

NYCT Subway Performance

Joseph Leader, Senior VP, Subways

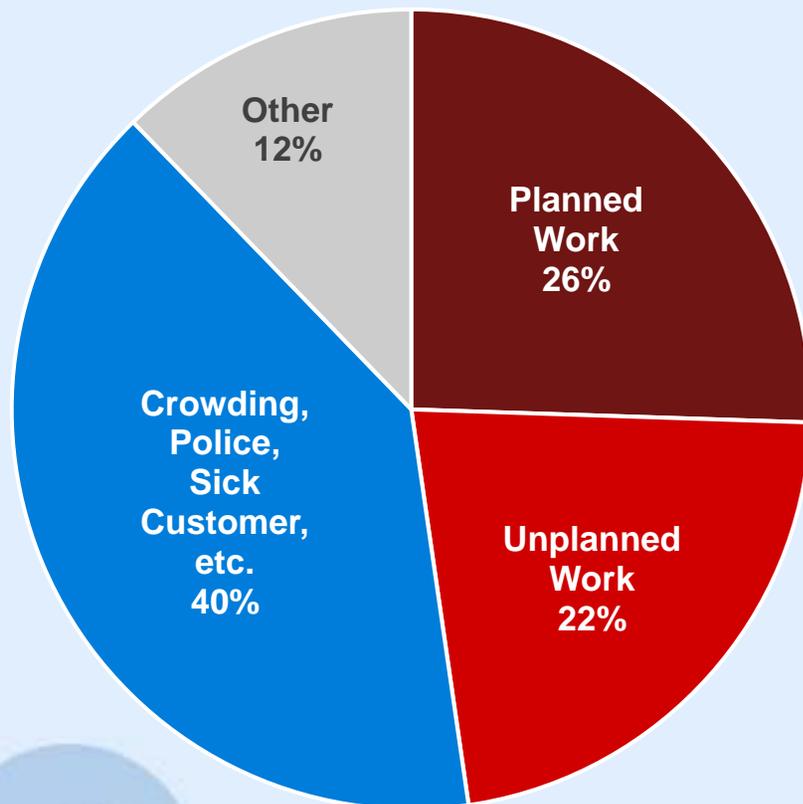
Peter Cafiero, Chief, Operations Planning

May 2015



Today, Subway performance is primarily challenged by growing ridership, ongoing maintenance needs & unplanned events

2014 – Delays by Cause*



- Ridership is growing in peak and off-peak periods
- Critical maintenance needs are growing and work often performed under train traffic
- Unplanned events do occur (e.g., power outages, water main breaks, signal trouble) and also have a significant impact on service

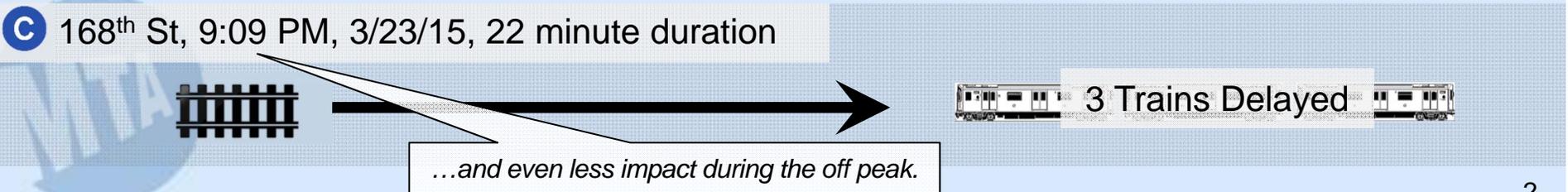
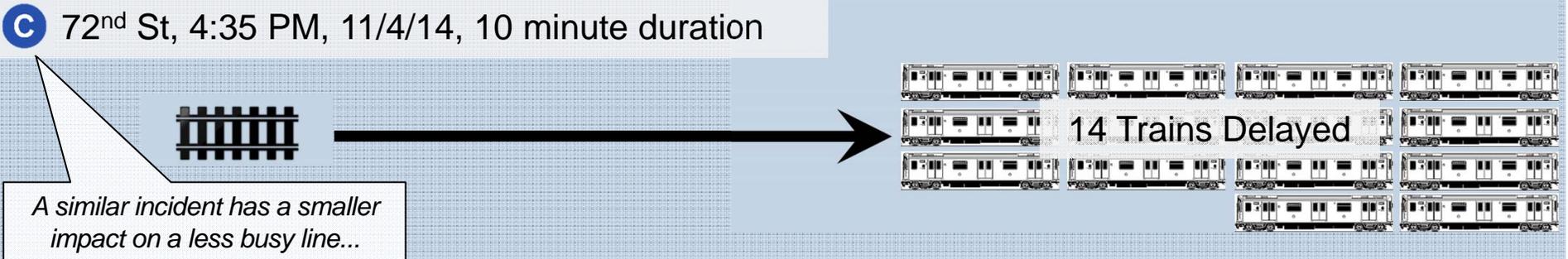
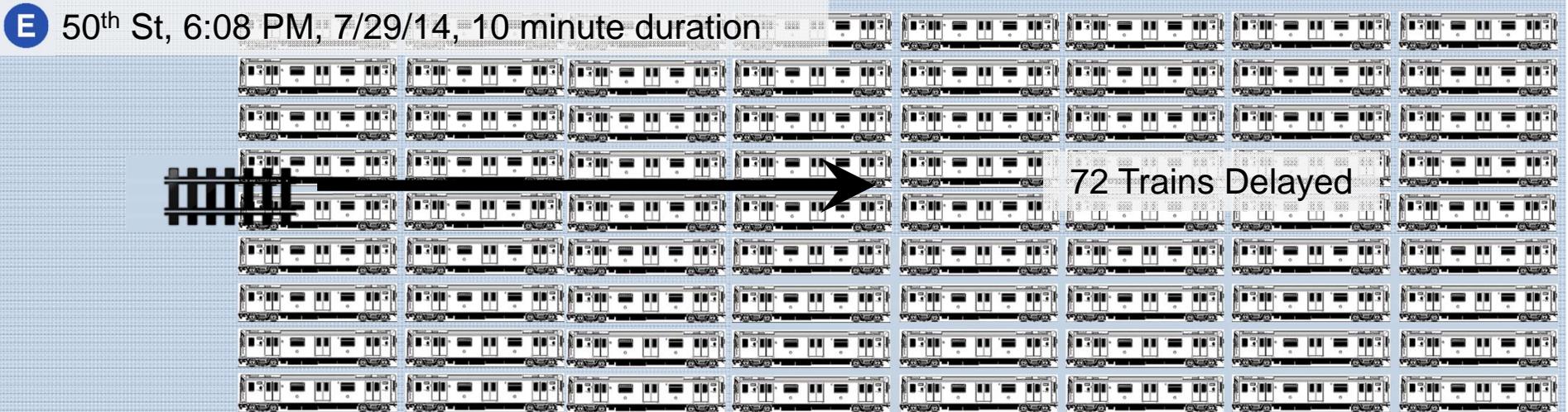


Incidents versus Delays: Impact of a given incident can vary widely by time, line and location

Example: Sick Customer Incident

Delayed Trains

(Number of trains rerouted or made 5 minutes late to the terminal by the incident)



Incidents vary in frequency and magnitude of impact

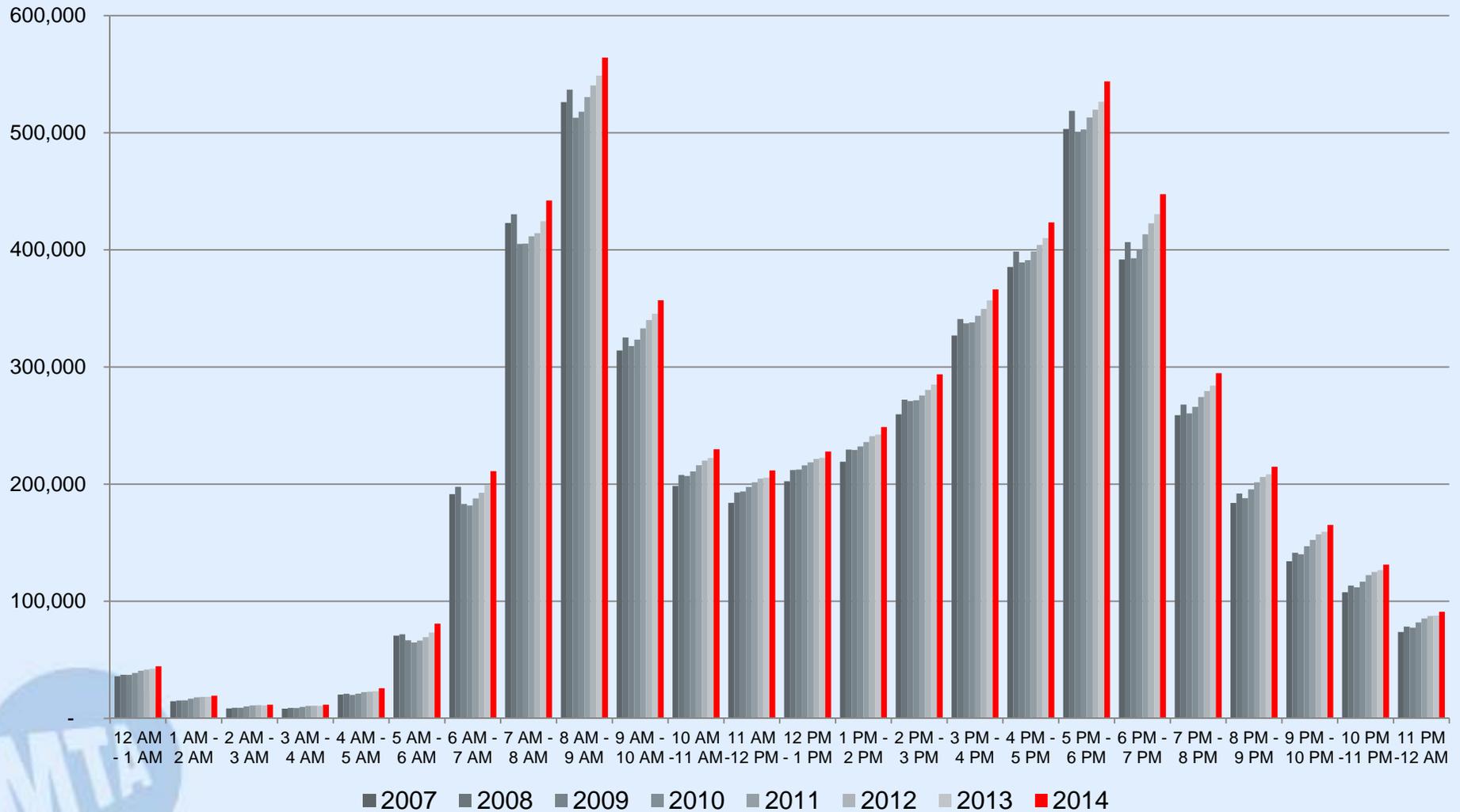
2014 Weekday Incidents, Major Categories

Incident Description	No. of Incidents	No. of Delays (avg. per Incident)
Unplanned Work		
Water Condition & Water Main Break	36	59
Track Conditions	548	33
Fire/Smoke Conditions	419	22
Signal Conditions	2,370	17
Door Closing Trouble (often crowding-related)	2,324	5
Planned Work	11,334	10
Crowding, Police, Sick Customers, etc	29,734	6



Ridership is growing at all hours of the day and has exceeded 2008 levels in all hours

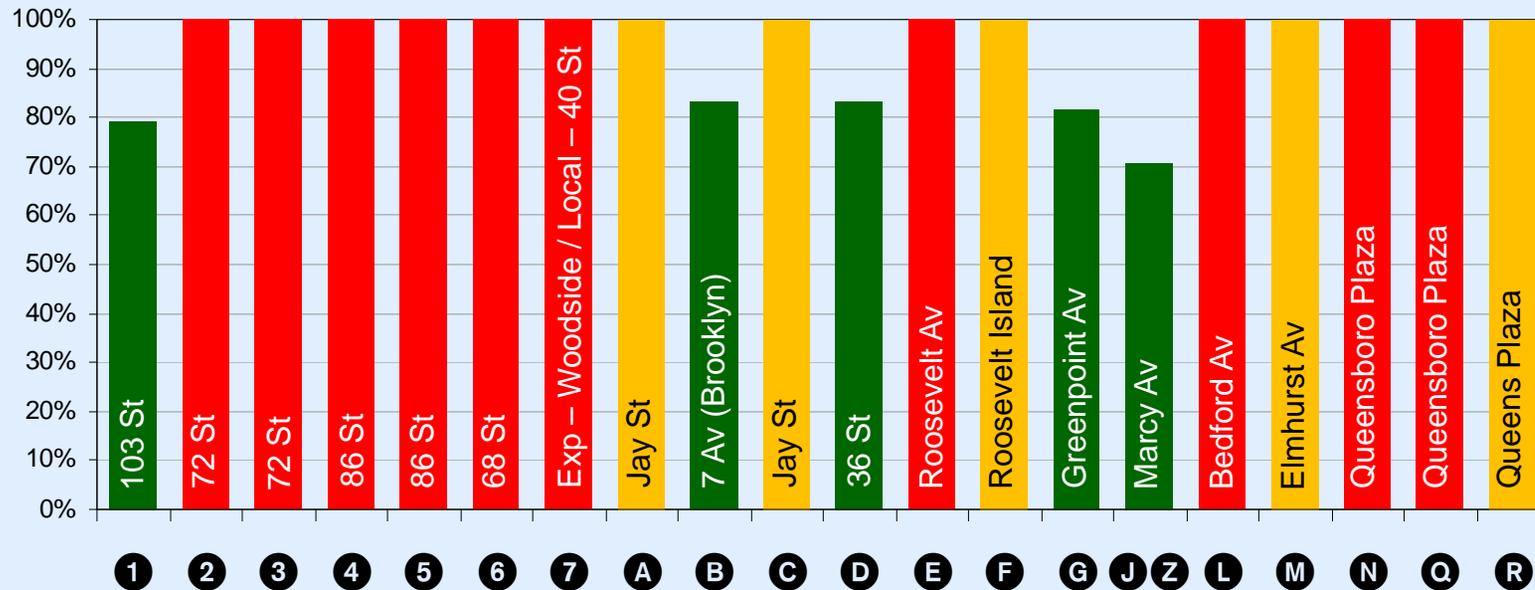
Weekday Subway Ridership by Hour



Source: OMB linked trips

15 out of 20 lines are at peak track capacity, including ten lines already at track *and* train (passenger carrying) capacity

Subway Track Capacity by Line - AM Peak Hour (Peak Direction)

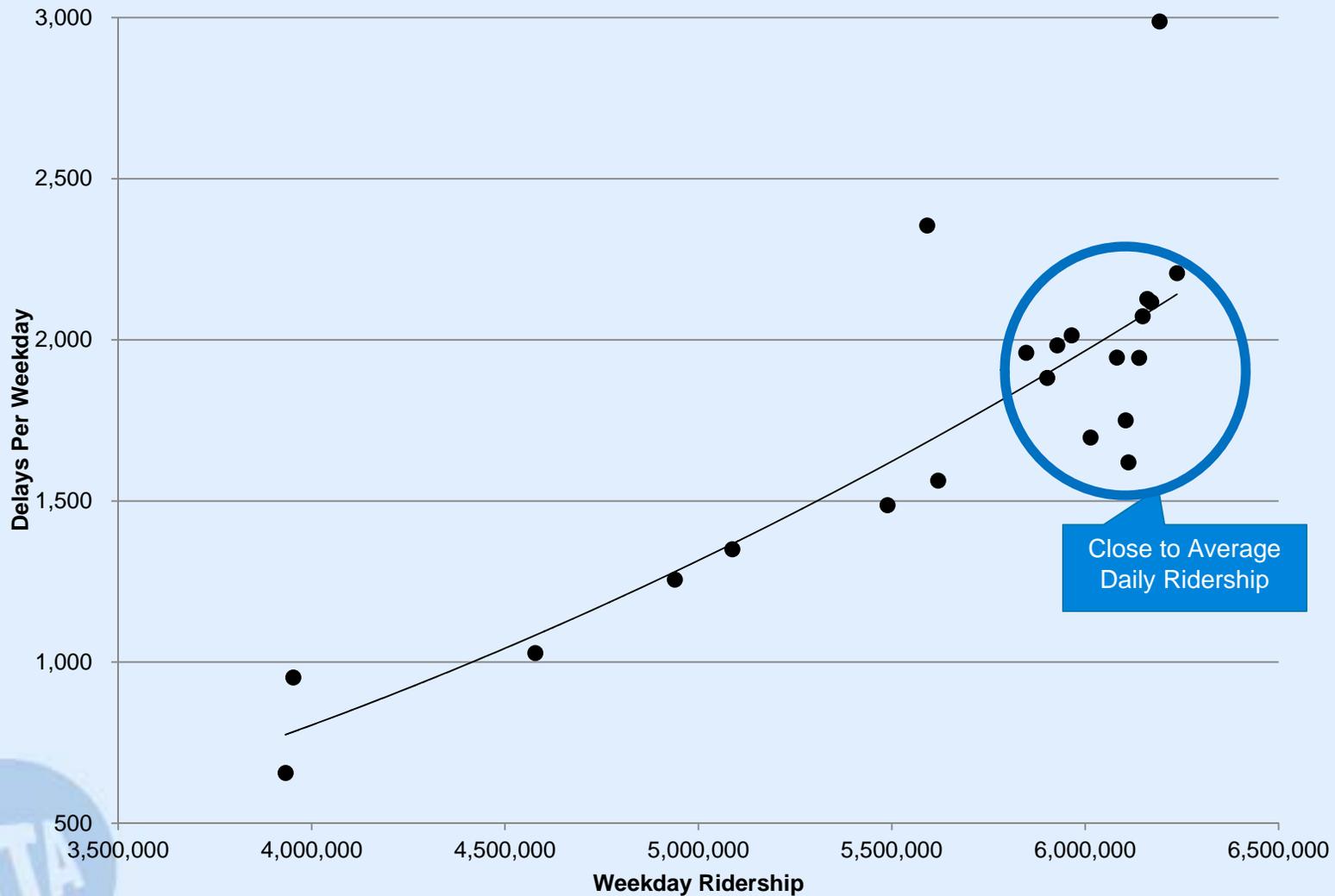


- Capacity measured at the **Peak Load Point**, where trains carry the heaviest load in the peak hour
 - Peak Load Point for busiest direction on each line shown above
- Colors indicate whether additional capacity is available
 - **Red** – constrained in both track and train capacity (10 lines)
 - **Yellow** – passenger capacity on existing trains but no track capacity to run more trains (5 lines)
 - **Green** – both track and train capacity available (5 lines)



Heavy ridership affects system performance – closely correlated with delays

December 2014 Weekday Delays vs. Ridership

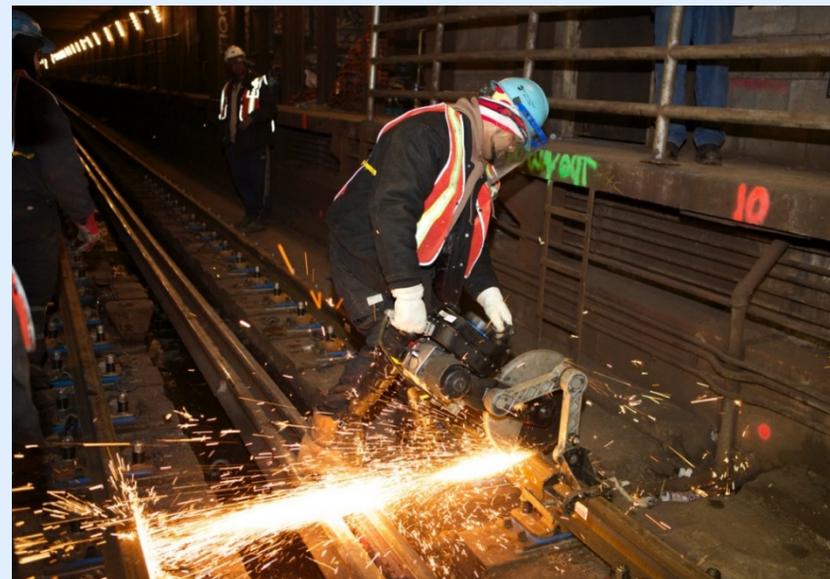


Amidst ridership challenges, planned work on the right of way is essential to maintain a State of Good Repair

In 2003, 3,900 delayed trains were due to planned work (6%).

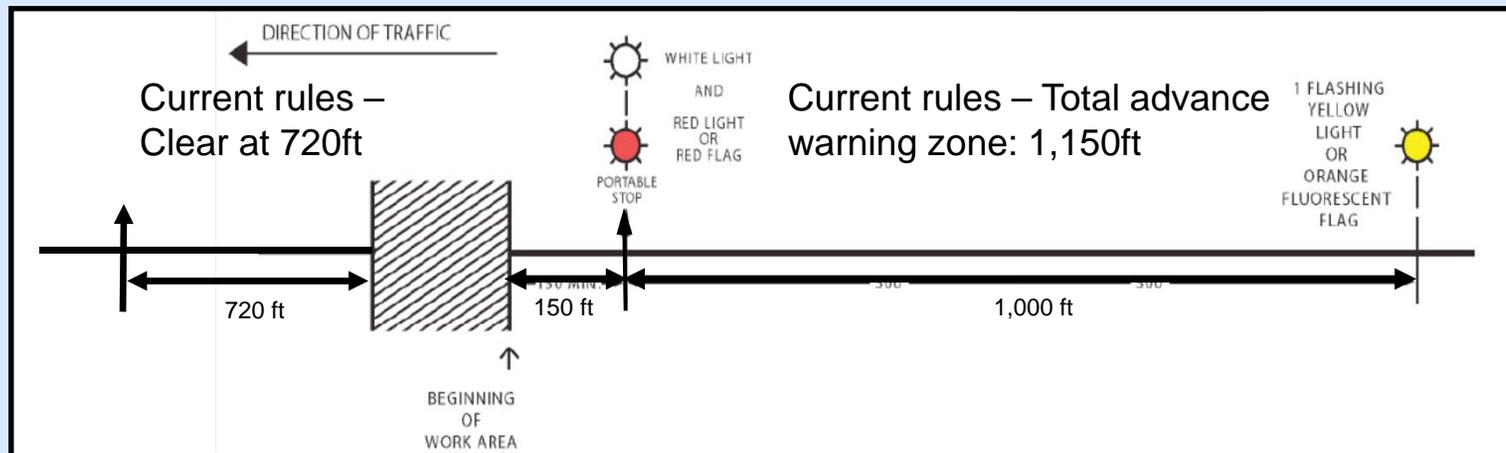
In 2014, 113,000 delayed trains were due to planned work (26%).

- We complete critical maintenance under traffic
- We have increased the frequency of infrastructure, track and signal inspections
- Every weekday, we average 400 work sites on the right of way, 150 of which occur between 9am and 4pm
- 75% of the work sites are for signals and track maintenance / repairs
- We work in approximately 4-5 locations per line during off-peak periods



Enhanced worker protection systems slow trains to protect workers on tracks

- Slow speeds (10 mph) past work sites ensure worker safety (“flagging”), but lower capacity
- Flagging rule enhancements since 2003 have lengthened slow speed zones and have added slow speed protection on adjacent tracks



- Even one small work zone requires more than 1/3 of a mile of slow train speed
- A typical slow speed zone reduces track capacity from 28 to 18 trains per track per hour

Service Improvement Plan



Service Delivery efforts focus on reliable, evenly-spaced service, as measured by Wait Assessment

Wait assessment is the percent of intervals between trains that are not more than scheduled interval +25%, based on multiple observations in each trip

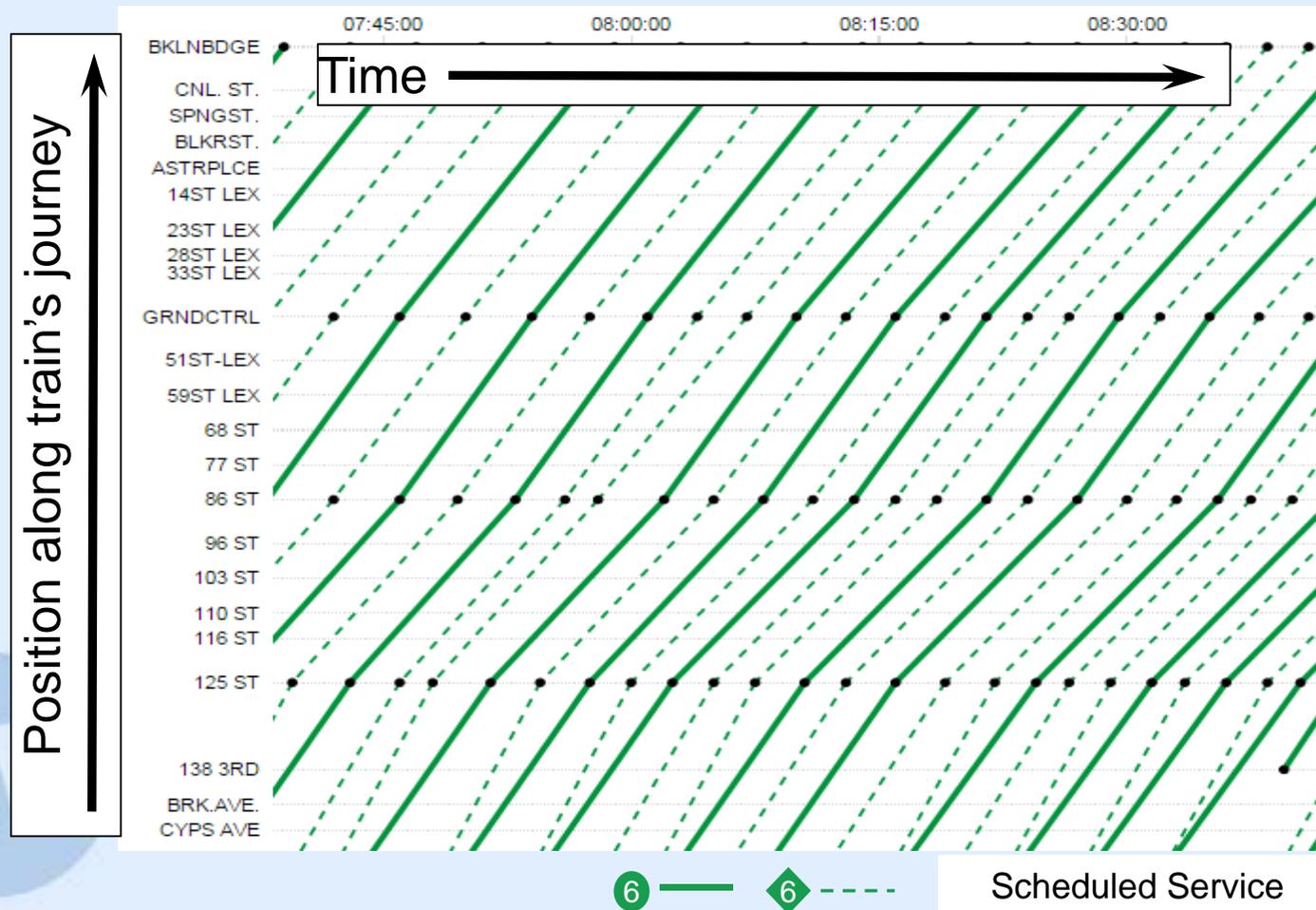
Wait assessment is a better measure of customer service than delays or OTP because:

- Unlike commuter rail, the vast majority of our riders are headway focused, not schedule focused
- Most customers ride only a portion of the line and do not ride terminal to terminal
- WA is calculated along each line and provides a more comprehensive picture of customer experience



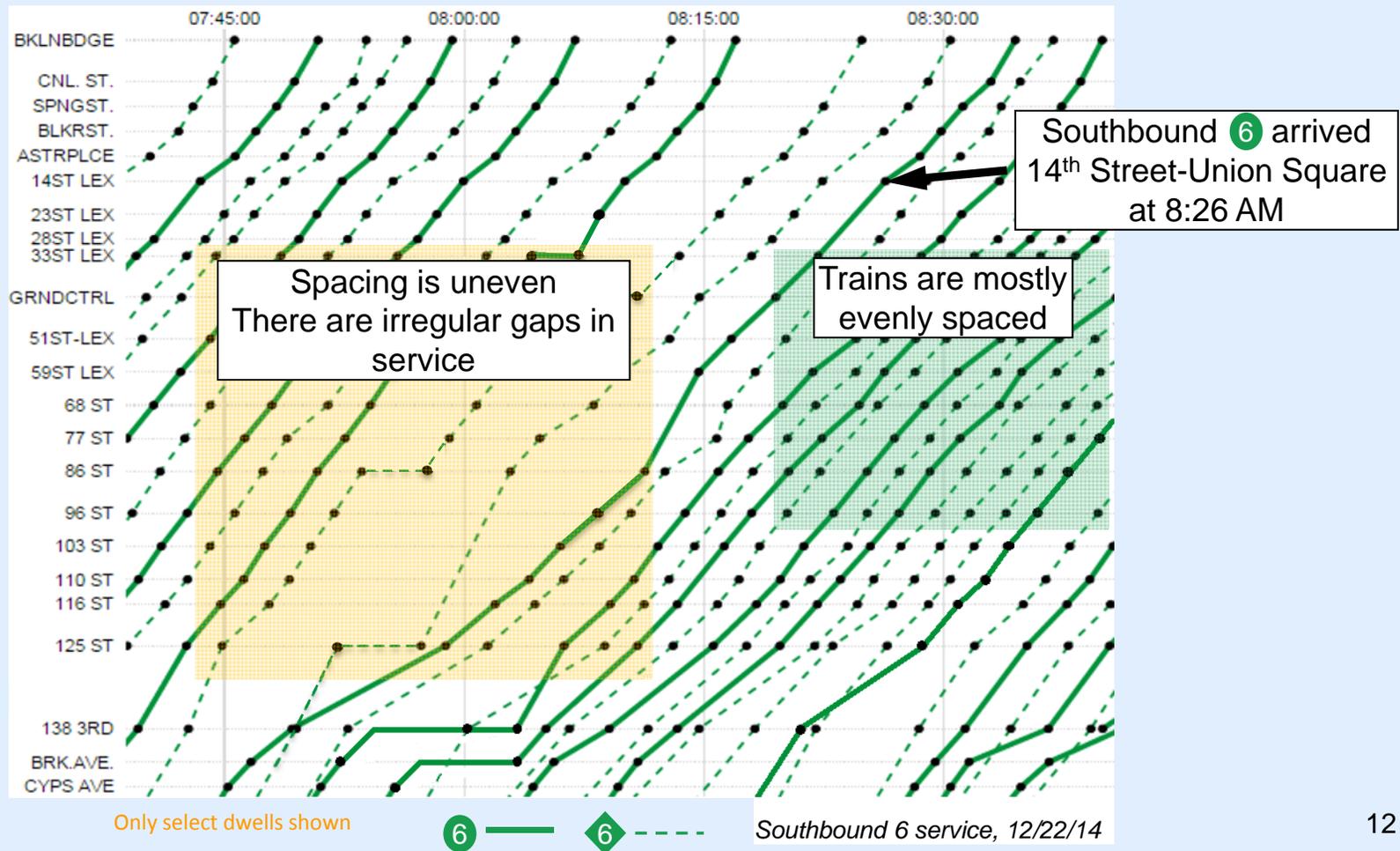
Efforts to maintain evenness improve customer service, at the expense of OTP

Diagram depicts train positions as they pass stations (vertical) over time (horizontal)



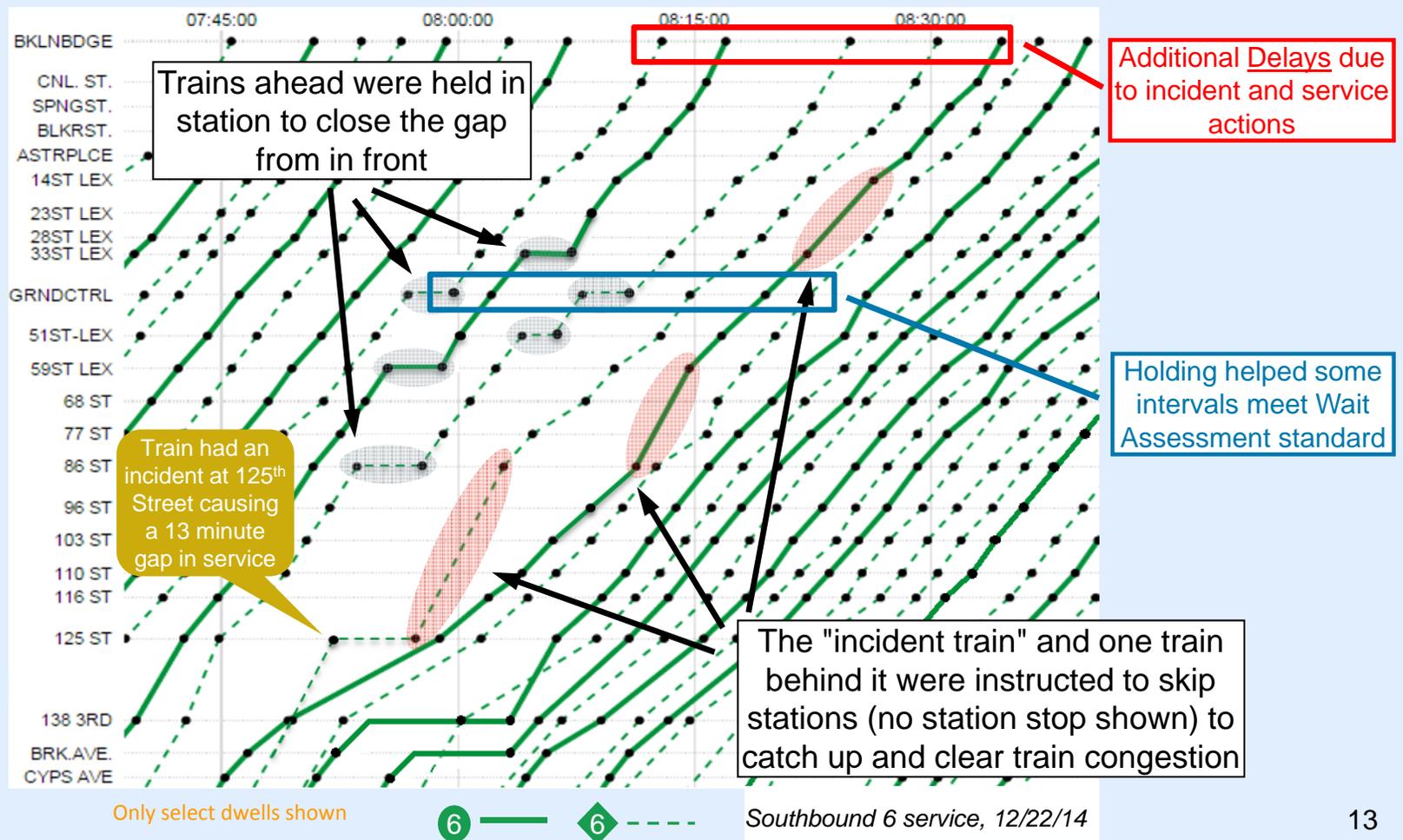
Efforts to maintain evenness improve customer service, at the expense of OTP

- Diagram depicts train positions as they pass stations (vertical) over time (horizontal)
- Each plotted point represents the time that a train arrived in a station
- Even train spacing is represented by parallel, evenly spaced string lines
- Large spaces and nonparallel lines indicate uneven spacing, possibly due to incidents



Efforts to maintain evenness improve customer service, at the expense of OTP (cont.)

- Train dispatchers employ strategies to regulate train spacing, especially around an incident
- Ahead of a delayed train, trains may be held to ensure a large gap in service does not follow
- Once the incident has been cleared, trains may be instructed to skip stops to catch up and lessen train bunching
- Service management actions typically help Wait Assessment, often at the expense of OTP



Subway Schedules - First comprehensive revision since 1990s, when weekday ridership was equivalent to current Saturday ridership

We have accelerated a thorough review of weekday schedules, will be fully implemented in 2015

Line-by-line, we are:

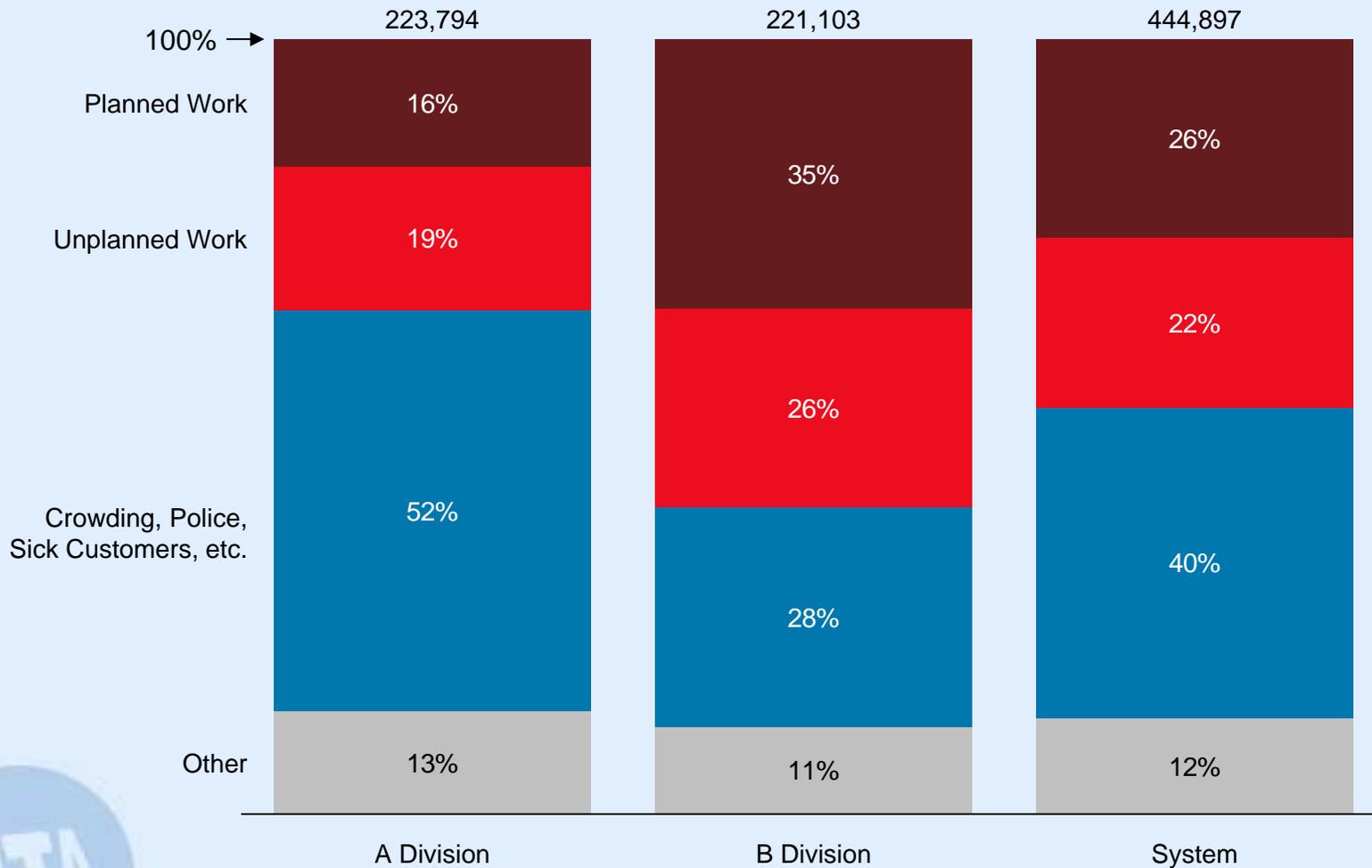
- Updating running times
- Providing terminal recovery times for arriving trains and crews to make return trips
- Adjusting schedules to better manage:
 - Merges and terminal operations
 - Even headways
 - Adjustments for off-peak planned work

Will expand to weekend schedules in 2016



Different lines are impacted by different factors, service and incident management efforts vary by line

2014 Delays*



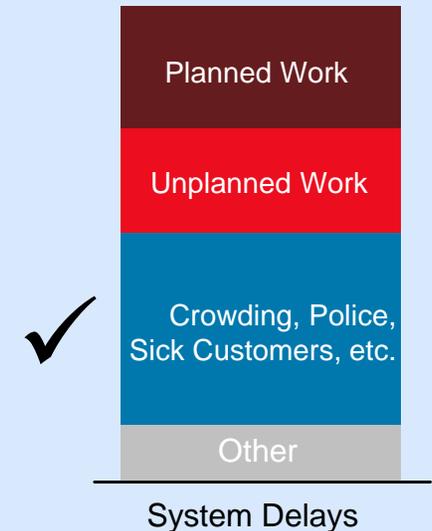
*Delays February 2014-January 2015

We are launching initiatives to target primary challenges on specific lines, based on wait assessment performance

Targeted Lines Based on Wait Assessment Decline: **6** **7** **F**

Crowding and Service Management

- Focus service management efforts on maintaining evenness of service (wait assessment)
- Reduce dwell times at problematic locations (initial focus is primarily on 6 line)
 - Additional platform controllers, step aside boxes, and revising door announcements to speed door closing
- Monitor platform crowding conditions via cameras and staged personnel and respond to real-time conditions
- Improve communications during disruptions
- Formalize partnership with NYPD to assist with platform metering during incident



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Targeted Lines Based on Wait Assessment Decline: **6** **7** **F**

Incident Prevention

- Targeting highest incident locations and enhancing inspections
- Increased ultrasonic testing
- Aggressive Continuous Welded Rail installation

Incident Response

- CAT Teams: Signals, Track and Third Rail teams strategically deployed for quick response
- Lex Line Signals Coverage: signal staff staged along Lexington Corridor for accelerated response to incidents
- Additional multi-discipline response personnel

Improved Coordination of Planned Work to Minimize Impact

- Consolidate work planning to create multi-discipline work zones and decrease impact of planned work on service; targeting Lexington corridor for initial pilot implementation

