

San Diego Association of Government (SANDAG)
San Diego Metropolitan Transit System (MTS)



San Diego Trolley Trolley Renewal Program



Background

- **Opened 1981 – Downtown to US Mexico Border**
- **82' LRV's with On-Board Wheelchair Lifts**
- **Four Car Platforms except Downtown - Limited by Block Length**
- **Continuous Expansion from 1981 to 2005**
 - **One Line to Three (17 miles to 53 miles)**
 - **18 to 53 Stations**
- **Yearly Increase in Ridership & Wheelchair Lift Operations**
- **1981 – 2005 Funding Sources and Agency Focus on Expansion**

MTS Trolley Map



LEGEND

- Connecting Bus Routes / Conexión de rutas de autobuses
- Amtrak and/or COASTER / Amtrak y/o COASTER
- Parking if not Encomendamiento (Gratis)
- Pay Parking / Estacionamiento de cuota
- Parking Nights and Weekends / Estacionamiento las noches y los fines de semana

Headways

- 10 Minute Peak
- 15 Minute Daytime
- 30 Minute Night

14 Million Riders per Year

Freight on Tracks After Revenue Service (Blue & Orange)





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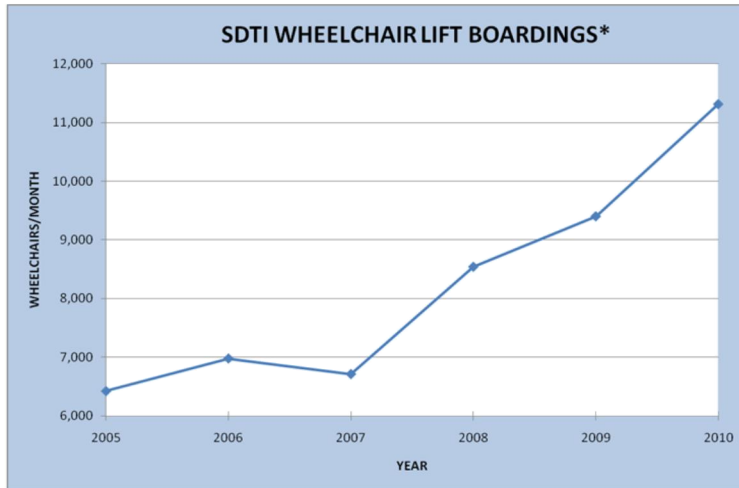


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5



5-Year Increase in Lift Boardings

May 16, 2011

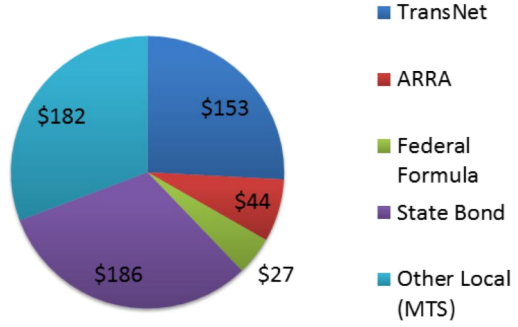


Trolley Renewal Funding

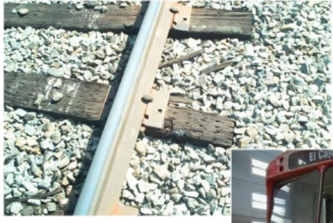
Combination of Local, State & Federal (2008 - 2010)

- **TransNet (voter approved)**
Capacity & Low Floor
- **Federal Stimulus Funds**
State of Good Repair
- **Federal Formula Funds**
Capital
- **State Proposition 1A & 1B**
Transit & Freight Capacity
- **Other Local**
MTS Capital

Funding Amount \$592
(in millions)



State of Repair Issues



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Low-Floor Vehicle Replacement

65 new low floor vehicles will replace old high floor U2s

- \$270 million investment
- Manufactured in California

Better access for passengers

- Easier boarding for mobility devices, strollers, luggage, seniors and mobility impaired
- Safer for passengers when de-boarding in an emergency

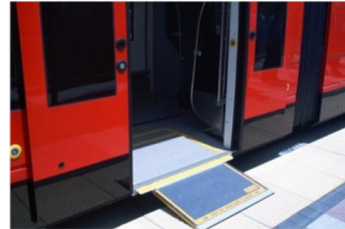
Significant improvement in performance

Low Floor Green Line

- On Time Performance : 97%
- Monthly Wheelchair Boardings: 4576

High Floor Blue/Orange Lines

- On Time Performance: 88%
- Wheelchair Boardings: 12,802



Trolley Renewal Program Objectives

- **Low Floor Service System Wide**
- **Reduce Wheelchair Boarding Delays**
- **Replace Aging Infrastructure Including:**
 - **Contact Wire**
 - **Ties, Rail, Special Trackwork**
 - **Replace & Upgrade Traction Power**
 - **Signals and Grade Crossing Devices**
- **Replace Worn Station Infrastructure**
 - **Shelters & Furniture**
 - **Trackway Paving and Crossings**
- **Add/Upgrade Communications and Systems**



Trolley Renewal Scope

- 65 New Low Floor Vehicles
- Reconstruct 34 Platforms Including Shelters, Communications, Access, Bus Facilities
- Replace 20 Miles of 90 lb Rail
- Replace Worn Ties & Correct Alignment and Grade (Blue Line)
- Add Crossovers and Replace Signal System (Blue Line)
- Grade Crossings and Warning Devices
- 17 Traction Power Substations
- 34 miles New Contact Wire & Replace Concrete Poles
- Add Fiber Optic Communications



Trolley Improvement Map

- 7 Green Line Ext. Stations**
- 8" Platforms
 - Shelters
 - Electrical
 - Communications

- 6 Downtown Stations**
- 8" Platform
 - Crossover America Plaza
 - Electrical
 - Communications
 - Switches at 12th & Imperial
 - Access improvements

- 9 Orange Line Stations**
- 8" Platforms
 - Shelters
 - Rail Replacement
 - Electrical
 - Communications
 - Drainage
 - Access improvements

- 12 Blue Line Stations**
- Overhead Wire (34 miles)
 - Fiber Optic
 - Crossovers
 - Signaling System
 - Platform Re-construction
 - Transit Centers
 - Grade crossings
 - Crossing Gates
 - Rail replacement (20 miles)
 - Tie replacement
 - Track replacement
 - Drainage
 - Station furniture
 - Communications
 - Access improvements



Trolley Renewal Plan of Attack

- **Single Program Office Over Multiple Projects**
 - Program Funding, Budget & Schedule
 - Environmental Clearance
 - Project Expenditure & Cost at Complete Tracking
 - Coordinated Construction Management
 - MTS Liaison
- **Project with Dedicated SANDAG Project Managers**
 - Project Budget & Schedule
 - Design, Bid & Award (one or more contracts)
 - MTS & CPUC Project Specific Coordination
- **Projects Scoped & Divided by Funding Requirements, Order of Construction, by Line or Location**



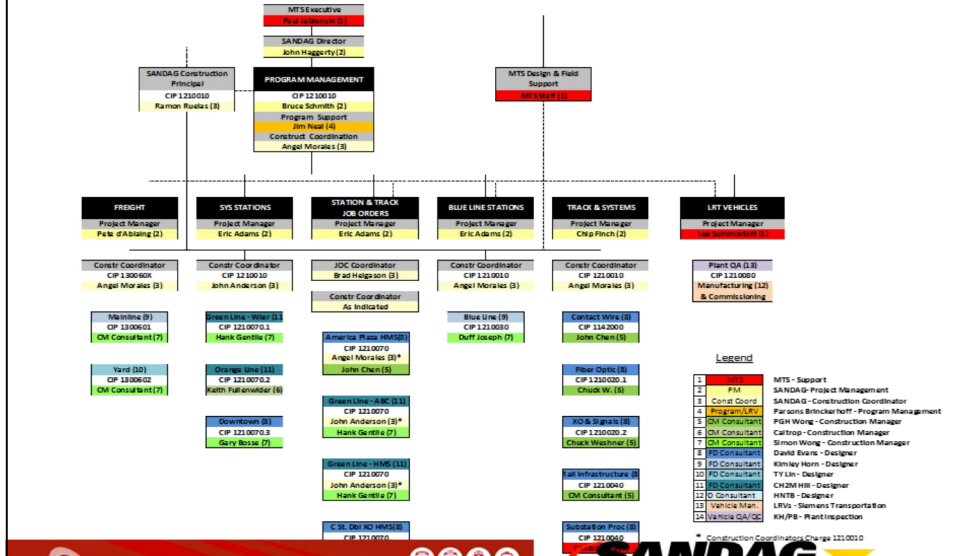
Trolley Renewal Plan of Attack

- **Monthly Tracking - Design thru Construction**
 - **Progress & Expenditure**
 - **Estimate at Complete**
 - **Construction Status**
- **Utilized On-Call Consultant Resources (Design & CM)**
- **Utilized Job Order Construction Contractors**
- **Weekly Coordination Meetings with MTS**
- **Coordinate SANDAG & MTS Public Outreach**



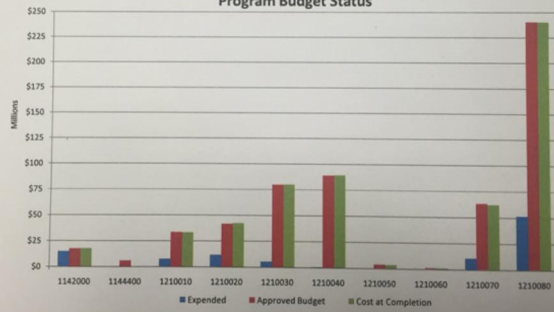
Trolley Renewal Organization

TROLLEY RENEWAL AND RAIL SYSTEM IMPROVEMENT
PROGRAM MANAGEMENT PROJECT & CONSTRUCTION ORGANIZATION



Trolley Renewal Program		Approved FY12 Budget	Estimated Cost at Completion	Expended	% Expended
CIP Number				As of 11/30/2011	
1142000	OCS	\$ 17,643,000	\$ 17,611,350	\$ 14,853,251	84%
1144400	Orange/Green Fiber Optic Cable	\$ 5,960,445	\$ 353,300	\$ 57,961	1%
	Subtotal	\$ 23,603,445	\$ 17,964,690	\$ 14,911,212	63%
1210010	Program & Construction Mgmt	\$ 33,357,000	\$ 33,167,389	\$ 7,576,712	23%
1210020	Blue Line Crossovers & Signaling	\$ 41,569,000	\$ 42,306,961	\$ 11,604,646	28%
1210030	Blue Line Stations	\$ 79,748,000	\$ 79,781,148	\$ 5,368,240	7%
1210040	Rail Infrastructure	\$ 88,970,000	\$ 89,336,930	\$ 521,902	1%
1210050	Slope Repair	\$ 3,774,000	\$ 3,725,103	\$ 4,901	0%
1210060	Substation Roofs	\$ 1,240,000	\$ 1,245,064	\$ -	0%
1210070	System Station Platforms	\$ 63,099,000	\$ 62,274,743	\$ 10,730,367	17%
1210080	Low Floor Vehicles	\$ 240,243,000	\$ 240,246,984	\$ 51,259,645	21%
	Subtotal	\$ 552,000,000	\$ 552,084,300	\$ 87,068,312	16%

Program Budget Status



Trolley Renewal Program CIP Number	Approved FY14 Budget	Estimated Cost at Completion	Expended As of 8/2/2014	% Expended
1142000	\$ 17,643,000	\$ 17,633,939	\$ 17,149,514	97%
1142100	\$ 6,759,000	\$ 6,748,145	\$ 6,557,556	97%
1144000	\$ 2,370,200	\$ 2,367,770	\$ 353,738	15%
Subtotal				
	\$ 26,772,200	\$ 26,749,854	\$ 24,060,810	90%
1210010	\$ 20,364,000	\$ 20,361,399	\$ 20,346,643	100%
1210020	\$ 41,199,000	\$ 40,925,938	\$ 38,393,572	93%
1210030	\$ 133,928,000	\$ 133,887,553	\$ 57,341,184	43%
1210040	\$ 29,000,000	\$ 28,792,840	\$ 21,339,330	74%
1210050	\$ 5,504,000	\$ 5,465,375	\$ 4,643,965	84%
1210060	\$ 3,000	\$ 3,103	\$ 3,103	103%
1210070	\$ 69,360,000	\$ 69,022,321	\$ 68,493,105	99%
1210080	\$ 293,520,000	\$ 293,518,468	\$ 121,133,308	41%
Subtotal				
	\$ 592,878,000	\$ 591,977,000	\$ 331,684,209	56%
Total				
	\$ 619,650,200	\$ 618,726,854	\$ 355,745,020	57%

Program Budget Status



Program Development

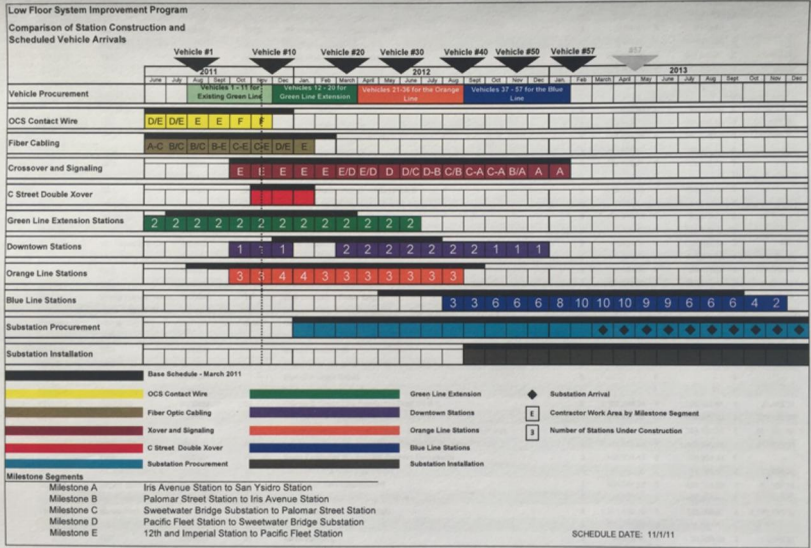
- **Station Design Criteria**
 - Eight Inch High Platforms
 - Consistency vs Individuality
 - Shelter and Furniture Kit of Parts (by Line)
 - Maintainable Surfaces and Finishes
- **Procurement of Long Lead Items (Substations & Rail)**
- **Project Construction Contract Sequence**
 - 1) Operational and Bid Ready Projects
 - 2) Station Re-construction
 - 3) Substations & Communications
 - 4) Blue Line Grade Crossings, Rail & Tie
- **Regulatory Certification Vehicles & Signals**

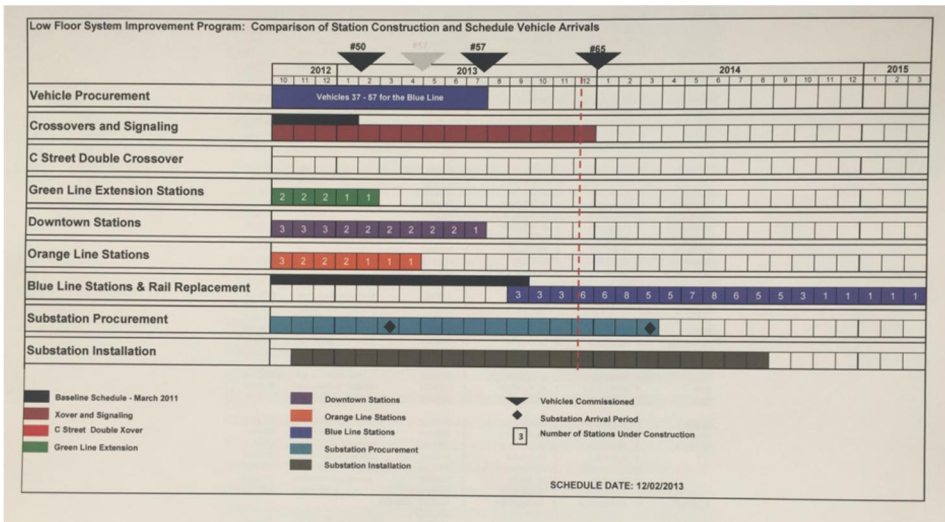


Design, Sequencing, Construction and Funding Challenges

- **Maintaining Trolley Operations**
 - **Limit Number of Stations Under Construction**
 - **Station Reconstruction Options: Closure, Operate Around Construction, Temporary Platforms**
 - **Single Tracking & Slow Orders**
 - **Coordinate Closures and Bus Bridges**
 - **Keep Riders and Community Informed**
- **Staging and Sequencing Across Projects & Contracts**
- **Maintaining Night Time Freight Operations**
- **Prioritizing Objectives within the Budget**
- **Segregate and Track by Funding Sources**







Issues

- Scope Creep – Catenary Poles, Shelters, Platform Finishes, Bus Facilities, Special Trackwork, Substations.....
- Contractor Substitution
- Contractor Time in Completing & Returning Stations to Service
- Maintaining Job Site Control & Access
- Paving System Failures & Changes
- Signal Controller and Wheel Counter Issues



Not Issues

- **Coordination with Operations**
- **Low Floor Service Transitions**
- **Budget Management**
- **Busing Around Shutdowns**
- **Public Outreach**
- **Public Acceptance**



Trolley Renewal Communications

- Construction advisories
- Maps
- Door hangers
- Interactive website page
- A-frames
- Kiosk



Low Floor Vehicles



Blue Line Crossover & Signaling



Traction Power Substation Installation



Green Line Stations

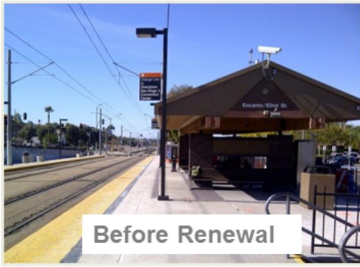


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Green Line Stations



Orange Line Stations



Downtown Stations – C Street



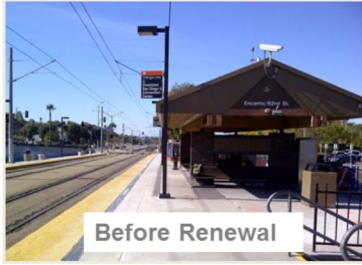
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Downtown Stations – 12th & Imperial



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Blue Line Stations



Blue Line Stations



Blue Line Stations



Blue Line Rail & Tie Replacement



Trolley Renewal Lessons Learned

- **Program Management Team - Vital**
- **Simplify Project Structure**
- **Partnership with Operator is Critical**
- **Consider Re-construction Over Rehabilitation**
- **Improve Paver Design and Application**
- **Contract Incentives & Dis-incentives of Limited Value**
- **Consider Alternative Contracting Methods**
- **Updated Cost at Complete Estimates Vital to Completing Priorities**



Trolley Renewal Program Conclusions

- **Highly Successful Program - SANDAG's Largest Project to Date in Shortest Time**
- **Program Management with Project Pool Proved Very Effective**
- **MTS Backlog of State of Good Repair Cleared**
- **Conversion to Low Floor System - Immediate Benefits Riders and MTS**
- **Model for Coordination Between SANDAG & MTS**

