budgeting and work execution processes. A prescriptive rail maintenance software will also allow the agency to develop the business case and identify the optimal rail maintenance strategy. This will allow Metrolink to more easily plan, approve, and fund rail maintenance, ultimately reducing maintenance costs and extending rail life and support the agency's State of Good Repair objectives.

### RISK CREATED BY NON-IMPLEMENTATION

### RANKING // PROJECT READINESS

1. System Reliability..... Average
  2. Ridership Increase..... Average
  3. Capacity Improvements..... Average
  4. Safety & Security..... Low
  5. Environmental..... Low
- This project request does not directly effect Operations in terms of Daily Service, thus the "average" System Performance score, but a new project management system will improve program delivery.

Metrolink has limited funds to invest in rail maintenance each year and needs to invest these funds in those most effective and prudent manner possible. The use of predictive rail maintenance software will provide the necessary economic and friction management data to make the sound business investment to reduce operating cost and extend the life of the rail assets. Not implementing these types of decision support tools will potentially lead to Metrolink over investing in areas that may not need maintenance or under invest areas that may need more immediate attention.

BUDGET		
	AMOUNT	START                      END
CONTRACT PACKAGING	\$0	
DESIGN	\$0	
ENVIRONMENTAL	\$0	
ROW ACQUISITION	\$0	
MATERIAL	\$0	
CONSTRUCTION	\$1,200,000	
SPECIAL RAIL EQUIP	\$0	
FLAGGING	\$0	
BUS BRIDGES	\$0	
CLOSE OUT	\$0	
DBE/LABOR	\$0	
PROJECT MANAGEMENT		
* SCRRRA STAFF	\$140,000	
* PROCUREMENT STAFF	\$133,000	
* CONSULTANT	\$72,000	
CONTINGENCY	\$155,000	
TOTAL	\$1,700,000	

CASH FLOW					
FY	Q1	Q2	Q3	Q4	TOTAL
2023	\$0	\$0	\$0	\$85,000	\$85,000
2024	\$148,750	\$148,750	\$148,750	\$148,750	\$595,000
2025	\$127,500	\$127,500	\$127,500	\$127,500	\$510,000
2026	\$127,500	\$127,500	\$127,500	\$127,500	\$510,000
2027	\$0	\$0	\$0	\$0	\$0
2028	\$0	\$0	\$0	\$0	\$0
Cash Flow is constructed based on overall % of project completion as determined by project management office. 1st year = 5%; 2nd year = 35%; 3rd year = 30%; 4th year = 30%					

SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

# CONTRACT E741B-15

## CMF MODERNIZATION AND EMF BUILD-OUT STUDY

### FINAL REPORT

TECHNICAL MEMORANDUM  
**Draft**

PREPARED FOR:



**METROLINK.**

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JANUARY 20, 2021

WSP PROJECT NO.: 28077R



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## QUALITY MANAGEMENT

	NAME	DATE
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Prepared by	Lauren German	1/18/2021
Technical Review by	Matt Geyer	1/19/2021
Quality Review by	Richard Marcus	1/20/2021
Released by	Patricia Watkins	1/20/2021

REVISION	DATE	DESCRIPTION





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## ACRONYMS

ARB	Air Resource Board
BNSF	BNSF Railway
BUILD	Better Utilizing Investments to Leverage Development
CalSTA	California State Transportation Agency
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CC	Community Concern
CE	Categorical Exemption
CEQA	California Environmental Quality Act
CHSRA	California High-Speed Rail Authority
CI	Capital Improvement
CMAQ	Congestion Mitigation and Air Quality
CMF	Central Maintenance Facility
CMU	concrete masonry unit
CP	Control Point
CRISI	Consolidated Rail Infrastructure and Safety Improvements
CS	Car Shop
DEF	Diesel exhaust fluid
DMU	Diesel multiple unit
EC	Engine Coolant
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMF	Eastern Maintenance Facility





ESD	Electrostatic discharge
EV	Electric vehicle
EVC	Ventura-East
EX	Exterior Location
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FTIP	Federal Transportation Improvement Program
FY	Fiscal Year
GB	General Building System
GHG	greenhouse gas
HVAC	Heating, ventilation, and air conditioning
KPI	Key performance indicator
LAUS	Los Angeles Union Station
LCS	Lancaster
LCTOP	Low Carbon Transit Operations Program
LED	Light emitting diode
Link US	Link Union Station
LS	Locomotive Shop
Metro	Los Angeles County Metropolitan Transportation
MMBF	Mean Miles Between Failure
MND	Mitigated Negative Declaration
MOD	Modernization



MOW	Maintenance of Way
MP	Milepost
MPK	Moorpark
MPO	Metropolitan Planning Organization
NCTD	North County Transit District
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NOFO	notice of funding opportunity
O&M	operations and maintenance
OC	Office Space
OCMF	Orange County Maintenance Facility
OE	Sustainability Opportunity
OOS	Out of Service
OSD	Oceanside
OTP	On-time performance
PM	Progressive Maintenance Tracks
POP	Program of Projects
PTC	Positive train control
PV	Photovoltaic
ROM	Rough order of magnitude
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
RVS	Riverside
RZA	urbanized areas
S&I	Service and Inspection



SB	Senate Bill
SBCTA	San Bernardino County Transportation Authority
SCAG	Southern California Association of Governments
SCO	State Controller's Office
SCORE	Southern California Optimized Rail Expansion
SCRRA	Southern California Regional Rail Authority
SF	Square feet
SO	Sustainability Opportunity
SOGR	State of Good Repair
SPS	Perris-South
SRA	State Rail Assistance
STGB	Surface Transportation Block Grant
STP	Surface Transportation Program
TIGER	Transportation Investment Generating Economic Recovery
TIRCP	Transit and Intercity Rail Capital Program
UPRR	Union Pacific Railroad
USDOT	United States Department of Transportation
VCTC	Ventura County Transportation Commission
VLM	Vertical Lift Module
VW	Volkswagen
WH	Warehouse for parts
ZEMU	zero or low emission multiple unit

# 1 EXECUTIVE SUMMARY

This study investigated modernization of Metrolink's Central Maintenance Facility (CMF) to address community concerns of noise and diesel emissions from maintenance activities, improvements to the facility to enhance operational efficiency, maintain a state of good repair (SOGR), and prepare for future fleet needs identified in a concurrent fleet modernization study. This study also reviewed all Metrolink facilities where daily fleet service and inspection is done including the Eastern Maintenance Facility (EMF) and layover yards in preparation for future modifications that could be made to support agency goals. Phase 2 plans from a 2007 EMF expansion study were reviewed for updates to a buildout of the maintenance shops to meet current and future needs.

WSP staff worked closely with Metrolink staff to identify the needs at the CMF and the EMF. The team developed alternatives to address the needs. Several meetings and workshops were held with Metrolink staff to clarify needs and receive feedback on concepts for improvements. Staff feedback was invaluable in formulating solutions.

The 30-year-old CMF is land-locked between the Los Angeles River and San Fernando Road and City of Los Angeles Taylor Yard Project to the north is operating essentially the same since service began in 1992. There is no property available to expand the yards or construct another building. It is the only maintenance facility equipped to perform heavy maintenance in the Metrolink system. Since opening, community density has increased, the number of trains maintained has grown, and the fleet equipment has changed. These changes have resulted in growing concerns by the adjacent community, inefficiencies in fleet maintenance and outdated equipment servicing areas. Investment in the facility is needed now to protect Metrolink's investment by updating the facility and prepare for future Metrolink service needs.

The WSP team has developed a list of recommended CMF projects that will modernize the facility without replacing the buildings and within the current property boundaries. The project list includes 42 CMF projects. Benefits of each project were identified as addressing a community concern (CC), a SOGR issue, operational efficiency (OE), safety, or provide an opportunity to make the facility more sustainable (SO) with most of the projects have more than one kind of benefit. Rough order of magnitude (ROM) cost estimates was developed for each project and an estimate was made for the months of duration needed to construct the project categorized into six to 12, 12 to 24, and over 24 months. For each project, Metrolink staff set the priorities of low, medium, and high with regard their need for implementation. Based on the priorities, three packages of projects were developed.

A primary package of projects contains all high priority projects. Implementing the projects of this package will address the most critical needs identified to resolve the issues at the CMF. The total amount of all project estimates represents the level of investment needed to implement all high priority projects. This package addresses all community concerns of noise and emissions and improves critical maintenance processes.

An intermediate package of projects includes the medium priority projects plus all the primary package projects. The cost estimates of the medium priority projects were totaled and added to the total of the primary package and represents an intermediate level of investment. Implementation of all the projects in this package will address all critical projects and enhance their impacts with additional improvements.

An unconstrained package of projects contains all projects of low, medium and high priority. The total amount of all cost estimates of the low priority projects is added to the total of the Intermediate package and represents the highest level of investment. Implementing all projects would address all Metrolink's current needs and prepare the facility to future needs.

Concepts were developed for the buildout of the EMF to include a maintenance building with preventive maintenance tracks for consist level maintenance, work-tables, tools and cranes for heavy maintenance, along with material warehouse and offices. Additionally, the expansion includes the addition of two new service and inspection (S&I) tracks and an overhaul building with paint shop for special projects. This expansion will double the number of trains that can be serviced and inspected at the facility and expand Metrolink's heavy maintenance capabilities to the east end of their system providing more flexibility than currently exists with all heavy maintenance only handled at the CMF. Additionally, this expansion could include maintenance for dual fleet systems, current diesel locomotives and diesel multiple units (DMUs), and can include alternative fueling provisions depending on future fleet needs. A list of nine projects was developed for this buildout with an ROM estimated for each project.

System-wide maintenance capacity was reviewed to determine where capacity exists and where potential expansion might be possible. This can assist Metrolink's future planning as passenger service markets change with the Southern California Optimized Rail Expansion (SCORE) Program, Link Union Station (US), and other Metrolink and member agency initiatives.

This study provides Metrolink and its member agencies a foundation for making improvements that will bring the Metrolink facilities up-to-date with modern tools, equipment, and process improvements. Implementing the projects will trim costs with increased operational efficiencies while resolving community concerns by lowering noise transmission and diesel emissions while also making facilities more sustainable.

A path forward section at the end of the study includes a scenario for packaging of high priority projects within time frames and calculates funding cashflow needs per six-month intervals. Discussion of environmental clearance requirements per project is included to assist with moving forward with the projects and funding opportunities are discussed to provide how to fund the projects. In addition, the final section discusses the specific projects that will make Metrolink facilities future ready.

## 2 INTRODUCTION

Metrolink has maintained its revenue equipment fleet at their CMF since service began in 1992. Located northeast of Los Angeles Union Station (LAUS), it is ideally located for commuter service that brought commuters from outlying locations in the five-county region to downtown Los Angeles during morning commute hours, with return trips during evening commute hours. Equipment is available during mid-day hours for servicing at the CMF, strategically close to LAUS, resulting in efficiently scheduled equipment maintenance operations for performing daily servicing and inspections, cleaning, fueling and repairs between morning and afternoon commute hours.

Today 23 trainsets are serviced daily Monday through Friday at the CMF during mid-day hours. Additionally, the CMF is the only facility in the Metrolink System that has the capacity to perform all FRA mandated periodic maintenance, rehabilitation and overhaul programs for fleet equipment required to maintain the fleet in a State of Good Repair. Operations at the CMF have largely been performed the same way since 1992 without an upgrade to the facility. This study explores improvements to the CMF that will modernize the facility, improve operational efficiency, and minimize community impacts.

In 2007 Metrolink's long term plans included a study for another equipment maintenance facility in the City of Colton in San Bernardino County, the EMF. The study laid out a phased implementation plan. In 2010 Metrolink built Phase 1 of the EMF for S&I and storage, with administration building and crew reporting center. In 2015 Phase 3 extended storage tracks to move San Bernardino Trains from the Old Depot to EMF for overnight storage to accommodate changes resulting from the Downtown San Bernardino Project, by San Bernardino County Transportation Authority (SBCTA). The plans for Phase 2 which included maintenance shops for heavy maintenance of locomotives and coach cars was not built.

During the first few years after the original buildout of phase 1, the EMF was leased to Rotem for the final production steps of the Rotem Crash Energy Management Coach and Cab Cars. Today, daily servicing and inspection of trainsets are performed at the EMF for 12 trainsets with additional storage capacity for an additional three trainsets. This study explores the buildout of the EMF for Phase 2 planning for future equipment needs to prepare for tomorrow's Metrolink equipment maintenance program.

Layover facilities at the end of each of the Metrolink service lines provide storage tracks for overnight storage for scheduled morning commuter trains. At the layover yards, testing and inspections are performed before trains go into service. As Metrolink service markets change under the SCORE Program and other initiatives, the staging of trains for new routes may need changes to maintenance and layover facilities to support the changes. This study explores options currently available and their potential for expansion.

This study is performed concurrently with a Locomotive Fleet Modernization Plan which is looking at alternative propulsion systems and alternative fuels for Metrolink's locomotive fleet. This study will address the accommodations needed at the maintenance facilities to accommodate the potential fleet changes.

### 2.1 OBJECTIVES

The objectives of this study directly support Metrolink's strategic goals to invest in its employees and infrastructure. Study objectives are summarized below.

#### **ADDRESS COMMUNITY IMPACTS**

The residential communities adjacent to the CMF including across the Los Angeles River have complained about noise and vibration and air quality from diesel emissions caused by activities at the CMF. One objective of this study is to clarify the community concerns and make recommendations to resolve them. The Los Angeles Metropolitan Transportation Authority (Metro) is conducting an independent Noise and Vibration Study of the CMF and surrounding communities as a parallel effort. This Metro Study will provide a community baseline of noise and vibration levels resulting from current operations at the Metrolink CMF. The Study will be able to pinpoint the origins of the highest noise and vibration events and the level at which these noises and vibrations are heard and felt in the surrounding communities. The results of the Metro Study are being shared with this technical team to identify potential mitigating measures to the noise and vibration impacts in the community.

## **RECOMMEND IMPROVEMENTS TO THE FLEET MAINTENANCE FACILITIES**

The 30-year-old CMF needs improvements that will modernize the facility to support enhancements in functionality and productivity of the fleet maintenance program. The expansion of the EMF to include heavy maintenance shops and additional service and inspection tracks will provide flexibility to the existing maintenance operations. An overview of the Metrolink Network of maintenance and layover facilities will assess the overall capacity for fleet inspection, repair, storage and rehabilitation.

## **EXPLORE IMPROVEMENTS THAT SUPPORT AGENCY GOALS**

This study takes into consideration Metrolink's initiatives and goals near term, and in the future, a concurrent Locomotive Fleet Modernization Plan, SCORE Program and other projects that interface with maintenance facilities.

## **DEVELOP CONCEPTS**

Develop engineering drawings of recommended improvements that can be implemented with minimal impacts to the maintenance operations and passenger service and are scalable to various levels of implementation.

## **PROVIDE SUPPORT DOCUMENTS**

Prepare supporting information that focuses on the benefits of the improvements to the Metrolink infrastructure and the efficiency of maintenance operations that can be used to obtain buy-in from member agencies and provide the basis for grant applications.

## **2.2 APPROACH**

Due to Covid-19 restrictions site visits and in-person meetings were limited. However, we were still able to hold highly effective virtual meetings. The WSP team held several workshops and meetings with Southern California Regional Rail Authority (SCRRA) teams to establish the existing conditions and needs and to receive feedback on concepts. These meetings allowed for input throughout the study from the main users of the equipment maintenance facilities, and other teams including government relations, engineering and construction, grants, facilities maintenance, materials handling, track and signals maintenance of way. We received invaluable feedback from Metrolink staff from these meeting and reviews.

We participated in one virtual meeting that Metrolink held with the CMF Community in September. In the meeting we discussed the community concerns as we understood them and possible solutions and gave the community an opportunity to comment on them. Minimal comments were received, but we believe that in general, our understanding of the community concerns was affirmed.

The approach to performing the study involved five general phases. Phase 1 focused on gathering and documenting the existing conditions. This involved virtual tours of facilities, one in-person site visit and a few video tours of the facilities. Many meetings with Metrolink staff were held to confirm the understanding of the conditions and use of the facilities. A series of meetings were held with different SCRRA functional teams to focus on their needs for changes and improvements to the facilities and coordinate with other projects related to the study. In this phase we documented the existing conditions and created a needs assessment of the facilities.

In a second phase we explored ways to address the items identified in the need's assessment. For the CMF we focused on facility improvements that would improve the efficiency of maintenance operations and mitigate the community concerns. For the EMF Buildout we reviewed original plans for the maintenance shops prepared several years ago and determined how they could be modified to meet the current state of the art and changed Metrolink needs including those most likely to be needed in the future.

In the third phase we evaluated alternatives for improvements and made some recommendations for changes. We held focused meetings with SCRRA Teams to discuss the concepts and get feedback. We incorporated the feedback into the recommendations.

In Phase 4 we drafted concepts drawings to depict recommended improvements, and prepared project lists with priorities set by Metrolink staff. Our team was asked to consider all improvements in the study and not rule anything out, however, to create three different levels of investments. We categorized the projects into three Packages. A package of Primary projects includes projects that have high priority to Metrolink in its current operating environment. An Intermediate Package of

projects contains projects with a medium priority to the current environment added to the projects in the Primary Package. A Third Package representing the maximum level of investment in an Unconstrained package of projects contains all the projects since it assumes an unconstrained budget to perform improvements. Cost estimates and timeframes for completion of each individual project were developed. Additionally, for each project an assessment was done as to whether the project would contribute to addressing community concerns, the level of State of Good Repair, Operational Efficiency, Safety and provide an opportunity to enhance the sustainability of the Metrolink Facilities. Capacity planning for the network of maintenance facilities and operations is also included in Phase 4.

In Phase 5, we developed a draft final study report to document the study outcomes and deliverables and make recommendations to Metrolink for moving forward with projects with funding possibilities and consideration of environmental clearance needs.

## 2.3 CONTENTS

In the remaining sections of this report, we discuss details of the CMF Modernization Study and EMF Buildout.

In Section 3, we describe the existing conditions at the Metrolink Maintenance Facilities. An Existing Conditions Report completed early in the study summarizes all the findings. Rather than repeating the entire Existing Conditions Report, we have included the entire Report as an attachment to this study and only include portions of it in this Final Study. The full report is contained in **Appendix A**. Results from investigating the existing conditions and meetings with SCRRA staff are summarized in Needs Assessment Tables contained in this section.

In Section 4, we discuss a variety of improvement alternatives that address the needs identified in Section 3 for the CMF. For each improvement alternative we included a concept drawing of the specific area. For each improvement concept an Item Identifying number was assigned consisting of a two-letter acronym for area of the facility and a number. The area identifiers for the CMF are:

- CS: Car Shop
- EX: Exterior Location
- GB: General Building System
- LS: Locomotive Shop
- OC: Office Space
- PM: Progressive Maintenance Tracks
- SI: Service and Inspection Track
- WH: Warehouse for Parts

In Section 5, we discuss how the Metrolink maintenance facilities would need to be accommodated to address alternative propulsion types and their fuel systems.

In Section 6, we discuss projects that are planned or underway by Metrolink, a member agency or other organization that will have a direct impact on the maintenance facilities and the improvements discussed in the report.

In Section 7, we have created projects from the improvements considered. Based on feedback from SCRRA staff we have packaged the projects into three levels of investment.

In Section 8, we discuss the benefits that could result from implementing the projects.

In Section 9, we provide some ways to move the project forward by discussing ways to package the projects, what environmental clearance needs would be expected and possible funding avenues.



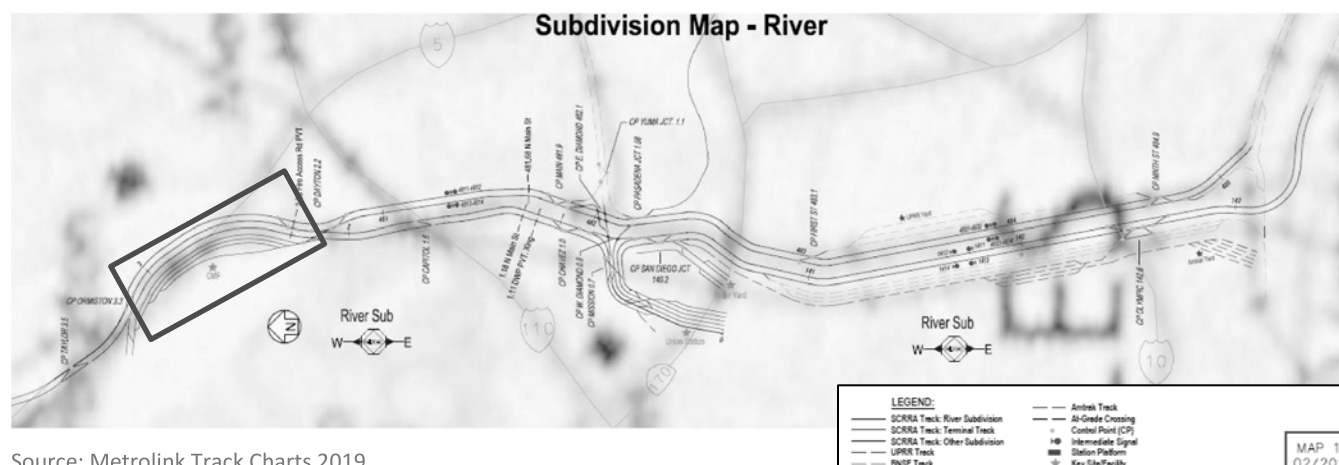
## 3 BASELINE CONDITIONS

### 3.1 EXISTING CONDITIONS

#### 3.1.1 CENTRAL MAINTENANCE FACILITY

The Metrolink CMF is located north of downtown LA between San Fernando Road and the Los Angeles River on a portion of a historical freight yard known as Taylor Yard, previously owned by Union Pacific Railroad (UPRR), which has serviced locomotives and rail cars since the 1920s. The CMF was built in the 1990s to service the newly formed Metrolink commuter rail system. The CMF's location on the Metrolink River Subdivision, west of LAUS, as shown in Figure 1, was strategically located to service trains arriving and leaving LAUS for commuter passenger service in a six-county Southern California region.

Figure 1: River Subdivision Map



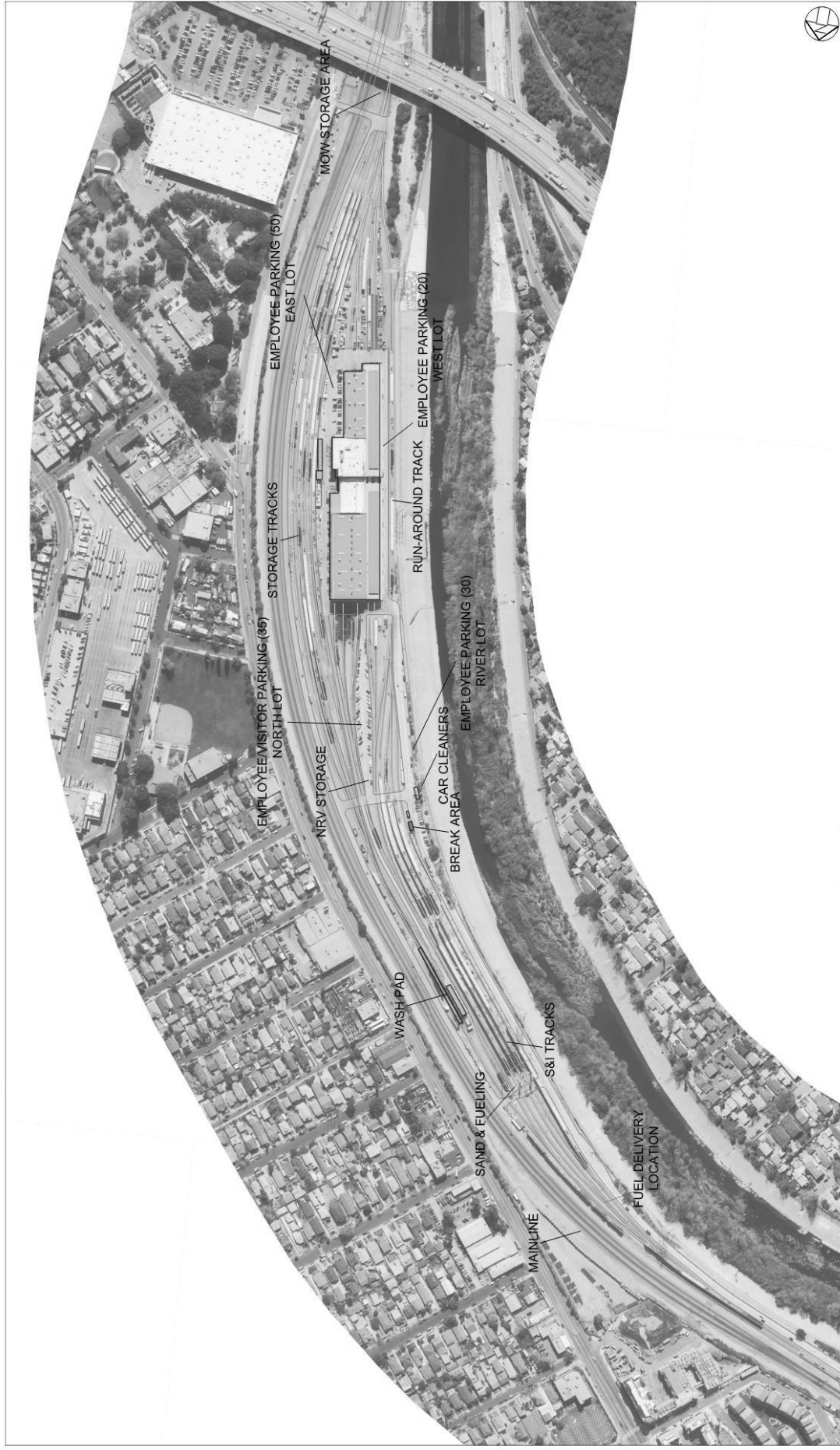
Source: Metrolink Track Charts 2019

The CMF was originally Metrolink's sole maintenance facility with some services being provided at outlying areas until the EMF was built and put into service about 10 years ago. Figure 2 shows the track chart overview of the CMF, with closer views shown in Figure 3 and Figure 4. The facility has five storage tracks with an average length of 1,800 feet. Two trains currently are stored here overnight, but capacity exists for approximately 15 trains to be stored overnight. The facility has four S&I tracks and a runaround track. There are two progressive tracks that run through the west side of the building and two stub-end tracks that enter south end and three stub-end tracks that enter the north end of the building.

The sole rail entrance into the facility is via Control Point (CP) Dayton and then into a yard lead at the south end of the property off the East Bank of the River Subdivision. Vehicle access is off San Fernando Road onto Kerr Road which leads to a private road onto west side of the property. Within the CMF property the private road continues south, circles around the maintenance facility building and reconnects with the entrance road. There are also on-site track access roads along the east and west side of the storage and S&I tracks.

The maintenance building is split into five different areas each with their own function; locomotive shop, car shop, progressive maintenance tracks, materials warehouse, and office space which covers approximately 112,000 square feet (SF) in total. The locomotive shop covers approximately 28,000 SF on the north side of the building and features the highest roof clearance level within the building. To the south of this shop area is the materials management area which covers approximately 12,000 SF separated into two storerooms separated by a hallway leading from the locomotive shop into the 1st floor office area. The south end of the building houses the car shop, this shop covers approximately 14,000 SF and is used for the maintenance of unpowered coach cars. Located between the car shop and material management area is a two-floor office space area for contractors and Metrolink employees. The first floor and second floor office spaces/equipment rooms cover approximately 13,500 SF each. The progressive maintenance tracks stretch the entire length of the building covering approximately 42,000 SF. This section of the building is designed to allow air flow from outside to pass through the structure. The west side of the tracks has a fence like structure between the columns and allows for exterior light and air flow.

Figure 2: CMF - Overview Track Chart



Source: WSP using Google Earth Background

Metrolink CMF Facilities Modernization and EMF Buildout Study

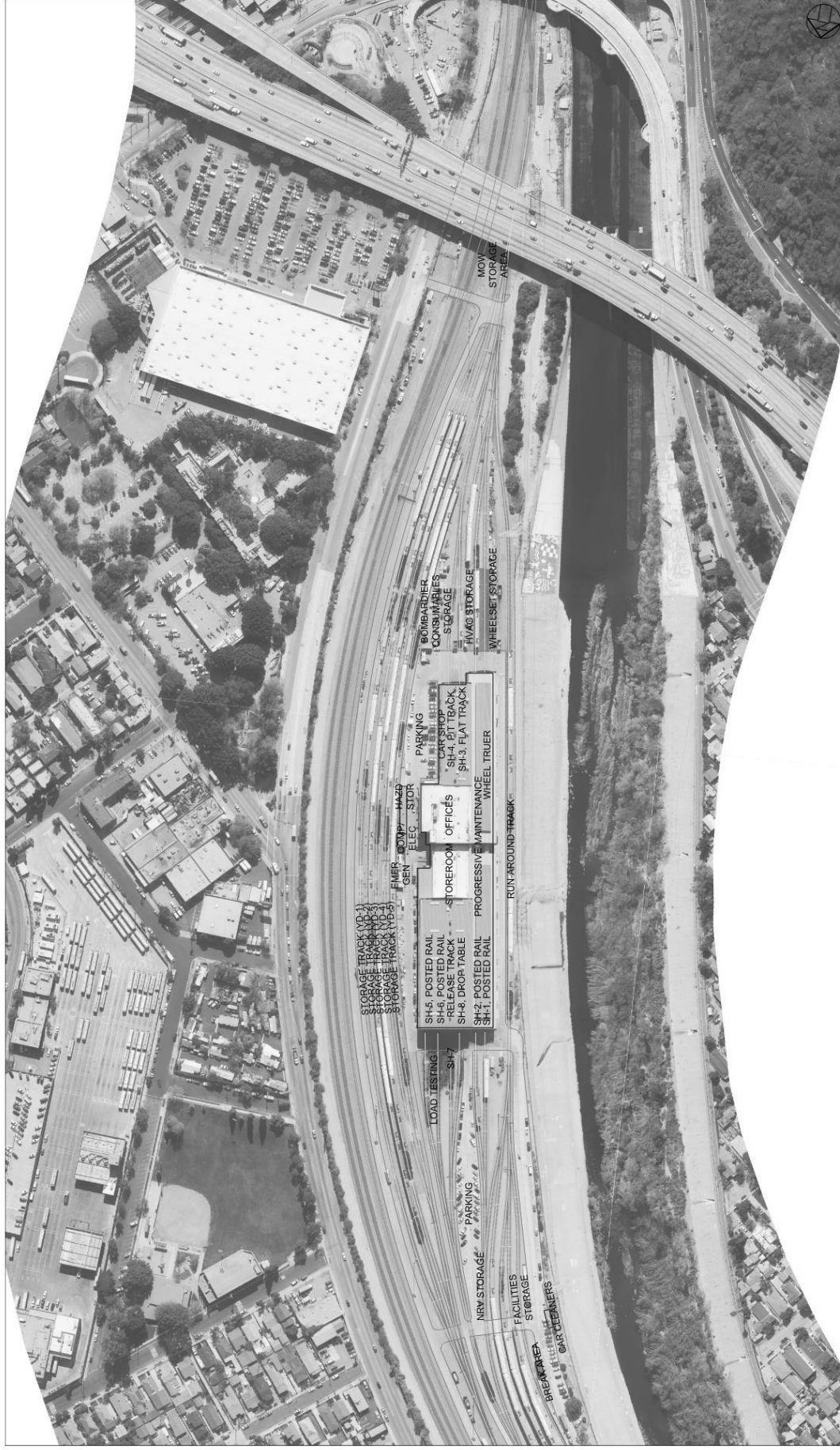
Figure 3: CMF - North End Track Chart



Source: RSE/WSP

Metrolink CMF Facilities Modernization and EMF Buildout Study

Figure 4: CMF - South End Track Chart



Source: RSE/WSP

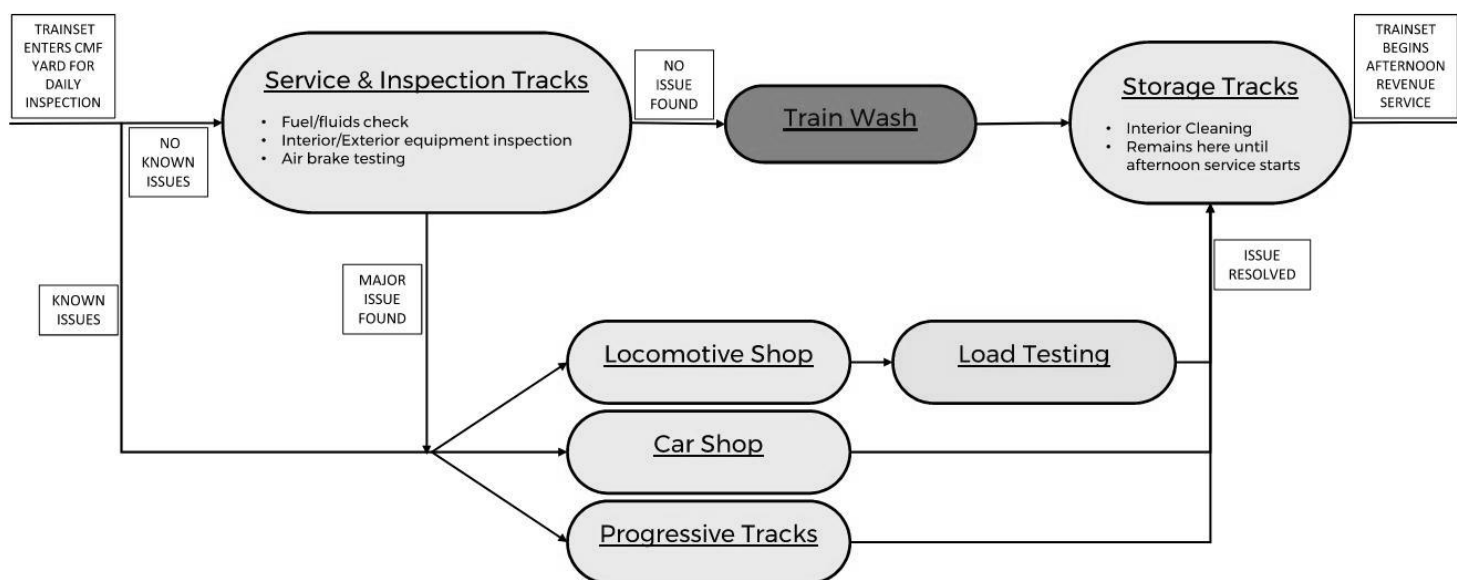
## OPERATIONS

All trains enter the CMF from the south via the river track, which parallels the LA River. Following early morning peak runs, nearly all Metrolink trains arrive at CMF to be inspected, tested, fueled, dumped, cleaned and serviced for afternoon departures. Trains are fueled prior to departure in the locomotive fueling area at the north of the facility. When possible, locomotives are transferred to ground power where then servicing and cleaning is performed. Service and inspection is usually completed in 45-60 minutes but may take longer depending on equipment arriving for service, as any defects needing to be addressed prior to departure are corrected. During the inspection and testing process, the locomotives are required to be running to perform various functional tests mandated by the Code of Federal Regulations 49 Parts 200-299.<sup>1</sup>

Central Maintenance Facility functions include:

- Daily Service & Inspection
- Heavy Locomotive Repair
- Heavy Car Repair
- Wheel Truing
- Preventive Maintenance
- Scheduled Maintenance
- Train Wash
- Overnight Storage
- Transportation
- Metrolink Office Space
- Material Management

Figure 5: CMF Daily Service & Inspection Flow Chart



Source: WSP

Central Maintenance Facility work groups include:

- Metrolink Management Staff
- Transportation (contractor)
- Maintenance (contractor)
- Material Management

<sup>1</sup> <https://metrolinktrains.com/community-main/cmf/>



The EMF, located in Colton, was constructed over 10 years ago and functions as the second of Metrolink's two facilities for service, inspection, and repair. The EMF is located on the east end of the Metrolink Short Way Subdivision, which is between the Metrolink San Gabriel Subdivision and the BNSF Railway (BNSF) San Bernardino Subdivision (Figure 6).

**San Gabriel Sub**

W E

N

**LEGEND:**

- SCRRRA Track: San Gabriel Subdivision
- SCRRRA Track: Other Subdivision
- UPRR Track
- BNSF Track
- At-Grade Crossing
- Control Point (CP)
- Intermediate Signal
- Station Platform
- Key Site/Facility

**Map Details:**

- San Gabriel Sub:** 45, 45.40 Calabas Ave, CP KAUSER 45.6, 47.16 Birch Ave, CP BEECH 47.5, 48.17 Citrus Ave, 48.94 Juniper Ave, 48.19 Santa Ave, 49.44 Mango Ave, 49.69 Palmetto Ave, 50.19 Alder Ave, 50.69 Locust Ave, CP LOCUST 50.7, 51.44 Cedar Ave, 52.19 Cactus Ave, 52.44 Lilac Ave, 52.59 Willow Ave, 52.64 Riverside Ave, 53.19 Sycamore Ave, 53.45 Acacia St, 53.70 Eucalyptus Ave, 53.85 Pepper Ave, 53-532, 54.54 Radio Ave, 55.24 Radio Ave, CP SHORTWAY 55.6, CP RAIL 1.1, 55.24 Radio Ave, CP RANCHO 55.3 (ACT. BNSF), CP VERNON 56.3/0.3, CP KENDALL 56.7, 56.08 W 2nd St, 57.14 White Ave, 57.57 S E St, 57.54 Arrowhead Ave, 58.21 Sierra Way, 58.71-58.72, 58.70 E Mill St, 58.11 E Central Ave, 60.9 TROPICANA STATION (DMU Service Only), 61.81-61.82, 60.911 Tropicana Ave, CP RANCHO 60.9/0.14, 61.33 Richardson St, 61.34-61.34, 61.27 Mountain View Ave, 63.00 California St, CP NEWPORT 63.30, 63.50 Newport St.

**Map 18**  
05/2019

The EMF relocated train storage and servicing from the San Bernardino Santa Fe Depot station area, allowing improved efficiencies at CMF. The EMF was split into three phases, but only two phases (Phase 1 and Phase 3) have been built to date. Phase 1 was designed to allow for improved servicing, cleaning, and fueling of trains operating on the San Bernardino and IEOC lines. Phase 1 built out the four storage tracks with full aisle access to accommodate S&I, ground power stations, the runaround track that enables continuous access from one end of the yard to the other, and the train wash. Phase 1 allowed equipment stored overnight at EMF to receive complete daily servicing overnight instead of at CMF, relieving congestion pressure at CMF. Phase 3 in 2012 increased train storage capacity. The EMF was also used for storage of the PTC test train and various aspects of PTC testing. The current configuration of the EMF is shown in the track chart overview (Figure 7).

Metrolink CMF Facilities Modernization and EMF Buildout Study

Figure 7: Overview Track Chart of EMF



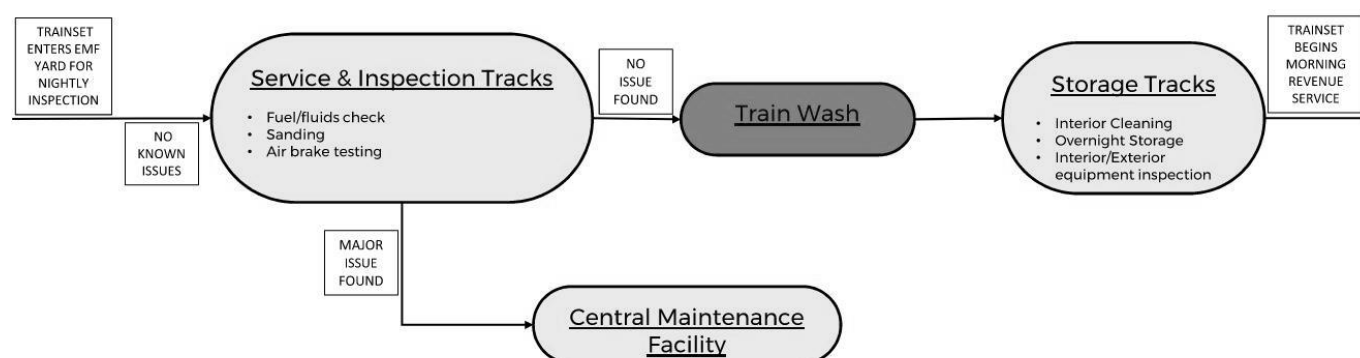
Source: RSE/WSP

## OPERATIONS

EMF Functions include:

- Nightly Service & Inspection
- Light Locomotive Repair
- Light Car Repair
- Train Wash
- Overnight Storage
- Transportation
- Maintenance of Way (MOW) (signal and track)

Figure 8: EMF Daily Service & Inspection Flow Chart



Source: WSP

EMF Work Groups:

- Metrolink Management Staff
- Transportation (contractor)
- Maintenance (contractor)
- MOW

## 3.2 NEEDS ASSESSMENT

### 3.2.1 CENTRAL MAINTENANCE FACILITY

Table 1 provides an overview of the needs at the CMF by detailing issues, impacts of these issues and potential solutions to be investigated. Improvement Categories include:

- State of Good Repair (SOGR) – Ongoing Facility Repairs
- Modernization (MOD) – Smaller Facility Improvements (operational funds)
- Capital Improvement (CI) – Larger Facility Improvements (capital funds)
- Community Concern (CC) – Facility Improvements with Community Focus
- Sustainability Opportunity (SO) - Potential for Incorporating Sustainable Features



**Table 1: Needs at CMF**

DEPARTMENT / AREA	ISSUE	IMPACTS	POSSIBLE SOLUTION	TYPE OF IMPROVEMENT
<b>Community Concerns</b>				
Locomotive Noise	Vehicle load testing and engine idling is very loud	Noise in adjacent community	Sound walls/barriers, loco run up enclosed sheds, additional ground power, hood technology, equipment improvements, operational changes	MOD, CI, CC, SO
Yard Noise	Early morning trains, work on S&I tracks	Noise in adjacent community	Double pane windows, sound walls (Photovoltaic (PV) Panels), change in operations, move some operations to EMF, use vegetation and shrubs to block sound	CI, CC, SO
Emissions	Air quality and health concerns		Additional ground power, hood technology, roof top solar panels, equipment improvements, operational changes	MOD, CI, CC, SO
	Locomotives Emissions		Convert all remaining Tier 2 locomotives to Tier 4	MOD, CI, SO
	Rail Car Mover Emissions		Purchase additional zero emissions equipment	MOD, CI, SO
<b>Mechanical</b>				
S&I Tracks	Length good for two four-car sets	Longer consists can't be doubled up	Consider reconfiguration a couple of tracks for longer consists	MOD, SO
	Orientation of loco with future changes (SCORE)	Fuel, sand, fill & dumping vehicle ports don't line up	Consider reconfiguration of services independent of loco end	MOD, SO
	Sanding towers frequent maintenance & need safety ladders for fall protection	Sand boxes maintenance issue and service personnel need fall protection	Provide better fall protection and consider outsourcing sanding system maintenance	SOG, CC, SO
	Damage of ground power receptacles and cables stolen	Damage, tripping hazards debris	Consider reconfiguring for overhead gantry cranes for 480V cables	SOG, MOD, CI, CC, SO
	Breakers need replacement	Operational inefficient	Update equipment	SOG

DEPARTMENT / AREA	ISSUE	IMPACTS	POSSIBLE SOLUTION	TYPE OF IMPROVEMENT
	Lubricant and coolant totes open to elements and other components	Environmental issue	Need enclosed area	SOGR, MOD, SO
	Additional storage tanks and reels for lubricant diesel distribution	Operational inefficient	Provide more flexible servicing	MOD, SOGR
	No remote monitoring of Diesel exhaust fluid (DEF) and diesel tanks	Inventory control	Add remote monitoring	MOD, SOGR
	No proper washroom facilities	Crews using railcar bathrooms	Locate new facilities close to workers	MOD, SO
Progressive Maintenance (PM) Tracks	Not used for consist-level maintenance	Would allow use of tracks sized for six-car consists and allow consist-level maintenance	Revisions needed to use out of service features and rearrangement of current use	MOD, CI, SO
	Unable to drop wheelset if needed	Trainsets must be broken up and cars moved into the car shop	Add split rail & jacks	MOD
	Inefficient operations – coaches only serviced here, without vehicle roof access platforms	Modify track accessories to accommodate consist maintenance practices	PM tracks servicing coaches only without vehicle roof access platforms	MOD, CI
	Rotor replacements not performed on PM tracks due to weight of rotors	Purchase or fabricate a portable rotor lifting device	Rotor replacements not performed on PM tracks due to weight of rotors	MOD
	Cannot perform wheel changeouts since missing spit rail & jacks to drop wheelset needed for consist level maintenance	Limits functionality of progressive tracks	Split rail for wheel changeout	MOD
	No crane available for vehicle maintenance	Cars must be re-shopped if crane is needed for maintenance	Investigate adding a bridge crane to PM tracks	CI
	Unused embedded rail along east side of PM tracks	Tripping Hazard/Safety Concern	Investigate filling or removing rail	MOD, CI
Wheel Truing	Conveyor chip removal may need replacement and metal shavings need cover	Reduced production rate and potential environmental fines	Investigate replacement of conveyor	SOGR, SO

DEPARTMENT / AREA	ISSUE	IMPACTS	POSSIBLE SOLUTION	TYPE OF IMPROVEMENT
	Equipment Location	Interference with PM track maintenance	Add a second wheel truing machine at the EMF so this one may be relocated	MOD, CI
Load Testing	Occurs on S&I tracks and outside of loco shop	Testing last 10-20 minutes resulting in community complaints	Enclose with ventilated hoods or relocate behind sound walls	CI, CC, SO
Electrical switchgear	Needs upgrades	Disruption to servicing	Bring up to date	SOG
Loco Shop	Air exhaust fans no longer run automatically	Safe work environment	Repair control system	SOG, SO
	Fall protection needs vary by area, some interference by cranes, needs to match all loco sizes	Safe work conditions	Update fall protection systems	SOG, MOD
	East track only vehicle roof access platform steel guardrails heavy to lift	Safe work conditions	Replace with aluminum	SOG, MOD
	Some highly used lubricants are not being centrally distributed and/or collected	Improves working conditions	Expand central distribution capacity	MOD
	Limited use of electronic files available to mechanics	Inefficient operations	Provide workstations and tables with charging stations in shops	MOD
	Missing anti-freeze storage and disposal		Add storage and waste tanks	MOD
	Drop Table damage	Could prevent future replacement of parts	Repair or replace drop table	SOG, CI
Shop Tracks	Re-shopping	Operational efficiency	Evaluation of manpower efficiency vs use of PM tracks	MOD, CI
Car Shop	Fall protection concerns for vehicle roof access and window replacement scaffolding	Safe work conditions	Replace temporary scaffolding with permanent fall protection	SOG, MOD

DEPARTMENT / AREA	ISSUE	IMPACTS	POSSIBLE SOLUTION	TYPE OF IMPROVEMENT
Train Wash	Two to three afternoon trains not washed daily. Reclaim water system nonfunctional. PVC pipes sun damaged.	Requires scheduling to make sure washed every other day	Relocation of Train Wash, replace water reclaim system, adjust operations to get each trainset washed at least every other day	MOD, CI, SO
	Wash is open pit	No longer meets storm water guideline	Replace wash pad with concrete	MOD
Move to Predictive Maintenance	Current Maintenance based on FRA regulations	Some maintenance occurring after failures causing inefficient operations	Requires rethinking workflows	MOD
	Review new technologies	Make maintenance, inspection and testing more efficient	Examples: Wheel Diagnostic Tool, rugged tablets for mechanics, all manuals available electronically	MOD
Office Spaces	Mix of contractor and SCRRRA staff on floors. Office spaces needed for Managers and Supervisors of Mechanical, Materials, Facilities, Project Management, Transportation, crew briefing and PTC vendor	Inefficient operations and time lost due to contractors needing to take breaks and use lockers upstairs	Locate contractors on different floors than SCRRRA staff, reconfigure office space. Consider adding crew area to avoid hotels in future	MOD, CI
<b>Material Storage and Handling</b>				
Storage areas	Insufficient storage space	Limits bulk purchases for price breaks. Decentralizes storage.	Reorganize facility for more space or expand vertically	MOD, CI
Several locations	Storage spread out in several areas interior and exterior	Inventory control poor and access to material time consuming	Reorganize space to create one large warehouse or consider satellite warehouse	MOD, CI
The Lean (Old Loading Dock)	Congested (requiring shuffling of pallets on floor) and separated from Bulk Stores	Inefficient material handling	Move storage to other location	MOD
Yard – south end of PM Tracks	Wheel Garden inventoried parts	Inefficient handling of shipping out repairs	Locate securely next to a new loading dock	MOD
Bulk Stores	At capacity	Limits bulk purchases for price breaks	Create more contiguous storage space	MOD, CI

DEPARTMENT / AREA	ISSUE	IMPACTS	POSSIBLE SOLUTION	TYPE OF IMPROVEMENT
	Parts retrieval from mezzanine level	Inefficient material handling	Use Vertical Lift Module (VLM)	MOD
	Safety issues with manual retrieval up stairs	Ergonomics	Use VLM	MOD
	Circulation aisles narrow and congested	Inefficient material handling	Enlarge and reorganize space	MOD, CI
	Some vertical clearance interference by ceiling hung building systems	Decreases storage space	Reutilize low clearance areas for other functions	MOD
	No direct access to room from exterior	Inefficient material handling	Design new direct access from exterior with loading dock	CI
Deliveries	No loading dock for bulk deliveries	Inefficient material handling of deliveries and shipments by forklifts	Direct access to exterior with loading dock	CI, SO
Fenced Storage Area (Old Shipping/Receiving)	No dedicated area for staging components for repair/rebuild Cores & repairs mixed in same area	Inefficient handling of repairs	Create organized area for in/out flow for components rebuilt off-site	MOD
Concrete masonry unit (CMU) building across vehicle lane	Battery storage with hazmat materials and high-pressure cylinders	Battery inventory poor, constant reconciling	Provide limited access to inventory	MOD, SO
Large Parts Shipments Loco Shop	Traction motors, wheelsets and combos use crane in loco shop for loading/unloading onto flatbed truck	Area cleared with coordination between Materials and Mechanical for loading/unloading	Provide another means for flatbed trucks to get under crane that doesn't interfere with maintenance activities	MOD, CI
Storeroom's one parts window	Inconvenient to shop floor	Inefficient parts retrieval	Consider parts ordering thru kiosks on the shop floor and devise more efficient distribution method	MOD
Storeroom location to Car Shop	Inconvenient to shop floor	Inefficient parts retrieval	Provide easier means of egress between Material Warehouse and Car Shop	MOD, CI
Lubricant storage	Supplier manages inventory	Lack of inventory control	Provide tank monitoring system for storeroom personnel	MOD, SO

DEPARTMENT / AREA	ISSUE	IMPACTS	POSSIBLE SOLUTION	TYPE OF IMPROVEMENT
Component Staging Areas	No area for staging components from store for mechanics	Inefficient parts retrieval	Reorganization of facility and/or expand building	MOD, CI
<b>Yard</b>				
Equipment Storage	Little space for the storage of single revenue vehicles	Inefficient operations; building of trains is difficult	Investigate adding rail storage separate from trainset storage tracks	CI
Yard Pavement	Vehicle traffic passes in front of loco shop	Safety concern	Relocate road to the north	MOD, CI
	Lack of pavement in work area	Requires vehicles to be brought into the shop for certain repairs	Additional paving on tracks in “Work Areas”	MOD, CI
Staff Vehicles	Insufficient employee parking, no charging stations, no non-revenue vehicle storage	Extremely limited visitor parking adjacent to the building and general inconvenience	Relocate yard containers, trailers and vehicle components or investigate potential remote lot with personnel bridge or underpass, charging stations	MOD, CI, SO
Vehicle and Truck Circulation Patterns	Current roadway around facility severely restricted for truck deliveries	Inefficient operations	Consider alternate routes for vehicles and truck deliveries	MOD, SO
Wi-Fi Access	Limited Wi-Fi Access around the yard	Supervisors and mechanics may not have immediate access to information required.	Investigate expanding access via network boosters in specific areas around the property	MOD
Lighting	Verify use of low energy lighting in yard	Operational costs	Use LED lighting	MOD, SO
<b>Building Systems</b>				
Fire System	Fire system in main building needs replacement	Safety concern	Replace	SOG, SO

DEPARTMENT / AREA	ISSUE	IMPACTS	POSSIBLE SOLUTION	TYPE OF IMPROVEMENT
Occupancy sensors needed for shops	Inefficient operations	Add sensors to lighting system	Occupancy sensors	SOGR, SO
Ventilation	Shop ventilation louvers worn out	Poor air quality	Replace louvers and reconnect for automatic fan operations	SOGR, SO
Fall Protection	New fall protection for roof maintenance	Safety concern	Investigate new fall protection equipment/procedures	MOD
High Energy Consumption	High power demand for facility	Cost concern	Investigate adding solar panels and battery storage	MOD, CI, SO
HVAC	Roof HVAC Unit (1 <sup>st</sup> floor unit only)	Inefficient and lead to poor working environment	Replace units	SOGR, SO
Building Modifications	Introduction of Hydrogen rail cars, Diesel multiple units (DMUs)	New requirements with new vehicle types	Evaluate future needs of technology for modifications	CI, SO

Source: WSP

### 3.2.2 EASTERN MAINTENANCE FACILITY

Table 2 provides an overview of the needs at the EMF by detailing issues, impacts of these issues, and potential solutions to be investigated. Improvement Categories include:

- State of Good Repair (SOGR) – Ongoing Facility Repairs
- Modernization (MOD) – Smaller Facility Improvements (operational funds)
- Capital Improvement (CI) – Larger Facility Improvements (capital funds)
- Community Concern (CC) – Facility Improvements with Community Focus
- Sustainability Opportunity (SO) - Potential for Incorporating Sustainable Features

**Table 2: Needs at EMF**

DEPARTMENT / AREA	ISSUE	IMPACTS	POSSIBLE SOLUTION	TYPE OF IMPROVEMENT
<b>Community Concerns</b>				
	Locomotive Noise	Vehicle load testing and engine idling is very loud	Sound walls/barriers, loco run up enclosed sheds, additional ground power, hood technology, equipment improvements, operational changes	CI, CC, MOD, SO

DEPARTMENT / AREA	ISSUE	IMPACTS	POSSIBLE SOLUTION	TYPE OF IMPROVEMENT
	Emissions	Air quality and health concerns	Additional ground power, hood technology, roof top solar panels, equipment improvements, operational changes	MOD, CI, CC, SO
<b>Mechanical</b>				
Maintenance Building	Leadman or maintenance office in new shop on ground floor	For better supervision	To incorporate in the shop design	CI
	Maintenance capabilities like a mini-CMF	Abilities to switch out fans, HVAC units, radiators, wheelsets	Provide progressive maintenance tracks and outfit them appropriately	CI
	Wheel True machine and drop table	Having these functions at the EMF will greatly reduce re-shopping to the CMF	Provide both functions at the EMF	CI
	Paint Vehicle body repair	No enclosed properly equipped site at CMF or EMF to paint cars and locomotives and make repairs to car bodies	Vehicles must be shipped out for repairs. Down times are much longer	CI
Welfare Areas	Mechanics need full length lockers	Mechanics have a lot of gear	Provide full length lockers in new EMF Shop building	CI
	No room for crew expansion, or track and signal crews	Need to address future needs	Address in conceptual design of maintenance building	MOD, CI
	No Signal and Track crew space	Need to address future needs	Address in conceptual design of maintenance building	CI
S&I Tracks	Two S&I tracks with six-car capacity	Having to index trainsets would be problematic	Design to allow for a six-car spot S&I	MOD, CI
	Low Water pressure from City Main	After expansion of S&I, water pressure will be too low to function properly	Investigate solutions such as a buster pump or storage tank to achieve needs	SOG, MOD
	Fueling capabilities at both ends of S&I tracks for future	Having to index trainsets with locos on wrong end would be problematic	To investigate	MOD, CI
<b>Material Storage and Handling</b>				
Storage areas	Small storage building with white roof not waterproof	Was intended to be a temporary structure for vehicle delivery	Will be replaced in buildout recommendations	MOD, SO



DEPARTMENT / AREA	ISSUE	IMPACTS	POSSIBLE SOLUTION	TYPE OF IMPROVEMENT
	Parts storage for replacement components	Don't want to send a runner to the CMF for every service requirement	Provide ample secure area to allow for efficient servicing of vehicles	CI
<b>Yard</b>				
Equipment Storage	Little space for the storage of individual revenue vehicles	Inefficient operations; building of trains is difficult	Investigated adding rail storage separate from trainset storage tracks	CI
Tail Tracks	Track retarder does not work properly	Trainsets sometimes are not able to move past retarder on tail tracks	Build bumper at end of track (check capacity)	MOD
Yard Pavement	Pavement Repair at Washer	Water damage to asphalt at the entry to the vehicle washer. Problem will become more severe if not addressed	Repair pavement	SOGR
Water runoff problems	Continuous monitoring is required	Site flooding/damage	To investigate storm water recapture systems	MOD, SOGR, SO
Fueling	Fuel capacity	Current needs met	Consider adding more	MOD, CI
<b>Building Systems</b>				
High Energy Consumption	Site Power	High power demand for facility	Investigate adding solar panels and battery storage	MOD, CI, SO

Source: WSP

### 3.3 OUTLYING FACILITIES

Metrolink relies on more facilities than just the CMF and EMF. Basic daily servicing and cleaning is performed at seven outlying layover facilities with mechanical servicing at five of the seven prior to returning to trains to service. Mechanical servicing includes inspection of the rolling stock in compliance with the requirements of 49 CFR Parts 229 and 238. Keller Yard has potential layover capacity as well but is not being currently used for this purpose. The location and capacity of each outlying facility is outlined in Table 3.

**Table 3: Outlying Facilities and Overnight Layover Capacity**

OUTLYING FACILITY	LAYOVER LOCATION (SUBDIVISION: MILEPOST (MP))	PHYSICAL ADDRESS	NUMBER OF TRACKS	TRACK LENGTH (FEET)	OVERNIGHT STORAGE (# OF TRAINSETS)	POTENTIAL CAPACITY (# OF TRAINSETS)	WASTEWATER DUMPING AVAILABLE
Ventura-East	Montalvo MP 403.3	6175 Ventura Blvd. Ventura, CA 93003	1	1,056	3	3	Yes
Moorpark	Ventura MP 426.97	585 Moorpark Ave. Moorpark, CA 93201	4	612 595 583 608	1	4	No

OUTLYING FACILITY	LAYOVER LOCATION (SUBDIVISION: MILEPOST (MP))	PHYSICAL ADDRESS	NUMBER OF TRACKS	TRACK LENGTH (FEET)	OVERNIGHT STORAGE (# OF TRAINSETS)	POTENTIAL CAPACITY (# OF TRAINSETS)	WASTEWATER DUMPING AVAILABLE
Lancaster	Valley MP76.6	44812 N. Sierra Hwy Lancaster, CA 93534	2	1,800 (each)*	6	8	Yes
Riverside-Downtown	BNSF San Bernardino MP 61.6	4066 Vine Street Riverside, CA 92507	2 (platform) 2 (siding)	1,500 (platform)* 550 (siding)	7	7	Yes**
Perris-South	Perris Valley MP 85.4	1304 Case Road Perris Valley, CA	3	Track 2: 1,582 Track 3: 1,580 Track 4: 1,803	4	8	Yes
Oceanside (Stuart Mesa)	San Diego MP222.1	810 Mission Ave. Oceanside, CA 92054	4	1,600*	5	5	Yes**
Keller Yard	River MP 140	720 Keller Street Los Angeles, CA 90012	5	600 (4 tracks) 900 (1 track)	0	5	Yes

Source: WSP

\*AVERAGE TRACK LENGTH

\*\*NOT ON ALL TRACKS

### 3.4 MAINTENANCE OF WAY

MOW storage is dispersed throughout the Metrolink system. Table 4 outlines the various MOW storage locations.

**Table 4: MOW Storage Locations**

MOW STORAGE FACILITY	MOW LOCATION (SUBDIVISION: MP)	PHYSICAL ADDRESS	ADDITIONAL INFO
Lang	Valley: MP 41.7	13903 Lang Station Road Canyon Country, CA 91387	One of two main MOW yards. Storage of MOW on-track equipment and materials
Bootlegger	Valley: MP 53.51		Small fenced in yard with a set out track off the Ravenna Siding
Marine Way	Orange: MP 183.35		One of two main MOW yards
Orangethorpe	Orange: MP 166		Small fenced in yard with a set out track near Orangethorpe Avenue
SONGS / Basilone	San Diego: MP 209.18	--	Set out, leased from NCTD
Moorpark Layover Facility	Ventura: MP 426.97	585 Moorpark Ave. Moorpark, CA 93201	MOW storage at layover facility
GEMCO Yard	Valley: MP 455.1	--	Adjacent to Gemco Yard, owned by Union Pacific Railroad

<b>MOW STORAGE FACILITY</b>	<b>MOW LOCATION (SUBDIVISION: MP)</b>	<b>PHYSICAL ADDRESS</b>	<b>ADDITIONAL INFO</b>
Perris-South Layover Facility	Perris Valley: MP 85.4	1304 Case Road Perris Valley, CA	MOW storage at layover facility
EMF	Short Way: MP 1.1	1945 Bordwell Avenue Colton, CA 92324	MOW storage at layover facility
Pomona Yard	San Gabriel: MP 31.23	2701 North Garey Avenue Pomona, CA 91767	MOW storage, crew reporting trailer, spur track for equipment storage
Melbourne Warehouse	Pasadena: MP 106.6	2700 Melbourne Pomona, CA 91767	Communications and Signal Storage, offices

Source: WSP

## 4 ALTERNATIVE SOLUTIONS

### 4.1 CMF IMPROVEMENTS

#### 4.1.1 IMPROVEMENT PROJECTS

##### **EX-01: CONSTRUCT EAST PARKING LOT & PEDESTRIAN BRIDGE**

Construction of a pedestrian bridge from a new parking lot across the mainline to the 2<sup>nd</sup> floor of the Main Shop. Allows for convenient access for employees/visitors from the nearby Los Angeles County Metropolitan Transportation (Metro) station. The addition of this parking lot will alleviate the already constrained parking on site and replace the spots that were lost during project EX-10 (Construct North Circulation Road). Security control can be enhanced with parking separated from the facility by a pedestrian bridge. The bridge will be an open-air canopy covered walkway. The parking lot will be paved, and fence will be put up between the parking lot and mainline as a safety precaution. The entrance to this area will be near the intersection of N San Fernando Road and W Avenue 26.

**Figure 9: Proposed Location of East Parking Lot and Pedestrian Bridge**

Source: WSP

##### **EX-02: INSTALL WHEEL DIAGNOSTIC SYSTEM ON RIVER TRACK**

Install wheel diagnostic system on the River Track to monitor all trains entering the yard. This machine will need to be placed in a location that allows an entire trainset to roll over the sensors at a constant speed. The data is then measured and stored in a database for personnel to access when needed.