



SFMTA

# Train Control Upgrade Project

SFMTA Board of Directors  
November 7, 2023





 **Background**

 **Objectives**

 **Budget and Funding**

 **Risk Management**

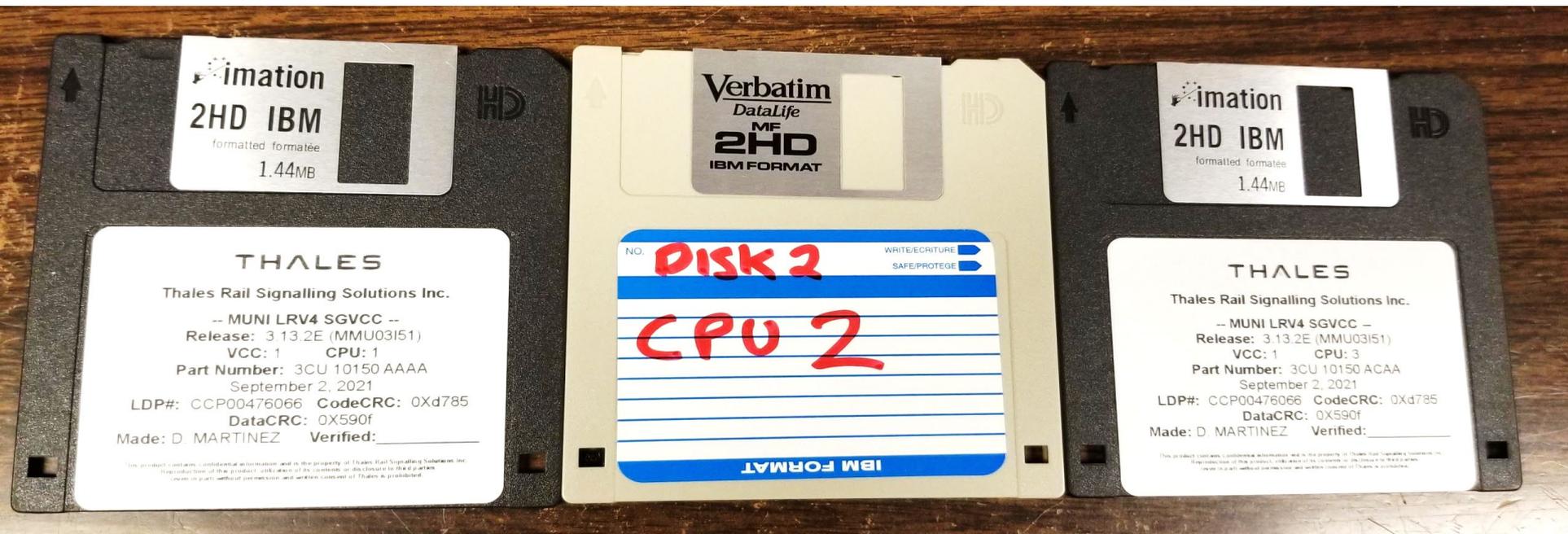
 **Contracting Strategy**



# Why upgrade Muni Metro's train control?

**Critical need:** Prevent critical equipment failure and ensure ongoing Muni Metro operations.

**Unique opportunity:** Centerpiece of subway renewal to modernize and grow Muni Metro for decades to come.



# Features of a modern train control system



Tracks the locations of all trains in the system at all times



Prevents collisions and enforces safe spacing between trains



Controls the trains' braking (and acceleration in auto mode)



Sets the train's routing through the system



Maintains consistent train spacing system-wide



Ensures reliability of train service and frequency



Allows greater flexibility of service plans and service during disruptions



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

# 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**Outdated train control  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

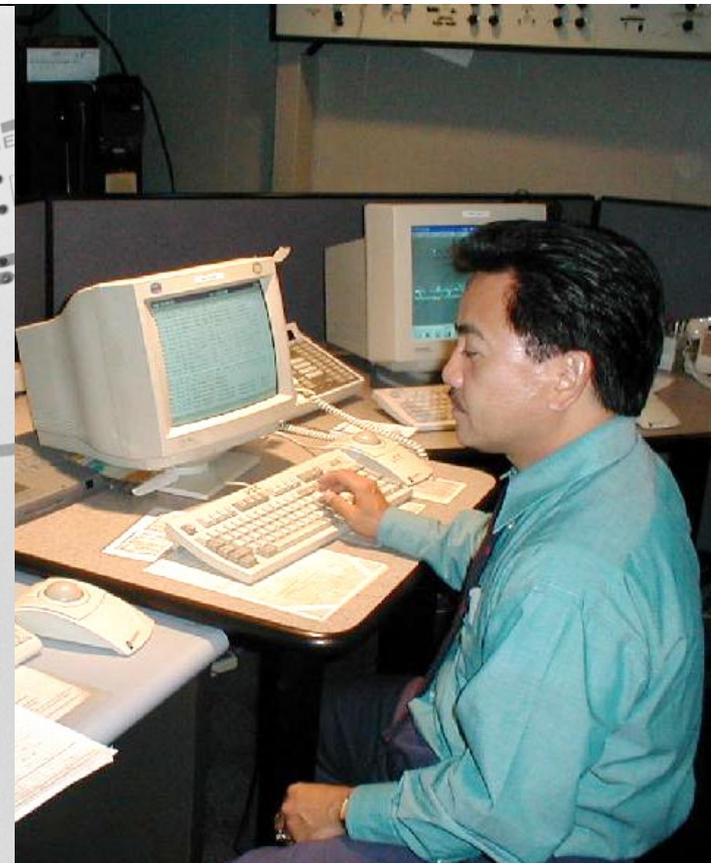
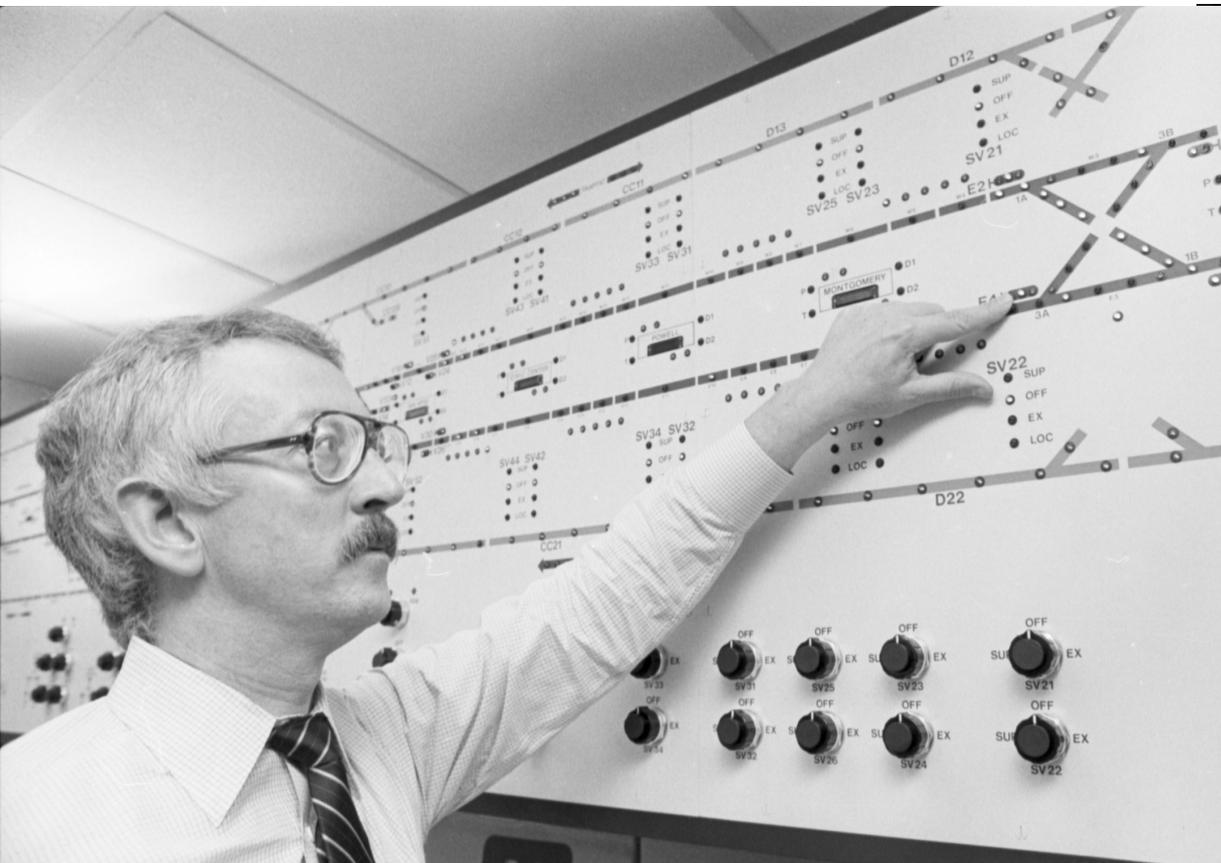
Communication failures

Lack of parts and expertise

No surface train control

# Critical Need

Replace the outdated Automatic Train Control System soon to prevent critical failure and keep Muni Metro running.



# Unique Opportunity

Modernize the systems that make Muni Metro work to fundamentally improve service and enable future Metro growth.





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# Project Objectives



# Train Control Upgrade Project (TCUP)

10 year, phased upgrade to Communications-Based Train Control (CBTC) to modernize Muni Metro operations, expand service, capacity and reliability.



# Key TCUP Objectives



Increase Muni Metro system capacity



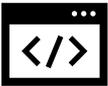
Extend high safety standards system-wide



Enable shorter, more consistent train spacing and travel times



Support Muni Metro operations and service at all times, system-wide



Provide greater flexibility to service and contingency operations



Build in continual system upgrades to keep hardware and software current

# TCUP Muni Metro Rider Benefits

In addition to maintaining the excellent safety record of the previous system, following the project, customers will see:

## Fewer delays

Customers no longer “stuck” on trains between stations due to subway congestion or slow-moving trains with a communication failure.

## Faster trips and less time waiting

Trips on Muni will be faster with better timed traffic signals on the surface. The CBTC system will tell signals a train is coming well in advance.

## More reliable service

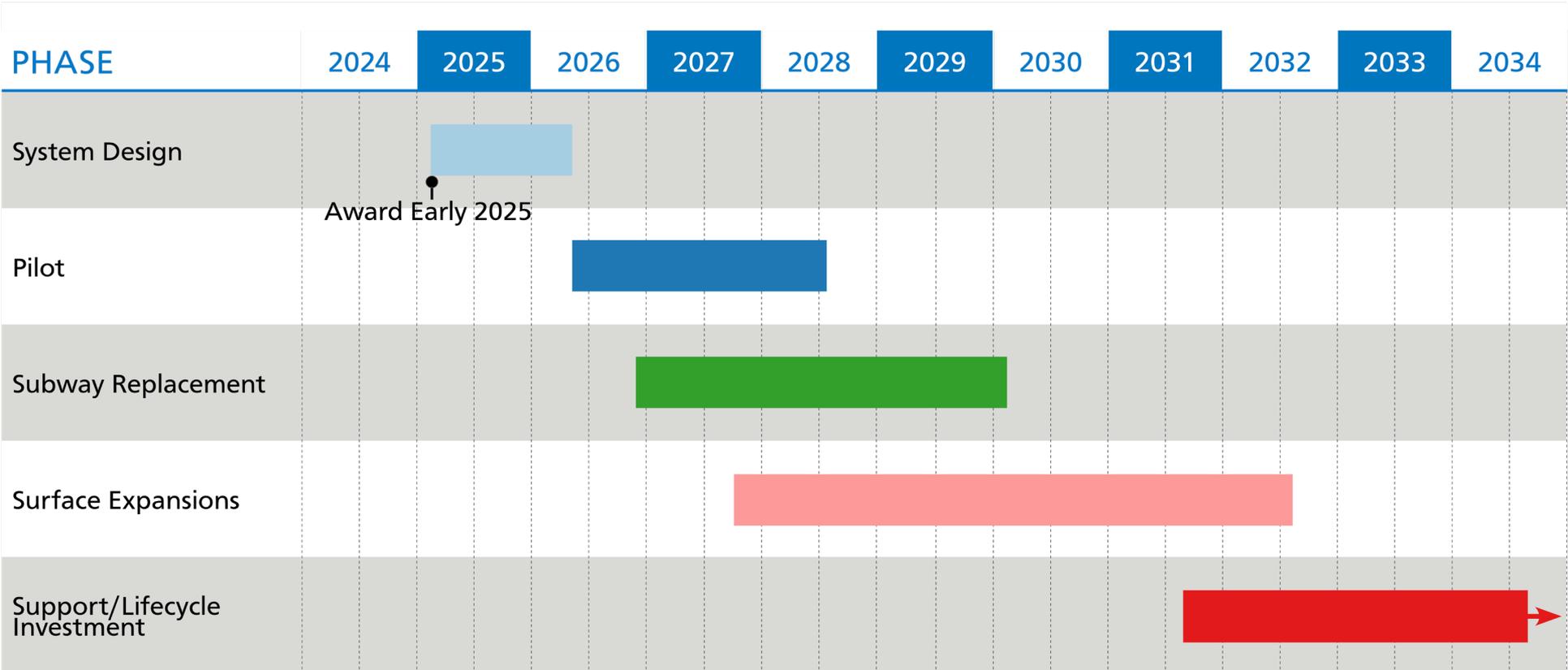
More consistent wait times that match the advertised frequency of trains, making trip-planning more reliable.

## Better service management

CBTC will give train controllers more flexibility to manage bunching and gaps.



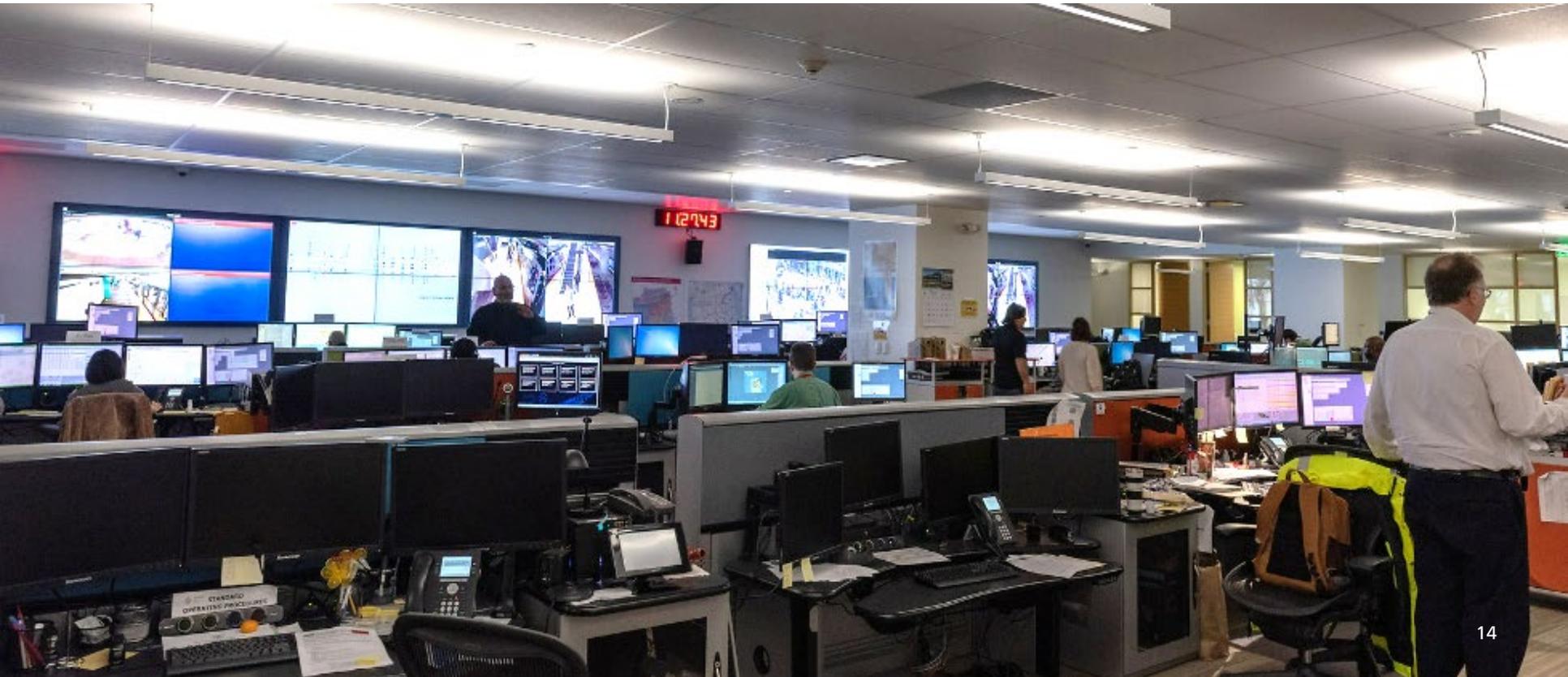
# TCUP Schedule





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# Project Funding



# Funding Approach

Carefully planned funding commits to project and prioritizes discretionary sources.

Capital Improvement Plan (CIP) FY23-27 Funding Plan: **\$290M**  
Full Project Estimate: **Over \$600M**

## Funding Highlights:

- TCUP has been successful in competitive grants and discretionary funding sources.
- 10-year funding plan shows commitment to the project necessary to compete for funding, but without adjustment will siphon formula funds for SOGR.
- Staff anticipate the strength of this project will continue to attract competitive discretionary funding sources and local opportunities.



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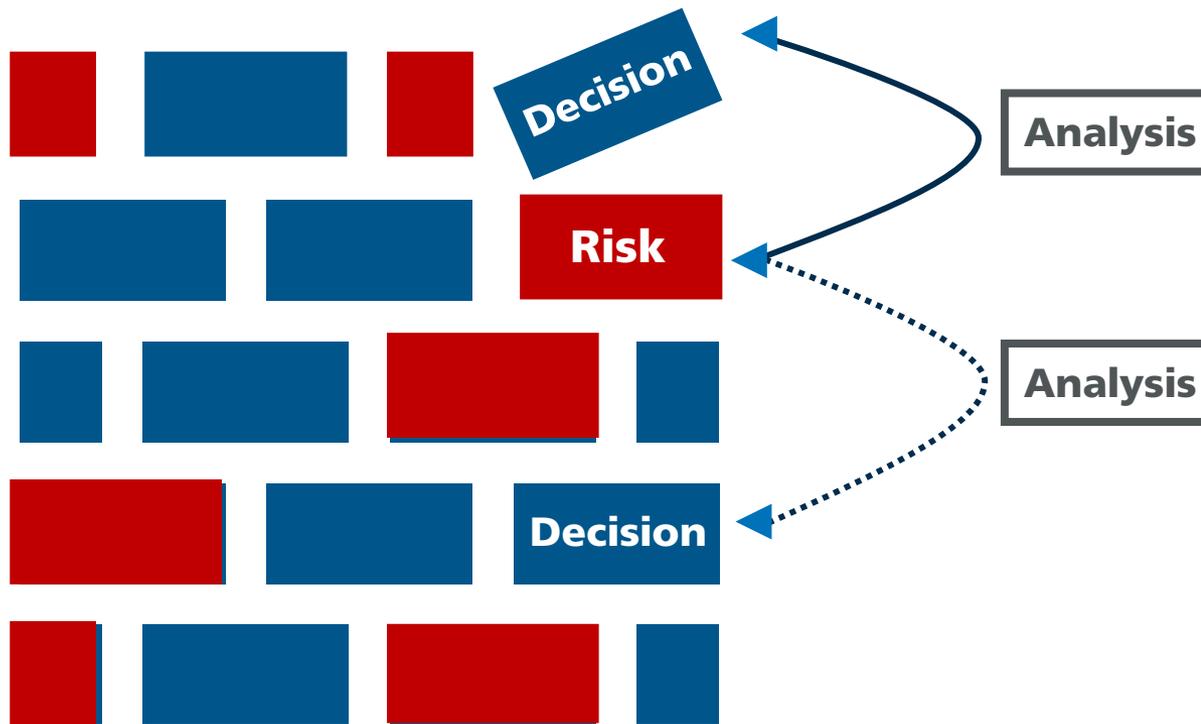
# Risk Management



# TCUP Risk Management Ethos

Proactive risk management early and often to minimize challenges.

**Decision → Analysis → Risk → Analysis → Decision ...**

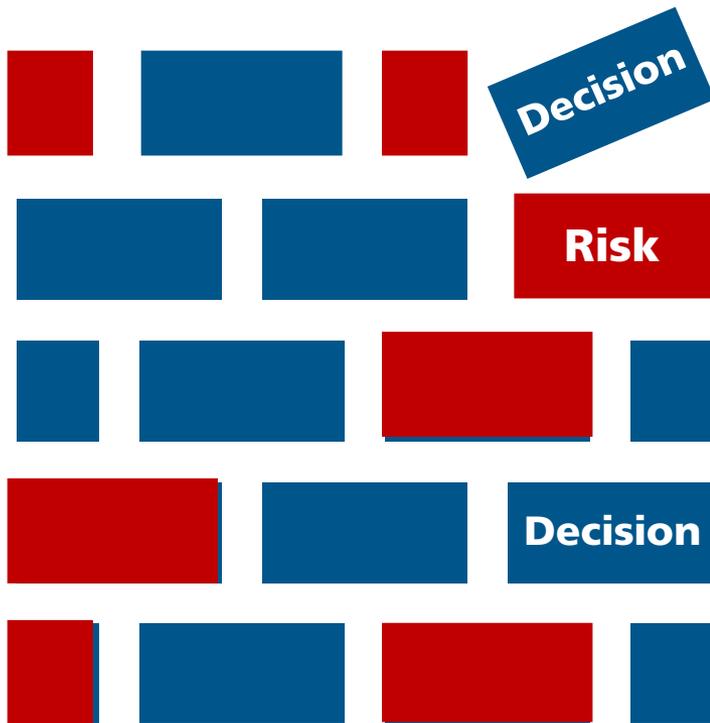


A project of this magnitude has many unavoidable risks including cost overruns and project delays.

Each decision carries potential risk that the team analyses carefully before choosing a path.

# Risk Management: Contract Strategy

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



RISK	MANAGEMENT
System quality	One contract for support + procurement
Limited ability to select system/supplier	Separate contracts – supplier, installer
System installation and tech integration	Supplier oversees install, project phasing
Supplier-installer conflicts	Consultant to hold contractors accountable and mediate disputes

# SFMTA Board Train Control Subcommittee

Part of the project risk management strategy

Provides a forum for MTA staff to discuss project risks with Board members and receive their advice

Topics covered this year included:

- Overall risks that train control obsolescence poses to Muni Metro service
- Risks to be encountered during the procurement process
- Risks to the schedule and how to build those in transparently
- Pricing risk and managing uncertainty in the budget
- International best practices and lessons learned from other projects



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# Contracting



# TCUP Contracts

## TCUP



### Supplier

System Design,  
Procurement, Support

Technology system procurement best fit for selection criteria, long-term performance-based support

**SBE/DBE goal: 5%**

Currently evaluating bids



### Installer(s)

System Installation

Separating installation contracts enables more refined construction scope and allows us to maximize SBE/DBE

**SBE/DBE goal: 100% (preliminary)**

Multiple future RFPs



### Consultant

Delivery Support

Technical consulting contract to support project management and leverage outside train control expertise to ensure we deliver the best system possible.

**SBE/DBE goal: 15%**

**This RFP**

# Consultant Request For Proposal (RFP)

As-needed technical services supporting SFMTA not to exceed 10 years and \$36,000,000.

## Key rationale for consultant contract:



Consultant helps SFMTA mitigate risks identified in project risk assessment



Consultant augments SFMTA technical staff and grows in-house CBTC knowledge so that SFMTA can self-support in the future



Consultant helps SFMTA hold Supplier & Installer accountable

# Services in Consultant RFP



Project Management & Administrative Support



Construction Management Support



Design and Engineering Support



System Integration Support



Quality Assurance Support



Testing & Commissioning



Safety and Security Evaluation



Post-Delivery, Ops & Maintenance Consulting

# Board Action

Staff recommends that the Board authorize the Director of Transportation to issue a Request for Proposals for Contract No. SFMTA-2024-20-FTA for Consulting Services supporting the Communications-Based Train Control Upgrade Project:

- For an initial term of five years in an amount not to exceed \$25,000,000;
- With five options to extend the term for an additional year;
- For a total of ten years in an amount not to exceed \$36,000,000.

# Questions?

