

# NYCT Subway Performance

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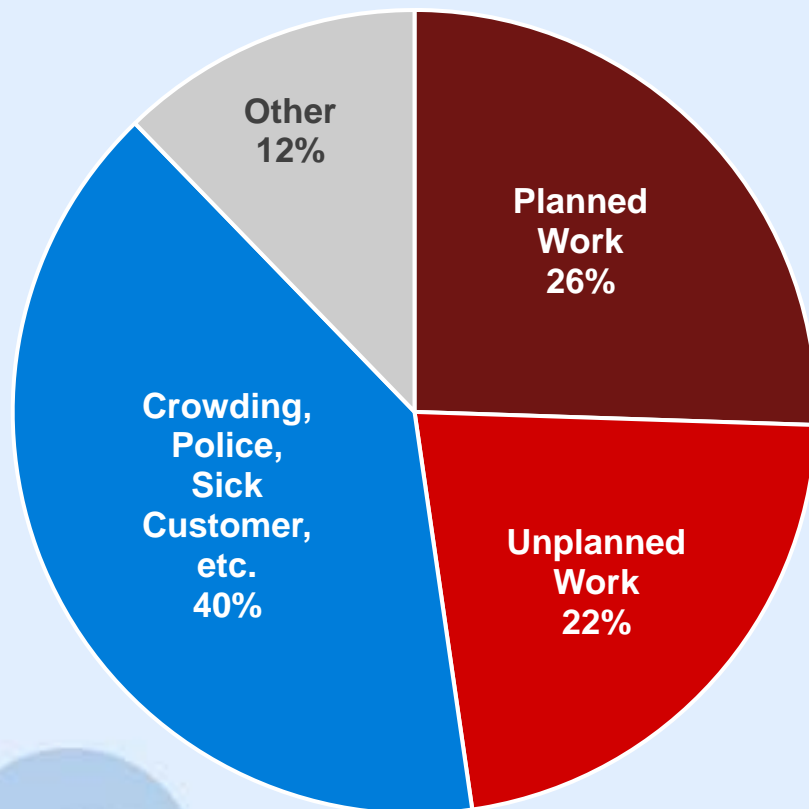
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May 2015



## 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

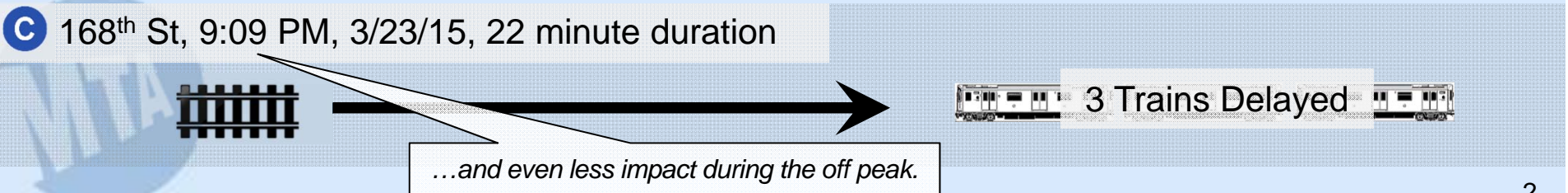
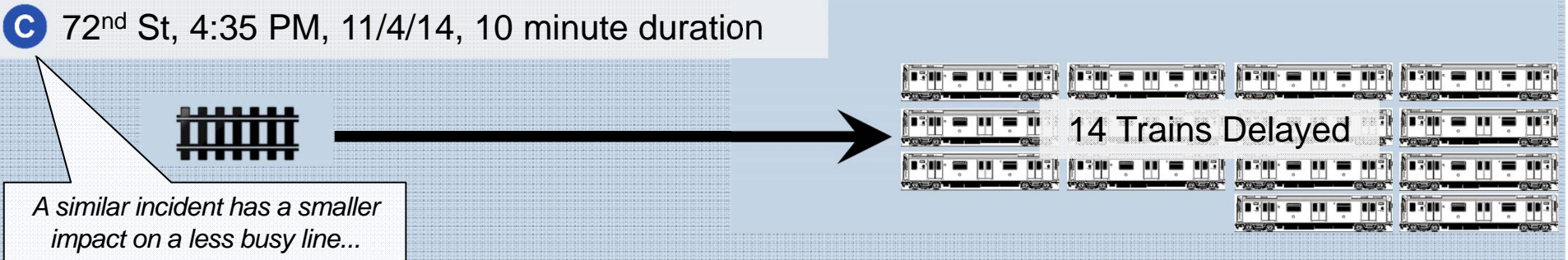
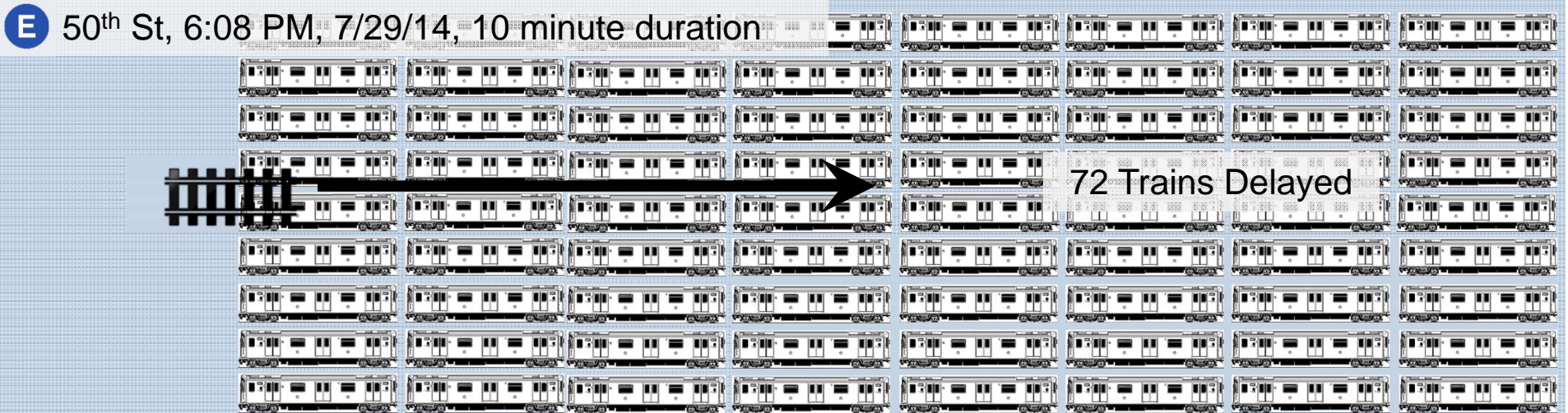


# Incidents versus Delays: Impact of a given incident can vary widely by time, line and location

## 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

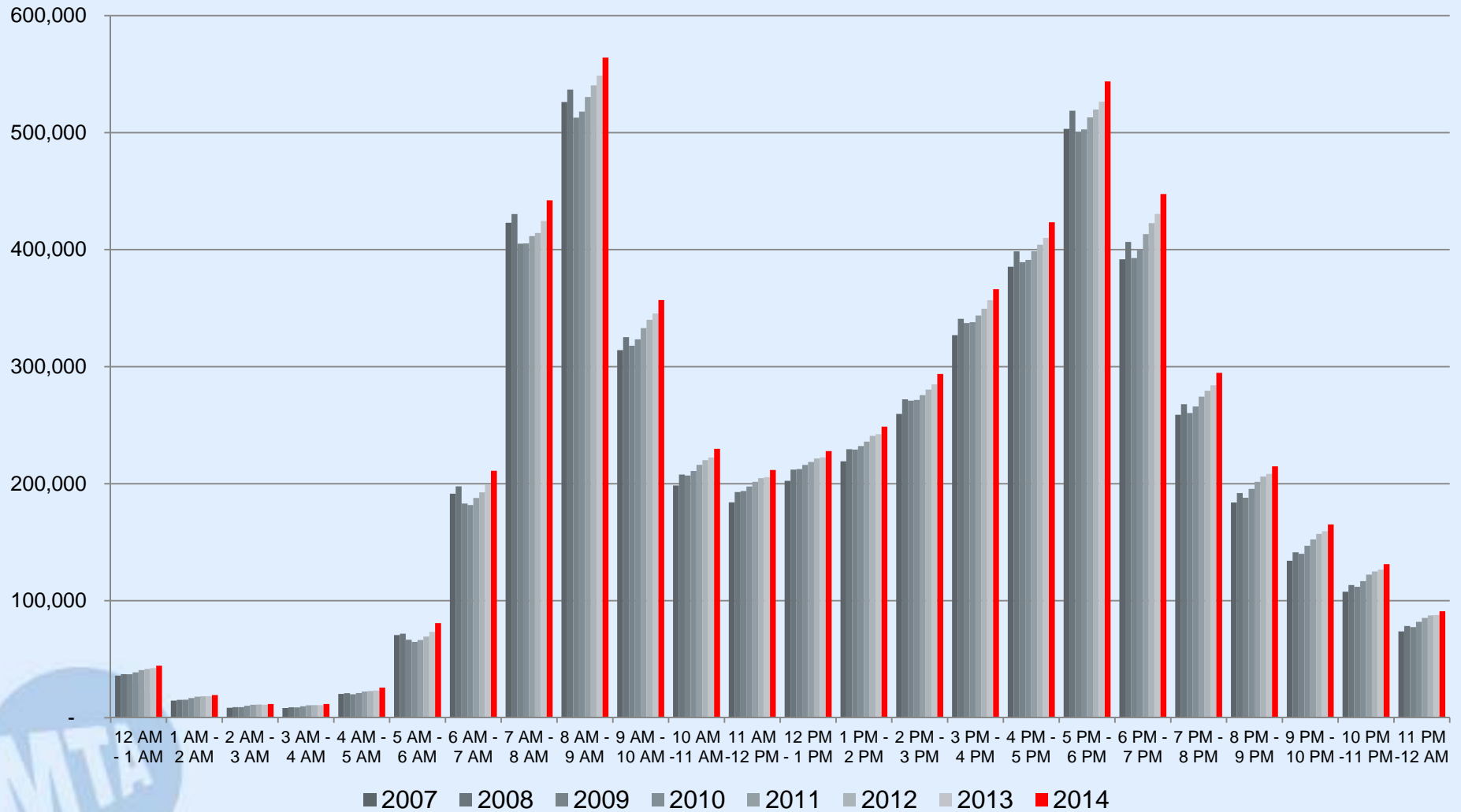
## 2014 Weekday Incidents, Major Categories

Incident Description	No. of Incidents	No. of Delays (avg. per Incident)
<b>Unplanned Work</b>		
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
<b>Planned Work</b>	11,334	10
<b>Crowding, Police, Sick Customers, etc</b>	29,734	6



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

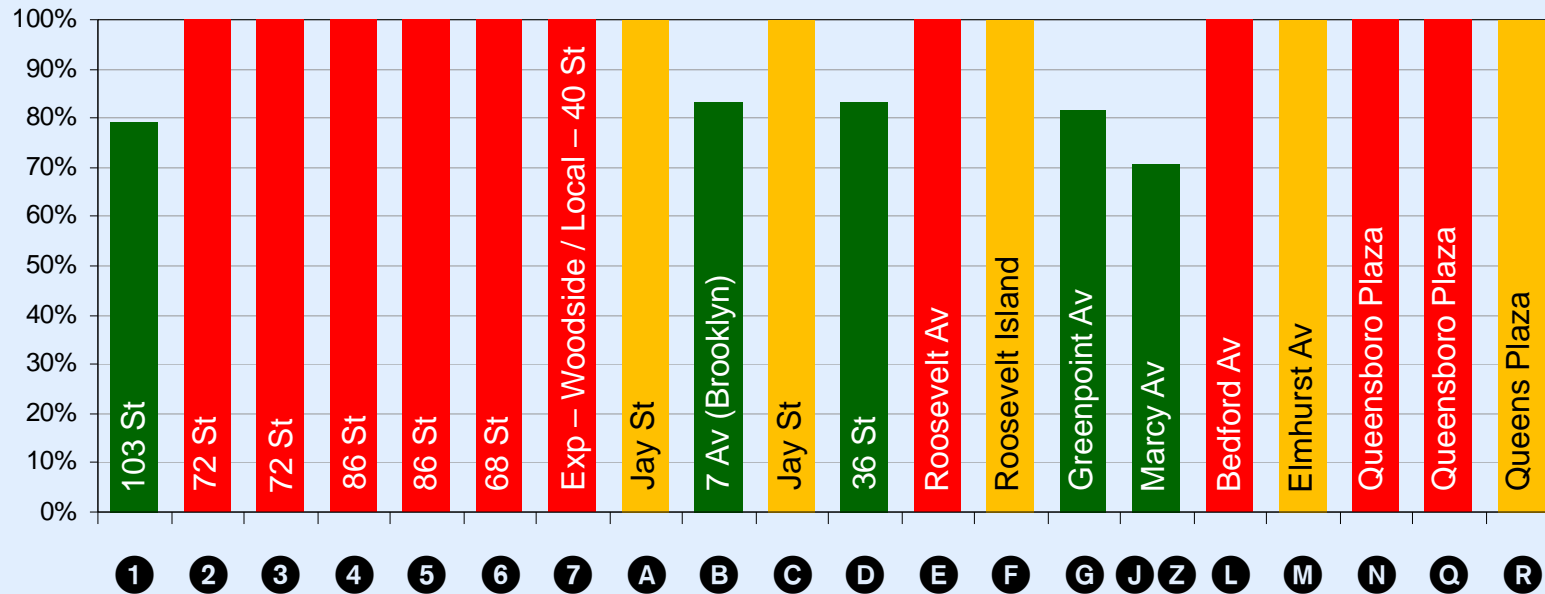
Weekday Subway Ridership by Hour



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)

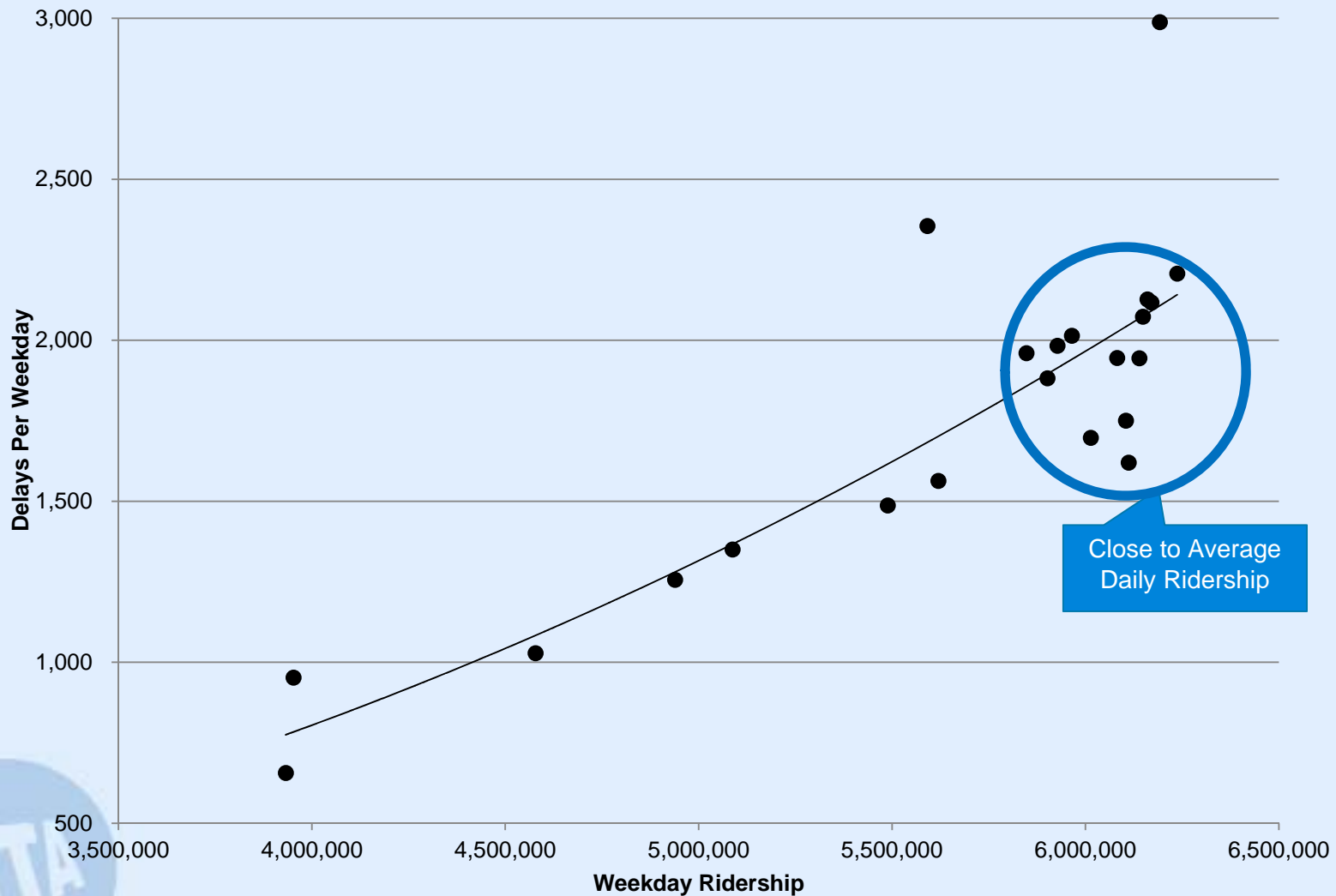


- Capacity measured at the **Peak Load Point**, where trains carry the heaviest load in the peak hour
  - Peak Load Point for busiest direction on each line shown above
- Colors indicate whether additional capacity is available
  - **Red** – constrained in both track and train capacity (10 lines)
  - **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

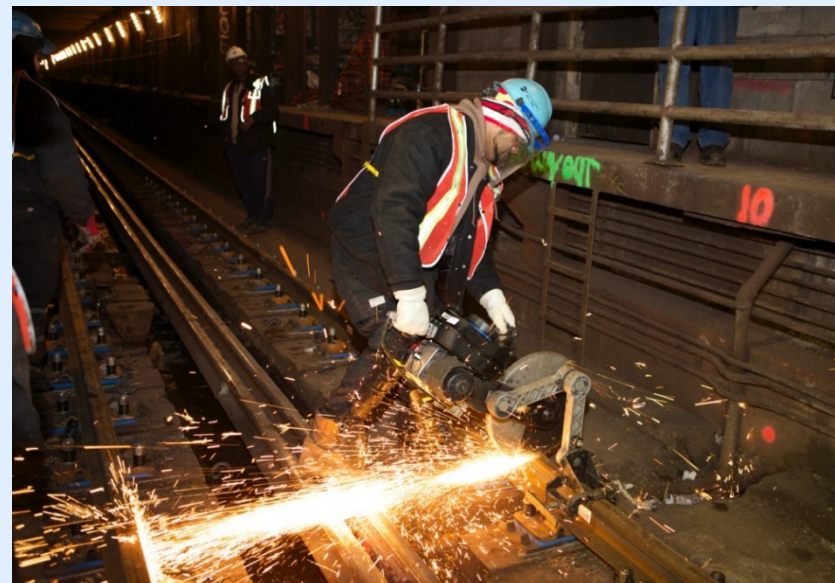


## Amidst ridership challenges, planned work on the right of way is essential to maintain a State of Good Repair

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

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

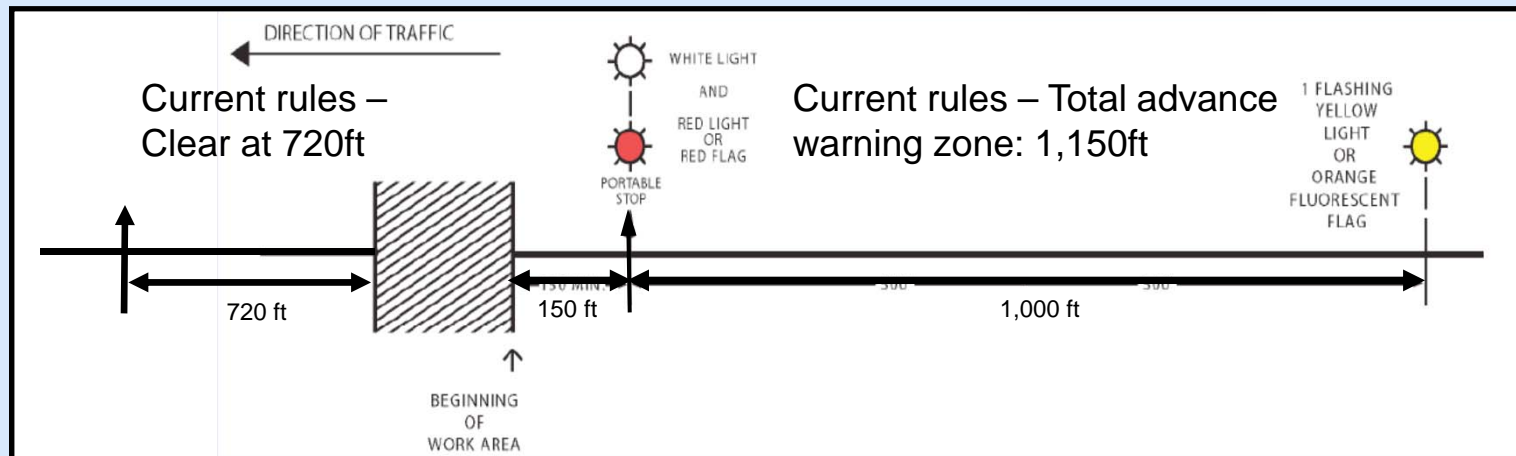
- We complete critical maintenance under traffic
- We have increased the frequency of infrastructure, track and signal inspections
- Every weekday, we average 400 work sites on the right of way, 150 of which occur between 9am and 4pm
- 75% of the work sites are for signals and track maintenance / repairs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

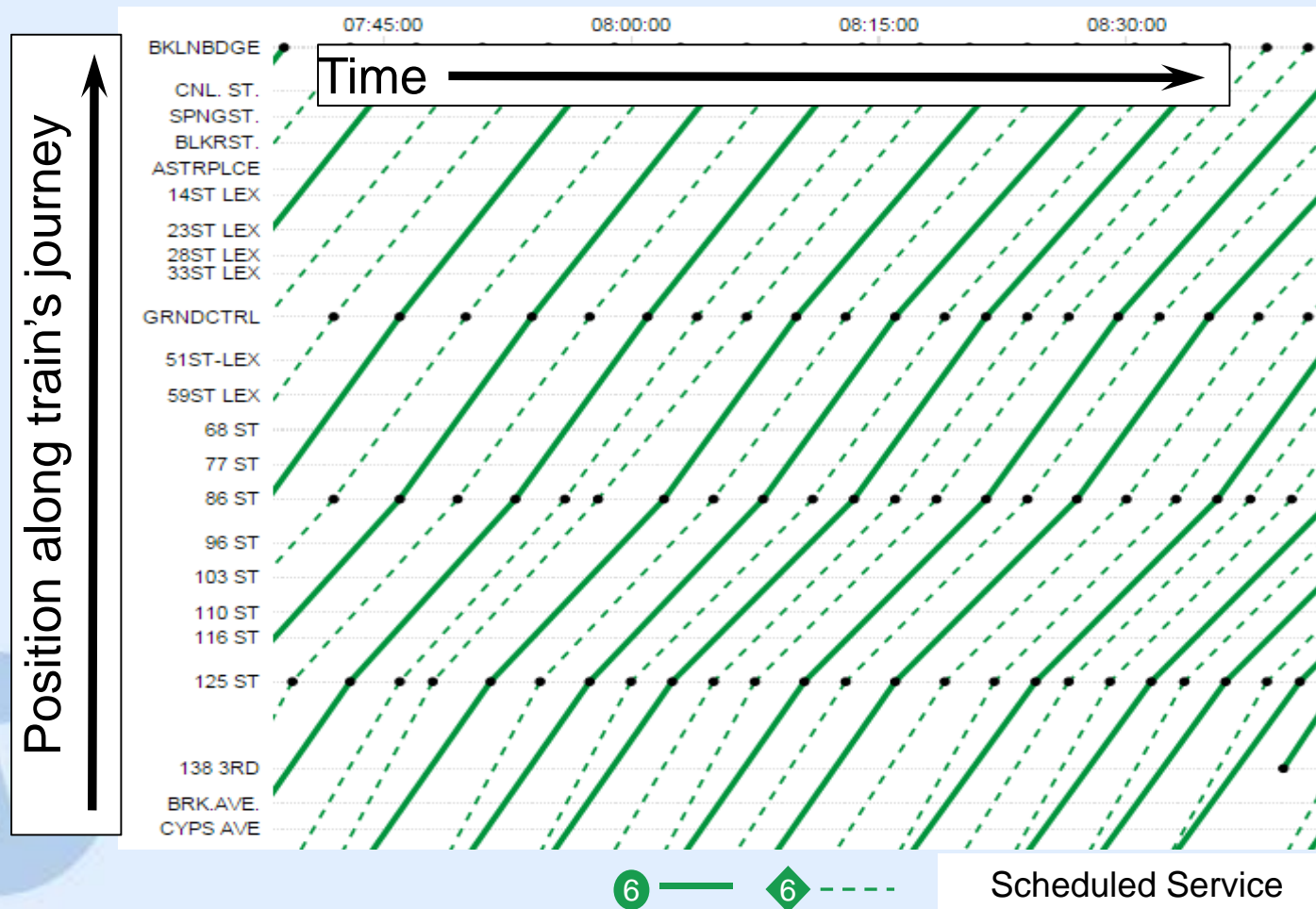
Wait assessment is a better measure of customer service than delays or OTP because:

- 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



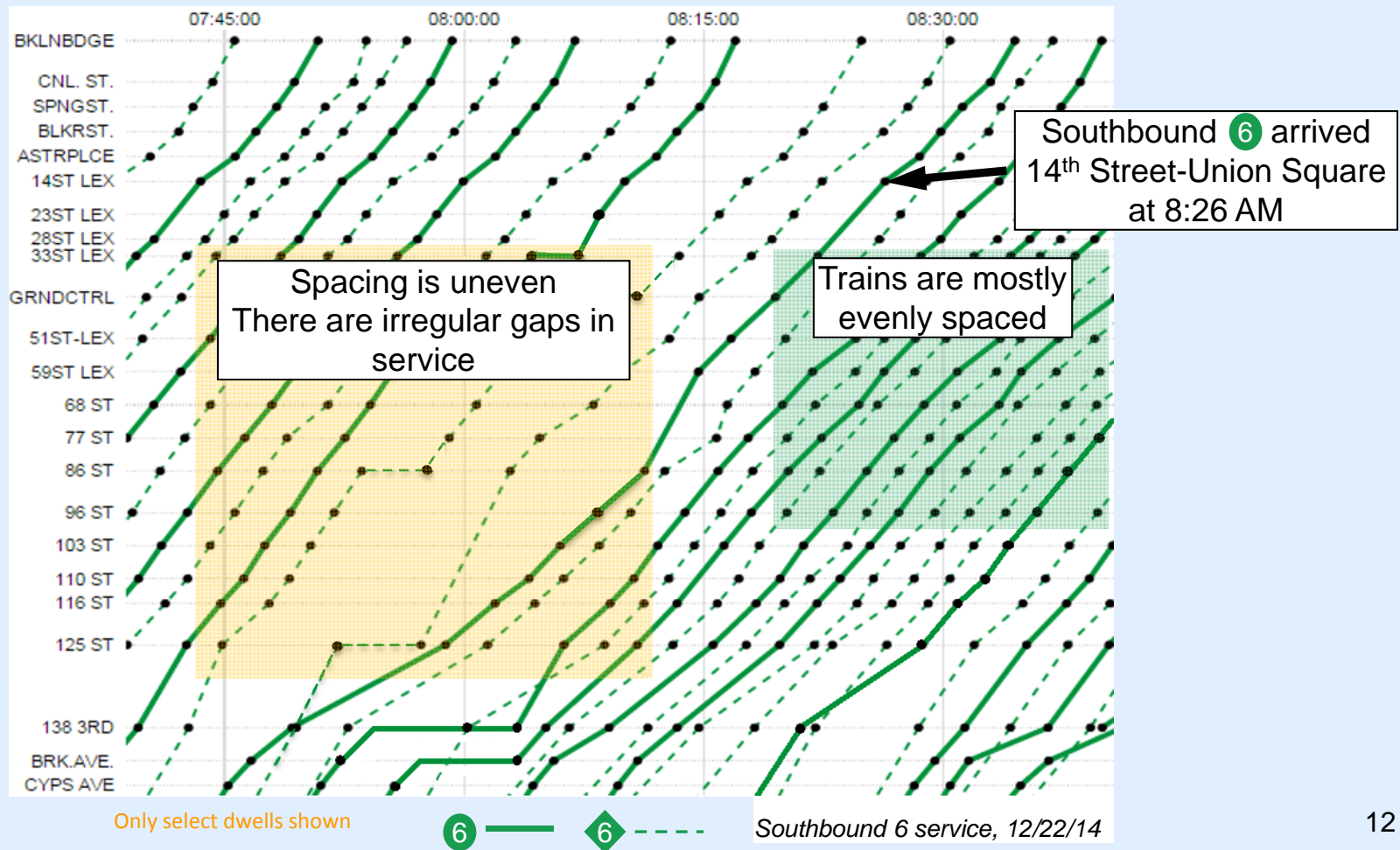
# Efforts to maintain evenness improve customer service, at the expense of OTP

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



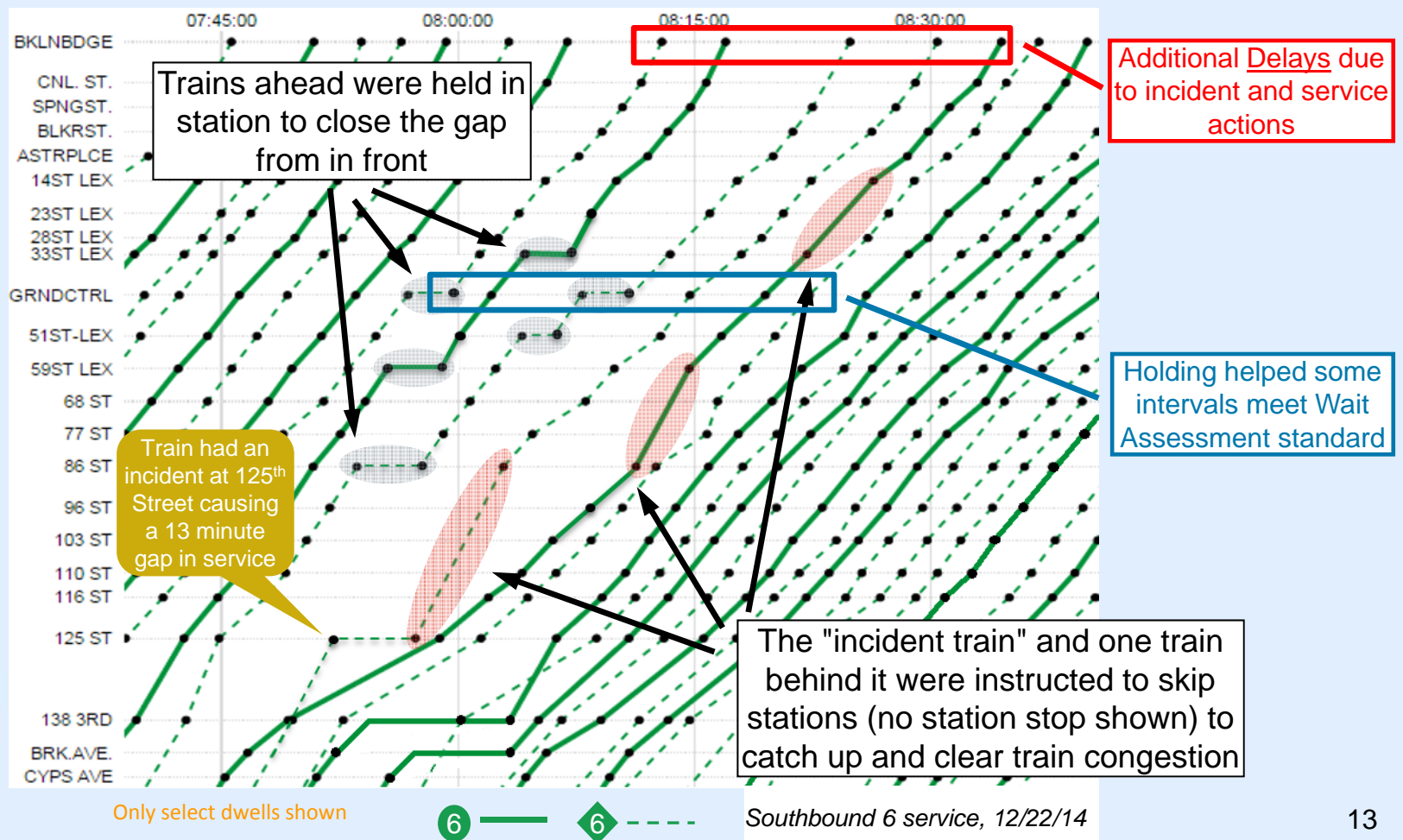
# Efforts to maintain evenness improve customer service, at the expense of OTP

- 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:

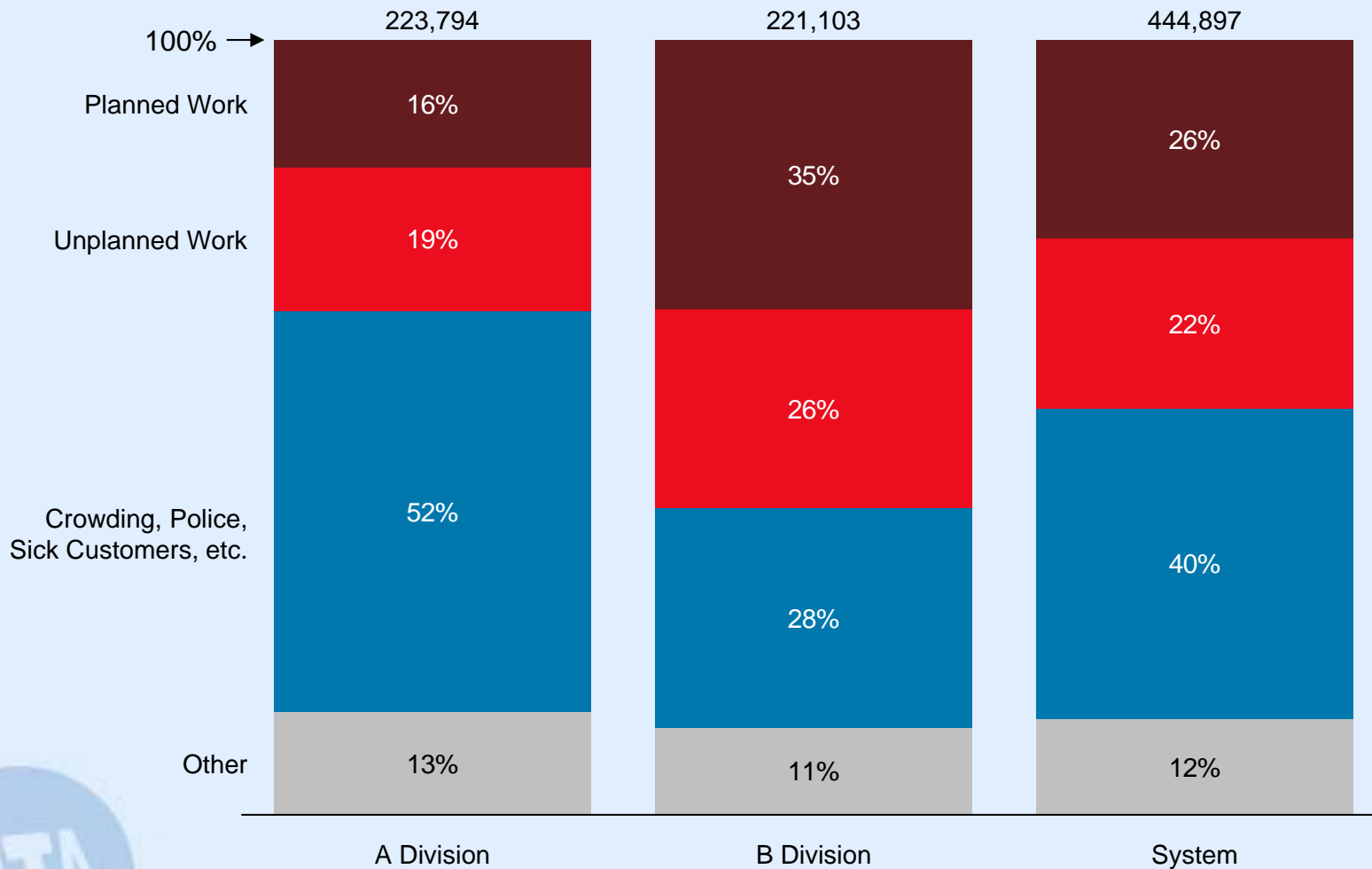
- Updating running times
- Providing terminal recovery times for arriving trains and crews to make return trips
- Adjusting schedules to better manage:
  - Merges and terminal operations
  - Even headways
  - Adjustments for off-peak planned work

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

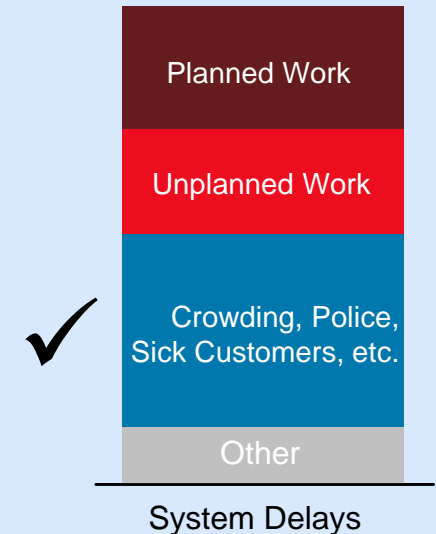


# We are launching initiatives to target primary challenges on specific lines, based on wait assessment performance

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



# 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**

## 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

