



RESOLUTION APPROVING AN AMENDED PROGRAM OF PROJECTS FOR THE 2020  
REGIONAL TRANSPORTATION IMPROVEMENT PROGRAM

WHEREAS, As Congestion Management Agency for San Francisco, every two years the Transportation Authority is responsible for programming San Francisco's county share of Regional Transportation Improvement Program (RTIP) funds, subject to approval by the Metropolitan Transportation Commission (MTC) and the California Transportation Commission (CTC); and

WHEREAS, On October 22, 2019, through approval of Resolution 20-12, the Board approved San Francisco's 2020 RTIP project priorities, including \$7,174,000 in new funding for the San Francisco Municipal Transportation Agency's (SFMTA's) New Flyer Midlife Overhaul - Phase III project and \$13,752,000 in Fiscal Year 2020/21 for the SFMTA's Restoration of Light Rail Lines - Axle Counters project carried forward from the 2018 RTIP (Attachment 1); and

WHEREAS, In September 2019, SFMTA notified Transportation Authority staff that it would like to incorporate the Restoration of Light Rail Lines - Axle Counters project scope into its larger, multiphase Communications-Based Train Control (CBTC) project, which will provide the same functionality as axle counters in tracking train movements but with modern technology and extended benefits such as reliability, capacity, and ease of maintenance to the entire Muni Metro, not just the subway; and

WHEREAS, SFMTA staff requested and Transportation Authority staff recommended reprogramming the \$13,752,000 in RTIP funds from the Axle Counters project to the first two phases of the seven phase CBTC project, with Phase 1 extending from 23<sup>rd</sup> Street along the T-Third line to the subway entrance at The Embarcadero and Phase 2 encompassing the entire Muni Metro Subway from West Portal to The Embarcadero with additional details on scope, schedule, cost and funding show in Attachment 2; and

WHEREAS, Through Resolution 20-12, the Transportation Authority recommended programming all new available capital funding (\$7,174,000) in the 2020 RTIP to the SFMTA's New Flyer Midlife Overhaul - Phase III project, which includes midlife overhauls of 13 New Flyer trolley coaches and additional scope elements for cosmetic improvements like exterior paint, seating configurations, and wheelchair securements; and

WHEREAS, Subsequently, MTC staff discovered an error in the Transportation



Authority staff's calculation of 2020 RTIP funding available, and as a result determined that there is an additional \$778,000 available for programming this cycle; and

WHEREAS, In consultation with the SFMTA, Transportation Authority staff recommended programming the additional \$778,000 in 2020 RTIP funds to the New Flyer Midlife Overhaul - Phase III project, bringing the total proposed 2020 RTIP funds from \$7,174,000 to \$7,952,000 and increasing the number of buses to be overhauled from 13 to 14 as shown in Attachments 1 and 2; and

WHEREAS, Subject to approval by the MTC and CTC, the amended 2020 RTIP program of projects would reduce the Transportation Authority's remaining RTIP commitment to the SFTMA's Central Subway project, which the Transportation Authority is fulfilling by programming RTIP funds to other RTIP-eligible SFMTA projects, to \$32,798,000 (Attachment 3); and

WHEREAS, At its October 23, 2019 meeting, the Citizens Advisory Committee was briefed on the subject request and unanimously adopted a motion of support to reprogram \$13,752,000 in Fiscal Year 2020/21 RTIP funds from the Restoration of Light Rail Lines - Axle Counters project to the CBTC - Phases 1 and 2 project; now, therefore let it be

RESOLVED, That the Transportation Authority hereby approves an amended San Francisco Program of Projects for the 2020 RTIP as summarized in Attachment 1; and be it further

RESOLVED, That the Executive Director is authorized to communicate this information to MTC and to all other relevant agencies and interested parties.

Attachments:

- Attachment 1 – Proposed Amended 2020 RTIP Program of Projects
- Attachment 2 – Project Programming Request Forms (for amended projects)
- Attachment 3 – Draft Remaining RTIP Commitments

**Attachment 1**

**Proposed Amended San Francisco 2020 Regional Transportation Improvement Program (RTIP) Programming Priorities**

		<b>Project Totals by Fiscal Year (\$ 1,000's)</b>						
CTC has advised that new programming is only available in FYs 2023/24 and 2024/25.								
<b>Agency<sup>1</sup></b>	<b>Project</b>	<b>Total</b>	<b>FY 2020/21</b>	<b>FY 2021/22</b>	<b>FY 2022/23</b>	<b>FY 2023/24</b>	<b>FY 2024/25</b>	<b>Phase</b>
<b>Existing 2018 RTIP Programming Priorities</b>								
SFMTA	Restoration of Light Rail Lines – Axle Counters Communications-Based Train Control - Phases 1 and 2	\$13,752	\$13,752					Construction
SFCTA	Planning, programming, and Monitoring	\$778	\$260	\$259	\$259			n/a
MTC	Planning, Programming, and Monitoring	\$237	\$76	\$79	\$82			n/a
<b>Existing Funds Programmed in 2018 RTIP</b>		\$14,767	\$14,088	\$338	\$341			
<b>New 2020 RTIP Programming Priorities</b>								
SFMTA	New Flyer Midlife Overhaul - Phase III	\$7,174 \$7,952					\$7,174 \$7,952	Construction
SFCTA	Planning, programming, and Monitoring	\$245				\$46	\$199	n/a
MTC	Planning, Programming, and Monitoring	\$173				\$85	\$88	n/a
<b>Proposed 2020 RTIP Programming</b>		\$7,592 \$8,370				\$131	\$7,461 \$8,239	
<b>Total RTIP Funds Available</b>		<del>\$22,359</del> \$23,137						
<b>Surplus/(Shortfall)</b>		\$0						

<sup>1</sup> Acronyms include the Metropolitan Transportation Commission (MTC), San Francisco County Transportation Authority (SFCTA), and San Francisco Municipal Transportation Agency (SFMTA).

## PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised Mar, 1 2018 v7.08)

General Instructions

Amendment (Existing Project) Yes					Date:	08/16/19	
District	EA	Project ID		PPNO	MPO ID		Alt Proj. ID / prg.
04				2137			
County	Route/Corridor	PM Bk	PM Ahd	Project Sponsor/Lead Agency			
SF				SFMTA			
				MPO	Element		
				MTC	MT		
Project Manager/Contact		Phone		E-mail Address			
Alex Hallowell		(415) 646-4112		<a href="mailto:Alexandra.Hallowell@sfmta.com">Alexandra.Hallowell@sfmta.com</a>			
<b>Project Title</b>							
Communications-Based Train Control - Phases I & 2							
<b>Location (Project Limits), Description ( Scope of Work)</b>							
A new Communications-Based Train Control (CBTC) system possesses the greatest potential of any single investment to bolster SFMTA Muni's light rail system's efficiency and reliability. The SFMTA will install a new CBTC system, starting with Phase 1 between 23rd Street and the subway portal at Market Street. Phase 2 will include the Market Street tunnel between Embarcadero and West Portal Stations and along the Central Subway alignment. CBTC will include the functionality of the Axle Counters project while taking advantage of newer technology and equipment. Five subsequent phases of the project will deploy CBTC throughout the entirety of the SFMTA's 75 miles of light rail service (full text on next tab).							
<b>Component</b>		<b>Implementing Agency</b>					
PA&ED		SFMTA					
PS&E		SFMTA					
Right of Way		NA					
Construction		SFMTA					
<b>Legislative Districts</b>							
Assembly:	17,19		Senate:	11		Congressional:	12,14
<b>Project Benefits</b>							
To grow ridership while increasing safety and reliability the SFMTA will install a state-of-the-art Communications Based Train Control System (CBTC) along 9 bidirectional miles of light rail lines and six transit lines. CBTC benefits are improved reliability, safety, line capacity, and decreased travel times for the most heavily-traveled segments of the light rail system.							
<b>Purpose and Need</b>							
The SFMTA Muni Metro system uses a centralized train control in the Market Street tunnel (the core segment described in Phase 2 above). The system was installed more than two decades ago and relies on outdated technology and equipment. The train control system provides two critical benefits to our operations (continues on next tab):							
<b>Category</b>		<b>Outputs/Outcomes</b>			<b>Unit</b>	<b>Total</b>	
Intercity Rail/Mass Trans		Operational improvements			Miles	18	
ADA Improvements N		Bike/Ped Improvements N			Reversible Lane analysis N		
Inc. Sustainable Communities Strategy Goals Y				Reduces Greenhouse Gas Emissions Y			
<b>Project Milestone</b>					<b>Existing</b>	<b>Proposed</b>	
Project Study Report Approved					11/30/19		
Begin Environmental (PA&ED) Phase					03/01/2019	NA	
Circulate Draft Environmental Document			<b>Document Type</b>	CE/CE			
Draft Project Report							
End Environmental Phase (PA&ED Milestone)					06/30/2019	03/31/20	
Begin Design (PS&E) Phase					07/01/2019	03/31/20	
End Design Phase (Ready to List for Advertisement Milestone)					06/01/2020	03/31/20	
Begin Right of Way Phase						NA	
End Right of Way Phase (Right of Way Certification Milestone)						NA	
Begin Construction Phase (Contract Award Milestone)					12/01/2020	01/01/21	
End Construction Phase (Construction Contract Acceptance Milestone)					12/01/2023	06/30/25	
Begin Closeout Phase					01/01/2024	06/30/25	
End Closeout Phase (Closeout Report)					01/01/2026	12/31/25	

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**PROJECT PROGRAMMING REQUEST**

DTP-0001 (Revised Mar, 1 2018 v7.08)

Date: 08/16/19

**Additional Information**

**LOCATION (PROJECT LIMITS), DESCRIPTION ( SCOPE OF WORK) (Full language):**A Communications-Based Train Control (CBTC) system possesses the greatest potential of any single investment to bolster SFMTA Muni's light rail system's efficiency and reliability. The SFTMA will install a new CBTC system, with phasing as follows: Phase 1 between 23rd Street and the subway portal at Market Street. This segment of nine stations serves the new Chase Center (Warriors arena), Oracle Park (Giants stadium) as well as Muni Metro East, one of SFMTA's two light rail maintenance facilities. Following this installation, Phase 2 will be installed throughout the Market Street tunnel between Embarcadero and West Portal Stations and along the Central Subway alignment. Phase 2 serves 9 underground Muni Metro subway stations and represents the heart of the light rail system along which all lines converge. It will also include Central Subway's two surface and two subway stations. CBTC is envisioned as a multi-phase project with previously programmed STIP funds to be spent on the project's Phases 1 and 2. CBTC will include the functionality of the "Restoration of SFMTA Light Rail Lines - Axle Counters" project while taking advantage of newer technology and equipment. These two phases are part of a larger seven-phase project to deploy CBTC throughout the entirety of the SFMTA's 75 miles of light rail service.

**PURPOSE & NEED (Full language):** The SFMTA Muni Metro system uses a centralized train control in the Market Street tunnel (the core segment described in Phase 2 above). The system was installed more than two decades ago and relies on outdated technology and equipment. The train control system provides two critical benefits to our operations:

- 1) essential safety features to ensure light rail vehicles never collide while operating underground.
- 2) higher travel speeds under a computerized system.

This system keeps vehicles safely and evenly spaced, permitting lower headways than could be achieved under manual operation. Today's SFMTA train control system is beyond its useful life and over capacity. The majority of the LRV network, including the Phase 1, 9-station segment, is governed by line-of-sight rules and signals working in isolation. The full CBTC system installation will expand the centralized vehicle control beyond the Market Street tunnel and along all surface lines. This will permit a more coordinated and centralized management of the entirety of our light rail system by using integrated signals to better manage vehicle flows along the surface. Additionally, CBTC will incorporate decades of technological improvements resulting in more flexible operations, lower operating and maintenance costs, and a better and more intuitive user interface.

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**PROJECT PROGRAMMING REQUEST**

DTP-0001 (Revised Mar, 1 2018 v7.08)

Date: 08/16/19

District	County	Route	EA	Project ID	PPNO	Alt. ID
04	SF, ,	, ,			2137	
<b>Project Title:</b> Communications-Based Train Control - Phases I & 2						

Existing Total Project Cost (\$1,000s)									Implementing Agency
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	
E&P (PA&ED)									SFMTA
PS&E									SFMTA
R/W SUP (CT)									NA
CON SUP (CT)									SFMTA
R/W									NA
CON		32,000						32,000	SFMTA
<b>TOTAL</b>		<b>32,000</b>						<b>32,000</b>	
Proposed Total Project Cost (\$1,000s)									Notes
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	
E&P (PA&ED)	2,435	6,000	500					8,935	
PS&E		8,569	4,856	1,475				14,900	
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON		13,752	40,072	12,551	825			67,200	
<b>TOTAL</b>	<b>2,435</b>	<b>28,321</b>	<b>45,428</b>	<b>14,026</b>	<b>825</b>			<b>91,035</b>	

Fund No. 1:	STIP								Program Code
Existing Funding (\$1,000s)									Funding Agency
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	
E&P (PA&ED)									CTC
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON		13,752						13,752	
<b>TOTAL</b>		<b>13,752</b>						<b>13,752</b>	
Proposed Funding (\$1,000s)									Notes
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON		13,752						13,752	
<b>TOTAL</b>		<b>13,752</b>						<b>13,752</b>	

Fund No. 2:	FTA \$5337 State of Good Repair								Program Code
Existing Funding (\$1,000s)									Funding Agency
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	
E&P (PA&ED)									FTA (programmed by MTC)
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON		18,248						18,248	
<b>TOTAL</b>		<b>18,248</b>						<b>18,248</b>	
Proposed Funding (\$1,000s)									Notes
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	
E&P (PA&ED)									
PS&E		2,760						2,760	
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON			816	403				1,219	
<b>TOTAL</b>		<b>2,760</b>	<b>816</b>	<b>403</b>				<b>3,979</b>	

Fund No. 3:		Operating/Population Baseline							Program Code	
		Existing Funding (\$1,000s)								
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	Funding Agency	
E&P (PA&ED)									SFMTA	
PS&E										
R/W SUP (CT)										
CON SUP (CT)										
R/W										
CON										
TOTAL										
		Proposed Funding (\$1,000s)							Notes	
E&P (PA&ED)	2,435	4,243	500					7,178		
PS&E		690	3,856	1,475				6,021		
R/W SUP (CT)										
CON SUP (CT)										
R/W										
CON			1,782	4,328				6,110		
TOTAL	2,435	4,933	6,138	5,803				19,309		

Fund No. 4:		Low Carbon Transit Operations Program							Program Code	
		Existing Funding (\$1,000s)								
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	Funding Agency	
E&P (PA&ED)									Caltrans	
PS&E										
R/W SUP (CT)										
CON SUP (CT)										
R/W										
CON										
TOTAL										
		Proposed Funding (\$1,000s)							Notes	
E&P (PA&ED)		1,757						1,757		
PS&E										
R/W SUP (CT)										
CON SUP (CT)										
R/W										
CON										
TOTAL		1,757						1,757		

Fund No. 5:		General Funds							Program Code	
		Existing Funding (\$1,000s)								
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	Funding Agency	
E&P (PA&ED)									SFMTA	
PS&E										
R/W SUP (CT)										
CON SUP (CT)										
R/W										
CON										
TOTAL										
		Proposed Funding (\$1,000s)							Notes	
E&P (PA&ED)										
PS&E		1,000						1,000		
R/W SUP (CT)										
CON SUP (CT)										
R/W										
CON										
TOTAL		1,000						1,000		

Fund No. 6:		SB1 State of Good Repair							Program Code	
Existing Funding (\$1,000s)										
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	Funding Agency	
E&P (PA&ED)									Caltrans	
PS&E										
R/W SUP (CT)										
CON SUP (CT)										
R/W										
CON										
TOTAL										
Proposed Funding (\$1,000s)									Notes	
E&P (PA&ED)										
PS&E		1,993	1,000					2,993		
R/W SUP (CT)										
CON SUP (CT)										
R/W										
CON			13,507	4,750	825			19,082		
TOTAL		1,993	14,507	4,750	825			22,075		

Fund No. 7:		Other FTA / Match Programming (MTC discretion)							Program Code	
Existing Funding (\$1,000s)										
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	Funding Agency	
E&P (PA&ED)									MTC	
PS&E										
R/W SUP (CT)										
CON SUP (CT)										
R/W										
CON										
TOTAL										
Proposed Funding (\$1,000s)									Notes	
E&P (PA&ED)										
PS&E		2,126						2,126		
R/W SUP (CT)										
CON SUP (CT)										
R/W										
CON			23,967	3,070				27,037		
TOTAL		2,126	23,967	3,070				29,163		



**PROJECT PROGRAMMING REQUEST**

DTP-0001 (Revised Mar, 1 2018 v7.08)

**Complete this page for amendments only**

Date: 08/16/19

District	County	Route	EA	Project ID	PPNO	Alt. ID
04	SF				2137	

**SECTION 1 - All Projects****Project Background**

As with the original 2018 STIP project, the SFMTA continues to work to grow light rail ridership and expand service frequency. Our outdated centralized train control system is under constant pressure and is operating beyond the capacity for which it was designed three decades ago. The risk to service disruption is growing with the recent expansion of our light rail fleet by 68 vehicles (45%) and with the incredible growth in development particularly along the Mission Bay corridor (which corresponds to the Phase 1 geography). To increase rail network capacity, the SFMTA proposes implementing a new Communications-Based Train Control (CBTC) system: a CBTC system possesses the greatest potential of any single investment to improve our light rail operations. The CBTC updates the scope of the Restoration of SFMTA Light Rail Lines - Axle Counters project with new technology. CBTC is envisioned as a multi-phase project with previously programmed STIP funds to be spent on the

**Programming Change Requested**

The SFMTA will complete its Restoration of SFMTA Light Rail Lines - Axle Counters project, which is currently programmed to receive \$13.752 M in the STIP, by folding its scope and purpose into its larger CBTC Phases 1 and 2 project. The requested scope amendment (and related amendments to project milestones) incorporates the train 'tracking' feature of the Axle Counter project as a core function of the new CBTC system. Essentially, the Axle Counter functionality as originally proposed would have been to enhance the original and old train control system, and investment in CBTC would instead replace it with a new system with a multitude of additional benefits to speed up and improve reliability in an expanded service area. Note the project sponsor has been and remains "SFMTA," not "San Francisco County MTA / Dept. of Parking and Traffic", and this is now reflected throughout the PPR.

**Reason for Proposed Change**

The SFMTA has developed a vision for the train control system and has determined that the most beneficial path is to replace and expand the existing system due to its limitations and remaining life cycle. This CBTC project replaces the previous plan of staged upgrades to the legacy system. This legacy project was of smaller scope, and would deliver limited benefits as compared with this new project. Based on project development that has occurred since the approval of the 2018 STIP, the SFMTA will launch the full CBTC system in phases. The 2018 STIP funds will be devoted to Phase 1 and 2 improvements on light rail's surface corridor from 23rd Street and the Portal leading to the Market Street subway and the Market Street subway itself along with Central Subway. This includes and expands the geography of the original Axle Counter project, and will provide far superior benefits to the public. It also leverages significantly more federal, state, and local funds than the original

**If proposed change will delay one or more components, clearly explain 1) reason the delay, 2) cost increase related to the delay, and 3) how cost increase will be funded**

There would be no delay. The cost increase is due to the expanded scope of work and will be funded with non-STIP funds as shown in the "Funding Info" tab (federal, state and local funds).

**Other Significant Information****SECTION 2 - For SB1 Projects Only**

Project Amendment Request (Please follow the individual SB1 program guidelines for specific criteria)

**SECTION 3 - All Projects****Approvals**

I hereby certify that the above information is complete and accurate and all approvals have been obtained for the processing of this amendment request.\*

Name (Print or Type)	Signature	Title	Date

**Attachments**

- 1) Concurrence from Implementing Agency and/or Regional Transportation Planning Agency
- 2) Project Location Map

## PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised 13 Aug 2019 v8.01g)

General Instructions

Amendment (Existing Project) No					Date:	10/22/19
District	EA	Project ID		PPNO	MPO ID	
04						
County	Route/Corridor	PM Bk	PM Ahd	Nominating Agency		
SF	var			SFMTA		
				MPO	Element	
				MTC	Mass Transit	
Project Manager/Contact		Phone		E-mail Address		
Alex Hallowell		(415) 646-4112		<a href="mailto:Alexandra.Hallowell@sfmta.com">Alexandra.Hallowell@sfmta.com</a>		
<b>Project Title</b>						
New Flyer Midlife Overhaul - Phase III						
<b>Location (Project Limits), Description ( Scope of Work)</b>						
The New Flyer Midlife Overhaul – Phase III of SFMTA’s overhaul program will perform midlife overhauls on fourteen 40-foot and 60-foot electric trolley or motor coaches. It will outfit the trolley and motor coach vehicles with upgraded engine technology and a higher capacity battery system to take advantage of technological advances and permit a hybrid vehicle to operate in full battery-electric mode for a portion of its route. Overhauls will also include improvements like repainted exteriors, updated seating configurations, and improved wheelchair securements. Phase III will address vehicles reaching the midpoint of their useful lives fleet shortly following the allocation of STIP funds.						
<b>Component</b>		<b>Implementing Agency</b>				
PA&ED		NA				
PS&E		SFMTA				
Right of Way		NA				
Construction		SFMTA				
<b>Legislative Districts</b>						
Assembly:	17, 19	Senate:	11	Congressional:	12, 14	
<b>Project Benefits</b>						
This midlife overhaul program ensures that the transit fleet continues to operate reliably, with work performed on a predictable basis rather than addressing component failures on a case-by-case, reactive basis which is costly and disruptive to customers. More productive, effective, and, ultimately, attractive service is likely to increase transit ridership. The project also increases the vehicles’ fuel efficiency.						
<b>Purpose and Need</b>						
Maintenance data shows that rehabilitation of the fleet significantly improves vehicle reliability, reduces the incidence of breakdowns, prevents service interruptions with additional costly repairs, and ensure consistency in systems deployed across SFMTA’s 800+ buses. Overhauls will also include improvements like repainted exteriors, updated seating configurations, and improved wheelchair securements.						
<b>Category</b>		<b>Outputs</b>			<b>Unit</b>	<b>Total</b>
Rail / Multi-Modal		Rail cars/ transit vehicles			EA	13
NHS Improvements	No	Roadway Class	NA	Reversible Lane analysis	Y/N	
Inc. Sustainable Communities Strategy Goals		Yes	Reduces Greenhouse Gas Emissions		Yes	
<b>Project Milestone</b>					<b>Existing</b>	<b>Proposed</b>
Project Study Report Approved					11/01/19	
Begin Environmental (PA&ED) Phase						
Circulate Draft Environmental Document			Document Type	CE		
Draft Project Report						
End Environmental Phase (PA&ED Milestone)						
Begin Design (PS&E) Phase						07/01/24
End Design Phase (Ready to List for Advertisement Milestone)						01/01/25
Begin Right of Way Phase						NA
End Right of Way Phase (Right of Way Certification Milestone)						NA
Begin Construction Phase (Contract Award Milestone)						07/01/25
End Construction Phase (Construction Contract Acceptance Milestone)						01/04/26
Begin Closeout Phase						01/04/26
End Closeout Phase (Closeout Report)						08/01/26

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**PROJECT PROGRAMMING REQUEST**

DTP-0001 (Revised 13 Aug 2019 v8.01g)

Date: 10/22/19

**Additional Information**

**PROJECT BENEFITS (FULL TEXT):**

This midlife overhaul program ensures that the transit fleet continues to operate reliably for its full useful life. Planning for midlife overhauls also reduces the impact on the riding public, as work is performed on a predictable basis. Without a midlife overhaul program, the SFMTA would need to address component failures on a case-by-case, reactive basis, which would diminish the overall availability and reliability of this critical fleet. This is costly and disruptive to customers and would result in higher rates of vehicle failures. Additionally, because the midlife overhaul program will make the fleet more reliable, breakdowns and other unscheduled repairs would decrease and it is likely that ridership will increase based on service being more productive, effective, and, ultimately, attractive. The project also increases the vehicles' fuel efficiency.

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**PROJECT PROGRAMMING REQUEST**

DTP-0001 (Revised 13 Aug 2019 v8.01g)

Date: 10/22/19

District	County	Route	EA	Project ID	PPNO
04	SF	var			
<b>Project Title:</b> New Flyer Midlife Overhaul - Phase III					

Existing Total Project Cost (\$1,000s)									Implementing Agency
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	
E&P (PA&ED)									NA
PS&E									SFMTA
R/W SUP (CT)									NA
CON SUP (CT)									SFMTA
R/W									NA
CON									SFMTA
TOTAL									
Proposed Total Project Cost (\$1,000s)									Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON							9,879	9,879	
TOTAL							9,879	9,879	

Fund No. 1:	STIP-STP	Existing Funding (\$1,000s)							Program Code
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	Funding Agency
E&P (PA&ED)									CTC/Caltrans
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding (\$1,000s)									Notes
E&P (PA&ED)									Federal-only funds requested as project is not Article XIX-eligible
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON							7,952	7,952	
TOTAL							7,952	7,952	

Fund No. 2:	AB 664 Bridge Tolls	Existing Funding (\$1,000s)							Program Code
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	Funding Agency
E&P (PA&ED)									MTC
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding (\$1,000s)									Notes
E&P (PA&ED)									MTC's Transit Capital Priorities Bridge Tolls (AB 664)
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON							1,794	1,794	
TOTAL							1,794	1,794	

Fund No. 3:		SFMTA Operating							Program Code
Existing Funding (\$1,000s)									
Component	Prior	20-21	21-22	22-23	23-24	24-25	25-26+	Total	Funding Agency
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding (\$1,000s)									Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON							133	133	
TOTAL							133	133	

**Attachment 3**  
**San Francisco County Transportation Authority**  
**Draft Remaining Regional Improvement Program (RIP) Commitments<sup>1</sup>**  
**Updated October 28, 2019**

<b>Project<sup>2</sup></b>	<b>Initial RIP Commitment</b>	<b>Current Remaining RIP Commitment</b>	<b>Proposed New RIP Funds</b>	<b>Proposed Remaining RIP Commitment</b>
Presidio Parkway [Fulfilled]	\$84,101,000	\$0		\$0
Central Subway [SFCTA 1st priority] <sup>3</sup>	\$92,000,000	\$40,750,000	<del>\$7,174,000</del> \$7,952,000	<del>\$33,576,000</del> \$32,798,000
MTC STP/CMAQ Advance for Presidio Parkway [SFCTA 2nd priority] <sup>4</sup>	\$34,000,000	\$34,000,000		\$34,000,000
Caltrain Downtown Extension to a New Transbay Transit Center [SFCTA 3rd priority]	\$28,000,000	\$17,847,000		\$17,847,000
Caltrain Electrification [Fulfilled]	\$24,000,000	\$0		\$0
<b>Total</b>	<b>\$262,101,000</b>	<b>\$92,597,000</b>	<del><b>\$7,174,000</b></del> <b>\$7,952,000</b>	<del><b>\$85,423,000</b></del> <b>\$84,645,000</b>

<sup>1</sup> Based on Transportation Authority Board-adopted priorities (Resolution 14-25, Approved October 22, 2013).

<sup>2</sup> Acronyms include California Transportation Commission (CTC), Congestion Mitigation and Air Quality (CMAQ), Metropolitan Transportation Commission (MTC), San Francisco County Transportation Authority (SFCTA), San Francisco Municipal Transportation Agency (SFMTA), and Surface Transportation Program (STP).

<sup>3</sup> Central Subway is currently the SFCTA's highest priority for future RIP funds. Since the RIP funds were unavailable when SFMTA was awarding the construction contracts, we are honoring this commitment by programming new RIP funds when they become available to other SFMTA eligible projects to comply with CTC guidelines or by programming other SFCTA funds to Central Subway.

Staff is proposing to program the ~~\$7,174,000~~ \$7,952,000 in available 2020 RIP funds to SFMTA for the New Flyer Midlife Overhaul - Phase III project, reducing the outstanding commitment to the Central Subway by a commensurate amount.

<sup>4</sup> Through Resolution 12-44, the SFCTA accepted MTC's proposed advance of \$34 million in STP/CMAQ funds for Presidio Parkway to be repaid with future county share RIP funds. Repayment of the advance, i.e. by programming \$34 million in RIP funds to a project or projects of MTC's choice, is the second priority after the Central Subway.



# Memorandum

## AGENDA ITEM 6

**DATE:** October 25, 2019  
**TO:** Transportation Authority Board  
**FROM:** Anna LaForte - Deputy Director for Policy and Programming  
**SUBJECT:** 11/5/2019 Board Meeting: Approve an Amended Program of Projects for the 2020 Regional Transportation Improvement Program

<p><b>RECOMMENDATION</b>    <input type="checkbox"/> Information    <input checked="" type="checkbox"/> Action</p> <p>Approve an amended Program of Projects for the 2020 Regional Transportation Improvement Program (RTIP).</p> <ul style="list-style-type: none"> <li>• Reprogram \$13,752,000 in Fiscal Year (FY) 2020/21 RTIP funds from San Francisco Municipal Transportation Agency's (SFMTA's) Restoration of Light Rail Lines - Axle Counters project to the Communications-Based Train Control (CBTC) - Phases 1 and 2 project.</li> <li>• Program \$778,000 in additional FY 2024/25 RTIP funds to the New Flyer Midlife Overhaul - Phase III project.</li> </ul> <p><b>SUMMARY</b></p> <p>As San Francisco's Congestion Management Agency (CMA), the Transportation Authority is responsible for programming San Francisco's county share RTIP funds. As part of the 2018 RTIP, the Board recommended, and the Metropolitan Transportation Commission (MTC) and California Transportation Commission (CTC) approved, \$13,752,000 for SFMTA's Restoration of Light Rail Lines - Axle Counters project. In September 2019, SFMTA notified Transportation Authority staff that it would like to incorporate the project scope into its larger, multiphase CBTC project, which will provide the same functionality as axle counters in tracking train movements but with modern technology and extended benefits to the entire Muni Metro, not just the subway. We also request programming \$778,000 in additional RTIP funds for the New Flyer Midlife Overhaul - Phase III project, as approved last month, for one additional bus overhaul (14 versus 13 buses), increasing RTIP funding to \$7,952,000 due to a funding calculation error.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Fund Allocation</li> <li><input checked="" type="checkbox"/> Fund Programming</li> <li><input type="checkbox"/> Policy/Legislation</li> <li><input type="checkbox"/> Plan/Study</li> <li><input type="checkbox"/> Capital Project Oversight/Delivery</li> <li><input type="checkbox"/> Budget/Finance</li> <li><input type="checkbox"/> Contract/Agreement</li> <li><input type="checkbox"/> Other: _____</li> </ul>
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## **DISCUSSION**

### **Background**

The State Transportation Improvement Program (STIP) is a five-year investment plan for state transportation money that is updated every two years by the CTC. Regional spending plans - developed by the MTC for the nine county Bay Area region and by other agencies elsewhere in California - account for 75% of the STIP. These are known as Regional Transportation Improvement Programs or RTIPs. The RTIPs can fund a broad range of projects from a bike path to highway redesigns or rail line extensions.

On October 22, 2019, the Board approved San Francisco's 2020 RTIP project priorities for \$7,592,000 of new funding (see Attachment 1 for details). As CMA, the Transportation Authority must submit its new 2020 RTIP priorities and any amendments to existing RTIP projects to MTC for approval by mid-November 2019.

### **SFMTA's Train Control.**

Of the entire Muni Metro system, only the Market Street Subway has centralized train control which was installed 30 years ago. Most of the 74-mile light rail vehicle (LRV) network is governed by signals that work in isolation rather than as a connected system. SFMTA staff estimates that this outdated train control system accounts for around half of the subway's acute delay incidents due to communication failures, failed entry into the subway, computer failures, and equipment failures.

Restoration of Light Rail Lines - Axle Counters [Current Project]: Axle counters are currently used to identify the locations of trains. As approved in the 2018 RTIP, this project would upgrade 83 rail-side axle counters to more current technology and install 20 additional axle counters to improve the spacing of the counters between Forest Hill and Eureka and outbound Embarcadero to Montgomery stations. The \$13,752,000 programmed in the 2018 RTIP would have leveraged \$18,248,000 in federal funds to complete the installation of the axle counters, with a contract awarded in late 2020 and project completion by early 2024. While this project would have provided operational benefits, it would be a solution that upgraded only one component of the system with old technology rather than addressing the larger need for a systemwide and modernized upgrade.

CBTC Phases 1 and 2 [Proposed Project]: SFMTA has decided to change its approach to train control. Rather than implementing incremental improvements, it is planning to replace the existing system with a modern Communications-Based Train Control (CBTC) system that would extend to the entire light rail system rather than just the Muni Metro Subway. The CBTC system will provide better technology to track train movements using an on-board control computer and global positioning system to communicate directly with the Operations Control Center. It would also allow systemwide management of the Muni Metro system including integration with surface traffic signals. This would allow trains to travel closer together and increase allowable train speeds. SFMTA staff anticipates CBTC will reduce subway delays by 20-25%, allow for improved maintainability, reduce the variability of surface trip times, better address bottlenecks, and increase overall capacity of the system. The project





will increase the number of trains through the subway from approximately 35 trains per hour to roughly 45 per hour in each direction.

SFMTA plans to implement the overall CBTC project in seven phases, as shown in Attachment 2. We are proposing to reprogram the RTIP funds to the first two phases of the project, leveraging \$77,283,000 in federal, state, and local funds for a project cost of \$91,035,000. Phase 1 extends from 23<sup>rd</sup> Street along the T-Third line to the subway entrance at The Embarcadero. Phase 2 will implement CBTC on the entire Muni Metro Subway from West Portal to The Embarcadero. Construction on Phase 1 will begin in early 2022 and conclude in late 2023. Construction on Phase 2 will begin in mid-2023 and conclude in mid-2025. The project will be delivered using a design-build contracting approach. Depending upon securing full funding, SFMTA will complete the deployment of CBTC across the entire Muni Metro System by late 2027 with a total cost estimate of \$300 million.

Attachment 3 contains a draft of the Project Programming Request form for the CBTC project, with basic information about scope, schedule, budget, and funding plan. Additional details are shown in the presentation (Attachment 4), which SFMTA staff will present at the November 5 Board meeting.

#### **Additional Funds for SFMTA's New Flyer Midlife Overhaul - Phase III Project.**

The Board-approved 2020 RTIP committed all new available capital funding (\$7,174,000) to the New Flyer Midlife Overhaul - Phase III project. The scope of work includes scheduled midlife overhauls on New Flyer trolley coaches or motor coaches, which has shown to significantly improve vehicle reliability, reduce the incidence of breakdowns, prevent service interruptions, and avoid additional costly repairs. The scope also includes cosmetic improvements like exterior paint, seating configurations, and wheelchair securements.

Subsequent to Board action, MTC staff discovered an error in our calculation of RTIP funding available, and as a result we have an additional \$778,000 available for programming this cycle. We are recommending increasing 2020 RTIP programming to the New Flyer project, which would allow the SFMTA to add one additional vehicle to the scope of work, resulting in fourteen vehicle overhauls instead of thirteen. This would bring the total amount of RTIP funds programmed to the project to \$7,952,000. A revised Project Programming Request form is included as Attachment 5.

Subject to Board approval, the proposed amended 2020 RTIP program of projects would reduce the Transportation Authority's remaining funding commitment to the SFMTA's Central Subway, being paid down by programming RTIP funds to other SFMTA RTIP-eligible projects such as the New Flyer Midlife Overhaul, to \$32,798,000 (Attachment 6).

#### **Next Steps.**

Subject to Board approval at the November 19 meeting, we would submit the amended San Francisco 2020 RTIP Program of Projects to the MTC. The MTC Commission will vote to approve the Bay Area's 2020 RTIP on December 18, 2019 and then will submit it to the CTC. The CTC will consider needs across the state and may adjust years of programming to match projected fund availability. The CTC is scheduled to adopt the STIP at its March 25, 2020 meeting. If approved, SFMTA would be able to allocate the funds for the CBTC project as



soon as July 2020. Funds for the New Flyer Midlife Overhaul project would be available in Fiscal Year 2024/25.

## **FINANCIAL IMPACT**

The recommended action would not have an impact on the adopted FY 2019/20 budget.

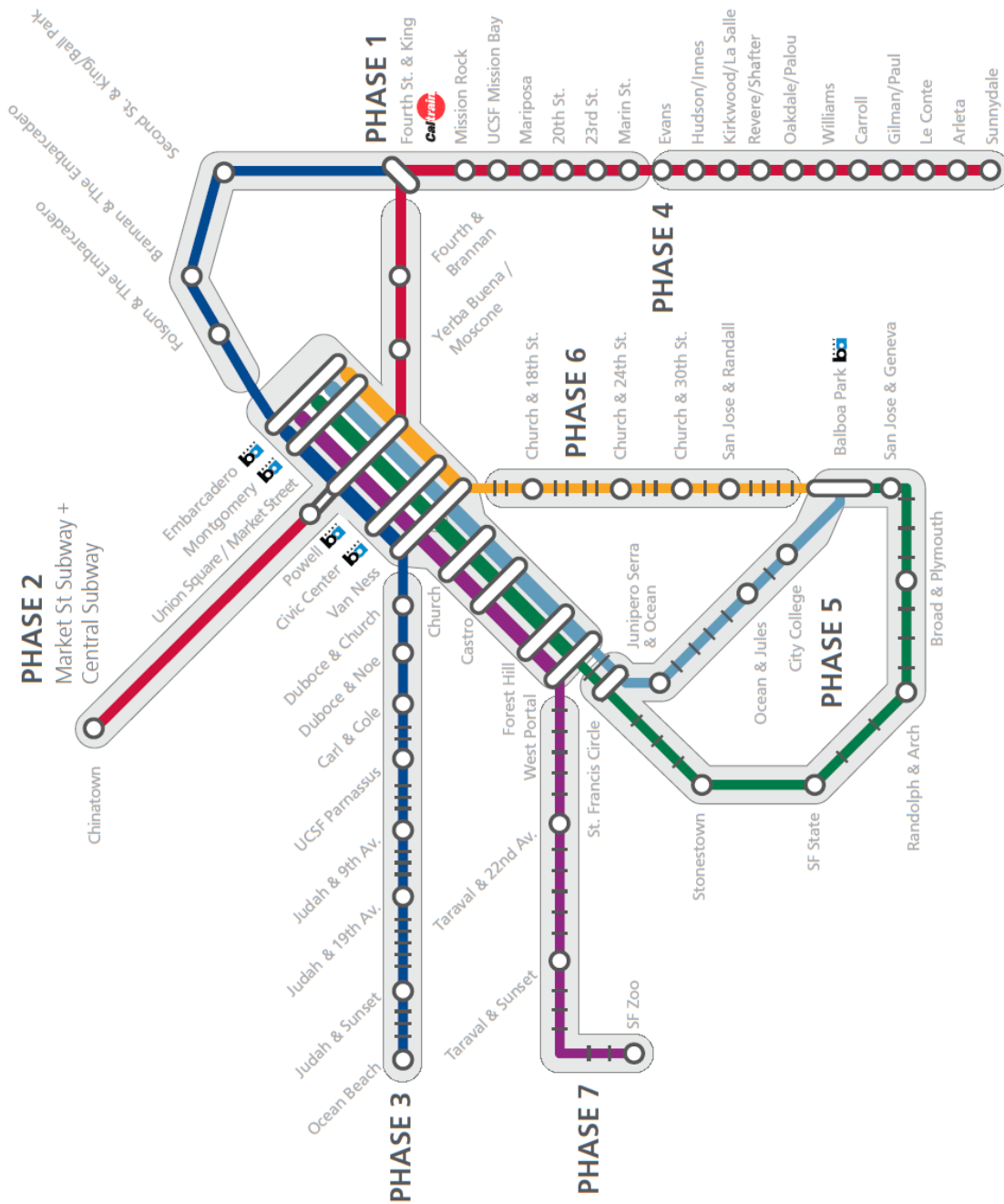
## **CAC POSITION**

The CAC was briefed at its October 23, 2019 meeting, and unanimously approved a motion of support to reprogram the \$13,752,000 in FY 2020/21 RTIP funds from the Restoration of Light Rail Lines - Axle Counters project to the CBTC - Phases 1 and 2 project. Information regarding the recommendation to program an additional \$778,000 to the New Flyer Midlife Overhaul - Phase III project was presented to the CAC but was not part of its action as we identified the additional RTIP funding after finalizing the meeting materials.

## **SUPPLEMENTAL MATERIALS**

- Attachment 1 - Proposed Amended 2020 RTIP Program of Projects
- Attachment 2 - Map of CBTC Implementation by Phase
- Attachment 3 - CBTC - Phases 1 and 2 Project Programming Request Form
- Attachment 4 - SFMTA presentation on the CBTC project
- Attachment 5 - New Flyer Midlife Overhaul - Phase III Revised Project Programming Request Form
- Attachment 6 - Proposed Remaining RTIP Commitments

# Preliminary Project Phasing





SFMTA

A photograph of a light rail train at a station platform. The train is white with a dark front and has the number '2001A' on its front. The platform is tiled and has an 'EXIT' sign. The scene is dimly lit, suggesting an indoor or covered station.

# Communications Based Train Control (CBTC) – STIP

**Daniel Howard**  
**Transit | SFMTA**

# What is automatic train control?

Primarily, train control is a **safety system** which is designed to prevent **train-to-train** collisions.



# SFMTA's train control system:



The current train control system operates in the Market Street tunnel between Embarcadero and West Portal Stations

- A train entering a portal pings the central computer system
- The system does a “handshake” with the vehicle, then routes it automatically
- System keeps vehicles safely spaced
- System controls use and activation of switches to route vehicles

# How does our system perform?

The present system was rolled out in the 1990s—it experienced significant issues then, and continues to cause headaches today

## Three entry portals

Multiplies the opportunity for system failures, makes systemic management of entire rail system complex

## Twenty-year-old system

Components fail regularly, technology has significant capacity issues, fewer and fewer people have expertise to understand system

## Rigid infrastructure

Extremely unforgiving system design, system is slow to come back up and results in delays that are disproportionate to significance of initial failure

## Congestion

We are operating at (or even above) capacity of the train control system, leaves zero room for error

# Program Plan





# New Train Control System

## Modern Equipment

New systems use modern standards like WiFi and cellular, provide redundant communication to keep trains connected. New equipment is less failure-prone than today.

## Better Software

Better software will allow for increases in capacity through more efficient operations. Software can also predict faults to reduce delay-causing failures in service.

## Traffic Signal Coordination

Train control system communicates with traffic signals so trains don't get stopped by red lights.

## Supervision Everywhere

A system-wide train control allows trains to enter system at yards, cutting out portal entry delays. It also permits better sequencing on the surface to avoid bunches/gaps.

# Budget & Funding Plan: STIP

## Phase I: 23<sup>rd</sup> St-Ferry Portal

Detail Design	\$ 3,450,000
Construction	\$ 23,250,000
	\$ 26,700,000

## Funding plan

FTA 5337	\$ 3,576,000
Transit Capital Priorities (MTC)	\$ 4,344,000
STIP	\$ 13,752,000
Population Baseline GF	\$ 3,271,000
SB1 State of Good Repair	\$ 1,757,000

## Phase II: Subway

Detail Design	\$ 11,450,000
Construction	\$ 43,950,000
	\$ 55,400,000

## Funding plan

FTA 5337	\$ 403,000
Transit Capital Priorities (MTC)	\$ 24,820,000
General Fund	\$ 1,000,000
Population Baseline GF	\$ 8,860,000
SB1 State of Good Repair	\$ 20,317,000

Geography for Phases I and II aligns with original Axle Counter project and provides substantially larger scope and benefits

# Total Program Cost & Schedule

Phase	Location	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
		FY21	FY21	FY22	FY22	FY22	FY22	FY23	FY23	FY23	FY23	FY24	FY24	FY24	FY24	FY25	FY25	FY25	FY25	FY26	FY26	FY26	FY26	FY27	FY27	FY27	FY27	FY28
Phase 1 DD	Embarcadero + 3rd to MME																											
Phase 1 CON	Embarcadero + 3rd to MME																											
Phase 2 DD	Subways																											
Phase 2 CON	Subways																											
Phase 3 DD	N Judah (Duboce to Ocean Bch)																											
Phase 3 CON	N Judah (Duboce to Ocean Bch)																											
Phase 4 DD	T Third (MME to Sunnydale)																											
Phase 4 CON	T Third (MME to Sunnydale)																											
Phase 5 DD	K & M Lines (WP to Balboa Pk / Parkmerced)																											
Phase 5 CON	K & M Lines (WP to Balboa Pk / Parkmerced)																											
Phase 6 DD	J Church (Duboce to Balboa Park)																											
Phase 6 CON	J Church (Duboce to Balboa Park)																											
Phase 7 DD	L Taraval (West Portal to Zoo)																											
Phase 7 CON	L Taraval (West Portal to Zoo)																											

	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
Project Cost	1,335,000	0	3,100,000	23,000,000	36,875,000	53,425,000	46,525,000	32,225,000	49,100,000	32,800,000	2,400,000
Escalation (5%/yr)			1,150,000	1,940,000	2,950,000	2,690,000	1,960,000	3,130,000	2,200,000	170,000	
<b>TOTAL</b>	<b>1,335,000</b>	<b>0</b>	<b>3,100,000</b>	<b>24,150,000</b>	<b>38,815,000</b>	<b>56,375,000</b>	<b>49,215,000</b>	<b>34,185,000</b>	<b>52,230,000</b>	<b>35,000,000</b>	<b>2,570,000</b>

296,975,000

## Potential funding sources for Phases 3-7 include:

- **Federal:** Capital Investment Grant program
- **State:** Transportation Infrastructure and Rail Capital Program, Affordable Housing/Sustainable Communities, CalTrans State of Good Repair Funds
- **Local:** GO Bond, Population Baseline funds, Developer feeds, future revenues (TNC tax)

\*Preliminary project cost estimate is subject to change, figures rounded



SFMTA

# Questions?

