7 Flushing Line

2016
Town Hall

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Sunnyside, Queens

New York City Transit

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  - Flushing Line Infrastructure Improvements
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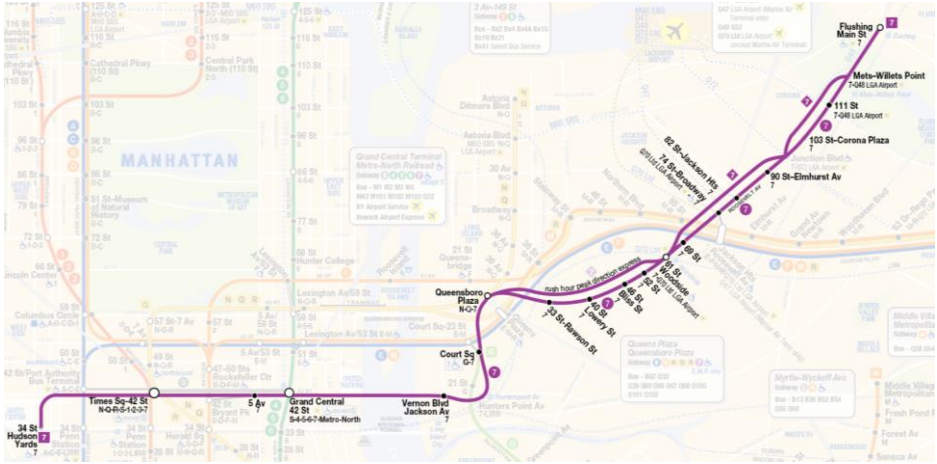
Flushing Line At A Glance

- 27.5 Miles of Track
- 22 Stations
  - 34th Street-Hudson Yards opened in September, 2015
- Average Daily Ridership:
  - Weekday = 525,000
  - Saturday = 350,000
  - Sunday = 300,000



- 7 line (tied with the 6 line) has the most frequency of service in the entire system.
- 27 Trains per hour in each direction during Weekday Peak

Operational Challenges

- Aging Signal System
- Aging Track Panels
- Bottlenecks
  - Steinway Tubes
  - Track Configuration (2 track segments).
- Elevated Line's Particular Restrictions
- High Ridership (Peak and Off-Peak) and High Service Frequency

Aging Signal System

- Flushing line uses "Fixed Block Signal System," parts of which are almost 100 years old
- Old and Malfunctioning signal equipment is a significant source of incidents and delays

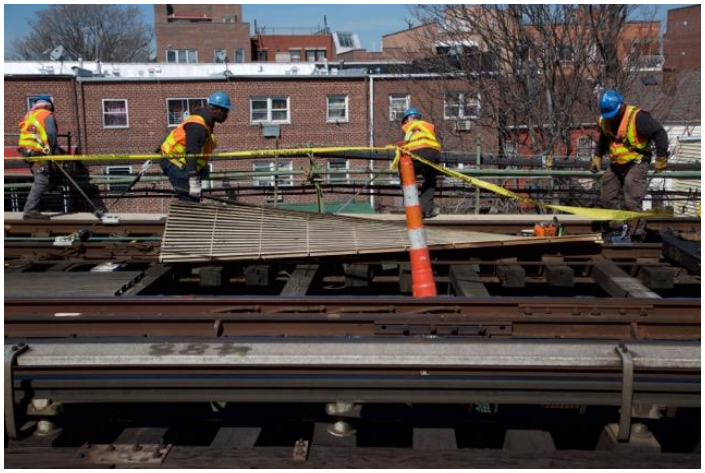
Bags added to keep water from shorting electrical circuits

Burned AC Switch

DN-11 Line Control Relays

Aging Track Panels

- 25-year lifespan. Some sections are over 30 years old.
- Face increased deterioration due to weathering.
- Worn or damaged track can lead to major service problems, including emergency "slow speed orders."
- In a 24/7 system, replacing tracks is, in itself, a source of delays

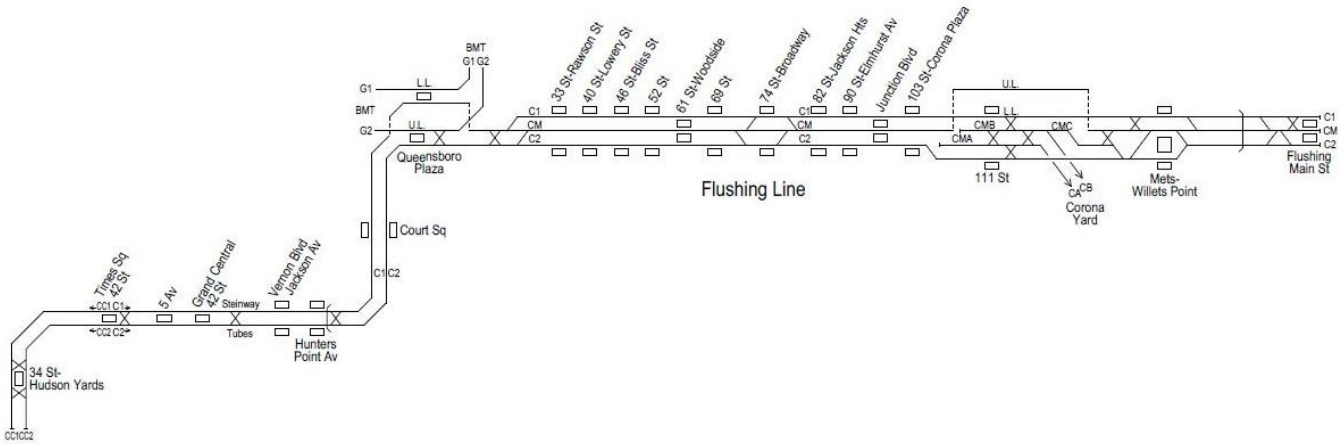


Bottleneck: Steinway Tubes

- Two single track "Tubes" that pre-date the subway system.
- Suffered age-related deterioration and damage from Superstorm Sandy in 2012.
- No clearance for workers to occupy Tubes while trains are running.
- Adds to delays by exacerbating impact of incidents due to space constraints.

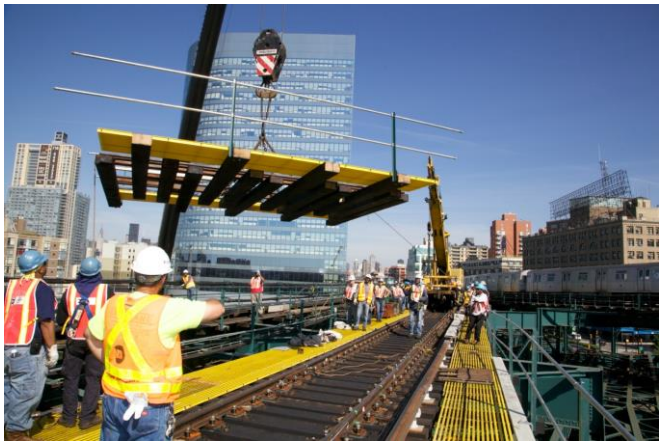
Bottleneck: 2-Track Railway Configuration

- West of 33 St-Rawson, the line drops from 3 tracks to 2 tracks
- Merging of trains into 2 tracks, with Local and Express services sharing the Right-Of-Way, coupled with high service frequency, creates bottlenecks and more room for delays.
- 2-Track segments pose problems for maintenance and capital improvement work.



Elevated Line

- Most work must be done during daylight hours, when ridership is higher.
- For employee safety, work is done "under flagging," requiring trains to travel at slower speeds.
- Cranes hoist heavy track segments from street level, requiring service disruptions as track panel swings overhead.
- Traffic patterns on roadways beneath structure are impacted.
- Work is greatly affected by weather.



High Ridership and High Frequency of Service

- High Ridership on the 7 requires High Frequency of Service
  - 7 Line's High Frequency of Service amplifies service impacts because more individual trains are affected by delays for each individual incident.

- Ridership on the 7 is high at all times:
  - This leaves little room to suspend service without inconveniencing thousands of customers

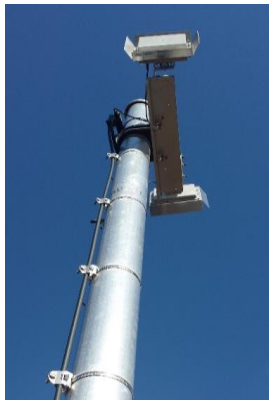
Confronting These Challenges:

- Communications-Based Train Control (CBTC)
- Track Panel Replacement
- Steinway Tube Reconstruction and Rehabilitation
- Capital Investments
- Operational Initiatives

Communications-Based Train Control (CBTC)

- $774 million capital improvement to replace old signal system
- Completed by end of 2017
- Improve system safety, reliability, capacity, and flexibility
- Allow for real-time arrival information for trains at stations
- New cars - CBTC needs compatible trains

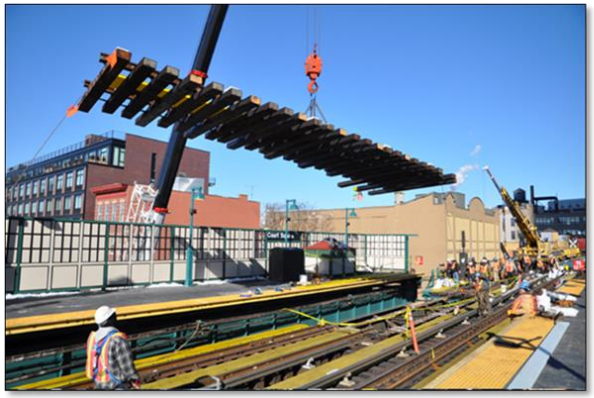
Track Circuit Cases

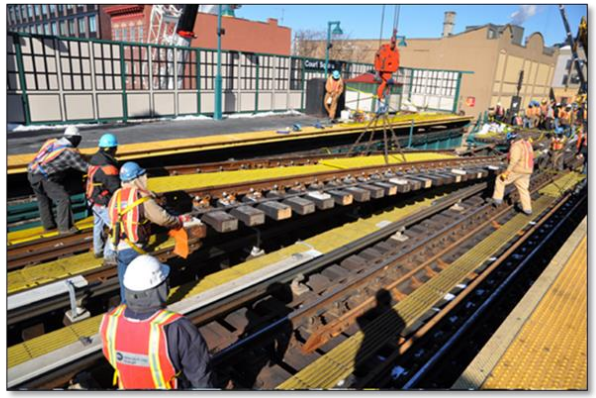


CBTC Radios and Antennas

Track Panel Replacement

- By the end of 2016, we will have replaced 45,708 feet of old track panels at a cost of $213,000,000.
- Track panel replacement work is a cause for delays, but we are almost done.
- By end of 2016, 94% of the Flushing line's tracks will be within the lifespan for use.





Steinway Tubes

- We are one weekend's work away from being done with the Sandy-related repairs.
  - We will complete the reconstruction, rehabilitation, and fortification of the Steinway Tubes by the end of the month
  - We have repaired the duct banks, cables, communications, tracks, pump rooms, discharge lines, and electrical equipment in the Tubes.
  - Total Cost for this work: Approximately $41 million.

Reconstructed Duct Bank

Additional Capital Investments

- Stations
  - Component Renewals: (2015-2019 Capital Program)
    - Junction Boulevard-2017
    - Elmhurst Avenue/90th Street-2017
  - Station Renewals: (2015-2019 Capital Program)
    - Mets-Willets Point - 2018
    - 111th Street - 2018
    - 103 Street-Corona Plaza - 2018
    - 82 Street-Jackson Heights - 2018
    - 69 Street - 2019
    - 61 Street-Woodside - 2019
    - 52 Street - 2019

Additional Capital Investments

- Structural Painting:
  - Hunters Point to Queensboro Plaza: Completed in 2004.
  - Queensboro Plaza to 33 St-Rawson: Completed in 2005.
  - Main Street to Junction Boulevard: Completed in 2011.
  - 72nd Street to 103rd Street contract will be awarded in 2017.
  - 48th Street to 72nd Street contract will be awarded in 2019.
- Help Point Installation
  - 16 stations have Help Point Installed and 6 stations remain with installation slated for 2017.

Operational Initiatives

- Incident Prevention
  - Enhanced Right of Way (ROW) inspections to correct defects.
  - Installation of 3rd rail heaters at Queensboro Plaza, 33rd Rawson, 52nd Street, 61st Street and the track section south of Main Street to reduce impact of ice and snow.

- Incident Mitigation
  - Combined Action Teams (CATs) – to respond to major incidents.
  - Additional staff to improve response to ROW incidents, including central coordination at the Rail Control Center and additional Train Service Supervisors at major 7 Line stations.

- Service Delivery
  - Platform Controllers – stationed at Grand Central, Queensboro Plaza, and 74th St/Broadway.

Conclusion

- 7 Line is one of the busiest lines in the system
- 7 line is receiving significant capital investment to improve existing infrastructure
  - Sandy-related work in the Steinway Tubes will be complete this month
  - CBTC installation will be complete by the end of next year
  - Most of our 7 line tracks have been replaced
- 7 line is also part of an operational initiative devoted to addressing crowding and service
- Even with CBTC, New Trains, Renewed Tracks, and restored Steinway Tubes, ever-increasing ridership will continue to pose challenges.
  - Record-high ridership is a challenge we are facing throughout the entire system.