



Briefing on the Metro Rail Service Disruption Review

November 16, 2017



Our Time Together Today

- Welcome and Team Introduction
- Project Scope
- Rail Delay Incidents in 2016
- Key Takeaways
- Recommendations and Next Steps

“We’re waging a transportation revolution. We have the opportunity to be bold and tackle not only the infrastructure challenges of today, but the challenges of tomorrow.”

Phil Washington, LA Metro
CEO



Project Scope

Scope

- Identify and evaluate the top three incident delay categories for each rail line.
- Determine if the issues causing delays are being addressed and appropriate state of good repair (SGR) investments are being made to reduce their reoccurrence.

Our Team



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*Project Executive
The Wathen Group*



Linda Kleinbaum
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Dr. Nabil Ghaly
*Technology, Security, and
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*Safety, Operations, and
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Jeraldine Herrera
*Data Analysis and
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Rail Delay Incidents in 2016

Incident Type	Expo	MBL	MGDL	MGL	Subtotal Light Rail	MR&PL	Subtotal Subway	Grand Total
Rail Vehicles	237	456	323	272	1,288	134	134	1,422
Rail Operations	76	97	74	57	304	26	26	330
Traction Power	19	30	19	15	83	9	9	92
Yard Control	25	17	25	13	80	1	1	81
Signals	13	18	14	17	62	10	10	72
Rail Accident	13	33	18	4	68	4	4	72
Extra Service/Missed Car Cut		25			25		0	25
Fire/Emergency		9	4		13	4	4	17
Track	2	2	10		14		0	14
TSE SCADA	1	1		2	4	6	6	10
Communication		1		2	3		0	3
Passenger Conduct			2	1	3		0	3
Fire Equipment					0	2	2	2
FM Contract Svc				1	1		0	1
Grand Total	386	689	489	384	1,948	196	196	2,144

*Grand Total excludes 441 Police / Health incidents (17% of delays)



Top Causes of Delay Incidents in 2016

Top 3 Causes for Each Line

Rail Vehicle Delays on all Lines

Rail Operations Delays on all Lines

Signal Delays on Metro Green
and Red Lines

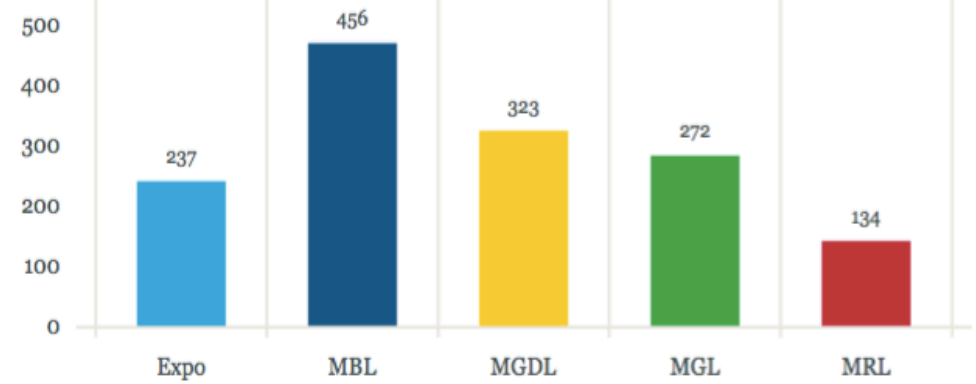
Yard Control Delays on Metro Expo
and Gold Lines

Traction Power Delays on Metro Blue Line

82% of total delays were rail vehicle and rail operations;
however, operations accounts for only 16%.

66% of total delays were rail vehicle – when you break that
down by subway and light rail it is still the #1 cause.

Rail Vehicle Incidents by Line



Rail Vehicle Fleet Composition

LRV Fleet	# of Cars	% of Total LRV	Age	Overhaul?
P865 / 2020	69	40%	23 - 27 years	N
P2000	52	31%	15 years average	Underway
*P2550	50	29%	10 years**	Planned

Subway	# of Cars	% of Total Subway	Age	Overhaul?
Base Buy (BB)	30	29%	24 years	N
General Electric (GE)	74	71%	18 years	Underway

On-going component upgrade programs to maintain fleet for P865 cars until decommissioned.

*Has train operator display / diagnostic system.

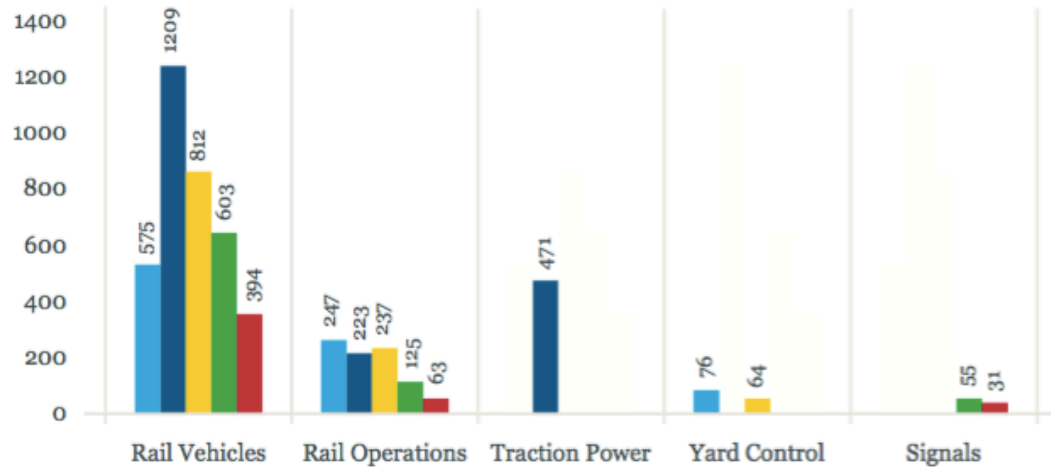
**Most reliable LRV car in the fleet.

***Procurement underway or in progress for P3010 (Replace P865); HR4000 (Replace BB).



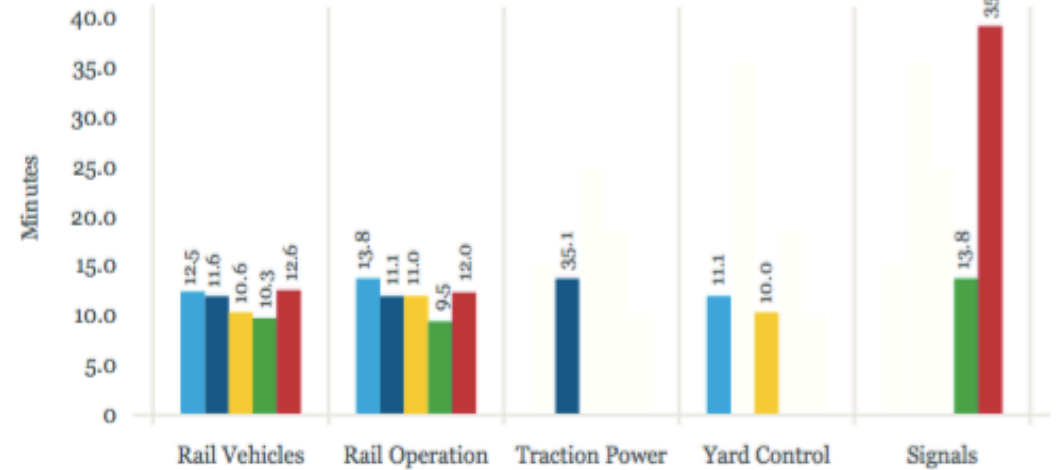
Impact to the Customer

Total Cancelled and Late Trains by Top 3 Incident Types



Expo MBL MGD MGL Subway (MRL)

Average 'Maximum Delay' Minutes for Top 3 Incidents Per Line



*High average 'maximum delay' is from 10 signal incidents on the MRL



Mitigating Delay Incidents through State of Good Repair Investment

State of Good Repair Investments

\$4.8 billion over ten years (\$480 million annually).



FY 2018 Capital Program: \$2.09 billion, which includes \$1.7 billion for expansions and \$394 million for Operating Capital.



\$224 million for Rail State of Good Repair.



\$145 million (65%) for Rail Vehicle investments that reflect priorities based on TWG analysis.



FY 2018 Rail SGR budget includes about \$80 million for all remaining rail SGR needs system-wide.

Rail Operations and Yard Related

No infrastructure/capital investments for mitigation.

Signal Related

Low number of incidents does not allow for an assessment of optimum investment decisions; need to include infrastructure failures for comprehensive analysis.

Traction Power Related

Lack of periodic condition surveys not possible to assess investment decisions.



Key Takeaways

Capital Investments

Importance of ongoing midlife vehicle overhauls and new car procurements.

Priority investment in redesign of M3 system.

Importance of robust SGR program based upon ongoing, systematic and comprehensive asset condition surveys.

Emphasis on creating effective balance between SGR versus system expansion.

Operations and Maintenance Measures

Reinforce root cause determination and reinstruct as appropriate.

Enhance collection and monitoring of all failures to identify preventative maintenance and capital investments.

Review allocation, level of Extraboard for rail operators.

Establish a mechanical desk, 24/7 of "super techs" in ROC.

Continue to hone service recovery planning.



57 Recommendations to Identify, Track and Reduce Incidents

Next Steps

Q&A

