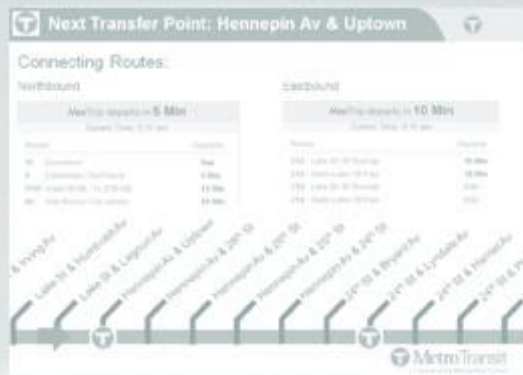# Implementing a Real-Time Transit Mobile Customer Information System

Vision vs. Reality
Apr 11, 2016 → Apr 11, 2018

Hoki Tse

Engineer – Intelligent Transportation Systems

MetroTransit

Minneapolis – St. Paul, Minnesota

Key Presentation Take-Aways

- Metro Transit Overview
- *A Line* Arterial Bus Rapid Transit
- Project Vision and Goals
- Reality Check
- Lessons Learned
- Next Steps

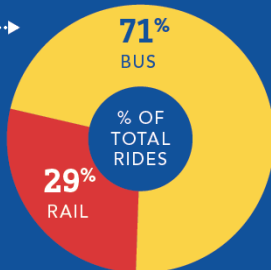# Metro Transit Overview
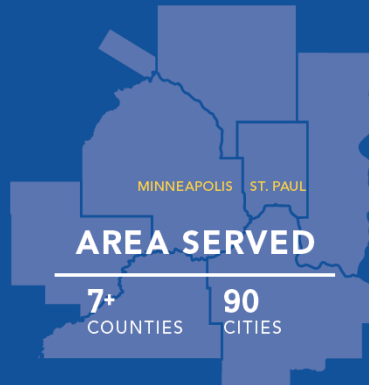
81.9 million RIDES

264,347 AVERAGE WEEKDAY RIDERSHIP
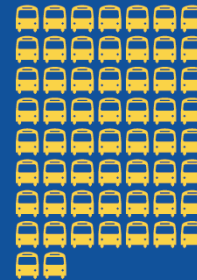
57.3 million RIDES

24.6 million RIDES

71% BUS

29% RAIL

% OF TOTAL RIDES

907 SQ. MILES

MINNEAPOLIS   ST. PAUL

AREA SERVED

7+ COUNTIES

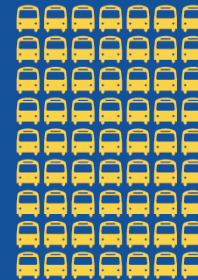**90** CITIES

130 ROUTES

55 URBAN LOCAL

63* EXPRESS

9 SUBURBAN LOCAL

2 LIGHT RAIL

1 COMMUTER RAIL

* Includes Maple Grove Transit routes operated by Metro Transit

Through Dec 31, 2017

3

Metro Transit Bus Service

BUS

514 40-FOOT DIESEL BUSES

133 HYBRID-ELECTRIC BUSES

13 A LINE BUSES

64 COACH BUSES

185 60-FOOT ARTICULATED BUSES

189,463 AVG. WEEKDAY BOARDINGS

24 TRANSIT CENTERS

12,067 BUS STOPS

970+ BUS SHELTERS

85% BUS ON-TIME PERFORMANCE

2,403,372 TOTAL VEHICLE HOURS OF SERVICE

7,940 AVG. VEHICLE MILES BETWEEN SERVICE CALL

64 PARK & RIDE LOTS/ RAMPS (BUS-ONLY)

15,674 PARK & RIDE SPACES (BUS-ONLY)

300+ MILES OF BUS-ONLY SHOULDER

Through Dec 31, 2017

A lot has happened since 2016 TransITech…

Implementing a Real Time Transit Mobile Customer Information System

Gary Nyberg
Metro Transit, Manager of Technology Systems
Minneapolis/ St. Paul, Minnesota

2016 TransITech Conference

Apr 11, 2016
San Diego, California

AMERICAN PUBLIC TRANSPORTATION ASSOCIATION
2016 TRANSIT SYSTEM OF THE YEAR
MetroTransit

WE'VE GOT YOUR
PLAYBOOK
FOR SUPER BOWL

Know Your Route

Use the new MetroTransit app to buy your bus, train or Northstar ticket on your smartphone!

metrotransit.org/superbowl   #MetroTransitMN

First Arterial BRT – *A Line*

Specialized Vehicles

Off-Board Payment

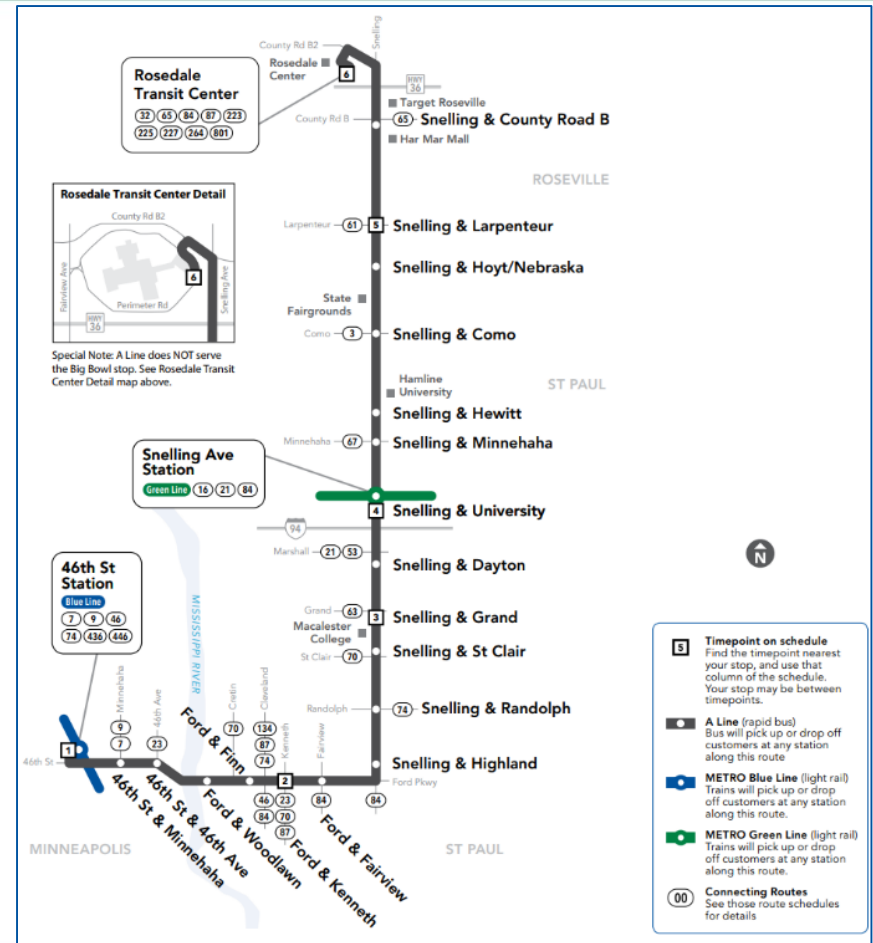Enhanced Stations

Curb Extensions

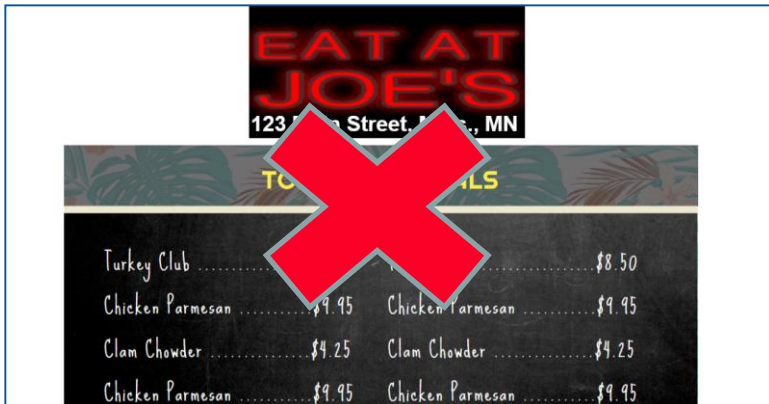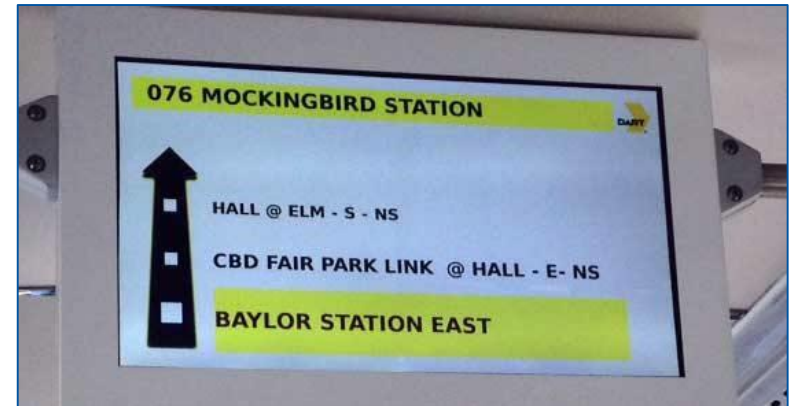Transit Signal Priority

HIGH Frequency

10-Minute Frequency

A Line Arterial BRT in Numbers

- 2 LRT connections
- 4 cities
- 10 miles
- 20 stations
- 25 local bus routes connections
- 5,400 weekday rides

Vision to Alleviate Connection Anxiety

# Onboard Real-Time Mobile Customer Information System (CIS)

- **Goal**
  Deliver real time, relevant information to transit riders via a customer information display system mounted to the ceiling or handrail stanchion of Metro Transit buses, light rail and commuter trains.

- **Metro Transit Vision *Toward 2020***
  1. Enhance the customer experience.
  2. Improve the amount and quality of information for customers.

2016 – Initial Mobile CIS Concept
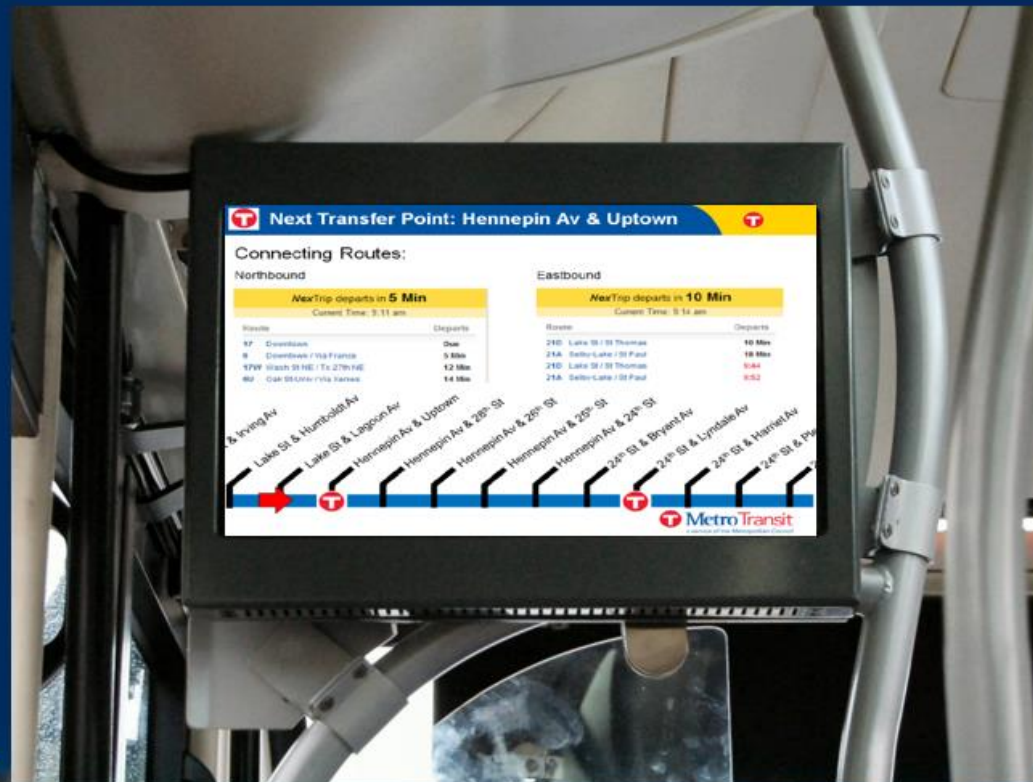
2016 – Project Initiation

- ✓ Business Case – Complete
- ✓ Concept of Operations/Use Cases – Complete
- ✓ RFI: Issue RFI, Review RFI/update RFP – Complete
- ✓ Finalize Requirements - Complete
- ✓ Advertise RFP - 3/23/16 - 4/27/16
- ⚠ Evaluate Proposals - 4/27/16 - 5/31/16

Lots of Clarifications
Evaluation Completed Jul 2016

Metro Transit

2016 – Getting Closer to Pilot Deployment

- Award Contract – 5/31/16
- Issue limited NTP for Pilot Install – Early June
- Proof of Concept Testing – Late June
- Issue second NTP for remaining buses – Early July
- Installation on remaining 11 buses – Late July/ August
- Final Acceptance - September

MetroTransit

Not as Easy as You Think…

Milestone	Vision	Reality
Award Contract	May 2016	Feb 2017
On Site Kickoff & *A Line* bus tour with Vendor	+	May 2017
Final Design Review	+	Dec 2017
NTP and Pilot Install	Early Jun 2016	Jan 2018
Issue second NTP for remaining 12 buses	Early Jul 2016	Feb 2018
Install on remaining buses	Late Jul/ Aug 2016	Apr 2018

What happened here?

Initial Communication Flow

Verint DVR

ODK

OnBoard Mobile Gateway (oMG)

Ehternet

Ethernet

Luminator Signs

Ethernet

Onboard Passenger Wi-Fi (Optional)

OnBoard Mobile CIS Solution

Depot Wi-Fi

Wi-Fi Signal

Rooftop Antenna

Cellular Signal

Firewall

Termination for Verizon Private Network

Cellular

Internet
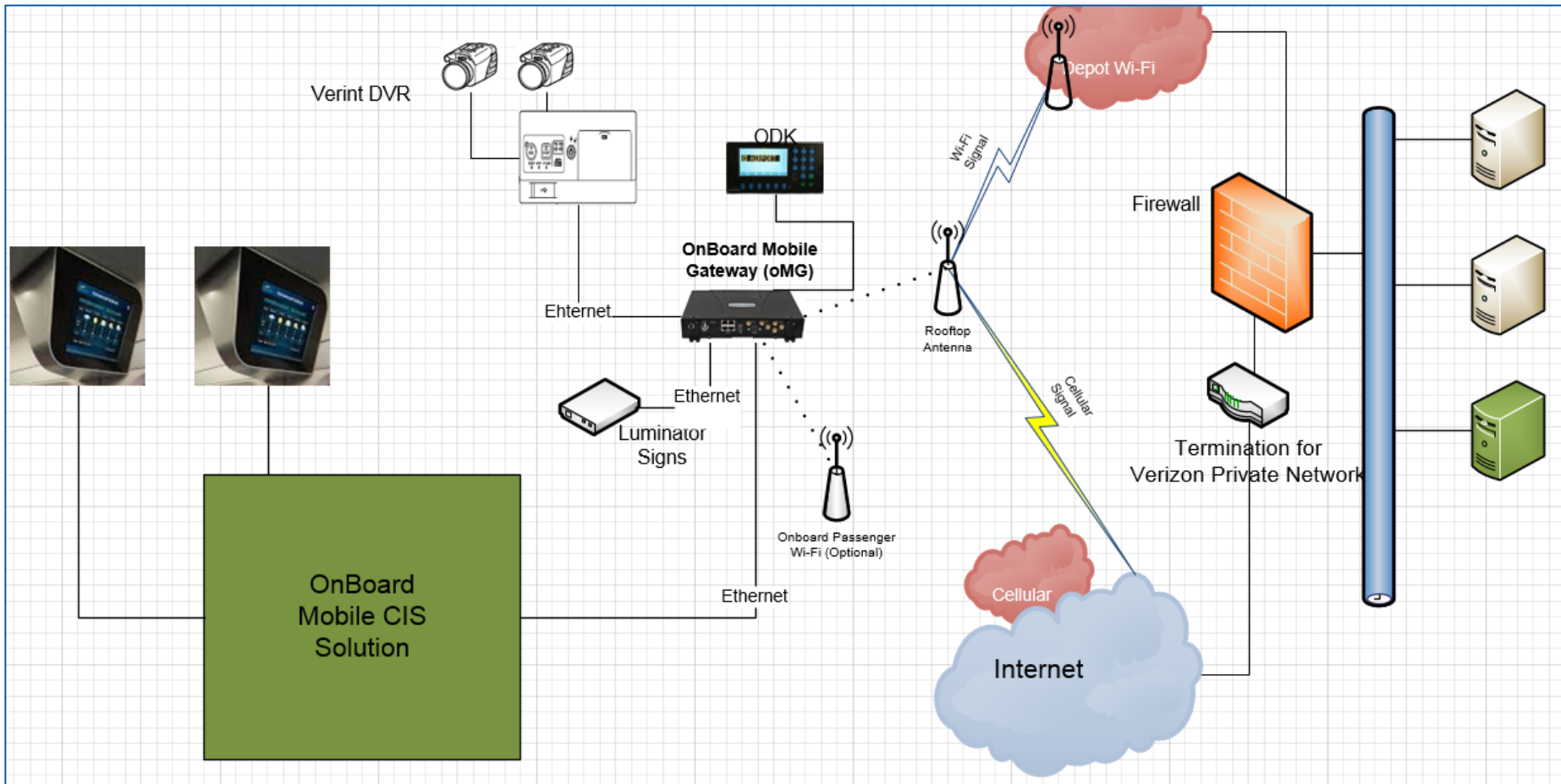
Deployed Communication Flow

Bus Mounted Devices

VLU — **InMotion Router**

Metro Transit Provided Services

Wi-Fi

Firewall

Metro Transit Internal Network

Cellular

Strategic Mapping Provided Services

Strategic Mapping Cloud Server

Internet

Metro Transit External Network

15
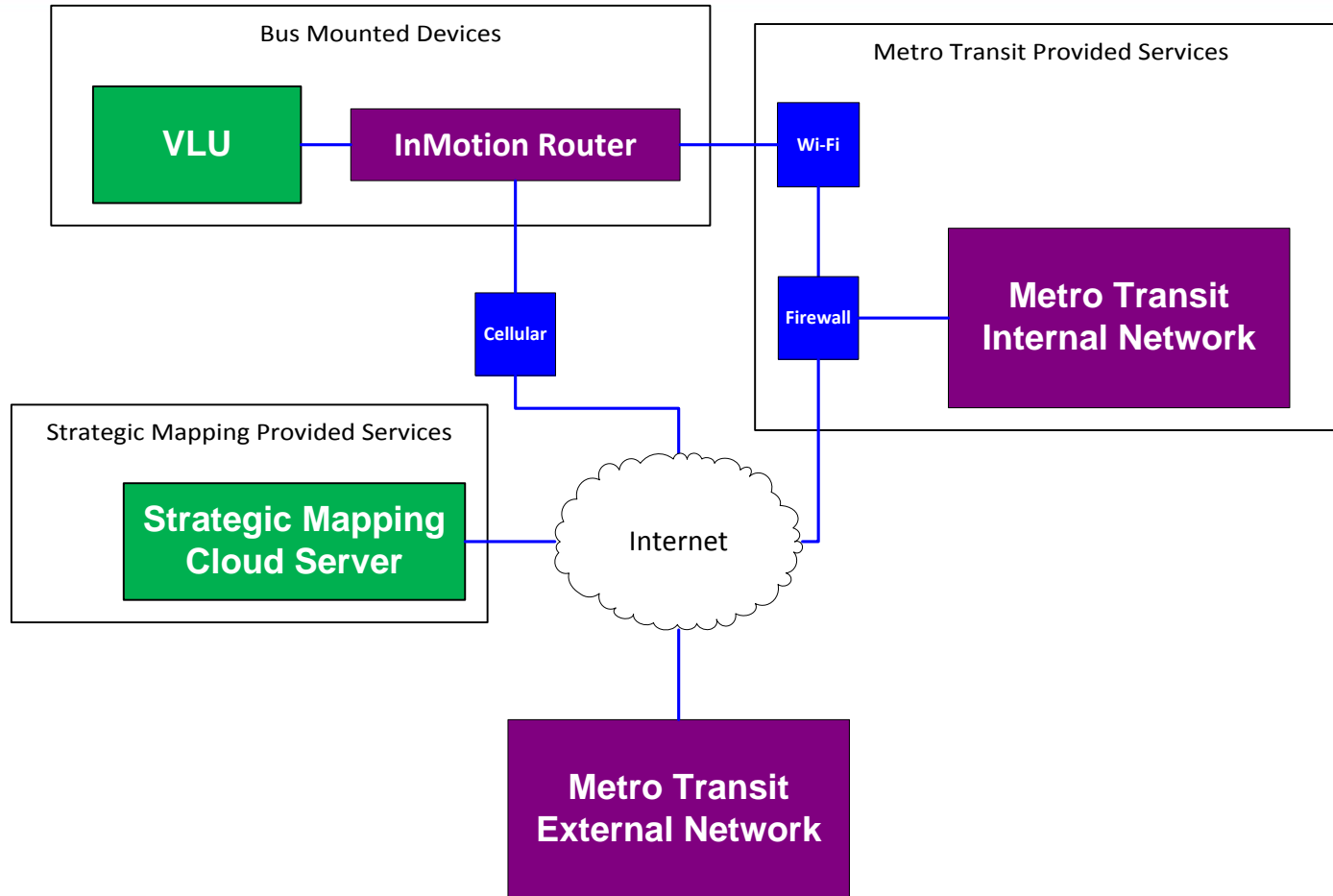
May 2017 – Kickoff Meeting

- Started with "Single-wide" hanging screens

- Vendor suggested "Double-wide" screen similar to NYC MTA

- Wider & heavier

- Redesign & re-evaluated risks
  - Make sure new screens don't fall or hit riders

- +4 months confirming with Gillig
  - Not voiding warranties
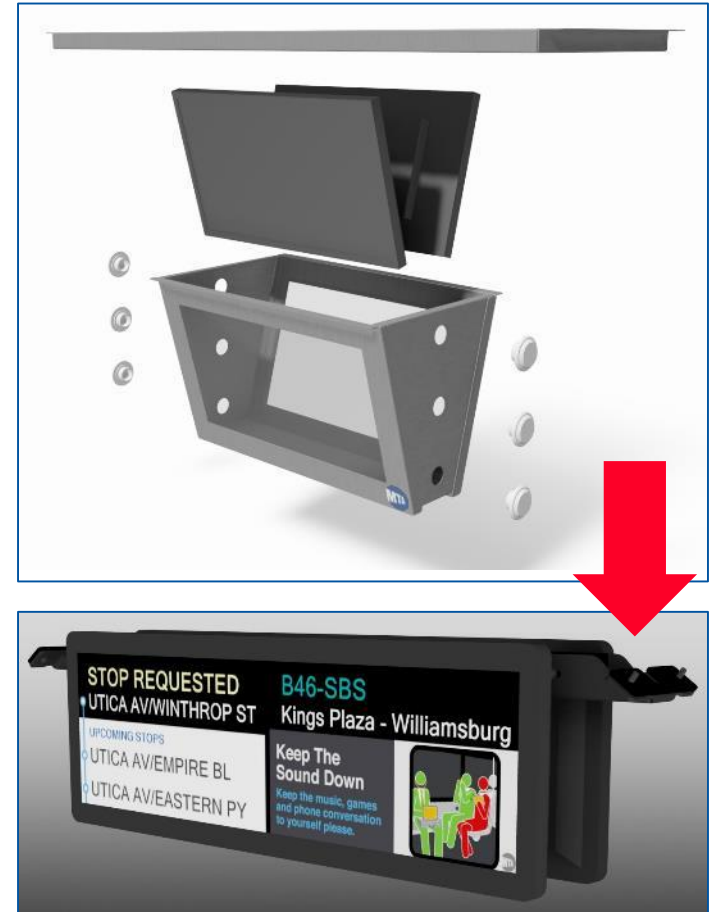
Oct 2017 – Change Order

- More information available on 2x wider screens
- Lead to more successful project outcome & impact
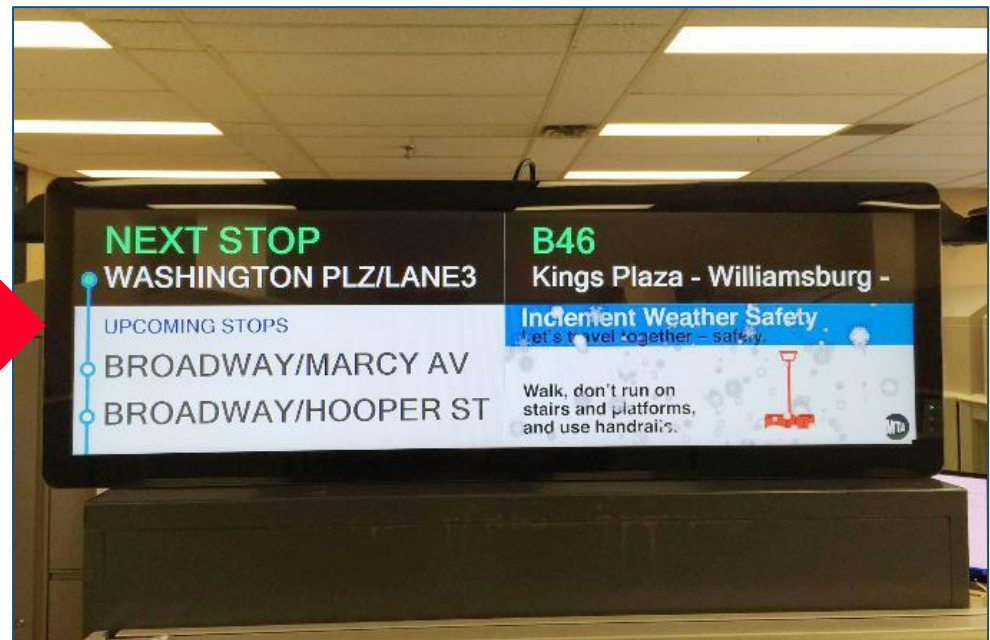
May 2017 – User Content Mockups with Single-wide Horizontal Screens

Aug 2017 – User Content Final Design with Double-wide Horizontal + Vertical Screens
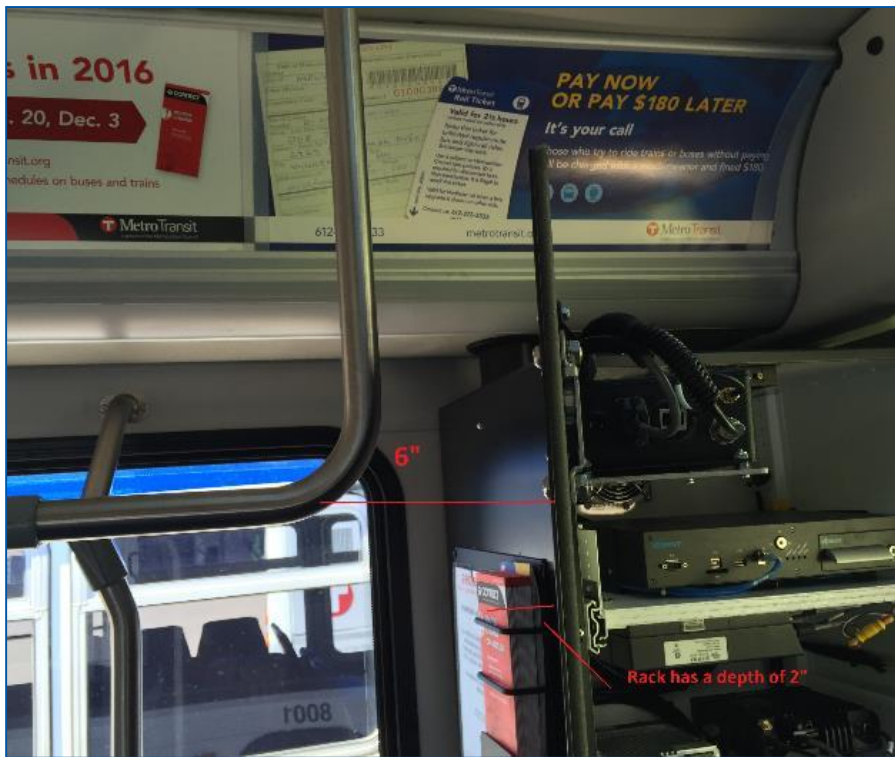
Screen Placement

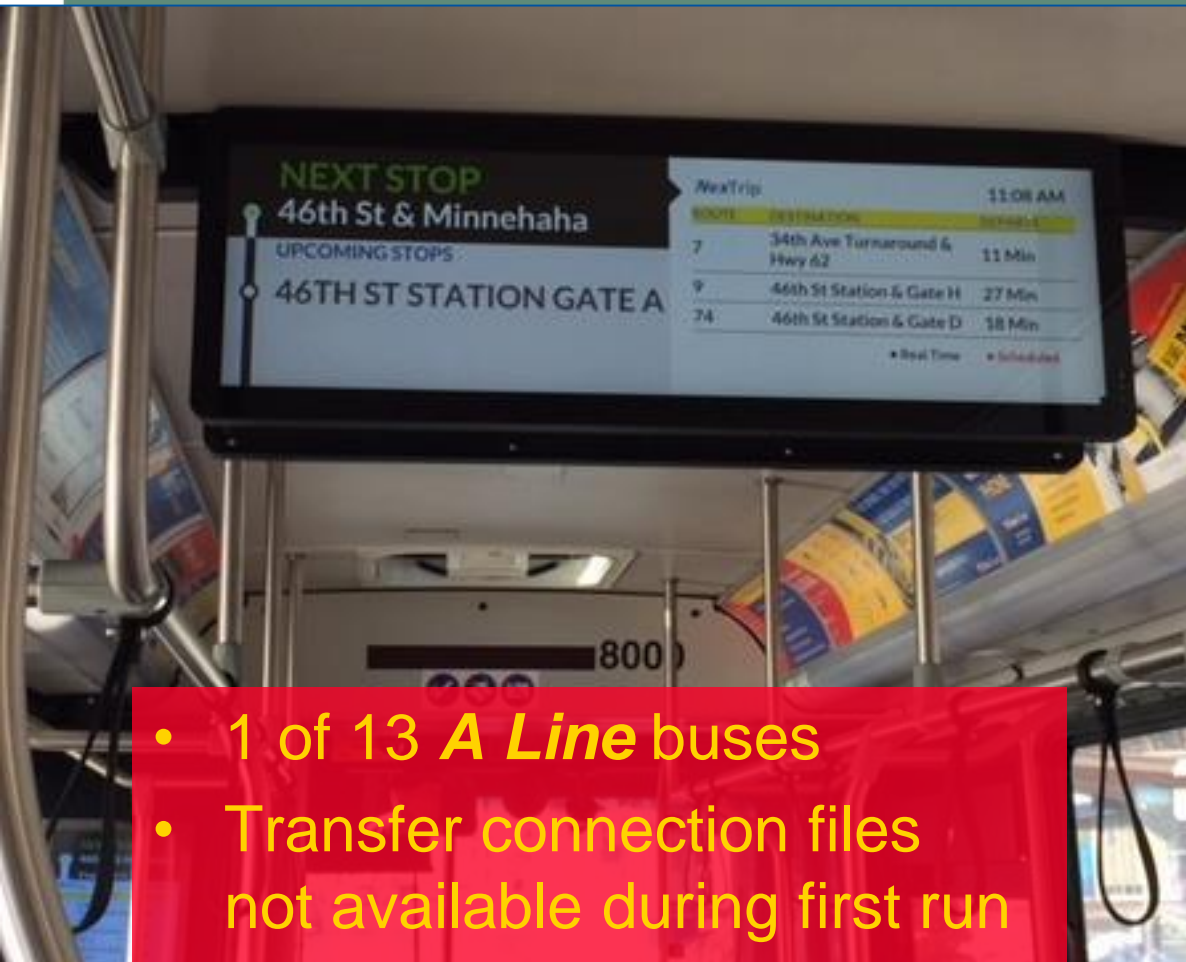- Ensure screens are high enough for 7-footers
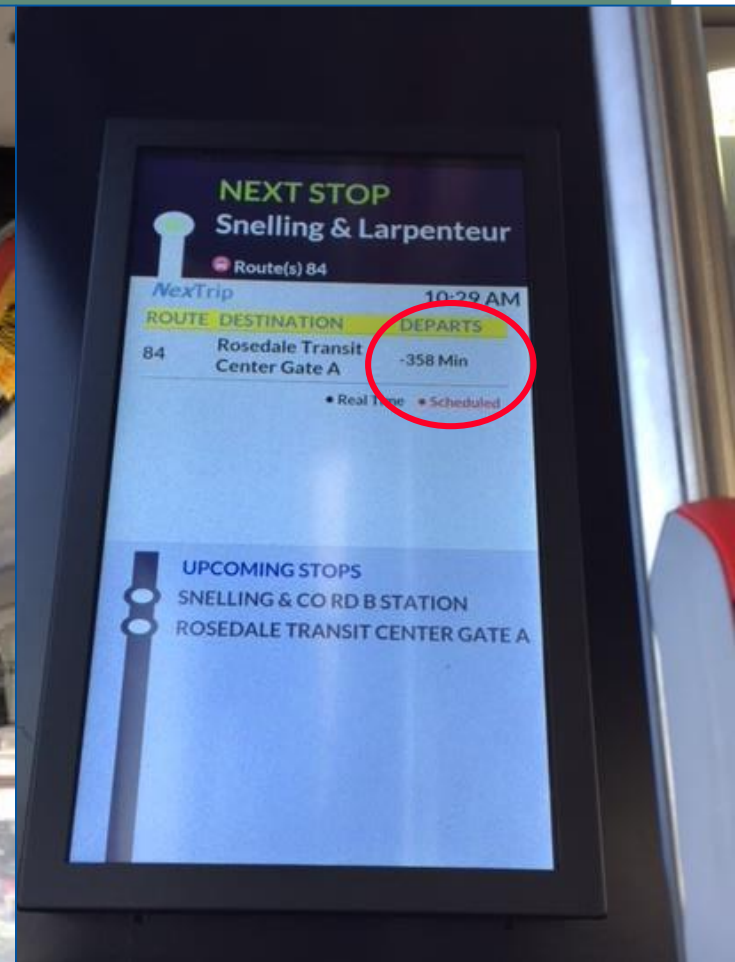
Wiring Challenges

- Ensure proper wiring amid current equipment
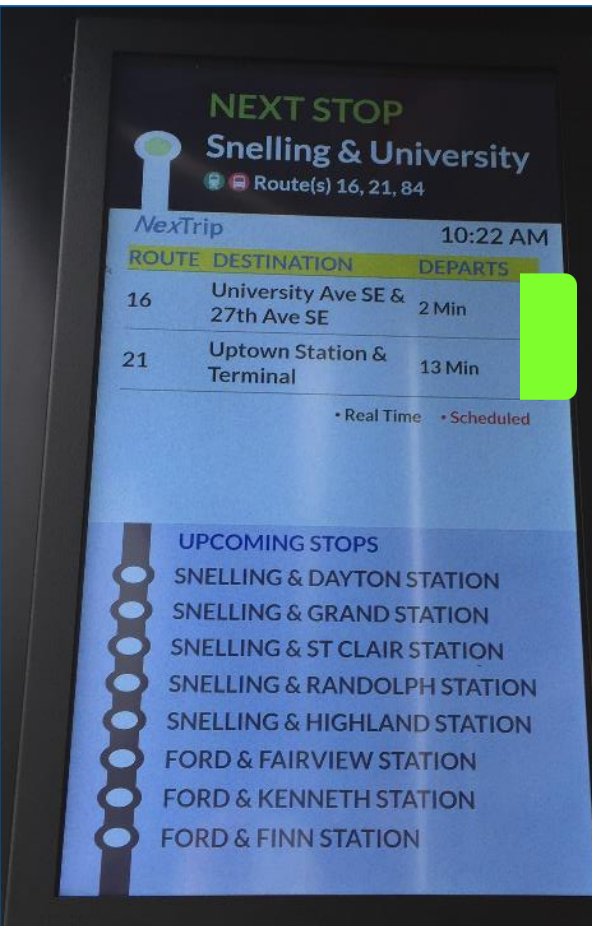- Outlets, Communications, Interference

Jan 2018 – First Run

- 1 of 13 *A Line* buses
- Transfer connection files not available during first run

Mar 2018 – Third Run
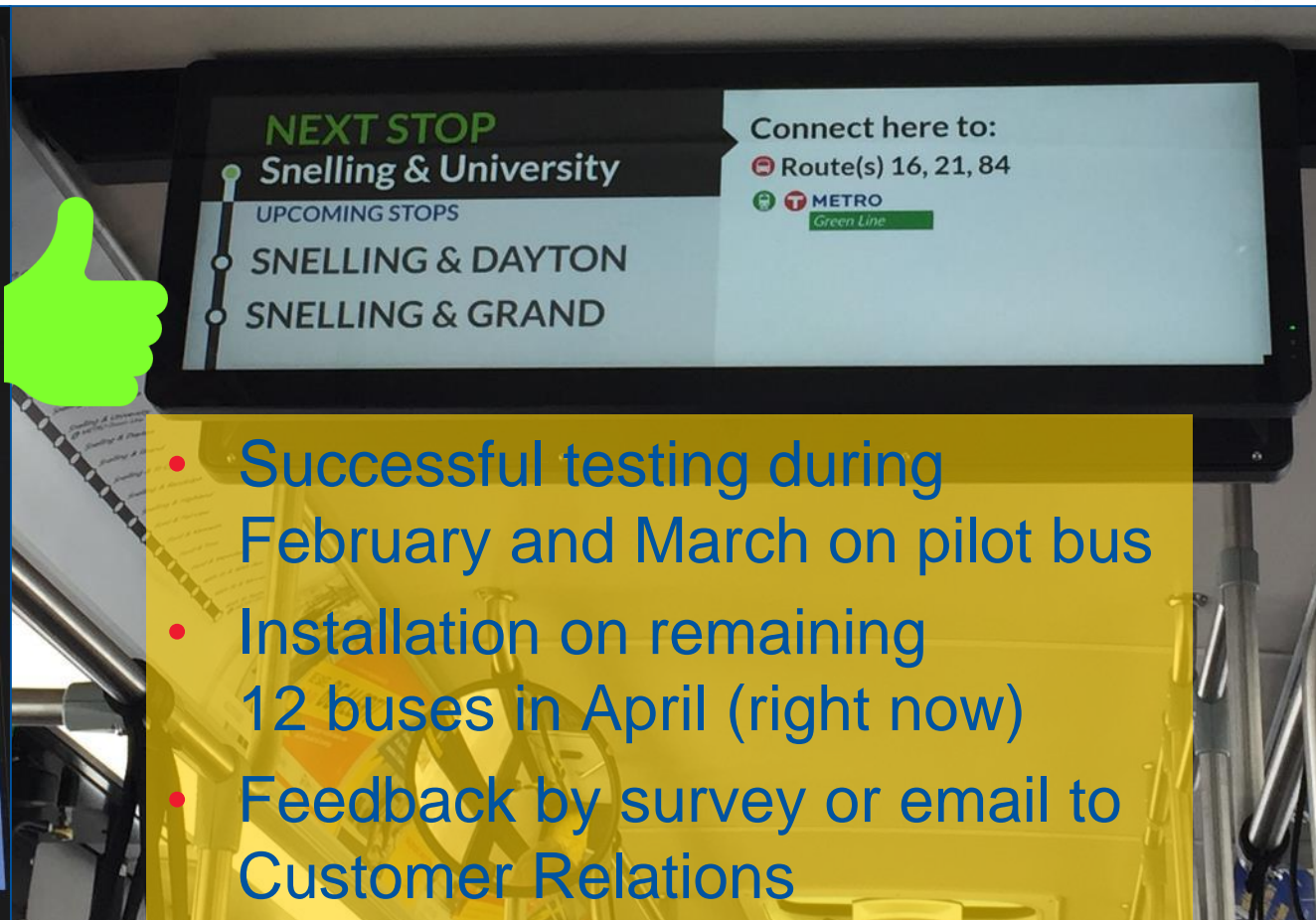
- Successful testing during February and March on pilot bus
- Installation on remaining 12 buses in April (right now)
- Feedback by survey or email to Customer Relations

Lessons Learned

- From 2016:

  - Procurement process will take longer than you think
  - Do not over define requirements
    - Allow flexibility in varied vendor solutions

- Partnerships across departments
  - More than a technology project
  - Bus Maintenance, Bus Operations, Customer Relations, Creative Services, Risk, Safety…

- Vandalism monitoring for all 13 buses

Next Step – Phase 2

- Evaluate Survey Results
  - User contents (interface, accuracy, alerts, detours…)
  - Impacts on Operators' duties
- Get ready for round 2 with a variety of bus type, model, manufacturer, etc.

Metro Transit

Bus Operations – Technology Systems
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A Line Rider: Hoki Tse – Hoki.Tse@metrotransit.org