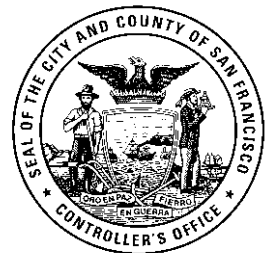


SFMTA Needs to Improve Accountability and Collaboration in Its Capital Planning and Project Delivery Processes

San Francisco Municipal Transportation Agency (SFMTA)

Communication and collaboration problems in the Construction, Transit, and Finance divisions of SFMTA contributed to delays of up to 1.7 years and cost overruns of up to \$9 million for four projects. Inadequate processes undermine collaboration, communication, and accountability, including processes for employee evaluations, training, oversight by the agency's Transportation Capital Committee, and stakeholder reviews during the design phase. SFMTA must reinforce agency and individual accountability and promote a culture of collaboration by improving these processes and making better use of its data and technology.



February 16, 2021

City & County of San Francisco
Office of the Controller
City Services Auditor

About the Audits Division

The City Services Auditor (CSA) was created in the Office of the Controller through an amendment to the Charter of the City and County of San Francisco (City) that voters approved in November 2003. Within CSA, the Audits Division ensures the City's financial integrity and promotes efficient, effective, and accountable government by:

- Conducting performance audits of city departments, contractors, and functions to assess efficiency and effectiveness of service delivery and business processes.
- Investigating reports received through its whistleblower hotline of fraud, waste, and abuse of city resources.
- Providing actionable recommendations to city leaders to promote and enhance accountability and improve the overall performance and efficiency of city government.

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Audit Authority

CSA conducted this audit under the authority of the City Charter, Section 3.105 and Appendix F, which requires that CSA conduct periodic, comprehensive financial and performance audits of city departments, services, and activities.

Statement of Auditing Standards

This performance audit was conducted in accordance with generally accepted government auditing standards. These standards require planning and performing the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for the findings and conclusions based on the audit objectives. CSA believes that the evidence obtained provides a reasonable basis for the findings and conclusions based on the audit objectives.



OFFICE OF THE CONTROLLER

CITY AND COUNTY OF SAN FRANCISCO

Ben Rosenfield
Controller

Todd Rydstrom
Deputy Controller

February 16, 2021

Board of Directors
San Francisco Municipal Transportation Agency
1 South Van Ness, Avenue, 7th Floor
San Francisco, CA 94103

Mr. Jeffrey Tumlin
Director of Transportation
San Francisco Municipal Transportation Agency
1 South Van Ness, Avenue, 7th Floor
San Francisco, CA 94103

Dear Board Chair Borden, Board Members, and Mr. Tumlin:

The Office of the Controller (Controller), City Services Auditor (CSA) presents its audit report on the capital program of the San Francisco Municipal Transportation Agency (SFMTA). The audit objectives were to determine whether SFMTA's communication, collaboration, and decision-making framework facilitate effective execution of the capital improvement program, and whether SFMTA's divisions effectively plan and deliver construction projects in the Capital Improvement Program according to scope, on schedule, and within budget.

The audit concluded SFMTA's inadequate processes undermine collaboration, communication, and accountability, including processes for employee evaluations, training, decision-making by the agency's Transportation Capital Committee, and stakeholder reviews during the design phase. The report includes 16 recommendations for SFMTA to reinforce agency and individual accountability and promote a culture of collaboration by improving these processes and making better use of its data and technology. SFMTA's response is attached as Appendix D. CSA will work with the agency to follow up every six months on the status of the open recommendations made in this report.

CSA appreciates the assistance and cooperation of everyone involved in this audit. For questions about the report, please contact me at mark.p.delarosa@sfgov.org or 415-554-7574 or CSA at 415-554-7469.

Respectfully,

Mark de la Rosa
Acting Director of Audits

cc: Board of Supervisors
Budget Analyst
Citizens Audit Review Board
City Attorney

Civil Grand Jury
Mayor
Public Library

Executive Summary

The audit assessed whether the collaboration, communication, and decision-making framework of the San Francisco Municipal Transportation Agency (SFMTA) helps its divisions to effectively plan and deliver capital projects according to scope, on schedule, and within budget. SFMTA oversees the public transportation network of the City and County of San Francisco (City) and engages in capital construction projects as part of its efforts to improve transit reliability and safety. SFMTA's 20-year capital plan includes \$31 billion in capital needs. The capital planning process requires the participation of various SFMTA divisions and stakeholders. Depending on the complexity of the project, staff knowledge, and resource availability, SFMTA may deliver capital projects using its Capital Programs & Construction Division (Construction Division) or by arranging to have San Francisco Public Works (Public Works) do so.

WHAT WE FOUND

SFMTA's inadequate collaboration, communication, and accountability weaken its ability to deliver capital projects effectively and efficiently. The audit focused on four capital projects owned by the Transit Division: the Twin Peaks Tunnel Trackway Improvement (Twin Peaks Tunnel Project), Green Light Rail Center Track Replacement (Green Center Project), UCSF Platform and Track Improvement (UCSF Platform Project), and 5 Fulton Outer Route Fast Track Transit Enhancements (Fulton Project).

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

Impacts of inadequate communication among SFMTA divisions on project delivery:

Ineffective collaboration through project design and lack of comprehensive reviews . . .



contributed to . . .



the **cancellation and subsequent rebidding** of the Twin Peaks Tunnel Project contract . . .

which caused . . .

rebidding that added **\$35 million** and **1.2 additional years** to project completion.

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 . . .



was not effectively carried through to the construction phase . . .



contributing to **insufficient testing and incomplete removal** of contaminated ballast (material supporting the tracks) . . .

which contributed to . . .






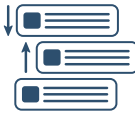

\$523,000 in change orders. Further, the contractor estimated a potential cost increase of \$3 to \$9 million for 15 to 17 weekends of new tunnel closures to fully replace the ballast.



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 . . .

which caused . . .

SFMTA's delays in providing previously agreed-upon support, which contributed to **620 days (1.7 years)** of project delays and **\$23,000** in change order costs.

Inadequate processes undermine collaboration, communication, and accountability				
				
Ineffective Employee Performance Evaluation Process to hold senior managers accountable for effective collaboration. Evaluations have no specific examples of growth opportunities or strategies for improving collaboration.	Ineffective Decision-Making by a weakened Transportation Capital Committee ¹ due to absenteeism, proxy use, and little or no empowerment or timely information to better inform decision-making.	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.	Critical Safety and Service Issues That Were Unaddressed because of inadequate communication and collaboration across project delivery phases.	Lack of Training to Improve Collaboration for employees who must coordinate their work to plan and execute the capital program.
SFMTA's inadequate use of its data and tools hinders the capital planning and project delivery processes				
<ul style="list-style-type: none"> Inadequate evaluation of proposers' safety records allowed the Twin Peaks Tunnel Project to be awarded to a contractor with a sustained serious or willful safety violation. Inaccurate cost estimates decrease the effectiveness of capital planning efforts. Poor document management may increase the City's liability in legal proceedings. 				
	SFMTA does not effectively use its strategic prioritization tool . If it did, it could make more data-driven, effective capital planning decisions.			The performance measures of SFMTA's capital program are inadequate to target process improvement efforts.

WHAT WE RECOMMEND

The report includes 16 recommendations to improve accountability, communication, and collaboration. Key recommendations include that SFMTA should:

- Reinforce agency and individual accountability and promote a culture of collaboration by:
 - Using the employee evaluation process to set clear expectations and hold individuals accountable for meeting those expectations.
 - Improving the attendance and information processes of the Transportation Capital Committee.
 - Requiring relevant training on effective collaboration.
- Verify the safety records submitted by construction contract bidders in the U.S. Occupational Safety and Health Administration (OSHA) Establishment Search database.
- Ensure capital project stakeholders thoroughly review construction contractor safety records, conceptual engineering reports, and design documents.
- Improve its capital planning process by better leveraging its strategic planning tool, Decision Lens, and developing more accurate project cost estimates.

¹ The Transportation Capital Committee is charged with overseeing the capital program and enables cross-division collaboration because its members are representatives assigned by the director of each SFMTA division.

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Glossary

AACE	Association for the Advancement of Cost Engineering
Cal/OSHA	The Division of Occupation Safety and Health, administered by the California Department of Industrial Relations
CIP	Capital Improvement Program
City	City and County of San Francisco
Construction Division	Capital Programs & Construction Division of SFMTA
Controller	Office of the Controller
CSA	City Services Auditor, Audits Division
Cumming	Cumming Management Group, Inc.
Finance Division	Finance & Information Technology Division of SFMTA
Fulton	5 Fulton Outer Route Fast Track Transit Enhancements
GAO	U.S. Government Accountability Office
GFOA	Government Finance Officers Association
Green Center	Green Light Rail Center Track Replacement
Muni	San Francisco Municipal Railway (operated by SFMTA)
OSHA	U.S. Occupational Safety and Health Administration
PER	Preliminary Engineering Report
PPAR	Performance Plan and Apparisal Report
Public Works or Department of Public Works	San Francisco Public Works
SFMTA	San Francisco Municipal Transportation Agency
TCC	Transportation Capital Committee
Twin Peaks Tunnel	Twin Peaks Tunnel Trackway Improvement
UCSF Platform	UCSF Platform and Track Improvement

Introduction

BACKGROUND

In 1999 the voters of the City and County of San Francisco (City) amended the San Francisco Charter by passing Proposition E, which called for the creation of the San Francisco Municipal Transportation Agency (SFMTA) through the consolidation of the City's Municipal Railway (Muni) and Department of Parking and Traffic. SFMTA is responsible for managing the City's transportation network. Its mission is to connect San Francisco through a safe, equitable, and sustainable transportation system. In 2019 SFMTA had approximately 6,000 employees, 1,200 transit vehicles, 163 miles of overhead wires, and 100 miles of rail tracks to support the estimated 700,000 riders it served each weekday.

SFMTA had a two-year (fiscal years 2018-19 and 2019-20) operating budget of \$2.5 billion, consisting of revenue from transit fares, operating grants, parking and traffic fees, other revenues such as taxi fees, and general fund transfers, which supports its expenditures for employee salaries and fringe benefits, professional contracts, materials, equipment, rent, insurance and claims, services from other city departments, and capital projects.

Capital Planning

As further explained in Exhibit 1, SFMTA uses a multiyear capital planning process to identify capital needs and capital improvement projects to address those needs.

Exhibit 1: Three documents present the results of SFMTA's capital planning process

Long-Term Capital Planning	Near-Term Capital Planning	
Capital Plan 20 years	Capital Improvement Program (CIP) 5 years	Capital Budget 2 years
Outlines a list of capital needs over the next 20 years without consideration of financial constraints .	Prioritizes capital needs from the Capital Plan. The CIP includes capital improvement projects with proposed scopes, schedules, and budgets, and with at least 90 percent of their funding identified . Once in the CIP, projects are removed from the Capital Plan.	Lists SFMTA board-approved capital projects—which must have full funding plans—that will occur in the next two years based on the CIP.

Source: SFMTA 2019 20-Year Capital Needs summary; SFMTA Capital Plan and Program Policies

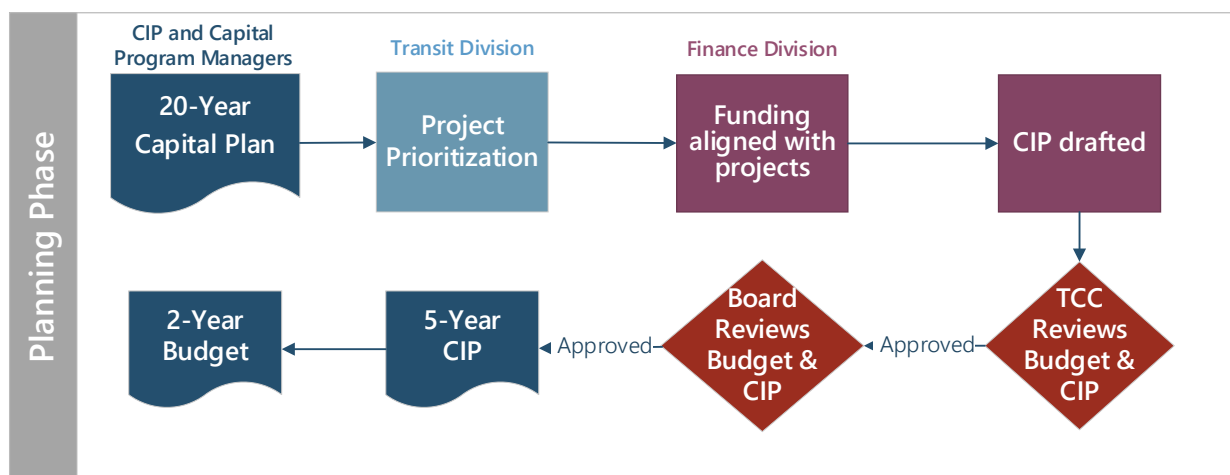
The capital planning process has several steps and requires the participation of various SFMTA divisions and stakeholders:

- Capital needs are added to the Capital Plan after the Transportation Capital Committee (TCC) approves and prioritizes them.
- The CIP managers, appointed by the director of transportation (SFMTA's chief executive), are responsible for convening committees to refine capital needs for inclusion in the CIP.

- The SFMTA Board of Directors must review and approve the scope, schedule, and budget of each project in the CIP and Capital Budget.
- The Capital Budget, Financial Planning and Analysis section of SFMTA's Finance & Information Technology Division (Finance Division) aligns funding sources to capital projects identified during the capital planning process.
- The TCC is charged with overseeing the capital program and is intended to enable cross-division collaboration. Employees of each SFMTA division are assigned by their division director to be a TCC member and are expected to make recommendations at TCC meetings that reflect the consensus of their respective divisions. The TCC meets monthly to discuss and approve changes to scopes, costs, and schedules for capital projects. Also, the TCC approves capital needs for inclusion in the Capital Plan and prioritizes the needs based on criteria established by SFMTA's director of transportation and executive team.

An overview of the capital planning process is shown in Exhibit 2.

Exhibit 2: SFMTA's capital planning process for Transit Fixed Guideway and Transit Optimization & Expansion capital programs



Source: SFMTA Capital Plan; Program Policies; Project Operations Manual

SFMTA's Capital Plan identifies \$31 billion of capital needs over the next 20 years.²

SFMTA capital needs are based on agency strategic goals, city mandates, and maintaining existing capital assets in a state of good repair. To address its capital needs, SFMTA engages in capital improvement projects, which may include new transportation infrastructure, vehicle and equipment purchases, and one-time efforts such as plans, evaluations, and educational programs. SFMTA categorizes its capital needs into 11 program areas, 2 of which are the focus of the audit: Transit Optimization & Expansion and Transit Fixed Guideway.

- The *Transit Optimization & Expansion* capital program aims to improve the reliability and increase the safety and comfort of Muni transit service. The program's projects include investments in transit bulb (sidewalk extension) installations, traffic signal upgrades, and transit stop improvements.

² SFMTA 2019 Capital Plan.

- The *Transit Fixed Guideway* capital program aims to maintain, replace, and enhance Muni's fixed guideway systems, which support the City's surface transportation, including light rail, trolley coach, streetcar, and historic cable car lines. The program's projects include investments in track replacement, maintenance of Muni's overhead wires and substations, and upgrades to the train control system.

Exhibit 3 details the capital needs identified in SFMTA's 2019 20-Year Capital Plan for all 11 program areas, highlighting the two program areas on which the audit focuses: Transit Optimization & Expansion and Transit Fixed Guideway.

Exhibit 3: The Transit Optimization & Expansion and Transit Fixed Guideway capital programs represent 42 percent of the \$31 billion in SFMTA's 20-Year Capital Plan

Program	Capital Needs ^a (in Millions)	Percentage of Capital Needs	Scope of Capital Program
Transit Optimization & Expansion	\$11,068	36.0%	Optimization and expansion of Muni service for greater connectivity
Fleet	\$5,419	17.6%	Revenue and non-revenue vehicles, such as motor coaches, light rail vehicles, and paratransit vans
Streets	\$4,936	16.0%	Improvements to street safety to promote walking and bicycling
Facility	\$4,599	15.0%	Maintenance facilities for transit, traffic, and parking operations
Transit Fixed Guideway	\$1,755	5.7%	Improvements to critical infrastructure, including rail track, overhead wires, and train control technology
Traffic Signals & Signs	\$1,488	4.8%	Traffic signals and related infrastructure to make streets safer, improve mobility and decrease transit travel time
Parking	\$681	2.2%	Public parking facilities or related street infrastructure
Security	\$557	1.8%	Systems to improve the security of the transportation system
Communications & Information Technology	\$218	0.7%	Information technology infrastructure to improve internal operations and customer experience
Taxi	\$65	0.2%	Improve taxi operation and enhance customer experience
Central Subway ^b	-	-	Muni Metro T-Third Line extension connecting Bayshore and Mission Bay to SoMa, downtown, and Chinatown
Total	\$30,786	100.0%	

Notes:

^a Capital needs included in SFMTA's Capital Plan are unfunded. Once funding is identified, capital projects are included in the CIP. According to SFMTA, approximately 30 funding streams exist for capital projects, with most funding coming from general obligation bonds, revenue bonds, development impact fees, and the general fund.

^b The Capital Plan includes the Central Subway Capital Program as a capital need, but the program is fully funded by a grant from the U.S. Department of Transportation, Federal Transit Administration.

Source: SFMTA 2019 Capital Plan

Capital Improvement Program

In its five-year CIP, SFMTA funds \$1.23 billion across 59 Transit Optimization & Expansion projects and \$557 million across 43 Transit Fixed Guideway projects.³

Project Delivery

Project delivery is the comprehensive process of planning, design, and construction required to execute and complete a capital project. SFMTA's Transit Division oversees both the Transit Fixed Guideway and the Transit Optimization & Expansion capital programs.

Depending on the complexity of the project, staff knowledge, and resourcing, SFMTA projects may be delivered internally by its Capital Programs & Construction Division (Construction Division) or externally by San Francisco Public Works (Department of Public Works or Public Works).⁴

- **SFMTA Construction Division:** The Construction Division provides professional services for the implementation of the CIP. The division's responsibilities in project implementation include design, engineering, project and contract management, contract administration, cost and schedule control, quality assurance, and procurement administration. In fiscal year 2019-20, the division's operating budget was almost \$70 million.
- **Public Works:** Public Works designs, builds, operates, maintains, greens, and improves the City's infrastructure, public right of way, and facilities. The department delivers capital projects on behalf of other city departments, including SFMTA. In fiscal year 2019-20, Public Works had an operating budget of almost \$387 million.

Regardless of the project delivery assignment, SFMTA is highly involved in the project through design, procurement, construction management, and close-out of capital construction contracts. This includes overseeing the work of the construction contractor(s). Also, the Construction Division's project delivery team is expected to work closely with the client⁵ throughout the life of the capital project to operationalize procedures, resolve issues, and minimize construction impacts.

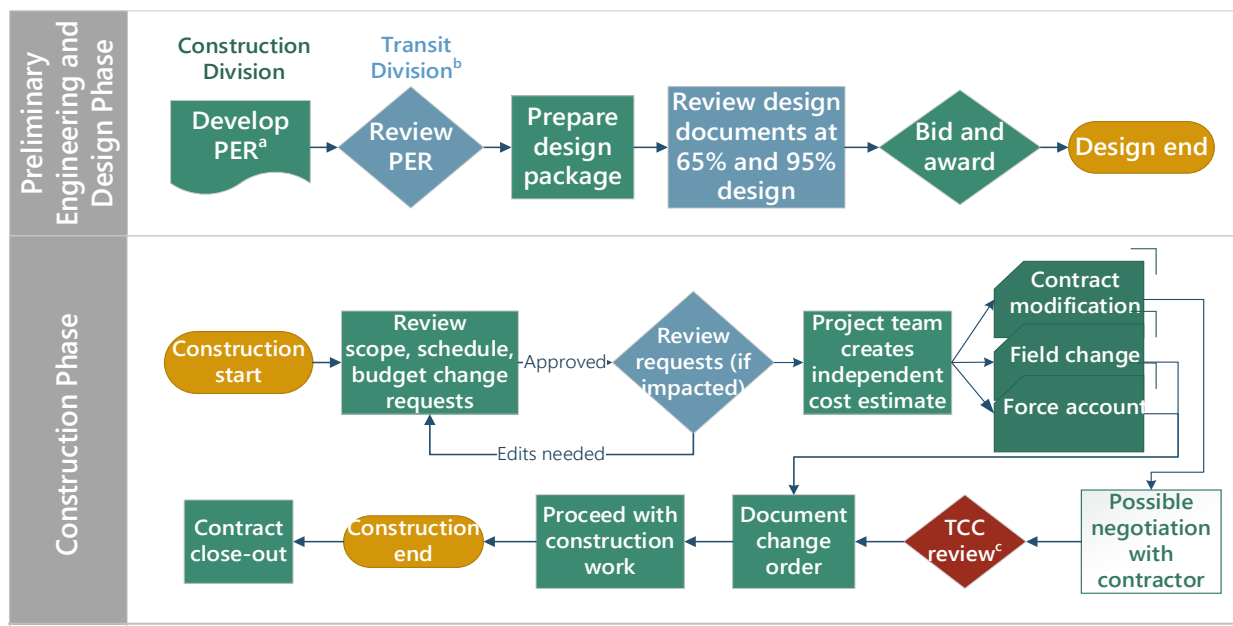
Exhibit 4 shows the project life cycle's phases, from the Preliminary Engineering Report (PER) through contract close-out.

³ SFMTA, *Fiscal Year 2019-2023 Capital Improvement Program*, adopted December 18, 2018.

⁴ According to SFMTA, the Transit Division also delivers operational projects, and the Finance Division delivers systems-oriented projects for the Transit Fixed Guideway and Transit Optimization & Expansion capital programs.

⁵ This audit focuses on Transit Optimization & Expansion and Transit Fixed Guideway projects that are primarily overseen by the Transit Division, which oversees bus maintenance, transit infrastructure management, and transit operations.

Exhibit 4: SFMTA's project life cycle from design through construction



Notes:

- ^a The Preliminary Engineering Report (PER) is the end-product of the investigations, studies, evaluations, and technical decisions that establish the project's completed scope, schedule, and budget.
- ^b The Transit Division is shown as the client because the audit focuses on the Transit Optimization & Expansion and Transit Fixed Guideway programs, which are primarily overseen by the Transit Division.
- ^c The Transportation Capital Committee (TCC) reviews all significant changes in project scope, schedule, or budget throughout the project life cycle, including the design phase. Contract modifications that are not significant project changes bypass this step.

Source: SFMTA Project Operations Manual

OBJECTIVE

The overall objective of the audit was to assess the effectiveness of SFMTA's 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.

SCOPE AND METHODOLOGY

The audit selected four capital projects for review, as shown in Exhibit 5.

Exhibit 5: The audit focused on four capital projects owned by the Transit Division

Project	Description	Budget (in Millions)	Construction Timeline	Service Disruption
Twin Peaks Tunnel Trackway Improvement (Twin Peaks Tunnel)	Replace the track structure in the Twin Peaks Tunnel between the West Portal and old Eureka Valley stations and perform seismic strengthening and structural repairs.	\$86.9	May 2016 ^a – February 2020 ^b	Temporary bus substitution in lieu of regular rail service
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 ^b	Bus stop relocations and transit service changes
UCSF Platform and Track Improvement (UCSF Platform)	Reconfigure track alignment, install new transit signals, and construct a new boarding platform.	\$51.7	April 2018 – October 2019 ^b	Temporary bus substitution in lieu of regular rail service
5 Fulton Outer Route Fast Track Transit Enhancements (Fulton)	Part of the Muni Forward Transit Priority Projects, these involve bus bulbs (curb extensions), new traffic signals, replacing stop signs, and pedestrian improvements.	\$6.1	February 2015 – May 2018	No service disruptions

Notes:

^a Date of notice to proceed for first executed contract for Twin Peaks Tunnel Project.

^b Project end date estimated by SFMTA because project had not yet closed out when audit testing ended. Dates refer to substantial completion, not project close-out. Through October 2019, none of the SFMTA-delivered projects had been closed out. At that time, the earliest estimated close-out date was January 2020.

Source: SFMTA and Public Works sample project documentation; SFMTA Board of Directors calendar items; SFMTA October 2019 Monthly Report; project descriptions on SFMTA website

To conduct the audit, CSA gathered evidence using a variety of procedures and from a range of sources. Specifically, the audit team did the following.

- Interviewed employees serving a variety of functions in CIP planning and capital projects delivery:
 - ♦ SFMTA executive managers
 - ♦ Senior leaders and mid-level managers in the Transit, Construction, and Finance divisions
 - ♦ TCC members
 - ♦ Capital project staff (project engineers, resident engineers, and project managers) for selected projects

- Assessed project documentation for the selected capital projects, including those relevant to design, procurement, and construction:
 - ♦ Preliminary engineering reports
 - ♦ Bid documents
 - ♦ Progress payment documentation
 - ♦ Change order documentation
 - ♦ Contract modification packages
- Distributed a 19-question survey to SFMTA employees with roles in the capital planning and project delivery processes to understand how they perceive the agency's communication, collaboration, and decision-making framework around its capital programs and processes.
- Analyzed additional documents relevant to CIP planning, project delivery, and governance, including frameworks, policies, procedures, project operations manuals, organizational charts, and TCC meeting minutes.
- Contracted with Cumming Management Group, Inc., (Cumming)⁶ to assess cost estimates and preliminary engineering reports for the selected capital projects.
- Interviewed staff of the Airport Commission (San Francisco International Airport), Port Commission (Port of San Francisco), San Francisco Public Utilities Commission, and San Francisco Public Works regarding their departmental practices for capital planning and project delivery. The audit team chose these departments because, along with SFMTA, they have construction contracting authority,⁷ and have a capital planning process that CSA could review.
- Distributed a survey to transportation agencies overseeing transit capital projects of the following U.S. local governments:
 - ♦ City and County of Denver (Colorado)
 - ♦ City of Portland (Oregon)
 - ♦ City of San José (California)
- Identified and reviewed best practices reports and research from the following sources:
 - ♦ 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)

⁶ According to its website, Cumming is a construction consulting company that provides services for the construction industry, including project management, cost management, dispute resolution, and project monitoring.

⁷ Six departments – the Airport Commission, Port Commission, Recreation and Park Commission, San Francisco Municipal Transportation Agency, San Francisco Public Utilities Commission, and San Francisco Public Works – are empowered to contract for public works or related professional services on the City's behalf. They are known as the Chapter 6 departments due to the city Administrative Code chapter that gives them this special authority.

Chapter 1

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

SUMMARY

SFMTA does not adequately hold itself and its employees accountable for effectively collaborating within and across divisions in capital planning and capital project delivery. Individual and agency accountability are two key best practices for collaborating successfully, according to the GAO. Also contrary to best practices, SFMTA's collaboration participants are regularly absent from meetings, express they do not have adequate time or information to make informed decisions, and state that some participants do not feel empowered to make decisions. This ineffective collaboration contributed to cost overruns and schedule delays in three of the four sample projects. Further, SFMTA lacks performance measures for capital planning and project delivery adequate to target process improvement efforts.

Finding 1.1 – Insufficient accountability led to poor communication and collaboration, weakening project delivery and oversight.

SFMTA does not hold its divisions and employees accountable for effective communication and collaboration in capital planning or project delivery. Inadequate collaboration contributed to project delays, budget overruns, and increased costs in three of four projects tested.⁸ 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. Also, the four sample projects had over \$2 million in change orders due to design changes (26 percent of all change order costs), some of which may have been prevented through improved communication and collaboration before contract award.

SFMTA does not hold its employees accountable for communicating or collaborating effectively.

The former director of transportation expressed feeling hindered in holding employees accountable in the absence of an agreed-upon set of expectations or framework for effective communication. Further, many surveyed staff and managers indicate there is no accountability for

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.

For full survey results, see Appendix A.

⁸ The fourth project also experienced collaboration and communication issues, but is expected to be completed within budget.

effective communication (63 percent) and collaboration (68 percent). Exhibit 6 discusses collaboration areas CSA identified as needing greater accountability.

Exhibit 6: SFMTA has implemented some processes to facilitate collaboration, but lack of accountability weakens those efforts

Area Needing Greater Accountability	Collaboration Best Practices Not Met
Ineffective PPAR Process. SFMTA did not leverage the City's Performance Plan and Appraisal Report (PPAR) process to hold senior executives and divisions accountable for cross-division collaboration.	Individual Accountability. Reinforce individual accountability through performance management systems by adding a collaboration-related competency or standard against which individual performance can be measured.
Weakened Transportation Capital Committee (TCC).* Consistent absenteeism, frequent use of proxies, and a lack of empowerment and timely information limit the TCC in its collaborative efforts to create the 20-year capital plan and 5-year CIP and to oversee SFMTA's capital program.	Agency Accountability. Reinforce agency accountability through plans and reports. Agencies that monitor, evaluate, and report the results of collaborative efforts can better identify areas for improvement. Participation. Participants in a collaborative effort need to know of all available resources, can make decisions, and can regularly attend meetings.
Inconsistent Design Reviews. Most design reviews were not completed in accordance with SFMTA policy or best practices.	Communication. Build trust and foster communication. Frequent communication can facilitate working across boundaries to prevent misunderstandings.
Critical Issues Unaddressed. Communication and collaboration issues during project delivery led to risks identified in the design stage of the sample projects not being properly addressed during construction.	
Lack of Trainings to Improve Collaboration. SFMTA could not demonstrate that it provides the necessary resources to support its employees in addressing collaboration deficiencies through training.	Building Organizational Capacity. Building organizational capacity through training improves the ability of agencies to collaborate internally and externally.

* The TCC provides a forum in which SFMTA divisions, including the Construction, Transit, and Finance divisions, can collaborate and exercise oversight, including by reviewing and approving the 20-year capital plan, 5-year CIP, and significant change orders.

Source: GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration Among Federal Agencies*, 2005; GAO, *Managing for Results – Key Considerations for Implementing Interagency Collaborative Mechanisms*, 2012; CSA analysis

Best Practice
Individual Accountability
Agency Accountability
Participation
Communication
Building Capacity
Monitoring Success

Ineffective employee performance plans and reviews contribute to a lack of accountability.

SFMTA's former director of transportation acknowledged to CSA that the agency's senior executives needed to better collaborate and communicate. Although SFMTA completed performance appraisals for the senior managers in the Construction, Transit, and Finance divisions, the PPAR process was not used to establish expectations, set goals, or address weaknesses in communication and collaboration.

Best practices for effective collaboration require holding individuals accountable through a performance management system.⁹ The City's PPAR process is a performance management system that provides an opportunity to annually¹⁰ reflect on opportunities to improve individual performance, establish clear expectations, and set goals and improvement strategies. The former director of transportation stated that he felt hindered in holding management accountable for effective communication and collaboration because there were no agreed-upon expectations or framework against which to measure their performance. However, in the absence of a departmentwide framework, such expectations can be clearly set for each employee through the PPAR process.

Beyond establishing expectations, the PPAR process should be used to set goals and performance improvement strategies. Of nine senior managers' performance appraisals reviewed for the audit, four (44 percent) noted the need to improve cross-division collaboration. However, these documents do not specifically describe the individuals' weaknesses or include improvement strategies. One of the nine appraisals is nearly identical to the employee's previous PPAR, with 15 of 30 sections exactly the same and 5 sections showing only minimal differences.

One employee received nearly identical performance appraisals in consecutive years.

The GAO specifies that agencies can enhance and sustain their collaborative efforts by reinforcing agency and individual accountability. By not leveraging the PPAR process to hold itself accountable for individual and agency performance, SFMTA misses an opportunity to offer greater professional development to its employees and hold them and the entire agency as accountable for effective and efficient operations as possible.

⁹ GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration Among Federal Agencies*, 2005.

¹⁰ In 2005 Mayor Gavin Newsom issued an executive directive instructing city departments to ensure performance planning and appraisals are completed annually for every employee. According to SFMTA's fiscal year 2017-18 annual report, only 44 percent of agency employees had performance plans and only 59 percent had performance reviews in fiscal year 2016-17.



A lack of accountability for attendance by members, timely information sharing, and decision-making weaken SFMTA’s Transportation Capital Committee’s effectiveness in oversight and collaboration.

The SFMTA employees appointed to be TCC members¹¹ do not adequately participate in the committee, hindering collaboration among divisions, undermining the committee’s oversight authority, and lowering its effectiveness.

Minutes of TCC monthly meetings show consistent absences and proxy use. During August 2017 through December 2018,¹² members were absent 14 percent of the time and sent a proxy another 20 percent of the time. Although attendance is mandatory for the committee’s 20 members, every meeting in the 18-month period tested had at least one absence or proxy attending. When the committee voted to approve the 2019-2023 CIP, only 55 percent of the votes were cast by members; one member was absent and eight votes were cast by proxy.

SFMTA’s Capital Plan and Program Policies require TCC members to attend all meetings. If a member cannot attend, they must inform their division director, who will appoint a proxy for that meeting. Best practices¹³ emphasize that the agency must dedicate appropriate resources, including ensuring that participants can regularly attend all collaborative meetings.

Beyond poor attendance, meeting records from January 2013 through October 2018 indicate multiple instances of members stating that they did not have enough time or information before meetings to review materials in order to make informed decisions. Meeting records also show multiple instances of decisions overturned by executive decision or made without involvement of all internal stakeholders. Examples include:

- Members raising concerns about approval of a new capital project, the SFMTA Facility Framework, as they had not been fully briefed on it before the meeting.
- Committee action coming after approval—or being overruled—by the director of transportation or senior executives, such as the schedule change for the Twin Peaks Tunnel Project due to the contract being canceled and rebid.
- Members expressing concern that only SFMTA’s chief financial officer and Transit Division director decided which project budgets to reduce when removing funding from the Nonrevenue Vehicle project.

Further, some interviewed TCC members stated that the former Transit Division director did not empower TCC members from the Transit Division to make decisions for the agency without his approval, which hindered them from collaborating with other committee members to reach

¹¹ This report uses *TCC members* to mean voting members; non-voting members may participate in the Transit Fixed Guideway Program and Security Capital Program Committees.

¹² Only TCC minutes for meetings held during August 2017 through December 2018 included member attendance and proxy attendance. Thus, the audit’s attendance review covers only those months for which attendance was recorded.

¹³ GAO, *Managing for Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, 2012.

decisions. Best practices¹⁴ require participants to have full information about available resources and be empowered to make decisions.

A weakened TCC risks capital needs not being included in SFMTA's 20-year capital plan and inappropriate prioritization of the needs within that plan. Further, it hinders the effective oversight in TCC's role of reviewing and approving changes to project scopes, budgets, and schedules.

Some interviewed employees also stated that the Transit Division's collaboration at TCC meetings noticeably improved after the division came under new leadership. Also, some TCC members report that members have become more comfortable in making decisions for their divisions.

Best Practice
Individual Accountability
Agency Accountability
Participation
Communication
Building Capacity
Monitoring Success

Design reviews, a formal process for cross-division collaboration, were not completed in accordance with best practices or SFMTA policy, resulting in increased costs and delays.

Designated reviewers did not provide review comments for five required design reviews for the sampled projects. Project design reviews are a medium for collaborating and documenting consensus among the project delivery team, the Construction Division, and the Transit Division, which is the project owner. SFMTA policy requires a minimum of two stakeholder reviews, two constructability reviews, and two quality assurance reviews before construction, during the detailed design phase of every project (at the 65 percent and 95 percent design thresholds). Interviewed employees expressed concerns that not having adequate stakeholder design reviews caused design changes during construction.

According to the National Institute of Building Sciences¹⁵ *Whole Building Design Guides*, operations and maintenance personnel—in this case, Transit Division employees—should be involved during planning and design phases to identify maintenance and other requirements that will aid them once the asset is turned over to them. Change orders due to design omissions or changes cost over \$2 million for the sample projects (26 percent of all change order costs).

Exhibit 7 identifies SFMTA's design review policy requirements and SFMTA's adherence to these requirements for each sample project.

Purpose of Design Reviews

Stakeholder Reviews ensure the stakeholders understand the design and functions of the project and that it meets their project requirements, including operational constraints.

Constructability Reviews evaluate the practicality of a project's design from the construction viewpoint.

Quality Assurance Reviews provide control for design procurement and construction and help ensure that the requirements for safe and reliable project operations are achieved.

¹⁴ Ibid.

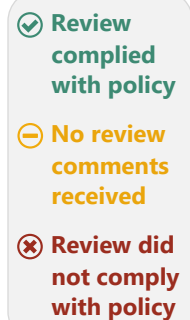
¹⁵ The National Institute of Building Sciences is a nonprofit, nongovernmental organization established by the U.S. Congress with a mission to unite the entire building community in advancing building science and technology.

Exhibit 7: Design reviews for sample projects did not occur or did not comply with most of SFMTA’s policy requirements

SFMTA Policy Requirement	Design Phase	Green Center	Twin Peaks Tunnel	UCSF Platform
The project team will document and prepare responses to all comments. ^a	Stakeholder			
	65%	✓	✓	⊖
	95%	⊖	✗	⊖
	Constructability			
	65%	✓	✗	✗
	95%	✗	✗	✗
	Quality Assurance			
	65%	✓	✗	⊖
	95%	⊖	✓	✓
The project team will make a presentation to stakeholders about the design package.	65%	✓	✗	✓
	95%	✓	✓	✓ ^b
The project manager will re-affirm with stakeholders their support for the project.	65%	✗ ^c	✗ ^c	✗
	95%	✗	✗	✗ ^c
The project team will obtain concurrence (dated initials) from stakeholders for their proposed resolution.	65%	✗	✓ ^d	⊖
	95%	⊖	✗	⊖

Notes:

- ^a Reviews are considered to be noncompliant with policy if the project team did not document a response to all reviewer comments.
- ^b Instead of a presentation, the project team held a “page-turning” of the design package with stakeholders but, contrary to SFMTA policy, did not document any issues identified in the page-turning.
- ^c It is unclear whether the stakeholder presentation reaffirmed the Transit Division’s project support because SFMTA could not provide the presentation.
- ^d The project team’s transmittal of the final design package included the team’s responses to the intermediate review comments, but there is no documentation that the Transit Division signed off on the team’s responses. SFMTA policy states that if the project team provides its responses to stakeholders for concurrence and no feedback or objection is received, all comments are considered closed.



Source: SFMTA Project Operations Manual; CSA analysis of stakeholder review documentation provided by SFMTA

Communication and collaboration challenges led to critical issues identified during design going unaddressed and other issues during construction, contributing to delays and cost overruns.

Communication and collaboration issues within and among SFMTA's Transit, Construction, and Finance divisions during project delivery¹⁶ contributed to cost overruns and delayed the completion of three of the four¹⁷ projects the audit assessed.

The project delivery process requires many types of communication and collaboration. Exhibit 8 highlights the communication and collaboration problems the audit identified in the sample projects.

Exhibit 8: SFMTA's inadequate communication and collaboration in the sample projects contributed to delays and cost overruns

Project	Communication/Collaboration Problem	Impact to Project Cost and Schedule
Twin Peaks Tunnel	Ineffective design reviews contributed to the contract being canceled and rebid.	The cancellation and subsequent rebidding of the contract resulted in \$35 million in additional costs and a project delay of up to 1.2 years.
	The project team did not communicate the need for hazardous material testing and remediation from the preliminary engineering report (PER) through actual construction.	The project included change orders totaling \$523,000 for testing and remediation of hazardous material. However, the ballast was only partially replaced, and the contractor estimated a further \$3 to \$9 million worth of work across 15 to 17 weekends to fully replace the ballast.
Green Center	A communication breakdown caused the final contract to state a duration that was 63 days shorter than the expected schedule that was put out to bid. SFMTA could not explain when or why this occurred.	The 63 days deducted from the schedule in the solicitation document accounts for 18 percent of the total project delays.
Fulton	Public Works' records show that SFMTA was unavailable to provide and did not communicate its availability to provide previously agreed-upon support, such as closing roads and de-energizing Muni lines.	Public Works' records show SFMTA's delays in providing previously agreed-upon support contributed to 620 days of project delays and \$23,000 in change order costs.

Source: Analysis of sample project documentation and interviews of SFMTA managers and project staff

¹⁶ Project delivery is the comprehensive process of planning, design, and construction required to execute and complete a capital project, as discussed in the Introduction.

¹⁷ The fourth project experienced some similar communication and collaboration issues, but is expected to be completed within budget.

Twin Peaks Tunnel

For the Twin Peaks Tunnel Project, communication around the project's scheduled closure of the tunnel and the resulting service disruption was incomplete at various times throughout the project. For instance, the project team documented the Transit Division's design review comments but did not document its own responses to some comments, including ones about the project's shutdown (tunnel closure) schedule. Also, the constructability review raised concerns related to the availability of bus substitutions and the duration of shutdowns, but those concerns were omitted from the final design presentation to Transit Division staff. Ultimately, SFMTA management decided to change the shutdown schedule after awarding the first contract, and rebid it,¹⁸ increasing total project costs by \$35 million (a 68 percent increase) and delaying the substantial completion date by 440 days, from August 2017 to November 2018.

The design phase PER also refers to detection of asbestos and other hazardous materials at the site during previous work and states the track ballast needed to be tested to determine whether it contained hazardous materials. However, this critical issue was not effectively communicated before or during construction, resulting in insufficient testing of the ballast, only partial replacement of the ballast (the cost of which exceeded the allowance by \$270,000), and negotiations with the contractor to later complete further work, which may result in another closure of the tunnel and another significant disruption in service.

Green Center

The Green Center Project had significant schedule and budget overruns in part because the final contract shortened by 63 days the scheduled duration that was included in the bid solicitation document. If the Transit Division disagreed with the engineer's estimated duration, it could have expressed its concerns during intermediate and final design reviews. However, the division's comments for the intermediate review were unrelated to duration, and the division did not provide any comments for the final design review.

Fulton

For the Fulton Project, Public Works records indicate that SFMTA was often unavailable to provide and did not communicate its availability to provide previously agreed-upon support, such as closing roads and de-energizing Muni. This led to significant delays. Best practices¹⁹ state that the ability to work collaboratively requires mutual trust and a shared belief that the partners will carry out their parts of an agreement.

¹⁸ SFMTA reports it attempted to negotiate with the contractor, but the contractor could not meet the revised schedule. The contractor had already begun construction site preparation when SFMTA terminated the contract.

¹⁹ GAO, *Results-Oriented Government*.

Best Practice
Individual Accountability
Agency Accountability
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Monitoring Success

Insufficient training hinders employees in improving collaboration and communication.

Even after acknowledging that collaboration among its units needs improvement, SFMTA could not demonstrate that it provides the necessary resources to support its employees in addressing collaboration deficiencies through training. According to SFMTA, the TCC members received training on communication and collaboration. However, the training was not provided to committee proxies, which is significant because TCC meetings were attended by proxies 20 percent of the time during August 2017 through December 2018. Further, SFMTA could not demonstrate that the training was offered to or required of any other SFMTA employee involved in capital planning and project delivery. Employees of the Construction Division must work collaboratively with those of the Transit Division to develop the 20-year capital plan, develop the 5-year CIP, design and bid projects, and construct projects, making collaboration a skill critical to effective job performance. Best practices specify that building organizational capacity through training helps facilitate agency collaboration.²⁰

Without accountability and professional development to improve collaboration and communication, SFMTA experienced problems in delivering three of the four projects reviewed.

Finding 1.2 – SFMTA does not have adequate capital program performance measures to inform decision-makers or target improvement efforts for capital projects.

SFMTA has not implemented performance measures to monitor the effectiveness of project delivery, hindering its ability to identify areas of improvement and to make informed decisions. According to SFMTA's Strategic Plan, one of the agency's objectives is to "increase the efficiency and effectiveness of business processes and project delivery through the implementation of best practices."²¹ As part of this objective, SFMTA identified three performance measures related to project delivery:

- Percentage of capital projects initiated on time
- Percentage of capital projects completed on time
- Percentage of capital projects completed within budget

The performance measures report in SFMTA's April 2018 strategic plan states that the agency was establishing the fiscal year 2017-18 baseline for these performance measures. However, as of August 2019, the measures were still in development and not implemented.²² SFMTA management attributes the delay in implementing the performance measures to the need to work on the integration of SFMTA's Capital Program Controls System with the City's financial system. SFMTA cannot identify weaknesses or measure success of process improvement efforts for project delivery without implementing meaningful performance measures. According to the Government






²⁰ GAO, *Managing for Results*.

²¹ Strategic Plan adopted April 3, 2018.

²² In December 2019 SFMTA implemented the performance measures tracking the percentage of capital projects initiated and completed on time, but not the measure tracking budget adherence.

Finance Officers Association (GFOA), performance measures are used by governments to collect information about operational activities, achievement of goals, community conditions, or other environmental factors to better understand a situation and make informed decisions. The GFOA recommends all organizations identify, track, and communicate performance measures to monitor financial and budgetary status, service delivery, program outcomes, and community conditions.

Exhibit 9: 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> ^a	<ul style="list-style-type: none"> Schedule projects realistically Deliver projects on schedule 	 ^b
% 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 ^c	<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> ^d	<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 	


Notes:


^a The dashboard provides a single, integrated reporting platform for key performance indicators from across the agency.


^b SFMTA implemented and began tracking this measure in December 2019, after the audit period.

^c The study involves the sharing of ideas and data on CIP implementation and project delivery among several agencies in the state’s largest cities, including Los Angeles, San Diego, San Francisco (Department of Public Works), and San Jose.

^d The tracker assesses how well the agency delivers services and products to its customers.

 **Tracked**

 **SFMTA reports implementation of measure is in progress**

 **Not tracked**

Source: SFMTA Strategic Plan Metrics Report; performance measures from Missouri Department of Transportation and Virginia Department of Transportation; California Multi-Agency CIP Benchmarking Study

As shown in Exhibit 9, SFMTA does not track other performance measures recommended by leading practices or used by other agencies. The GFOA states the use of performance monitoring should be integral to an organization’s decision-making processes. And as evidenced by other agencies, performance monitoring provides key benefits to an organization, such as the ability to track customer satisfaction or assess systemic reasons for change orders.

SFMTA could also track the difference between cost estimates it generates when developing the PER and final cost estimates for procurement. If it had done so, SFMTA might have discovered that its preliminary engineering cost estimates are significantly understated because of missing contingencies, as explained in [Finding 3.2](#).

Furthermore, by not measuring its performance related to delivering projects within budget, SFMTA is less able to monitor areas for improvement, make informed decisions around project delivery, or communicate key information to stakeholders. A publicly available performance measure on the percentage of capital projects completed on time would not only inform internal stakeholders on the adjustments to internal processes that may be needed to achieve performance targets but would also keep external stakeholders, like business owners and city residents, apprised and increase agency accountability. For example, the SFMTA Board's Policy and Governance Committee receives monthly strategic plan performance measures reports as part of its responsibility to monitor the implementation of SFMTA's strategic plan. Not tracking the performance measures in Exhibit 9 hinders the Policy and Governance Committee's ability to oversee whether capital projects are delivered efficiently and effectively.

Recommendations

The San Francisco Municipal Transportation Agency should:

1. Leverage the performance plan and appraisal process by including in evaluations for managers a core competency to set clear expectations, identify clear goals, and hold direct reports accountable for effective communication and collaboration.
2. Require relevant trainings, such as effective communication, group facilitation, project management, and collaboration to all employees involved in the capital planning and project delivery processes.
3. Require trainings related to effective collaboration and communication for key employees involved in capital planning and project delivery, including division directors and Transportation Capital Committee members and designated proxies.
4. Establish baselines and set targets for construction project delivery including, but not limited to, variance from estimated budget and schedule.
5. Adopt additional construction project delivery performance measures identified by leading practices.

Chapter 2

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

SUMMARY

Opportunities exist for SFMTA to improve its project delivery by:

- Adequately evaluating bidder and contractor safety records.
- Ensuring preliminary engineering reports (PERs) contain all key information needed to accurately determine a project's scope, schedule, and budget.
- Improving the classification of change orders to identify areas of process improvement.
- Developing robust document management to ensure compliance with SFMTA's document retention policy.

Throughout the project phases, it is imperative that all project documents are maintained so that they are easily accessible to all project stakeholders. Due to inadequate document management, SFMTA could not provide CSA some requested project documentation either at all or in a timely manner. More effective document management practices would mitigate the risk of losing important project data and ensure pertinent documents could be located as project staff changes over time. The audit identified other key areas of the project life cycle that can be improved to further develop SFMTA's ability to successfully complete projects on time, on budget, and consistent with construction safety best practices.

Design

Cumming reviewed the PERs for three of four projects in the audit sample and concluded that the PERs are missing key information that would help inform decision-makers of the larger implications of a project's schedule, budget, and all potential risks. Further, one project proceeded without a PER, which is inconsistent with industry best practices and implies that a transit project proceeded without a clearly defined scope of work.

Procurement

Upon review of the SFMTA procurement process, CSA found that contractor safety records are not adequately evaluated for the projects included in the audit sample. Therefore, SFMTA cannot ensure contractors have a safe work record, which exposes contractor and city employees to increased risk of injury during the project construction phase.

Construction

SFMTA's classification of change orders generally align with best practices. However, SFMTA does not track when a change order request originates from the project owner (the Transit Division). Because change orders contribute to cost overruns and delays, projects can be more efficient if SFMTA avoids initiating change orders to the extent possible. This is possible only if change orders are appropriately and clearly classified to enhance review and tracking.

Finding 2.1 – SFMTA did not adequately evaluate contractors' safety records in awarding sampled capital contracts and awarded the Twin Peaks Tunnel Project to a contractor with a serious safety violation.

SFMTA did not adequately evaluate bidder safety records for the Twin Peaks Tunnel Project and awarded the contract to a contractor with a serious safety violation. For the other three projects reviewed, SFMTA did not include or consider safety history in the contract selection process.

By not incorporating safety aspects as part of its procurement process, SFMTA cannot ensure contractors have a safe work record, which exposes contractor and city employees to increased risk of injury. For the Twin Peaks Tunnel Project, Cal/OSHA²³ investigated a fatal accident and cited the contractor with serious violations, which the contractor is contesting. Exhibit 10 shows SFMTA's incorporation of safety records into the contract award process for the four sampled projects.

Exhibit 10: 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 ^a	Cal/OSHA Violations From Project?
Green Center	No	No	No
<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>			
Twin Peaks Tunnel ^c	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

Notes:

^a Includes serious or willful closed Cal/OSHA violations issued within ten years of the contract award date.

^b *Citywide Construction: The City Would Benefit From a More Proactive Approach to Construction Safety Management*

^c Analysis is of the Twin Peaks Tunnel Project's second procurement process. Finding 1.1 discusses the Twin Peaks Tunnel Project's multiple procurements.

Source: SFMTA procurement documentation for sample projects; U.S. OSHA's Establishment Search database

SFMTA awarded the contract for the Twin Peaks Tunnel Project to a joint venture of Shimmick Construction (Shimmick) and Con-Quest Contractors Inc. Shimmick had a closed willful violation

²³ The Division of Occupation Safety and Health, administered by the California Department of Industrial Relations. Cal/OSHA's mission is to protect and improve the health and safety of workers in California, which it does, in part, by setting and enforcing safety standards.

cited in August 2011.²⁴ In September 2015 Cal/OSHA's Appeals Board affirmed the violation as serious and willful. This was two years before the contractor asserted in the bid it submitted to SFMTA that it had not been cited for any serious and willful safety violations within the last ten years. According to SFMTA, it reviewed the contractor's safety records and consulted with the City Attorney before moving forward with the contract.

In response to CSA's 2017 audit report, SFMTA concurred with the recommendation to consider contractor safety history as a component in the selection process. Specifically, SFMTA stated that it would consider a contractor's safety history as a component in the selection process when following a Best Value Procurement method and for all other methods of procurement through the responsibility determination.

During questioning in a 2018 Board of Supervisor's Government Audit and Oversight Committee meeting,²⁵ SFMTA was asked about contractors' safety records and stated that contractors submit applications under penalty of perjury, meaning that contractors who knowingly falsify applications or omit information from them could be charged with perjury.²⁶

Finding 2.2 – One of four projects tested did not have a preliminary engineering report, and the remaining three contain errors and exclude key information needed to inform decision-makers of a project's scope, schedule, and budget.

The PERs provided by SFMTA's Construction Division for projects in the audit scope do not include all risks and their associated schedule or cost allowances and could be better formatted for clarity and readability. A PER is a planning document that should provide clear and complete information through detailed discussion and design drawings to inform decision-makers of a project's scope, schedule, budget, and factors that would put a construction project at risk of delay, extended service disruption, or increased project cost.

Decision-makers are not always involved in the technical details of a construction project and rely on the project PER to understand the larger implications of a project's schedule, budget, and all potential risks. CSA contracted with industry expert Cumming to review and conclude on the clarity, completeness, and format of PERs created by the SFMTA Construction Division. According to Cumming, crafting an easy-to-read PER requires:

- Avoiding complicated or undefined jargon.
- Providing appropriate graphics and design drawings.
- Clearly listing risks and including schedule and cost allowances as appropriate.

²⁴ Cal/OSHA classifies violations as regulatory, general, serious, repeat, and/or willful. A violation is classified as serious if there is a realistic possibility that death or serious physical harm could result from the hazard created by the violation. If contested, a violation is not determined to be closed until the Cal/OSHA Appeals Board issues a decision affirming, modifying, or vacating the violation.

²⁵ Meeting of October 17, 2018.

²⁶ A perjury conviction in California may result in a fine of up to \$10,000 and/or up to four years in prison.

SFMTA provided PERs for three of the four sample projects—the Green Center, Twin Peaks Tunnel, and UCSF Platform projects—but provided only planning documents for the Fulton Project because no PER was created for it. Cumming concluded that the three PERs had errors, omissions, or outdated information that understated the project budgets by \$53 to \$61 million (as discussed in Finding 3.2). Also, the PERs did not address factors that could affect the project schedule. These include traffic management, concurrence of multiple construction projects in the same area, and the abatement of hazardous materials. Further, without a PER, the Fulton Project proceeded without key planning steps expected for a capital project.

Exhibit 11 provides examples of the flaws Cumming identified in the sample PERs. [Appendix C](#) includes a full list of the issues.

Exhibit 11: 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>
Aged components	Green Center	Aged components may require maintenance or refurbishment before installation, more frequent maintenance, and earlier replacement. Project schedule delays increase these risks. <i>By the time they were installed, 11 track switches were 10 years old.</i>
Missing supporting documents	UCSF Platform	PERs incorporate information from external reports, such as environmental reviews and geotechnical reports. Attaching these supporting documents to the PER demonstrates due diligence and can enable a more accurate determination of the scope of work by providing stakeholders more comprehensive information.

* The contractor is responsible for preparing as-built drawings, which should show, in red ink, on-site changes made to the work specified on the original construction documents.

CSA asked SFMTA and Public Works to provide a PER for the Fulton Project, but both departments confirmed that this project proceeded without a PER. Based on the function of a PER, Cumming concluded that this project proceeded without:

- A clearly defined scope of work.
- Graphic representation of the work, including as-built drawings.
- Schedule and budget contingencies.
- A logistics plan, including a traffic management plan.
- Initial assessment of required accessibility upgrades by a California Access Specialist.
- Geotechnical, hazardous materials, and other testing, as needed.

SFMTA's current Project Operations Manual contains detailed guidance on creating a PER that includes its purpose and the information it should contain. The previous version of the manual, which was in use when the PERs for the projects in the audit sample were created, has less robust guidance on PER development.

Finding 2.3 – SFMTA should improve its classification of change order categories so it can better identify process improvement efforts.

SFMTA classifies the causes of Design Change Proposals and Proposal Contract Changes (change requests) in a manner generally consistent with practices identified in change order classification research studies but does not track when a change order is caused by an owner-directed (client) request. By not tracking this information, SFMTA cannot quantify the number of change orders caused by client requests and misses an opportunity to further its understanding of the project to improve future project delivery. One study found that client request is the second-leading cause of change orders, behind only design error and omission.²⁷

In contrast to SFMTA, Public Works does track when change orders result from client requests. In the Fulton Project, delivered by Public Works, there were nine change orders caused by client requests, resulting in a net cost increase of \$244,002 and a schedule extension of 615 days. However, because SFMTA does not track whether change orders are caused by client requests, CSA could not quantify the cost or schedule impacts of client requests on the three sample projects delivered by the Construction Division. According to Construction Division staff, there have been instances of Transit Division staff requesting changes during construction that could have been made earlier.

SFMTA Uses the Following Categories to Classify Change Orders:

- ♦ Changes in Operational or Functional Requirements
- ♦ Errors and Omissions in Contract Documents
- ♦ Revised Criteria and/or Codes
- ♦ Material Substitutions
- ♦ Benefits or Savings Through Value Engineering
- ♦ Unforeseen Condition
- ♦ Other – Not Listed

Source: SFMTA Construction Division Proposal Contract Change form




²⁷ R. Killingsworth, D. Olsen, B. Page, *Change Order Causation; Who is the Guilty Party?*, 2012. This study was included in the *Associated School of Construction International Proceedings of the Annual Conference*, which is a venue for academic and industry practitioners to share best practices, current management models, and research findings.

Because change orders contribute to cost overruns and schedule delays, projects will be more efficient if SFMTA reduces the occurrence of avoidable change orders to the extent possible. The four sample projects had 102 change orders, which resulted in increases of \$10 million in costs and 1,307 days of duration.

The study referred to above assessed the classification systems recommended in past research studies to identify a system that reduces overlap between categories and limits the discretion of researchers when sorting the data.^{28, 29} The study, and the studies that it assessed, all recommend different classification systems but agree that a category for client requests should be used. Similarly, the *California Multi-Agency CIP Benchmarking Study*³⁰ also recommends as a best management practice to include client requests in the classification system. All ten cities that participated in the benchmarking study, including San Francisco (as represented by Public Works), indicated that they have implemented this leading practice.

Exhibit 12 shows that SFMTA partially complies with the leading practice of classifying change orders and complies with the other two leading practices recommended in the benchmarking study that CSA determined to be relevant to change order management.

Exhibit 12: 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</i> , <i>unforeseen conditions</i> , <i>owner requests</i> , or <i>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 amount	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.	

 **Complies** with leading practice  **Partly** complies with leading practice

Source: *California Multi-Agency CIP Benchmarking Study*; compliance based on SFMTA Project Operations Manual

²⁸ Ibid.

²⁹ J. O'Brien, *Construction Change Orders: Impact, Avoidance, Documentation*, 1998; H. Johnston, W. Mincks, *Construction Jobsite Management*, 2004; M. Sun, X. Meng, *Taxonomy for Change Causes and Effects in Construction Projects*, 2009.

³⁰ This study involves several of the largest cities in California sharing ideas and data. Participating agencies discuss and track leading management practices to provide themselves a living archive of practices being implemented by peers, lessons learned through their implementation, and potential benefits to be derived if implemented.

Finding 2.4 – SFMTA inadequately manages its documents, risking loss of important project data.

Throughout the audit SFMTA could not produce or had difficulty locating key projects documents. Based on communication with SFMTA, documentation either did not exist, was not retained, or could not be located due to the addition or removal of staff from projects before project completion.

Exhibit 13 shows examples of poor document management related to the sampled projects.

Exhibit 13: SFMTA could not locate or produce key documents for sample projects

Sample Project Chosen by CSA	Document Management Issues
Fulton	Documents that are referenced by and support the PER are absent. Both SFMTA and Public Works are uncertain about the documents they have and their location. Also, although it is the project owner, SFMTA stated that it does not have access to project documents maintained by Public Works.
UCSF Platform	Documents that are referenced by and support the PER are absent.
Green Center	SFMTA did not provide the full third contract modification and could not locate documentation to support that design reviews had been completed or that comments had been adequately addressed.

Source: CSA analysis

SFMTA could not determine whether the project documents never existed or did exist but were not kept. [Finding 2.2](#) discusses issues related to project documents that Cumming could not obtain as part of its review. By not creating or not keeping some required documents for the four projects, SFMTA violated its record retention policy, which states that all documents related to construction must be maintained for at least two years following project close-out.

Effective and efficient document controls are crucial to any construction project. Proper document management ensures construction documents are appropriately stored and are easily accessible when needed. Construction documentation includes project contract drawings, estimates, and every document needed to complete a project. Document management is crucial in construction because, if needed documents are not kept, vital project information can be lost as staff changes occur during and after projects. Further, city departments should document their adherence to contracts and departmental policy and procedures in case of subsequent litigation, audits, or investigations.

Recommendations

The San Francisco Municipal Transportation Agency should:

6. Include and consider contractors' safety records in awarding construction contracts.
7. Verify the safety records submitted by construction contract bidders and review each company's record in the U.S. Occupational Safety and Health Administration's Establishment Search database.
8. Improve its policies to ensure SFMTA preliminary engineering reports include all foreseeable costs and appropriate schedule and cost contingencies, consistent with industry standards.
9. Update its change order policies to include additional categories of reasons for change order requests, consistent with leading practices, and require project teams to categorize the reason(s) for every change order request.
10. Analyze change order data across projects to identify trends and opportunities for improving internal processes.
11. Revise its lessons-learned policies to require project teams to review the cause and effect of change orders and implement a mechanism to ensure the lessons learned are applied in future projects.
12. Ensure all required design reviews occur in compliance with SFMTA's Project Operations Manual and ensure project teams properly document and address all stakeholder comments.
13. Revise its policies to establish centralized document management to ensure project data is maintained, consistent with its records retention policy, and can be easily located.

Chapter 3

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

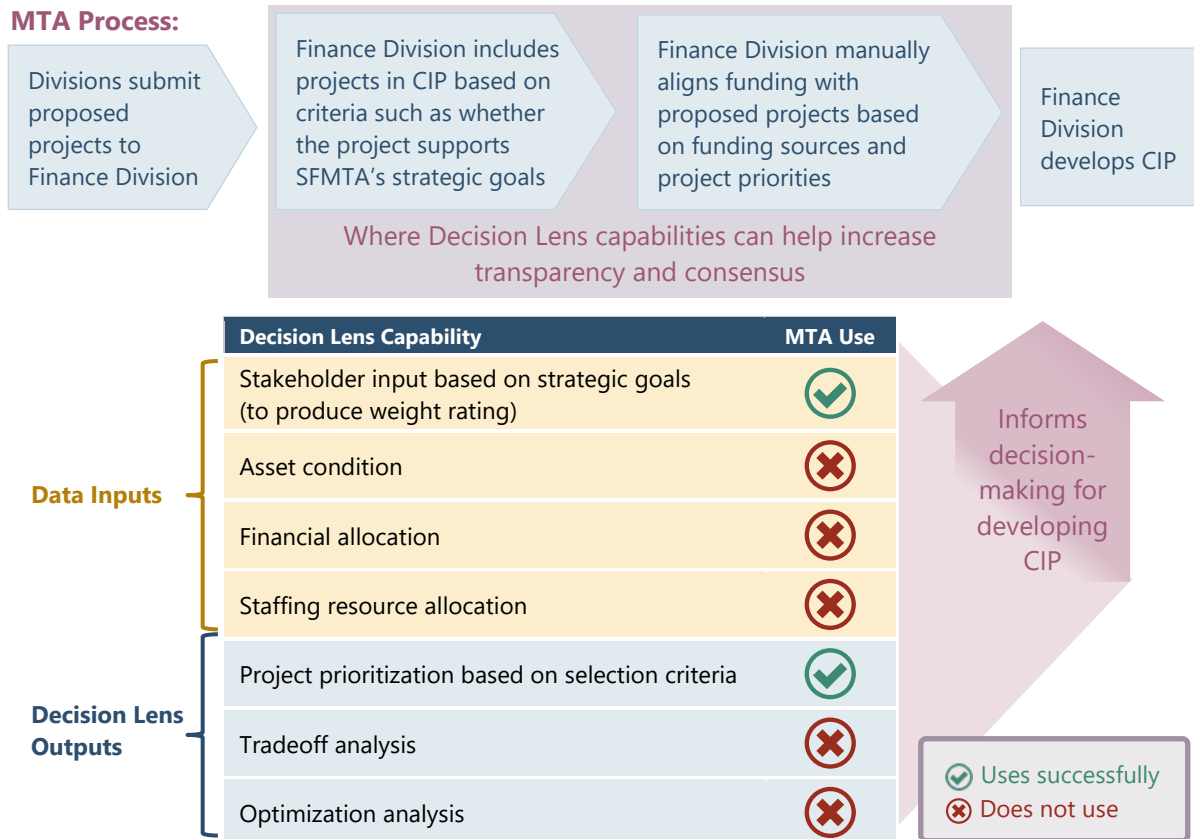
SFMTA does not use all functionality available in its strategic prioritization tool, which the agency could use to improve its project prioritization process. This improvement would result in greater transparency and consensus among stakeholders and allow SFMTA to better align projects with available resources. Furthermore, 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.

Finding 3.1 – SFMTA has not effectively used its strategic prioritization tool to improve its prioritization of capital projects, increase transparency, or improve consensus among stakeholders.

SFMTA does not effectively use its strategic prioritization tool, Decision Lens, despite spending more than \$500,000 on this software during 2011 through 2019. Improved use of Decision Lens would better support the agency in making data-driven decisions on the prioritization of capital investments, increasing transparency of the CIP development process and increasing the likelihood of consensus among stakeholders.

After SFMTA stakeholders expressed frustration over uncertain priorities related to the agency's strategic and capital planning, in 2011 SFMTA acquired and implemented Decision Lens, intending it to become an integral part of the agency's capital and strategic planning processes. The goal was to enable stakeholders to use the tool to better understand each other's interests and the agency's goals and to facilitate productive discussions among stakeholders to help set priorities and make trade-off decisions. However, as shown in Exhibit 14, SFMTA has not incorporated asset, financial, or staffing resource data into Decision Lens as part of its strategic prioritization of projects.

Exhibit 14: SFMTA does not use all functionality available in Decision Lens to prioritize its capital investments



Source: CSA analysis of interviews with SFMTA staff, SFMTA policies, and Decision Lens documents

According to SFMTA, it has only used Decision Lens to rank potential capital investments based on formal criteria from its strategic plan as part of its 20-year Capital Plan. However, the agency did not incorporate asset condition, financial, or staffing resource data into Decision Lens to fully use its capabilities. Further, SFMTA intended that it would use the tool to inform the allocation of resources to develop the 2-year capital budget.

Although the agency used Decision Lens to prioritize its capital needs for the 2015 20-year capital plan based on its strategic plan goals, it has not used the tool to develop its CIP or capital budget. The lack of key data—including asset, financial, and staffing resource data—in Decision Lens hinders SFMTA’s ability to allocate its finite resources to potential capital investments as efficiently and effectively as possible. For example, SFMTA could use Decision Lens to simulate a range of budgeted funding levels and resource constraints to determine the key tradeoffs among the prioritized projects. The agency could also use it to further maximize the value of its portfolio of projects by evaluating project schedules and the projects’ interdependencies.

The Government Finance Officers Association states that the use of appropriate technology during the capital planning and management process can enhance collaboration and improve management

of the capital program by providing timely, relevant, and complete information to all stakeholders.³¹

Also, other government organizations use strategic technology to plan and prioritize their capital investments. The San Francisco Bay Area Rapid Transit District uses Decision Lens to rank the importance of projects in real time against established parameters and incorporates information about costs and assets in the tool. State and local governments such as the Texas Department of Transportation and Austin (Texas) Capital Metro report that they use Decision Lens for capital investment prioritization and optimal resource allocation. By effectively using this tool, on which it has spent more than \$500,000, SFMTA can bring more clarity and transparency to its capital planning processes.

Finding 3.2 – SFMTA develops inaccurate project cost estimates in preliminary engineering reports, which increases the risk of cost overruns and schedule delays.

Based on an analysis of three PERs, SFMTA significantly underestimates the costs of its capital projects. For the three sample projects reviewed, Cumming estimates that SFMTA may have underestimated costs by a total of at least \$53.5 million, or more than 40 percent of the projects' combined estimated costs. These inaccuracies hinder SFMTA's ability to fully understand its capital budget needs and increase the risk of cost overruns for its capital projects. Exhibit 15 shows SFMTA underestimated the project budgets for three of the four sample projects by a total of \$53.5 to \$60.5 million.³²

Exhibit 15: SFMTA's preliminary engineering cost estimates are inaccurate

Project*	SFMTA Estimate <i>(In millions)</i>	Costs Not Included <i>(In millions)</i>
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

Source: Cumming's review of cost estimates in SFMTA PERs

Cumming identified multiple reasons why, at the preliminary engineering stage, SFMTA significantly underestimated the costs of the three sample projects. As discussed in [Finding 2.2](#), Cumming found that PERs and project scopes used assumptions or did not include key information that would have yielded higher, and more accurate, cost estimates. For example:

- **The UCSF Platform** preliminary engineering cost estimate did not budget for worst-case scenarios. This caused SFMTA to underestimate the project's costs by up to \$1 million. Further, omissions related to temporary barriers, maintenance, and traffic control caused SFMTA to understate the project's cost estimate by \$1.5 to \$2 million of related costs.

³¹ Government Finance Officers Association, *Technology in Capital Planning and Management*, 2011.

³² CSA did not include the fourth project (Fulton) because Public Works designed the project, so the Construction Division did not develop a preliminary engineering cost estimate for it.

- **The Twin Peaks Tunnel** preliminary engineering cost estimate included only up to \$305,000 for remediating hazardous material³³ SFMTA identified as likely to be present, when the estimate should have included \$1 to \$2 million for this purpose. Through June 2018, hazard abatement for the tunnel had resulted in \$523,000 in costs for partial replacement of the hazardous ballast. The contractor estimated a further \$3 to \$9 million was required to fully replace the ballast.

Besides the problems illustrated by the examples above, SFMTA did not always follow industry standards when developing its preliminary engineering cost estimates. For instance, Green Center's cost estimate did not include the costs of general conditions, general requirements, bonds and insurance, or a contractor fee for its prime contract. Cumming estimated that, all together, these items could have increased the cost of the construction contract by an additional 37 to 42 percent, or more than \$8 to \$9.2 million. Similarly, the Twin Peaks Tunnel estimate did not include the cost of general conditions or general requirements in the construction contract, which would have increased the cost of the contract by 22 to 26 percent (or \$5 to \$6 million). Furthermore, the cost estimate for all three projects either did not include or understated the contingency costs needed to cover unexpected issues that may occur, a commonly included item in construction cost estimates. Appendix C gives a comprehensive overview of issues that Cumming identified regarding SFMTA's preliminary engineering costs for the three sample projects.

The nature of these problems indicates that the primary cause of large inaccuracies in SFMTA's preliminary engineering cost estimates is that they are developed by staff that may not have specific experience or knowledge of professional cost estimating. According to SFMTA, it uses employees in various project manager, engineer, and architect job classifications to develop cost estimates for projects during the engineering phase. SFMTA stated that it does not specifically require these employees to have specific training or certifications in cost estimating. CGR Management Consultants also found similar issues in its 2011 audit of SFMTA's capital programs. According to the report of that audit, "the process for preparing CIP estimates does not provide a sound basis for making critical decisions about new projects and should be supported by professional estimators."

Other jurisdictions include or require professional estimating experience as a prerequisite for developing project estimates. For example, the U.S. General Services Administration's Office of the Chief Architect requires professional cost estimators to prepare capital project estimate submissions and states that one way to demonstrate an estimator's qualifications is a certification through the Association for the Advancement of Cost Engineering (AACE) or the American Society of Professional Estimators. Also, the San Francisco Public Utilities Commission states that it develops cost estimates in accordance with expected accuracy levels set by the AACE.

³³ The PER's cost estimate for remediating hazardous material is unclear because portions of the estimate are in two locations and bundled with other costs. Combining both portions, the estimate includes an allowance of up to \$305,000 for remediating hazardous materials.

Recommendations

The San Francisco Municipal Transportation Agency should:

- 14.** Use Decision Lens, or similar strategic prioritization tools, to implement more data-driven decision-making in the development of its five-year Capital Improvement Program.
- 15.** Ensure its strategic prioritization tool incorporates data such as funding, staffing needs, and asset condition to develop a more accurate Capital Improvement Program.
- 16.** Ensure employees who are involved in preparing project cost estimates have the appropriate knowledge, skills, and abilities to develop accurate capital planning estimates. Alternatively, contract with professional cost estimators to create estimates for large capital projects.

Appendix A

SFMTA Employee Survey Results

CSA surveyed staff in SFMTA's construction, transit, and finance divisions to understand how employees perceive the agency's communication, collaboration, and decision-making framework around its capital planning processes. CSA asked a sample of 46 managers and staff to respond to the anonymous survey. All employees received the same questionnaire and 33 (72 percent) responded.

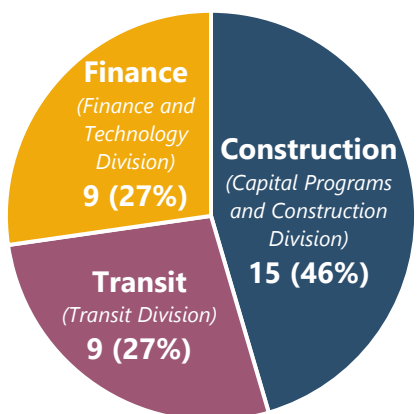
This appendix summarizes the responses by:

- **Demographics** of the respondents (Questions 1 to 3)
- **Collaboration** within and across divisions (Questions 4 to 6)
- **Accountability** for communication and collaboration (Questions 7 to 9)
- **Communication** within and across divisions (Questions 10 and 11)
- **Decision-making** in the capital planning process (Questions 12 to 15)
- **Effectiveness** of employees and the Transportation Capital Committee in carrying out responsibilities (Questions 16 and 17)

Note – Responses of *do not know* are omitted from the visuals and total number of respondents (n) for each question.

Demographics

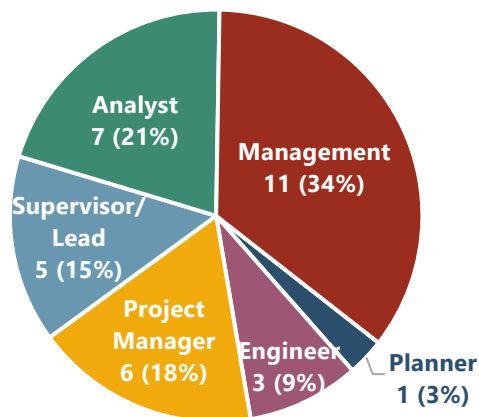
1. In which division of SFMTA do you currently work? (n=33)



2. How many years have you worked in this division? (n=33)

<1 year	1 (3%)
1-5 years	19 (58%)
>5 years	13 (39%)

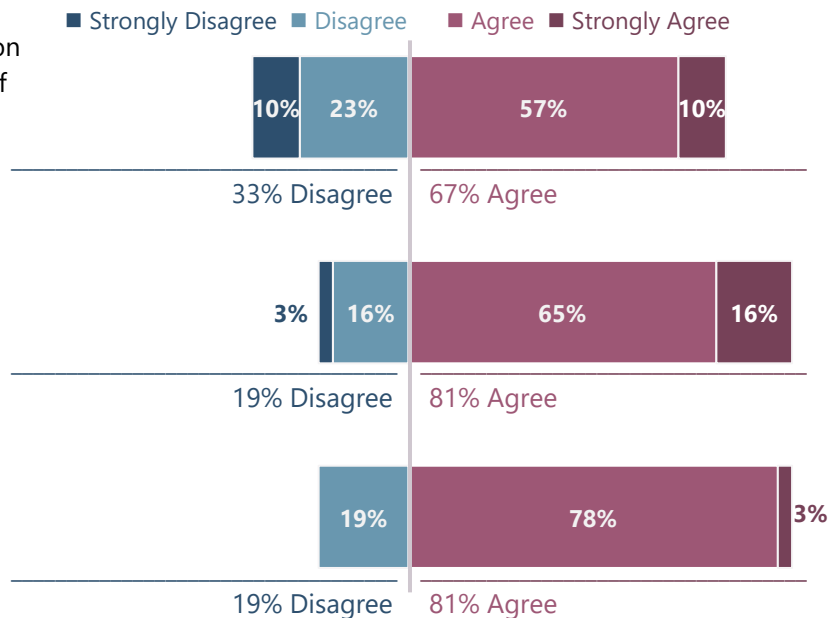
3. What type of employee are you? (n=33)



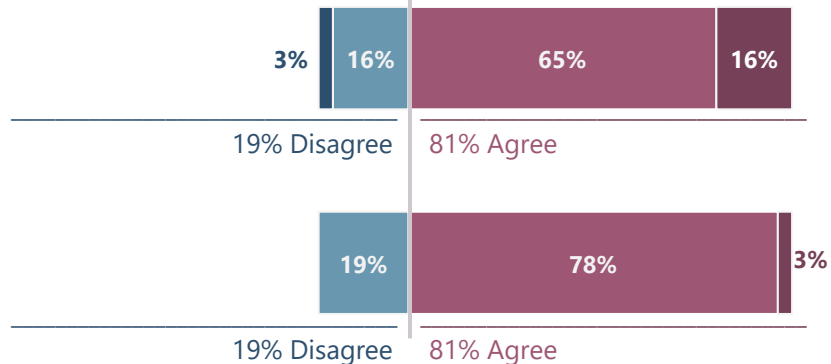


COLLABORATION

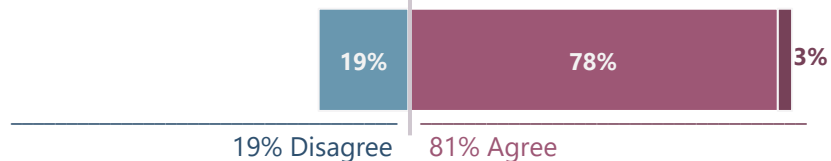
Q4. Managers in my organization actively model SFMTA's value of collaboration and take a leadership role. (n=30)



Q5. People in my division collaborate well with each other to achieve work goals. (n=32)

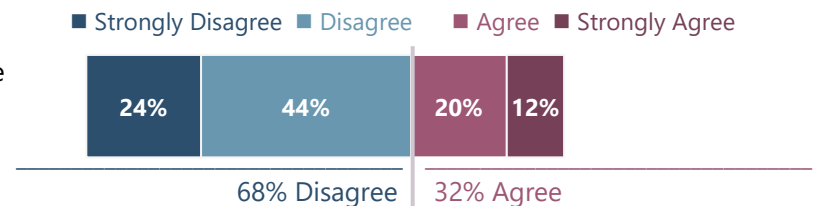


Q6. People in my division collaborate well with people in other divisions to achieve work goals. (n=31)

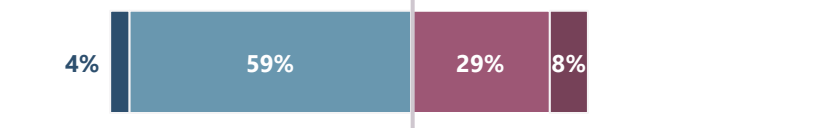


ACCOUNTABILITY

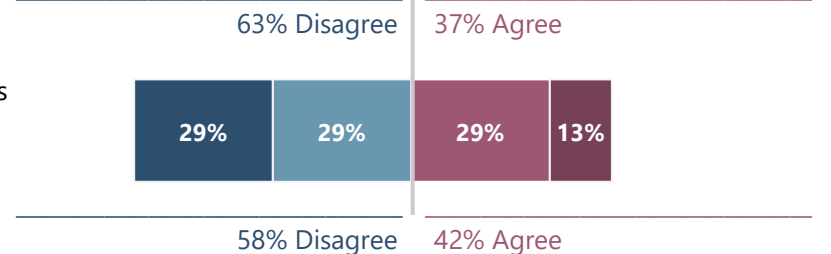
Q7. The organization holds its managers and staff accountable for working collaboratively as a team. (n=25)



Q8. The organization holds staff and managers accountable for communicating openly and constructively. (n=24)

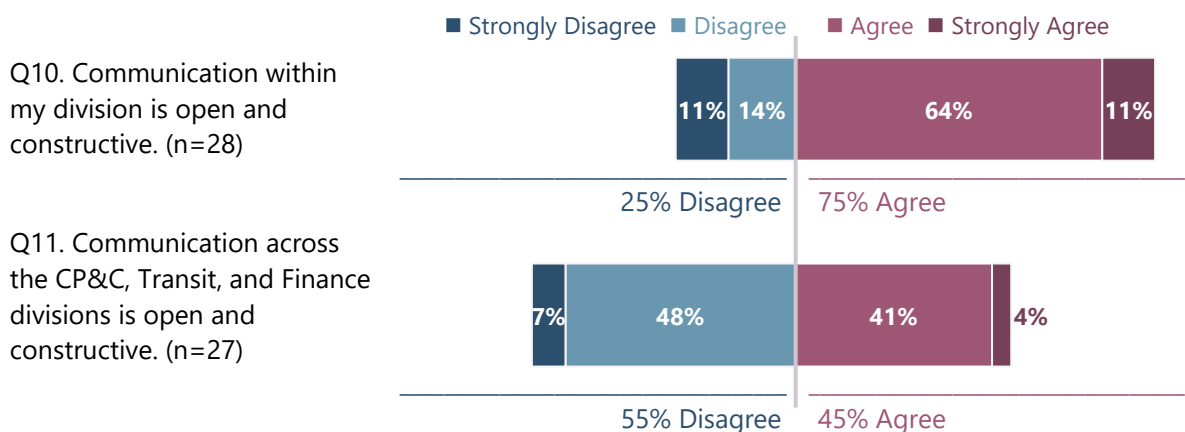


Q9. The organization holds decision-makers accountable for fulfilling their responsibilities related to critical capital planning and project delivery activities. (n=17)





COMMUNICATION

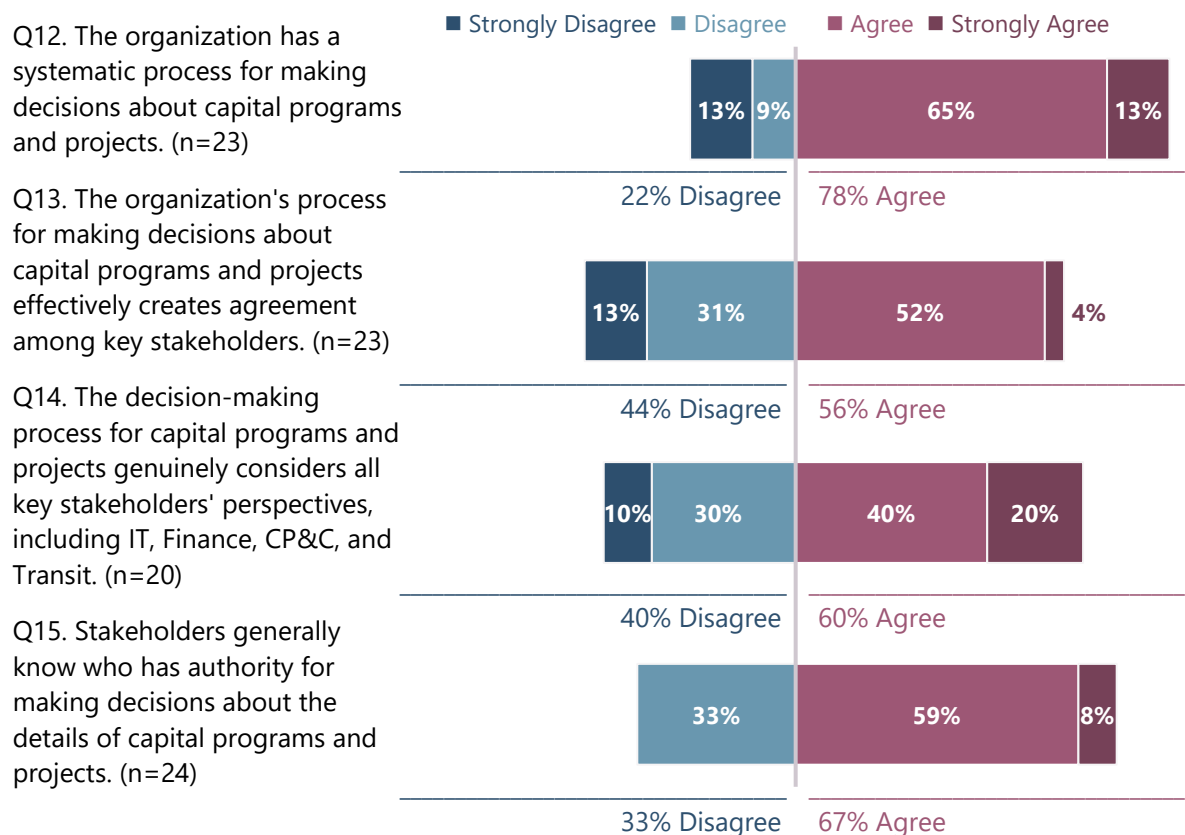


Not all respondents were asked the following questions (questions 12 to 17).

Respondents were presented with the following questions only if they responded that they are involved in the [development of SFMTA's Capital Plan or Capital Improvement Program](#). Of 33 total respondents, 25 (76 percent) responded that they are involved.



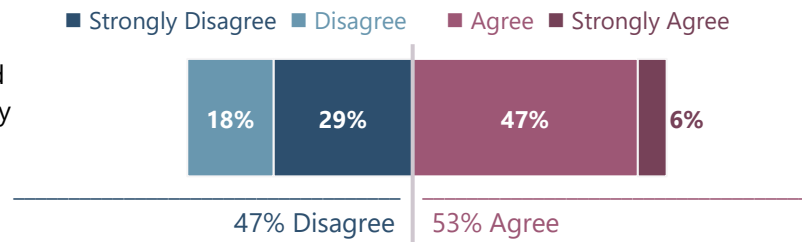
DECISION-MAKING



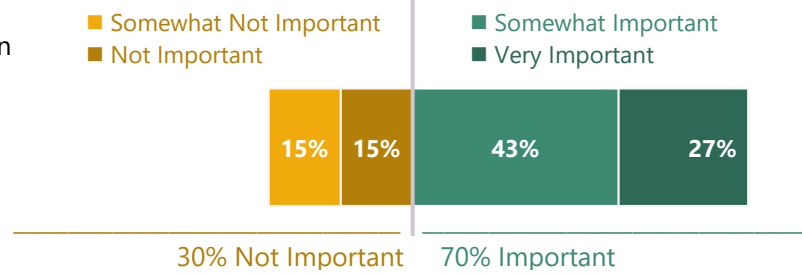


EFFECTIVENESS

Q16. People in critical roles related to capital planning and project delivery can adequately carry out their responsibilities. (n=17)



Q17. In your experience, how important is the Transportation Capital Committee for a successful capital project delivery? (n=26)



Appendix B

Benchmarking Results

CSA gathered information by distributing a benchmarking survey to other city departments and transportation departments of other cities. Specifically, CSA distributed the survey to divisions that manage capital projects to gather information about the organization's capital planning and project delivery processes.

City departments: CSA interviewed departmental staff and distributed a survey to four city departments, all of which responded. Also, CSA asked follow-up questions to seek additional information based on the initial survey responses. CSA surveyed the following departmental capital project delivery divisions:³⁴

- Airport – Planning, Design, and Construction Division
- San Francisco Public Works – Building, Design, and Construction Division
- Port of San Francisco – Engineering Division and Project Management Office
- San Francisco Public Utilities Commission – Infrastructure Division

Other cities: CSA received completed survey responses from three (60 percent) of five cities contacted.^{35,36} Also, CSA asked follow-up questions to seek additional information based on initial survey responses. CSA surveyed the following capital project delivery divisions of other local governments:

- City and County of Denver – Department of Transportation & Infrastructure
- City of Portland – Bureau of Transportation
- City of San José – Department of Transportation

Benchmarking Responses from City and County of San Francisco Departments

City Department	Abbreviation	
Airport	AIR	
San Francisco Public Works	DPW	
Port of San Francisco	PRT	
San Francisco Public Utilities Commission	PUC	

³⁴ The Airport, Port, and Public Utilities Commission have internal capital project delivery functions. Public Works delivers capital projects for client departments citywide, including those with internal delivery functions.

³⁵ CSA contacted the Capital District Transportation Committee of the Albany-Schenectady-Troy and Saratoga Springs metropolitan areas, but determined it is not a good candidate for benchmarking because its operations are dissimilar to San Francisco's. Also, CSA distributed the survey to the San Francisco Bay Area Rapid Transit District (BART) and did not receive a completed response due to many of the questions not being applicable to their operations. However, CSA conducted a benchmarking inquiry with BART by phone and e-mail.

³⁶ The cities of Seattle (Washington) and Dallas (Texas) did not respond.

1. Which stakeholders are involved in the capital planning processes below?

	Identifying Capital Needs	Developing Long-Term Capital Plan	Developing Short-Term Capital Plan	Capital Budgeting	Prioritizing Capital Projects	Not Applicable
Project owner	AIR DPW PRT PUC	AIR DPW PRT PUC	AIR DPW PRT PUC	AIR DPW - PUC	AIR DPW PRT PUC	- - - -
Project manager	- DPW - PUC	- DPW - PUC	- DPW - PUC	- DPW - PUC	- DPW - PUC	AIR ^a - PRT -
Project engineer/ architect	AIR DPW - -	AIR DPW - -	AIR DPW PRT -	- DPW - -	- DPW PRT -	- - - PUC ^b
Capital finance unit	- DPW - -	- DPW PRT -	- DPW PRT -	AIR DPW - PUC	AIR DPW PRT -	- - - -
Procurement unit	- - - -	- - - -	- - - -	- - - -	- - - -	AIR DPW PRT PUC
Executive management (of project owner)	AIR DPW PRT PUC	- DPW PRT PUC	- DPW PRT PUC	- DPW - PUC	- DPW PRT PUC	- - - -
Executive management (of project delivery unit)	AIR ^a DPW PRT -	- DPW PRT PUC	- DPW PRT PUC	- DPW - -	- DPW PRT -	- - - -
Oversight board	- DPW - -	AIR ^c DPW - -	AIR ^c DPW - -	- DPW - -	- DPW - -	- DPW PRT PUC

Notes:

^a AIR stated that project managers and executive management play a support role in the capital planning process.

^b PUC stated that engineers and architects are not highly involved in the listed processes, but help refine estimates.

^c The Airport Commission approves AIR's long-term and short-term capital plan.





2. Which stakeholders are involved in the construction processes below?

	Design	Engineering	Procurement	Change Orders	Close Out	Not Applicable
Project owner	AIR DPW PRT PUC	- - - -	- DPW - -	AIR DPW - PUC	- DPW - PUC	- - - -
Project manager	- DPW PRT PUC	- DPW PRT PUC	AIR DPW PRT PUC	AIR DPW PRT PUC	AIR DPW PRT PUC	- - - -
Project engineer/ architect	AIR DPW PRT PUC	AIR DPW PRT PUC	- DPW PRT -	AIR DPW PRT PUC	- DPW PRT -	- - - -
Capital finance unit	- - - -	- - - -	- DPW - -	AIR - - PUC	- DPW - -	- - PRT -
Procurement unit	- - - -	- - - -	AIR DPW PRT PUC	- DPW - -	- - - -	- - - -
Executive management (of project owner)	- DPW PRT -	- DPW - -	- DPW PRT -	- DPW - -	- DPW - -	AIR - - PUC
Executive management (of project delivery unit)	- DPW PRT -	- DPW - -	- DPW PRT -	- DPW - -	- DPW - -	AIR - - PUC
Oversight board	- - - -	- - - -	- - PRT -	- - PRT -	- - - -	AIR DPW - PUC

Additional comments about stakeholder involvement during construction processes:





- **PUC:** Division directors sign off on a design criteria report that nails down criteria, scope, schedule, budget, levels of service, and other key project information.
- **AIR:** Project owners are involved in a review capacity and their opinions are incorporated in the final product if they are feasible. Project managers and engineers sometimes play a support role in processes that are not their direct responsibility. Executive management of project owners and project deliverers become involved when there are major changes on the programmatic or portfolio level. The Airport Commission must approve large contract change orders.
- **DPW:** Capital Finance is involved at project initiation, finish, and if budget issues arise. Executive management of DPW and the project owner would be involved if items exceed project parameters. Executive management of DPW plays a support role throughout the construction process.

3. How much do the following items inform your department's prioritization of capital projects?










	A Lot	Somewhat	A Little
AIR 	<ul style="list-style-type: none"> ♦ Policies and procedures ♦ Asset condition assessment ♦ Executive management directive 		<ul style="list-style-type: none"> ♦ Oversight board meetings: input from board members ♦ Oversight board meetings: input from members of the public
PRT 	<ul style="list-style-type: none"> ♦ Policies and procedures ♦ Asset condition assessment ♦ Executive management directive 	<ul style="list-style-type: none"> ♦ Oversight board meetings: input from board members ♦ Oversight board meetings: input from members of the public 	<ul style="list-style-type: none"> ♦ Coordination with other agencies' construction activities
PUC 	<ul style="list-style-type: none"> ♦ Policies and procedures ♦ Asset condition assessment 	<ul style="list-style-type: none"> ♦ Oversight board meetings: input from board members ♦ Oversight board meetings: input from members of the public ♦ Executive management directive ♦ Coordination with other agencies' construction activities 	
DPW 	<ul style="list-style-type: none"> ♦ Asset condition assessment ♦ Executive management directive ♦ Oversight board meetings: input from board members ♦ Oversight board meetings: input from members of the public ♦ Coordination with other agencies' construction activities 	<ul style="list-style-type: none"> ♦ Policies and procedures 	

Note: Because the Airport does not share its location, coordination with other agencies' construction is not a factor.





4. Does your department use an analytical tool to prioritize capital projects? If so, what is the name of the tool and how is it used to inform prioritization of projects?

Yes	AIR 	An internal spreadsheet is used for the prioritization process. The Airport's process of capital prioritization is facilitated by its Business and Finance division. Criteria are defined and established, a matrix is used to evaluate projects against the criteria, scored by management, and then ranked. The result is a final list of projects that is recommended for approval. Finance and executive management may further refine the projects on this list.
	DPW 	Internal project progress tracking dashboards, regular communication with client departments, and the Capital Planning Committee.
	PRT 	Internal spreadsheets.
	PUC 	Oracle's Primavera Unifier is the analytical and management tool that includes information on all projects on the <i>wish list</i> . Enterprise divisions use this tool to help rank and prioritize projects. Business Services then summarizes and reports this information for the rest of the agency.





5. Which procurement method(s) does your department use in its construction contract award decisions?

Best value			Low bid				Negotiated	
AIR 	DPW 	PRT 	AIR 	DPW 	PRT 	PUC 	AIR 	DPW 
Other			DPW: Construction Manager/General Contractor, Job Order Contracting PRT: Construction Manager/General Contractor					

6. Does your department consider contractors' past performance when deciding on construction contract awards?

Yes	AIR 	Past performance can be one factor in consideration during the contractor selection process for design-build and Construction Manager/General Contractor delivery method projects. Past performance is not a consideration in design-bid-build projects.
	DPW 	Will consider past performance through pre-qualified vendor pools. They also ensure bids are responsive and responsible. DPW is building a system to monitor and rate contractors for the City and plans to start applying this system to contracts this year.
	PUC 	PUC will generally try to create pre-qualified pools of contractors for larger or more complex projects. PUC will also verify the past experiences reported by contractors.
No	PRT 	Port does not have a systematic process for verifying contractor safety or contractor's past performance as part of the procurement process. DPW is leading the citywide effort and negotiating with contractors' representatives about how such a performance database would be implemented.





7. How often does the project delivery unit use the following communication methods to provide project updates to the project owner?

	Weekly	Monthly	As needed	Not used
AIR 	♦ In-person meetings	♦ Update reports	♦ Phone/video meetings ♦ E-mail ♦ Project management software	-
DPW 	-	-	♦ In-person meetings ♦ Phone/video meetings ♦ E-mail ♦ Update reports ♦ Project management software	-
PRT 	♦ E-mail	♦ In-person meetings	♦ Phone/video meetings ♦ Update reports ♦ Project management software	-
PUC 	-	♦ Update reports	♦ In-person meetings ♦ Phone/video meetings ♦ E-mail	♦ Project management software

8. Which entity is responsible for providing updates to the oversight board?

Project owner	-
Project delivery unit	AIR PUC
Both	DPW: (for example, DPW would work with the Fire Department to update the Fire Commission) PRT

9. Does your agency formally capture lessons learned?

Yes			No, but planning to in the next two years
DPW 	PRT 	PUC 	AIR 
<p>Additional comments about lessons learned:</p> <ul style="list-style-type: none"> ■ DPW: Uses a formal lessons-learned system that documents project teams' lessons learned. There are also STAT meetings where employees exchange information about projects with each other. The close-out session of a project often functions as a lessons-learned session, as well. These sessions allow for 360-degree reviews among a client, contractor, and service provider, and (results are) captured in a report form. ■ PRT: Uses a spreadsheet to track lessons learned. Port is implementing a lessons-learned workshop process. ■ AIR: Director is trying to implement a more formal lessons-learned process, potentially in SharePoint. 			

10. What resources help your department guide capital project delivery?

Responses included a mixture of the following resources:

- Agency policies and procedures specific to capital projects
- Jurisdiction-wide laws, policies, and procedures on capital projects
- Project Management Institute's *Project Management Body of Knowledge (PMBOK)* or other similar guidelines
- Project Management Institute's *The Standard for Program Management Guide* or other similar guidelines
- U.S. Department of Transportation or Federal Transit Administration guidelines
- Looking to sister agencies for comparison
- Tri-agency benchmarking study by the State of California's three largest public works agencies

Benchmarking Responses From Other Cities

1. Which stakeholders are involved in the capital planning processes below?

	Identifying Capital Needs	Developing Long-Term Capital Plan	Developing Short-Term Capital Plan	Capital Budgeting	Prioritizing Capital Projects	Not Applicable
Project owner	Denver Portland San Jose	Denver Portland San Jose	Denver Portland San Jose	Denver Portland San Jose	Denver Portland San Jose	- - -
Project manager	- - -	- - -	Denver Portland -	Denver Portland San Jose	Denver Portland -	- - -
Project engineer/ architect	- - -	- - -	- - -	- Portland San Jose	Denver - -	- - -
Capital finance unit	Denver Portland -	- Portland -	Denver Portland -	Denver Portland -	Denver - San Jose	- - -
Procurement unit	- - -	- - -	Denver - -	Denver - -	- Portland -	- - San Jose
Executive management <i>(of project owner)</i>	Denver Portland -	Denver Portland -	Denver Portland -	Denver Portland -	Denver Portland San Jose	- - -
Executive management <i>(of project delivery unit)</i>	Denver Portland -	Denver Portland -	Denver Portland -	Denver Portland San Jose	Denver Portland -	- - -
Oversight board	Denver - -	Denver Portland -	Denver Portland -	Denver Portland -	Denver - -	- - San Jose

2. Which stakeholders are involved in the construction processes below?

	Design	Engineering	Procurement	Change Orders	Close Out	Not Applicable
Project owner	Denver - San Jose	Denver - San Jose	Denver - -	Denver - -	Denver Portland -	- - -
Project manager	Denver Portland San Jose	Denver Portland San Jose	Denver Portland -	Denver Portland -	Denver Portland San Jose	- - -
Project engineer/ architect	Denver Portland -	Denver Portland San Jose	Denver Portland San Jose	Denver Portland San Jose	Denver Portland San Jose	- - -
Capital finance unit	- - -	- - -	Denver Portland -	Denver - -	Denver - -	- - San Jose
Procurement unit	- - -	- - -	Denver Portland San Jose	- Portland -	- - -	- - -
Executive management (of project owner)	Denver Portland San Jose	Denver - -	Denver Portland -	Denver - -	Denver Portland -	- - -
Executive management (of project delivery unit)	Denver Portland -	Denver Portland -	Denver Portland San Jose	Denver Portland -	Denver Portland -	- - -
Oversight board	- - -	- - -	Denver - -	- - -	- Portland -	- - San Jose

Additional comments about stakeholder involvement during construction processes:

- San Jose does not have an oversight board for capital projects or a capital finance unit. However, it has a budget office that is involved at various steps in the project. San Jose's City Council is the board but typically is not deeply involved in capital projects and does not regularly have oversight but does approve projects at certain milestones.

3. How much do the following items inform your agency's prioritization of capital projects?

	A Lot	Somewhat	A Little
Denver	<ul style="list-style-type: none"> ♦ Policies and procedures ♦ Asset condition assessment ♦ Oversight board meetings: input from board members 	<ul style="list-style-type: none"> ♦ Oversight board meetings: input from members of the public ♦ Executive management (of project owner) ♦ Executive management (of project delivery unit) ♦ Coordination with other agencies' construction activities 	
Portland	<ul style="list-style-type: none"> ♦ Policies and procedures ♦ Asset condition assessment ♦ Oversight board meetings: input from members of the public ♦ Executive management (of project owner) 	<ul style="list-style-type: none"> ♦ Oversight board meetings: input from board members ♦ Executive management (of project delivery unit) ♦ Coordination with other agencies' construction activities 	
San Jose	<ul style="list-style-type: none"> ♦ Policies and procedures ♦ Executive management (of project owner) 	<ul style="list-style-type: none"> ♦ Asset condition assessment ♦ Oversight board meetings: input from board members ♦ Executive management (of project delivery unit) ♦ Coordination with other agencies' construction activities 	<ul style="list-style-type: none"> ♦ Oversight board meetings: input from members of the public

4. Does your department use an analytical tool to prioritize capital projects? If so, what is the name of the analytical tool and how is it used to inform prioritization of projects?

Yes	<p>Denver: Internal spreadsheets.</p> <p>Portland: Criticality Matrix and eBuilder. Together the tools synthesize data to provide clarity regarding resource allocation, political pressures, funding triggers and restrictions, bureau priorities, and risk tolerance.</p>
No	San Jose

5. Which procurement method(s) does your agency use in its construction contract award decisions?

Best value	Denver
Low bid	Denver (most frequently used) Portland San Jose
Negotiated	Denver
Other	Portland: Construction Manager/General Contractor San Jose: Currently pursuing ways to include elements of best value contracting.

6. Does your department consider contractors' past performance when deciding on construction contract awards?

Yes	Denver: Past performance can be considered but seldom affects the final award.
No	Portland San Jose

7. How often does the project delivery unit use the following communication methods to provide project updates to the project owner?

	Weekly	Monthly	Quarterly	As needed
Denver	♦ E-mail	♦ Update reports ♦ Project management software	♦ In-person meetings	♦ Phone/video meetings
Portland	♦ In-person meetings ♦ E-mail ♦ Project management software	♦ Update reports	-	♦ Phone/video meetings
San Jose	♦ In-person meetings	-	-	♦ Phone/video meetings ♦ E-mail

Note: San Jose responded that it does not use update reports or project management software.

8. Which entity is responsible for providing updates to the oversight board?

Project owner	-
Project delivery unit	Denver Portland
Both	San Jose

9. Does your agency formally capture lessons learned?

Yes	Portland San Jose
No	-
No, but planning to in the next two years	Denver

Additional comments about lessons learned:

- Portland: At the conclusion of each project, an after-action meeting is held, and a report is crafted identifying strengths, weaknesses, creativity in problem solving, and project team chemistry. The delivery process is reviewed for consistency, transparency, and expediency. Project team members are often assigned to similar projects in similar geographies to ensure there is institutional knowledge of potential pitfalls and opportunities for success.
- San Jose: Project teams give a formal presentation to its executive team at the end of each project.

10. What resources help your department guide capital projects delivery?

Responses included a mixture of the following resources:

- Agency policies and procedures specific to capital projects
- Jurisdiction-wide laws, policies, and procedures on capital projects
- Project Management Institute's *Project Management Body of Knowledge (PMBOK)* or other similar guidelines
- Project Management Institute's *The Standard for Program Management Guide* or other similar guidelines
- U.S. Department of Transportation or Federal Transit Administration guidelines

Appendix C

Preliminary Engineering Report Analysis

The following sections list key information Cumming identified as missing from the Preliminary Engineering Reports (PERs) for the Twin Peaks Tunnel, UCSF Platform, and Green Center projects and the reason the information is important to the development of an accurate project schedule and budget.

Twin Peaks Tunnel

Upon reviewing the Twin Peaks Tunnel PER, Cumming concluded that it is incomplete due to missing elements such as schedule contingencies, accessibility upgrades, hazardous materials remediation provisions, updated as-built drawings, and phasing assumptions. The following table lists what Cumming noted as flaws in the PER and the impact each can have.

Flaw	Impact
Underbudgeting due to assuming best-case scenarios – Best practices suggest including scoping assumptions that address possible scenarios for a specific element of the project scope that could affect the schedule and budget. Estimates may be reduced as more information becomes available throughout the design phase.	
The PER discusses the lining tunnel drainpipes, which might require new manholes to allow access, but the cost of the manholes was not in the pricing.	Any element missing from the scope, including costs that may only occur in a worst-case scenario, could cause schedule and cost overruns.
The PER states existing conduits and junction boxes for the fire suppression and detection system at the operational command center were to be reused for the new system, but it does not describe the condition of the elements to be reused or whether they are code-compliant. Further the PER assumes the system must remain operational until the new system is certified for use but does not include costs for new conduit or junction boxes.	<p>The PER assumes and budgets for the best-case scenario that the existing fire suppression system components to be reused:</p> <ul style="list-style-type: none"> ♦ Are in adequate condition. ♦ Comply with code. ♦ Will allow the existing system to remain operational until the new system is certified for use. <p>However, if any of those assumptions are incorrect, or if new conduit and junction boxes are needed, the project's schedule and costs may increase.</p>
The PER states the Twin Peaks Tunnel's unreinforced brick crown needed further investigation to determine its seismic stability and whether it must be retrofitted. Although the report mentions that several possible retrofit methods exist, there is no proposed scope.	Assuming the best-case scenario—that no seismic retrofit would be required—risks understating the project's budget and schedule.

Flaw	Impact
Planning delays and inadequate accounting for cost escalation – Construction costs increase over time. Cost estimates should account for escalation over the project’s life and should be adjusted for delays in the design phase.	
Internal approvals of the PER occurred over a five-month period, from January 6 to June 3, 2014.	Delayed internal project approvals can cause costs to be underestimated because of escalation in construction costs or other changes in market factors that occur during the delay.
Cost estimates in the PER do not indicate when they were made. Based on our review, it appears the estimates were made no later than September 2013, but the report was not approved until June 2014, and cost escalation was not factored into the estimate.	Delayed internal project approvals can delay project completion, which may cause increased costs due to escalation and/or other market factors.
Missing or grossly understated costs and allowances – All work identified as required scope should be included in cost and schedule estimates.	
The PER includes no schedule contingency for any delay in starting construction, which could be caused by a delay in another project. ³⁷	Schedule delays may impact a project’s cost. Standard industry practice requires schedule contingencies for all known potential delays, including any other projects that may affect the project schedule.
The PER’s cost estimate includes an insufficient allowance of \$220,000 for tunnel cleaning. This is despite the fact that the PER notes a significant amount of debris, sludge, and water intrusion in the tunnel trackway, walls, and niches, making it difficult to determine the extent of environmental damage.	In this instance, a larger allowance to repair the entire length of the tunnel is recommended due to the unknown extent of environmental damage. The costs and schedule could be reduced during the detailed design phase if less cleaning is needed than was anticipated. A sufficient allowance for tunnel cleaning would add \$200,000 to \$300,000 to the cost estimate.
The PER’s cost estimate for remediating hazardous material is unclear because portions of the estimate are in two locations and bundled with other costs. Combining both portions, the estimate includes an insufficient allowance of up to \$305,000 for remediating hazardous materials. This is despite the fact that the PER acknowledges the likelihood of the track ballast containing asbestos and confirms that SFMTA found asbestos at the site during prior work.	The U.S. Environmental Protection Agency began banning asbestos in insulation in 1973 and later expanded the ban to other materials. Lead paint was banned in 1978. It is industry standard to assume that a project’s insulation and paint produced before these years should be tested to determine whether they contain hazardous materials. A \$305,000 allowance is less than would be recommended for the testing, remediation, and air monitoring of hazardous materials for this scope of work. Remediation of the 22,000 track feet and 5,500 square feet of the Eureka Valley Station’s ceiling would potentially add \$1.03 to \$2.05 million to the cost estimate.

³⁷ ATCS Final Cutover Project (CPT 595.4)

Flaw	Impact
The PER describes some work that is not budgeted or scheduled. Although the PER states that existing overhead contact system and loop cable work would need to be removed and reinstalled, the PER omits any budget or diagram for such work.	This contributed to both the cost estimate and schedule being understated, which may have contributed to the project's budget overruns and delays. An allowance to cover any damage to existing systems and potential costs for removing and reinstalling loop cables would add up to \$15 million to the cost estimate.
The PER refers to the <i>MUNI Tunnel Seismic Vulnerability Study (Volume 1)</i> , which outlines a number of below-grade structures, including stair and elevator shafts, but neither the study nor PER include or address ventilation shafts along the tunnels.	When a referenced study explicitly excludes items that may be relevant to the project scope, the project team must address the excluded items in the PER. Missed in-scope items may result in added costs and schedule delays.
The <i>MUNI Tunnel Seismic Vulnerability Study (Volume 1)</i> notes the Eureka Valley Station's roof is eight inches of reinforced concrete under ten feet of soil, yet the PER's scope does not include soil removal or re-waterproofing of the roof.	These missing tasks, (if later found necessary), could cause significant budget and schedule overruns.
The PER omits accessibility upgrades.	The California Building Code requires providing opportunities for differently abled individuals to access and use the built environment. Transit projects that include vertical access for passengers may require costly improvements to create accessible paths of travel.
Outdated as-built drawings of structures, missing supplemental studies, and missing condition information – <i>Accurate scope and strong estimates rely on current, accurate information about the site.</i>	
As-built drawings for the tunnel range from 1913 to 1980. As-built drawings were not updated during the PER phase and were not included in the report.	It is important to obtain accurate as-built drawings as early in the project as possible to ensure the scope of work is accurate and comprehensive. Site conditions are expected to change over time due to maintenance and other programmatic needs.
The existing overhead contact system work was installed around 2004, but there was no as-built drawing of it and the PER has no assessment of the physical condition of the then decade-old components.	Whenever performing work on an existing system, the PER should confirm its anticipated longevity based on its current conditions and ensure costs for all identified scope are included in the estimate.

Flaw	Impact
The PER states relocation of an electrical room in the Eureka Valley Station and its equipment adjacent to an old station platform may be triggered if the structural reinforcement requires its current space. However, the room size and equipment are not stated.	Estimates cannot be validated if a more detailed graphic or narrative representation of scope is not provided.
Although the PER states a geotechnical engineering study is required to evaluate part of the tunnel structure to determine the need for seismic upgrade, a geotechnical report was not provided as part of the PER.	Not confirming the required seismic performance category of a structure early on risks inefficiency in the detailed design phase.
The PER states the Forest Hill Station is equipped with an undercar deluge system and the West Portal Station has no deluge system and is not required to by the California Building Code. However, the report does not explain why the deluge system is required at one station and not the other.	This statement should be supported by a code section citation or a letter from the San Francisco Fire Department. The lack of support may indicate that due diligence was not exercised. If this statement were erroneous and the project turned out to require the addition of a deluge system, this would have significantly increased costs and delayed the schedule.
Stakeholder Consensus Not Documented – Agreement between stakeholders on scope and estimates is a critical factor in project success. Documenting stakeholder consensus ensures shared understanding and can prevent conflict later in the project.	
Resolution of stakeholder comments is not documented, but the PER notes stakeholder approval was conditioned on resolving comments, as discussed in Finding 1.1.	When comments are provided as a condition of stakeholder approval, it is critical those comments are incorporated in the PER. Comments or requested changes that are mistakenly disregarded commonly surface later in a project when it is more expensive or too late to incorporate them.
Other Issues	
The PER refers to Biennial Tunnel Inspection Report excerpts disjointedly, making the scope unclear.	Unclear scope or location assignment can result in added costs if anything is missed.

Green Center

Upon reviewing the Green Center PER, Cumming concluded that it is incomplete and would benefit its reader with more clarity and alternative formatting. The PER lacks industry-standard elements such as schedule contingencies, provisions for hazardous materials testing, updated as-built drawings (or provisions for them), and scope elements such as accessibility upgrades and phasing assumptions. The Green Center PER does not clearly explain how:

- The pre-determined budget was set.
- The scoping drawings relate to electrical and other work.
- Adjacent accessibility upgrades for the BART project relate to the Green Center.
- Site drainage is proposed to be improved.

Further, the format makes the PER difficult to navigate due to the lack of a key plan and a disjointed narrative of existing conditions and proposed corrections. The following table lists what Cumming noted as flaws in the PER and the impact each can have.

Flaw	Impact
Underbudgeting due to assuming best-case scenarios – Best practices suggest including scoping assumptions that address possible scenarios for a specific element of the project scope that could affect the schedule and budget. Estimates may be reduced as more information becomes available throughout the design phase.	
The report states the condition of the Overhead Contact System components varies.	If a more detailed as-built inventory cannot be accomplished during the PER phase and the worst-case scenario is not assumed in the pricing, project schedule and budget overruns may result.
Planning delays and inadequate accounting for cost escalation – Construction costs increase over time. Cost estimates should account for escalation over the project's life and should be adjusted for delays in the design phase.	
Approvals from team members occurred during October 1 through November 6, 2009, but final approval of the PER by the interim chief operating officer is undated.	Any delays to a project's internal approvals can increase costs due to escalation or other market factors.
Missing or grossly understated costs and allowances – All work identified as required-scope should be included in cost and schedule estimates.	
The PER does not include a schedule contingency for any delay in start or progress of the project because of adjacent construction projects. Standard industry practice recommends including schedule contingencies for all known potential delays.	Schedule delays may increase a project's cost.

Flaw	Impact
<p>The PER indicates an accessibility upgrade of the San Jose Avenue platform, but other work that would be triggered by this upgrade (such as artwork, detectable warning strips, electrical, and technology) is not identified.</p> <p>San Francisco’s Art Enrichment Ordinance requires 2 percent of the construction cost of transportation projects be allocated for public art. Typically, the art is on or near the platform, but neither its design nor cost is included in the PER. Also, artwork may require a footing or other supporting structure, which may affect the platform’s spatial requirements.</p>	<p>Not including the scope of artwork, warning strips, electrical, or technology in the platform’s concept narrative or graphic representation would likely cause the project’s cost and duration to be understated.</p>
<p>The PER states the Bryant Power Control Center cannot remotely monitor the status of voltages or currents on equipment located at the San Jose (Avenue) Substation but does not further address the issue or its solution, which would be a Building Management System (BMS).</p>	<p>A BMS is a critical part of modern facilities management infrastructure, including transit and building projects. It is a suite of software that allows an authorized individual to remotely monitor and operate mechanical, electrical, and plumbing systems from a computer or tablet. In many cases, a properly used BMS removes the need for an individual to be on site to troubleshoot operational issues. If the substation had required a BMS, it would have been a significant added cost to the project.</p>
<p>The PER mentions that spare parts for the 650-volt direct current disconnect switches are not easily available but does not mention early procurement of these parts. Also, the PER does not justify the decision to keep the existing switches despite stating the switches are old and inefficient.</p>	<p>Any delay in procuring these items during construction may result in delays and general conditions cost increases. Replacing with upgraded switches would increase costs an estimated \$35,000.</p>
<p>The PER addresses automated perimeter fencing that has had operational issues and the need for environmental signage along the fence and inside the Muni Metro yard. It does not appear that the cost of the fence’s repair or new environmental signage are included in the estimate.</p>	<p>Omitting these items from the scope may have contributed to the project’s cost overrun.</p>
<p>The PER states that site drainage is ineffective but does not quantify the locations or conditions requiring the remediation of existing drains or the addition of new drains.</p>	<p>The lack of clarity on this scope can cause schedule and cost overruns.</p>

Flaw	Impact
The PER addresses the existence of track ballast (material underneath the tracks) and mentions that most of the track was constructed in 1974 but does not mention testing the ballast for hazardous materials.	The U.S. Environmental Protection Agency banned asbestos in thermal insulation in 1973 and asbestos in all other building materials effectively by 1993. Lead paint was banned in 1978. It is industry standard to assume that insulation and paint produced before these years should be tested for any relevant hazardous materials. An allowance of \$1-2 million is recommended for the testing, remediation, and air monitoring of hazardous materials for this scope.
The PER refers to some settlement of the rails over time and to replacing the asphalt base with concrete base pavement in the entire yard but does not mention the potential requirement to compact and grade the underlying soil again.	If required, this is a substantial amount of civil work that affects other utilities, such as drainage, and can cause schedule and cost overruns.
The PER Scope of Work includes improving yard lighting and miscellaneous electrical work. The PER also states there are no 120-volt alternating current receptacles in the yard. These scopes are overly broad and do not correspond to any other attempt to quantify the work.	Because the type and number of light fixtures and other electrical scope items required are not stated (and may not have been known), executing this work may have contributed to the project's schedule and cost overruns.
The report does not mention maintenance and protection of traffic.	Given the plan to keep the revenue tracks operational while the yard was under construction and the multiple other activities (the nearby BART construction project and San Jose Avenue platform upgrade), dynamic traffic management was required. This may have increased the project's duration and could have added an estimated \$600,000 to its cost.
Outdated as-built drawings of structures, missing supplemental studies, and missing condition information – <i>Accurate scope and strong estimates rely on current, accurate information about the site.</i>	
The PER lacks as-built drawings for scope items other than the track work.	Accurate as-builts must be obtained as early in the project as possible so in-scope items are not missed.
Eleven track switches purchased under another contract that were intended to be installed as part of the project were a decade old as of 2009 and were anticipated to have a useful life of 30 years.	Delays in a project's start may further reduce the useful lifespan of components, even if they have never been used. Equipment that remains unused for years is more likely than new equipment to require maintenance or refurbishment before installation and/or may become obsolete or discontinued before or relatively soon after construction is completed.

Flaw	Impact
The PER mentions abandoning the inspection pit (an undercarriage observation pit) and miscellaneous electrical works, but lacks scoping drawings related to either.	A lack of necessary drawings can cause schedule and cost overruns.
Various accessibility upgrades are indicated in the report, but it is unclear how all of them connect to one another around the Green Light Rail Center. Some upgrades are shown at the Balboa Park Station as part of that project, while others are shown on San Jose Avenue as part of this PER, but a complete site map of accessibility upgrades and existing compliant and noncompliant conditions is not included.	The California Building Code requires new and renovation construction to provide opportunities for differently abled individuals to access and use the built environment. In the case of transit projects, which may include vertical access, permitted projects may be subject to costly improvements to meet the current requirements for accessible paths of travel. This can result in missed in-scope items, which can cause schedule and cost overruns. Cumming states that a \$500,000 allowance should have been included in the PER for this scope.
Other Issues	
The PER states the tracks in the maintenance building were to remain and only the tracks in the yard were to be replaced. Yet the PER does not state the basis for this decision, lacks a summary assessment of the condition of the interior tracks, and does not assert a presumption of their compatibility with the new yard tracks.	Outlining all salient reasons for not performing certain work demonstrates to the stakeholders that all implications of a decision have been considered and that potential in-scope items have not been missed.
The PER mentions 20 percent of 124 existing trolley poles need to be replaced and that the spacing is tight in some cases.	Given this information and the absence of a site plan showing the poles' locations, potential complications should be expected to arise, which could cause schedule and cost overruns.
The PER refers to a pre-determined budget constraint but does not state the amount or how it was determined. Of greater concern is that the contingency was reduced from a standard 30 percent to just 10 percent.	The decision to slash the contingency percentage by two-thirds rather than reduce the base scope of work should be expected to cause a significant, avoidable cost overrun.

UCSF Platform

Upon reviewing the UCSF Platform PER, Cumming concluded that it lacks industry standard items such as timely or complete stakeholder approvals, phasing assumptions, schedule contingencies, sufficient traffic control allowances, current geotechnical and hazardous materials testing, and as-built drawings. The PER should be clearer about the accessibility upgrades needed. The PER's format makes it difficult to navigate due to the lack of a key plan and a disjointed narrative of existing conditions and proposed corrections. The following table lists what Cumming noted as flaws in the PER and the impact each can have.

Flaw	Impact
Missing or grossly understated costs and allowances – All work identified as required scope should be included in cost and schedule estimates.	
The report does not account for phasing of the work required for continued pedestrian and vehicle access or the work's proximity to the nearby Chase Center mixed-use complex, which was another significant construction zone.	If there were limitations preventing the entire scope from being performed simultaneously, this could have caused significant schedule and cost overruns.
The PER lacks a schedule contingency for any delay in the start or progress of construction. Such delays could have been caused by adverse weather or the construction of the adjacent Chase Center.	Omitting the potential delays understates the estimated schedule. Also, because the general contractor may include such a contingency in its bid, with the contract covering some of its costs, the cost estimate may also be understated.
The report does not go into detail about maintenance or protection of traffic despite the prominent location and multiple intersections affected by the project. The allowances for unforeseen work related to traffic control (\$20,506) and community relations support (\$10,000) appear to be quite low.	Given the prominent location of this work, these line items were likely to require more interface with the Chase Center construction team and substantial traffic management, which would have increased costs. Adding protection barriers and accounting for traffic control officers and possible street closures would increase costs \$1.5 to 2 million.
Outdated as-built drawings of structures, missing supplemental studies, and missing condition information – <i>Accurate scope and strong estimates rely on current, accurate information about the site.</i>	
Site plans indicate many unidentified gray boxes that may be utilities, furnishings, or other components that required relocation. Also, the drawings appear to show that many poles were intended to remain, but planned curb cuts may have required their removal and relocation.	These unidentified potential works may increase the project duration and cost.

Flaw	Impact
The PER's site investigations section references other reports but does not include any of them in the appendix. Also, although existing hazardous materials and geotechnical reports are outdated, SFMTA based cost estimates on them.	Geotechnical reports relied upon do not meet the latest testing standard, so a schedule and cost contingency were needed to cover the risk of additional testing and additional soil grading and compaction work.
The PER states not all utility companies had responded to the City's inquiry about underground utilities at the site.	Because some utility information was missing, a contingency of up to \$500,000 should have been included to cover the risk of missing additional in-scope items.
Stakeholder Consensus Not Documented – Agreement between stakeholders on scope and estimates is a critical factor in project success. Documenting stakeholder consensus ensures shared understanding and can prevent conflict later in the project.	
Internal approval of the PER from one team member is missing, and final approval from the transit director is dated six weeks after the other approvals.	Given the project's tight schedule, any delay in internal approvals could have delayed the project's completion, which, in turn, could have delayed public transit access to the Chase Center. Delays also bring higher costs due to escalation and other market factors that can change during the delay.
The PER states the Civic Design Review Committee had not approved the conceptual design, so a resubmittal was required. The PER did not include contingencies for schedule or cost for any redesign or delay in obtaining the committee's approval.	Estimated schedule and costs may be understated.
Other Issues	
The schedule projects 9 months for design, 4 for bidding and award, 14 for construction, and 12 for closeout, but does not identify when necessary approvals will be obtained, such as those needed from Pacific Gas & Electric Company for utility work. These approvals take at least 3 months to receive, and sometimes the process does not start until after the contract is awarded.	The schedule's lack of detail regarding approvals could have resulted in added activities, which often cause schedule and cost overruns.

Appendix D

Department Response



London Breed, Mayor

Gwyneth Borden, Chair
Amanda Eaken, Vice Chair
Cheryl Brinkman, Director
Steve Heminger, Director

Fiona Hinze, Director
Sharon Lai, Director
Manny Yekutieli, Director

Jeffrey Tumlin, Director of Transportation

January 21, 2021

Mark de la Rosa
Acting Director of Audits
Office of the Controller, City Services Auditor Division
City Hall, Room 476
1 Dr. Carlton B. Goodlett Place
San Francisco, CA 94102

Subject: SFMTA Capital Programs Audit (Capital Programs and Construction Division)

Dear Mr. de la Rosa:

We have reviewed the report prepared by your audit team regarding delivery of four of our capital projects within the San Francisco Municipal Transportation Agency's (SFMTA) Capital Programs and Construction Division (CP&C). Please find attached our responses to the audit recommendations.

We appreciate the work of your staff throughout the course of this audit. We found particular value in the audit's review of inter-divisional collaboration and communication and its impact on project delivery. Some of the findings and related recommendations within the audit report were consistent with a mid-2016 internal assessment of agency-wide project delivery that staff conducted and which resulted in the agency-adopted *Project Delivery Framework* and establishment of the Project Management Office (PMO) in 2017. The PMO was established to align best practices and procedures among the agency's multiple project delivery units and to improve coordination, communication and project delivery across the agency over time. The PMO is also responsible for implementing the 14 priority actions identified in the 2016 Project Delivery Framework, over half of which are completed. The Capital Programs audit was beneficial in lending further validation to, and support of, the areas we highlighted for improvement and the corrective actions established to address some of the shortcomings.

Successful and effective delivery of the SFMTA's Fiscal Year 2023 – 2027 Capital Improvement Program (CIP), including multi-modal, complete street, technology, and transit system projects, requires various project delivery disciplines to work in concert. This matrixed delivery organization requires a clear and consistent management structure, effective tools and processes, and a governance structure so problems can be resolved and critical path decisions made. Weaknesses in these areas can lead to project delays, cost increases or project objectives not being achieved. This audit was helpful in identifying continued issues in this area within our Transit Fixed Guideway and Transit Optimization Programs and helped inform our Subway Renewal Program's systematic approach to capital upgrades over the next ten years, targeting a backlog of repairs

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on the most critical systems. The Subway Renewal Program will be implemented through a partnership between CP&C and the Transit Division as an integrated team, consistent with recommendations made within the audit report.

Some of the recommendations in the audit have already been implemented or partially implemented through the PMO. The PMO has begun the process of developing specific trainings of key elements of project delivery and, as recommended, will work to integrate effective communication and collaboration elements to the training program for project delivery staff. The SFMTA has also amended its *Capital Plan and Program Policies* to set clear definitions for budget management, baseline setting and performance management. Related to construction safety, San Francisco City Ordinance No. 113-20, which went into effect in August 2020, has been fully operationalized. We also have implemented a data framework for project prioritization, which is expected to be expanded as we work to develop the FY 2023 – 2027 CIP. This is not to say that there is not more work to be done and the PMO will work diligently to implement the remaining recommendations.

There are many areas in which the SFMTA is successfully delivering within its portfolio of nearly 300 projects. One example is the *Geary Rapid Project*, a complete street project that replaces aging water lines in coordination with the San Francisco Public Utilities Commission and includes transportation improvements such as upgraded traffic signals and streetlights, sidewalk extensions at bus stops and intersection corners, improved median refuges and roadway repaving. Another example is the *16th Street Transit Priority Project*, which successfully delivered infrastructure upgrades with minimal changes to the contract and was a collaborative effort involving multiple divisions across the agency and coordination with the San Francisco Public Utilities Commission. The *Vision Zero Quick Build Program* is designed to swiftly improve street safety by using low-cost, reversible traffic engineering tools and employing internal collaborative teams. The agency has also successfully managed billions of dollars of fleet procurements, facilities and complex technology infrastructure projects. The successful aspects of these projects serve as examples of how our project delivery can be improved in other areas of the agency.

Thank you again for the work on this critical audit. We are focused on continuous improvement to project delivery within the agency and the work of the audit team and recommendations will help us get there. If you have any questions or need additional information, please do not hesitate to contact me at (415) 646-2522.

Sincerely,



Jeffrey P. Tumlin
Director of Transportation

Enclosure

Recommendations and Responses

For each recommendation, the responsible agency should indicate in the column labeled Agency Response whether it concurs, does not concur, or partially concurs and provide a brief explanation. If it concurs with the recommendation, it should indicate the expected implementation date and implementation plan. If the responsible agency does not concur or partially concurs, it should provide an explanation and an alternate plan of action to address the identified issue.

Recommendation	Agency Response	CSA Use Only Status Determination*
The San Francisco Municipal Transportation Agency should:		
1. Leverage the performance plan and appraisal process by including in evaluations for managers a core competency to set clear expectations, identify clear goals, and hold direct reports accountable for effective communication and collaboration.	<input checked="" type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input type="checkbox"/> Partially Concur Concur. The San Francisco Municipal Transportation Agency (SFMTA) will incorporate core competencies and expectations for effective communication and collaboration in the performance planning and appraisal process for relevant managers. Expected Implementation Date: Q4 2021	<input checked="" type="checkbox"/> Open <input type="checkbox"/> Closed <input type="checkbox"/> Contested
2. Require relevant trainings, such as effective communication, group facilitation, project management, and collaboration to all employees involved in the capital planning and project delivery processes.	<input type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input checked="" type="checkbox"/> Partially Concur Partially concur. The SFMTA will continue to incorporate training related to these topics and expand training where necessary. Trainings take place through the Project Management Office meetings attended by capital planning and project delivery staff from across the Agency. Expected Implementation Date: Q4 2021	<input checked="" type="checkbox"/> Open <input type="checkbox"/> Closed <input type="checkbox"/> Contested

*Status Determination based on audit team's review of the agency's response and proposed corrective action.

Recommendation	Agency Response	CSA Use Only Status Determination*
<p>3. Require trainings related to effective collaboration and communication for key employees involved in capital planning and project delivery, including division directors and Transportation Capital Committee members and designated proxies.</p>	<p><input checked="" type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input type="checkbox"/> Partially Concur</p> <p>Concur. SFMTA will incorporate training related to these topics for key employees involved in capital planning and project delivery, including division directors and Transportation Capital Committee (TCC) voting members and designated proxies.</p> <p>Expected Implementation Date: Q4 2021</p>	<p><input checked="" type="checkbox"/> Open <input type="checkbox"/> Closed <input type="checkbox"/> Contested</p>
<p>4. Establish baselines and set targets for construction project delivery including, but not limited to, variance from estimated budget and schedule.</p>	<p><input checked="" type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input type="checkbox"/> Partially Concur</p> <p>Concur. Recommendation already implemented.</p> <p>The process for managing project schedule and budget is described in the Capital Plan and Program Policies. Schedule and budget information is maintained by the Project Controls group in EcoSys. The Strategic Plan establishes objectives and targets for budget and schedule variance.</p>	<p><input type="checkbox"/> Open <input checked="" type="checkbox"/> Closed <input type="checkbox"/> Contested</p>
<p>5. Adopt additional construction project delivery performance measures identified by leading practices.</p>	<p><input type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input checked="" type="checkbox"/> Partially Concur</p> <p>Partially concur. Recommendation partially implemented.</p> <p>The SFMTA has an established practice in place related to appropriate performance measures for project delivery conforming to funding agency requirements. Nevertheless, best practices in project delivery metrics will be evaluated as part of our forthcoming strategic plan process, and new metrics will be implemented as appropriate.</p> <p>Expected Implementation Date: Q4 2021</p>	<p><input checked="" type="checkbox"/> Open <input type="checkbox"/> Closed <input type="checkbox"/> Contested</p>

*Status Determination based on audit team's review of the agency's response and proposed corrective action.

Recommendation	Agency Response	CSA Use Only Status Determination*
6. Include and consider contractors' safety records in awarding construction contracts.	<input checked="" type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input type="checkbox"/> Partially Concur Concur. Recommendation already implemented. During the process of awarding construction contracts, safety records are evaluated as required by City Ordinance No. 113-20, which went into effect in August 2020.	<input type="checkbox"/> Open <input checked="" type="checkbox"/> Closed <input type="checkbox"/> Contested
7. Verify the safety records submitted by construction contract bidders and review each company's record in the U.S. Occupational Safety and Health Administration's Establishment Search database.	<input checked="" type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input type="checkbox"/> Partially Concur Concur. Recommendation already implemented. During the process of awarding construction contracts, safety records are evaluated as required by City Ordinance No. 113-20, which went into effect in August 2020.	<input type="checkbox"/> Open <input checked="" type="checkbox"/> Closed <input type="checkbox"/> Contested
8. Improve its policies to ensure SFMTA preliminary engineering reports include all foreseeable costs and appropriate schedule and cost contingencies, consistent with industry standards.	<input type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input checked="" type="checkbox"/> Partially Concur Partially concur. While it may not be possible to anticipate all foreseeable costs at the PE phase, the SFMTA has processes in place to ensure that all project delivery staff are aware of factors that should inform schedule and cost contingencies. The SFMTA's current policies include the following Project Management Office (PMO) General Notices: Management of Project Schedules (12/2016), Management of Project Contingencies (5/2017), and Project Cost Estimate Development (10/2018). The SFMTA will review its current policies and make changes as needed in the areas of schedule and cost contingencies. Expected Implementation Date: Q3 2021	<input checked="" type="checkbox"/> Open <input type="checkbox"/> Closed <input type="checkbox"/> Contested

*Status Determination based on audit team's review of the agency's response and proposed corrective action.

Recommendation	Agency Response	CSA Use Only Status Determination*
<p>9. Update its change order policies to include additional categories of reasons for change order requests, consistent with leading practices, and require project teams to categorize the reason(s) for every change order request.</p>	<p><input checked="" type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input type="checkbox"/> Partially Concur</p> <p>Concur. SFMTA will update its change order policies in the Project Operations Manual (POM) to include additional categories of reasons, including those consistent with FTA guidelines and leading practices, where appropriate. Project teams will continue to categorize the reason for change order requests.</p> <p>Expected Implementation Date: Q1 2022</p>	<p><input checked="" type="checkbox"/> Open <input type="checkbox"/> Closed <input type="checkbox"/> Contested</p>
<p>10. Analyze change order data across projects to identify trends and opportunities for improving internal processes.</p>	<p><input checked="" type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input type="checkbox"/> Partially Concur</p> <p>Concur. The SFMTA will produce quarterly reporting on change orders for contracts that require MTA Board approval in order to identify trends and opportunities for improving internal processes. Results will be reviewed by the Project Management Office (PMO).</p> <p>Expected Implementation Date: Q1 2022</p>	<p><input checked="" type="checkbox"/> Open <input type="checkbox"/> Closed <input type="checkbox"/> Contested</p>
<p>11. Revise its lessons-learned policies to require project teams to review the cause and effect of change orders and implement a mechanism to ensure the lessons learned are applied in future projects.</p>	<p><input checked="" type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input type="checkbox"/> Partially Concur</p> <p>Concur. SFMTA will revise its lessons-learned policies to require project teams to review the cause and effect of change orders. SFMTA will ensure the lessons learned are applied to future projects by implementing evaluations of change orders by category and other metrics as needed, and implementing a Lessons Learned form for change orders through the Budget, Financial Planning and Analysis (BFPA) to the Transit Capital Committee (TCC) for all changes over a specific threshold.</p> <p>Expected Implementation Date: Q1 2022</p>	<p><input checked="" type="checkbox"/> Open <input type="checkbox"/> Closed <input type="checkbox"/> Contested</p>

*Status Determination based on audit team's review of the agency's response and proposed corrective action.

Recommendation	Agency Response	CSA Use Only Status Determination*
12. Ensure all required design reviews occur in compliance with SFMTA's Project Operations Manual and ensure project teams properly document and address all stakeholder comments.	<input checked="" type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input type="checkbox"/> Partially Concur Concur. Recommendation partially implemented. Concur. SFMTA will continue to ensure that project teams properly document and address all stakeholder comments. Adherence will be confirmed through project manager review and approval prior to bid advertisement. Expected Implementation Date: Q3 2021	<input checked="" type="checkbox"/> Open <input type="checkbox"/> Closed <input type="checkbox"/> Contested
13. Revise its policies to establish centralized document management to ensure project data is maintained, consistent with its records retention policy, and can be easily located.	<input type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input checked="" type="checkbox"/> Partially Concur Partially Concur. CP&C will evaluate current processes and policies and will identify a document tracking system where project data can be tracked, located and retrieved. Expected Implementation Date: Q2 2022	<input checked="" type="checkbox"/> Open <input type="checkbox"/> Closed <input type="checkbox"/> Contested
14. Use Decision Lens, or similar strategic prioritization tools, to implement more data-driven decision-making in the development of its five-year Capital Improvement Program.	<input checked="" type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input type="checkbox"/> Partially Concur Concur. Recommendation already implemented. While the SFMTA has discontinued the use of Decision Lens due to budget constraints, procedures were developed internally to incorporate more data driven decision-making into the development of the most recent five-year Capital Improvement Program (CIP) covering FY 2021- FY 2025 using tools readily available to SFMTA staff including MS Excel, Teams and SharePoint.	<input type="checkbox"/> Open <input checked="" type="checkbox"/> Closed <input type="checkbox"/> Contested

*Status Determination based on audit team's review of the agency's response and proposed corrective action.

Recommendation	Agency Response	CSA Use Only Status Determination*
15. Ensure its strategic prioritization tool incorporates data such as funding, staffing needs, and asset condition to develop a more accurate Capital Improvement Program.	<input checked="" type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input type="checkbox"/> Partially Concur Concur. Recommendation already implemented. In June 2019, the Agency shifted to a Consolidated Budget Development Process. This process was guided by a series of CIP Instructions that describe the steps to be taken by staff during each of the four instruction periods leading to the adoption of the CIP by the SFMTA Board of Directors. This included asset condition rating and backlog needs, and staffing resources.	<input type="checkbox"/> Open <input checked="" type="checkbox"/> Closed <input type="checkbox"/> Contested
16. Ensure employees who are involved in preparing project cost estimates have the appropriate knowledge, skills, and abilities to develop accurate capital planning estimates. Alternatively, contract with professional cost estimators to create estimates for large capital projects.	<input checked="" type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur <input type="checkbox"/> Partially Concur Concur. Recommendation partially implemented. SFMTA contracts with professional cost estimators to create estimates for certain large capital projects. For other projects, SFMTA will look to incorporate training so that employees involved in preparing project cost estimates for transit infrastructure capital projects have the appropriate knowledge, skills and abilities to develop accurate capital planning estimates. Expected Implementation Date: Q1 2022	<input checked="" type="checkbox"/> Open <input type="checkbox"/> Closed <input type="checkbox"/> Contested

*Status Determination based on audit team's review of the agency's response and proposed corrective action.