Massachusetts Bay Transportation Authority

Safety Data Analysis Report
March 2022
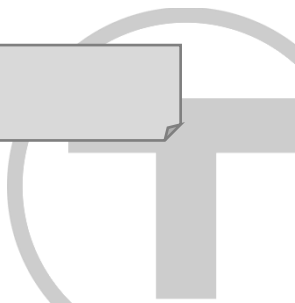
Matthew DeDonato
Deputy Director Safety Oversight and Planning
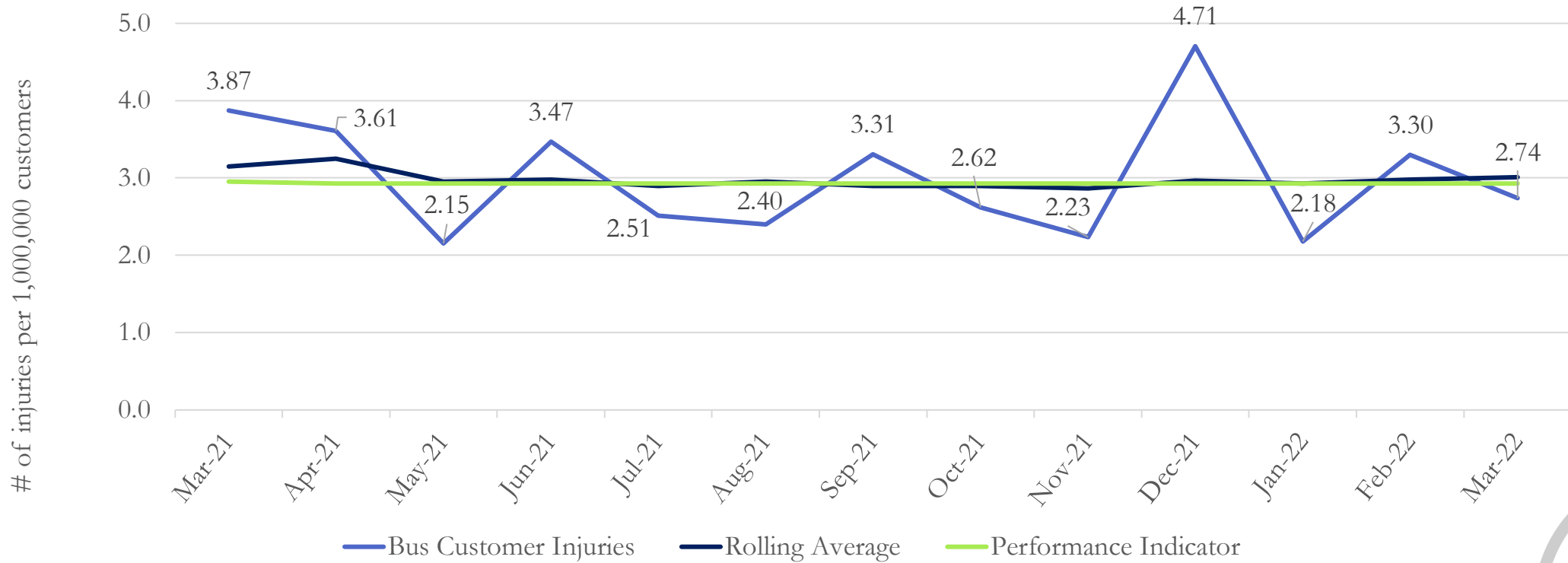
BUS

SAFETY PERFORMANCE INDICATORS

Bus - Safety Performance Indicators																			
Bus	2021 Monthly Target	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	2021 Target	2021 Total	2022 Monthly Target	Jan-22	Feb-22	Mar-22	2022 Target	2022 YTD
Fatalities - Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NTD Reportable Safety Events - Rate per million revenue miles	6.00	3.55	6.04	4.25	2.56	2.00	4.29	5.33	3.46	1.02	6.65	6.00	3.71	5.21	4.26	2.37	3.63	5.21	3.46
NTD Reportable Injuries - Rate per million revenue miles	15.50	12.69	9.29	8.50	11.24	11.53	11.93	13.86	9.90	10.22	17.90	15.50	11.01	14.00	9.59	12.42	9.86	14.00	10.56
Customer Injuries - Rate per milllion passenger trips	2.95	3.83	3.56	2.14	3.44	2.51	2.40	3.31	2.62	2.23	4.71	2.95	2.99	2.93	2.18	3.30	2.74	2.93	2.75
Collisions - Rate per million revenue miles	85.63	49.22	54.78	61.90	64.39	57.64	59.18	73.02	60.37	58.27	64.44	85.63	58.60	57.42	74.58	79.83	77.88	57.42	77.35
with Vehicle - Rate per million revenue miles	N/A	31.97	44.10	47.72	49.06	43.60	46.29	59.16	48.00	47.53	48.59	N/A	45.08	44.18	59.66	61.50	60.75	44.18	60.61
with Object - Rate per million revenue miles	N/A	14.21	6.50	10.39	10.73	11.53	8.59	9.59	9.40	9.71	11.25	N/A	9.93	9.73	11.72	14.78	13.50	9.73	13.29
with Person - Rate per million revenue miles	N/A	1.01	1.39	2.83	1.53	0.50	3.34	1.07	2.47	1.02	1.53	N/A	1.54	1.51	0.53	1.77	2.08	1.51	1.46
with T Vehicle - Rate per million revenue miles	N/A	2.03	2.79	0.94	3.07	2.00	0.95	3.20	0.49	0.00	3.07	N/A	2.04	2.00	2.66	1.77	1.56	2.00	2.00
Reportable Smoke/Fire Incidents	1	1	0	3	0	3	2	1	1	3	2	15	16	1	1	0	0	15	1
Mean Miles between Mechanical Failures	18,000	32,886	29,916	34,707	32,075	32,018	23,284	29,301	26,073	22,281	31,775	18,000	28,638	25,000	18,531	22,047	26,099	25,000	21,977

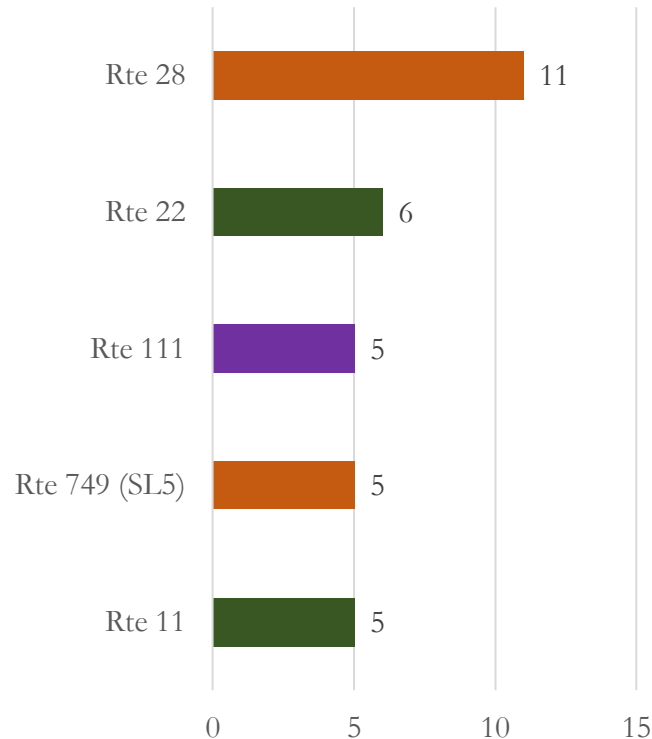In March 2022, bus ridership was at approximately 70% of the 2019 ridership.

BUS

CUSTOMER INJURIES
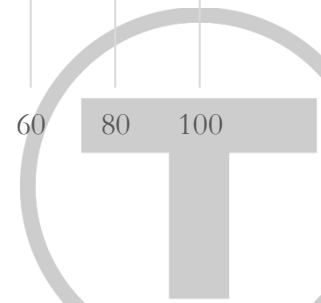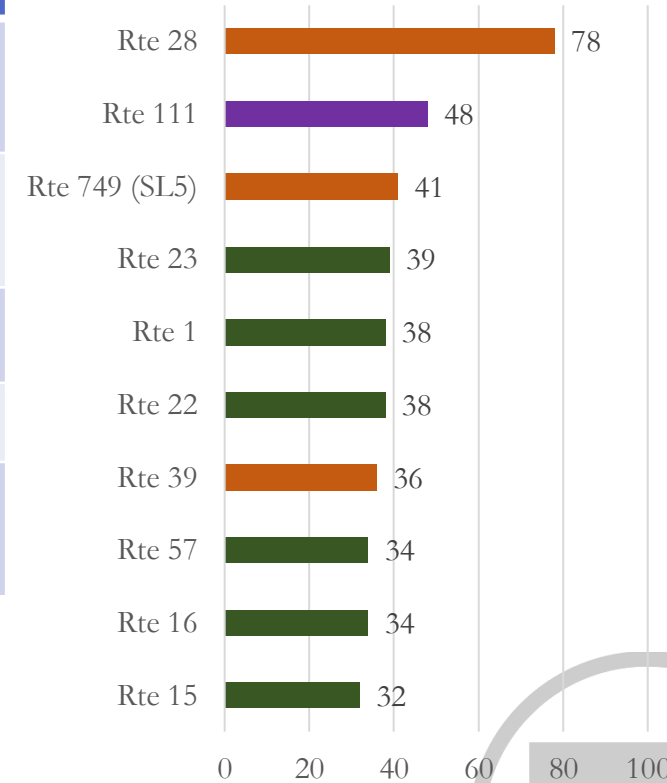## PER 1,000,000 CUSTOMERS, PAST 13 MONTHS

Legend: Bus Customer Injuries — Rolling Average — Performance Indicator

Data labels: 3.87, 3.61, 2.15, 3.47, 2.51, 2.40, 3.31, 2.62, 2.23, 4.71, 2.18, 3.30, 2.74

Y-axis: # of injuries per 1,000,000 customers

X-axis: Mar-21, Apr-21, May-21, Jun-21, Jul-21, Aug-21, Sep-21, Oct-21, Nov-21, Dec-21, Jan-22, Feb-22, Mar-22

BUS

Collision Breakdown

Top 5 Routes with Highest # of Collisions

Route	Collisions
Rte 28	11
Rte 22	6
Rte 111	5
Rte 749 (SL5)	5
Rte 11	5

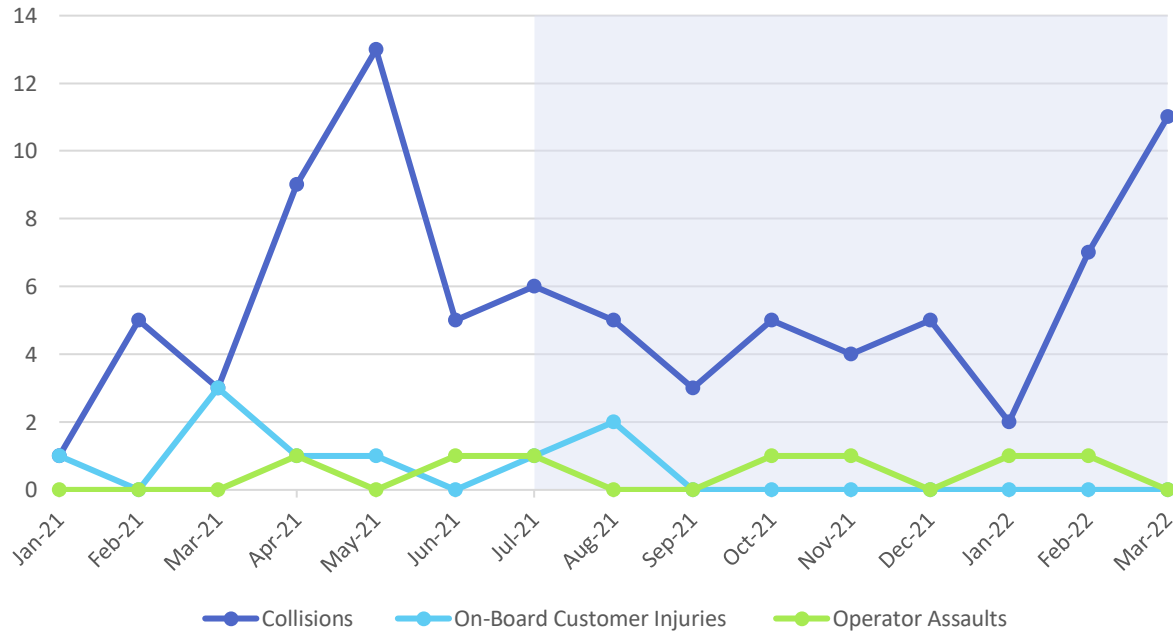| Route	Description
28	Mattapan Station to Ruggles Station
22	Ashmont Station to Ruggles Station
111	Woodlawn to Haymarket Station
SL5	Nubian Station to Temple Place
11	City Point to Chauncy St & Summer St

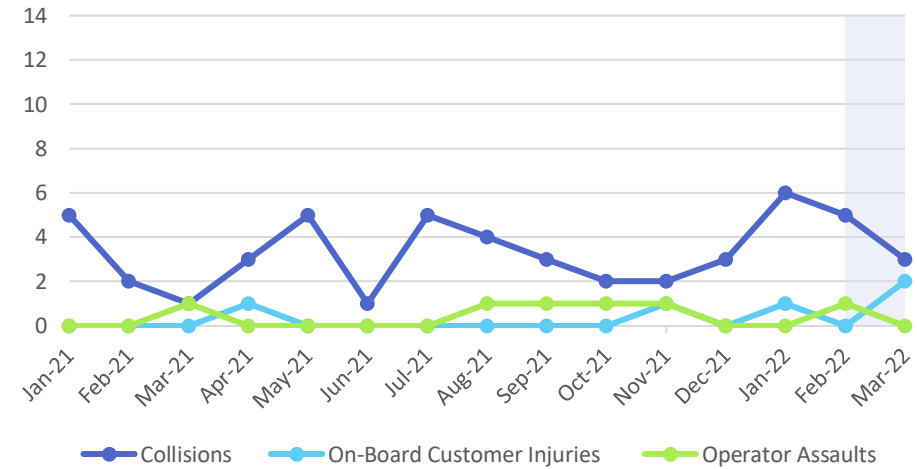**Top 10 Routes with Highest # of Collisions Past 12 Months**

Route	Collisions
Rte 28	78
Rte 111	48
Rte 749 (SL5)	41
Rte 23	39
Rte 1	38
Rte 22	38
Rte 39	36
Rte 57	34
Rte 16	34
Rte 15	32

BUS

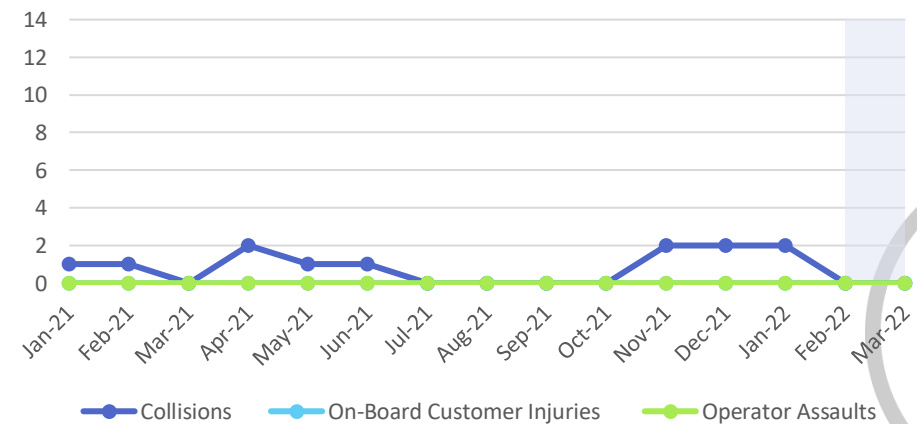## Free Bus Route Safety Incidents

Route 28 Safety Incidents

Route 23 Safety Incidents

Route 29 Safety Incidents

RAIL

SAFETY PERFORMANCE INDICATORS - Heavy Rail

Heavy Rail - Safety Performance Indicators

Heavy Rail	2021 Monthly Target	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	2021 Target	2021 Total	2022 Monthly Target	Jan-22	Feb-22	Mar-22	2022 Target	2022 YTD
Fatalities - Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NTD Reportable Safety Events - Rate per million revenue miles	1.00	1.17	0.00	1.74	1.76	0.51	1.00	1.62	0.52	1.63	1.04	1.00	1.09	1.00	0.00	1.78	0.52	1.00	0.73
NTD Reportable Injuries - Rate per million revenue miles	9.45	9.94	8.06	5.81	8.78	6.67	6.02	7.02	13.12	10.34	8.87	9.45	8.39	8.46	12.54	10.66	9.32	8.46	10.82
Mainline Revenue Train Derailments	0	1	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0
Mainline Non-Revenue Train Derailments	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Mean Miles between Mechanical Failures	47,000	76,206	55,634	41,955	47,064	48,344	51,118	40,399	29,975	39,987	42,484	47,000	44,617	47,500	26,193	33,891	43,898	47,500	33,272

Orange Line	2021 Monthly Target	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	2021 Target	2021 Total	2022 Monthly Target	Jan-22	Feb-22	Mar-22	2022 Target	2022 YTD
Customer Injuries - Rate per milllion passenger trips	2.99	3.44	2.61	2.26	3.53	2.78	2.20	1.52	4.95	3.09	2.53	2.99	3.12	3.06	1.57	3.20	3.09	3.06	2.69
Collisions - Rate per million revenue miles	0.77	3.07	5.32	4.28	2.25	0.00	3.54	2.01	2.12	0.00	2.13	0.77	2.32	2.27	0.00	0.00	0.00	2.27	0.00
Reportable Smoke/Fire Incidents	5	3	4	6	2	3	1	2	0	3	2	56	29	2	1	5	2	28	8

Red Line	2021 Monthly Target	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	2021 Target	2021 Total	2022 Monthly Target	Jan-22	Feb-22	Mar-22	2022 Target	2022 YTD
Customer Injuries - Rate per milllion passenger trips	4.36	5.62	4.67	2.08	2.26	2.45	2.33	1.98	1.79	3.55	1.89	4.36	3.05	3.01	5.75	3.93	2.59	3.01	3.88
Collisions - Rate per million revenue miles	0.48	0.00	1.10	0.00	2.14	1.89	0.00	0.00	0.00	2.85	0.91	0.48	0.90	0.88	1.88	0.00	0.84	0.88	0.91
Reportable Smoke/Fire Incidents	5	10	6	4	9	2	6	3	5	4	5	63	71	5	6	11	5	70	22

Blue Line	2021 Monthly Target	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	2021 Target	2021 Total	2022 Monthly Target	Jan-22	Feb-22	Mar-22	2022 Target	2022 YTD
Customer Injuries - Rate per milllion passenger trips	1.02	0.00	0.00	1.23	0.00	0.00	0.00	0.00	2.65	1.07	3.52	1.02	1.07	1.05	3.88	0.00	0.00	1.05	1.12
Collisions - Rate per million revenue miles	0.21	0.00	0.00	3.06	0.00	0.00	2.74	0.00	0.00	0.00	0.00	0.21	0.73	0.72	6.03	0.00	2.79	0.72	2.98
Reportable Smoke/Fire Incidents	1	2	0	1	1	1	0	0	0	0	1	6	11	1	0	0	0	11	0

In March 2022, heavy rail ridership was at approximately 53% of the ridership compared to 2019.

SAFETY PERFORMANCE INDICATORS – Light Rail

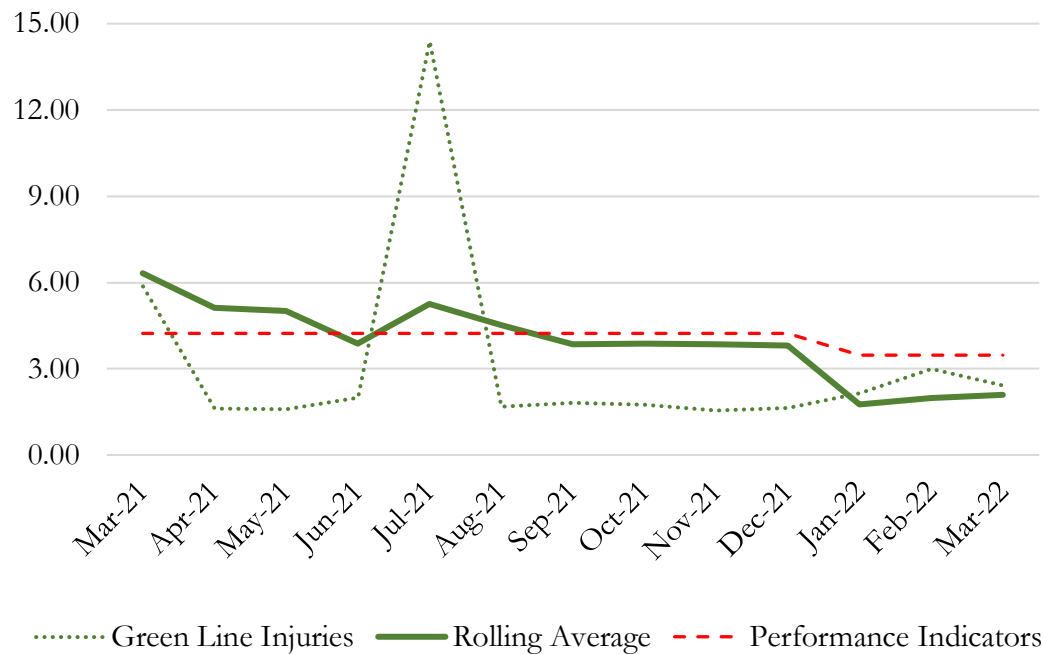| Light Rail	2021 Monthly Target	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	2021 Target	2021 Total	2022 Monthly Target	Jan-22	Feb-22	Mar-22	2022 Target	2022 YTD
Fatalities - Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NTD Reportable Safety Events - Rate per million revenue miles	5.83	0.00	0.00	2.65	2.48	4.72	11.67	0.00	2.10	2.07	3.99	5.83	3.21	5.58	6.27	6.79	8.05	5.58	7.06
NTD Reportable Injuries - Rate per million revenue miles	17.25	18.27	5.13	21.20	9.93	68.38	9.33	10.94	10.52	8.29	9.97	17.25	16.60	14.70	10.45	22.64	14.09	14.70	15.53
Mainline Revenue Train Derailments	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0
Mainline Non-Revenue Train Derailments	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Mean Miles between Mechanical Failures	7,000	9,511	12,202	7,814	7,280	5,721	6,077	7,308	7,516	8,393	7,817	7,000	7,780	7,500	7,329	5,311	7,558	7,500	6,612
Green Line	2021 Monthly Target	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	2021 Target	2021 Total	2022 Monthly Target	Jan-22	Feb-22	Mar-22	2022 Target	2022 YTD
Customer Injuries - Rate per million passenger trips	4.23	5.88	1.61	1.60	2.00	14.37	1.60	1.69	1.60	1.55	1.56	4.23	3.53	3.48	2.00	2.75	2.41	3.48	2.41
Collisions - Rate per million revenue miles	6.65	2.28	0.00	5.30	2.48	9.43	4.67	2.19	2.10	4.14	7.98	6.65	4.53	4.44	6.27	11.32	6.04	4.44	7.76
Reportable Smoke/Fire Incidents	4	3	1	2	3	0	2	1	0	7	5	45	34	3	3	8	4	33	15

In March 2022, light rail ridership was at approximately 47% of the ridership compared to 2019.

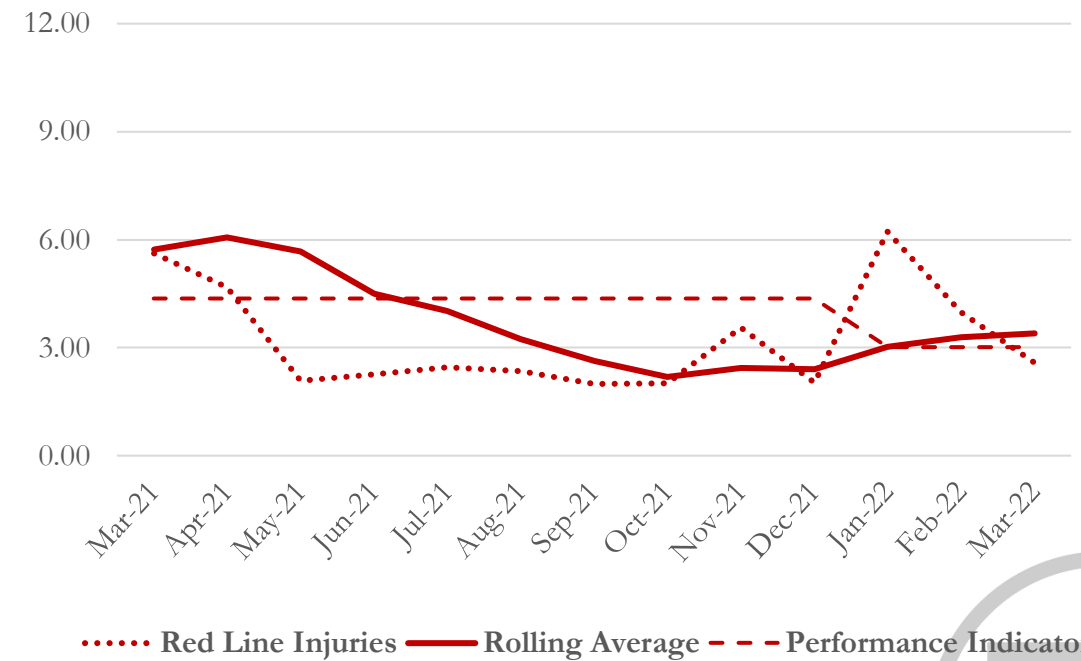# RAIL

CUSTOMER INJURIES per 1,000,000 Customers
PAST 13 MONTHS

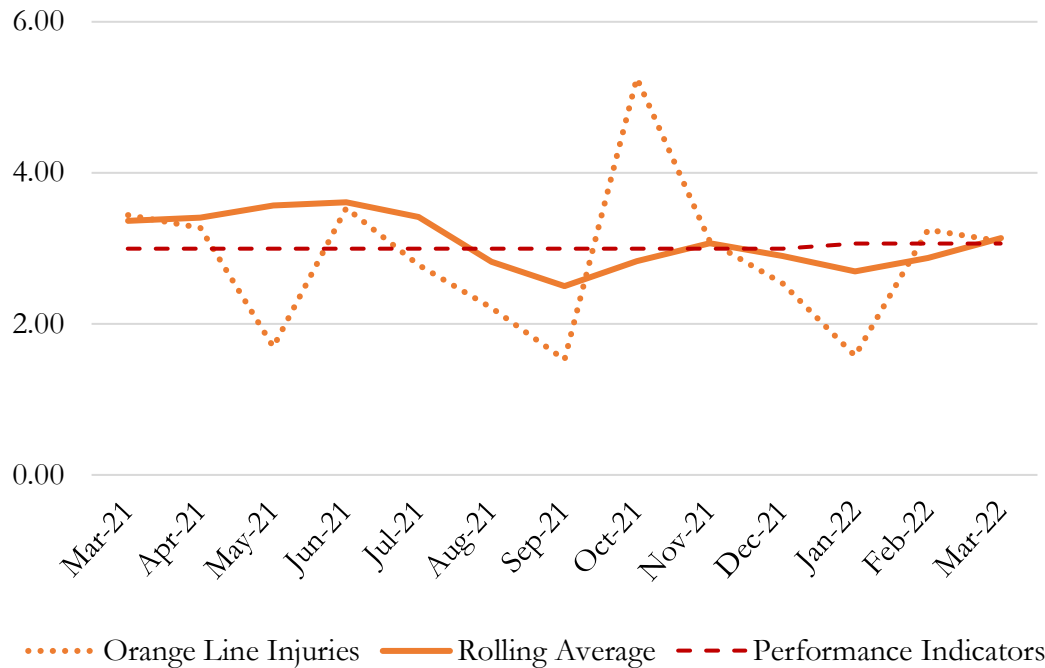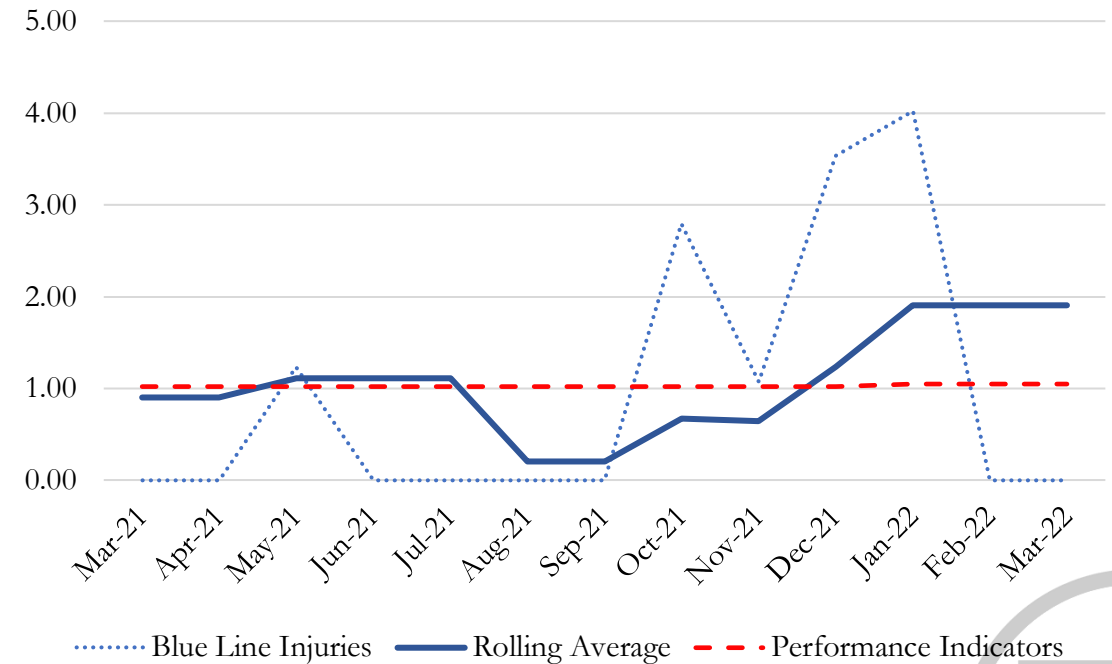

Green Line Customer Injuries per 1,000,000 Customers

Green Line Injuries ········ Rolling Average —— Performance Indicators – – –

Red Line Customer Injuries per 1,000,000 Customers

Red Line Injuries ········ Rolling Average —— Performance Indicators – – –

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RAIL

CUSTOMER INJURIES per 1,000,000 Customers
PAST 13 MONTHS CONT'D

Orange Line Customer Injuries per 1,000,000 Customers

········ Orange Line Injuries ——— Rolling Average – – – Performance Indicators

Blue Line Customer Injuries per 1,000,000 Customers

········ Blue Line Injuries ——— Rolling Average – – – Performance Indicators

FIRE/SMOKE

Code 1 **Reportable** Incidents
- fire/smoke with 1 or more injuries
requiring transport
OR
- fire/smoke that requires suppression
but not evacuation
OR
- fire/smoke with an evacuation onto the ROW

Code 1 **Non-Reportable** Incidents
- fire/smoke with **NO** injury transport,
suppression or evacuation

TOTAL REPORTABLE INCIDENTS - March 2022
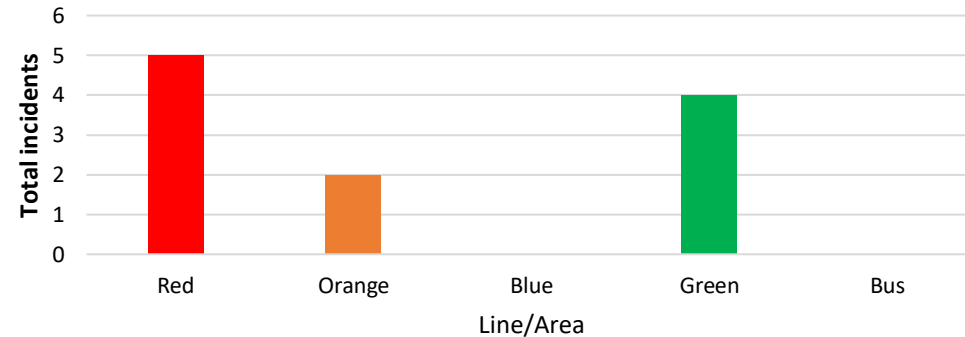
March Total Code 1: Fire/Smoke Incidents		
NTD Criteria	**Non-Reportable**	**Reportable**
Rail	13	11
Bus	3	0
March Total Incident	16	10
2021 Total Monthly Avg	*17.7*	*12.8*

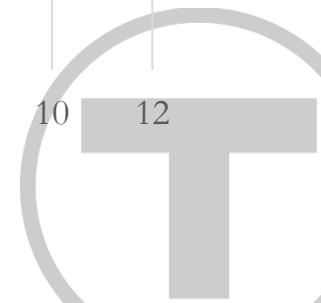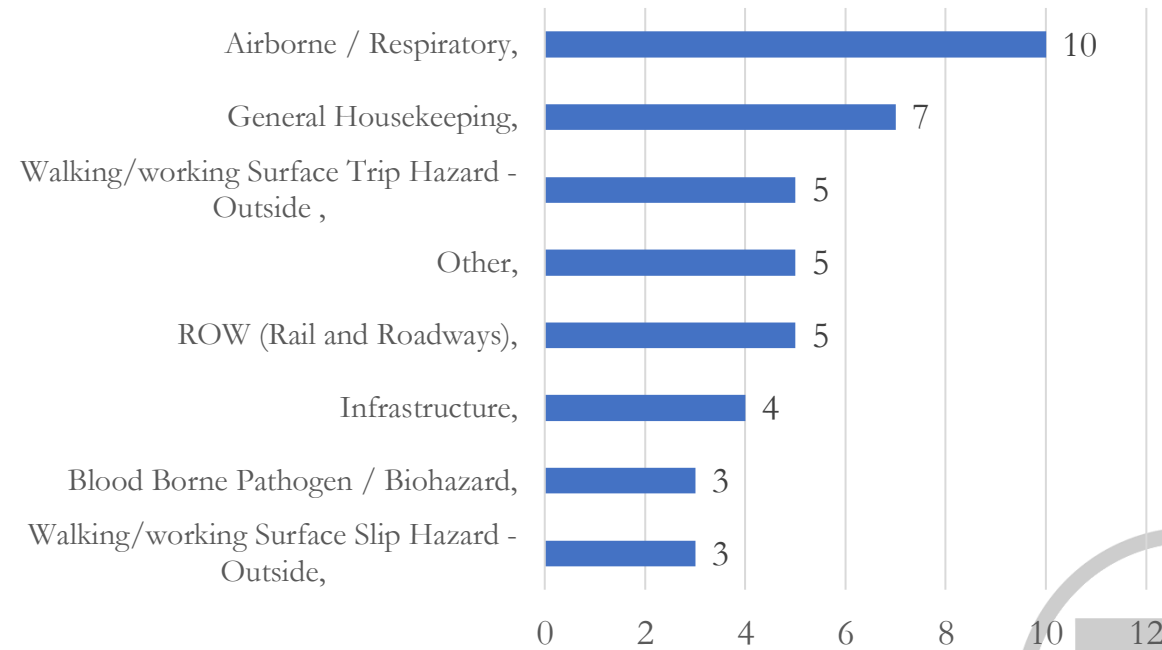| March Total Reportable Incidents - AREA		
	Mar-22	*Mar-21*
Red	5	9
Orange	2	3
Blue	0	2
Green	4	3
Bus	0	1
TOTAL	**11**	**18**

SAFETY HOTLINE

Safety Hotline Reporting Options
- Safety Hotline
- Safety Notification email
- Direct reporting to an MBTA Safety official
- Submitting Form B by email, to an MBTA Safety official, or by fax

Month	Total Reports	Closed
Jan 2022	15	11
Feb 2022	24	17
Mar 2022	23	11
Total	**62**	**39**

Safety Hotline Reports by Hazard Types (3 or more): Last 3 months

Hazard Type	Count
Airborne / Respiratory,	10
General Housekeeping,	7
Walking/working Surface Trip Hazard - Outside ,	5
Other,	5
ROW (Rail and Roadways),	5
Infrastructure,	4
Blood Borne Pathogen / Biohazard,	3
Walking/working Surface Slip Hazard - Outside,	3

SAFETY HOTLINE

Below are examples of MBTA Safety Hotline reports received and investigated in March 2022.

- REPORT – The new traffic light system at Congress St @ Sudbury St has the walk sign for pedestrian in both direction when buses have the "proceed with caution" light.
  Pending – The signal was implemented by the City without working with the MBTA. Schedule and Planning is working with the City to resolve this hazard.

- REPORT - Construction signage was left blocking a pathway at the new Union Square Station when entering station and heading toward the bathroom.
  Complete - Signage was in the process of installation and was moved to ensure the pathway was clear. Safety coordinated with GLX to ensure that material drop off is coordinated with specified drop off locations.

- REPORT – Employee was assigned to clean equipment at Kenmore substation and found that there were problems with the ventilation system and no eyewash station.
  Monitoring - Safety visited and assessed the facility. The ventilation system was broken and there was no eyewash station nor first aid kit found. Safety conducted an assessment of the air quality in the area and requested (1) eyewash bottle, (2) replacement First Aid Kits, and repair or replacement of the ventilation system.

Eyewash Station at Kenmore Substation

SAFETY INITIATIVES

| Notable Safety Initiatives in March 2022 |
| --- |

SMS Implementation

In March, MBTA Safety continued review of the Transit Safety Plan as part of the 2022 updates as well as the Phase 2 SMS Implementation exit criteria. Phase 2 has focused on strengthening the Safety Risk Management processes and completion of SMS Training. Safety also continued to work with the business units to review completion rates for the SMS Fundamentals Course.

OHS Program Development

In March, the OHS Team presented the Material Handling & Storage Program to the SMRC. The committee formally voted to approve the program, which is now moving to implementation. The next program for review will be Tools: Hand & Power. The OHS Team is also continuing to host OSHA 10 and OSHA 30 classes.

2022 Internal Safety Audits

In March, MBTA Safety kicked off the 2022 Annual Internal Safety Audit cycle. The 2022 audits will include Heavy Rail Transportation and Training, Power, Bus Operations, Signals, and Capital Delivery.
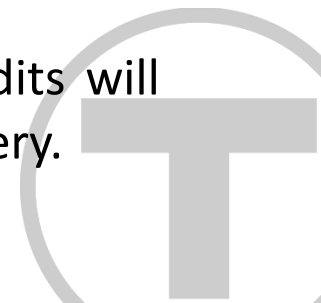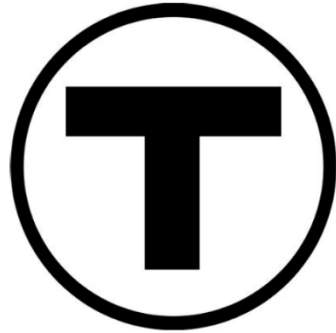
Massachusetts Bay Transportation Authority

Calendar Year 2022 – Quarter 1
Safety Data Review

Matthew DeDonato
Deputy Director Safety Oversight and Planning

Mandated Performance Targets - Fatalities

A fatality meets the threshold for reporting if it occurs on our property and is confirmed within 30 days.

Fatalities – Rate per million vehicle revenue miles			
	Annual Performance Target	Basis for Target	CY22 - Q1 Performance
Heavy Rail	0	Move to zero	0
Light Rail	0	Move to zero	0
Bus	0	Move to zero	0
The RIDE	0	Move to zero	0

Per FTA guidance, this metric excludes fatalities related to suicide or trespassing.

Mandated Performance Targets - Injuries

An injury (of customer, employee, or member of the public) meets the threshold for reporting if it requires transport away from the scene for medical attention for one or more persons.

NTD Reportable Injuries – Rate per million vehicle revenue miles			
	Annual Performance Target	Basis for Target	CY22 - Q1 Performance
Heavy Rail	8.46	2% reduction	10.82
Light Rail	14.70	2% reduction	15.53
Bus	14.00	2% reduction	10.56
The RIDE	1.91	2% reduction	5.30

Per FTA guidance, this metric excludes injuries related to assault and other security related injuries.

Mandated Performance Targets – NTD Reportable Safety Events

An event is considered a **safety event** if it meets the reporting thresholds for collisions, derailments, fire, hazardous material spill, act of nature (Act of God), evacuation, or Other Safety Occurrence Not Otherwise Classified occurring on a transit right-of-way, in a transit revenue facility, in a transit maintenance facility, or involving a transit revenue vehicle and meeting a NTD Major event threshold.

NTD Reportable Safety Events – Rate per million vehicle revenue miles			
	Annual Performance Target	Basis for Target	CY22 - Q1 Performance
Heavy Rail	1.00	2% reduction	0.73
Light Rail	5.58	2% reduction	7.06
Bus	5.21	2% reduction	3.46
The RIDE	1.99	2% reduction	0.53

Mandated Performance Targets – System Reliability

Reliability is measured as the mean distance between major mechanical failure by mode. Major mechanical system failures prevent a vehicle from completing or starting up a scheduled revenue trip because actual movement is limited or because of safety concerns.

System Reliability - Revenue miles traveled per major mechanical failure			
	Annual Performance Target	Basis for Target	CY22 - Q1 Performance
Heavy Rail	47,500	Move to 3-year avg.	33,272
Light Rail	7,500	Move to 3-year avg.	6,612
Bus	25,000	Move to 3-year avg.	21,977
The RIDE	60,000	Move to 3-year avg.	Pending

Commuter Rail CY22-Q1 Performance

Commuter Rail - Performance Metrics		
	CY21 – Q1 Performance	CY22 – Q1 Performance
Fatalities (per million revenue miles)*	0	0.17
Reportable Injuries (per million revenue miles)	2.25	3.06
Reportable Customer Injuries (per million revenue miles)	0.32	0.85
Reportable Incidents (per million revenue miles)	0.97	1.19
Reportable Derailments (total)	0	0

Metrics are in conformance with FRA Reporting Requirements.
*Excludes fatalities related to suicide and trespassing

Ferry CY22-Q1 Performance

Ferry - Performance Metrics		
	CY21 – Q1 Performance	CY22 – Q1 Performance
Fatalities (per million revenue miles)*	0	0
Reportable Injuries (per million revenue miles)	0	0
Safety Events (per million revenue miles)	0	0

*Excludes fatalities related to suicide and trespassing