

## **Review of Operations and Maintenance (O&M) Cost Estimates Presentations in FTA New Starts Reports Between 2008 and 2010**

### **1. Introduction**

The presentation during the planning process of a new public transit project's operating and maintenance costs are an important part of determining the long term costs and benefits of the proposed transit service made possible by a capital improvement. The presentation and calculation of a new urban transit system under design and construction is comprised of three major information sources: a) the new project's scope, size and completion schedule; b) the transit agency's goals as expressed in a project service plan that organizes resources and effort required to deliver the desired daily service; and, c) the Federal Transit Administration (FTA) reporting protocols to identify and account for the potential costs according to best industry practice.

#### New Project System Scope, Size and Construction Schedule

The Project's O&M costs are first determined by the new project's scope, size and construction schedule. The Central Subway Project (Project or Phase 2) scope and size is a 1.7-mile extension from the existing Phase 1 Third Street Light Rail Station at Fourth and King Streets to a new terminus in Chinatown at Stockton and Jackson Streets. The Project will operate as a surface double-track light rail in a primarily semi-exclusive median on Fourth Street between King and Bryant Streets. The rail line will transition to subway operation at a portal under the I-80 Freeway, between Bryant and Harrison Streets, and continue underground along Fourth Street in a twin-tunnel configuration, passing under the BART/Muni Market Street tube and continuing north under Stockton Street to the Chinatown Station. Phase 2 will have four stations: one surface station between Brannan and Bryant Streets; and three subway stations. Based on the Project scale, the O&M costs are for a new service less than two miles in length with a service travel time of less than 10 minutes per trip end to end.

Based on the Project completion schedule, the date the Central Subway extension starts revenue service is the date that the operating and maintenance costs begin to run and maintain 1.7 miles of new light rail infrastructure. When the line is nearing operating readiness for revenue service, the (capital) Project accounts will cease to fund the new service and preparation will be in place for the Agency's operating funds accounts to become the source of payment for costs thereafter.

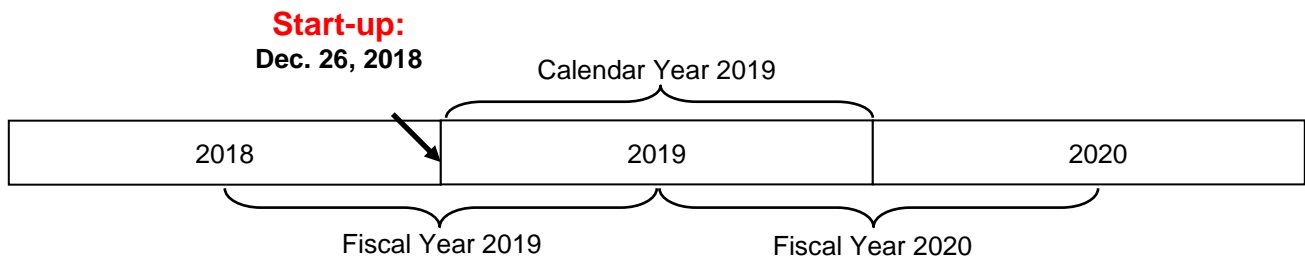
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The handover of the new service and line to SFMTA Operations, along with the full O&M costs shifting from the Project's construction close out budget to the SFMTA's annual operating budget is one of several dates that determine the project's final capital costs as well as the on-going actual O&M costs.

The first new SFMTA O&M expenses will be marked in the calendar year time point that SFMTA's electrical power and personnel operate the service on a daily basis. The first full calendar year for the Central Subway Project is now projected to begin in 2019 based on the projected start-up on Dec. 26, 2018.

However, O&M costs analysis use fiscal year schedules to capture cost time points for FTA and SFMTA budget purposes. The first full fiscal year of revenue operation for the Central Subway Project would begin in FY 2020 or July 1, 2019. The O&M cost model uses FY2020 for the cost estimate as shown below. However, for the reasons stated here, the first year of service may be given as 2018 or 2019.



As a further example of the project schedule determining O&M costs projections, the calendar year assumed for the Central Subway start up in the 2007 FTA New Starts Reports was 2 years earlier than was assumed in the FTA New Starts Reports produced in 2008, 2009, and 2010.

Service Levels vs. Service Demand

The Phase 2 only opening year ridership estimate is 24,900 average weekday boardings and the 2030 forecasted ridership is 35,100 average weekday boardings. The Service Plan is designed to meet this service demand beginning with the initial demand in 2020 and gradually increasing service to meet the expected growing demand in 2030.

The Project service plan to serve the expected demand includes hours of operation in the opening year that matches the Market Street Muni Metro, 4:30 a.m. to 1:30 a.m. on weekdays. Saturday from 5:30 am to 1:30 am and Sunday from 7:30 am to 1:30 am. Service headways in 2018 are planned to be 7.5 minutes in the weekday peak period, 10 minutes in the weekday off-peak, 12 minutes on weekday evenings, and 20 minutes at night. Saturday and Sunday will have a 10 minute headway with Sunday operating on a 15 minute evening headway.

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The Project will operate two-car trains on the alignment at all times except weekend evenings.

This development of the Project O&M cost reflects revisions to improve the service design. Examples are, the change in service to maintain 30 Stockton service all the way to the Caltrain terminal instead of turning southbound buses on Folsom as once planned; or, the change to use two car trains on all T-Third line service patterns instead of using one car trains during the off peak., and other changes in 30 Stockton levels of service. These changes are reviewed in Section 2 below.

### Federal Transit Administration O&M Cost Analysis<sup>1</sup>

O&M costs are presented in formats in the Federal Transit Administration's annual New Starts reporting guidance. Consistent with the FTA requirements of the, the Central Subway financial plan projects operating and maintenance (O&M) costs on a fully-allocated basis. This means that all costs in the SFMTA operating budget grow proportionate to the level of service, e.g., if SFMTA service grows by 5 percent, then costs grow by 5 percent. This also means that every cost driver, such as vehicle revenue hours, vehicle revenue miles, stations, and track-miles, has associated with it not only the direct cost of operation but also the supporting costs for administration of these functions and other administrative costs.

The alternative method for projecting O&M costs is the incremental basis, in which only costs directly associated with the level of service delivered is represented. This would include the wages and fringes for vehicle operators and street supervision; for vehicle mechanics, fuel, and parts; for track maintainers and parts; and for electricity but would exclude the costs for SFMTA headquarters functions including finance, planning, human resources, and other "back-office" functions. FTA does not accept this approach for the projection of O&M costs in financial plans for New Starts projects.

The fully-allocated approach to O&M costing has two impacts. It tends to drive up the long-term costs resulting from service growth, which results in a more conservative financial plan. It also results in an estimation of larger cost savings compared to incremental costing in the event of reduction of service, for instance by replacement of trolley coach service with light rail service.

Finally, the presentation of O&M costs in the attached New Starts Report O&M Cost chapter is based on FTA guidance to address costs in several formats. Ridership, service

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<sup>1</sup> Presentation of cost changes may also need to reflect the FTA O&M cost analysis guidance that changes in some form almost every year. In addition, the staff preparing the reports is rarely the same year to year. The Central Subway O&M supporting cost analysis and projections were prepared by AECOM in 2007, Parsons Brinkerhoff in 2008 and AECOM thereafter, in 2009 and 2010.

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and costs projections are for the first year of revenue service, 2020, and for the design year 2030. The costs are presented in constant dollars valued in the year that the O&M analysis was completed in order to eliminate inflation as a factor. Future cost increases reflect growth in expenditures based on service increases. However, the in the Project financial plans tables in the New Starts Report, also show future O&M costs that are inflated to the year of expenditure to include inflation as a factor.

The project scale is primarily presented to describe the 1.7 mile new extension of Phase 2. However, tables in the New Starts Report, also present the ridership, service and scale of the complete based on integration of Phase 1 and Phase 2 in order to understand the combined costs and benefits of the T-Third complete line as originally planned.

Project costs are also presented to compare the 1.7 mile new extension vs. the baseline existing conditions without the project. However, in some cases, the project costs are presented as standalone, and there is no comparison to the baseline existing conditions without the project.

In the analysis here the main factors for the update and change in O&M costs since 2008 are changes in the service design, such as the change in service to maintain 30 Stockton service all the way to the Caltrain terminal instead of turning buses on Folsom as once planned, a variety of changes in T-Third line service patterns, and other changes in 30 Stockton levels of service. These changes are reviewed in the next section below.

### **2. Service Plan and O&M Cost Estimate Changes**

The 2008-09 New Starts Central Subway Reports projected a modest net savings in the base line Agency operating budget in the opening year of service. More recently, revisions to the proposed service plan have led to a small net increase in Agency operating costs as stated in the 2010 Central Subway New Starts Report. The 2008 estimates included a cost increase associated with Central Subway rail service and a related savings associated with the parallel bus service. While there will still be some savings associated with bus service changes, the new cost estimates reflect a better understanding of the future travel plans of the area and come from a close collaboration with the Planning Department and the SFCTA to understand and prepare for growth associated with development projects in Mission Bay and the Southeast quadrant. All changes to the proposed service plan have been thoroughly reviewed by the Federal Transit Administration (FTA). The following reflect these refinements:

- The annual operating cost of the Central Subway has always been projected to be several million dollars. For example, most recently, the stand alone annual costs for the CS in 2030 (in 2030 dollars) is projected to be approximately \$15 million.
- Service bus hours – proposed frequencies for the 30/45 routes have been increased slightly to balance peak load capacity during the peak travel time when the T-Third is estimated to approach capacity between Mission Bay and UMS approximately four years after service starts.

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- Service bus miles – estimated 30/45 route miles increase slightly because the revised service plan eliminates previously planned turn back of bus service at Folsom Street, e.g, all buses are now planned to continue to travel from Marina/Cow Hollow to a terminus at Caltrain before returning via Third Street.
- Service car miles – both the T-Third long line from Bayshore to Chinatown and the T-Third short line from Mission Bay to Chinatown are now proposed to operate as two car trains. This adjustment was made in response to feedback from FTA to avoid mixing one and two car trains on a heavily used light rail line. Using two car trains will improve service reliability and better support the estimated loads. The previous New Starts Reports envisioned using 1-car trains serving Bayshore and 2-car trains travelled to and from Mission Bay.
- Service train miles – based on a review of estimated ridership, the T-third service was increased slightly during the AM and PM peak periods – a total of 6 hours per day.

The service plan improvements made over several years result in a small net increase in operating costs relative to the baseline service (i.e., future service without Central Subway). Although the projected operating cost for 2018 and beyond is higher in the latter New Start Reports, the proposed service changes will better handle estimated loads, and lead to improved reliability for future T Third customers.