# The Miracle on Second Avenue

## Less is More for the Second Ave Subway

NetPoint + GPM CONFERENCE

NASHVILLE, TN | MARCH 2 & 3, 2017

PRESENTED BY: BRUCE STEPHAN

# MEET THE PRESENTER

- **Civil Professional Engineer and Attorney**
- **35 years Experience in public works**
- **20 years + with PMA**
- **Skills:** CM, Scheduler, Claims, PM Systems, Risk
- **Clients:** FTA, MTA, LA Metro, SFPUC, SCVWD


Bruce Stephan PE, PMP, ESQ

*Executive Director*

PMA Consultants

bruce@pmaconsultants.com

# PRESENTATION AGENDA

01 History of Second Ave Subway

02 Second Ave Subway Details

03 Acceleration Agreement

04 Field Monitoring & Control

05 Use of NetPoint

06 The Miracle Happens

01

02

03

04

05

06

# History of
# ***Second Ave Subway***

# 2ND AVE EL HISTORY

*1875-1942*

The original Second Ave train line was elevated.

**1875**
NYC starts to build the 2nd Ave EL Train

**1900**
The line was electrified

**1914**
Started third track for Express service

**1916**
Express service starts

**1942**
2nd Ave El demolished - no replacement

# 2ND AVE HISTORY

*1920-1939*

**1920**

Daniel L. Turner proposes new Rapid Transit Plan

- *Already 1.3 million daily NYC Subway riders*

**1929**

NYCDOT proposed $86M 2nd Ave Subway from Houston St. to the Harlem River

- *Contracts were expected 1930 and 1935, with RSD 1938-1941.*

**1929-39**

Great Depression halts plans

**1939**

WWII suspends new subway construction

- *Cost for SAS was now estimated to be $249M*

# 2ND AVE HISTORY

*1949 - Present*

## 1949-57

Plans for SAS halted by Queens County's demands for a subway

- *TA used $500M bond to improve existing system*
- *Cost for SAS was now estimated to be $504M*

## 1964 - 1968

MTA formed - requested $254 million federal grant funds for SAS

- *Cost for SAS was now estimated to be $220 million*
- *Phase One: two-track line from 34th St. to the Bronx*
- *Phase Two: down to Water St. near the Battery.*
- *Initial grant of $25 million approved by Urban Mass Transportation Administration*

## 1972 - 1975

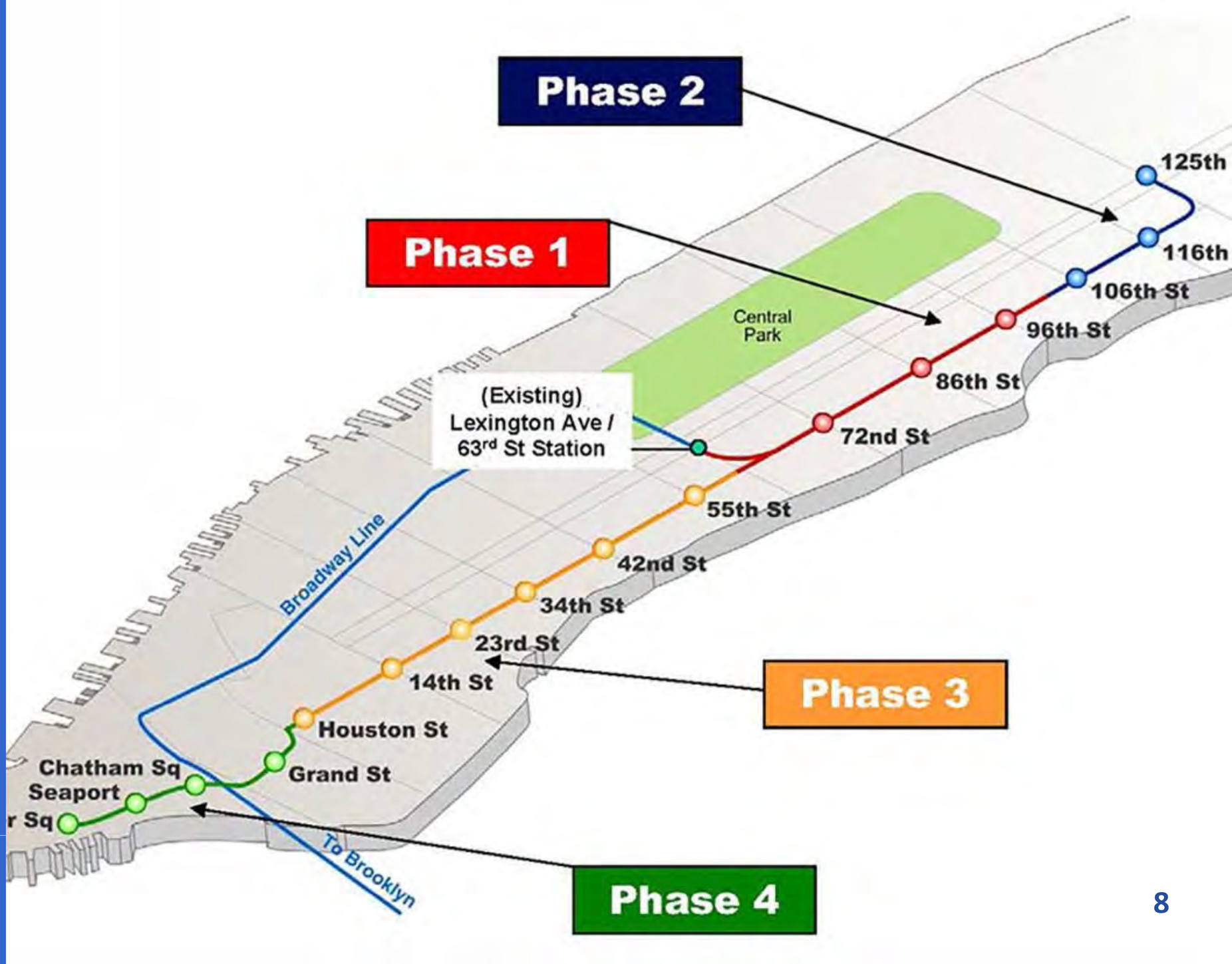
Construction of SAS started, then stopped due to NYC fiscal crisis

## 2007 - 2017

MTA awards tunneling contract for Phase 1

Phase 1 Revenue Service starts January 1, 2017

# SECOND AVE SUBWAY **FUTURE EXPANSION**



# *Second Ave Subway*

Details

# SECOND AVE SUBWAY PROGRAM PHASE 1 - **SCOPE**

- 2 miles of twin-bored tunnels in densely packed urban area
- 3 New Stations- 96th, 86th and 72nd Streets
- $4.5 Billion overall cost
- Revenue Service date established by FTA as **December 31, 2016**
- State-of-the-Art Fire Life Safety & Communication Systems
- Tracks, Signals, Power, HVAC, Vent Buildings, Axial fans, Elevators, Escalators, Street Restoration

# 2ND AVE SUBWAY PHASE 1 PROGRAM CHRONOLOGY

**2001**
Design contract awarded for entire line

**December 2001**
FTA approved start of PE

**April 23, 2007**
Start of utility relocation construction

**May 14, 2010**
TBM begins boring the west tunnel

**February 5, 2011**
TBM completes the west tunnel

**March 28, 2011**
TBM begins boring the east tunnel

**September 22, 2011**
TBM completes the east tunnel

# 2ND AVE SUBWAY PHASE 1 PROGRAM CHRONOLOGY

**November 2013**
Blasting for the station caverns finished

**June 1, 2013**
Awarded station finishes & systems contracts

**May 2, 2014**
66% complete reported

**May 21, 2015**
80% complete reported

**August 2015**
84.3% complete reported

**December 31, 2016**
FTA Grant Agreement-specified Revenue Service Date (RSD)

# RSD in Jeopardy

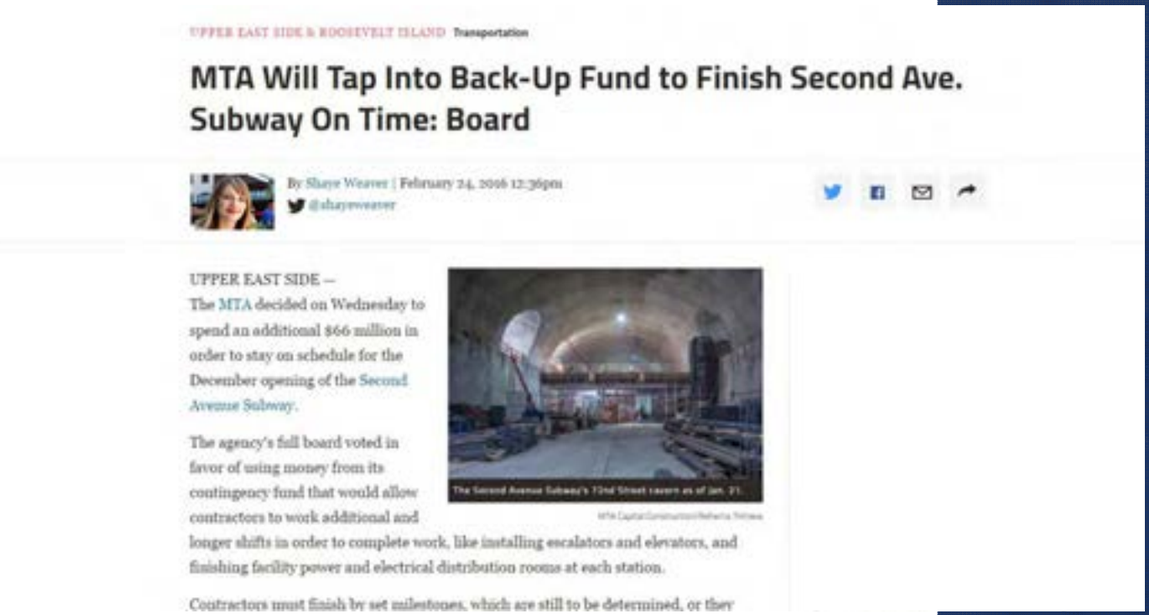
By the end of 2015 it was obvious the RSD was in jeopardy

The contractors and the MTA blamed the delays on each other…

MTA said that the contractors did not show up to work on certain days…

Contractors…said that the MTA had asked for over 2,500 design changes

# The decision was made to accelerate



UPPER EAST SIDE & ROOSEVELT ISLAND Transportation

**MTA Will Tap Into Back-Up Fund to Finish Second Ave. Subway On Time: Board**

By Shaye Weaver | February 24, 2016 12:36pm
@shayeweaver

UPPER EAST SIDE —
The MTA decided on Wednesday to spend an additional $66 million in order to stay on schedule for the December opening of the Second Avenue Subway.

The agency's full board voted in favor of using money from its contingency fund that would allow contractors to work additional and longer shifts in order to complete work, like installing escalators and elevators, and finishing facility power and electrical distribution rooms at each station.

Contractors must finish by set milestones, which are still to be determined, or they

*"On February 24, 2016, the MTA allocated $66 million to speed up the construction of the first phase so that it could open in December"*

Despite Acceleration, by fall it was obvious things were not going fast enough…

Congresswoman: MTA slow on 2nd Ave. subway testing

Second Avenue subway's 72nd St. station work falling behind

MTA

## Second Avenue Subway could be delayed yet again

12

*Postponed fire safety, elevator, and escalator tests may point to a delay*

BY TANAY WARERKAR | SEP 26, 2016, 10:00AM EDT

# Acceleration
# ***Agreement***

# C-26009 SYSTEMS WIDE CONTRACT

Activities | Projects

Layout: ART Long Path by Finish Date | Filter: All Activities

| Activity ID | Activity Name | Original Duration | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|---|
| CPM UPDATE #53 dated January 1, 2017 - C-26009 - 2nd Av Sbwy Syst | | 1454 | 69 | 01/18/12 A | 04/10/17 | -69 |
| CONTRACT MILESTONES AND ACCESS CONSTRAINTS | | 1325 | 59 | 01/18/12 A | 04/10/17 | -69 |
| CONTRACT FINISH MILESTONES | | 1325 | 59 | 01/18/12 A | 04/10/17 | -69 |
| CONTRACT MILESTONES | | 1325 | 59 | 01/18/12 A | 04/10/17 | -69 |
| ACCELERATION AGREEMENT MILESTONES | | 338 | 0 | 10/01/12 A | 12/31/16 A | |
| CONTRACT MILESTONES | | 338 | 0 | 10/01/12 A | 12/31/16 A | |
| GENERAL | | 338 | 0 | 10/01/12 A | 12/31/16 A | |
| CONTRACT ACCESS CONSTRAINTS | | 882 | 0 | 07/22/13 A | 11/10/16 A | |
| CONTRACT ACCESS CONSTRAINTS | | 882 | 0 | 07/22/13 A | 11/10/16 A | |
| 96TH ST STATION | | 827 | 0 | 09/03/13 A | 11/10/16 A | |
| 86TH ST STATION | | 321 | 0 | 06/02/15 A | 10/31/16 A | |
| 72ND ST STATION | | 736 | 0 | 02/18/14 A | 11/01/16 A | |
| 63RD ST. STATION | | 869 | 0 | 07/22/13 A | 10/03/16 A | |
| ADDITIONAL WORK ORDERS | | 193 | 20 | 05/25/16 A | 01/30/17 | -20 |
| COMMUNICATIONS WORK | | 193 | 20 | 05/25/16 A | 01/30/17 | -20 |
| 63RD ST - COMMUNICATION SYSTEMS | | 20 | 20 | 01/03/17 | 01/30/17 | -20 |
| AWO 146 - Changes to Installed Infrastructure to Facilitate Completion of Station Communication S | | 20 | 20 | 01/03/17 | 01/30/17 | -20 |
| 72ND ST - COMMUNICATION SYSTEMS | | 190 | 19 | 05/25/16 A | 01/19/17 | -80 |
| AWO 206 - Changes to and Completion of Station Infrastructure | | 190 | 19 | 05/25/16 A | 01/19/17 | -80 |
| 96TH ST - COMM. SYSTEMS GENERAL | | 190 | 19 | 05/25/16 A | 01/19/17 | -100 |
| AW0 208 - Changes to and Completion of Station Infrastructure | | 190 | 19 | 05/25/16 A | 01/19/17 | -100 |
| 86TH ST - COMM. SYSTEMS GENERAL | | 190 | 19 | 05/25/16 A | 01/19/17 | -80 |
| AWO 207 - Changes to and Completion of Station Infrastructure | | 190 | 19 | 05/25/16 A | 01/19/17 | -80 |
| ENGINEERING / PROCUREMENT | | 1317 | 61 | 01/18/12 A | 03/28/17 | -61 |
| PROJECT WIDE ACTIVITIES | | 598 | 0 | 01/18/12 A | 01/29/16 A | |
| SUBMITTAL / APPROVALS | | 598 | 0 | 01/18/12 A | 01/29/16 A | |
| GENERAL | | 598 | 0 | 01/18/12 A | 01/29/16 A | |
| TRACK WORK | | 849 | 0 | 05/01/12 A | 01/29/16 A | |
| SUBMITTAL / APPROVALS | | 839 | 0 | 05/01/12 A | 01/29/16 A | |
| GENERAL | | 839 | 0 | 05/01/12 A | 01/29/16 A | |
| PROCUREMENT | | 664 | 0 | 12/03/12 A | 08/02/15 A | |
| GENERAL | | 664 | 0 | 12/03/12 A | 08/02/15 A | |
| SURVEYS | | 404 | 0 | 06/15/12 A | 06/30/15 A | |
| GENERAL | | 404 | 0 | 06/15/12 A | 06/30/15 A | |

- Value: $261,900,000
- Scope simplified:
  - *Pull cable in conduit installed by others*
  - *Install equipment in rooms built and finished by others*
  - *Install devices and test systems*
- NTP January 18, 2012
- 55 month duration
- Contract Substantial Completion August 18, 2016
- ~5,000 activities P6 Schedule

# ACCELERATION AGREEMENT – JUSTIFICATION, GOALS & SCOPE

Whereas, performance and completion of the Contract has been delayed and the Parties have agreed that in order to mitigate potential risks to the start of revenue service ("Revenue Service") of the Second Avenue Subway ("SAS") by December 1, 2016 (the "Revenue Service Date" or "RSD") and the start of pre-revenue service operations training ("Pre-Revenue Service Training") by September 1, 2016 (the "Pre-Revenue Service Training Date") the remaining Contract Work will need to be accelerated; and

Whereas, acceleration of the Contract Work will require the Contractor to work extended hours and weekends, resulting in premium time costs, requiring additional technical management and additional field supervision; and

**Consider specifying:**

- Double Shifts
- Extra Crews
- Minimum Staffing

# ACCELERATION AGREEMENT – LUMP SUM AT RISK

3.2. Provided that the Contractor achieves the Milestone date established for a Milestone, as set forth in Exhibit A and does not unreasonably interfere with the work of any other SAS Contractor, the Contractor shall be entitled to the Milestone payment for achieving such Milestone as shown on Exhibit A. Such payments shall be made upon the Contractor's submission of contractually compliant requisitions.

- 20 new Milestones added to the Contract
- $16M allocated to each Milestone

- No payment if miss Milestone date
- No payment if unreasonably interfere with other contractors

# ACCELERATION AGREEMENT

3.3. Notwithstanding the Contractor's failure to achieve any of Milestones 6 through 20 by the date established for such Milestone in Exhibit A, the Contractor shall earn the Milestone payment for any such Milestone if it does not unreasonably interfere with the work of any other SAS Contractor, and: (1) achieves such Milestone within 30 calendar days of the Milestone date for that Milestone, or (2) achieves such Milestone and Milestone 21 on or before September 30, 2016.

3.4. Notwithstanding the Contractor's failure to achieve any of Milestones 6 through 21 by the date established for such Milestone, the Contractor shall be entitled to such Milestone payment if Revenue Service commences on or before December 24, 2016 and the Contractor has made good faith efforts to complete the Work associated with such Milestone and to support the MTA in achieving Revenue Service.

- While at risk, preserves ability to get all acceleration $ right to the very end

# ACCELERATION SCOPE DEFINED

| System | Station | MS# | Acceleration Agreement Milestone Description | Accel Agreement MS Date |
|---|---|---|---|---|
| TRACTION POWER | 72 | 6 | The Contractor shall complete all Field Installation Acceptance Tests on the Traction Power system at 72nd Street Station such that it is ready for Con Edison High Tension Power. | 5/2/2016 |
| | 96 | 7 | The Contractor shall complete all Field Installation Acceptance Tests on the Traction Power system at 96th Street Station such that it is ready for Con Edison High Tension Power. | 4/4/2016 |
| | 86 | 8 | The Contractor shall complete all Field Installation Acceptance Tests on the Traction Power system at 86th Street Station such that it is ready for Con Edison High Tension Power. | 5/9/2016 |
| | all | 9 | The Contractor shall complete all Field Installation Acceptance Tests on the entire Traction Power system including the 63rd Street Station such that it is ready for Con Edison High Tension Power. | 6/27/2016 |
| TRACK | | 10 | The Contractor shall complete installation of Trackwork and the Third Rail for Tracks S1 & S2 including submittal of complete scans demonstrating a contractually compliant installation. | 5/30/2016 |
| SIGNAL | 72 | 11 | The Contractor shall complete all Field Installation Acceptance Tests (FIAT) of the Signal System at 72nd Street. Work includes, but is not limited to, breakdown testing of all relays, ground detectors, transfer switches and other components in the Relay Rooms & Wayside. | 5/23/2016 |
| | 96 | 12 | The Contractor shall complete all Field Installation Acceptance Tests (FIAT) of the Signal System at 96th Street. Work includes, but is not limited to, breakdown testing of all relays, ground detectors, transfer switches and other components in the Relay Rooms & Wayside, and buildout and testing of the Rail Transit Operations (RTO) Tower and Dispatchers Office. | 5/23/2016 |
| | 86 | 13 | The Contractor shall complete all Field Installation Acceptance Tests (FIAT) of the Signal System at 86th Street. Work includes, but is not limited to, breakdown testing of all relays, ground detectors, transfer switches and other components in the Relay Rooms & Wayside, Signal System Wide Track Circuit Bulletin Certification & Code Signal In-Service acceptance | 7/18/2016 |
| | 63 + | 14 | The Contractor shall complete all Field Installation Acceptance Tests (FIAT) of the Signal System at 63rd Street and existing tie-in rooms listed below. Work includes, but is not limited to, installation, wiring and breakdown testing of all relays, ground detectors, transfer switches and Signal Equipment in 63rd S.RR, 115CIR, 21st RR, 147CIR, QBP Tower, City Hall, G3/G4 Wayside. | 5/30/2016 |
| | Wayside | 15 | The Contractor shall install stops, Megger test cables, terminate cases and complete all Field Installation Acceptance Tests (FIAT) of the Signal System at 72nd St, 86th St, & 96th St Wayside | 5/23/2016 |
| | 63rd | 16 | The Contractor shall complete all work and preliminary testing and pre-testing required to perform Field Installation Acceptance Tests (Level 3/4) on the 63rd Street Station communication systems. | 5/31/2016 |
| | | 16A | The Contractor shall complete all work and testing through Systems Integrated Testing of all the 63rd Street Station Communications Systems, except UHF SIT and Fire Alarm Combined SIT . | 6/30/2016 |
| | | 17 | The Contractor shall complete all work and preliminary testing and pre-testing required to perform Field Installation Acceptance Tests (Level 3/4)on the 72nd Street Station communication systems, except for the UHF Radio system and work associated with room 7024. | 6/13/2016 |
| | | | The Contractor shall complete all work and testing through Systems Integrated Testing of all the 72nd Street Station Communications Systems, except escalators, elevators and except UHF SIT and Fire Alarm Combined SIT. | 8/29/2016 |
| | | | Contractor shall complete all work and preliminary testing and pre-testing required to perform installation Acceptance Tests (Level 3/4) on the 86th Street Station communication systems, or the UHF Radio system. | 6/27/2016 |
| | | | tor shall complete all work and testing through Systems Integrated Testing of all the tation Communications Systems, except escalators, elevators and except UHF SIT and mbined SIT. | 8/1/2016 |
| | | | shall complete all work and preliminary testing and pre-testing required to perform Acceptance Tests (Level 3/4) on the 96th Street Station communication systems, F Radio system. | 6/20/2016 |
| | | | all complete all work and testing through Systems Integrated Testing of all the n Communications Systems, except escalators, elevators and excep UHF SIT and ed SIT. | 8/1/2016 |
| | | | all complete all work and testing through Final Systems Integrated Testing of all 72nd, 86th, & 96th Local Area Network (LAN) and overall Wide Area Network t the LAN/ WAN is available for Final Systems Integrated Testing by the Station | 6/6/2016 |
| | | | actor shall complete all work and testing through Final Systems Integrated Testing of the nication Systems including the UHF Radio, the work associated with room 7024 (72 Station), all other work required to start Pre-Revenue Service Training, except such work that is acted by incomplete escalators and elevators. | 9/30/2016 |
| | | | Substantial Completion | 12/30/2016 |

Exhibit A
**Milestone Schedule**


Exhibit B
**P6 Activities sorted by MS**

# EXHIBIT C **ROOM & CONDUIT TURNOVER**

## EXHIBIT C - ACCESS & SUPPORT REQUIREMENTS

**72nd St Station**

| Room | Room Description | Turnover Date | Notes |
|---|---|---|---|
| 5011 | MR 4770 (Comm Closet) | 4/18/2016 (Shared) | Water mist to be installed on 4/7/16. Flooring to be completed on 4/6 |
| 7024 | MR-477E (Comm Closet) | Shared to 6/21 | NYCT to allow test simulation |
| C401 | Fan Control Rm | Shared till 5/1/16 | |
| A404 | Fan Control Rm | | |
| 7104 | FACILITY POWER | 4/15/2016 | Sta Contractor to provide 2nd pull line & tone |
| 6011 | FACILITY POWER | | |
| 3013 | INGEN ROOM | 4/25/2016 | |
| 3132 | Station Service Center (Token booth) | 4/25/2016 | SHARED access to 5/15/16. NYCT to allow test simulation |
| 3101 | Elev Mach Rm | 4/25/2016 | SHARED access. |
| 3148 | Elev Mach Rm | 4/25/2016 | SHARED access. |
| 2121 | Elev Mach Rm | 4/25/2016 | SHARED until 5/15/16. CS will pull cable to closest point |
| 8106 | SECR 8106 | 4/25/2016 | SHARED UNT 7/1/16. CS will pull cable to closest point |

**86th St Station**

| Room | Room Description | Turnover Date | Notes |
|---|---|---|---|
| 4007 | Main Communication Room (MR-476) | Turned Over | Branch conduits to Anc. 1 and Entrance 1 (6/15/16) |
| 6008 | Radio Communication Room (MR-476B) | 4/18/2016 | Branch conduit for Ancillary GPS to Anc. 1 ( 5/15/16) ; Openings for Ingen Room Dampers and CMU for chase. |
| 4017 | Communication Closet (MR-476F) | 4/18/2016 | Branch and Main conduits to Anc. 2 (6/20/16); Openings for Ingen Room Dampers and CMU for chase |
| 3023 | Communication Closet (MR-476C) | 4/25/2016 | Branch conduits to Anc. 1 and Entrance 1 (6/15/16) |
| 3122 | Communication Closet (MR-476D) | 4/25/2016 | Branch Conduits to Ancillary 2 (6/20/16) and Mezzanine shared access rooms (5/15/16) |
| C106 | Communication Closet (MR-476E) | 4/25/2016 | Branch conduits to Entrance 2 (4/30/16); openings for room dampers not completed. |
| 4002 | Fan Control Room | 4/25/2016 | |
| No. 16 | Tunnel Pump Room | 4/25/2016 | |
| 1009 | Sprinkler Valve Set Room | 4/25/2016 | |
| 3022 | Facility Power Room | 4/25/2016 | |
| D102 | SECR Room | 4/25/2016 | Room structure and build out not completed. Conduit not completed |
| 1107 | Station Service Center | 4/25/2016 | CS remains to core through closet and remediate conduit into SSC. wire mesh also. |
| D202 | Dry Cooler Room | 4/25/2016 | Conduit to be completed 5/31/16. |
| 3045 | Elevator Machine Room | 4/25/2016 | Equipment within the room will be reprocessed to provide sufficient wall space for CS equipment 5/15/2016 |
| 3115 | Elevator Machine Room | 4/25/2016 | Conduit work will be done 5/31/16. |
| | Platform Service Center w/ Speaker Brackets | SHARED ACCESS | CS to work on one side of center and swap as necessary. |
| | Mezzanine Service Center | SHARED ACCESS | |
| | Traction Power Brackets | 4/22/2016 | With bi brackets |
| | Mezz Wall Speaker Brackets | SHARED until 5/1/16 | |
| | Mezz Ceiling Speaker/ CCTV Brackets | SHARED ACCESS | |

**96th St Station**

| Room | Room Description | Turnover Date | Notes |
|---|---|---|---|
| 3119 | Main Communication Room (MR-475) | Turned Over | Shared Access for branch conduits to be completed 4/26/2016 |
| 3025 | Communication Closet (MR-475C) | Turned Over | Shared Access for branch conduits to be completed 4/26/2016 |
| 3148 | Communication Closet (MR-475D) | Turned Over | Shared Access for branch conduits to be completed 4/26/2016 |
| 3001 | Signal Relay Room | Turned Over | Shared Access for lighting panel U GP-3, second ground, floor finish, floor drain, emergency lighting and relocation of |
| 2102 | Fan Control Room | 4/25/2016 | |
| 2082 | Dispatcher's Office | 4/18/2016 | Shared access for communication branch conduit 4/18/16, wall clock conduit, closure of ceiling (after CS/e work above the ceiling) |
| 3015 | Power Supply Room | 4/25/2016 | |
| C104 | SECR Room | 4/25/2016 | |
| 3004 | Ingen Room | 4/18/2016 | |
| 3108 | Station Service Center | 4/18/2016 | |
| 3075 | Telephone Room | 4/4/2016 | |
| 2109 | Elevator Machine Room | 4/25/2016 | |
| 3103 | Street Elevator Machine Rooms | 4/25/2016 | Shared Access for Station Contractor Work |

**ASSUMPTIONS**

1. MTACC/NYCT shall be available to inspect and support the Traction Power, Signal & Communication activities 10 hours per day 7 days a week from 0700 hours to 1730 hours
2. MTACC/NYCT shall be available to inspect and support the Track activities 12 hours per day 6 days a week from 0700 hours to 1900 hours
3. FIAT/FIST Systems Testing will not be stopped or suspended because of punch list work that is not essential to achieving Pre-Revenue Service Training dates, as determined by MTACC.

But are Station Contractors committed…?

# Agreement Signed April 20, 2016

Now we can really get going!

01

02

03

04

05

06

# *Field Monitoring & Control*

# SCHEDULE ANALYTICS

- We ran the Contractor's schedule through our beta version of NetPoint Numerati Schedule Analytics
- Marginally reliable


**Schedule IQ™ - Summary Report - C6-UPD42 2-1-16**

v1.0.0.110

Summary

**IQ Scores**

| Category | Rating | Result | Tripwire | Definition |
|---|---|---|---|---|
| **Overall Schedule** | **Marginally Reliable** | **59*** | **≥ 80 (!)** | **Whether or not the schedule is comprehensive, credible, well-built, and controlled.** |
| Comprehensive | Highly Reliable | 97* | ≥ 80 | Whether or not the schedule is aligned, complete, conforming, formulaic, and resourced. For example: activities and their durations, contract dates, resource, code, and WBS assignments, etc. |
| Credible | Unreliable | 9* | ≥ 80 (!) | Whether or not the schedule is predictive, risked, weather-fit, resource-flowing, and flexible. For example: critical activities, total float, risk, weather, etc. |
| Well Built | Somewhat Reliable | 65* | ≥ 80 (!) | Whether or not the schedule is hierarchical, phased, logical, connected, and calendar-fit. For example: milestones, constraints, redundant logic, dangling and open ends, calendars etc. |
| Controlled | Marginally Reliable | 56* | ≥ 80 (!) | Whether or not the schedule is statused, weathered, re-baselined, forensic, and trended. For example: activities completed, out-of-sequence progress, remaining duration, etc. |

# CONTRACTORS' P6 SCHEDULES WERE MARGINALLY RELIABLE

Schedule had not been accepted by the CM

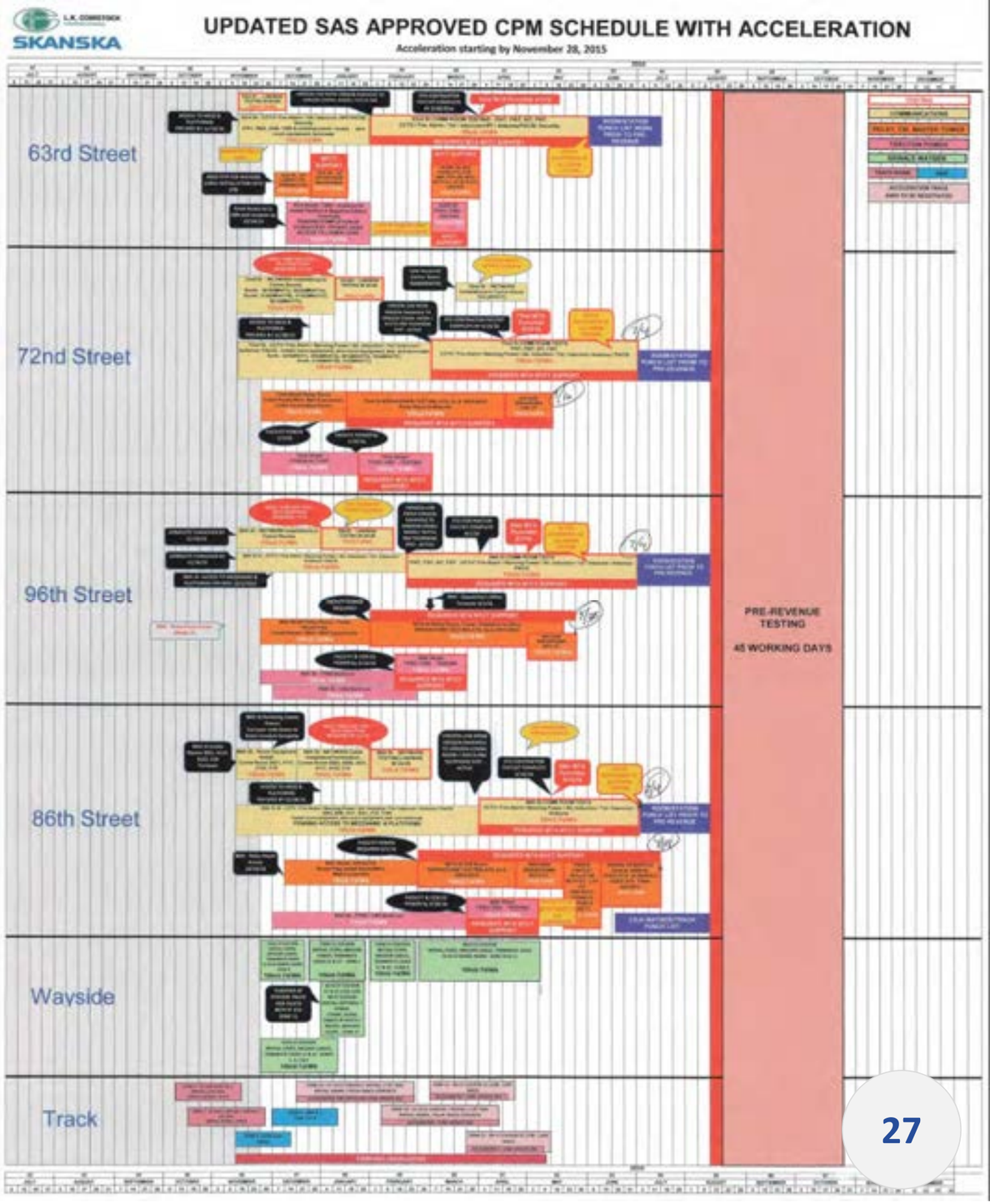
Contractor was working off Excel barchart schedules

While it scored high on Comprehensive, there was not enough detail for Testing work

Change Orders not added to schedule

# CONTRACTOR'S "REAL" SCHEDULE

The black and red callout boxes were all access constraints and impediments to meeting the promised dates

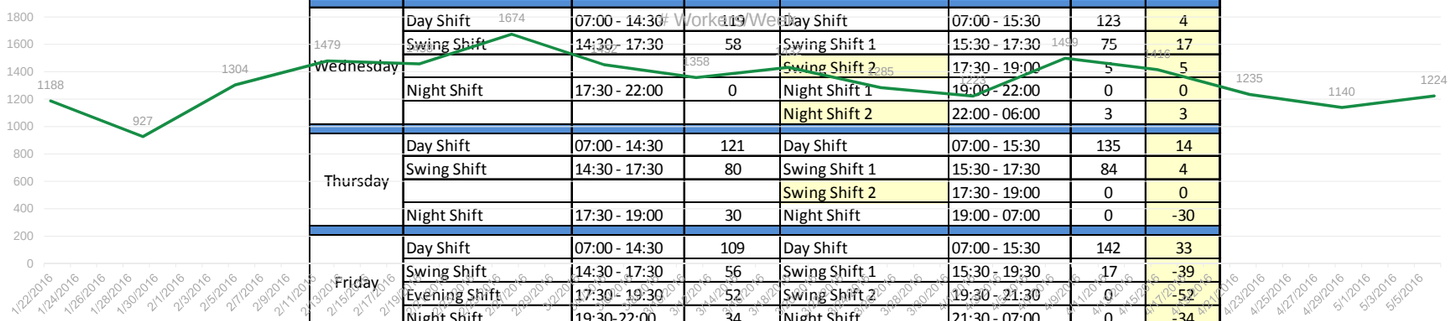


# ACCELERATION MANPOWER TRACKING

Initially night crew was just unloading trucks

No contract commitment of manpower levels so no “teeth” to enforce

Late room turnovers & incomplete conduit by others gave easy out— ***“Not enough work to bring more guys in”***




| Day | WE 1/22/16 | | | WE 5-6-16 | | | Change in # of workers |
|---|---|---|---|---|---|---|---|
| | Shift | Time | Number of workers | Shift | Time | Number of workers | |
| Saturday | Weekend Day Shift | 07:00 - 14:30 | 59 | Weekend Day Shift | 07:00 - 17:30 | 70 | 11 |
| | Weekend Swing Shift | 14:30 - 17:30 | 59 | Weekend Swift Shift | 17:30 - 19:00 | 31 | -28 |
| | Weekend Night Shift | 17:30 - 22:00 | 0 | Weekend Night Shift | 19:30 - 07:00 | 13 | 13 |
| Sunday | Weekend Day Shift | 07:00 - 14:30 | 37 | Weekend Day Shift | 07:00 - 14:30 | 51 | 14 |
| | Weekend Swing Shift | 14:30 - 15:30 | 36 | Weekend Swing Shift | 14:30 - 19:30 | 17 | -19 |
| | Weekend Night Shift | 15:30 - 22:00 | 0 | Weekend Night Shift | 19:30 - 07:00 | 0 | 0 |
| Monday | Day Shift | 07:00 - 14:30 | 87 | Day Shift | 07:00 - 15:30 | 132 | 45 |
| | Swing Shift | 14:30 - 18:30 | 61 | Swing Shift 1 | 15:30 - 17:30 | 68 | 7 |
| | | | | Swing Shift 2 | 17:30 - 19:30 | 13 | 13 |
| | Night Shift | 18:30 - 22:00 | 0 | Night Shift | 19:30 - 07:00 | 0 | 0 |
| Tuesday | Day Shift | 07:00 - 14:30 | 123 | Day Shift | 07:00 - 15:30 | 146 | 23 |
| | Swing Shift | 14:30 - 18:30 | 67 | Swing Shift 1 | 15:30 - 17:30 | 80 | 13 |
| | | | | Swing Shift 2 | 17:30 - 19:30 | 19 | 19 |
| | Night Shift | 18:30 - 22:00 | 0 | Night Shift | 19:30 - 07:00 | 0 | 0 |
| Wednesday | Day Shift | 07:00 - 14:30 | 119 | Day Shift | 07:00 - 15:30 | 123 | 4 |
| | Swing Shift | 14:30 - 17:30 | 58 | Swing Shift 1 | 15:30 - 17:30 | 75 | 17 |
| | | | | Swing Shift 2 | 17:30 - 19:00 | 5 | 5 |
| | Night Shift | 17:30 - 22:00 | 0 | Night Shift 1 | 19:00 - 22:00 | 0 | 0 |
| | | | | Night Shift 2 | 22:00 - 06:00 | 3 | 3 |
| Thursday | Day Shift | 07:00 - 14:30 | 121 | Day Shift | 07:00 - 15:30 | 135 | 14 |
| | Swing Shift | 14:30 - 17:30 | 80 | Swing Shift 1 | 15:30 - 17:30 | 84 | 4 |
| | | | | Swing Shift 2 | 17:30 - 19:00 | 0 | 0 |
| | Night Shift | 17:30 - 19:00 | 30 | Night Shift | 19:00 - 07:00 | 0 | -30 |
| Friday | Day Shift | 07:00 - 14:30 | 109 | Day Shift | 07:00 - 15:30 | 142 | 33 |
| | Swing Shift | 14:30 - 17:30 | 56 | Swing Shift 1 | 15:30 - 19:30 | 17 | -39 |
| | Evening Shift | 17:30 - 19:30 | 52 | Swing Shift 2 | 19:30 - 21:30 | 0 | -52 |
| | Night Shift | 19:30-22:00 | 34 | Night Shift | 21:30 - 07:00 | 0 | -34 |
| | **Overall Change in # of Workers** | | **1188** | | | **1224** | **36** |

# TEST PROCEDURE SUBMITTALS STATUS

Level 3 /4 (FIAT) test procedures – almost 30% outstanding

Level 5 (FIST) test procedures – over 70% outstanding

Level 6 (SIT) test procedures – almost 70% outstanding

**Contractor was not focused on required paperwork**

| Procedure | | LEVEL 2 (FAT) | | | LEVEL 3/4 (FIAT) | | | LEVEL 5 (FIST) | | | LEVEL 6 (FSIT/SIT) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Required | Submitted | Approved | Required | Submitted | Approved | Required | Submitted | Approved | Required | Submitted | Approved |
| 63rd Street | Test Documents | 12 | 11 | 11 | 32 | 30 | 25 | 12 | 10 | 5 | 14 | 13 | 9 |
| | Percent Completed | - | 92% | 92% | - | 94% | 78% | - | 83% | 42% | - | 93% | 64% |
| 72nd Street | Test Documents | 20 | 19 | 19 | 40 | 38 | 30 | 21 | 18 | 8 | 25 | 16 | 9 |
| | Percent Completed | - | 95% | 95% | - | 95% | 75% | - | 86% | 38% | - | 64% | 36% |
| 86th Street | Test Documents | 20 | 19 | 19 | 39 | 36 | 21 | 18 | 15 | 6 | 26 | 15 | 9 |
| | Percent Completed | - | 95% | 95% | - | 92% | 54% | - | 83% | 33% | - | 58% | 35% |
| 96th Street | Test Documents | 21 | 20 | 20 | 41 | 37 | 29 | 22 | 17 | 6 | 29 | 17 | 9 |
| | Percent Completed | - | 95% | 95% | - | 90% | 71% | - | 77% | 27% | - | 59% | 31% |

# TESTING HAD NOT EVEN STARTED DUE TO CONDUIT DELAYS

**72nd Street Station - Systems Testing**

Test Dates are from Draft Communications Mitigation Schedule, Updated as of October 24, 2016 and CPM Update 49, September 1, 2016

**August, 2016**

| | | | FIAT Level 4 Test | | | | SIST Level 5 Test | | | | FSIT Level 6 Final Close Out | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Scheduled Start | Actual Start | Scheduled Finish | Actual Finish | Scheduled Start | Actual Start | Scheduled Finish | Actual Finish | Scheduled Start | Actual Start | Scheduled Finish | Actual Finish |
| Traction Power | 26 Traction Power | 26 08 01 - AC Switchgear | 1/25/2016 | 2/16/2016 | 2/22/2016 | 2/17/2016 | 1/25/2016 | 1/25/2016 | 2/22/2016 | 2/22/2016 | | | | |
| | | 26 09 21 - PCC SCADA System | 5/1/2016 | 2/16/2016 | 5/4/2016 | 2/17/2016 | 7/15/2016 | | 9/5/2016 | | | | | |
| | | 26 09 22 - Stray Current Panel | 10/13/2016 | | 10/17/2016 | | 10/13/2016 | | 10/17/2016 | | | | | |
| | | 26 09 27 - HVAC Remote Supervisory System | 1/16/2017 | | 1/20/2017 | | 1/21/2017 | | 1/26/2017 | | 1/21/2017 | | 1/26/2017 | |
| | | 26 26 60 - TPSS Battery | | 7/26/2016 | | 7/26/2016 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | 34 05 00 - DC Panel Mount Circuit Breakers | 3/7/2016 | 3/24/2016 | 3/30/2016 | 3/24/2016 | 3/7/2016 | 3/24/2016 | 3/30/2016 | 3/24/2016 | 11/9/2016 | | 11/11/2016 | |
| | | 34 05 00 - DC Switchgear | 1/25/2016 | 2/16/2016 | 2/22/2016 | 2/17/2016 | | 1/25/2016 | | 2/22/2016 | 11/6/2016 | | 11/9/2016 | |
| | | 34 21 23 - Transformer | 1/25/2016 | 2/16/2016 | 2/22/2016 | 2/17/2016 | | 1/25/2016 | | 2/22/2016 | 11/6/2016 | | 11/9/2016 | |
| | | 26 - Traction Power O&M Manual | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| RMS | 19CR RMS | 19CR Power Plant & Battery String | | 4/13/2016 | | 4/13/2016 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | 19CR Power Plant & Battery String for Radio Comm Room | 10/17/2016 | 10/26/2016 | 10/24/2016 | 10/26/2016 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | 19CRGB Grounding System (Comm Rooms) | | 4/27/2016 | | 4/27/2016 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| CCTV | 19Q CCTV | 19Q - CCTV Cabinets | 11/27/2016 | | 12/3/2016 | | 12/4/2016 | | 12/10/2016 | | 12/11/2016 | | 12/17/2016 | |
| CBDS | 19MM CBDS | 19MM - CBDS | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| EBCS | 19 EBCSC EBCS | 19 EBCSC - EBCS - Emergency Booth Communication System | 12/18/2016 | | 12/23/2016 | | 12/18/2016 | | 12/23/2016 | | 12/18/2016 | | 12/23/2016 | |
| FAS | 19KR Fire Alarm System | 19KR - Fire Alarm System (FAS) | 11/3/2016 | | 11/29/2016 | | 11/3/2016 | | 11/29/2016 | | 12/1/2016 | | 12/15/2016 | |
| | | 19KR - Fire Alarm System (FAS) Entrance 1 | TBD | | TBD | | TBD | | TBD | | TBD | | TBD | |
| IAC | 19L Intrusion Access Control | 19L - Intrusion Access Control (IAC) | 10/29/2016 | | 11/4/2016 | | 11/5/2016 | | 11/11/2016 | | 11/12/2016 | | 11/18/2016 | |
| EA | 19LL Emergency Alarms | 19LL - Emergency Alarms | 10/31/2016 | 9/19/2016 | 11/3/2016 | | 11/4/2016 | | 11/6/2016 | | 11/7/2016 | | 11/13/2016 | |
| PMRS | 19R PMRS | 19R - UHF Radio Cabinet (URC) - Police Radio Service (PRS) | 11/7/2016 | | 11/13/2016 | | 11/14/2016 | | 11/20/2016 | | N/A | N/A | N/A | N/A |
| | | 19R - VHF Radio Cabinet - RTO VHF, NYPD-Transit Bureau VHF | 11/7/2016 | | 11/13/2016 | | 11/14/2016 | | 11/20/2016 | | N/A | N/A | N/A | N/A |
| | | 19R - 63rd St. Cutover | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | 19R - Antenna Coverage Station | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 12/5/2016 | | 12/15/2016 | |
| | | 19R - Antenna Coverage Tunnel | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 12/5/2016 | | 12/15/2016 | |
| | | 19R - MOSCAD Control | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 12/5/2016 | | 12/15/2016 | |
| | | 19R - Channel Bank | N/A | N/A | N/A | N/A | 11/14/2016 | | 11/20/2016 | | N/A | N/A | N/A | N/A |
| PA/CIS | 19P PA/CIS | 19P - Public Address / Customer Information Systems | 11/5/2016 | | 11/9/2016 | | 11/10/2016 | | 11/14/2016 | | 11/15/2016 | | 11/19/2016 | |
| Cable Tests | 19C Cable Tests | 19B.3 - Fire Alarm System Cable | 9/22/2016 | 9/22/2016 | 2/1/2017 | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | 19B.3 - Data Communications CAT6 Cable | | | 2/1/2017 | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | 19B.3 - Communications Cable | 1/11/2016 | 1/11/2016 | 2/1/2017 | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | 19B.3 - PA Speaker & ASM Cable | 6/11/2016 | 6/11/2016 | 2/1/2017 | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | 19B.3 - Radio Antenna Cable | 5/11/2016 | 5/11/2016 | 2/1/2017 | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | 19B.3 - RF Cable Sweep | 5/11/2016 | 5/11/2016 | 2/1/2017 | 6/22/2016 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | 19B.3 - Security Cable | 3/7/2016 | 3/7/2016 | 2/1/2017 | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | Fiber Optic Cable | 3/7/2016 | 3/7/2016 | 2/1/2017 | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

# TRACKING COMM. ROOM TURNOVERS TO C6

**EXHIBIT C - ACCESS & SUPPORT REQUIREMENTS**

**72nd St Station**

| Room | Room Description | AA Date | Forecast Date | Notes |
|---|---|---|---|---|
| 5012 | MR-477D (Comm Closet) | 4/18/2016 (Shared) | (Work Complete) | COMPLETE |
| 7024 | MR-477E (Comm Closet) | Shared to 6/21 | 6/6/2016 | NYCT to allow test simulation |
| C401 | Fan Control Rm | Shared till 5/1/16 | 6/30/16 | Installation of VFD and power conduits need to be completed. Communication conduits will be installed after majority of Level 3 and 4 testing is complete. Shared Access once C6 mobilizes to install comm wire. |
| A404 | Fan Control Rm | | Forecast Date 7/15/16 | Installation of VFD and power conduits need to be completed. Communication conduits will be installed after majority of Level 3 and 4 testing is complete. Shared Access once C6 mobilizes to install comm wire. |
| 7104 | FACILITY POWER | 4/15/2016 | (Work Complete – 4/30/2016) | COMPLETE |
| 6011 | FACILITY POWER | | | |
| 3013 | INERGEN ROOM | 4/25/2016 | | (Majority of work is complete. Contractor to confirm 5/2 if any work is remaining) |
| 3112 | Station Service Center (Token booth) | 4/25/2016 | 6/13/15 | This is a 1 month slip from the SHARED access to 5/15/16 date in AA agreement. Electrical contractor needs to complete lighting, conduit, wire terminations and JCI needs to install rubber floor after that. Plan was always to simulate |
| 3101 | Elev Mach Rm | 4/25/2016 | Shared until 6/1/2016 | SHARED access.in AA |
| 3148 | Elev Mach Rm | 4/25/2016 | Shared until 6/1/16 | SHARED access in AA |
| 2121 | Elev Mach Rm | 4/25/2016 | 6/15/2016 | This is a 1 month slip from the SHARED access to 5/1/16 date in AA agreement. C6 will pull cable to closest point was in AA |
| B106 | SECR B106 | 4/25/2016 | 7/1/2016 | Utility relocation needs to be done. Solution being worked out. No change from AA note "SHARED until 7/1/16. C6 will pull cable to closest point" |

**86th St Station**

| Room | Room Description | AA Date | Forecast Date | Notes |
|---|---|---|---|---|
| 6002 | Main Communication Room (MR-476) | Turned Over | **Turned Over** except as noted in AA | (Per AA: Branch conduits to Anc. 1 and Entrance 1 by 6/15/16) |
| 6006 | Radio Communication Room (MR-476B) | 4/18/2016 | **Turned Over** except as noted in AA | (Per AA: Branch conduit for Antenna GPS to Anc. 1 (5/15/16) ; Openings for Inergen Room Dampers and CMU for chas)e still not progressing. |
| 4117 | Communication Closet (MR-476F) | 4/18/2016 | **Turned Over** except as noted in AA | Branch and Main conduits to Anc. 2 (6/20/16); Openings for Inergen Room Dampers and CMU for chase. Battery Cable not completed |
| 3021 | Communication Closet (MR-476C) | 4/25/2016 | **Turned Over** except as noted in AA | Branch conduits to Anc. 1 and Entrance 1 (6/15/16) |
| 3122 | Communication Closet (MR-476D) | 4/25/2016 | **Turned Over** except as noted in AA | Branch Conduits to Ancillary 2 (6/20/16) and Mezzanine shared access rooms (5/15/16) |
| C106 | Communication Closet (MR-476E) | 4/25/2016 | Shared with issues | (per AA: Branch conduits to Entrance 2 (4/30/16); openings for room dampers not completed.). MAY NEED WAIVER FOR LAN/WAN FROM C106 TO STREET) |
| 4002 | Fan Control Room | 4/25/2016 | Shared | |
| No. 16 | Tunnel Pump Room | 4/25/2016 | Shared with Issues | Conduit needs to be re-routed under AWO. C2785 run to room may also need AWO |
| 3009 | Sprinkler Valve Set Room | 4/25/2016 | Shared | |
| 3022 | Facility Power Room | 4/25/2016 | Shared | |
| D102 | SECR Room | 4/25/2016 | 5/16/2016 | **Room structure completed.** Conduit to start 5/9 |
| 3107 | Station Service Center | 4/25/2016 | Shared by 5./9 | Per AA: FSE remains to core through closet and complete conduit into SSC, wire mold also remains (4/20/2016). Not done but being coordinated in Field |
| D202 | Dry Cooler Room | 4/25/2016 | | Per AA: Conduit to be completed 5/31/16. |
| 3045 | Elevator Machine Room | 4/25/2016 | shared with pull box provided. | Per AA: "Equipment within the room will be repositioned to provide sufficient wall space for C6 equipment 5/15/2016." C6 has not pulled cable yet |
| 3115 | Elevator Machine Room | 4/25/2016 | | Conduit work will be done 5/31/16. |
| | Platform Service Carrier w/ Speaker Brackets | SHARED ACCESS | Turned over except as noted | **AAJV needs to provide cut-out locations** |
| | Mezzanine Service Carrier | SHARED ACCESS | S end TURNED OVER, N End Turnover this week | |
| | Traction Power Brackets | 4/23/2016 | Majority Done | Missing a few brackets but may be ok for cable pull |
| | Mezz Wall Speaker Brackets | SHARED until 5/1/16 | 5/9/2016 | Expect to complete this week |
| | Mezz Ceiling Speaker/ CCTV Brackets | SHARED ACCESS | | Waiting on field of view survey |
| | **Not in AA but requested by Doug:** | | | |
| | Fiber Conduits room to room | | | |
| | 25/50 Pair conduits room to room | | | |
| | CBH Conduits for 25 pair 16 batter | | | |
| | AWO for negative duct banks N end | | | |

**96th St Station**

| Room | Room Description | Turnover Date | Forecast Date | Notes |
|---|---|---|---|---|
| 3119 | Main Communication Room (MR-475) | Turned Over | | Shared Access for branch conduits to be completed 4/29/2016 |
| 3005 | Communication Closet (MR-475C) | Turned Over | | Shared Access for branch conduits to be completed 4/29/2016 |
| 3148 | Communication Closet (MR-476D) | Turned Over | | Shared Access for branch conduits to be completed 4/29/2016 |
| 3001 | Signal Relay Room | Turned Over | | Shared Access for lighting panel U-LDP-5, second ground, floor finish, floor drain, emergency lighting and relocation of telephone conduit |
| 2162 | Fan Control Room | 4/25/2016 | 5/31/2016 | Incomplete lighting and FA – smoke det. backboxes |
| 2032 | Dispatcher's Office | 4/18/2016 | 5/6/2016 | Wiremold relocation- blocked by C6. Lighting fixtures relocation – not enough clearance |
| 3015 | Power Supply Room | 4/25/2016 | Turned Over | |
| C104 | SECR Room | 4/25/2016 | 5/6/2016 | Missing permanent tags |
| 3004 | Inergen Room | 4/18/2016 | Turned Over | |
| 3108 | Station Service Center | 4/18/2016 | 5/31/2016 | Missing conduit C323 ( induction loop for hearing impaired) |
| 3075 | Telephone Room | 4/4/2016 | Turned Over | |
| 2102 | Elevator Machine Room | 4/25/2016 | 5/31/2016 | Inc. comm conduits, FA, ATS & Disc Sw |
| 3103 | Street Elevator Machine Room | 4/25/2016 | 5/31/2016 | Missing lighting, room incomplete |

**LEGEND:**

| |
|---|
| TURNED OVER |
| ISSUE TO RESOLVE |

# THE GOVERNOR WAS WATCHING, AND THINGS WERE NOT GOING WELL

| Milestone(s) | | 72 St. | | | | | |
|---|---|---|---|---|---|---|---|
| Stations | % Complete as of 9/1/16 | Target Date | Late Finish | Float (days) | Change in Float with respect to 8/1/16 (days) | % Complete as of 8/1/16 | % Complete as of 9/1/16 |
| Escalators Installation | 91% | 9/30/2016 | 10/4/2016 | 4 | 0 | 84% | 88% |
| Escalators Level 3 -> 4 Testing | 19% | 10/30/2016 | 11/1/2016 | 2 | 0 | 0% | 5% |
| Escalators Level 5 Testing | 0% | 11/30/2016 | 12/1/2016 | 1 | 0 | 0% | 0% |
| Elevators Installation | 80% | 9/30/2016 | 10/1/2016 | 1 | 0 | 75% | 81% |
| Elevators Level 3 -> 4 Testing | 0% | 10/30/2016 | 11/1/2016 | 2 | 0 | 0% | 0% |
| Elevators Level 5 Testing | 0% | 11/30/2016 | 12/1/2016 | 1 | 0 | 0% | 0% |
| Tunnel Vent Fans Level 3 -> 4 Tes | 40% | 9/10/2016 | 9/1/2016 | -9 | -10 | 50% | 80% |
| Tunnel Vent Fans Level 5 Testing | 0% | 10/30/2016 | 10/1/2016 | -29 | | | 0% |
| HVAC Level 3 -> 4 Testing | 37% | 10/17/2016 | 9/1/2016 | -46 | -33 | 21% | 29% |
| HVAC Level 5 Testing | 0% | 10/30/2016 | 10/1/2016 | -29 | | | 0% |
| Fire- Life Safety Installation | 100% | 9/6/2016 | 8/15/2016 | -22 | -25 | 95% | 95% |
| Fire- Life Safety Level 3 -> 4 Testi | 18% | 9/30/2016 7 | 9/1/2016 | -29 | -14 | 6% | 6% |
| Fire- Life Safety Level 5 Testing | | 10/30/2016 | 10/1/2016 | -29 | | | |
| Road Restoration | 60% | 12/1/2016 | 12/30/2016 | 29 | 0 | 16% | 17% |
| Systems | | | | | | | |
| Traction Power Energization | 92% | 11/15/2016 con Ed doing in phases | 12/1/2016 not needed to do PRST | #VALUE! | #VALUE! | 88% | 84% |
| Communications Highlights | | | | | -2 | | |
| LAN/WAN Installation | 100% | Complete | | | | 100% | 100% |
| LAN/WAN Testing | 30% | 9/20/2016 | 9/19/2016 | -1 | -18 | 50% | 70% |
| Fire Alarm Installation | 29% | 10/7/2016 | 9/1/2016 | -36 | -12 | 23% | 23% |
| Fire Alarm Testing | 0% | 11/5/2016 | 9/24/2016 | -42 | -20 | 0% | 0% |
| PACIS Installation | 66% | 9/25/2016 | 9/1/2016 | -24 | -21 | 79% | 88% |
| PACIS Testing | 0% | 10/23/2016 | 10/1/2016 | -22 | -21 | 15% | 40% |
| Emergency Alarm Installatio | 98% | 9/12/2016 CSJV taking longer than planned | 9/1/2016 | #VALUE! | #VALUE! | 99% | 99% |
| Emergency Alarm Testing | 0% | 9/30/2016 | 10/1/2016 | 1 | -12 | 0% | 0% |
| CCTV Installation | 66% | 9/15/2016 | 9/1/2016 | -14 | -18 | 51% | 77% |
| CCTV Testing | 0% | 10/24/2016 | 10/1/2016 | -23 | -29 | 0% | 0% |
| Sound Powered Phone Insta | 67% | 9/16/2016 Scope Change | 9/1/2016 | #VALUE! | #VALUE! | 97% | 97% |

| GRAND TOTAL | 72 | 42 | 22 | ALL STATIONS | |
|---|---|---|---|---|---|
| SAS – Planned Tests by Week<br>Week Ending 12/9/16 | | | | Details | 12/7/2016<br>Issue & Solution |
| 63rd Street Station | TESTS Remaining | PLAN This week | DONE This Week | | |
| Total by week | | 0 (+4) | | Station Complete | |
| Fire Alarm SIT | 1 | 0 (+1) | 1 | Modified SIT Saturday | ISSUE: Today on 12/6 CSJV provided MTA a new list of incomplete Contractor work that they are discovering during pre-test.<br>ACTION: CM is following up on list |
| PA / CIS SIT | 1 | 0 (+1) | 0 | SIT | SIT impacted by GUI Interface and Line Driver; NYCT programming/ cards? MKJ resource issue |
| Sound Powered Telephone DFSP | 1 | 0 (+1) | 1 | SPT DFSP Saturday<br>EA GAI (off book) | GAI-Tronics done as part of EA SIT |
| Dispatch NA | | -- | 0 | | |
| CCTV | 2 | 0 (+1) | 1 | Elevator FIST this week Saturday<br>SIT | |
| *Subtotal Comms by Week* | *5* | *0 (+4)* | 3 | Comms 3 / 4 | |
| SAS – Planned Tests by Week<br>Week Ending 12/9/16 | | | | Details | Issue & Solution |
| 72nd Street Station | TESTS Remaining | PLAN This week | DONE This Week | | |
| Fire Alarm | 3 | 1 | 0 | 0 of 1. Reported L5 next week | ISSUE: Today on 12/6 CSJV provided MTA a new list of incomplete Contractor work that they are discovering during pre-test.<br>ACTION: CM is following up on list |
| Radio (VHF and UHF) | 2 | -- | 0 | 1 Antenna Coverage - Tunnel<br>1 MOSCAD | Per CSJV, all tests for Radio will be done 12/16 |
| PA / CIS | 3 | 0 (+1) | 0 | FIAT. L3/4 | SIT impacted by GUI Interface and Line Driver; NYCT programming/ cards? MKJ resource issue |
| Telephone / Intercom | 11 | 3 (+1) | 0 | 1 SP Phone DFSP<br>3 HPI<br>3 SPI LOW HANGING FRUIT?<br>3 Induction Loop L3/4,5,6<br>1 EHI/ECI ADA Speakerphone Elev | SPT delayed by incomplete installation. Work progressing<br>HPI impacted by map boards<br>SPI may need programming by CSJV<br>Induction loop delayed by cracked glass in booth |
| Dispatch | 3 | 3 | 3 | 3 6-wire L3/4,5,6 Sunday | Bridge delivered and getting done this week - test on Sat & Sunday |
| CCTV | 2 | 3 (-1) | | FIST<br>SIT | Limited to Elev CCTV. Currently pre-test troubleshooting |

# STATION CONTRACTOR ISSUES & STRATEGIES

- What is preventing us from getting there?
- And what are we doing about it (mitigation strategy)?

| ISSUE | Mitigation Strategies |
|---|---|
| Incomplete Station Infrastructure:<br>• Conduit completion<br>• Non-code compliant installation<br>• Work not meeting contract/standards<br>• Inaccessible conduit and pull points<br>• PA/CIS brackets<br>• Liftnet/BMS | • Directive issued on 5/27/16 for all but procurement of PA/CIS brackets<br>• Station contractors to remain engaged in conduit completion<br>• Pressure to be put on station contractors to support CSJV |
| Disputed scope items:<br>• Security doors installation fire alarm completion | • Pressure to be put on station contractors<br>• Directive issued on 5/27/16 |
| • Lack of permanent power impacted comms Level 3 & 4 testing | • Temp power will be used for Level 3 & 4 FIAT testing<br>• Permanent power will be live mid to late June for Level 5 testing |
| • Grounding delayed by connection to new water pipe to be installed 72nd and 86th station contractors | • Pressure to be put on station contractors and DEP |
| • Lack of access due to station finishes | • Selective Stop Work Orders |

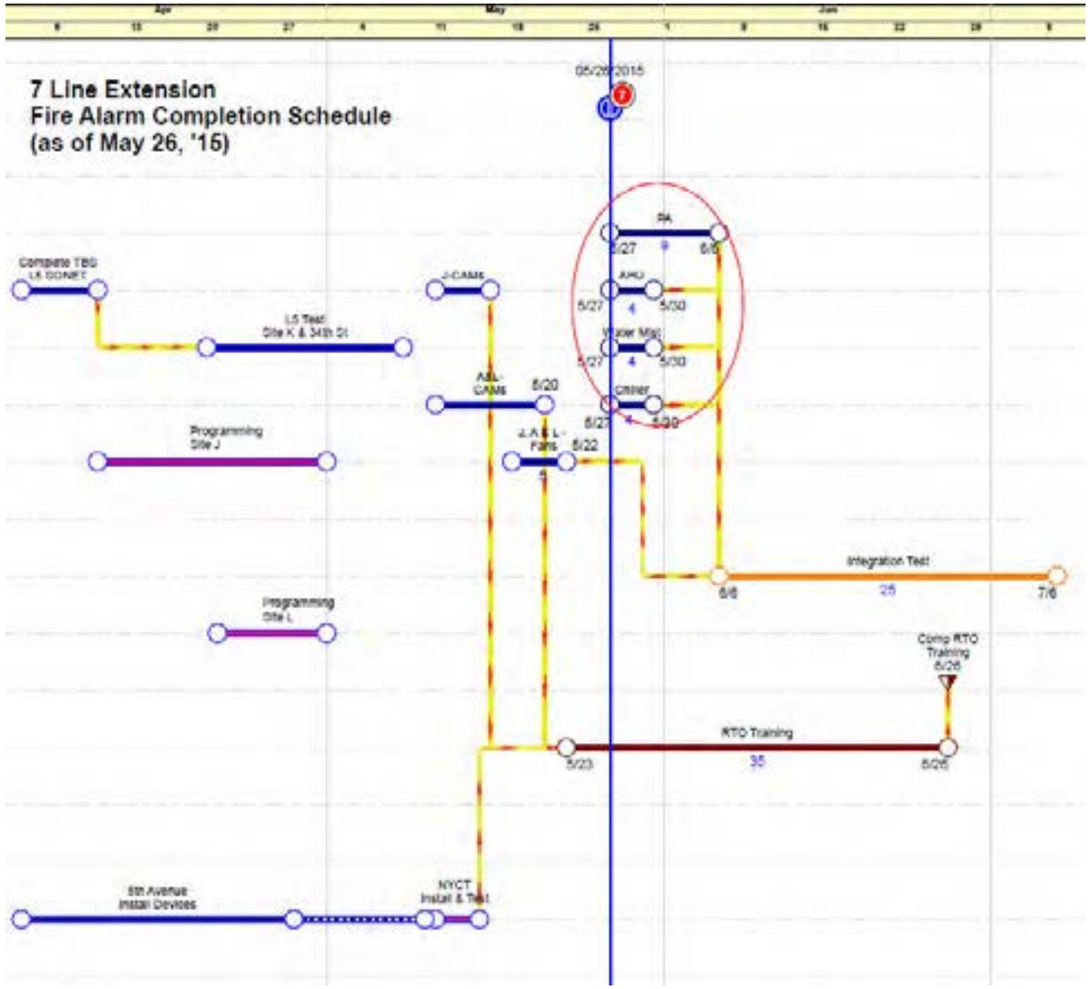
# Use of NetPoint

# IMPETUS FOR USE OF NETPOINT

Started with the 7 Train Extension

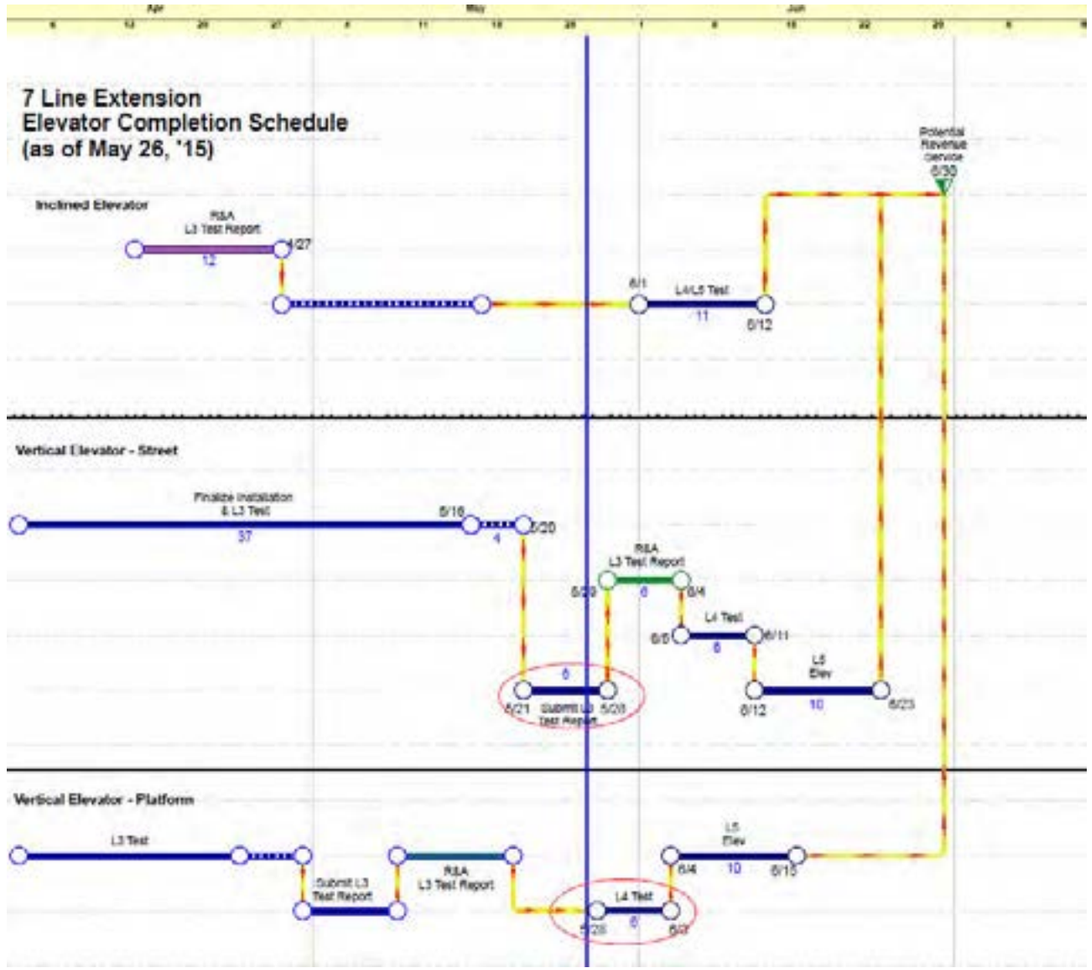
Needed to brief President of MTACC, Contractor's Senior Management and NYCT's Operations twice weekly

They wanted to discuss detailed subnets for systems completions and Startup testing activities



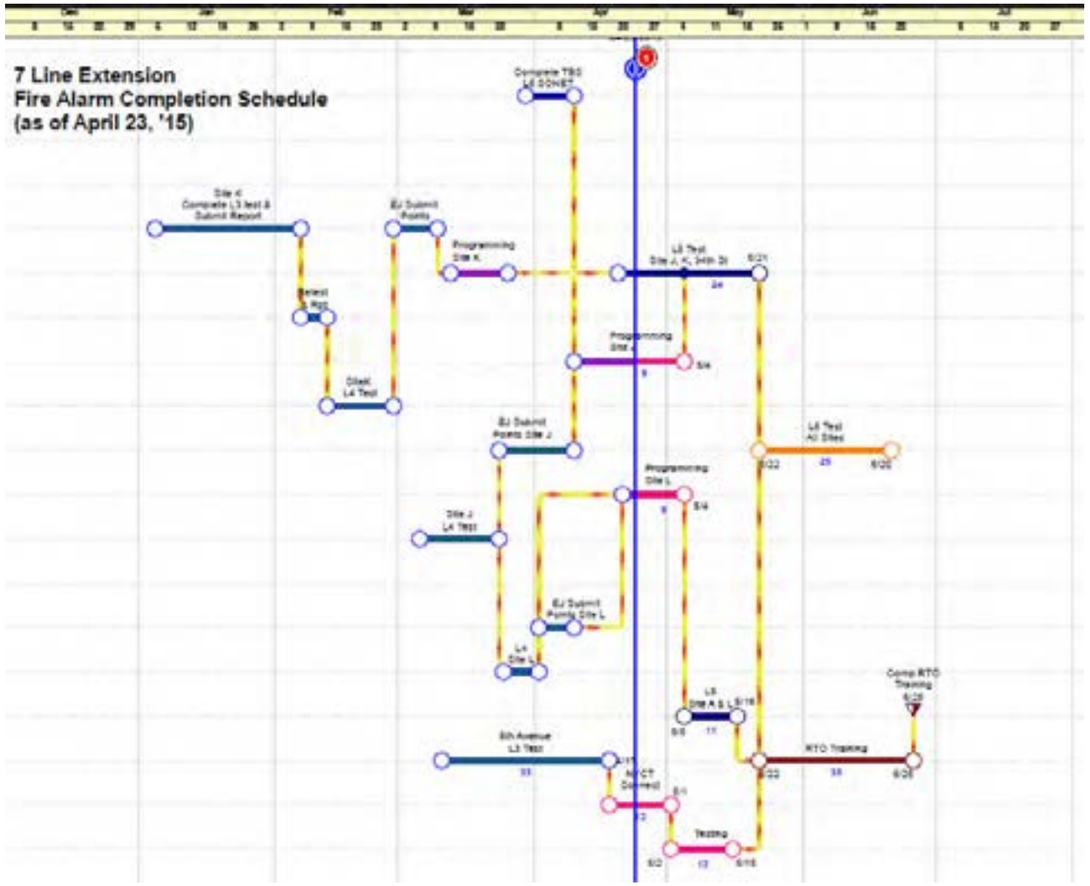
# OVER 50 EXECUTIVES IN THE MEETING…

MTA's president walked thru the subnets line by line (he personally followed each path and link) with responsible parties to obtain status and discuss solutions to obstacles

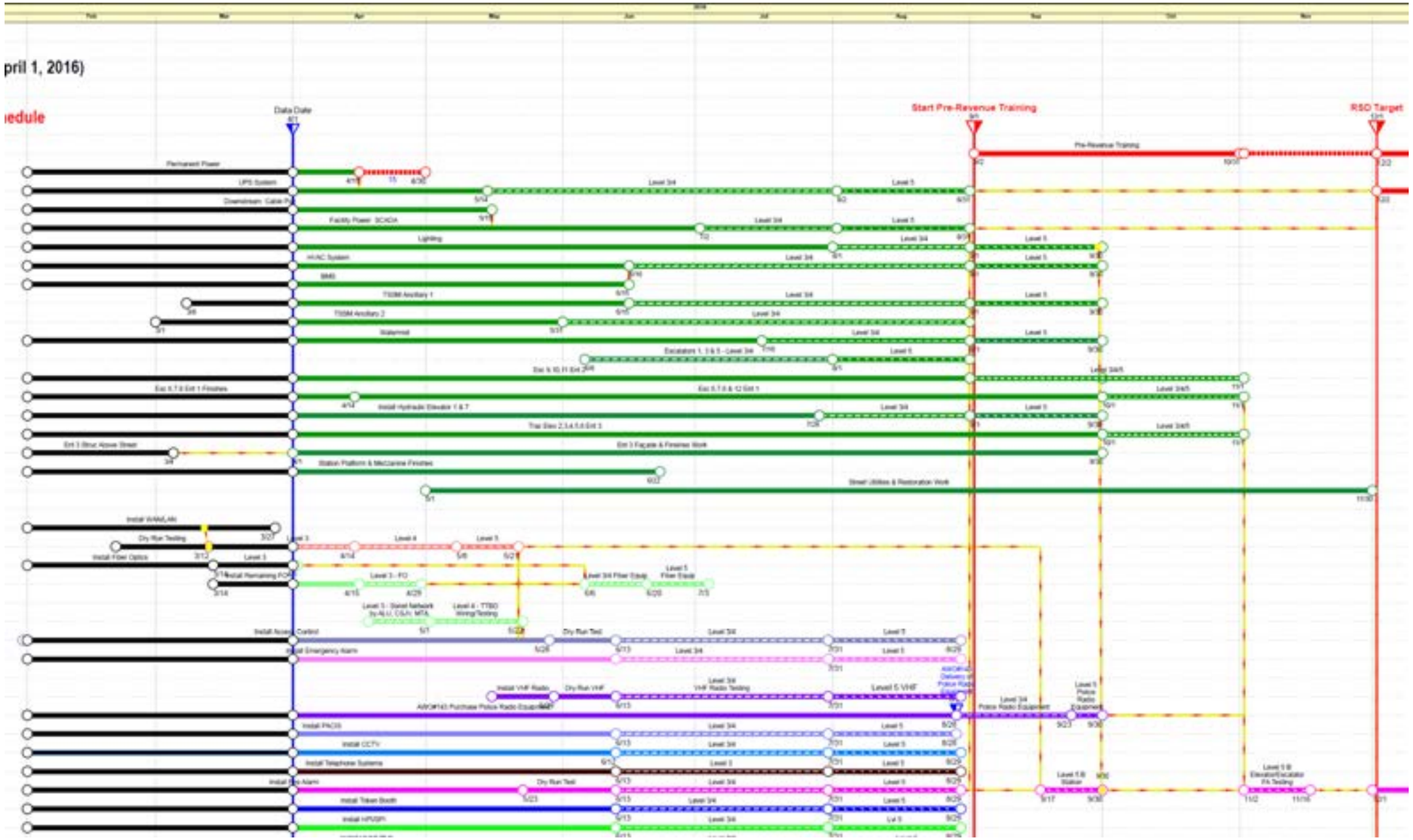


# EFFECTIVE MANAGEMENT TOOL

The subnets were quite effective and a major management tool that assisted in scheduling Operational training and ultimately in getting this significant, complex project opened to revenue service



NetPoint’s use then spread to Second Ave Subway Integrated Project Master Schedule helped identify dependencies between contracts

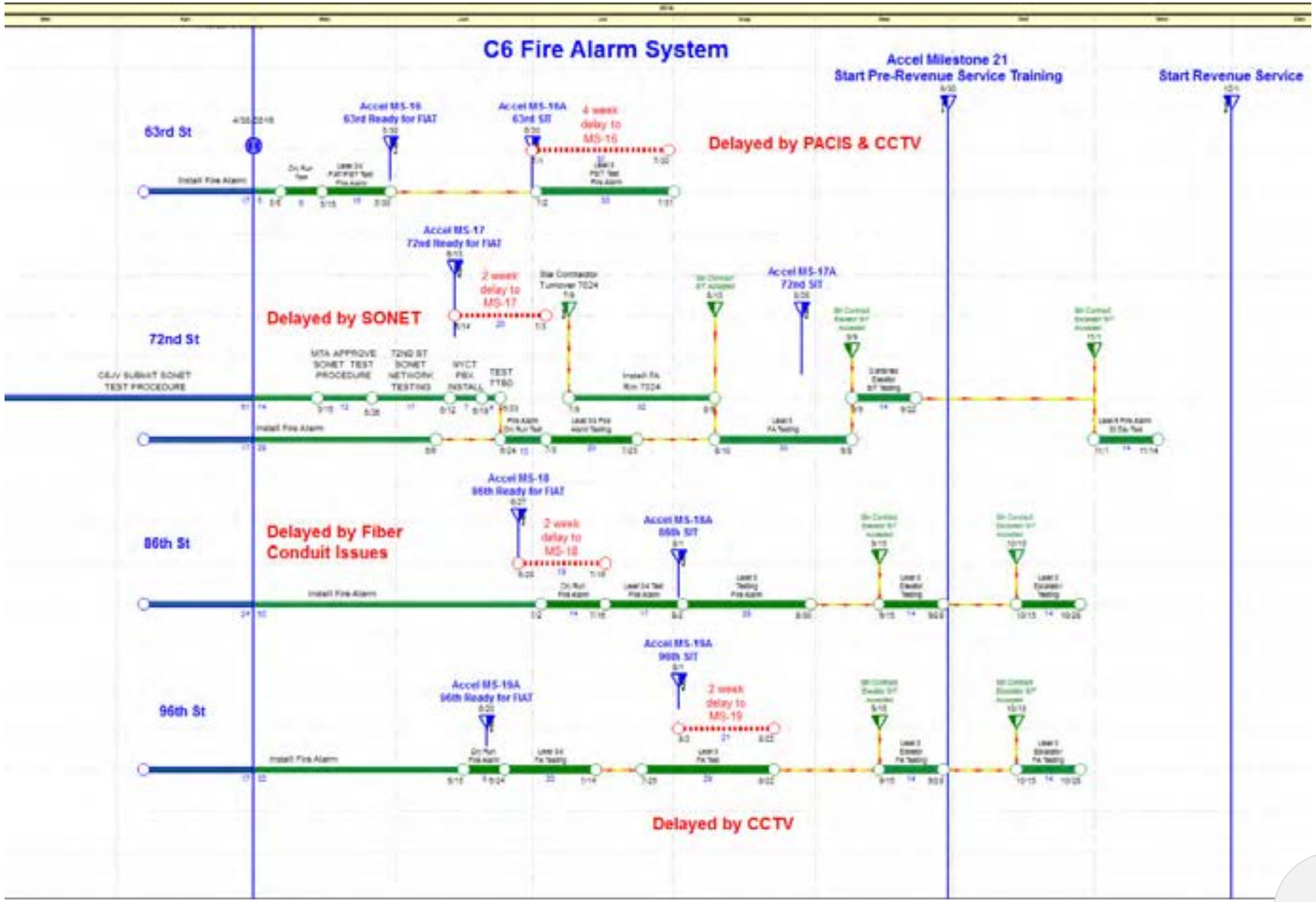


# ACCELERATION MILESTONES 16-19A FIRE ALARM

## April 30 2016

Fire Alarm drives the Milestone Critical Paths

Re-testing of System (10% devices) takes place after Elevator/Escalator SIT

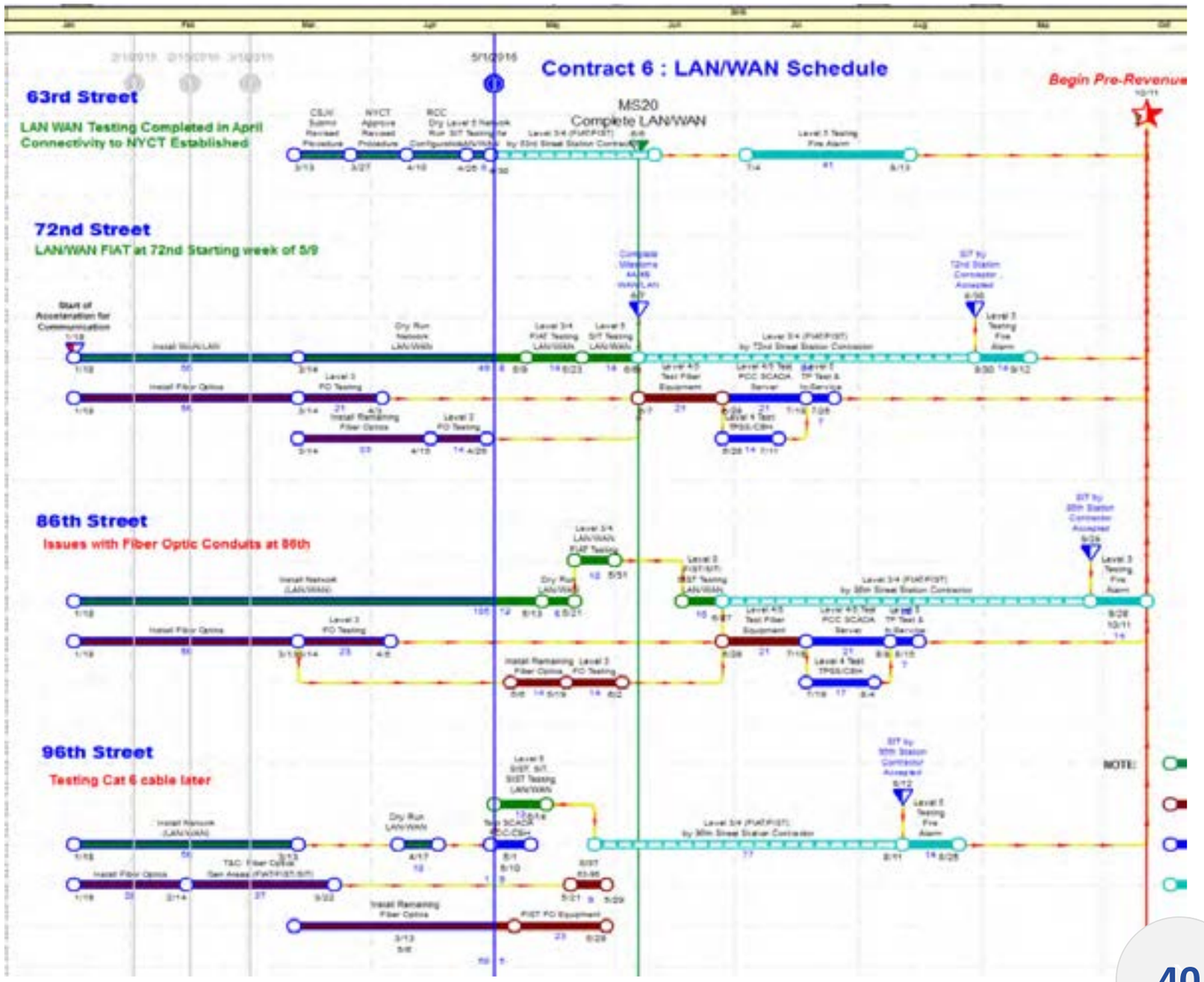


# ACCELERATION MILESTONE 20 LAN/WAN NETWORK

## April 30, 2016

## RISKS

- All Stations Conduit Completion
- Station Room Turnovers
- 86th Fiber Optic Conduit Issues
- Fiber Optic Access Nodes



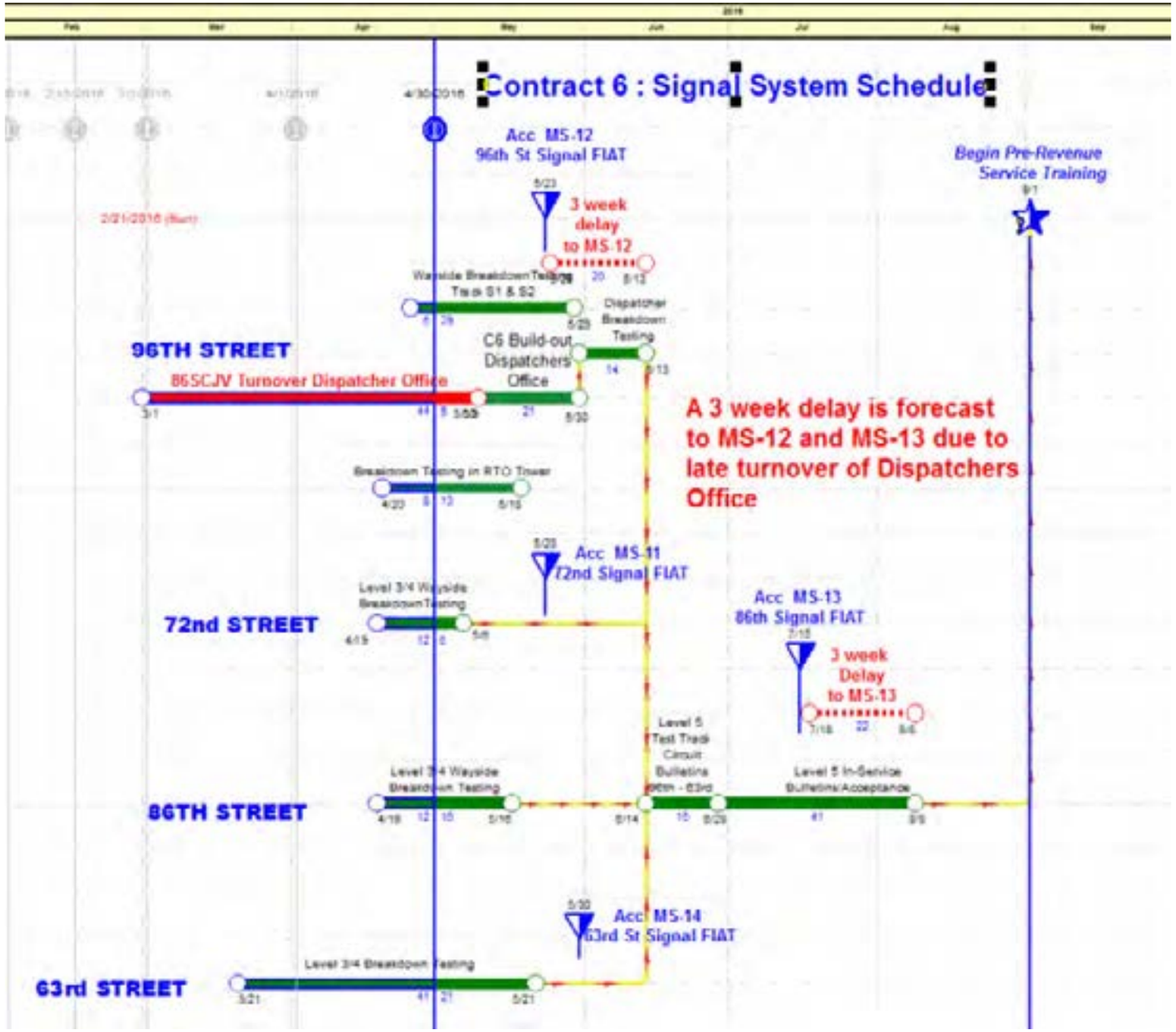
# NETPOINT FRAGNETS | SYSTEM BY SYSTEM, STATION BY STATION

*Focused management attention on risks and opportunities*

## April 2016

## Signal System Risks

- Rework of signal cable tray
- Completion of work in 1200 Cir
- 86th Fiber Optic Conduit Issues
- Fiber Optic Access Nodes



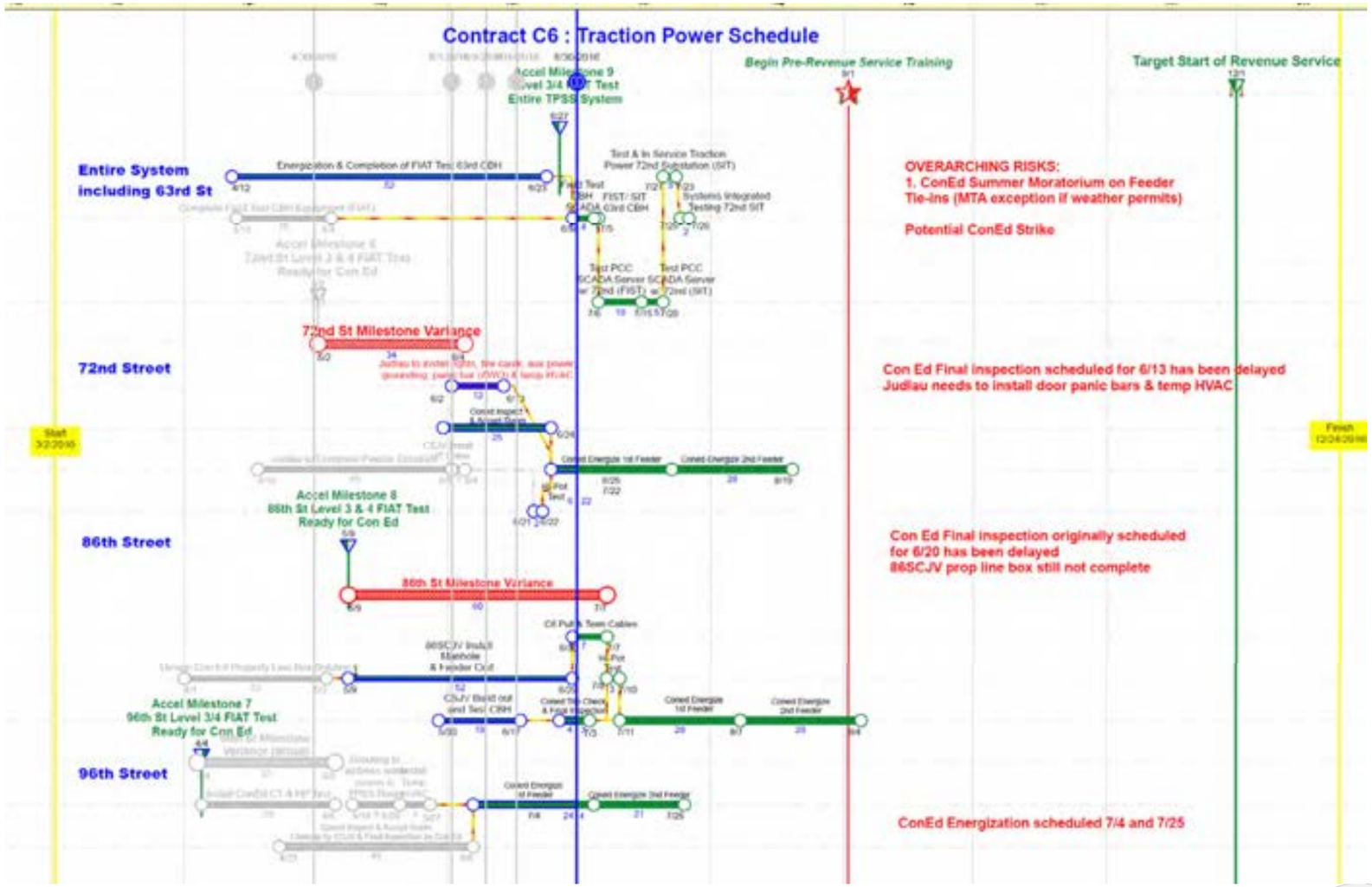
# NETPOINT FRAGNETS | SYSTEM BY SYSTEM, STATION BY STATION

*Focused management attention on risks and opportunities*

## July 2016

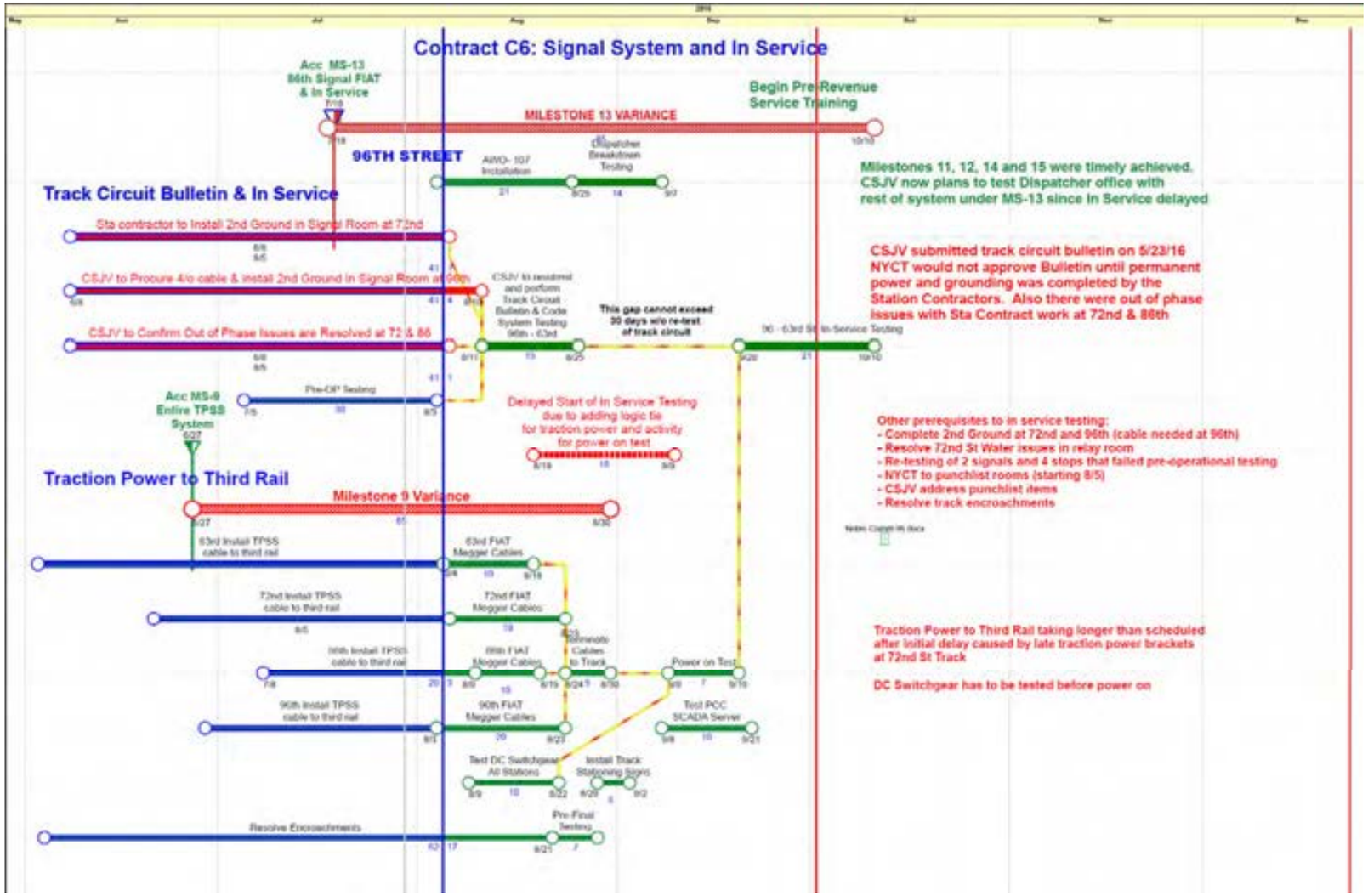
## Traction Power Risks

Con Ed Energization



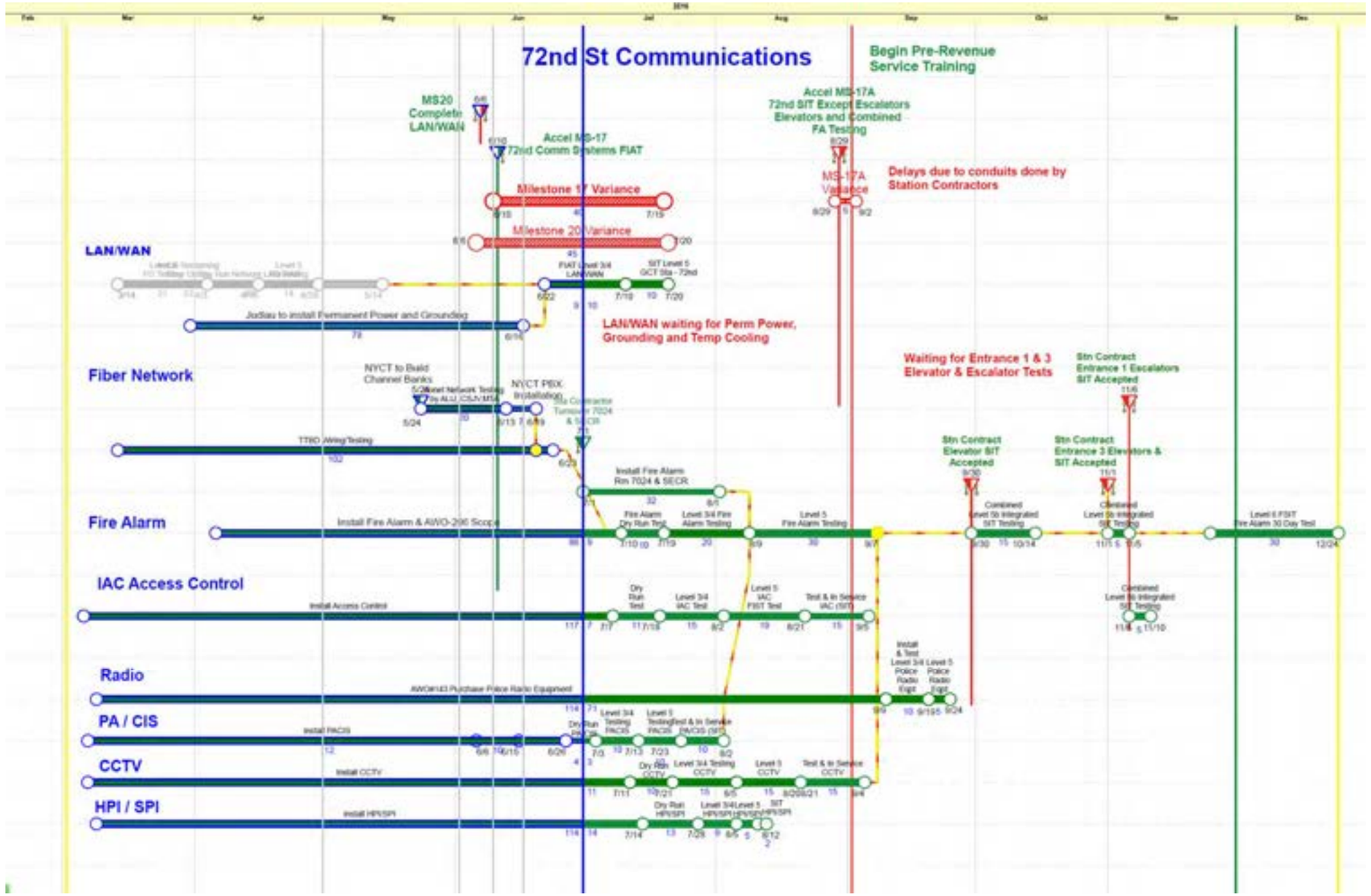
# NETPOINT FRAGNETS

## October 2016

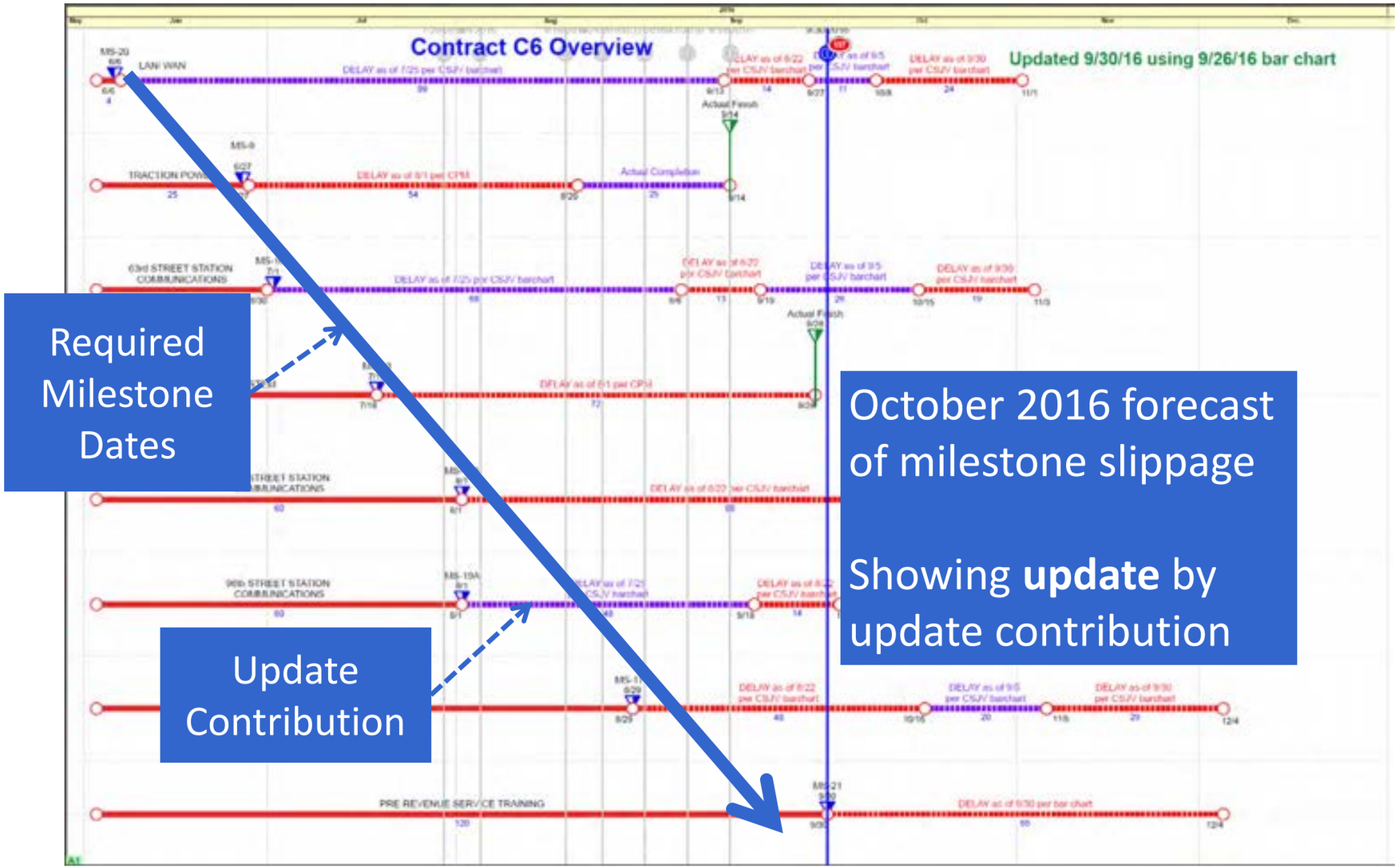


# NetPoint Schedule

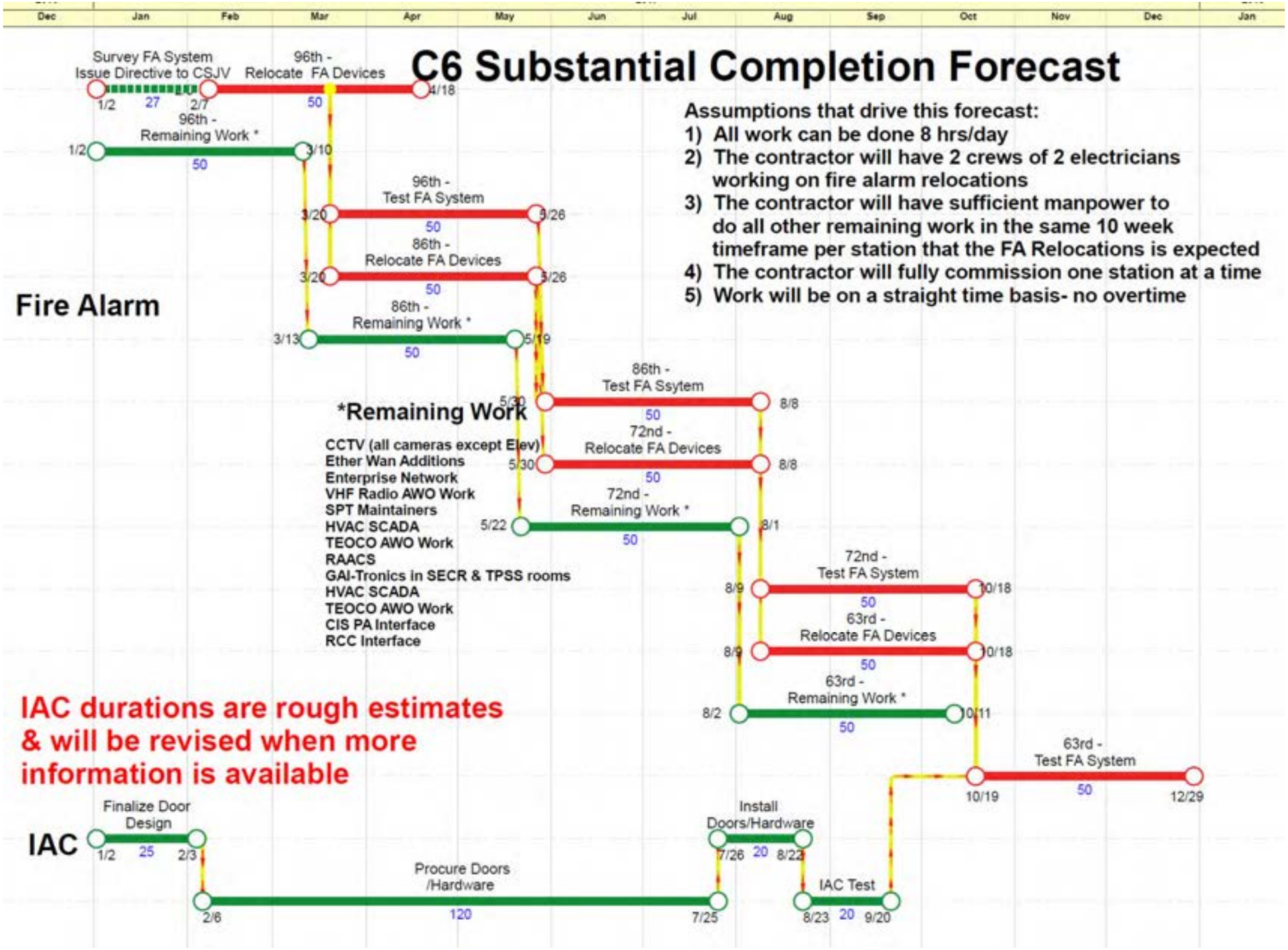
Mapping the relationships between systems at a single station



NetPoint also made it obvious that the milestones kept slipping through the summer



# C6 Substantial Completion Forecast




**Assumptions that drive this forecast:**

1) All work can be done 8 hrs/day
2) The contractor will have 2 crews of 2 electricians working on fire alarm relocations
3) The contractor will have sufficient manpower to do all other remaining work in the same 10 week timeframe per station that the FA Relocations is expected
4) The contractor will fully commission one station at a time
5) Work will be on a straight time basis- no overtime

# The ***Miracle*** Happens

# ANATOMY OF A MIRACLE

## Driving Force

An indomitable will in a position of power

## Vision

Clearly established goals and objectives

## Talent

A team with the desire and ability to achieve the goals

## Follow up

Daily reinforcement of the goals to the team

# ANATOMY OF A MIRACLE

## Proactivity

Anticipating impediments and taking steps to avoid them

## Knowledge

Timely comprehensible information provided by the team*

* NetPoint helped a little with this factor

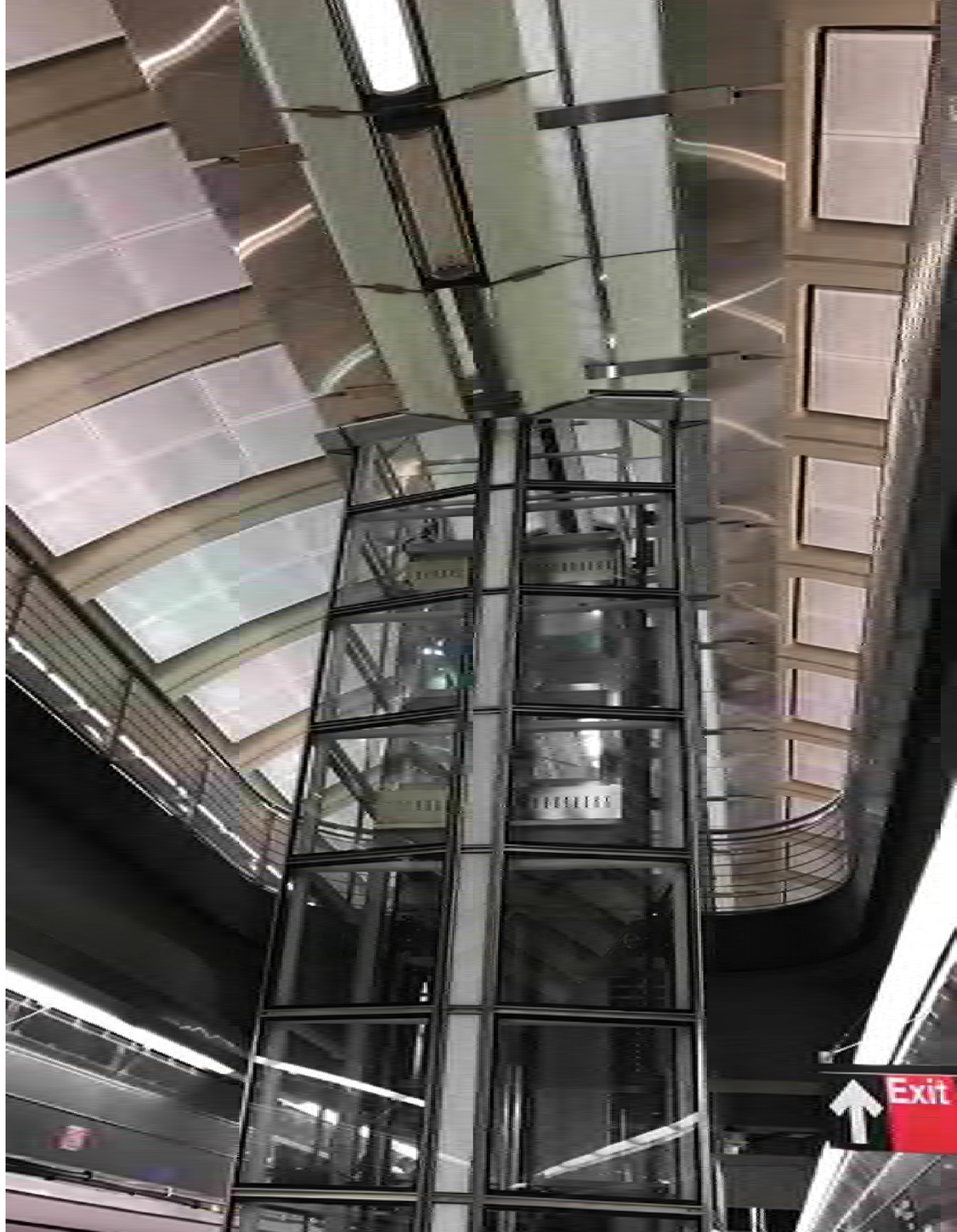
## Decisiveness

Responsive and effective action from management

## Divine Will

The myriad disasters over which we have no control don't happen


E PLURIBUS UNUM
6 days ago


Exit


96 Street
Subway Station
Q
Wednesday, December 21
Elevator at NW corner
95 Street & 2 Avenue


Uptown to 96 Street
Downtown & Brooklyn
Uptown to 96 Street
Downtown & Brooklyn

# HAPPY NEW YEAR 2017

Second Avenue Subway Ringing in New Year With Party - The New ...
https://www.nytimes.com/2016/12/29/.../**second-avenue**-subway-**party-new-years-eve**.ht...
Dec 29, 2016 - An invitation-only group of about 500 people, including track engineers and elected officials, is expected for the **celebration**, which will include ...

Second Avenue subway first ride before New Year's Eve ball drop ...
www.nydaily**news**.com/**new**.../**avenue**-subway-ride-**new-year-eve**-ball-drop-article-1.29...
Jan 1, 2017 - **Second Avenue** subway takes first ride just before **New Year's Eve** ball drop in ... Cuomo rings in **New Year** with the first ride of **Second Ave**.

MTA Announces Official Hours For Inaugural Second Avenue Subway ...
gothamist.com/2016/12/31/**second_avenue**_subway_inaugural_trips.php
Dec 31, 2016 - Hours after the New York Times published a tantalizing preview of Governor Cuomo's **New Years Eve Second Avenue** Subway Celebration ...

Governor Cuomo Will Ride The Second Avenue Subway On New ...
gothamist.com/2016/12/26/post_189.php
Dec 26, 2016 - But Governor Andrew Cuomo is not one to miss an infrastructure-related photo opportunity, hence the inaugural **New Year's Eve** ride planned ...

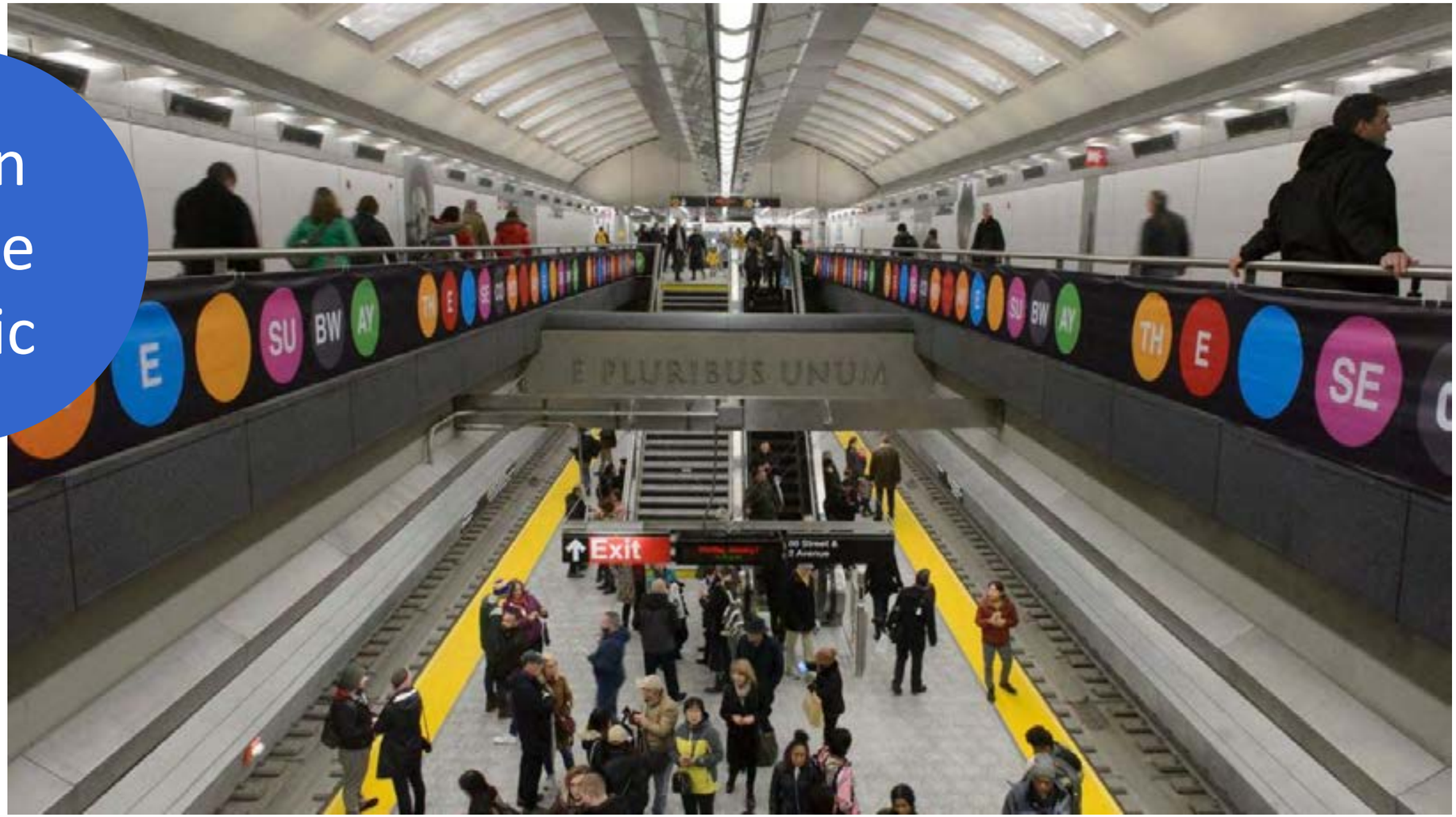
Second Avenue Subway gets its historic inaugural ride on New Year's ...
ny.curbed.com/2017/1/1/.../**second-avenue**-subway-first-ride-governor-cuomo
Jan 1, 2017 - Inside the 72nd Street station on the new **Second Avenue** subway Amy Plitt ... what was (briefly) the city's most exclusive **New Year's Eve party**.

Second Ave Subway's ceremonial first ride will be a New Year's party ...
ny.curbed.com/2016/12/27/14094206/**second-avenue**-subway-ceremonial-ride
Dec 27, 2016 - While the rest of us will be spending our **New Year's Eve** elsewhere, Governor Andrew Cuomo is planning on spending his on the inaugural ...

Second Avenue Subway poised to open by New Year's Eve - Curbed NY

# THE NEW SECOND AVE SUBWAY

Open to the public



# Questions?

Thank you!

NetPoint + GPM
CONFERENCE

NASHVILLE, TN | MARCH 2 & 3, 2017