

FMCB Commuter Rail Update

April 22nd, 2019

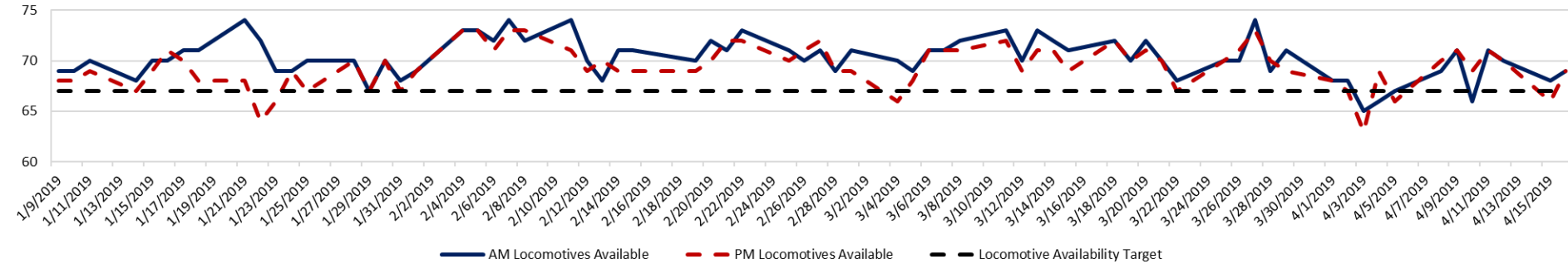


Equipment Availability



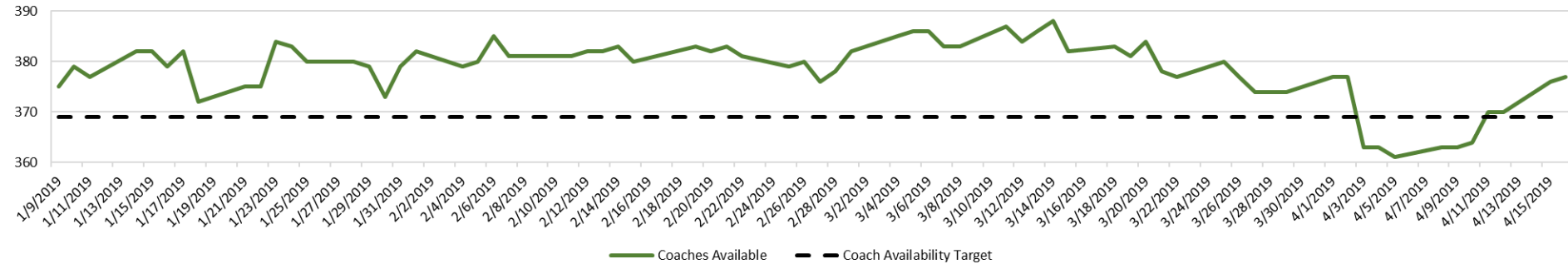
Locomotive Availability
(last 12 weeks)

Target: 67 Locomotives Available



Coach Availability
(last 12 weeks)

Target: 369 Coaches Available





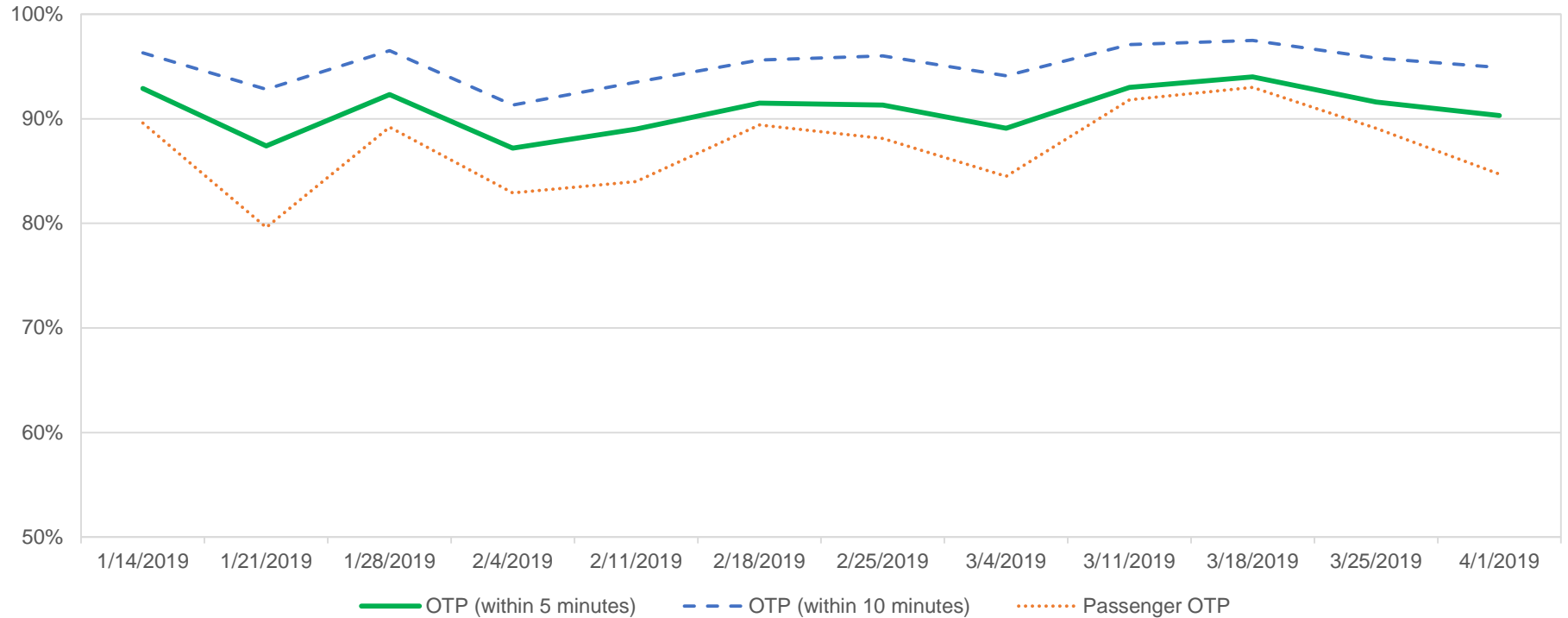
Coach Availability

- ⦿ Coach availability decreased temporarily in early April due to an increase in unscheduled repairs
- ⦿ This followed a streak of 196 weekdays with availability above target
- ⦿ Keolis immediately took steps to increase production, restoring coach count levels to again above target by April 11
- ⦿ The number of available coaches often doesn't equate to the number of coaches in service:
 - Some spare coaches are earmarked to backfill other coaches coming out for maintenance
 - Spare coaches may not be at the location where a coach is removed for unscheduled maintenance
 - In a 24-hour period there can typically be between 4 and 12 coaches being removed from the 'in service' lineup for planned maintenance and unscheduled repairs
 - The 'in service' lineup requires 369 coaches for every trainset to be at its planned consist
 - There is considerable variation in consists, so a necessary trainset swap can put a smaller than planned consist on a busy train and a larger than planned consist on a lower ridership train



On Time Performance

On Time Performance (OTP) by Week





OTP Within 5 Minutes

	April 2018	May 2018	June 2018	July 2018	August 2018	September 2018	October 2018	November 2018	December 2018	January 2019	February 2019	March 2019	Trailing Year Average
Fairmount	97.9%	97.9%	95.3%	96.8%	95.2%	94.1%	97.2%	95.3%	98.3%	96.2%	96.9%	95.7%	96.4%
Fitchburg	86.7%	84.9%	87.0%	85.5%	88.0%	88.1%	87.1%	76.3%	88.4%	88.1%	87.5%	89.4%	86.4%
Franklin	89.2%	82.5%	84.9%	77.8%	80.2%	84.8%	82.8%	79.7%	90.8%	89.5%	90.1%	92.7%	85.3%
Greenbush	98.0%	94.6%	95.4%	93.5%	93.7%	94.7%	94.6%	91.7%	98.0%	94.8%	93.2%	97.0%	94.9%
Haverhill	90.6%	93.9%	93.0%	92.3%	92.6%	92.5%	92.5%	88.6%	93.1%	94.2%	92.5%	92.6%	92.4%
Kingston/Plymouth	94.0%	93.0%	90.1%	90.2%	91.6%	92.7%	90.6%	87.3%	95.4%	92.4%	89.0%	93.8%	91.7%
Lowell	90.9%	89.2%	92.7%	91.8%	93.0%	90.6%	89.6%	85.3%	95.4%	95.0%	91.7%	92.3%	91.5%
Middleboro	95.7%	90.3%	89.4%	88.1%	88.5%	91.8%	91.3%	88.3%	93.6%	87.5%	88.7%	91.1%	90.3%
Needham	91.4%	90.2%	92.0%	88.8%	91.6%	94.6%	89.9%	85.3%	92.2%	92.0%	86.5%	91.6%	90.5%
Newburyport	92.2%	92.7%	92.7%	91.9%	89.8%	92.6%	86.8%	85.3%	94.6%	93.7%	91.6%	92.8%	91.3%
Providence	86.5%	87.8%	87.1%	81.4%	86.6%	84.0%	82.5%	83.0%	89.0%	90.7%	88.4%	86.5%	86.1%
Rockport	92.7%	93.8%	92.2%	93.4%	90.1%	93.4%	86.4%	85.4%	96.2%	95.0%	90.9%	93.1%	91.9%
Stoughton	86.9%	87.1%	88.7%	81.1%	82.7%	84.3%	82.4%	80.1%	90.7%	87.3%	82.9%	85.9%	85.0%
Worcester	90.8%	88.0%	83.0%	78.9%	88.5%	93.3%	85.7%	82.4%	90.5%	88.8%	87.0%	91.2%	87.4%
Grand Total	91.4%	90.3%	90.0%	87.8%	89.4%	90.8%	88.3%	85.2%	93.2%	91.9%	90.0%	91.9%	90.0%



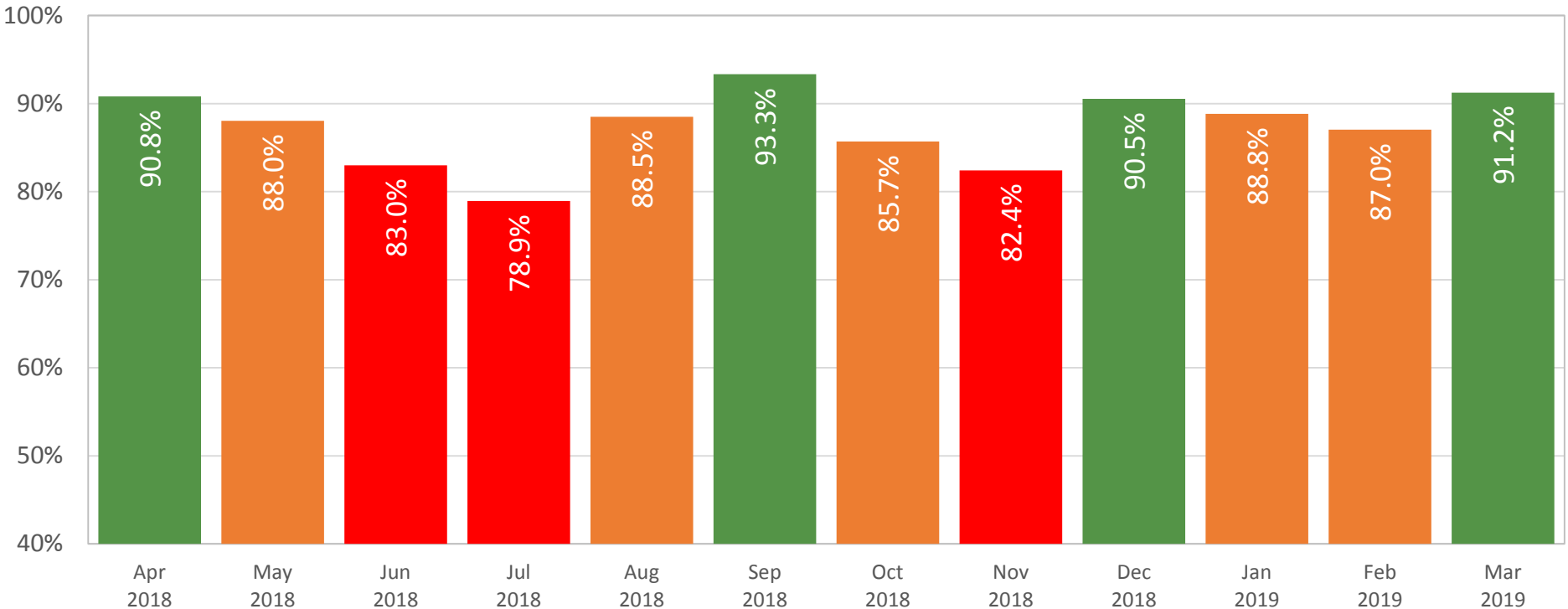
OTP Within 10 Minutes

	April 2018	May 2018	June 2018	July 2018	August 2018	September 2018	October 2018	November 2018	December 2018	January 2019	February 2019	March 2019	Trailing Year Average
Fairmount	99.3%	99.5%	97.8%	98.8%	97.2%	97.2%	98.6%	98.0%	99.5%	97.5%	98.2%	97.9%	98.3%
Fitchburg	93.1%	93.2%	92.9%	93.0%	94.4%	93.7%	93.6%	85.7%	94.4%	93.5%	91.9%	95.3%	92.9%
Franklin	95.5%	91.9%	93.1%	87.5%	89.2%	92.2%	91.0%	90.9%	96.3%	95.0%	93.3%	96.6%	92.7%
Greenbush	98.9%	97.3%	97.8%	95.8%	96.8%	96.5%	96.9%	95.1%	98.6%	96.7%	96.0%	98.5%	97.1%
Haverhill	96.2%	96.5%	97.0%	96.5%	96.0%	96.5%	96.9%	94.1%	96.9%	96.7%	96.6%	96.1%	96.3%
Kingston/Plymouth	98.0%	96.6%	96.0%	95.8%	96.0%	96.2%	94.7%	91.0%	98.0%	94.5%	93.8%	97.3%	95.7%
Lowell	96.9%	96.7%	97.4%	97.0%	97.4%	96.5%	95.5%	94.4%	98.5%	97.5%	96.5%	95.3%	96.6%
Middleboro	98.3%	95.4%	95.2%	94.0%	92.2%	95.1%	94.7%	93.5%	97.4%	93.2%	92.7%	95.5%	94.8%
Needham	96.8%	95.1%	96.7%	94.9%	96.6%	98.7%	95.3%	93.4%	97.3%	97.6%	93.7%	97.9%	96.1%
Newburyport	97.1%	97.2%	96.2%	98.2%	96.1%	97.6%	93.5%	94.1%	97.8%	96.4%	94.8%	97.0%	96.3%
Providence	94.0%	94.1%	94.3%	90.8%	93.9%	92.5%	91.9%	90.8%	95.4%	95.3%	93.6%	94.6%	93.4%
Rockport	96.4%	97.2%	97.4%	97.0%	94.6%	98.1%	93.8%	91.8%	98.0%	98.3%	94.8%	96.0%	96.1%
Stoughton	94.7%	94.4%	94.2%	89.9%	90.3%	92.8%	89.8%	90.6%	94.8%	95.5%	88.2%	92.9%	92.3%
Worcester	96.2%	94.7%	90.2%	88.1%	93.7%	96.5%	91.9%	91.9%	95.5%	94.8%	91.9%	95.7%	93.5%
Grand Total	96.4%	95.7%	95.3%	94.0%	94.6%	95.7%	94.1%	92.6%	97.0%	95.9%	94.2%	96.2%	95.1%

Worcester Line Performance



Worcester Line OTP Within 5 Min

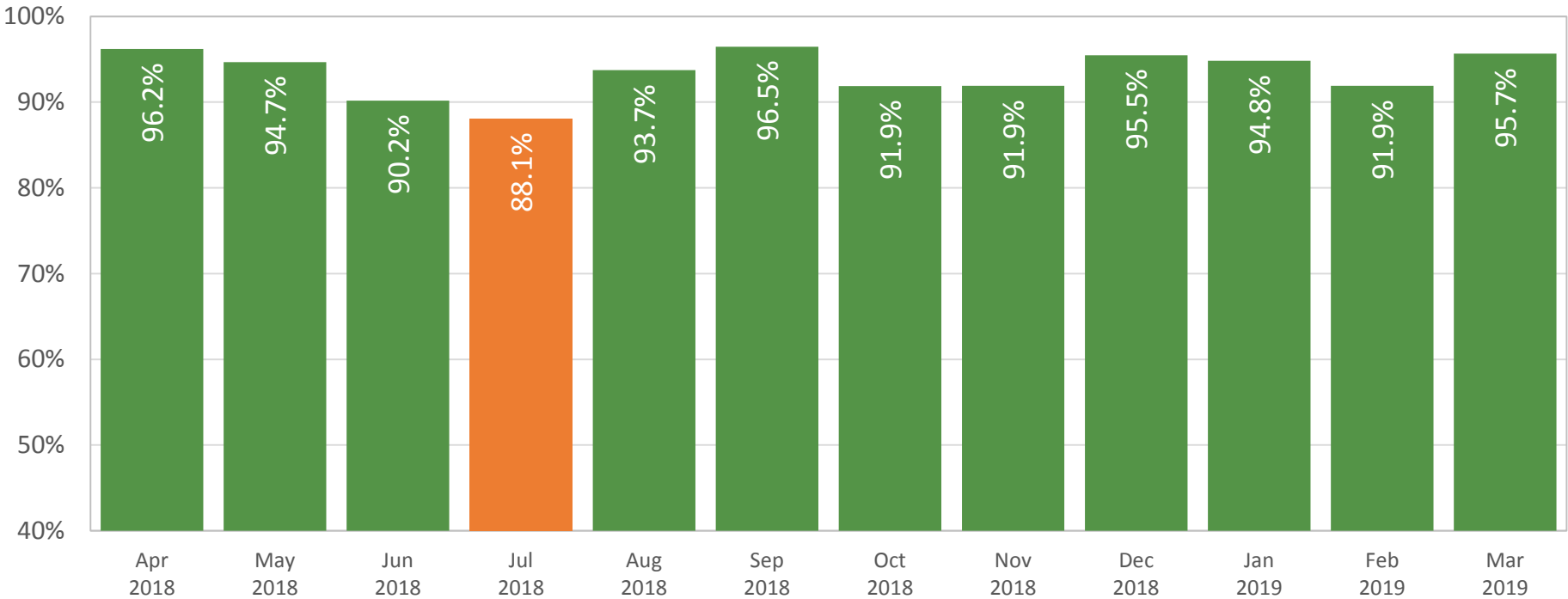


**March data not finalized*

Worcester Line Performance



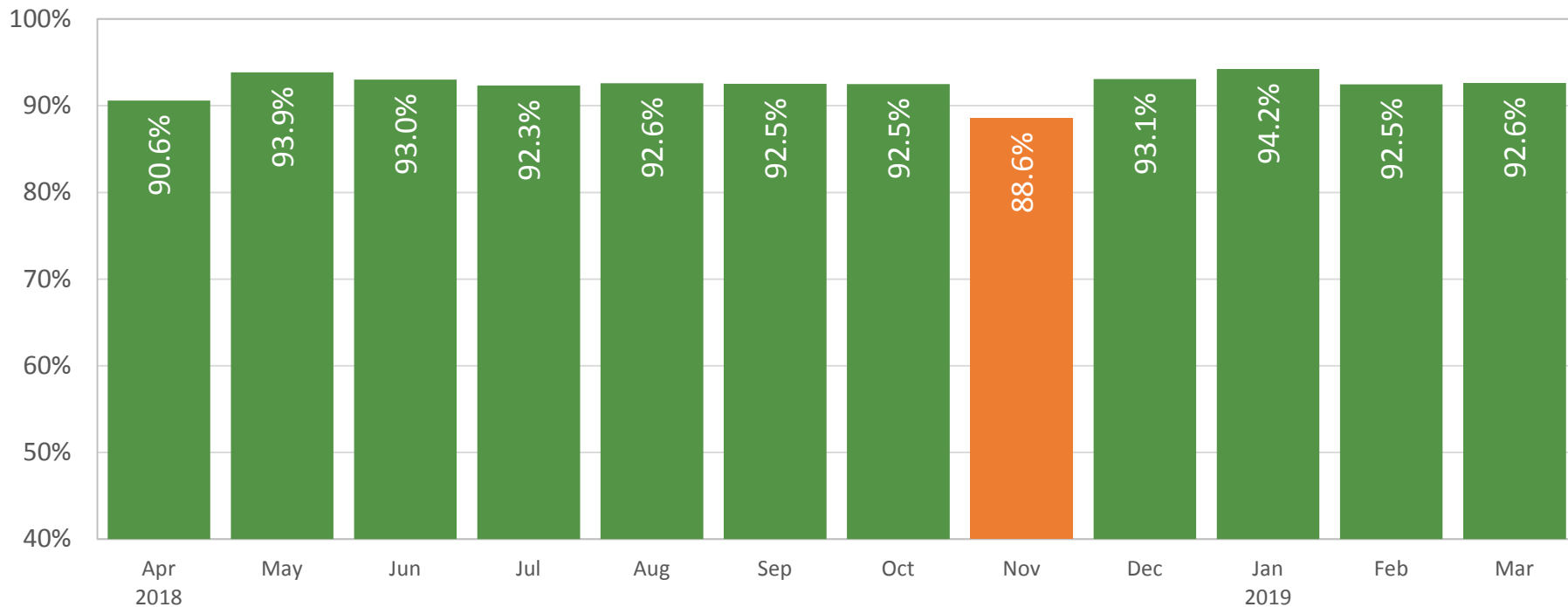
Worcester Line OTP Within 10 Min



Haverhill Line Performance



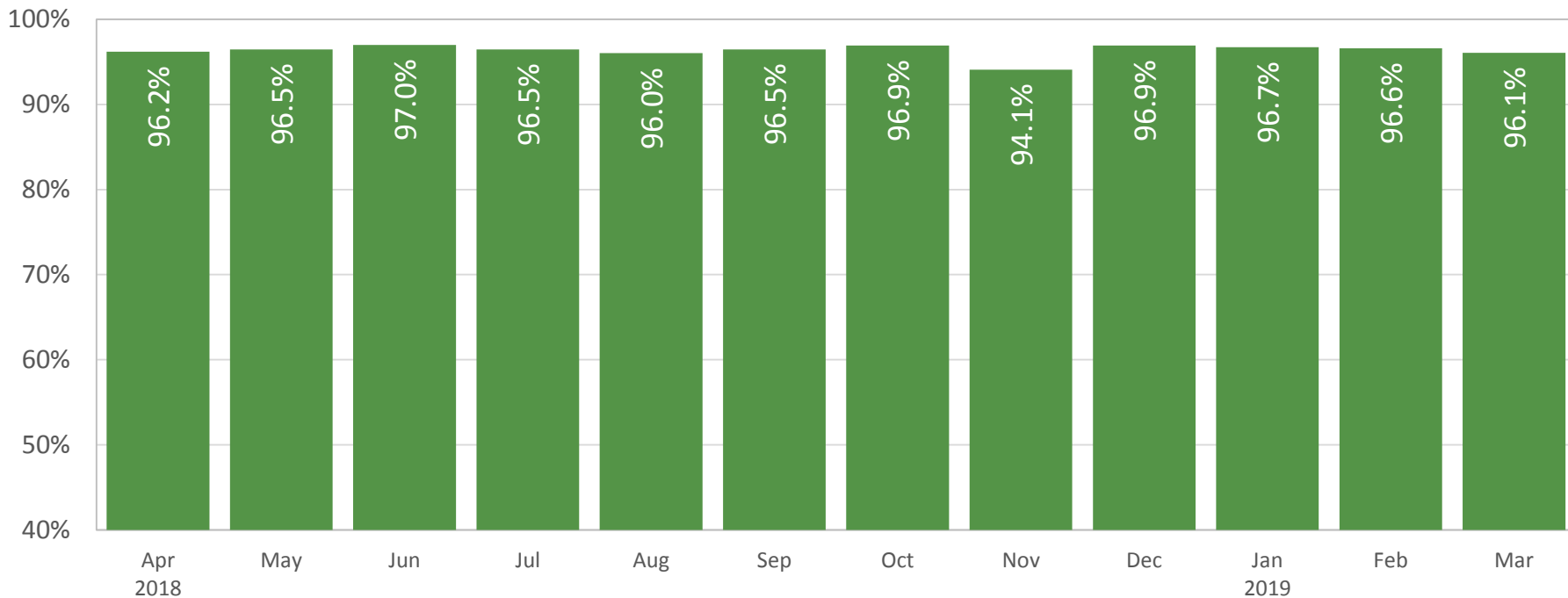
Haverhill Line OTP Within 5 Min



Haverhill Line Performance



Haverhill Line OTP Within 10 Min





Commuter Rail Derailments

◉ Fitchburg Line, November 27th

- Upright derailment on Train 404
- Detailed engineering failure analysis - **Completed**
- Premature coach bearing failure caused rapid overheating of axle
- These bearings are sealed units meant to operate for 4-6 years without maintenance
- Devices for visual inspection for overheating conditions added to all coaches
- New automated detection system will be installed to detect early bearing performance issues before failure

◉ Rockport Line, April 2nd

- Slow speed, upright derailment on Train 102 near North Station
- Detailed engineering failure analysis - **Underway**
- Preliminary focus on locomotive axle assembly components including bearing, lubrication, axle shaft
- Out of an abundance of caution, all similar locomotive axle assemblies immediately inspected

◉ Fairmount Line, April 9th

- Out-of-service train coming out of yard made contact with Fairmount Line train 780
- Caused by human error: train crew did not adhere to properly displayed red signal
- No correlation to other incidents
- Action plan to address 'human factors' developed and being implemented