

Washington Metropolitan Area Transit Authority

Board Action/Information Summary

☒ Action ☐ Information

MEAD Number:
201925

Resolution:
☐ Yes ☒ No

TITLE:

Discussion on Train Offloads/Evacuations

PRESENTATION SUMMARY:

The Department of Safety & Environmental Management (SAFE) will discuss recent trends and actions pertaining to train offloads and emergency evacuations.

PURPOSE:

To provide a statistical review and analysis of train offloads and emergency evacuations, followed by remedial actions that have yielded improvements as well as possible mitigations moving forward.

DESCRIPTION:

Train offloads occur for a variety of reasons, including rail vehicle malfunctions, track or supporting infrastructure problems, service adjustments to alleviate crowd conditions elsewhere in the system, and offloads due to public activities, such as Metro Transit Police Department (MTPD) security-related activities and sick passengers.

Emergency evacuations occur less frequent, and can be categorized in three areas including: passenger train self-evacuations, WMATA-assisted passenger train evacuations, and station emergency evacuations. The primary cause of both offloads and train evacuations is railcar malfunctions. There has been a decrease in both offloads and evacuations as railcar reliability has increased.

Additionally, Rail Operations Control Center (ROCC) field communication has improved, with the utilization of an incident command structure and the introduction of a fire liaison. Stations are being evacuated as part of improved safety awareness to safeguard passengers when smoke is reported. Finally, station overcrowding is a consequence of train offloads. Station configurations at high volume stations are being explored to reduce station overcrowding.

Key Highlights:

- Train offloads and emergency evacuations have steadily decreased over the past 20 months as railcar availability and other infrastructure conditions have improved.
- Improved track flow and station signs/markings are being explored to reduce station overcrowding at high volume stations during peak travel times.

Background and History:

The Board requested a discussion and review of train offloads and emergency evacuations. Offloads can occur for a variety of reasons, as do emergency evacuations

from both trains and rail stations. Both have seen decreases due to railcar and overall system improvements, as the data demonstrates.

Discussion:

Train Offloads

Train offload causes can be categorized in four groups: railcar malfunctions, infrastructure issues, service adjustments to alleviate crowd conditions elsewhere in the system, and offloads due to public needs, such as MTPD security-related activities and sick passengers. Railcar malfunctions comprise 72% of all train offloads, from January 2016 through August 2017, followed by service adjustments (11%), public needs (10%), and infrastructure-related (7%).

Brake, door and propulsion malfunctions are the primary issues encountered with railcar-related offloads. One railcar-related key performance indicator is measured by Mean Distance Between Delays (MDBD) or how long a railcar travels before having an incident that causes a delay to customers. There has been a steady increase in this measure since January 2016. To date, the average MDBD is approximately 91,000; CY16 ended with a MDBD of 65,029. Many of the issues that result in railcar-related malfunctions have been addressed by removing the 1K and 4K series cars. In addition, acquiring more 7K series cars, coupled with revised maintenance processes, has led to a 45% decrease in railcar-related offloads when compared to the same time period in CY16 (i.e., January – August).

The January 12, 2017, Board briefing provided detailed information on railcar improvement campaigns that positively impact MDBD. The campaigns included specific inspections that are designed to cover critical sub-systems that cause the majority of railcar delays, such as HVAC, doors, pneumatic, brakes and propulsion. The long term strategy for improving railcar reliability is to strengthen preventative maintenance practices to prevent the failures from happening in the first place. The campaigns also use a data-driven approach to evaluate and re-tool maintenance strategies, evaluating inspection intervals, and advancing strategies to monitor condition to proactively prevent delays and strengthen mechanic training.

Service adjustments are necessary when parts of the system experience an influx of passengers; trains may need to be discharged and turned around before arriving at the terminus in order to service the core stations and alleviate station overcrowding. MTPD personnel are often dispatched to crowded stations to choreograph crowd control activities. This category had a 25% reduction when compared to last year.

Infrastructure issues may include track problems (e.g., cracked rail, arcing insulator) or signaling issue where trains may be unable to pass through certain areas. This category had a 32% reduction, primarily as a result of SafeTrack. Finally, events that involve the public also contribute to offloads. This may be the result of MTPD activities/investigations and sick passengers. This category had a slight 5% reduction.

Evacuations

There are three types of emergency evacuations: passenger self-evacuations, WMATA-assisted train evacuations, and fire/life safety station evacuations. There have been 24 incidents since January 2016 through September 2017. The number of overall evacuations decreased 74% when compared to the same time period in CY16 (i.e., 19 in 2016 vs. five in 2017).

Station evacuations may be the result of an electrical arcing event or other fire/smoke

event. Station evacuations also occur to safeguard passengers until the actual fire/smoke cause is identified and confirmation is received through the ROCC fire liaison. As significant system fires have declined, so have station evacuations. WMATA-assisted train evacuations occur when a train becomes stalled due to a malfunction, as described earlier. As with train offloads, as MDBD (i.e., railcar reliability) improves the number of emergency evacuations decrease. The majority of passenger self-evacuations occur when passengers remain on the train after it's announced that the train will be removed from service (e.g., pocket track storage) or unintentionally sent to a rail yard. Enhanced processes have been implemented to prevent customers remaining on trains when they are removed from service, such as having the rail operator walk through the train before moving to the yard.

Future Initiatives

To assist with crowded station conditions, several surveys were conducted at stations that are commonly crowded (i.e., Gallery Place, Navy Yard, Metro Center, L'Enfant Plaza, Farragut North, and Union Station). Passenger movement was recorded and navigation patterns were analyzed. Depending on the challenges posed at each location, solutions include, but are not limited to, installing enhanced floor markings and decals guiding passengers to the best location for when a train arrives, and temporary stanchions that would direct passengers in the most efficient traffic pattern to avoid bottlenecks. Both would be accompanied by additional WMATA staff at peak times to assist with crowd management.

Leak mitigation efforts are also underway along the Red Line. These efforts include waterproofing the tunnel walls that will prevent water infiltration into the system, which is one of the main causes of arcing events.

FUNDING IMPACT:

No additional budget required.	
Project Manager:	Patrick Lavin
Project Department/Office:	SAFE

TIMELINE:

Previous Actions	<ul style="list-style-type: none"> To review the Train Reliability Program as part of the January 12, 2017 Customer Service, Operations, and Security Committee.
Anticipated actions after presentation	<ul style="list-style-type: none"> Continue to monitor train and station evacuations and to continue to enhance reliability to reduce offloads.

RECOMMENDATION:

To inform the Board's Safety Committee of the actions that are improving service reliability therefore reducing offloads.

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Washington Metropolitan Area Transit Authority

Discussion on Train Off-Loads/Evacuations

Safety Committee
October 26, 2017



Train Offloads – Primary Causes

January 2016 – August 2017

Railcar Malfunctions

- Brakes (31%)
- Doors (16%)
- Propulsion (12%)
- Other (13%)

Service Adjustments

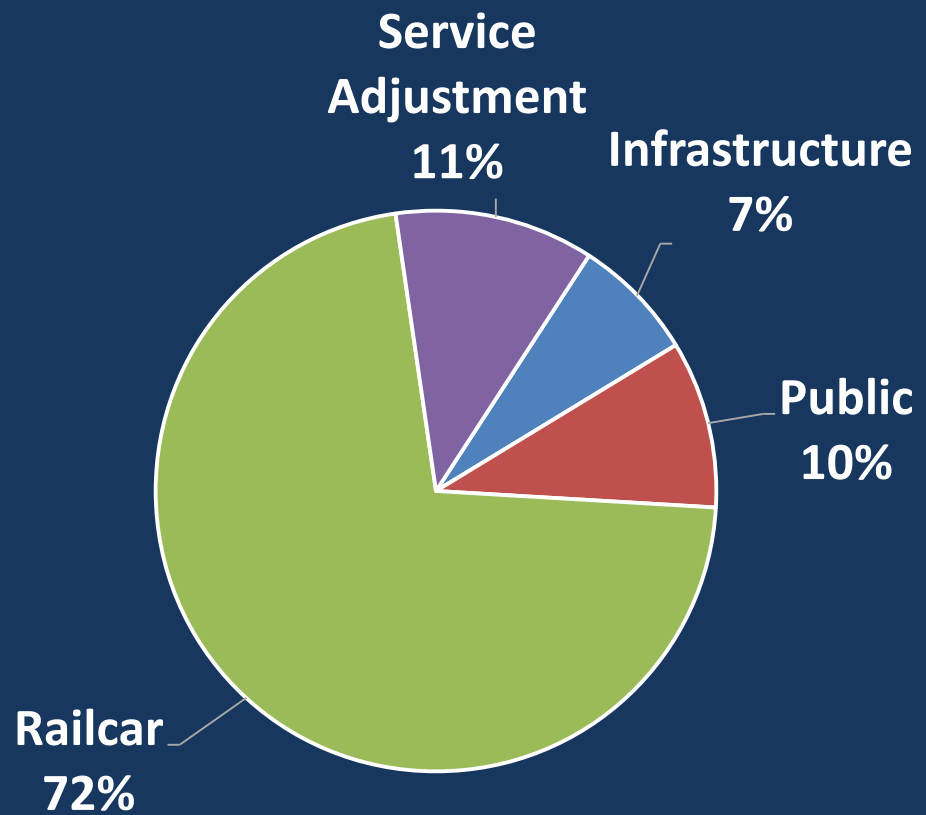
- Schedule adjustments to alleviate core crowding

Public:

- Sick Passenger
- Security/MTPD event

Infrastructure

- Smoke/fire event
- Signal issue
- Track switch issues

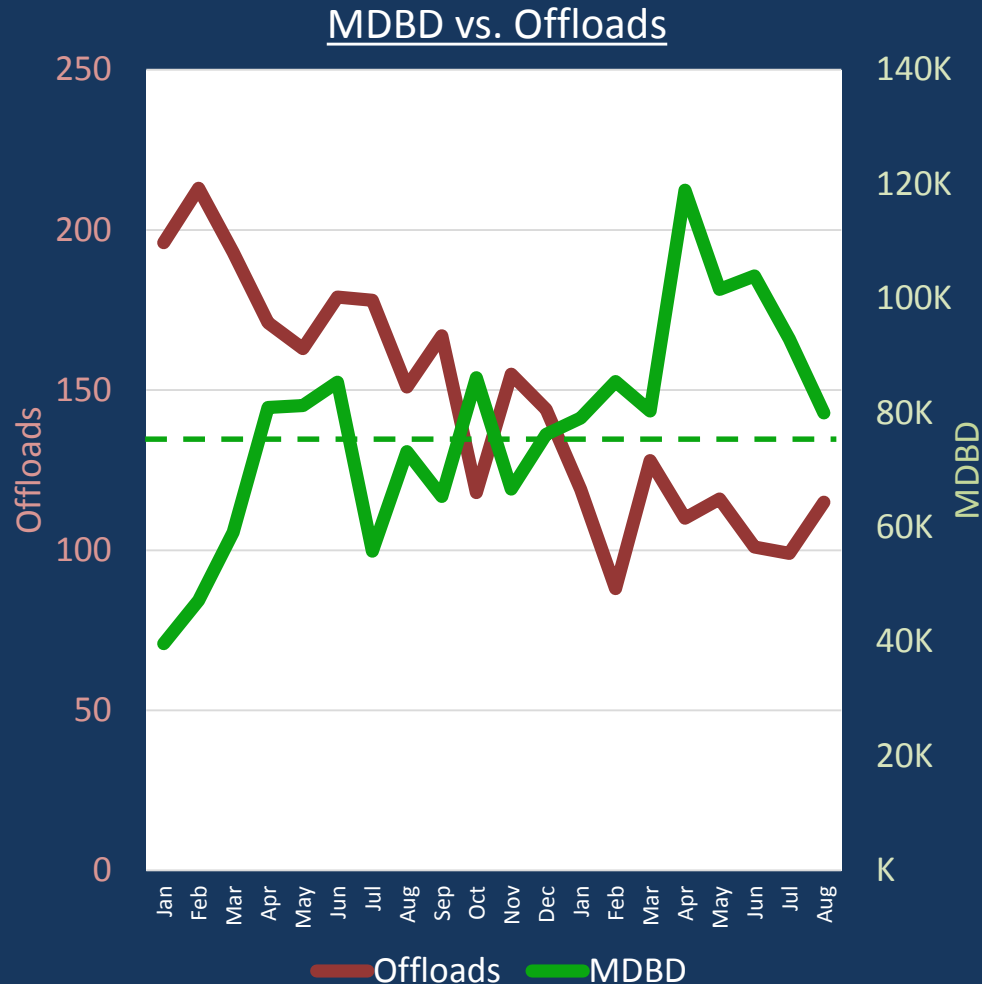




Train Offloads – Improvements

January 2016 – August 2017

- CYTD Decreases:
 - Railcar - 45%
 - Infrastructure - 32%
 - Service Adjustments - 25%
 - Public - 5%
- Primary driver of offloads: railcar malfunctions
- Railcar Key Performance Indicator: “Rail Fleet Mean Distance Between Delay” (MDBD) (Target: 75k miles)
- As MDBD increased, train offloads decreased



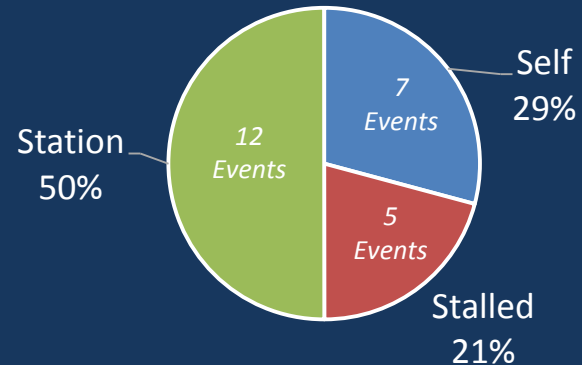


Emergency Evacuations

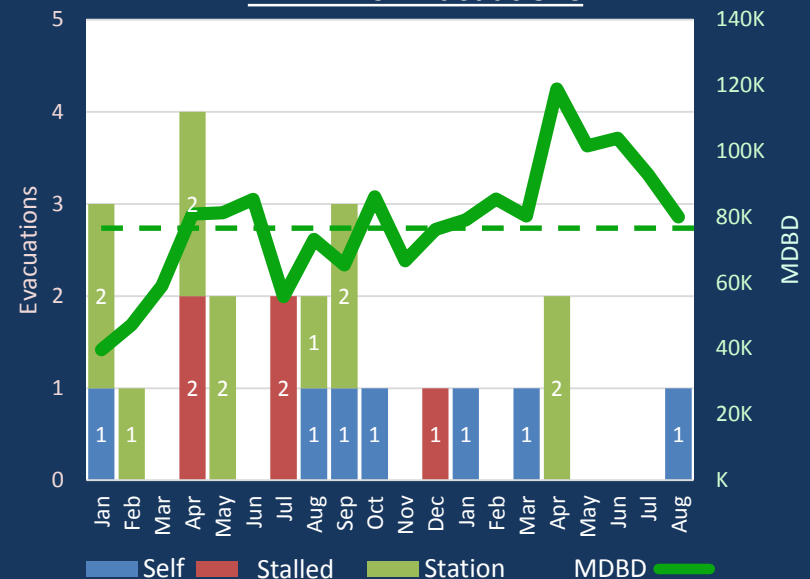
January 2016 – August 2017

- 24 events since Jan 2016
 - 19 (CY16) vs 5 (CY17)
- CYTD Decrease: 74%
- Three main types of evacuation
 - Train
 - Passenger self evacuations
 - Train stalled / WMATA-assisted evacuation
 - Station
 - Fire/Life Safety concerns
- As MDBD increased, emergency evacuations decreased

Evacuation Types



MDBD vs. Evacuations



Improved Incident Management

- MTPD dispatched to choreograph crowd control
- ROCC Fire Department Liaison
- Improved coordination with ROCC personnel and first responders





Actions Taken

- Removal of the 1K and 4k rail cars
- Acquiring additional 7k rail cars
- Red Line leak mitigations
- Get Well Program
 - Revised maintenance practices
- Engineering Modifications (EMI)
 - Engineering solutions to routine maintenance problems
- SafeTrack
 - Accelerated track work plan ⁴⁸



SafeTrack

Future Initiatives

- Station surveys of passenger movement and navigation
- Review of crowded station floor marking, signage, and announcement improvements
 - Gallery Place
 - Navy Yard
 - Metro Center
 - L'Enfant Plaza
 - Farragut North
 - Union Station

