San Francisco County Transportation Authority

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Memorandum

Date: 07.09.14

RE: Plans and Programs Committee
July 15, 2014

To: Plans and Programs Committee: Commissioners Mar (Chair), Kim (Vice Chair), Breed, Campos, Yee and Avalos (Ex Officio)

From: Lee Saage – Deputy Director for Capital Projects

Through: Tilly Chang – Executive Director

Subject: **INFORMATION** – Major Capital Projects Update – Van Ness Avenue Bus Rapid Transit Project

Summary

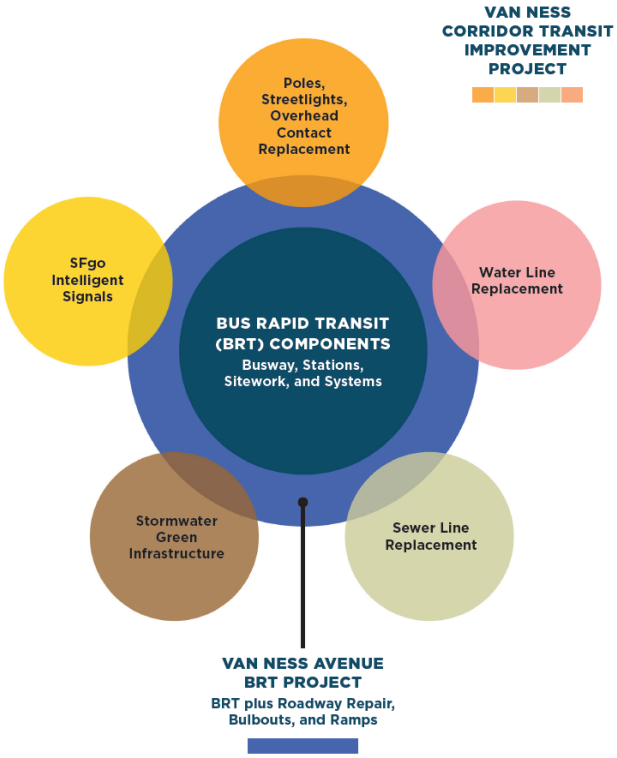
Van Ness Avenue Bus Rapid Transit (BRT) Project, one of the signature projects of the Prop K Expenditure Plan, comprises a package of transit improvements along a two-mile corridor of Van Ness Avenue between Mission and Lombard Streets, including dedicated bus lanes, consolidated transit stops, and pedestrian safety enhancements. The Transportation Authority completed environmental review for the project in December 2013 and at that time transferred project lead to the San Francisco Municipal Transportation Agency (SFMTA). SFMTA completed preliminary engineering in June 2014 with approval of its Conceptual Engineering Report (CER). SFMTA began final design in May 2014 and expects to conclude in mid-2015. Under current assumptions, construction would begin in late 2015 and revenue service would begin in 2018. The CER recommends use of the Construction Manager at Risk project delivery method as opposed to traditional design-bid-build. Cost of the core BRT project is now estimated at $162 million and a total of $250 million when separate but related projects are included. The design team expects to obtain conceptual approval in July 2014 from the San Francisco Arts Commission for station platforms. SFMTA is concerned that cost and maintenance implications of providing level boarding between the platform and the vehicle floor may outweigh the benefit of speedier passenger loading times. SFMTA is, therefore, recommending a curb height platform for the Van Ness BRT project. **This is an information item.**

BACKGROUND

Van Ness Avenue Bus Rapid Transit (BRT) Project comprises a package of transit improvements along a two-mile corridor of Van Ness Avenue between Mission and Lombard Streets. Key features include: dedicated bus lanes, level or near level boarding, consolidated transit stops, high quality stations, transit signal priority, elimination of most left turn opportunities for mixed traffic, and pedestrian safety enhancements. Van Ness Avenue BRT is a signature project in the Prop K Expenditure Plan, a regional priority through the Metropolitan Transportation Commission's Resolution 3434 and Plan Bay Area, and a Federal Transit Administration (FTA) Small Starts program project. The project is a partnership between the Transportation Authority, which led the environmental review, and the San Francisco Municipal Transportation Agency (SFMTA), which is leading the preliminary and detailed design phases and will be responsible for construction and operation of the facilities. SFMTA's preliminary engineering team includes internal SFMTA engineers with design support from the Department of Public Works (DPW), Public Utilities Commission (SFPUC), and Planning Department. SFMTA is also working with its on-call consultant HNTB for some specialized tasks.

As part of preliminary engineering, the core Van Ness Avenue BRT project has been combined with several parallel projects for design, management, and eventual construction. These projects overlap the geography and will result in lower overall cost and construction duration when combined, compared to if they were built separately, but may increase the construction duration when added to the core Van Ness Avenue BRT project. The projects include Overhead Contact System, Streetlights, and Poles replacement; SFgo traffic signal replacement; sewer line replacement; water line replacement; and stormwater "green infrastructure" installation. Meanwhile, pavement resurfacing, curb ramp upgrades, and sidewalk bulb outs have always been considered part of the core BRT project. The parallel projects have largely independent funding, but many scope items will be cost-shared with the BRT project. The Conceptual Engineering Report (CER) includes all these projects as part of a single Van Ness Corridor Transit Improvements Project, as shown in Figure 1.

Figure 1: Relationship of Van Ness BRT and Van Ness Corridor Transit Improvement Project



STATUS AND KEY ACTIVITIES

In June 2014, SFMTA signed the final CER. With the completion of the CER, Final Design for the project is now underway. After extensive review and after conducting a number of cost workshops, the design team has prepared a new cost estimate as part of the CER. Cost of the core BRT project has increased approximately $36 million, or 28%, as compared to the cost estimate prepared as part of the environmental document, although the BRT facility components (not including mixed flow lane resurfacing and related curb-work), remain in the $125 million cost range. Cost increases are associated with changes in design standards, electrical and communications components, construction duration and continued uncertainty about platform architecture and other features requiring conservative

assumptions (see Current Issues and Risks section of this memo). The final CER includes an updated cost and funding plan that identifies specific sources to cover the increase.

SFMTA on-call consultant HNTB has prepared a construction sequencing plan and a construction schedule. A construction duration of about 2.5 years can be achieved with variances from Caltrans and City permitting agencies that allow for greater productivity. HNTB and SFMTA are developing a traffic management plan that will model traffic disruptions and should provide justification for easing the restrictions. This effort will continue during Final Design and the schedule will be updated as planning progresses. The Transportation Authority will continue to closely monitor the schedule. See the schedule section at the end of this memo for more detail.

SFMTA's project delivery analysis has concluded with a recommendation to use the Construction Manager at Risk (CMAR, also known as Construction Manager-General Contractor or CMGC) method of procurement. This method allows SFMTA to advertise and award a contract before the completion of final design, with a potential of gaining valuable input from the contractor on design details. However, this alternative delivery method may take longer to procure and may produce fewer bids due to its relative novelty. CMAR also does not lock in a total contract price until after design is complete. If the price cannot be agreed upon, the work would be re-bid as a traditional contract.

CURRENT ISSUES AND RISKS

Civic Design Review of Platform Features: The architectural features of the BRT platforms were not finalized with the CER. The San Francisco Arts Commission (SFAC) Civic Design Review Committee has jurisdiction over the project architectural and landscape features, and at a preliminary hearing, SFAC members did not grant the expected Phase I approval for the platform design, and objected to the inclusion of SFMTA's red "seismic wave" shelters. The SFMTA Director of Transportation held a meeting May 9, 2014 with the Directors of the Transportation Authority, DPW, the Planning Department, and the Arts Commission. The Directors agreed that staff should develop a platform design that provides information displays and advertisement panels positioned to provide some wind protection, but omits the red seismic wave roofs (i.e., no station roofs or canopies). The staff will also evaluate the possibility of providing seating. Additional features including railings, lighting, and branding flags will also be developed in cooperation with the Arts Commission. Based on this direction, the project team is developing station designs and plans to present them at the July Civic Design Review Committee meeting in order to secure Phase I approval.

Platform Height and Level Boarding: SFMTA has identified significant challenges to providing level boarding between the platform and the vehicle floor and is recommending a curb height platform for the Van Ness BRT project. Bus manufacturers have indicated that bridge plates would be necessary at middle doors to meet Americans with Disabilities Act (ADA) standards for gaps between platforms and vehicles. Buses would continue to need standard wheelchair ramps at the front door in order to operate at both level-platform and curb heights outside the BRT corridor. SFMTA believes that low-floor articulated buses and all-door boarding already achieve most of the benefit that level boarding would provide, and that having level boarding at only some stops or certain doors would limit the additional benefit. Meanwhile, bridge plates would have additional capital and maintenance costs, and could impact vehicle reliability.

After analyzing these tradeoffs, SFMTA is recommending that Van Ness BRT platforms be built at standard curb height, but preserve room to lengthen ramps and raise the platforms in the future if circumstances change. SFMTA's level boarding alternatives analysis is attached to this memo.

ONGOING ACTIVITIES

Agreements and Approvals: The project team has finalized a maintenance agreement with Caltrans, the final item needed for approval of the Project Study Report/Project Report (PSR/PR). The final PSR/PR, including the agreement, has been assembled for distribution and is circulating within Caltrans for the required signatures. The report allows the project to proceed into the next phase of the Caltrans process.

SFMTA is in general agreement with the sewer replacement and other parallel projects, including water service replacement, green stormwater infrastructure, overhead contact system and pole replacement and SFgo signal work. The SFMTA and SFPUC have a tentative agreement on cost sharing for sewer replacement work to be coordinated with the Van Ness Avenue BRT Project. The next priority will be to establish cost-sharing agreements with the various partners.

The Transportation Authority has also completed an Addendum to the Archaeological and Native American Cultural Resources Sensitivity Assessment. The Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR) included the writing of the addendum as a mitigation/minimization measure as part of the process related to Section 106 of the National Historic Preservation Act. The document has been submitted to the FTA and will be transmitted to the State Historic Preservation Officer (SHPO) for concurrence.

Outreach: The environmental review phase Citizens Advisory Committee (CAC) held its final meeting in September 2013. The SFMTA has created a new CAC for design and construction, and the first meeting was held on Thursday, June 26.The CAC meetings are open to members of the public.

Next Steps/Upcoming Key Milestones: The environmental documentation phase was completed with the publication of the Federal Record of Decision on January 2, 2014. The Final CER was completed in June 2014, and the Caltrans PSR/PR document is expected to be executed by the end of June. Budget, funding, and schedule updates based on the CER are detailed in the following sections. The next application for Prop K funds will be for the final design phase. SFMTA expects to bring this allocation request forward for the September Board cycle concurrent with Board consideration of the 2014 Prop K 5-year Prioritization Program (5YPP) update for the Bus Rapid Transit/Transit Preferential Streets/Muni Metro Network category**.**

PROJECT SCHEDULE AND BUDGET

Schedule: Figure 2 shows the project schedule for the consolidated Van Ness Corridor Transit Improvement Project. Preliminary Engineering was completed in June. Final Design activities began in late May, and will be completed by mid-2015 with Construction beginning in late 2015. Construction is expected to last approximately 2-1/2 years based on aggressive but reasonable assumptions. Revenue service is still anticipated to begin in 2018.

Figure 2: Van Ness Avenue Corridor Transit Improvement Project Schedule

Activities	2013				2014				2015				2016				2017				2018			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1. Conceptual Engineering + Environmental Studies[1]																								
2. Preliminary Engineering (CER)																								
3. Final Design																								
4. Advertise + Award Contract																								
5. Construction																								
6. Testing/Startup																								
7. Revenue Operations Begin																								

1. Conceptual Engineering and Environmental Studies began in 2007

Budget: Table 1 shows the budget for the BRT project by phase as well as expenditures to date, not including the parallel projects. A cost estimate update was performed as part of the CER, and SFMTA has revised the budget accordingly. The table shows the Environmental budget and the CER budget. The total project cost is expected to increase from $125.6 million to $162 million, although BRT facility components remain in the $125 million cost range. See the "Status and Key Activities" section of this memo for more detail.

Appendix 1 shows the BRT project funding plan. The project will use a mix of Prop K, FTA Small Starts, and other local funds. Transportation Authority staff are supporting SFMTA's request to program an additional $15.4 million in Prop K funds through the aforementioned 2014 5YPP update. FTA Small Starts funds are expected to be committed by spring 2015, and the project should receive the maximum allowable funds under this program. Caltrans has programmed State Highway Operations Protection Program (SHOPP) funds to the project The funding plan also includes revenues from Central Freeway land sales for state of good repair improvements on Van Ness Avenue and California Pacific Medical Center development fees for BRT. SFMTA has stated its intention to use revenue bonds to cover the remaining cost of the BRT.

The parallel projects shown in Figure 1 above, have separate funding sources for betterments above and beyond what is needed to build and operate the BRT. These include Prop K and FTA funds for guideways, which will contribute to Overhead Contact System work needed to maintain a state of good repair.

Table 1: Van Ness Avenue Bus Rapid Transit Budget and Expenditures to Date

Project Name ***(in $ millions)***	**Budget as of Environmental Phase** ***($ millions)***	**Budget in CER** ***($ millions)***	**Expended to Date** ***($ millions)***[1]	**% Complete**
Conceptual Engineering + Environmental Studies	$ 7.4	$ 7.4	$ 7.31	99%
Preliminary Engineering (CER)	$ 6.8	$ 6.8	$ 3.24	48%
Final Design (PS+E)	$ 9.4	$ 7.1	$0	0%
Construction (Including Testing/Startup)	$ 92.7	$ 136.7	$0	0%
Procurement	$ 9.4	$ 4.0	$0	0%
Total	$125.6	$ 162.0	$ 10.55	8.4%

[1]As of April 30, 2014. Budget update anticipated with July Board Memo.

Table 2: Van Ness Corridor Improvement Project Cost Breakdown

Project Description	Project Cost (*$ Million*)
Core Van Ness BRT	$162.0
Overhead Contact System and Pole Replacement	$29.14
SFgo Traffic Signal	$23.46
Lighting	$16.56
Sewer Replacement	$12.56
Water Line Replacement	$6.62
Green Infrastructure	$3.67
Total	**$254.0**

Attachments (2):

1. Van Ness Avenue BRT funding plan
2. SFMTA Platform Height Alternatives Analysis

Attachment 1: Van Ness Bus Rapid Transit Funding Plan
Updated: April 2014

			Project Phases[1]				
Source	**Type**	**Status**	**ENV, CER/PE**	**PS&E**	**CON**	**Total by Status**	**TOTAL**
5309 Small Starts[2]	Federal	Allocated	$7,031,202	$6,371,063	$1,597,734	**$14,999,999**	**$74,999,999**
		Programmed			$30,000,000	**$30,000,000**	
		Planned			$30,000,000	**$30,000,000**	
SHOPP[3]	State	Allocated				**$0**	**$7,304,868**
		Programmed			$7,304,868	**$7,304,868**	
		Planned				**$0**	
PPM Funds[4]	Local	Allocated	$197,907			**$197,907**	**$197,907**
		Programmed				**$0**	
		Planned				**$0**	
Prop K[5]	Local	Allocated	$6,977,180			**$6,977,180**	**$36,302,444**
		Programmed		$1,594,280	$12,367,440	**$13,961,720**	
		Planned			$15,363,544	**$15,363,544**	
SFMTA Revenue Bonds	Local	Allocated				**$0**	**$26,053,479**
		Programmed				**$0**	
		Planned			$26,053,479	**$26,053,479**	
California Pacific Medical Center Contribution[6]	Local	Allocated				**$0**	**$5,000,000**
		Programmed		$2,100,000	$2,900,000	**$5,000,000**	
		Planned				**$0**	
Central Freeway Parcel Revenues[7]	Local	Allocated				**$0**	**$12,654,135**
		Programmed			$12,654,135	**$12,654,135**	
		Planned				**$0**	
SFMTA Operating Funds	Local	Allocated	$1,823			**$1,823**	**$1,823**
		Programmed				**$0**	
		Planned				**$0**	
	Totals	**Allocated**	**$14,208,112**	**$6,371,063**	**$1,597,734**	**$22,176,909**	**$162,514,655**
		Programmed	**$0**	**$3,694,280**	**$65,226,443**	**$68,920,723**	
		Planned	**$0**	**$0**	**$71,417,023**	**$71,417,023**	
			$14,208,112	**$10,065,343**	**$138,241,200**	**$162,514,655**	

[1] Acronyms used for project phases include: ENV - Environmental Documentation, CER/PE - Conceptual Engineering Report/Preliminary Engineering (30% Design), PS&E - Plans, Specifications & Estimates or Final Design, CON - Construction. The construction phase includes the incremental cost for procuring new BRT vehicles for the project.

[2] $15 million appropriated in the FY 2010/11 federal budget and $30 million appropriated in FY 2011/12 federal budget.

[3] State Highway Operation and Protection Program (SHOPP) funding amount programmed in the 2014 SHOPP, adopted by the California Transportation

[4] PPM: Planning, Programming and Monitoring funds

[5] Prop K amount includes $420,900 in Authority operating funds in Fiscal Years 2009/10 and 2010/11.

[6] The development agreement with the California Pacific Medical Center was approved by the San Francisco Board of Supervisors through Ordinance 138-13 on July 11, 2013.

[7] $12.7 million in Central Freeway Parcel Revenues is dedicated for Van Ness Avenue State of Good Repair improvements.

A. Boarding Platform Height

The level-boarding platform is 14 inches high and is considered the most desirable system for passenger loading and unloading dwell times. This platform system is not feasible due to the configuration of Muni buses, as demonstrated by field tests which concluded a conflict between a 14-inch high platform and bus vehicle wheel lugs.

Other systems are unable to close the gap to the required **3** inches. In one study by the National Bus Rapid Transit Institute, the Health Line in Cleveland achieved a minimum gap of **4** inches with average gaps of **8.11** and **5.92** inches depending on the station. The same study reported that the EmX BRT in Eugene Oregon achieved a minimum gap of **6.5** inches, with average gaps of **8.55** to **9.73** inches.

EmX overcomes this gap by using bridge plates that deploy from the middle door. AC Transit plans a similar approach for their new BRT, using bridge plates that deploy from doors other than the front doors. In the EmX BRT this prevents the use of all doors for boarding at the platforms since the front doors are blocked by railing to prevent confusion as to where wheelchairs should board. Considering the volume of passengers that the Van Ness BRT is expected to carry this approach is not recommended.

Because the level boarding islands would only be available in the BRT corridor it would mean that wheelchair using passengers boarding outside the BRT corridor would board at the front door. Then they would have to maneuver through the bus to the middle door where the bridge plate would be available to alight in the BRT corridor. This was considered to be impractical considering the volume of passengers the system is expected to carry. Requiring a passenger in a wheelchair to maneuver from one part of the coach to another would be difficult for all customers on board and increase in dwell time.

In addition, using bridge plates would require having them installed on the entire SFMTA rubber tired fleet or having a limited subset of vehicles which could operate on BRT corridor. The first option is an additional expense and the second greatly restricts operational flexibility and reliability by limiting the vehicles available for BRT service.

Additional Concerns:

New Flyer was contacted about the possibility of shortening the wheel base of the front axle to minimize or eliminate the problem with the lug nuts. The team was informed that because of the retooling necessary this is would be prohibitively expensive.

No docking technology or driver skill can guarantee a docking that is within the ADA limits 100% of the time. In the event that the ramp would need to be deployed to compensate for a poor docking the ramp's deployment envelope would intersect the 14 inch high platform making the ramp unusable.

The height of the vehicle floor is specified at 14 inches but based on the vehicle load and the condition of the vehicles suspension this height can vary by as much as an in in either direction, from 13 inches to 15 inches.

A person with a bicycle would be required to step off a 14-inch high platform in order to use the bus' bike rack. And a 14-inch height is well beyond the established criteria for a step or stair riser. As stated in the California Building Code Section 1009.4.2 - Riser Height and Tread

Depth, "*….riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum."*

Golden Gate Transit buses will also be using the BRT platforms and running way. The high floor configuration of the Golden Gate Transit vehicles makes operating at a 14 inch high platform problematic and prevents the use of their wheelchair lifts. This would require a number lower platforms for Golden Gate Transit to continue operating on Van Ness Avenue.

A 6-inch high platform eliminates the need for a 1.5 foot tactile warning strip, which is a savings in both capital and future maintenance costs and improves the ADA path of travel on the platform. In addition it facilitates the loading and unloading of bicycles from the front of the coaches and minimizes the chance for damage to the platform or the coaches should the bus get too close to the platform while docking.

The following platform heights were evaluated:

1. Standard 6-inch high platform - Recommended
2. Standard 8 to 10 - inch high platform
3. Level Boarding Platform
4. Level Boarding Platform with mid-door bridge plate

For details regarding the evaluation of the various platforms, see Table 20: Alternatives for Platform Heights.

Recommendation: The 6-inch high platform is the recommended platform height. It is similar to the current configuration used and it meets established step riser criteria for passengers entering/exiting the bus as well as patrons using the bike rack. Furthermore, handrails are not necessary at this platform height.

A 14-inch high platform increases capital and operational costs, reduces operational reliability and passenger comfort, and provides no discernable benefit.

Table 20: Alternatives for Platform Heights

	ALTERNATIVES	PICTURES	DESCRIPTION	PROPERTY / AGENCY	ADVANTAGES	DISADVANTAGES
1	Standard Platform ***RECOMMENDED***		A 6-inch high platform similar to sidewalk-level boarding	▪ LA Metro Rapid, CA ▪ Kansas City MAX, MO ▪ SFMTA, SF, CA	▪ Handrails not required on ramps ▪ Patron familiarity as this is consistence with SFMTA's existing boarding platform height.	▪ Higher dwell time than level boarding due to steps and/or ramps for disabled passenger required for passenger loading. ▪ ▪ Requires handrails on ramp.
2	Raised Platform		A platform height of between 8 to 10 inches to achieve an optimal step of between 5 to 7 inches	▪ EmX System, Eugene, OR	▪ Easier boarding than standard curb height platform. ▪ Reduced risk of damage to buses compared to level boarding height.	▪ Higher dwell time than level boarding due to steps and/or ramps for disabled passengers required for passenger loading. ▪ Requires handrails on ramp.
3	Level-Boarding Platform ***NOT ACCEPTABLE*** *due to compatibility issues with both MUNI and potentially Golden Gate Transit buses*		Station platform raised 14 to 15-inches to approximately same height as low-floor bus floor height thereby eliminating vertical gap.	▪ Las Vegas MAX, NV ▪ EmX System, Eugene, OR ▪ Cleveland Health Line, OH ▪	▪ Reduced dwell time because of ease of boarding for all passengers. ▪ Potential elimination of ramp deployment. ▪ More rail-like experience compared to standard height platform	▪ Does not work with MUNI's New Flyer Xcelsior Buses because ofconflict with wheel lugs and front door ramp with platform. ▪ Does not comply with established stair criteria (riser height) for a person stepping off of the platform to use the bus bike rack. ▪ More risk of injury if patrons should fall from platform.
4	Level-Boarding Platform with Mid-door Bridge Plate		Station platform raised 14 to 15-inches to approximately same height as low-floor bus floor height thereby eliminating vertical gap. Bridge plate at mid-door to allow boarding across horizontal gap between bus and platform	▪ EmX System, Eugene, OR ▪	▪ Potential elimination of ramp deployment. ▪ More rail-like experience compared to standard height platform	▪ Higher dwell time because all passengers required to board at mid-door. ▪ BRT project will not have dedicated bus fleet. Requires entire bus fleet to be outfitted with bridge plates, which is cost prohibitive. ▪ Requires wheel chair patrons to move to front of bus for harnessing, payment and unloading outside of BRT corridor. ▪ May require railing along edge of platform for safety.