



Board Report

File #: 2017-0464, File Type: Contract

Agenda Number: 32.

EXECUTIVE MANAGEMENT COMMITTEE OCTOBER 19, 2017

SUBJECT: ALL-DOOR BOARDING EXPANSION STUDY

ACTION: APPROVE RECOMMENDATIONS

RECOMMENDATION

CONSIDER:

- A. RECEIVING AND FILING staff update on the All-Door Boarding (ADB) Expansion Feasibility Study in response to a Motion 10 (February 2017) approved at the Regular Board Meeting;
- B. APPROVING ADB expansion on the Metro Rapid Line 720 (Wilshire) and Metro Rapid Line 754 (Vermont);
- C. AUTHORIZING the Chief Executive Officer to execute Modification No. 148 to Contract No. OP02461010 with Cubic Transportation Systems, Inc. (Cubic) for the purchase of 405 Bus Mobile Validators and 480 Installation Kits in the amount of \$961,323 and maintenance support services in the amount of \$28,736 through June 30, 2019 for a total modification value of \$990,059. This Modification would increase the total contract value from \$259,959,813 to \$260,949,872; and
- D. ESTABLISHING a life-of-project budget of \$1,128,003 for the purchase of Bus Mobile Validators, installation costs, and services under Capital Project no. 203040.

ISSUE

At the February 2017, Regular Board Meeting, the Board adopted Motion 10 (Attachment A) which directed staff to report back on the following items within 90-120 days:

- A. Prepare a plan evaluating alternatives to implement ADB on the Vermont Av Metro Rapid Line 754; and
- B. Prepare and report on a strategic plan to roll-out ADB to all lines which meet ADB criteria and include what other lines are heavily impacted.

This report responds to the Board directive outlined in the motion as adopted. Pursuant to completion of the feasibility study for ADB expansion, staff recommends that the Board approve expansion to

two Metro Rapid Lines, and approve funding for the LOP expansion of ADB.

DISCUSSION

Background

February 2017, the Board directed staff to continue ADB indefinitely on the Metro Silver Line beyond the initial 6-month pilot period. At that time, a motion was introduced and approved directing staff to return within 90-120 days with a plan to implement ADB on the Vermont Av Metro Rapid Line 754. In addition, staff was to develop a strategic plan to implement ADB to other lines which meet the ADB criterion.

All-door boarding is a strategy for improving speed and reliability of transit service through faster boarding and efficient fare collection. Payment of bus fare in the traditional way (at the front door, with cash or tokens) can be time consuming and extend dwell time. Recent ADB implementation on the Metro Silver Line has shown to reduce boarding times and improve on time performance (from 69% to 81%). The benefits of implementing ADB will be realized on the busiest lines as they typically have transit demand, dedicated bus lanes and signal prioritization. The system's most heavily utilized lines are impacted by a slow and cumbersome boarding process. On lines that experience higher average daily boardings, slower boarding can affect service reliability and performance.

Staff initiated a study to:

1. Identify the routes where ADB policy could be implemented; and
2. Identify and define the project delivery strategy for the expansion of ADB.

1. All-Door Boarding Route Identification Process and Recommendation

To identify potential routes for expansion, staff conducted a thorough review of existing service and the underlying markets served by specific routes.

In this study, Metro's entire bus network was analyzed to identify the route(s) with the highest potential for successful ADB expansion. To measure the success of potential expansion of ADB on routes in Metro's system, the following criteria were used as the basis for the study:

- Service Frequency - In order to maximize resource savings the amount of dwell time saved must equal or exceed the scheduled headway. Therefore, any future candidate for ADB should maintain a peak hour average headway of less than 10 minutes.
- Stop Activity - Maximum benefits of ADB are derived at stops with heavy passenger activity. Therefore, new ADB lines should have more than 10 boardings and alightings per trip at stops that account for at least 50% of the trip's total boardings and alightings.
- Transit Priorities - To minimize the external factors influencing dwell time, any near side stop at a signalized intersection on a candidate line should have transit priorities. In addition, utilization of an exclusive or partially exclusive Right of Way is preferable.
- Other Considerations - Other factors that would improve the candidacy of a line for ADB include high wheelchair boardings, articulated buses, and a high percentage of cash paying

customers.

As a result of the feasibility study the list of candidate routes was reduced to two initial ADB routes through the application of these criteria. Staff is recommending the Board approve expansion of the ADB program on Metro Rapid Lines 720 (Wilshire) and 754 (Vermont) as these routes best meet the criteria for ADB and maximized mobility, operational efficiency and customer convenience. The scoring results are outlined in the feasibility study (Attachment B).

2. Project Delivery Strategy for the Expansion of All-Door Boarding

The objective of ADB is to expedite boarding and reduce dwell time at bus stops, and thereby enhance convenience and reduce travel time for Metro customers. The expansion of ADB onto the Metro Rapid System involves the installation of bus mobile validator (BMV) devices at the front, middle and rear doors of the proposed lines to process TAP fare payments. Access to all doors means there may be a more even distribution of the passenger load, a reduction of boarding-related safety hazards and fewer opportunities for customer injuries.

Upon Board approval, Metro will roll out ADB to two (2) Rapid Lines utilizing BMVs. Staff anticipates starting ADB on the 754 Rapid Line in late June 2018 followed by the 720 Rapid Line at the end of 2018. To achieve the expansion schedule will require Metro to increase its BMV inventory and acquire additional installation kits. TAP will contract with Cubic to supply hardware and Metro's Bus Maintenance will prepare the vehicles.

ADB will require TAP only boardings. Transitioning customers from cash to TAP boardings will facilitate the program's objective to improve speed, reliability and fare compliance. Fareboxes will be programmed with capabilities to allow customers with cash or tokens to purchase TAP cards plus fare and add stored value to cards on board the bus at stops that are not near TAP Vending Machines (TVM) or TAP vendor outlets in addition to Metro's other efforts to expand the TAP vendor network.

Accompanying the rollout of ADB expansion will be a countywide public information campaign to communicate the changes in boarding and TAP only fare payment. Advertisements on shelters, vehicles, social media, billboards and traditional media will be used to convey the new boarding process and benefits of ADB. Blue Shirt Staff will assist with customer education and training component on an ongoing basis to guarantee customer satisfaction.

The following enhancements to the ADB program include:

- BMV Procurement and Installation
- Farebox Software Modifications
- Operator and Maintenance Employee Training
- Customer Education and Training

- Bus Service Adjustments

Staff anticipates the ADB expansion Lines will result in resource savings that can result in true dollar cost savings. The more significant benefit of ADB is the delivery of better service, which heavily influences the decision to use transit. Reduced variability in dwell time helps to improve the line's overall reliability and headway regularity. Based on previous customer feedback, the overwhelming majority were in favor of the program.

Also, Operator and Supervisor feedback indicates that they believe the ADB project is good for the system as it would help reduce:

- Dwell time at high usage stops
- Disputes regarding fares
- Assaults against operators

The perceived benefits of the program should be considered equally important, given its influence on service quality and ridership.

Title VI Review

The introduction of ADB on Lines 720 and 754 will require customers to use a TAP only method of fare payment. Operator supervision of fare payment is not possible for passengers that board through the rear doors. Therefore, a proof of payment method must be employed in conjunction with on vehicle fare compliance inspections. Customers will be asked to use a validated TAP card when boarding lines permitting all door boarding. Modifying fare payment to TAP only constitutes a fare change pursuant to Metro's Administrative Code Section 2-50-015.

In March 2016, a Title VI/Environmental Justice Fare Equity Analysis was received and filed by the Board of Directors. This document assessed the potential of an adverse disparate impact on minority passengers and/or a disproportionate burden on low-income customers arising from the change in acceptable fare payment methods. The findings of the Title VI analysis of TAP only fare payment are as follows:

- There would be no Disparate Impact to Minorities by changing the fare payment to TAP only; and
- There would be a Disproportionate Burden on low-income riders who currently use cash and/or tokens to pay their fare.

To mitigate the burden on cash and token customers and eliminate any barriers, staff has developed a number of options for customers to access TAP prior to and during the boarding process.

Customers may purchase and reload TAP cards via the mobile app, ticket vending machines at rail stations or utilize the "top-off" feature aboard the coach. Utilizing TAP will allow for quick boarding and accurate fare compliance checks. Since ADB allows boarding at front and rear doors, additional

equipment will be purchased to accommodate the TAP method of fare payment on the prospective lines.

Customers may purchase TAP cards and fare products at 415 retail vendor locations, 93 Metro Rail stations, 18 Orange Line Stations, 10 Silver Line Stations, online at taptogo.net, by calling 866.TAPTOGO, onboard bus and at Metro Customer Centers.

TAP is working to expand TAP vendor locations throughout Los Angeles County to support ADB. Recently, 35 County Libraries were added and up to 52 additional county libraries may be added in the future. TAP is also working with 7-Eleven on a 16 location pilot. If this proves successful, 7-Eleven may choose to expand to hundreds of their stores in Los Angeles. TAP is also proposing new technology initiatives that will increase TAP card and fare media access within communities and along ADB corridors. These initiatives include a mobile fare payment app and distributing TAP cards at gift card kiosks in major chain stores.

FINANCIAL IMPACT

Total LOP funding in the amount of \$1,128,003 will be included in Cost Center 3151- Service Planning & Scheduling in project 203040. For FY18 \$1,055,003 of the \$1,128,003 will be transferred from FY18 project cash flow reforecasts based on revised schedule and corresponding expenditure plans. After completing the capital project, staff currently estimates annual operating costs of \$253,948. This amount will fluctuate as implementation and ADB operation progresses. A schedule of capital and estimated operating costs are included in Attachment F of this report.

Because this is a multi-year project, the respective Cost Center Manager within Operations will be responsible for ensuring that the future year balance of capital funding, as well as operating funding is programmed and budgeted.

Impact to budget

The source of funds for this project will come from Federal, State and local funding sources including sales tax and fares that are eligible for Bus Operating or Capital Projects. They will maximize fund use given funding allocation provisions.

ALTERNATIVES CONSIDERED

The alternative to the proposed staff recommendation is to not expand ADB on Lines 720 and 754. Not implementing ADB on these two lines is not recommended, as customers will not benefit from shorter dwell times, and Metro will not be able to attain improved on-time performance as quickly, without additional resources.

NEXT STEPS

Upon Board approval, staff will prioritize the implementation of ADB expansion on Lines 720 and 754.

Staff will initiate the implementation plan that will include the procurement and installation of equipment, revised schedules reflecting shorter dwell times, fare enforcement deployment plan, and public outreach. Staff will provide periodic updates to the Board on future plans for expanding ADB.

ATTACHMENTS

Attachment A - February 2017 Board Motion on Item #10

Attachment B - All-Door Boarding Feasibility Study

Attachment C - Procurement Summary

Attachment D - Contract Modification/Change Order Log

Attachment E - DEOD Summary

Attachment F - LOP and Operating Budget Summary

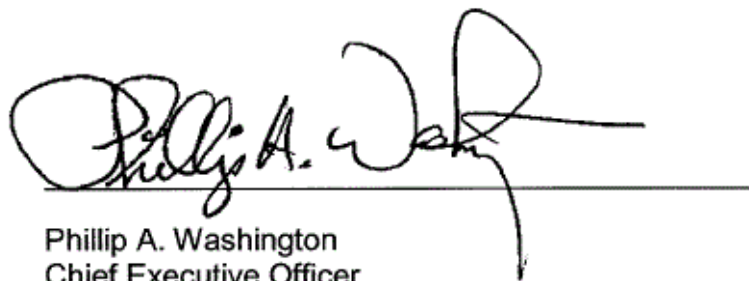
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Board Report

File #:2017-0100, **File Type:**Motion / Motion Response

Agenda Number:10.1

REVISED
REGULAR BOARD MEETING
FEBRUARY 23, 2017

Motion by:

**Director Dupont-Walker
As amended by Director Solis**

Relating to Item 10; File ID 2016-0767 All-Door Boarding Expansion

Metro strives to be the nation's leader in transit innovation.

All-Door Boarding (ADB) pilot program intends to reduce bus stop dwell times and variability, by allowing customers with valid TAP cards to enter at all doors.

The 6 month Silver Line All-Door Boarding (ADB) pilot program has proven to be successful that results in faster boarding through more efficient fare collection.

The Silver Line All-Door Boarding pilot serves as a great example for innovation and evidence-based results throughout the agency.

With the evaluation from the pilot program, Metro now has the framework on expanding All-Door Boarding to new lines across Los Angeles County.

CONSIDER **Motion by Dupont-Walker as amended by Solis** that the Board direct the CEO to:

- A. Prepare a plan evaluating alternatives within 90 to 120 days to implement permanent all-door boarding on the Vermont Avenue Rapid 754, which is LA County's second highest-ridership bus corridor; and
- B. Prepare and report back in 120 days on a strategic plan to roll-out all-door boarding to all lines which meet all-door boarding criteria and include what other lines are heavily impacted.

Feasibility Analysis Methodology & Results

All Door Boarding Expansion and Proposed Program August 2017

Service Planning and Scheduling

Introduction

Today, most Metro bus routes require front-door boarding and fare verification by the operator in order to increase fare compliance. However, front-door boarding also extends dwell times at stops with high passenger activity, lengthens overall travel times and uses already scarce resources less efficiently.

Previously available on Metro Rail and Metro Orange Line, Metro recently expanded all-door boarding (ADB) to the Silver Line. Customers with valid TAP cards may enter through any door of the bus at any time. TAP card customers must validate their cards by tapping bus mobile validators (BMV) which were adjacent to every door.

The general aim of this study is to determine the feasibility of expanding the ADB at the route-level. All-door boarding policy can be implemented in three ways:

1. System-level implementation - Applying ADB policy to all the routes in Metro's bus network
2. Route-level implementation - Applying ADB policy on individual routes
3. Stop-level implementation - Applying ADB policy at individual stops

A system-level policy would allow passengers to board any bus in the network through any door. This would allow for a consistent policy across all buses, and would be easiest for passengers to understand. Conversely, it is unlikely that all routes in the network would see sufficient running-time improvements to offset installing new fare-collection machines on all buses in the system. Prior to moving towards a system-level implementation, expanding the policy at the route-level is recommended to capture the most cost-efficient implementation scenario.

This study is not intended to be a detailed alternatives analysis, but rather seeks to evaluate the long-range feasibility for the proposed expansion of all-door boarding policy and to provide guidance to be used in the decision making process.

Route Selection

In this section, the methodology used to determine which bus routes would benefit from ADB policy is explained. More specifically, this paper uses Metro bus data to develop a methodology which evaluates the performance of ADB policies at the route-level. Four quantitative methodologies are presented for selecting the routes that would perform best under route-level implementation. The list of candidate routes was filtered through the application of a 4-phase process. Each phase in the evaluation process focused the analysis on progressively fewer candidates. From this process emerged a picture of future ADB utilization and potential routes identified for service. To determine the viability of expanding the ADB program, the study considered service frequency, stop activity, and transit priorities amongst other criteria.

Phase 1: Service Frequency

Metro analyzed each route in its bus network to identify the routes with the highest potential for successful ADB service. It was determined that the best time periods of focus were the AM and PM peaks (6:00am – 9:00am and 3:00pm – 6:00pm, respectively). Since these periods have the greatest number of passenger boardings, they will also stand to benefit the most from an ADB policy. Additionally, it was decided that both travel directions on a route (inbound and outbound) should be examined separately, as some routes might have a higher frequency in one direction, but not in the other. The ideal route would maintain average peak hour headways of less than 10 minutes in both peak periods and directions.

Results of Phase 1

Based on the analysis of the transit criteria, routes highlighted in yellow demonstrated suitable service frequency and were considered viable candidates for ADB in a short timeframe. These routes were carried forward to Phase 2 of the selection process.

The table below summarizes the results of phase 1.

Phase 1: High Frequency Lines (based on average peak hour headway of less than 10 minutes in both directions)

	AM Peak		PM Peak		Total
	Inbound	Outbound	Inbound	Outbound	
Line 2		•	•		3
Line 10		•	•		3
Line 14	•	•	•	•	4
Line 16	•	•	•	•	4
Line 18	•		•		3
Line 20		•	•		2
Line 30	•	•	•	•	4
Line 33		•			1
Line 45	•			•	2
Line 51	•	•	•	•	4
Line 53	•			•	2
Line 55	•				1
Line 60	•	•	•	•	4
Line 66	•			•	2
Line 78		•	•		2
Line 81	•	•		•	3
Line 108	•	•	•	•	4
Line 115		•			1
Line 152		•	•		2
Line 165		•			1
Line 166		•			1
Line 200	•	•	•	•	4
Line 204				•	1
Line 212	•				2
Line 224		•			1
Rapid 720	•	•	•	•	4
Rapid 745	•	•			2
Rapid 754	•	•	•	•	4
Rapid 757	•			•	2

Phase 2: Passenger Activity

Two main criteria were chosen to identify which routes would excel under route-level implementation. First, for ADB to result in significant dwell-time savings, high numbers of passenger must board at each stop; as such, the best routes will have a high average number of boardings across all stops. Secondly, in order to achieve significant time savings over the course of a day, a route must have a high number of total boardings. A high total boarding count can be attained by either having many stops on each bus trip, or by having many bus trips in a given time period.

It was also necessary to determine how often routes connect with the Metro Rail network. The most suitable routes would be ones that have significant connection(s). Regional connectivity was also considered in evaluating and selecting the routes to be part of Metro's ADB network.

Results of Phase 2

The following table summarizes the results of Phase 2 analyses. A yellow highlight identifies routes with high transit demand and connects different sub-regions of Metro's service area.

Phase 2: Transit Demand and Stop Level Activity

	Line 14	Line 16	Line 30	Line 51	Line 60	Line 108	Line 200	Rapid 720	Rapid 754
Major Stops (Stops with avg. daily boardings greater than 10)		•		•				•	•
Corridor form important connection to regional fixed guide way transit system	•	•	•	•	•	•	•	•	•
High existing corridor transit demand offers opportunity for service improvement (Avg. daily boardings greater than 15,000)	•	•		•	•	•		•	•
Corridor serves large proportion of people who depend on transit	•	•	•	•		•	•	•	•
Total	3	4	2	4	2	3	2	4	4

Phase 3: Transit Priorities

A route with many bus stops near side of an intersection with traffic lights can eliminate savings from faster passenger boarding. If a bus stop is at a traffic light, then there is the potential for boarding-time savings to be lost when the light turns red. Thus, ADB would work best when stops are on the far side of an intersection, past the traffic light. To minimize the external factors influencing dwell time, any near side stop at a signalized intersection on a candidate line should have transit priorities. The stops with an average of 300 or more weekday boardings were identified as major stops. In addition, planned roadway improvements or current use of an exclusive or partially exclusive Right of Way (ROW) for the majority of the line is preferable.

Results of Phase 3

Based on ROW characteristics and transit signal priority utilization, it was determined that achieving travel time savings on Lines 16 and 51 would be a challenge for an ADB policy. These two routes were not carried forward for further evaluation. Based on ongoing Bus Rapid Transit (BRT) studies in the Vermont corridor, Line 754 transit service is expected to be enhanced and was carried forward as it planned to utilize the ADB policy once upgraded to a full BRT. Line 720 current ROW has no impediment for travel time savings and was also carried forward for further evaluation in Phase 4.

The table below summarizes the result of Phase 3.

Phase 3: Transit Priorities

	Line 16	Line 51	Rapid 720	Rapid 754
Major far side stop	•	•	•	•
Transit Signal Priority			•	•
Roadway configuration presents opportunity for travel time savings			•	
Planned roadway improvements offer potential for travel time savings				•
Total	1	1	3	3

Phase 4: Other Considerations

The two remaining routes were further evaluated in this phase of the study with the goal of selecting the appropriate route(s) for ADB policy. These routes were further evaluated by the following additional measures:

- Wheelchair boardings
- Cash boardings
- Vehicle assignment

Under the front-door boarding policy, this means that passengers must board buses via the front door only; the second doors of standard buses and the third doors of articulated buses are only to be used for alighting. Front-door boarding coupled with the “pay the operator” system slow boarding times.

Use of ADB, where passengers can board through any door of the bus with a valid TAP card allows for multiple passenger-boarding streams, which can not only reduce boarding time per passenger, but also reduce the total in-vehicle travel time for all passengers. Furthermore, reductions in boarding time can result in significant improvements to running times, in the overall efficiency of the bus route, and improved customer satisfaction.

With this in mind, the other factors to consider are routes with high numbers of wheelchair boardings and cash paying customers. Routes with articulated buses assigned to them were also identified as the additional door has the potential to generate additional time savings.

Results of Phase 4

Phase 4 concludes that the potential cost savings and related passenger-satisfaction improvements resulting from ADB on Lines 720 and 754 are significant, and are worth pursuing.

The table below summarizes the findings of Phase 4.

Phase 4: Customer Enhancements

	Rapid 720	Rapid 754
Wheelchair boardings	•	
Cash paying customers		•
Articulated bus assignment	•	•
Total	2	2

PROCUREMENT SUMMARY

ALL-DOOR BOARDING EXPANSION STUDY / OP02461010

1.	Contract Number: OP02461010		
2.	Contractor: Cubic Transportation Systems, Inc.		
3.	Mod. Work Description: Procurement, Installation, and Maintenance of Bus Mobile Validators (BMV)		
4.	Contract Work Description: Universal Fare System		
5.	The following data is current as of: September 22, 2017		
6.	Contract Completion Status		Financial Status
	Contract Awarded:	2/20/2002	Contract Award Amount: \$84,003,444
	Notice to Proceed (NTP):	3/7/2002	Total of Modifications Approved: \$175,956,369
	Original Complete Date:	9/1/2007	Pending Modifications (including this action): \$990,059
	Current Est. Complete Date:	12/31/2024	Current Contract Value (with this action): \$260,949,872
7.	Contract Administrator: Anush Beglaryan		Telephone Number: (213) 418-3047
8.	Project Manager: Mauro Arteaga		Telephone Number: (213) 922-2953

A. Procurement Background

This Board Action is to approve Contract Modification No. 148 with Cubic Transportation Systems for the procurement of 405 Bus Mobile Validators (BMV), 480 BMV installation kits, and maintenance of BMVs through June 30, 2019.

Upon Board approval, Metro will roll out All-Door Boarding (ADB) to two Rapid Lines, 720 and 754 utilizing BMVs. To achieve the expansion schedule, Metro is required to increase its BMV inventory and acquire additional installation kits and provide maintenance.

This Contract Modification will be processed in accordance with Metro's Acquisition Policy.

On February 20, 2002, Contract No. OP02461010 was awarded by the Metro Board to Cubic Transportation Systems, Inc. (Cubic). The Contract provides a countywide fare collection system to serve Metro's public transit customers. Cubic developed the NextFare software application and related databases which is the core technology managing the entire Transit Access Pass (TAP) network consisting of bus and rail equipment and devices. NextFare communicates with all of the fare collection

devices including BMVs which contain proprietary intellectual property. Therefore, Cubic is the only company that can provide the necessary BMVs as well as maintain them.

Please refer to Attachment E – Contract Modification/Change Order Log.

B. Cost/Price Analysis

The recommended price has been determined to be fair and reasonable based upon price analysis, technical evaluation, independent cost estimate, and negotiations. Negotiated amount is inclusive of a volume discount for BMVs.

Proposal Amount	Metro ICE	Negotiated Amount
\$990,059	\$1,363,504	\$990,059

CONTRACT MODIFICATION/CHANGE ORDER LOG
UNIVERSAL FARE SYSTEM / OP02461010

Mod. No.	Description	Status	Date	Amount
1	Table X-1 Milestone Changes	Approved	8/19/2002	\$0.00
2	Ticket Vending Machine Soft Keys	Approved	9/4/2002	\$0.00
3	San Fernando Valley BRT, Additional Quantities	Approved	4/13/2004	\$7,454,844
4	Modification to General Conditions	Approved	10/8/2002	\$0.00
5	TVM Third Coin Hopper	Approved	8/22/2003	\$416,858
6	Stand Alone Validator Video Clips	Approved	3/3/2003	\$0.00
7	Gold Line Functional Test Waiver	Approved	2/13/2003	\$0.00
8	Languages Supported	Approved	2/13/2004	\$0.00
9	Modifications to Compensation & Payment	Approved	2/20/2003	\$0.00
10	Smart Card to Smart Card Value Transfer	Approved	3/3/2003	\$0.00
11	SCADA Cable Installation on Gold Line	Approved	3/3/2003	\$48,476
12	Gold Line Functional Test Waivers	Approved	4/8/2003	\$0.00
13	Farebox Coin Dejam	Approved	4/8/2003	\$0.00
14	Change in Milestone Schedule	Approved	4/16/2003	\$0.00
15	Time Extension, Gold Line	Approved	7/1/2003	\$0.00
16	Change from Datastream MP5 to Express Metrix	Approved	7/1/2003	\$0.00
17	Final Design Review, changes in CDRLS	Approved	7/18/2003	\$0.00
18	Deletion of Printer from Hand Held Validator	Approved	1/6/2004	-\$35,252
19	Variable Message Sign	Approved	2/19/2004	\$243,828
20	Changes to Compensation and Payment	Approved	4/7/2004	\$0.00
21	PCMCIA Card Slot use for WAN	Approved	4/13/2004	\$0.00
22	Data Transmission System	Approved	6/22/2004	\$675,000
23	Mifare Card Initialization and Verification	Approved	6/8/2004	\$9,629
24	Farebox Mounting Adapter for NABI Buses	Approved	7/9/2004	\$32,485
25	Provide Regional CDCS	Approved	2/25/2005	\$5,348,335
25.01	Regional CDCS Overhead Rate Adjustment	Approved	1/17/2007	-\$31,621
25.02	Regional CDCS Acceptance Test Participants	Approved	8/7/2008	\$0.00
26	Remove Requirement for Focus Groups	Approved	12/20/2004	-\$111,704
27	Farebox Rotation	Approved	1/4/2005	\$74,967
28	Metro Gold Line Eastside Extension, Fare Equipment	Approved	7/25/2006	\$3,808,722

29	Stainless Steel Panels for TVM Alcoves	Approved	4/25/2005	\$45,521
30	Data Communication Cabling for Orange Line	Approved	6/10/2005	\$41,560
31	(Not Used)			
32	Additional Spare Part Quantities for Eastside Ext.	Approved	7/25/2005	\$15,480
33	Mifare Card Functionality on UFS	Approved	8/15/2005	\$33,105
34	Revisions to Project Schedule	Approved	10/26/2000	\$0.00
35	OCU Mount	Approved	11/15/2005	\$87,634
36	(Not Used)			
37	Deductive Change for Line 1.36	Approved	4/6/2007	-\$33,116
38	Installation of Third TVM and Relocation of Two SAVs and Blue Line Willow Station	Approved	7/6/2006	\$10,084
39	Upgrade the CDCS System from IB SSA Disk Storage Subsystem to Fiber Disk	Approved	10/2/2006	\$20,000
40	UFS Equipment for Expo Line	Approved	2/16/2007	\$5,197,204
41	(Not Used)			
42	(Not Used)			
43	HHV, PMOS and CPOS Interim Maintenance Deductive Change	Approved	2/16/2007	-\$162,628
44	UFS Additional Quantities for Contracted Services	Approved	2/16/2007	\$2,499,916
45	Replace Go-Cards with Mi-Fare Cards	Approved	2/16/2008	-\$1,157,850
46	Relocation of Data Probes and Receive Vaults at Division 7	Approved	4/9/2007	\$29,787
47	Revisions to US Base and Regional Manuals for Release to ACS	Approved	4/23/2007	\$46,000
48	Expo Line, Pico Station Infrastructure	Approved	7/18/2007	\$18,542
49	Relocation of UFS Lab Equipment	Approved	6/2/2008	\$106,905
50	Expo 7 th and Metro Additional Infrastructure	Approved	8/30/2007	\$81,719
50.01	Expo 7 th and Metro Infrastructure Deductive change	Approved	8/30/2007	-\$30,173
51	Handheld Validator Holster	Approved	10/16/2007	\$6,184
52	Installation and Testing of Farebox at Transportation Concepts	Approved	3/6/2008	\$16,091
53	Relocate OCUs on Ford Cutaways and MST Buses at Contracted Services	Approved	5/14/2008	\$79,170
54	Installation of one Farebox and Testing for two Fareboxes at Contracted Services	Approved	5/27/2008	\$18,842
55	UFS Quantity Adjustments	Approved	10/9/2008	\$0.00
56	Contracted Bus Service Equipment Change	Approved	12/3/2008	\$36,704
57	Installation and Acceptance Testing of One Farebox at First Transit	Approved	12/19/2008	\$3,040

58	Provide UFS Equipment for Expo from Culver City to Venice/Robertson Aerial Station	Approved	3/4/2009	\$304,246
59	Regional CDCS Electrical Power Reconfiguration	Approved	2/9/2009	\$17,186
60	Rail Equipment Warranty and Bus Equipment Warranty	Approved	2/19/2009	\$0.00
61	TAP Enables Turnstile Fare Gates for Rail Stations	Approved	4/9/2009	\$10,000,000
62	Provide UFS Equipment for Expo Truesdale Station	Approved	3/4/2009	\$284,167
63	System Support Services	Approved	6/8/2010	\$33,988,558
63.01	SSS, Additional Costs	Approved	3/22/2013	\$677,631
63.02	SSS, Orange Line Credits	Approved	3/22/2013	-\$58,243
63.03	SSS, One-year Extension	Approved	3/22/2013	\$8,148,263
64	\$5 Dollar Bill handling Unit for Fareboxes and TVMs	Approved	7/27/2009	\$304,658
65	Installation of Additional SAVs for Eastside Extension	Approved	1/4/2010	\$34,077
66	Relocation of Wing Gate at MRL Wilshire/Normandie Station	Approved	2/2/2010	\$18,905
67	(Not Used)	Approved		
68	UFS Equipment for Orange Line Extension	Approved	11/2/2010	\$2,749,476
68.01	Transfer Maintenance Dollars to 63.01	Approved	1/25/2013	-\$677,631
68.02	UFS Equipment for Orange Line Extension, Credits	Approved	3/22/2013	-\$10,982
69	Additional TVM at Aviation Greenline Station	Approved	4/2/2010	\$13,031
70	TAP Card Physical Testing	Approved	4/28/2010	\$41,844
70.01	TAP Card Physical Testing	Approved	3/22/2013	\$12,658
71	Concession Light Functionality	Approved	6/30/2010	\$96,726
72	(Not Used)	Approved		
73	API Test Server Imaging	Approved	9/9/2010	\$45,024
74	Contract Services Relocation	Approved	11/1/2010	\$33,854
75	Limited Function Sales Office Terminals, Increase Quantity	Approved	2/15/2011	\$993,795
76	CISCO ASA Acquisition and Implementation for API Test and Production Servers	Approved	2/28/2011	\$59,209
77	Cubic LU Key Installation	Approved	3/3/2011	\$69,097
78	Updates Farebox Configuration to Support ARUB Wireless Security Data Transfer	Approved	3/3/2011	\$40,204
79	Relocation of UFS Test Lab Equipment	Approved	4/25/2011	\$80,911
80	7 Byte UID Support	Approved	4/20/2011	\$362,069
81	Fare Gate Fencing Installation	Approved	4/25/2011	\$24,004

	Modifications, North Hollywood and Avalon Stations			
82	Additional TVM at Hollywood/Western Redline Station	Approved	4/25/2011	\$15,531
83	Purchase Drive Control Unit Light Validators DCU-LV	Approved	4/25/2011	\$363,492
84	Install TVMs at Three Metro customer Centers	Approved	6/6/2011	\$386,680
85	Cubic Modification to Gate Software/Locking Commands	Approved	6/29/2011	\$111,188
86	UFS Equipment for Expo Phase I Farmdale Station	Approved	7/26/2011	\$415,184
87	Relocation of TVMs at the Green Line Long Beach Station	Approved	8/25/2011	\$15,909
88	Mobile Validator Non-Recurring Engineering System Development	Approved	10/12/2011	\$611,677
89	Expo Pico Station North Platform TVM/SAV Work	Approved	3/5/2012	\$17,592
90	Deletion of Contract Line Items 1.03, 1.04 & 1.33	Approved	2/15/2012	-\$20,622
91	Orange Line Installation of 12 Metro Provided SAVs	Approved	2/15/2012	\$34,483
92	(Not Used)			
93	(Not Used)			
94	System Support Services, Six Year Extension	Approved	7/1/2013	\$55,000,000
94.01	(Not Used)			
94.02	System Support Services for Expo II and Foothill Extension	Approved	3/2/2015	\$1,152,749
94.03	Maintenance Support Services for 54 TVMs	Approved	4/14/16	\$838,211
95	UFS Equipment Storage Costs	Approved	6/13/2012	\$4,129
96	Faregating, Three Additional Swing Gates	Approved	2/4/2013	\$44,611
97	Green Line Faregating Additional Fire Key Switches at Vermont Station	Approved	4/1/2013	\$8,392
98	Emergency Swing Gate Upgrades	Approved	4/15/2013	\$252,145
99	Removal of TVM from Wilshire/LaBrea Customer Center	Approved	10/8/2013	\$4,883
100	Supplying and Supporting a Turn Key Mobile Validator System	Approved	7/1/2013	\$2,996,113
101	Bus Division Vault Relocation	Approved	8/1/2013	\$995,940
102	Install One TVM at East Portal Customer Service Center and One at Culver City Station	Approved	10/8/2013	\$252,905
103	El Monte Bus Facility TVMs	Approved	10/15/2013	\$474,753
104	Fare Gate Consoles for Expo 2,	Approved	5/26/2014	\$380,000

	Colorado/4 th Street Station			
105	TVM and SAV Relocations	Approved	12/16/2013	\$1,456,632
106	Modification to Nextfare to Allow For Segregation of Facility Specific Data	Approved	1/29/2014	\$647,869
107	Passback Modification	Approved	2/18/2014	\$70,301
108	UFS PCI Compliance	Approved	10/23/2014	\$9,015,319
109	Service Provider Support	Approved	6/14/2014	\$66,777
110	Autoload Segregation by Muni	Approved	6/30/2014	\$111,707
111	SAV Three Distinct Tones	Approved	8/4/2014	\$46,634
112	Modify TAP Vending Machine to Improve Purchases	Approved	8/4/2014	\$250,000
113	ADA TVM Upgrades for CN No. 162 and 150 Replacement TVMs	Approved	8/5/2014	\$416,815
114 A	UFS Equipment for Gold Line Foothill Extension	Approved	8/25/2014	\$1,878,756
114 B	UFS Equipment for Expo Phase	Approved	8/25/2014	\$3,783,200
115	FBX External Interface Spec Changes	Approved	8/19/2014	\$20,488
116	Willowbrook Station Blue Line SAVs	Approved	11/19/2014	\$62,882
117	TAP-In, TAP-In, Transfer Gate	Approved	11/19/2014	\$88,598
118	Virtual Gate Arrangement of SAVs at Gold Line Union Station Entrance	Approved	11/19/2014	\$84,964
119	Conversion of Expo 1 Aerial Stations to Fare Gates	Approved	3/2/2015	\$3,077,952
120	Change in Service Level Agreement for TVM & GC Network Additions at No Cost	Approved	3/2/2015	\$0
121	Emergency Swing Gate External Alarm Mode	Approved	11/19/2014	\$0
122	Installation of Colorado & 4 th Faregates & ESGs	Approved	3/2/2015	\$163,143
123	OCDC Replacement Equipment Software and Installation	Approved	5/12/2015	\$681,068
124	Expo One Claim No. 1 Settlement	Approved	5/26/2015	\$19,648
125	UFS Global Network, Change for Credit/Debit Processing at TVM	Approved	5/12/2015	\$52,735
126	Metrolink Integration Support	Approved	5/12/2015	\$56,073
127	Metro Network Assistance	Approved	5/12/2015	\$48,758
128	Division 13 Bus Operations TVMs	Approved	5/12/2015	\$99,401
129	Fare Equipment Changes at MRL North Hollywood Station	Approved	5/12/2015	\$577,401
130	Installation of Additional TVM at MRL Civic Center Station North Entrance	Approved	7/15/2015	\$21,593
131	Relocate One TVM From Hawthorne to Hollywood	Approved	9/2/2015	\$31,983
132	Service Provider Support – Deductive Change (Mod 109)	Approved	6/13/2015	-\$66,777
133	Additional Emergency Swing Gate for	Approved	6/3/2015	\$10,970

	Expo 2			
134	Metrolink Support for LU Encoding	Approved	10/7/2015	\$13,666
135	Emergency Swing Gate Hinge Post Substitution at Expo 2 Bundy Station – No Cost Change	Approved	10/21/2015	\$0
136	Relocation of TVMs at MGL Artesia Station	Pending		\$0
137	(Not Used)			
138	Vertiba Support (Salesforce – CRM)	Approved	8/20/2015	\$9,671
139	Regional Inter Agency Transfer Policy Change	Approved	1/21/2015	\$435,000
139.01	Regional Inter Agency Transfer (IAT) Policy Change	Approved	7/15/16	\$480,000
140	54 TVMs, purchase and install	Approved	4/14/16	\$5,194,834
141	(Not Used)			
142	Network, back office station configuration and IAT support	Approved	4/25/17	\$14,578
143	Reduction in monthly PM services	Approved	5/8/17	(\$404,550)
144	20 BMV Install Kits	Approved	5/8/17	\$10,310
145	Sales, Use, Activate, Initialize and read transactions into Nextfare	Approved	5/25/17	\$0
146	TVM Screen Flow Phase 2	Approved	6/30/17	\$475,000
147	Revisions to Mod 140/CN 185.03 TVM Deployment Scope of Work	Approved	8/28/17	\$0
148	Procurement, Installation, and Maintenance of Bus Mobile Validators (BMVs)	Pending	-	\$990,059
	Modification Total:			\$175,956,369
	Original Contract:			\$84,003,444
	Total:			\$260,949,872

DEOD SUMMARY

ALL-DOOR BOARDING EXPANSION STUDY / OP02461010

A. Small Business Participation

Cubic Transportation Systems, Inc. (Cubic) made a 5.65% Disadvantaged Business Enterprise (DBE) commitment. Cubic is exceeding their current commitment with a DBE participation of 8.81%.

Small Business Commitment	5.65% DBE	Small Business Participation	8.81% DBE
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	DBE Subcontractors	Ethnicity	% Committed	Current Participation¹
1.	American Alloy Fabrication	Caucasian Female	0.26%	0.37%
2.	J-Tec Metal Products	Hispanic American	0.15%	0.04%
3.	KLI, Inc.	Asian Pacific American	0.26%	0.11%
4.	Kormex Metal Craft, Inc.	Asian Pacific American	1.00%	0.30%
5.	Lows Enterprise, Inc.	African American	0.14%	0.04%
6.	Priority Manufacturing, Inc.	Caucasian Female	0.93%	0.05%
7.	Robnett Electric, Inc.	African American	2.49%	7.82%
8.	Techprose – The Natchez Group	Caucasian Female	0.42%	0.08%
Total			5.65%	8.81%

¹Current Participation = Total Actual amount Paid-to-Date to DBE firms ÷ Total Actual Amount Paid-to-date to Prime.

B. Living Wage and Service Contract Worker Retention Policy Applicability

The Living Wage and Service Contract Worker Retention Policy is not applicable to this Modification.

C. Prevailing Wage Applicability

Prevailing Wage requirements are applicable to this project. DEOD will continue to monitor contractors' compliance with the State of California Department of Industrial Relations (DIR), California Labor Code, and, if federally funded, the U S Department of Labor (DOL) Davis Bacon and Related Acts (DBRA).

D. Project Labor Agreement/Construction Careers Policy

The PLA/CCP is not applicable to this Project.

LOP and Operating Expenditures

LOP	FY18 (adopted)	FY 19	FY 20	Total
LABOR				
Metro Non-Represented Labor (Training)	\$ 13,680	\$ -	\$ -	\$ 13,680
Metro Represented Labor	\$ 40,000	\$ 38,000	\$ -	\$ 78,000
Labor Total	\$ 53,680	\$ 38,000	\$ -	\$ 91,680
NON-LABOR				
Acquisition - Equipment & Parts	\$ 961,323	\$ -	\$ -	\$ 961,323
Professional & Technical Services	\$ 40,000	\$ 35,000	\$ -	\$ 75,000
Non-Labor Total	\$ 1,001,323	\$ 35,000	\$ -	\$ 1,036,323
Total Project Cost	\$ 1,055,003	\$ 73,000	\$ -	\$ 1,128,003

Operating Expenditures	FY18 (adopted)	FY 19	FY 20*	Total
LABOR				
Metro Non-Represented Labor	\$ -	\$ 177,840	\$ 177,840	\$ 355,680
Labor Total	\$ -	\$ 177,840	\$ 177,840	\$ 355,680
NON-LABOR				
Equipment Maintenace	\$ -	\$ 28,736	\$ 28,736	\$ 57,472
Equipment Mobile Cell Service (T-Mobile)	\$ -	\$ 42,372	\$ 42,372	\$ 84,744
Professional & Technical Services	\$ -	\$ 5,000	\$ 5,000	\$ 10,000
Non-Labor Total	\$ -	\$ 76,108	\$ 76,108	\$ 152,216