



SFMTA

# Train Control Upgrade Project

San Francisco Board of Supervisors  
Budget and Finance Committee  
September 11, 2024



# What we are asking the Budget and Finance Committee to recommend today:

## As-needed consultant services contract for Train Control Upgrade Project:

- Fiveyear term
- Five options to extend term an additional year, for a total of ten years
- Not to exceed \$30,000,000

Train control technical experts will assist in the design and engineering of the new technology, quality assurance, construction management, and knowledge transfer.

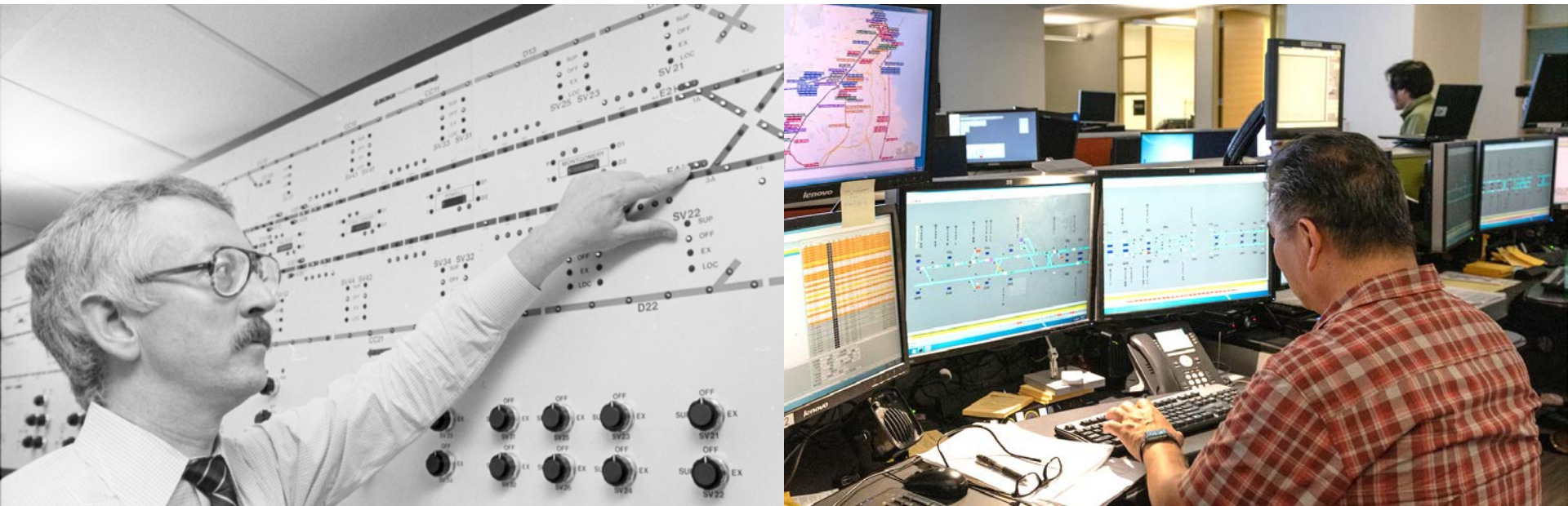
Consultant will help SFMTA avoid preventable risks and add capacity and expertise to SFMTA's staff.



# Why upgrade Muni Metro's train control?

**Critical need:** Replace the outdated Automatic Train Control System to prevent critical failure and keep Muni Metro running.

**Unique opportunity:** Modernize the technology that make Muni Metro work, improve service and enable future Metro growth. Centerpiece of subway renewal plan.





# TCUP Benefits to Muni Metro Riders

## Fewer delays

Customers no longer “stuck” due to subway congestion or slow-moving trains

## Faster trips, less time waiting

Better traffic signal management for less waiting at red lights

## More reliable service

More consistent frequencies and travel times making trip-planning more reliable

## More efficient connections

Metro reliability will improve existing connections to crosstown routes and between neighborhoods

## Better service management

More flexibility for train controllers to manage bunching and gaps



# Consultant Contract

Consultants support project delivery, bring needed global expertise.

We need the consultant's knowledge to avoid preventable risks. It would be irresponsible not to add this critical resource to support our staff.



Help identify and reduce project risks



Support and transfer knowledge to SFMTA staff



Help hold supplier & installers accountable

# WSP/PGH Wong Joint Venture

- Local ties and international experience
- Know the Bay Area contracting environment
- Experience with SFMTA peer agencies
- Strong relationships with all likely suppliers, installers and other vendors
- Small businesses and minority-owned businesses are key part of the team



Global CBTC Experience • 8 SBE/DBE Firms • Local and National Talent

### Trusted to Deliver CBTC Projects Worldwide

Experience with all 9 SFMTA-Identified Peer Transit Agencies

U.S. Peers	Boston	Bay Area	New York
Canadian Peers	Edmonton	Toronto	Vancouver
International Peers	London	Frankfurt am Main	Amsterdam

**ALSTOM**

**HITACHI**  
Inspire the Next

**SIEMENS**

**THALES**

**Strong CBTC Vendor Relationships**

Extensive experience with Alstom, Hitachi Rail, Siemens and Thales. Team members include past CBTC vendor employees.



# Funds Authorization Amendment

SFMTA Board **reduced** the staff-recommended **not -to -exceed** amount from **\$36M to \$30M.**

Gives the SFMTA Board and Board of Supervisors **additional contract oversight with a review at roughly the five -year mark.**

**Staff will need to seek approval to use funds beyond \$30M, if necessary.**

The amendment does not change the cost of the consultant.

Staff feel comfortable that \$30M will cover at least the first five years of the project.

The overall project funding plan budgets sufficient funds to prevent shortfalls.



# Funding Approach

**\$400M : Capital Improvement Plan (CIP) FY2019 Funding Plan**

**\$700M : Full Funding Plan**

## Funding Highlights:

- Current project funding plan still relies heavily on infrastructure formula funds that are also needed for other deferred capital projects
- To date, TCUP has been **successful in competitive grants and discretionary funding** sources and will continue to pursue new grant opportunities.
- **10-year funding plan shows commitment to the project** necessary to execute supplier and consultant contracts and compete for new funding.
- Staff anticipate the strength of this project **will continue to attract competitive funding** sources and local opportunities.



# Questions?



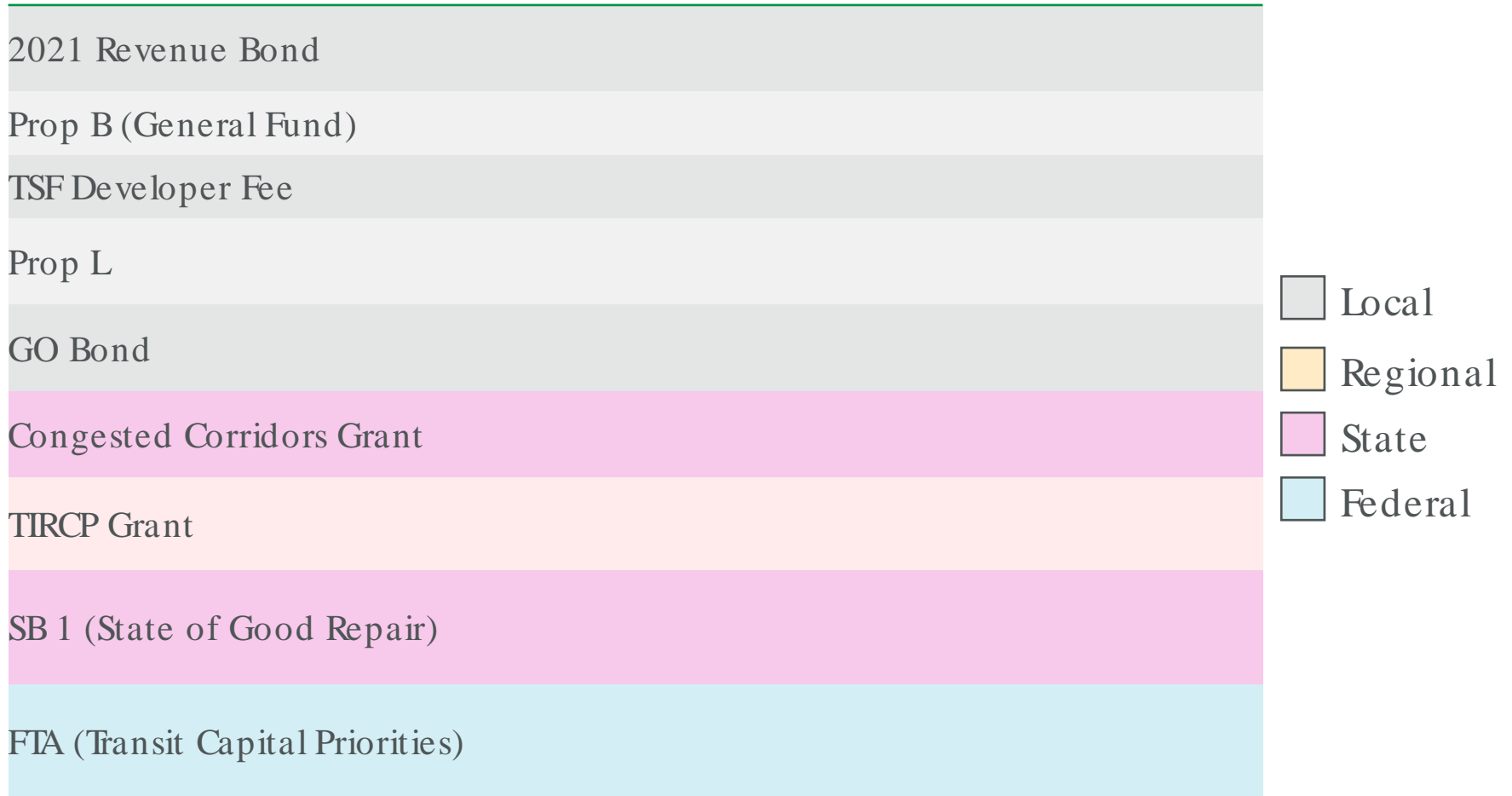


# Allocated Funds To Date

Funding Source	Funds	
FY18 Operating Savings	\$2,095,000	
2021 Revenue Bond	\$18,137,549	Local
Prop B (General Fund)	\$340,000	Regional
TSF Developer Fee	\$10,000	State
AB 664 (Bridge Tolls)	\$1,312,500	Federal
<b>Total</b>	<b>\$21,895,049</b>	

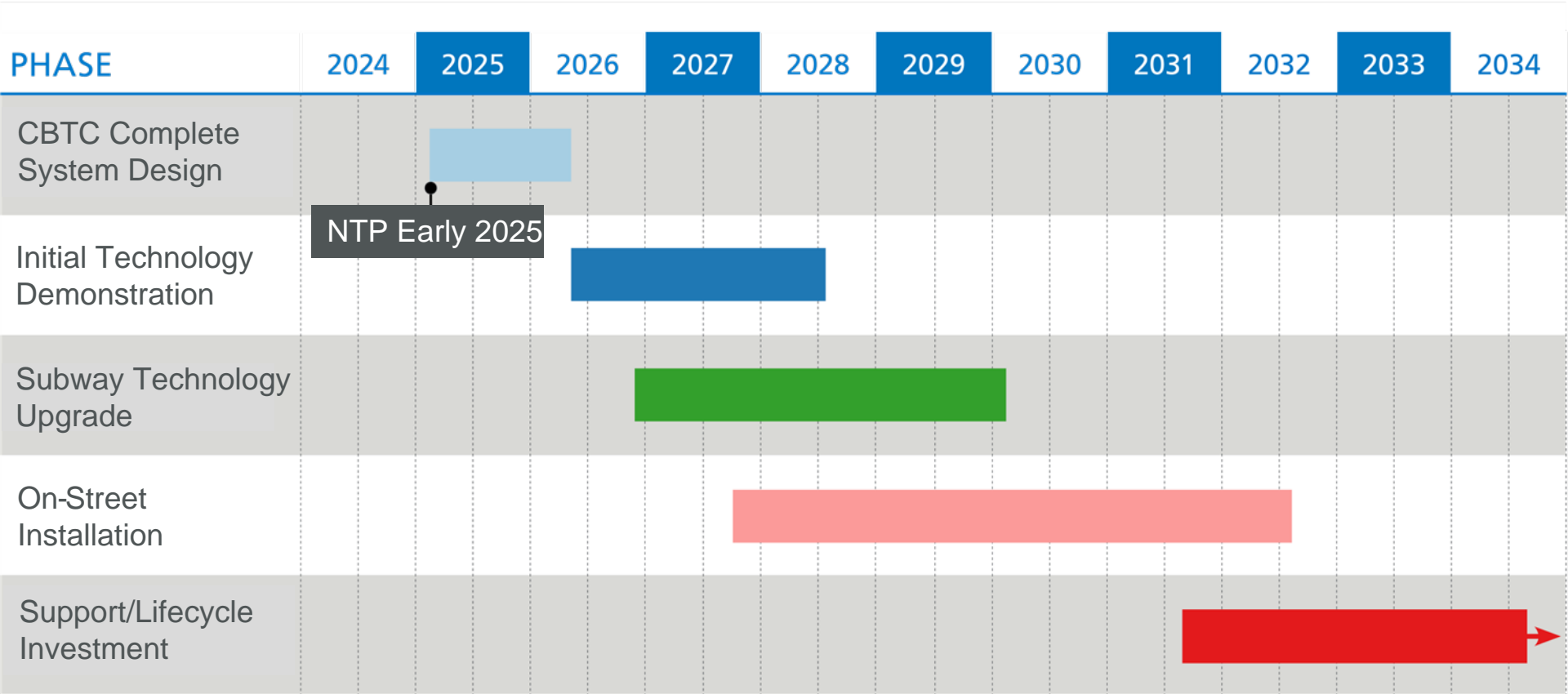


# Future Funding Sources

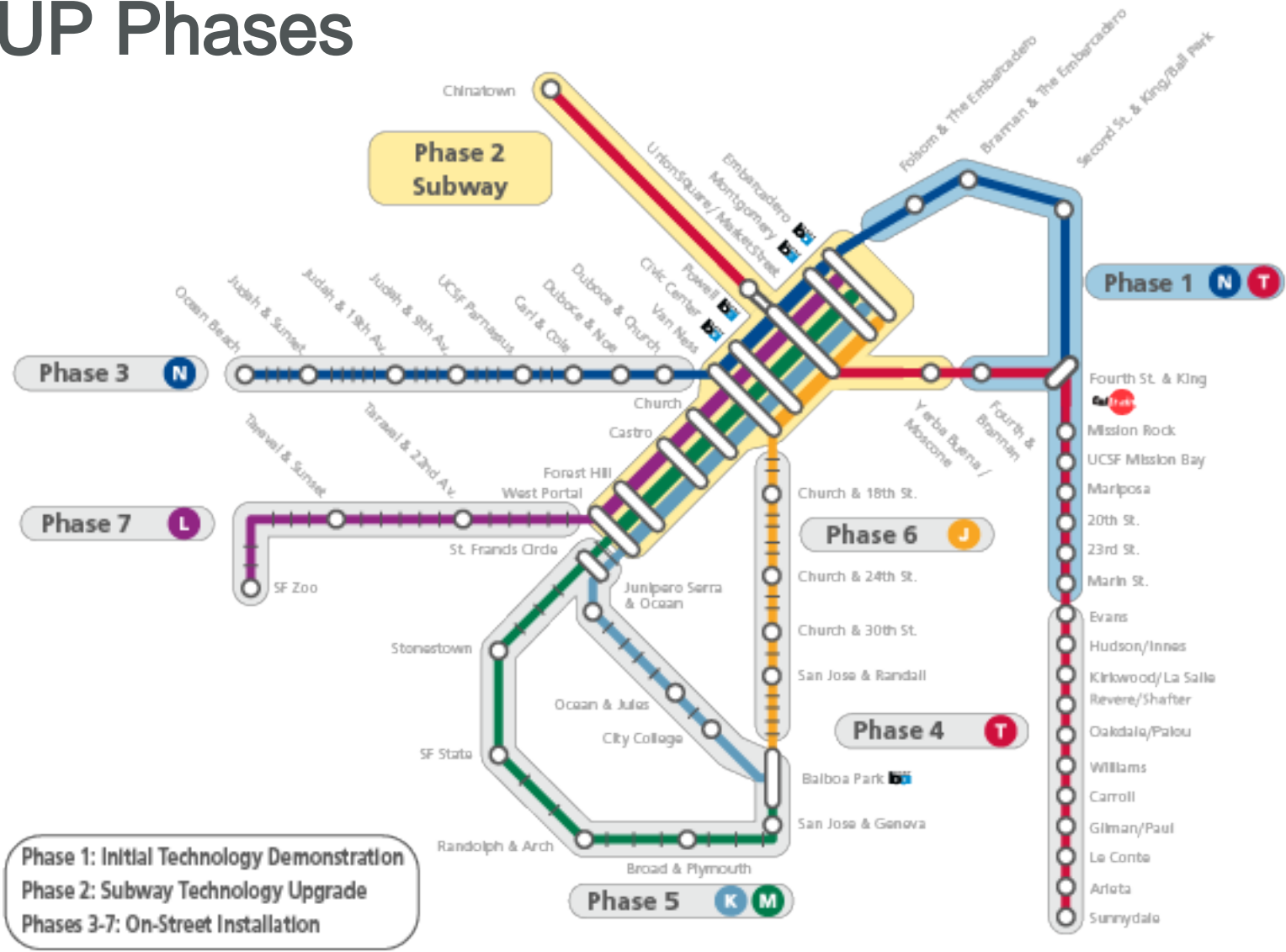




# Train Control Upgrade Project Schedule



# TCUP Phases





# Learning from past project and improving contracts

## Separate contracts

### SUPPLIER

- Provides technology
- Helps design system
- Provides long-term maintenance support

### INSTALLERS

- Multiple installers shorten construction timeline

### CONSULTANT

- Support staff with project delivery

## Key Features

Performance goals

Long -term needs

Staff training



# Current system limitations

The Automatic Train Control System (ATCS) is almost 30 years old with 1980s technology and 1990s components.

2019 Muni Reliability Working Group recommended **replacing the ATCS as the top priority.**

Aging train control infrastructure

+

Outdated train control technology

Computer failures

Communication failures

Lack of parts and expertise

No on-street train control



# Muni Metro structural design

5 lines operate mostly in 1 tunnel. A highperforming system is required.

*Muni Metro is the 3rd busiest light rail in the U.S. and the last to use only 1 main tunnel for majority of service.*







# Characteristics of a modern CBTC system



Tracks the locations of all trains at all times



Prevents collisions and enforces safe spacing between trains



Maintains consistent spacing between trains



Controls the trains' braking and acceleration



Sets the train's routing



Prevents delays due to train congestion, traffic signals, or junction delays



Ensures reliable train frequency and service



Allows greater flexibility of service plans and service during disruptions



# Alignment with City Priorities

- **Economic recovery**



TCUP will make Muni Metro faster and more efficient for thousands of workers and shoppers along transit citywide.  
**Fast, frequent, efficient transit attracts investment and economic opportunities.**

- **Advancing equity**



TCUP will improve service and mobility between outer neighborhoods, education centers, citywide jobs and downtown.  
**Better, faster transit service benefits students, workers and low -income households.**

- **Increasing job access**



TCUP will **lower travel time** , providing more access to jobs especially for people who live farther away.

- **Climate goals**



TCUP will move more people reliably and sustainably, **reducing the need for greenhouse gas vehicles** as the population grows.



# Workforce Outreach

SFMTA engaged existing train control engineering, operations and maintenance staff to help develop the scope of this contract.

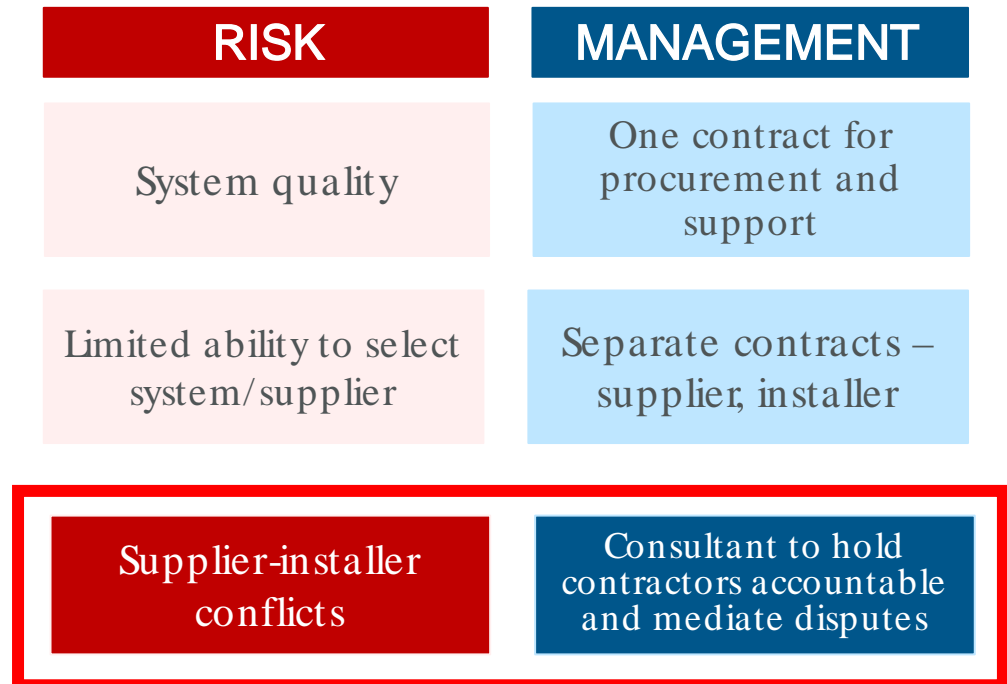
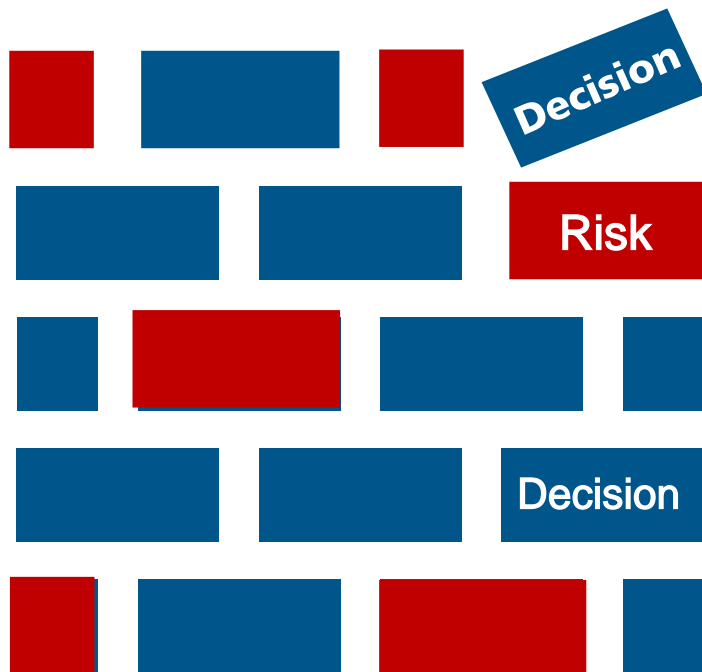
## Key staff participated in developing contract requirements and selecting contractors:

- Transportation Management Center (TMC)
- Fleet Engineering
- Signal Maintenance
- Maintenance of Way Engineering
- Systems Engineering
- Transit Engineering / SFgo
- Transit Services
- Transit Program Delivery
- Transit Operations
- Technology Solutions and Integration

# Risk Management in Contract Strategy

TCUP centers proactive risk management early and often to minimize challenges. Decision → Analysis → Risk → Analysis → Decision ...

Partnering with knowledgeable CBTC consultants is a vital part of the TCUP risk management strategy.



# Applying Lessons Learned: Performance Based Approach -

## Procurement

Separate contracts for supplier, installers provides more choice

## Supplier Partnership and Performance Incentives

Long-term performance, support terms part of competitive bid process

## Quality, Timely, Flexible, Construction Delivery

Pool of qualified installers offers greater flexibility during construction

## Using Lessons Learned

Planning and project strategy based on train control experience and future needs

## Proactive Risk Management

Continually anticipate and assess risk, build into decisions, manage proactively



# Success Strategy: Lessons Learned

The SFMTA has drawn from multiple sources of lessons learned to set the Train Control Upgrade Project up for success.



Peer agencies in North America and Europe



Major SFMTA capital projects like Central Subway and Van Ness Bus Rapid Transit



Past SFMTA technology projects



Current Automatic Train Control System (ATCS)

# Harnessing Peer Expertise

## U.S.A

MBTA Green Line  
BART  
New York City Subway



## CANADA

Vancouver SkyTrain  
Edmonton  
Toronto (Eglinton LRT)



## EUROPE

London (LU and DLR)  
Amsterdam  
Frankfurt VGM

