March 2020

The pandemic unfolded very quickly:

• Staff began calling out sick, reducing coverage for critical activities

• Ridership fell by 80% in two weeks

• Every day was new and unpredictable

• We redesigned service appropriate to needs and available resources
### Real Time Data Guiding All Decisions

**Date**
- Sunday 09/13/2020

**Trend Type**
- Weekly

**Period Type**
- (Multiple values)

**Service Category**
- (All)

**Routes**
- (All)
- 1 California
- 5 Fulton
- 7 Haight/Noriega
- 8 Bayshore
- 9 San Bruno
- 9R San Bruno Rapid
- 12 Folsom/Pacific
- 14 Mission
- 14R Mission Rapid
- 19 Polk
- 22 Fillmore
- 24 Divisadero
- 25 Treasure Island
- 38 10th Avenue

**Median Load**
- 0
- 26
- 30

**Median Passenger Count by Stop**
- Sunday 09/13/2020

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**Click and Drag to Zoom Neighborhoods**

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**SFMTA**

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3
COVID19 Service Strategy

• How do we deliver *predictable* service during an unpredictable time?
• How do we ensure equity is at the core of our decisions?
• How do we make the best use of our limited resources?
• How have trip patterns changed?
Evaluate Resources for Resilience

It is always better to plan for a service change than to cut service unexpectedly - Muni Metro was a vulnerability:

- Staff shortages could require us to halt service unexpectedly
- Shortages in maintenance could lengthen response times to urgent issues
- The cost-to-passenger ratio given reduced ridership was very high

Muni Metro bus substitution effective March 30, 2020
Work accelerated while Metro was closed

• Initially, DPH restricted maintenance work to caretaker role, basic safety inspections

• Mid-summer, close contact guidelines for maintenance allowed state-of-good-repair (SGR) work to accelerate:
  – Completed work on LRV4s that will improve reliability
  – Activated West Portal crossover for three car subway shuttles
  – Renewed sections of overhead wire, replaced and adjusted electrical hardware in the subway
  – Cleaned stations top to bottom
  – Replaced sections of track and track fasteners
  – Installed better lighting in tunnels to improve work environment for rail maintenance staff
  – Campaigned the trolley bus network
Why reopen rail?

• Increasing economic activity also means increasing crowding

• Following five months of operations, felt we had a handle on this “new normal”

• Light rail can carry more passengers per operator, freeing up buses to add service to crowded routes

• Overhead line issues known, but solutions were underway, and presented as relatively low risk
Ridership recovery since Shelter in Place

While ridership is down ~70%, we are carrying nearly twice the passengers since the low in mid-April.
Shutting down rail for a second time

- Risk profile changed significantly when two splices broke within 72 hours
- Splice failures in the subway raised concern of customers getting stuck in the subway for extended periods of time during COVID
What is a splice?

- A *splice* is how we connect two pieces of overhead wire to one another

- Splices are customized to our system’s specifications and require highly specialized manufacturing

- Splices should be stronger than the surrounding wires
Background on Failed Splices

Failed splices

2019

April 16

2020

No subway service

August 23
August 21

June 9 (surface)

May 15

April 26 (surface)
Poor Quality Led to Splice Failure

• Independent failure analysis determined that splices failed due to poor metallurgy quality - it contained low silicon levels which results in low tensile strength

• Splice is not a new design, and has been used in our system for over a decade

• Splice is a low-cost part ~$200, more like a bolt than an engine

• Splice did not fail because of state of good repair issues

• Splice problem not visible as part of our routine preventative maintenance inspections
Next Steps for Overhead Lines in Subway

• New splice identified with enhanced design features
• Overall splices will be reduced by replacing subway wire in sections with the most splices
• Reaching out to the industry to identify other opportunities and new perspectives
Maximize SGR work to come back stronger

- Shutdown presents opportunity to address state of good repair needs and create more reliable subway
- Will build on progress made over the summer (*minimal work was conducted this spring due to COVID restrictions*)
- Multi-disciplinary Task Force created to identify and plan work in key areas including track, signals, and fire/life safety systems
Safety, Reliability, Efficiency

All work is assessed against the initiative’s three goals:

• **Safety**: Does it improve the safety of our staff and/or the public?

• **Reliability**: Will it bring back the system in a better state of health?

• **Efficiency**: Does this work improve the future maintainability of our system and effectiveness of our staff

We will perform a combination of major maintenance campaigns and capital project upgrades to bring the system back better.
Lessons Learned – What Worked

• Making difficult decision early preserved service for essential workers

• Radical resilience of our bus system continues to allow SFMTA to respond to the changing needs of COVID pandemic

• Extended maintenance windows should continue – existing splices reduced by 25% since April 2019
Lessons Learned – For Improvement

• Direct more engineering resources to accelerate solutions
• Think bigger – consider full replacement rather than incremental upgrades
• Continue cultural shift towards cross-silo problem solving
• Build closer relationships with peer agencies – recent work shows some systems having similar challenges
• Re-evaluate COVID procedures for Transportation Management Center (TMC) and other small, mission critical groups
• Run several days of full service (without customers) to stress-test system before start-up
Thank you