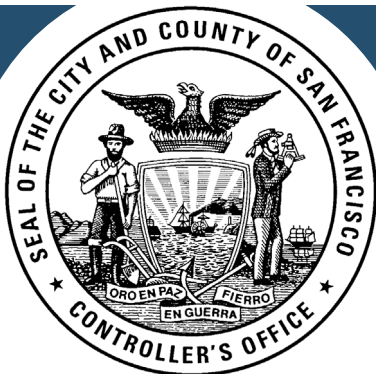


SFMTA Capital Programs Audit:

The San Francisco Municipal Transportation Agency
Needs to Improve Accountability and
Collaboration in Its Capital Planning and
Project Delivery Processes

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CITY & COUNTY OF SAN FRANCISCO

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San Francisco Municipal Transportation Agency (SFMTA)

- Oversees the public transportation network of the City and County of San Francisco (City).
- Engages in capital construction projects as part of its efforts to improve transit reliability and safety.
- Requires the participation of stakeholders across its various divisions on the capital planning process.

Audit Overview

This is the seventh divisional audit we have conducted at SFMTA.

The audit assessed whether the collaboration, communication, and decision-making framework of SFMTA helps its divisions to effectively plan and deliver capital projects according to scope, on schedule, and within budget. The audit found:

- SFMTA inadequately communicates and collaborates, adding to delays and cost overruns in the four sample projects we reviewed.
- Inadequate processes undermine collaboration, communication, and accountability.
- SFMTA's inadequate use of its data and tools hinders the capital planning and project delivery processes.

Audit Objectives & Scope

To assess the effectiveness of SFMTA's Capital Improvement Program (CIP) development process and the capital project delivery process. Specifically, the audit sought to:

- Assess whether SFMTA's communication, collaboration, and decision-making framework facilitates effective execution of the CIP.
- Determine whether the Construction, Transit, and Finance divisions effectively plan and deliver construction projects in the CIP within scope, schedule, and budget.

The audit selected four capital projects for review, as shown below.

Project	Description	Budget (in millions)	Construction Timeline
Twin Peaks Tunnel Trackway Improvement (Twin Peaks Tunnel)	Replace track structure in Twin Peaks Tunnel between West Portal and old Eureka Valley stations. Perform seismic strengthening and structural repairs.	\$86.9	May 2016 – February 2020
Green Light Rail Center Track Replacement (Green Center)	Replace worn tracks and switches, improve yard lighting, and construct new curb ramps.	\$54.1	January 2013 – December 2017
UCSF Platform and Track Improvement (UCSF Platform)	Reconfigure track alignment, install new transit signals, and construct new boarding platform.	\$51.7	April 2018 – October 2019
5 Fulton Outer Route Fast Track Transit Enhancements (Fulton)	Bus bulbs (curb extensions), new traffic signals replacing stop signs, and pedestrian improvements. Part of Muni Forward Transit Priority projects.	\$6.1	February 2015 – May 2018

What We Did

- Interviewed and surveyed employees in CIP planning and capital projects delivery.
- Assessed project documentation for selected capital projects.
- Analyzed documents relevant to CIP planning, project delivery, and governance.
- Contracted with Cumming Management Group, Inc., to assess cost estimates and preliminary engineering reports for selected capital projects.

Sources of Criteria

- U.S. Government Accountability Office (GAO)
- Government Finance Officers Association (GFOA)
- U.S. Office of Management and Budget (OMB)
- Project Management Institute (PMI)
- Association for the Advancement of Cost Engineering (AACE)
- National Institute of Building Sciences (NIBS)

SFMTA Must Improve Contractor Safety Assessment, Preliminary Engineering Reports, and Change Management to More Effectively Manage Its Construction Project Delivery.

SFMTA should improve its project delivery by:

- Adequately evaluating bidder and contractor safety records.

SFMTA did not consider bidder safety in three of the four sample projects.

Project Reviewed	Bidder Safety Considered?	Awarded Contractor Had Cal/OSHA-Closed Violations	Cal/OSHA Violations From Project?
Green Center	No	No	No
<p><i>In April 2017 CSA issued an audit report on citywide construction safety. In response, SFMTA agreed to incorporate contractor safety records into its contract award process. Bidding for the projects below occurred after April 2017.^b</i></p>			
Twin Peaks Tunnel	Partly. Selection criteria included safety records, but SFMTA did not verify bidders' records with U.S. OSHA's Establishment Search database.	Yes. In August 2011 Cal/OSHA cited contractor for a willful violation, which in September 2015 Cal/OSHA's Appeals Board affirmed as willful and serious.	Yes. Fatal accident: Cal/OSHA cited contractor with serious violations, which the contractor is contesting.
UCSF Platform	No	No	No

SFMTA Must Improve Contractor Safety Assessment, Preliminary Engineering Reports, and Change Management to More Effectively Manage Its Construction Project Delivery.

SFMTA should improve its project delivery by:

- Ensuring preliminary engineering reports (PERs) contain all key information needed to accurately determine a project’s scope, schedule, and budget.

Flaws in Preliminary Engineering Reports may have hindered project delivery.




Flaw in PER	Projects Affected	Possible Impact of Flaw on Project Delivery
Outdated as-built drawings or unknown current conditions	Green Center Twin Peaks Tunnel UCSF Platform	Without updated, clear as-built drawings, it is difficult to accurately define the scope of work. Apparently conflicting information may expose the City to liability in instances of litigation or public scrutiny. Documenting explanations for apparent conflicts demonstrates due diligence in planning.
Missing or understated risks	Green Center Twin Peaks Tunnel UCSF Platform	When life and safety risks, such as the presence of hazardous materials, are omitted from the PER, the project team is more likely to overlook tasks critical to public safety. <i>Hazardous material abatement in the Twin Peaks Tunnel was not fully completed.</i>
Missing or grossly understated allowances	Green Center Twin Peaks Tunnel UCSF Platform	Missing and understated allowances cause inaccurate cost and schedule estimates, which, in turn, can lead to unanticipated service disruptions that harm the public’s perception of Muni, delays that can cause cascading delays to other projects that need the same resources, and cost overruns that take funding away from other planned projects. <i>The Twin Peaks Tunnel Project incurred \$250,000 in excess of the contract allowance for hazardous material abatement, and SFMTA anticipates another \$1-3 million in costs for further work that will also result in additional service disruptions.</i>

SFMTA Must Improve Contractor Safety Assessment, Preliminary Engineering Reports, and Change Management to More Effectively Manage Its Construction Project Delivery.

SFMTA should improve its project delivery by:

- Improving the classification of change orders to identify areas of process improvement.

SFMTA follows two of three leading practices related to change order management.

Leading Practice		Does SFMTA Comply?
Classify types of change orders	Classifying change orders into categories such as <i>changed conditions, unforeseen conditions, owner requests, or design changes for owner use</i> improves understanding of the project. Lessons learned from the data may improve project delivery on similar projects.	
Allow change orders to be approved up to a contingency	Delegating authority to an individual to approve change orders up to a contingency amount ensures critical work can be acted on promptly and not be delayed by a review and authorization process.	
Limit scope changes to early stages of design	In general, the later a given change occurs in the construction process, the more costly it will be.	

SFMTA’s Project Prioritization Processes and Inaccurate Cost Estimates Hinder Its Ability to Improve the Effectiveness of Its Capital Programs and Project Delivery.

- SFMTA does not use all functionality available in its strategic prioritization tool, which the agency could use to improve its project prioritization process.

SFMTA does not use all functionality available in Decision Lens to prioritize its capital investments.

		Decision Lens Capability	MTA Use
Data Inputs	}	Stakeholder input based on strategic goals <i>(to produce weight rating)</i>	✔
		Asset condition	✘
		Financial allocation	✘
		Staffing resource allocation	✘
Decision Lens Outputs	}	Project prioritization based on selection criteria	✔
		Tradeoff analysis	✘
		Optimization analysis	✘

✔ Uses successfully

✘ Does not use

SFMTA's Project Prioritization Processes and Inaccurate Cost Estimates Hinder Its Ability to Improve the Effectiveness of Its Capital Programs and Project Delivery.

- SFMTA develops inaccurate engineering cost estimates, which hinders its ability to understand its project delivery needs and increases the risk of cost overruns and schedule delays.

SFMTA's preliminary engineering cost estimates are inaccurate.






Project*	SFMTA Estimate (In millions)	Costs Not Included (In millions)
Green Center	\$39.0	\$14.5 – 16.7
Twin Peaks Tunnel	\$41.0	\$28.9 – 31.1
UCSF Platform	\$47.9	\$10.1 – 12.7
Total	\$127.9	\$53.5 – 60.5

Insufficient Accountability and Ineffective Collaboration Contributed to Cost Overruns and Schedule Delays in SFMTA's Capital Program.

- Inadequate collaboration contributed to project delays, budget overruns, and increased costs in three of four projects tested.
- For example, cross-division collaboration problems contributed to the cancellation of the initial contract for the Twin Peaks Tunnel Project, adding \$35 million in costs.






SFMTA Inadequately Communicates and Collaborates, Adding to Delays and Cost Overruns

Impacts of inadequate communication among SFMTA divisions on project delivery:

<p>Ineffective collaboration through project design and lack of comprehensive reviews . . .</p>  <p>contributed to . . .</p> <p>the cancellation and subsequent rebidding of the Twin Peaks Tunnel Project contract . . .</p>  <p>which caused . . .</p> <p>rebidding that added \$35 million and 1.2 additional years to project completion.</p>	<p>During the design of the Twin Peaks Tunnel Project, SFMTA identified the need to test for and remove hazardous materials but did not effectively and fully communicate this, so the information . . .</p>  <p>was not effectively carried through to the construction phase . . .</p>  <p>contributing to insufficient testing and incomplete removal of contaminated ballast (material supporting the tracks) ...</p> <p>which contributed to . . .</p> <p>\$523,000 in change orders. Further, the contractor estimated a potential cost increase of \$3 to \$9 million for 15 to 17 weekends of new tunnel closures to fully replace the ballast.</p>
<p>Although Public Works required collaboration and support from SFMTA to deliver the Fulton Project, including de-energizing Municipal Railway lines, Public Works records show SFMTA did not provide and did not communicate its availability to provide the necessary support . . .</p>  <p>which caused . . .</p> <p>SFMTA's delays in providing previously agreed-upon support that contributed to 620 days (1.7 years) of project delays and \$23,000 in change order costs.</p>	

Insufficient accountability led to poor communication and collaboration, weakening project delivery and oversight.

- SFMTA does not adequately hold itself and its employees accountable for effectively collaborating within and across divisions in capital planning and capital project delivery.
- This ineffective collaboration contributed to cost overruns and schedule delays in three of the four sample projects.

Inadequate processes undermine collaboration, communication, and accountability				
				
<p>Ineffective Employee Performance Evaluation Process to hold senior managers accountable for effective collaboration with no specific examples of growth opportunities or strategies for improving collaboration.</p>	<p>Ineffective Decision-Making by a weakened Transportation Capital Committee due to absenteeism, proxy use, and little or no empowerment or timely information to better inform decision-making.</p>	<p>Inconsistent Design Reviews that left the Construction Division without adequate feedback from the Transit Division during project planning. Change orders due to design omissions or changes cost over \$2 million for the four sample projects.</p>	<p>Critical Safety and Service Issues That Were Unaddressed because of inadequate communication and collaboration across project delivery phases.</p>	<p>Lack of Training to Improve Collaboration for employees who must coordinate their work to plan and execute the capital program.</p>






Surveyed managers and staff:

- 55% disagree that cross-division communication is open and constructive.
- 63% disagree that SFMTA holds employees accountable for communicating openly and constructively.
- 68% disagree that SFMTA holds employees accountable for working collaboratively.

One employee received nearly identical performance appraisals in consecutive years.

SFMTA does not have adequate capital program performance measures to inform decision-makers or target improvement efforts for capital projects.

SFMTA does not track several performance measures that other transportation agencies have recognized as valuable.

Performance Measure	Other Agency That Uses It	Benefit of Tracking – Measure Shows the Agency’s Ability to:	Does SFMTA Track?
% of projects completed on time	Virginia Department of Transportation, <i>VDOT Dashboard</i>	<ul style="list-style-type: none"> Schedule projects realistically Deliver projects on schedule 	
% of projects completed within budget	Virginia Department of Transportation, <i>VDOT Dashboard</i>	<ul style="list-style-type: none"> Establish adequate baseline budgets Deliver projects cost-efficiently 	
Categories of change orders over time across capital projects	California Multi-Agency CIP Benchmarking Study	<ul style="list-style-type: none"> Assess change order categories over time to inform process improvement efforts 	
% difference between total construction cost and original contract award amounts	Missouri Department of Transportation <i>Tracker: Measures of Departmental Performance</i>	<ul style="list-style-type: none"> Control costs by avoiding changes to projects after contract award 	
% of customers who believe completed projects are the right transportation solution	Missouri Department of Transportation <i>Tracker: Measures of Departmental Performance</i>	<ul style="list-style-type: none"> Deliver appropriate transportation solutions based on public perception 	

-  Tracked
-  SFMTA reports implementation of measure is in progress
-  Not tracked

Recommendations for Investing in People:

- Leverage the Performance Plan and Appraisal Report process to hold employees accountable, specifically for effective communication and collaboration.
- Require communication trainings for all employees involved in the capital planning and project delivery processes, including division directors and Transportation Capital Committee members.
- Use performance measures, including variance from estimated budget and schedule, to track the performance of construction project delivery.

Thank you.

Any questions?

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