

# FMCB Commuter Rail Update

November 20, 2017





# Commuter Rail Executive Director

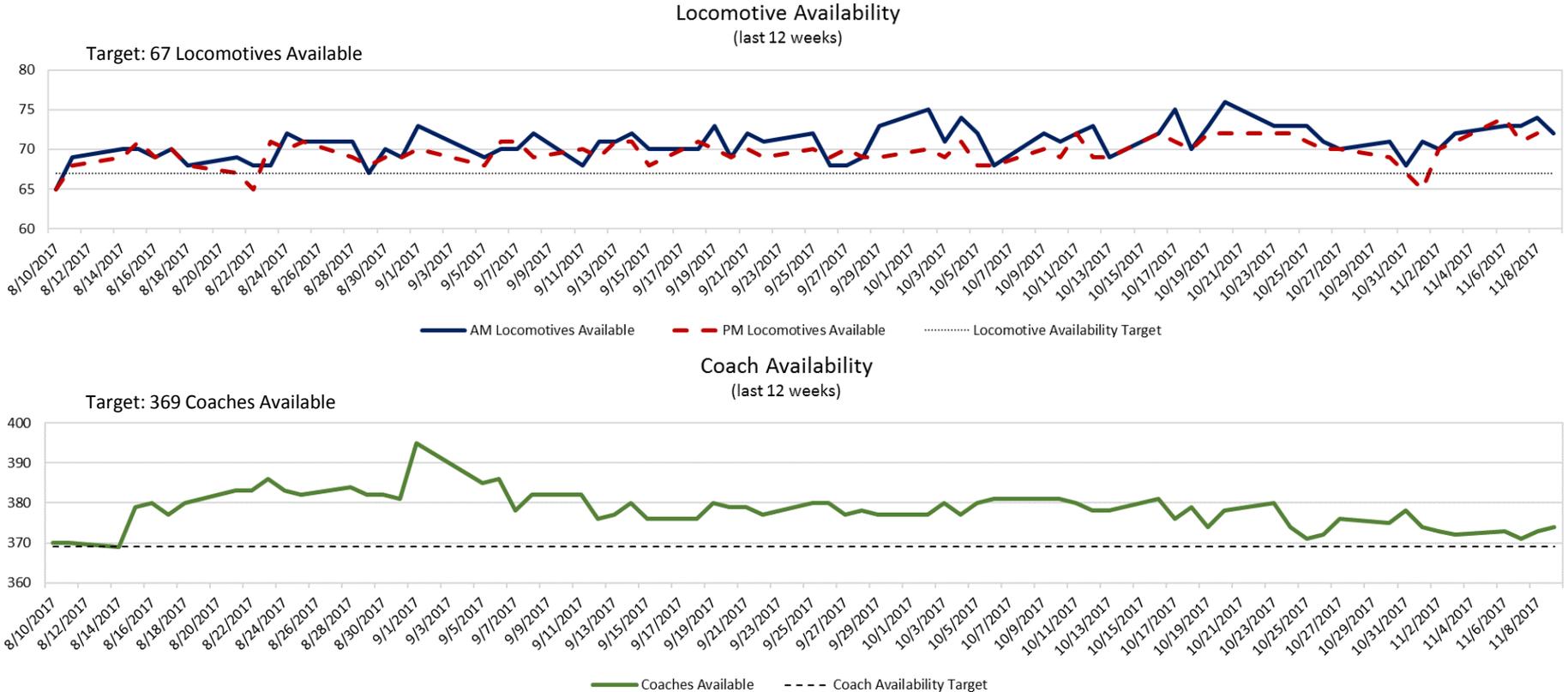
## Introduction

- Started September 25<sup>th</sup>
- Initial Observations
  - Challenges
  - Relationship with Keolis
  - Safety
  - Customer Service
- Initial Action Items
  - People
  - Processes
  - Equipment – SGR





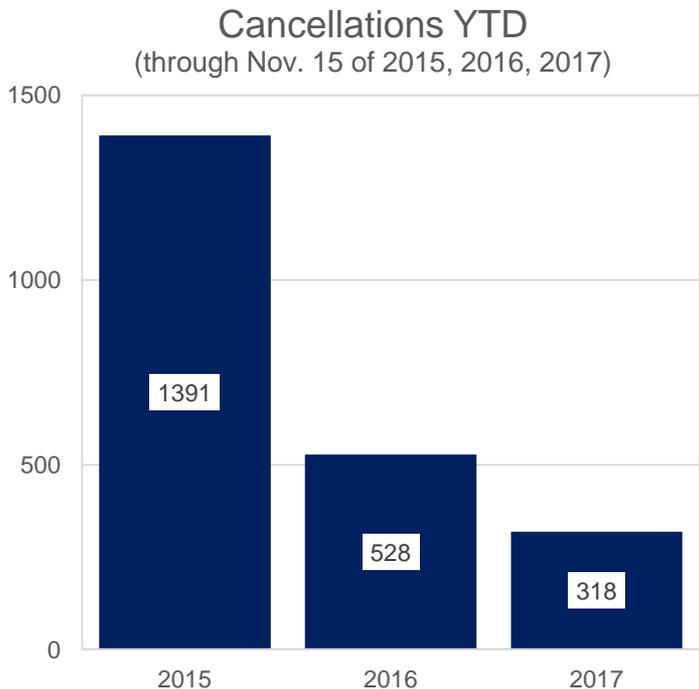
# Equipment Availability: Generally stable over last 12 weeks



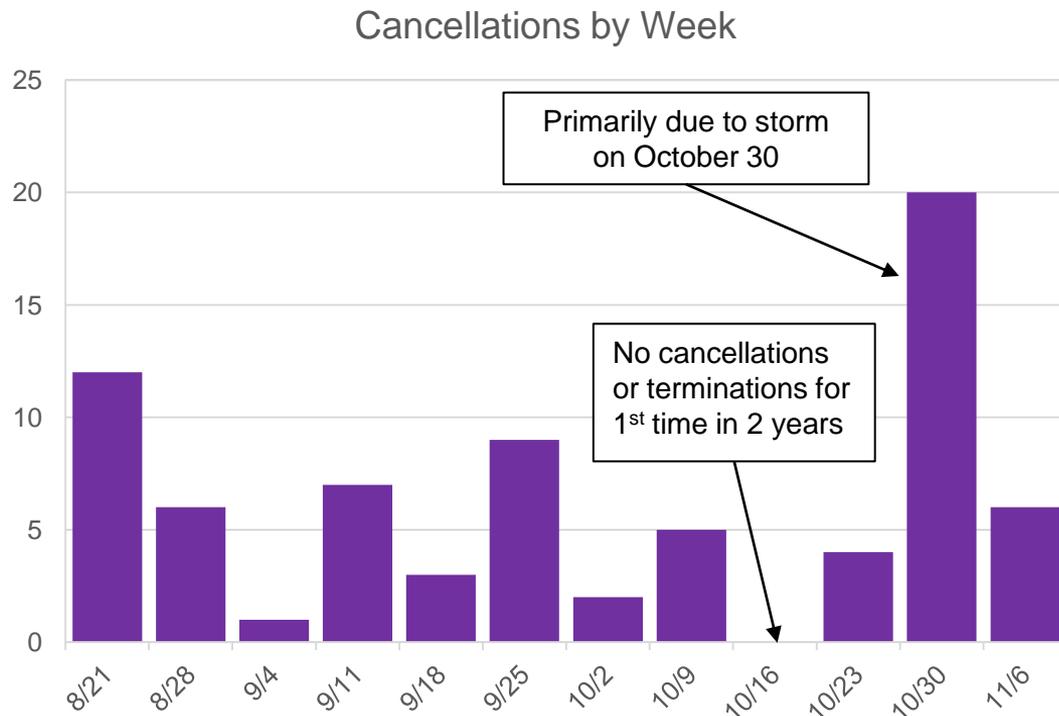


# Cancellations

2017 cancellations trending lower than 2015 and 2016, *but still too many*



Note: 1403 total cancellations in 2015 and 561 in 2016

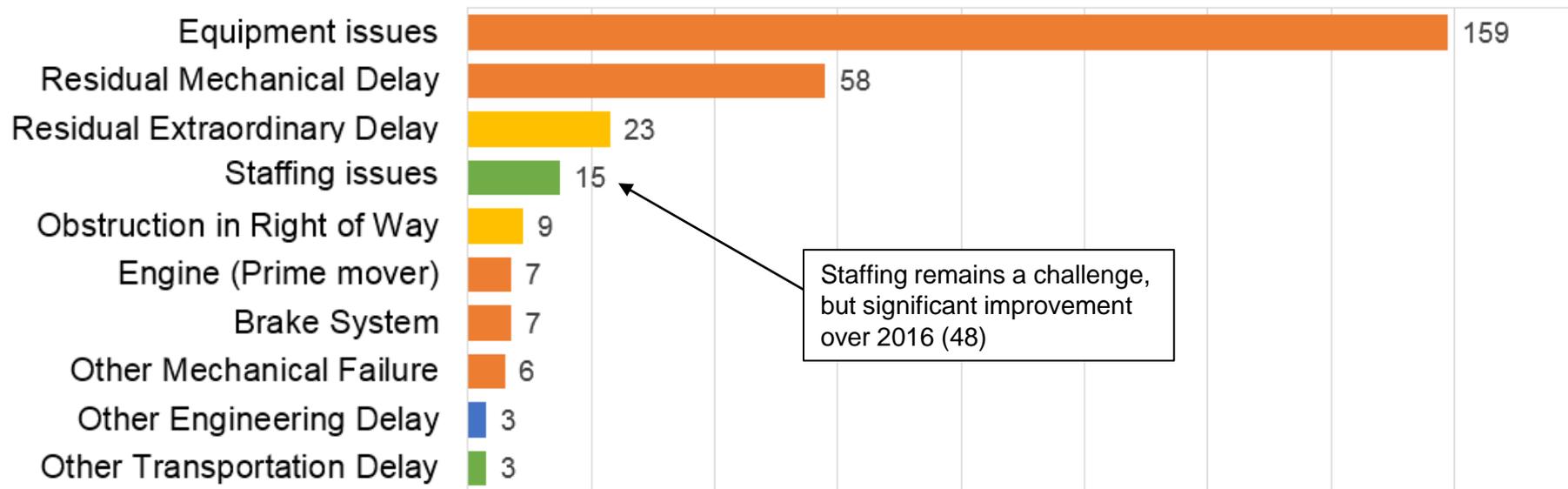




## Causes of Cancellations – 2017 year to date

Cancellations are typically caused by mechanical failures

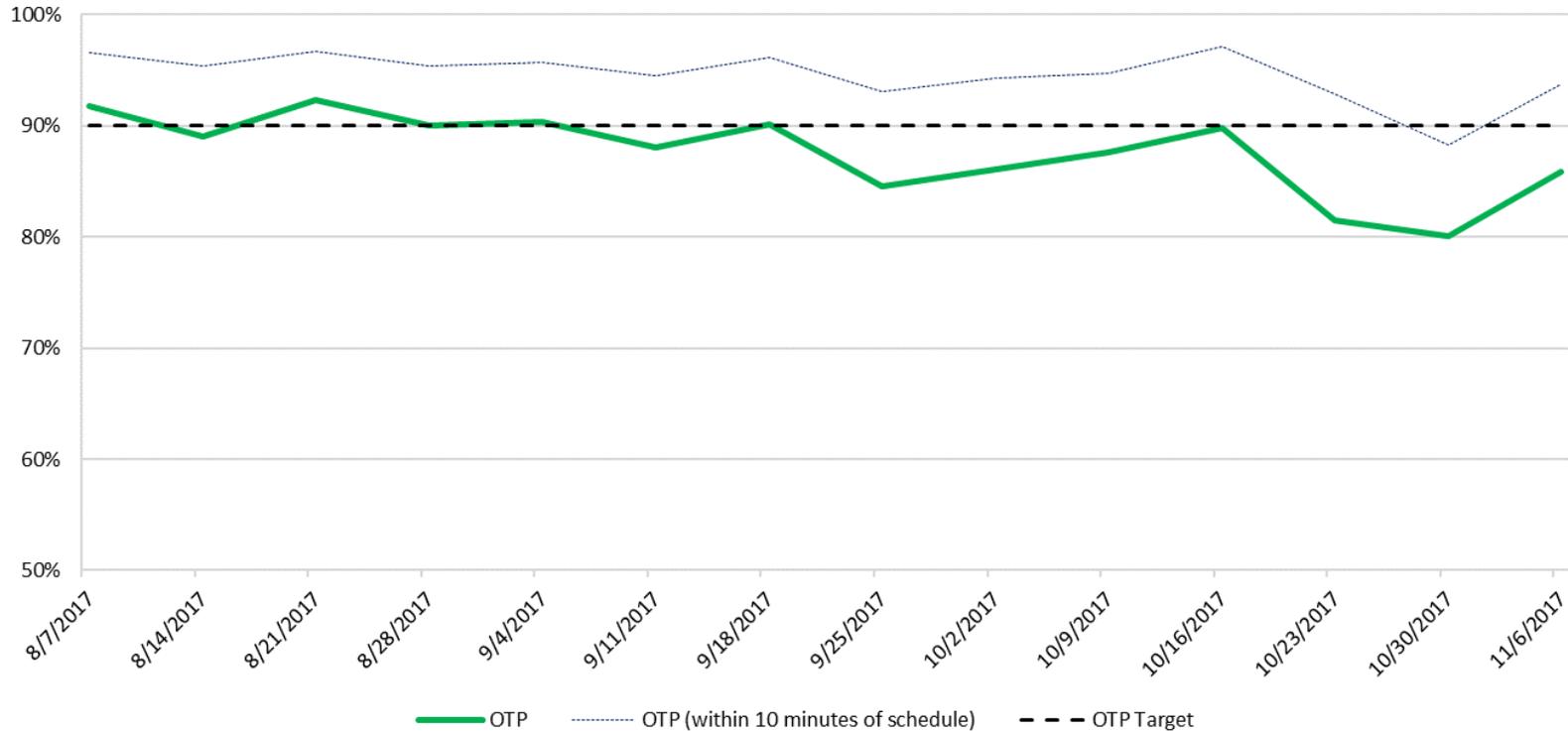
### Top 10 Cancellation Causes (Frequency)





# On Time Performance (of trains that run)

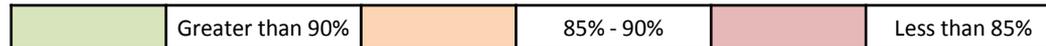
On Time Performance (OTP) by Week





# OTP (Within 5 Minutes) Trends by Month

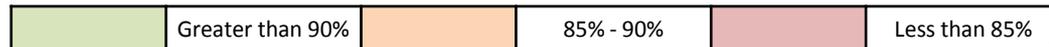
	2016-10	2016-11	2016-12	2017-01	2017-02	2017-03	2017-04	2017-05	2017-06	2017-07	2017-08	2017-09	2017-10	Average
Worcester	70.0%	67.6%	85.8%	84.6%	82.8%	81.3%	74.5%	79.3%	69.1%	80.2%	82.5%	74.1%	79.4%	<b>77.8%</b>
Lowell	91.0%	88.1%	94.7%	92.7%	86.5%	90.2%	94.6%	96.8%	94.8%	95.2%	94.5%	90.1%	88.2%	<b>92.1%</b>
Providence	87.9%	86.8%	91.5%	88.7%	80.0%	87.8%	92.2%	89.6%	86.4%	89.0%	89.3%	89.0%	86.6%	<b>88.1%</b>
Haverhill	79.8%	83.8%	86.3%	89.2%	80.4%	85.1%	91.9%	90.4%	80.6%	79.0%	88.8%	81.4%	74.7%	<b>84.1%</b>
Franklin	84.1%	76.8%	92.7%	91.2%	84.9%	89.0%	88.7%	91.0%	88.7%	88.2%	86.6%	88.2%	82.5%	<b>87.2%</b>
Fitchburg	74.0%	69.7%	78.7%	88.3%	75.0%	80.9%	88.1%	91.1%	85.7%	88.9%	89.7%	91.2%	79.8%	<b>83.2%</b>
Newburyport	84.6%	86.4%	90.4%	89.5%	81.0%	85.0%	90.5%	94.1%	87.1%	92.5%	87.5%	88.5%	88.5%	<b>88.2%</b>
Fairmount	96.6%	96.7%	97.5%	97.8%	97.2%	96.4%	97.6%	95.8%	97.3%	98.3%	97.3%	97.6%	98.0%	<b>97.2%</b>
Needham	90.9%	80.6%	94.0%	90.6%	83.4%	92.6%	92.7%	94.7%	91.6%	94.1%	92.3%	92.1%	90.0%	<b>90.8%</b>
Rockport	87.8%	85.8%	92.0%	90.0%	83.4%	87.7%	91.4%	94.1%	89.1%	92.6%	89.1%	84.7%	86.6%	<b>88.7%</b>
Stoughton	86.7%	85.7%	91.6%	84.6%	78.4%	87.1%	87.6%	87.8%	87.1%	91.0%	89.1%	89.5%	84.8%	<b>87.1%</b>
Middleboro	91.6%	95.2%	94.1%	93.4%	94.7%	92.6%	90.2%	93.0%	88.7%	92.4%	91.2%	92.2%	83.2%	<b>91.6%</b>
Kingston/Plymouth	97.7%	96.0%	94.7%	95.6%	95.5%	91.7%	95.0%	94.0%	92.4%	94.7%	95.1%	96.7%	84.2%	<b>94.0%</b>
Greenbush	96.4%	98.0%	97.7%	97.1%	97.7%	94.8%	93.9%	94.6%	95.0%	97.4%	95.3%	96.9%	85.3%	<b>95.3%</b>
<b>Network OTP</b>	<b>86.2%</b>	<b>84.5%</b>	<b>91.2%</b>	<b>90.8%</b>	<b>85.4%</b>	<b>88.3%</b>	<b>90.3%</b>	<b>91.5%</b>	<b>87.4%</b>	<b>90.3%</b>	<b>90.2%</b>	<b>88.6%</b>	<b>85.1%</b>	<b>88.5%</b>





# Arrival Within 10 Minutes

	2016-10	2016-11	2016-12	2017-01	2017-02	2017-03	2017-04	2017-05	2017-06	2017-07	2017-08	2017-09	2017-10	Average
Worcester	86.3%	84.1%	95.1%	93.7%	92.3%	89.2%	90.2%	88.1%	84.4%	90.4%	91.3%	87.7%	90.7%	<b>89.5%</b>
Lowell	96.3%	94.7%	97.4%	96.8%	96.8%	97.6%	97.0%	99.0%	97.4%	98.7%	98.7%	97.5%	95.3%	<b>97.2%</b>
Providence	94.4%	93.1%	96.6%	94.5%	86.8%	95.1%	93.2%	94.0%	92.6%	94.0%	93.8%	95.1%	93.4%	<b>93.6%</b>
Haverhill	89.1%	93.7%	92.4%	94.8%	88.9%	95.8%	92.1%	96.0%	90.4%	90.4%	95.7%	90.0%	87.1%	<b>92.1%</b>
Franklin	92.8%	85.8%	97.5%	96.6%	92.2%	92.9%	96.1%	96.2%	96.2%	93.9%	94.0%	95.5%	91.4%	<b>94.0%</b>
Fitchburg	85.0%	83.1%	87.0%	95.1%	85.6%	94.3%	90.4%	96.9%	93.2%	94.3%	94.3%	96.4%	90.6%	<b>91.3%</b>
Newburyport	92.1%	93.4%	96.2%	96.0%	91.6%	95.1%	91.1%	98.2%	93.6%	96.5%	95.5%	95.0%	95.0%	<b>94.6%</b>
Fairmount	97.0%	97.9%	98.7%	99.1%	98.7%	98.5%	98.2%	98.2%	98.6%	98.9%	98.2%	99.0%	98.8%	<b>98.4%</b>
Needham	95.4%	89.4%	97.8%	97.6%	92.0%	97.9%	98.5%	98.2%	95.9%	97.2%	95.9%	96.6%	96.4%	<b>96.1%</b>
Rockport	95.7%	94.3%	96.9%	95.8%	92.1%	96.0%	92.5%	97.2%	94.6%	96.6%	95.7%	92.4%	92.6%	<b>94.8%</b>
Stoughton	95.2%	95.6%	97.2%	93.3%	88.6%	95.2%	93.2%	94.8%	94.4%	96.0%	95.8%	95.3%	92.9%	<b>94.5%</b>
Middleboro	97.0%	97.8%	97.4%	96.4%	96.7%	94.4%	95.5%	96.9%	95.0%	97.6%	96.8%	95.0%	96.3%	<b>96.4%</b>
Kingston/Plymouth	98.3%	97.7%	96.5%	97.9%	97.8%	97.2%	95.8%	97.6%	96.2%	97.4%	97.9%	98.8%	95.4%	<b>97.3%</b>
Greenbush	97.1%	99.4%	98.9%	98.3%	99.0%	97.2%	97.8%	97.5%	97.1%	98.9%	97.6%	98.1%	95.4%	<b>97.9%</b>
<b>Grand Total</b>	<b>93.2%</b>	<b>92.3%</b>	<b>96.0%</b>	<b>96.1%</b>	<b>92.7%</b>	<b>95.3%</b>	<b>94.2%</b>	<b>96.1%</b>	<b>93.9%</b>	<b>95.4%</b>	<b>95.6%</b>	<b>94.9%</b>	<b>93.5%</b>	<b>94.6%</b>



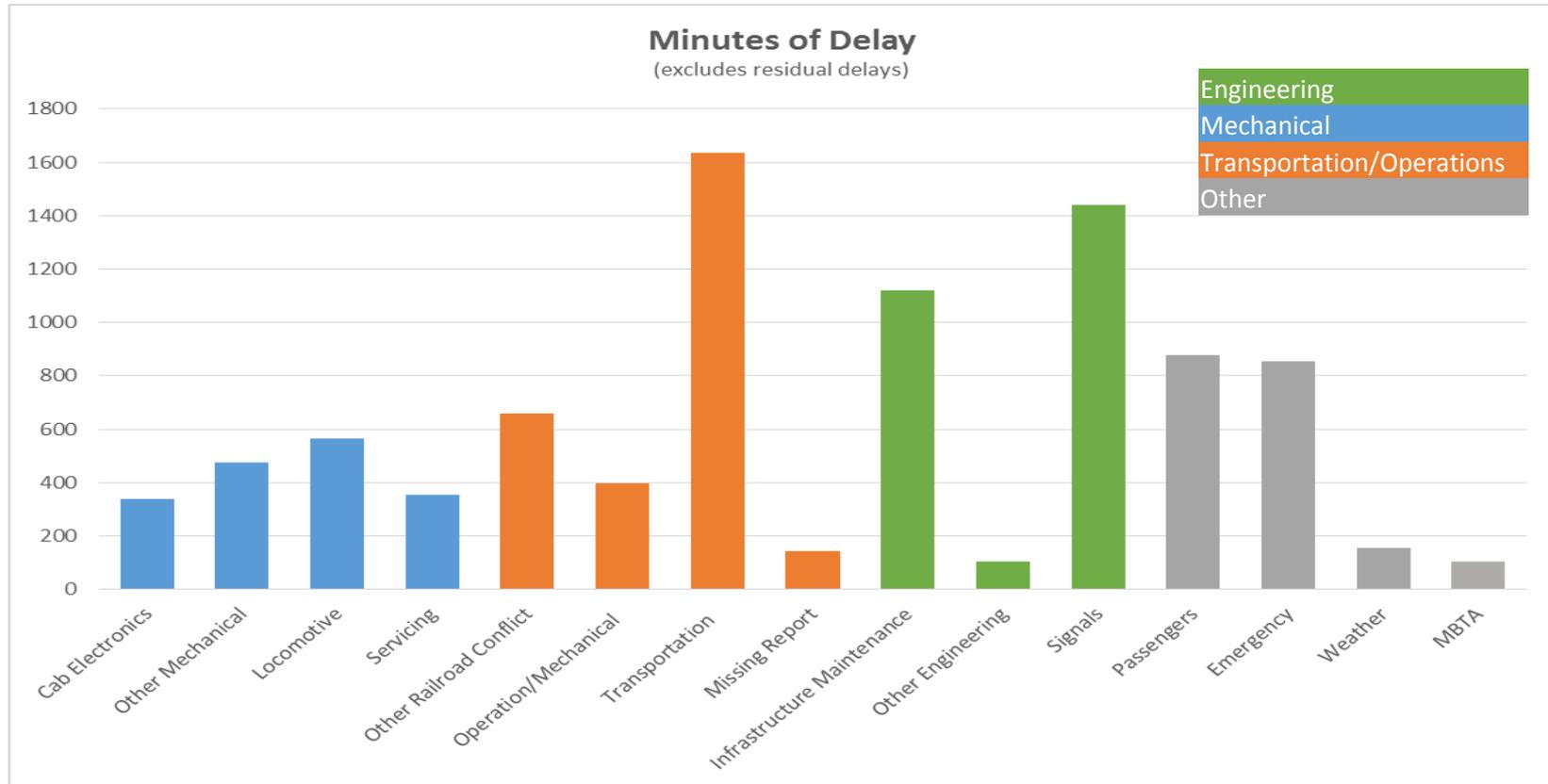


# Commuter Rail Delay Matrix - Process

November Launch

- ⦿ **Goal:** Identify root causes of delays and corrective actions
- ⦿ **Process:**
  - Develop monthly Delay Overview by the 5<sup>th</sup> of each month;
  - MBTA and Keolis managers will meet by the 7<sup>th</sup> of each month to review delays and develop corrective actions;
  - Commuter Rail Executive Director will receive a report of the month's action items by the 10<sup>th</sup> of each month; and
  - In addition, review the previous month's action items and identify if they have been closed out, are in process, etc.

# Commuter Rail Delay Matrix Prototype – September 2017





# Commuter Rail Delay Matrix Prototype – September 2017

## Noteworthy Causes of Delay

Transportation	<b>Insufficient Staffing</b>	Total Delays:	<b>88</b>
	* together with “Heavy Ridership” delays, a total of 218 delays	Average Delay:	<b>7 minutes</b>
	Too few conductors, resulting in slow boarding and alighting. 78% were on South Side, including 42% on Worcester Line.	Longest Delay:	<b>15 minutes</b>
	<b>Other Transportation Delays</b>	Total Delays:	<b>80</b>
	21% were due to a revised trap and door procedure, with average of 4 minutes per delay.	Average Delay:	<b>7 minutes</b>
	13% might be better categorized as Amtrak – Intercity Conflict. These had average delay time of 13 minutes.	Longest Delay:	<b>23 minutes</b>
Signals	<b>Signals</b>	Total Delays:	<b>154</b>
	Half of these occurred over 5 days. 44% were on Worcester Line, largely between MP 42 and 40.3.	Average Delay:	<b>9 minutes</b>
	12% on Gloucester Branch, many involve Gloucester Drawbridge, and/or MP 32.	Longest Delay:	<b>49 minutes</b>

**New Approach:** Renewed focus. Joint review and corrective action planning.



## Other Actions to Address Largest OTP Issues

Item	Action	Status
Network restrictions (Vic retaining wall, GLX work, Haverhill restrictions)	<ul style="list-style-type: none"><li>• Vic retaining wall repaired October 28<sup>th</sup> returning track to 60 mph line speed from 10 mph on Old Colony lines</li><li>• Haverhill double track opened Monday November 6<sup>th</sup></li><li>• GLX work impact mitigated to 3 trains; examining longer term schedule change for project</li></ul>	
Heavy ridership	<ul style="list-style-type: none"><li>• <b>Class of 32 additional ACs starts November 27<sup>th</sup></b></li></ul>	
Slippery Rail	<ul style="list-style-type: none"><li>• See separate action update</li></ul>	
Amtrak conflicts	<ul style="list-style-type: none"><li>• Haverhill Line double track operational</li><li>• Working group with Amtrak to reduce delay patterns</li></ul>	
Signal failures	<ul style="list-style-type: none"><li>• <b>Recurring Worcester line failure resolved</b></li></ul>	
Mechanical failures	<ul style="list-style-type: none"><li>• See separate action update</li></ul>	



## Fall Preparedness Measures

Brush clearing and test of the power wash train

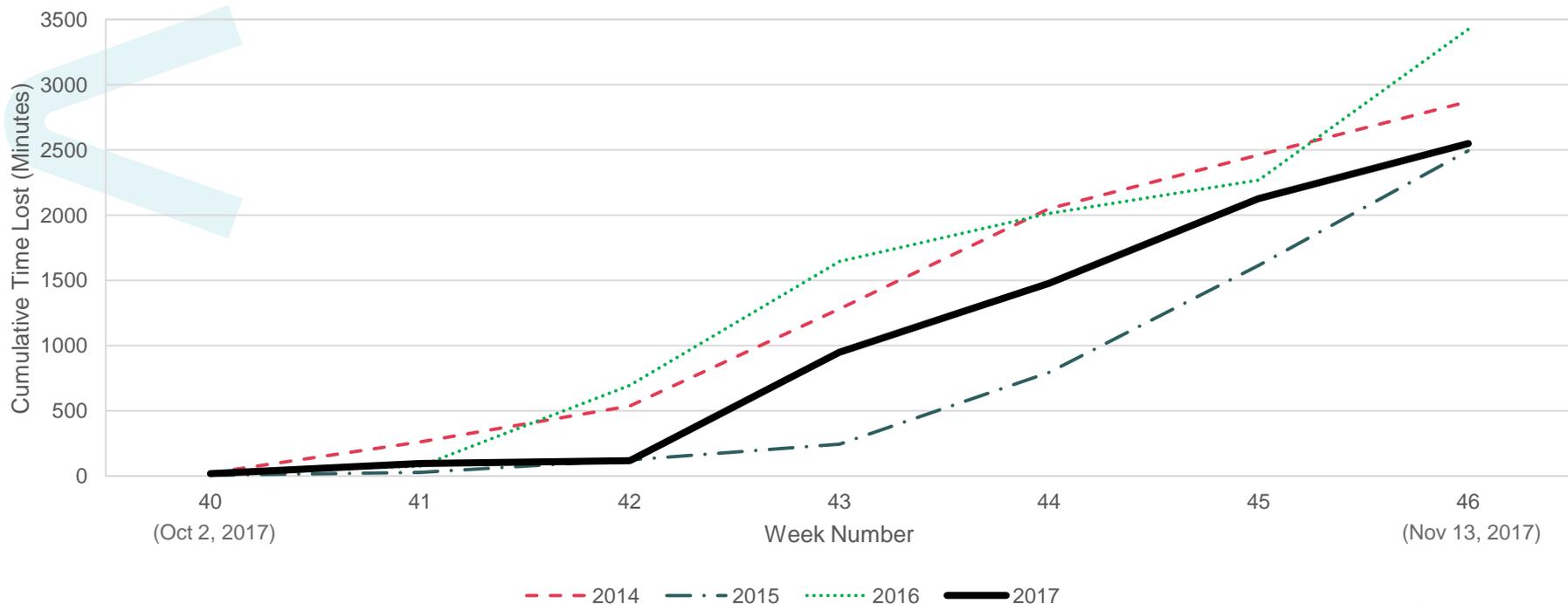




## Recent Performance - Slippery Rail Losses

2017 YTD has seen a 20% improvement in lost OTP compared with 2016 YTD

Cumulative Minutes Lost due to Slippery Rail





## Slippery Rail Mitigation Actions for 2017 Season

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- ⊙ KCS commissioned Network Rail for slippery rail study in March 2017 & implemented all possible improvement actions for this season
- ⊙ Appointment of slippery rail program director
- ⊙ Established goal of 20% reduction in delay minutes from the previous year
- ⊙ Tree removal
  - Tree removal along Newburyport and Rockport Lines, yielding **63% reduction in delays to date\***
  - Continuing tree removal on Fitchburg Line
- ⊙ Inspection program for locomotive sanding systems
- ⊙ Improved deployment of wash train
  - Leasing of four spare locomotives
  - Early testing of wash trains and stockpiling of spare parts
  - Improved effectiveness of wash train by targeting biggest issue lines

\* 28 delays Oct. 1 – Nov. 16 2017 versus a 76.6 delay average for Oct. 1 – Nov. 16 2014 – 2016.

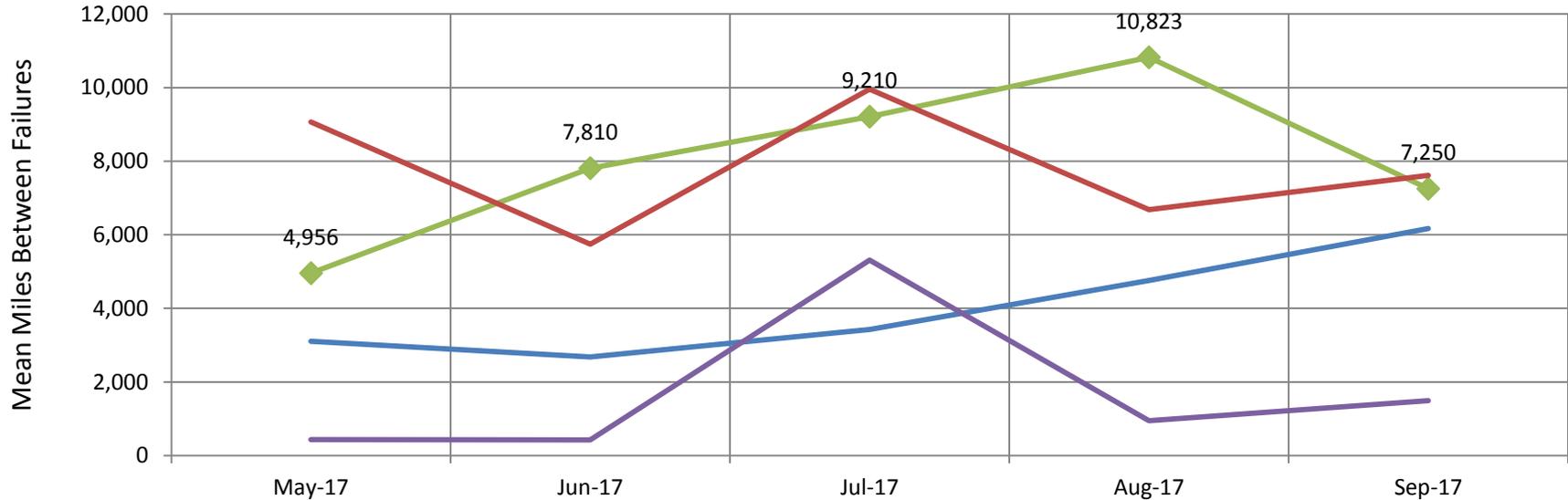


# Slippery Rail 2017: Lessons Learned for 2018

- ⦿ Improve Sanding Management: New Equipment
  - NEW: Recommended to purchase additional mobile sanding truck(s) which can refill sand hoppers at layover facilities.
- ⦿ Adjust Annual Fall Schedule
  - NEW: Move the annual Fall schedule adjustment date earlier to incorporate Slippery Rail Season.
- ⦿ Locomotive Modification: Reduce Axle Lock Threshold
  - NEW: Adjust MPI axle lock threshold from 3 seconds to 6 or more seconds
- ⦿ Issue Special Operating Instructions
  - Require use of blended brake and add more training and instruction on braking
- ⦿ Increase Rail Head Cleaning and Treatment
  - NEW: Purchase a minimum of 2 new spray machines
- ⦿ Increase Targeted Tree and Vegetation Removal
  - NEW: Recommended to increase the capital request to continue catch up with decades of deferred work.
- ⦿ Install Leaf Control Fences
  - NEW: Strategically position fences to catch leaves blowing out of the woods



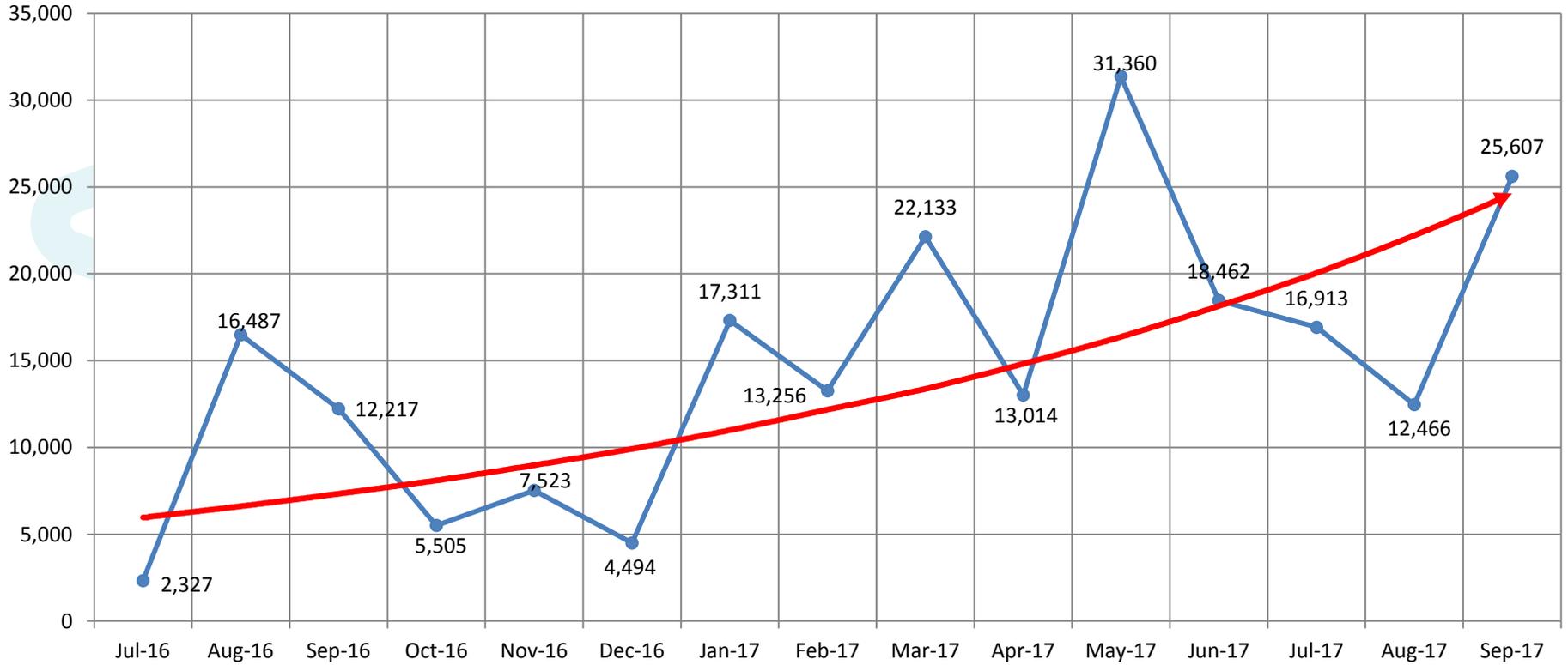
# Legacy Locomotive Fleet Performance



	May-17	Jun-17	Jul-17	Aug-17	Sep-17
◆ UTEX	4,956	7,810	9,210	10,823	7,250
— GP40MC	3,105	2,676	3,425	4,757	6,167
— MP36-3C	430	420	5,313	947	1,492
— F40's	9067	5747	9957	6686	7613



# HSP-46 (MPI) Locomotive Fleet Performance





## Mechanical Reliability Actions

Increasing reliability by replacing key components and improving root cause analysis

### Legacy fleet improvement

- Identifying locomotives with worst performance for root cause analysis
- Introducing diagnostic equipment to identify root cause of failures
- Near-term Fleet Plan: UTEX and MBTA locomotive overhauls

### MPI fleet improvement

- Turbocharger replacement program is progressing to plan with 30/40 locomotives completed; remaining 10 to be completed by end of 2017
- Replacement of Guru valves to improve winter freeze protection – 36/40 completed to date; remaining 4 to be completed by end of 2017
- Additional training on MPI fleet for mechanical team
- Target is to achieve 40k mean miles between failures (MMBF)



## Near-Term Fleet Plan – Moving Forward

- The plan consists of locomotive repair and overhaul programs designed to keep the legacy fleet operating reliably until the next locomotive procurement.
- Programs Underway:
  - Short-term recovery program (14 locos): \$2M
  - UTEX Phase I: \$6M
  - UTEX Phase II: \$6M
  - F-40 Overhaul: \$27M
  - GP-40 Overhaul: \$6M
  - MP-36 Top Deck Overhaul: \$2M
- Potential Additional Initiatives:
  - UTEX Phase III: \$9.6M





## Near-Term Fleet Plan – Moving Forward

Program	# of Locos	Cost	Anticipated Completion
Short-term Recovery	14 to date	\$2M to date	Ongoing
UTEX Phase I	5	\$6M	December 2017
UTEX Phase II	5	\$6M	December 2018
F40 Overhaul	10	\$27M	June 2019
GP40 Overhaul	4	\$6M	January 2019
MP36 Top Deck Overhaul	2	\$2M	January 2019



# Looking Ahead

## Areas of Focus:

- Reorganization
- Fleet Recommendations
- Winter Service Delivery
- Coordination with major projects (e.g., PTC, GLX, AFC 2.0) to increase OTP
- Commuter Rail Vision

## New Approach:

- Use better data in management to improve service today
- Invest in fleet and design next contract to improve service in the future

