Bay Area Metro Center
375 Beale Street
San Francisco, CA 94105

Meeting Agenda

Clipper Executive Board

Committee Members:

Denis Mulligan, Chair ***Edward D. Reiskin, Vice Chair***

Grace Crunican, Nuria Fernandez, Jim Hartnett, Steve Heminger, Michael Hursh, Rick Ramacier, Nina Rannells

Monday, February 27, 2017 **3:30 PM** **San Francisco Bay Area Rapid Transit District**
344 20th Street, 3rd Floor
Oakland CA, 94612
BART Board Room

This meeting will be recorded. Copies of recordings may be requested at the Metropolitan Transportation Commissioner (MTC) at nominal charge, or recordings may be listened to at MTC offices by appointment.

To access meeting location, please access through the Webster Street entrance between CVS Pharmacy and 24-Hour Fitness. Take the elevator to the 3rd floor and exit the elevator to your right where the agenda will be posted. Please enter the room through the double doors. For meeting location questions, please contact Angelica Dill-James at 510-464-6093.

1. Roll Call / Confirm Quorum

Quorum: A quorum of this committee shall be a majority of its regular voting members (5).

2. Consent Calendar

2a. 17-2256 Minutes of January 23, 2016 Meeting

Action: Board Approval

Attachments: 2a_CEB Minutes_Jan 2017.pdf

2b. 17-2264 Contract Change Order- FY 2015-16 Price Schedule Finalization: Cubic Transportation Systems, Inc. ($200,000)

Finalization of the FY 2015-16 Price Schedule.

Action: Board Approval

Presenter: Edward Meng

Attachments: 2b_Annual Price Adjustment.pdf

3. Approval

3a. 17-2265 Funds Disbursement to the Clipper® Budget

Disbursement of Inactive Unregistered Funds to the Clipper® Budget.

Action: Board Approval

Presenter: Carol Kuester

Attachments: 3a_Clipper Funds Disbursement Proposal.pdf

3b. 17-2257 Clipper® Two Year Budget and Work Plan

Clipper® Two Year Operating and Capital Budget and Work Plan.

Action: Board Approval

Presenter: Edward Meng

Attachments: 3b_Clipper 2 Year Budget and Work Plan.pdf

4. Information

4a. 17-2266 Next-Generation Clipper® (C2) Request for Proposal (RFP) for Industry Review

Update on the C2 System Integrator Draft RFP for Industry Review.

Action: Information

Presenter: Jason Weinstein

Attachments: 4a_C2 RFP Update.pdf

4a_Handout-article-Uber-liketransitUX.pdf

5. Executive Director's Report – Kuester

6. Public Comment / Other Business

7. Adjournment / Next Meeting

The next meeting of the Clipper® Executive Board will be March 20, 2017, 3:30 p.m. in the Caltrain / SamTrans Board Room, 2nd Floor, 1250 San Carlos Avenue, San Carlos, CA.

Public Comment: The public is encouraged to comment on agenda items at Committee meetings by completing a request-to-speak card (available from staff) and passing it to the Committee secretary. Public comment may be limited by any of the procedures set forth in Section 3.09 of MTC's Procedures Manual (Resolution No. 1058, Revised) if, in the chair's judgment, it is necessary to maintain the orderly flow of business.

Meeting Conduct: If this meeting is willfully interrupted or disrupted by one or more persons rendering orderly conduct of the meeting unfeasible, the Chair may order the removal of individuals who are willfully disrupting the meeting. Such individuals may be arrested. If order cannot be restored by such removal, the members of the Committee may direct that the meeting room be cleared (except for representatives of the press or other news media not participating in the disturbance), and the session may continue.

Record of Meeting: Committee meetings are recorded. Copies of recordings are available at a nominal charge, or recordings may be listened to at MTC offices by appointment. Audiocasts are maintained on MTC's Web site (mtc.ca.gov) for public review for at least one year.

Accessibility and Title VI: MTC provides services/accommodations upon request to persons with disabilities and individuals who are limited-English proficient who wish to address Commission matters. For accommodations or translations assistance, please call 415.778.6757 or 415.778.6769 for TDD/TTY. We require three working days' notice to accommodate your request.

可及性和法令第六章：MTC 根據要求向希望來委員會討論有關事宜的殘疾人士及英語有限者提供服務/方便。需要便利設施或翻譯協助者，請致電 415.778.6757 或 415.778.6769 TDD / TTY。我們要求您在三個工作日前告知，以滿足您的要求。

Acceso y el Titulo VI: La MTC puede proveer asistencia/facilitar la comunicación a las personas discapacitadas y los individuos con conocimiento limitado del inglés quienes quieran dirigirse a la Comisión. Para solicitar asistencia, por favor llame al número 415.778.6757 o al 415.778.6769 para TDD/TTY. Requerimos que solicite asistencia con tres días hábiles de anticipación para poderle proveer asistencia.

Attachments are sent to Committee members, key staff and others as appropriate. Copies will be available at the meeting.

All items on the agenda are subject to action and/or change by the Committee. Actions recommended by staff are subject to change by the Committee.

375 Beale Street, Suite 800
San Francisco, CA 94105

Metropolitan Transportation Commission

Legislation Details (With Text)

File #:	17-2256	**Version:**	1	**Name:**	
Type:	Minutes			**Status:**	Consent
File created:	1/24/2017			**In control:**	Clipper Executive Board
On agenda:	2/27/2017			**Final action:**	
Title:	Minutes of January 23, 2016 Meeting				
Sponsors:					
Indexes:					
Code sections:					
Attachments:	2a_CEB Minutes_Jan 2017.pdf				

Date	Ver.	Action By	Action	Result

Subject:
Minutes of January 23, 2016 Meeting

Recommended Action:
Board Approval

Attachments

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Bay Area Metro Center
375 Beale Street
San Francisco, CA 94105

Meeting Minutes - Draft

Clipper Executive Board

Committee Members:

Denis Mulligan, Chair ***Edward D. Reiskin, Vice Chair***

Grace Crunican, Nuria Fernandez, Jim Hartnett, Steve Heminger, Michael Hursh, Rick Ramacier, Nina Rannells

Monday, January 23, 2017 **3:30 PM** **San Francisco Bay Area Rapid Transit District**
344 20th Street, 3rd Floor
Oakland CA, 94612
BART Board Room

1. Roll Call / Confirm Quorum

Present: 8 - Rannells, Ramacier, Chair Mulligan, Vice Chair Reiskin, Fernandez, Crunican, Heminger, and Hartnett

Absent: 1 - Hursh

Tom O'Neill acted as a delegate and voting member of the Board in place of Michael Hursh. Actions noted below as "Hursh" were taken by O'Neill.

Board Member Rannells arrived during the presentation of Agenda Item 3b, Next-Generation Clipper® (C2) Request for Proposal (RFP) for Industry Review.

2. Consent Calendar

Upon the motion by Crunican and second by Heminger, the Consent Calendar was unanimously approved by the following vote:

Aye: 8 - Hursh, Ramacier, Chair Mulligan, Vice Chair Reiskin, Fernandez, Crunican, Heminger and Hartnett

Absent: 1 - Rannells

2a. 17-2196 Minutes of November 28, 2016 Meeting

Action: Board Approval

Attachments: 2a_CEB Minutes_Nov 2016.pdf

2b. 17-2197 Minutes of December 19, 2016 Meeting

Action: Board Approval

Attachments: 2b_CEB Minutes_Dec 2016.pdf

2c. 17-2198 Clipper® Executive Board 2017 Calendar and Locations

Action: Board Approval

Presenter: Edward Meng

Attachments: 2c_ClipperEB 2017 Calendar and Locations.pdf

3. Information

17-2261 MTC staff proposed that Agenda Item 3a, the Clipper Bank Account Cash Management Proposal, be presented after Agenda Item 3c, the Clipper® Draft Two Year Budget and Work Plan.

Upon the motion by Ramacier and second by Fernandez, the proposal was unanimously approved by the following vote:

Aye: 8 - Hursh, Ramacier, Chair Mulligan, Vice Chair Reiskin, Fernandez, Crunican, Heminger and Hartnett

Absent: 1 - Rannells

3a. 17-2199 Clipper® Bank Account Cash Management Proposal

Proposal to Distribute "Inactive" Clipper Card Funds to Operators.

Action: Information

Presenter: Carol Kuester

Attachments: 3a_Clipper Bank Account Cash Management Proposal.pdf

3b. 17-2200 Next-Generation Clipper® (C2) Request for Proposal (RFP) for Industry Review

Overview and Release of the C2 System Integrator RFP for Industry Review.

Action: Information

Presenter: Jason Weinstein

Attachments: 3b_C2 RFP for Industry Review.pdf

Adina Levin, Friends of Caltrain / Around the Bay Coalition was called to speak.

3c. 17-2202 Clipper® Draft Two Year Budget and Work Plan

Overview of the Initial Draft Clipper® Two Year Operating and Capital Budget and Work Plan.

Action: Information

Presenter: Edward Meng

Attachments: 3c_Clipper Draft Two Year Budget and Work Plan.pdf

4. Executive Director's Report – Kuester

5. Public Comment / Other Business

Adina Levin, Friends of Caltrain / Around the Bay Coalition spoke during Public Comment.

6. Adjournment / Next Meeting

The next meeting of the Clipper® Executive Board will be February 27, 2017, 3:30 p.m. in the BART Board Room, 3rd Floor, 344 20th Street, Oakland, CA.

375 Beale Street, Suite 800
San Francisco, CA 94105

Metropolitan Transportation Commission

Legislation Details (With Text)

File #:	17-2264	**Version:**	1	**Name:**	
Type:	Contract			**Status:**	Consent
File created:	1/26/2017			**In control:**	Clipper Executive Board
On agenda:	2/27/2017			**Final action:**	
Title:	Contract Change Order- FY 2015-16 Price Schedule Finalization: Cubic Transportation Systems, Inc. ($200,000) Finalization of the FY 2015-16 Price Schedule.				
Sponsors:					
Indexes:					
Code sections:					
Attachments:	2b_Annual Price Adjustment.pdf				

Date	Ver.	Action By	Action	Result

Subject:

Contract Change Order- FY 2015-16 Price Schedule Finalization: Cubic Transportation Systems, Inc. ($200,000)

Finalization of the FY 2015-16 Price Schedule.

Presenter:

Edward Meng

Recommended Action:

Board Approval

Attachments

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Agenda Item 2b

Bay Area Metro Center
375 Beale Street
San Francisco, CA 94105
TEL 415.778.6700
WEB www.mtc.ca.gov

TO: Clipper® Executive Board DATE: February 21, 2017

FR: Carol Kuester

RE: Contract Change Order – FY 2015-16 Price Schedule Finalization: Cubic Transportation Systems, Inc. ($200,000)

Background

The Clipper® Contract requires annual adjustment of specified Contract prices based on industry-specific labor and materials indices published by the Bureau of Labor Statistics (BLS) because of the Contract's multi-year time-span. According to the terms of the Contract, a Provisional Price schedule is implemented with an across-the-board 3% increase at the beginning of each fiscal year; when the indices are published mid-fiscal year, a reconciliation is calculated and resolved via Contract Change Order.

The Change Order recommended for Board approval applies the contractual methodology to adjust prices in the Clipper® Contract for FY 2015-2016. The capital price adjustment for FY 2015-16 is minus0.28%, decreasing the capital expense by $17,354.84 from the Provisional Price Schedule. The operating price adjustment is 1.72% for FY 2015-16, resulting in an additional cost of $209,267.45 for operating invoices submitted during the fiscal year. Both the capital and operating price adjustments were higher than in past years, and the highest since the Cubic was assigned the contract in 2009. Per the Clipper® Amended and Restated Memorandum of Understanding with the participating Operators, MTC will invoice the Operators for their share of the operating cost adjustments.

This Change Order will finalize the Clipper® Contract Price Schedule for FY 2015-16 and enable Cubic to issue a credit for the adjusted capital costs and invoice for the increased operating costs.

Recommendation

Staff recommends the Clipper® Executive Board's approval of a Contract Change Order with Cubic in an amount not to exceed $200,000 for the price schedule adjustment described above.

Carol Kuester

Carol Kuester

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REQUEST FOR CLIPPER® EXECUTIVE BOARD APPROVAL
Summary of Contract Change Order

Contractor:	Cubic Transportation Systems, Inc.
Work Project Title:	FY 2015-16 Price Schedule Adjustment Finalization for Clipper® Contract
Purpose of Amendment:	Adopt an updated Clipper® Contract Price Schedule for FY 2015-16 in accordance with the terms and conditions of the Clipper® contract
Brief Scope of Work:	Finalize Clipper® Contract Price Schedule for FY 2015-16, which includes capital credit of $17,354.84 and $209,267.45 in additional operating costs
Project Cost Not to Exceed:	$200,000 (this Change Order) Approved Contract plus Change Orders prior to today's actions (not including this item): $161,290,533
Funding Source:	Participating Operator funds, STP, CMAQ, STA, STP Exchange, Regional Measure 2 Capital and Regional Measure 2 Operating
Fiscal Impact:	Funds available in the FY 2016-17 MTC agency budget. Participating Operators will cover a portion of the costs per the Clipper® Amended and Restated Memorandum of Understanding.
Motion:	That a Contract Change Order with Cubic Transportation Systems, Inc., for the purposes described herein and in the Executive Director's memorandum dated February 21, 2017, is hereby approved by the Clipper® Executive Board.

Clipper® Executive Board:

Denis Mulligan, Chair

Approved: Date: February 27, 2017

375 Beale Street, Suite 800
San Francisco, CA 94105

Metropolitan Transportation Commission

Legislation Details (With Text)

File #:	17-2265	**Version:**	1	**Name:**	
Type:	Report			**Status:**	Committee Approval
File created:	1/26/2017			**In control:**	Clipper Executive Board
On agenda:	2/27/2017			**Final action:**	
Title:	Funds Disbursement to the Clipper® Budget Disbursement of Inactive Unregistered Funds to the Clipper® Budget.				
Sponsors:					
Indexes:					
Code sections:					
Attachments:	3a_Clipper Funds Disbursement Proposal.pdf				

Date	Ver.	Action By	Action	Result

Subject:
Funds Disbursement to the Clipper® Budget

Disbursement of Inactive Unregistered Funds to the Clipper® Budget.

Presenter:
Carol Kuester

Recommended Action:
Board Approval

Attachments

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Agenda Item 3a

Bay Area Metro Center
375 Beale Street
San Francisco, CA 94105
TEL 415.778.6700
WEB www.mtc.ca.gov

TO: Clipper® Executive Board DATE: February 21, 2017

FR: Carol Kuester

RE: Funds Disbursement to the Clipper® Budget

Background

At the January 27, 2017 Executive Board meeting, staff reported that the Clipper® Program Float Bank Account held $53 million, of which approximately $6 million represents funds linked to cards that have not been used within the last three years, which MTC is calling "Inactive Funds". The $6 million in Inactive Funds is roughly split between registered and unregistered cards. MTC staff stated that Inactive Funds on unregistered cards could be disbursed based on the distribution plan described in the staff materials and that additional research was required regarding use of other Inactive Funds.

At the January 27, 2017 meeting, staff also reported that the Two Year Budget and Work Plan showed about a $3 million deficit in the Operating Budget. The Executive Board discussed the idea of using the $3.3 million in Inactive Funds tied to unregistered cards to address the Operating Budget deficit, and requested that the item return to the Executive Board in February 2017 for approval.

Near Term

Before any distribution of funds from the Float Account can occur, Cubic must make technical and accounting changes to the Clipper® back-end systems. This work is underway now and scheduled to be completed by Summer 2017. The estimated cost of system and process changes is $50,000.

Longer Term Proposal

Clipper® staff will seek approval to change the Clipper® cardholder agreement and Operating Rules to allow for the distribution of other Inactive Funds to transit operators and will continue to monitor other funds that are highly likely to remain unspent. Per MTC Resolution 3983, Revised, the Clipper® Executive Board has been delegated authority over changes to the Operating Rules.

Recommendation

Staff recommends the disbursement of approximately $3 million of the $3.3 million in unregistered card Inactive Funds to the overall Clipper® budget to address the near-term Operating Budget deficit, retaining a 10% reserve to mitigate risk that cards may return to the system.

Carol Kuester

Carol Kuester

375 Beale Street, Suite 800
San Francisco, CA 94105

Metropolitan Transportation Commission

Legislation Details (With Text)

File #:	17-2257	**Version:**	1	**Name:**	
Type:	Report			**Status:**	Committee Approval
File created:	1/24/2017			**In control:**	Clipper Executive Board
On agenda:	2/27/2017			**Final action:**	
Title:	Clipper® Two Year Budget and Work Plan Clipper® Two Year Operating and Capital Budget and Work Plan.				
Sponsors:					
Indexes:					
Code sections:					
Attachments:	3b_Clipper 2 Year Budget and Work Plan.pdf				

Date	Ver.	Action By	Action	Result

Subject:
Clipper® Two Year Budget and Work Plan

Clipper® Two Year Operating and Capital Budget and Work Plan.

Presenter:
Edward Meng

Recommended Action:
Board Approval

Attachments

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Agenda Item 3b

Bay Area Metro Center
375 Beale Street
San Francisco, CA 94105
TEL 415.778.6700
WEB www.mtc.ca.gov

TO: Clipper® Executive Board DATE: February 21, 2017

FR: Carol Kuester

RE: Clipper® Two Year Budget and Work Plan

This memorandum presents the Clipper® budget and work plan for FY 2017-18 and 2018-19 for the Clipper® Executive Board's approval.

Budget Process and Content

Under the Amended and Restated Clipper® Memorandum of Understanding, the Executive Board is to review and adopt a biennial Clipper® budget.

The budget is intended to provide an understanding of the scope and size of major expense categories and confirm availability of funding. The budget includes a work plan and staffing plan for the following two years and is updated annually. The budget includes both C1 and C2 work items, as well as transit-operator requested and funded projects.

Proposed FY 2017-18 and 2018-19 Budget and Work Plan

The proposed budget and work plan for FY 2017-18 and 2018-19 is attached. Included in the attachments are:

- Clipper® Projected Operating Budget (Table 1) and Operating Budget Detail (Table 1A);
- Clipper® Projected Capital Budget (Table 1) and Capital Budget Detail (Table 1A); and
- Clipper® Staff Organizational Chart.

Highlights and Key Assumptions

1. A draft budget was presented at the January 23, 2017 meeting of the Clipper® Executive Board, which showed an operating deficit of $3.3M estimated in FY 2018-19 that grew larger in the following years, largely due to projected cuts in STA funds that the program had expected to receive. The current budget now shows an operating surplus in FY 2018-19. The following items were updated:
    - $3 million of unregistered "Inactive" funds were assumed to be available from the program Float account (see Agenda Item 3a) and encumbered in FY 2017-18;
    - As described in January's Clipper® Executive Board, an additional $2 million of RM2 Operating funds were included in the Operating Budget, subject to availability and the approval of the MTC Commission;
    - In the upcoming MTC agency budget, operating staff costs in FY 2017-18 were reconsidered in anticipation of demand for staff resources in the ramp-up for C2; and

- Regional Measure 2 funds were programmed through the Transit Capital Priorities program to the Capital budget, which allowed STA funds originally dedicated as a capital local match to be used for Operations.

2. Operating costs for C2 are assumed to be similar to current operating costs, with C1 operating costs decreasing as C2 comes on line. The current assumption is that the C1 and C2 systems operate in parallel in FY 2021-22, once C2 is deemed Revenue Ready after an assumed two years of design, implementation, and transition.
3. Transit operators were surveyed for upcoming projects that would require enhancements to the Clipper® system. Capital System Enhancements for Operator Requested and Paid projects are current anticipated transit operator requests, and prioritization of these projects along with other system enhancements will occur at a later date.
4. Full capital and operating costs of C2 are unknown at this time. The budget includes a high level capital estimate of $110M plus an additional $4M for integration of existing Clipper® ticket vending machines (TVMs) and faregates, with the majority of the costs being encumbered in years three through five of the C2 contract. This high level estimate does not include the following costs:
    - Communication infrastructure upgrades that may be required for C2; and
    - Replacement of transit operator TVMs and faregates.
5. At this time, we anticipate that revenue to support C2 implementation may be provided from the following programs:
    - Transit Capital Priorities - $70M
    - Cap and Trade, Low Carbon Transit Operations Program (LCTOP) - $20M
    - To Be Determined - $20M
6. The timing of funding availability is unclear; MTC staff is working closely with MTC Programming and Allocations to manage cash flow. This effort requires staff resources to stay abreast of matching fund type to operational needs.
7. Limited capital funds are available for new C1 capital initiatives. Additional C1 capital projects will increase the deficit for C2; capital funds are reserved for limited back-end system improvements and replacement of equipment that has reached end-of-life. Costs for implementation of equipment for fleet expansion are the responsibility of the transit operators.

Recommendation

Staff recommends the Clipper® Executive Board approve and adopt the Clipper® Two Year Budget and Work Plan as shown in the attachments to this memorandum.

Carol Kuester

Carol Kuester

Attachments:

- Attachment A: Clipper® Projected Operating Budget
- Attachment B: Clipper® Projected Capital Budget
- Attachment C: Clipper® Staff Organizational Chart

CLIPPER® PROJECTED OPERATING BUDGET - FEBRUARY 13 2017
TABLE 1: COSTS and REVENUES, FY 2016/17-2020/21

Two Year Work Plan for Approval

Operating Budget ($M)							
Item No.	Descriptions	Current FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	Total FY 16/17-FY 20/21
MTC Operating Costs							
1	Annual C1 Operating Costs - MTC	$8.0	$8.4	$8.8	$9.3	$9.7	$44.2
2	Annual C2 Operating Costs - MTC	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
3	MTC Staff	$2.0	$1.3	$1.4	$1.5	$1.6	$7.8
4	Clipper® Operations - Misc.	$0.7	$0.6	$0.6	$0.6	$0.7	$3.2
5	In Person Customer Service Centers	$1.3	$1.4	$1.4	$1.5	$1.6	$7.1
6	Customer Education Program	$1.4	$1.3	$1.4	$1.4	$1.5	$7.0
7	Consultants	$0.2	$0.2	$0.2	$0.3	$0.3	$1.2
8	*Subtotal MTC expenses*	$13.5	$13.3	$13.9	$14.6	$15.3	$70.5
Transit Agency Costs							
9	Annual C1 Operating Costs - Transit Agencies	$18.0	$19.7	$20.7	$21.7	$22.8	$102.9
10	Annual C2 Operating Costs - Transit Agencies	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
11	*Subtotal Transit Operator expenses*	$18.0	$19.7	$20.7	$21.7	$22.8	$102.9
12	**Total Operating Costs (MTC+Transit)**	**$31.5**	**$33.0**	**$34.6**	**$36.3**	**$38.1**	**$173.4**
Operating Revenues							
13	**Total STA Revenues**	**$12.4**	**$11.0**	**$5.3**	**$5.3**	**$5.7**	**$39.7**
14	**Total RM2 Marketing Revenue**	**$1.3**	**$1.3**	**$1.3**	**$1.3**	**$1.4**	**$6.6**
15	**Additional RM2 Marketing Revenue[1]**	**$1.7**	**$1.7**	**$1.7**	**$1.7**	**$1.7**	**$8.5**
16	**Additional RM2 Operating Revenue[1]**	**$0.0**	**$2.0**	**$2.0**	**$2.0**	**$2.0**	**$8.0**
17	**Unregistered Inactive Funds[2]**	**$0.0**	**$3.0**	**$0.0**	**$0.0**	**$0.0**	**$3.0**
18	**Total Transit Agency Revenue**	**$18.0**	**$19.7**	**$20.7**	**$21.7**	**$22.8**	**$102.9**
19	**Total Operating Revenue**	**$33.4**	**$38.7**	**$31.0**	**$32.0**	**$33.6**	**$168.7**
20	**Cumulative Surplus/Deficit**	**$2.1**	**$7.9**	**$4.3**	**$0.0**	**($4.5)**	

[1] Contingent upon availability and MTC Commission Approval

[2] Contingent upon Clipper Executive Board Approval

TABLE 1A: Operating Budget Detail
February 13, 2017

Operating Budget Item #	Category	Phase	Project Name	Vendor	Current FY 16/17 ($M)	FY 17/18 ($M)	FY 18/19 ($M)
1	**Annual C1 Operating Costs - MTC**	C1	MTC share of annual C1 operating costs per the MOU	Cubic	8.00	8.40	8.82
2	**Annual C2 Operating Costs - MTC**	C2	Estimated MTC share of C2 annual operating costs	TBD	NA	NA	NA
3	**MTC Staff**	C1	MTC Staff	MTC	1.98	1.35	1.42
4	**Clipper Operations - Misc.**	C1	Data Store, ATT Network Services, Storage Fees	Various	0.10	0.11	0.11
		C1	SSAE Audit	Cubic	0.20	0.21	0.22
		C1	Operational Reporting and Analysis	RDA	0.18	0.19	0.20
		C1	Website Maintenance	Cubic	0.08	0.08	0.08
		C1	SFSU passes	Cubic	0.10	0.00	0.00
5	**In Person Customer Service Centers**	C1	AC Transit In Person Customer Service Center	AC Transit	0.25	0.25	0.25
		C1	Embarcadero Kiosk	Nematode	0.70	0.00	0.00
		C1	Embarcadero Kiosk	TBD	0.00	0.74	0.77
		C1	Bay Crossings In Person Customer Service Center	Nematode	0.30	0.32	0.33
		C1	Transportation Information Booth	Fanueil	0.00	0.08	0.08
6	**Customer Education**	C1	Creative design for website and customer education initiatives	MIG	0.54	0.55	0.55
		C2	C2 Public Engagement Promotion	MIG	0.01	0.00	0.00
		C1	Ad Campaigns	TBD	0.40	0.25	0.40
		C1	Research/Survey	TBD	0.00	0.10	0.00
		C2	C2 Customer Research	TBD	0.10	0.15	0.10
		C1	Outreach Support	Caribou	0.20	0.20	0.25
		C1	Production costs for signage and collateral	TBD	0.02	0.02	0.02
		C1	Contingency	N/A	0.03	0.00	0.00
		C1	Cardholder Materials	Cubic	0.05	0.05	0.06
7	**Consultants**	C1	Program Mgt. and Strategic Planning	Synapse Strategies	0.21	0.24	0.24
		C2	C2 Public Engagement Strategic Planning and Management	Synapse Strategies	0.04	0.02	0.02
8	**TOTAL**				**13.49**	**13.29**	**13.91**

CLIPPER® PROJECTED CAPITAL BUDGET - FEBRUARY 8, 2017
TABLE 1: CAPITAL COSTS AND REVENUES, FY 2016/17-2020/21

Two Year Work Plan for Approval

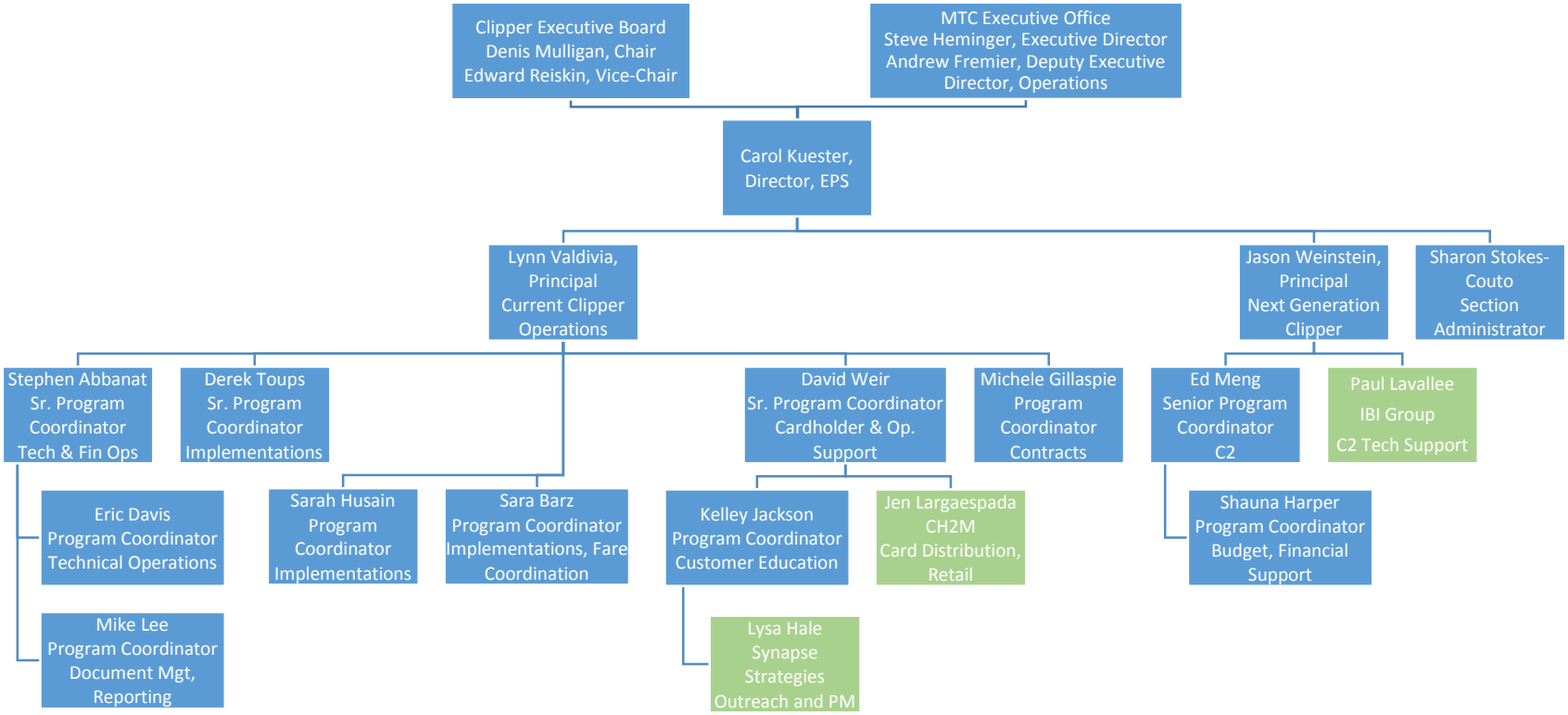
Item No.	Description	Capital Budget ($M)					
		Current FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	TOTAL FY 16/17 - 20/21
Capital Costs (See Table 2 for Cost Detail)							
	Current Clipper® System (C1)						
1	MTC Staff	$1.1	$1.1	$1.2	$1.3	$1.3	$6.0
2	Clipper® Cards	$2.0	$2.0	$2.0	$2.0	$2.0	$10.0
3	Consultants	$1.2	$1.0	$0.8	$0.5	$0.0	$3.5
4	System Enhancements	$0.4	$0.3	$0.0	$0.0	$0.0	$0.7
5	System Enhancements - Operator Requested and Paid	$0.5	$0.5	$0.0	$0.0	$0.0	$1.0
6	Infrastructure Refresh/End-of-Lifecycle Replacement	$2.0	$3.5	$3.5	$3.0	$2.0	$14.0
	Next Generation Clipper® System (C2)						
7	MTC Staff	$0.9	$1.8	$1.9	$2.0	$2.1	$8.7
8	Replace Back End/Front End Devices (not TVMs/faregates)	$0.0	$0.0	$5.0	$15.0	$35.0	$55.0
9	Integrate Existing C1 TVMs/Faregates	$0.0	$0.0	$4.0	$0.0	$0.0	$4.0
10	Replace TVMs/Faregates - Operator Paid	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
11	Consultants	$2.8	$2.7	$1.7	$1.3	$1.3	$9.8
12	**Total Expenses**	**$10.9**	**$12.9**	**$20.1**	**$25.0**	**$43.7**	**$112.7**
Revenue							
13	TCP - FTA	$13.9	$5.0	$0.0	$0.0	$25.0	$43.8
14	TCP - OBAG2-STP/CMAQ	$0.0	$0.0	$5.7	$8.8	$9.5	$24.0
15	TCP - OBAG2-RM2	$1.0	$1.1	$2.5	$3.5	$4.9	$13.0
16	Operator Paid Revenue	$1.2	$0.5	$0.0	$0.0	$0.0	$1.7
17	Card Fee Revenue	$2.0	$2.0	$2.0	$2.0	$2.0	$10.0
18	STA	$1.0	$0.0	$0.0	$0.0	$0.0	$1.0
19	Cap and Trade	$3.6	$1.1	$1.1	$1.1	$1.1	$8.0
20	**Total Annual Revenue**	**$22.6**	**$9.7**	**$11.3**	**$15.3**	**$42.5**	**$101.5**
21	**Cumulative Surplus/Deficit**	**$30.6**	**$27.3**	**$18.6**	**$8.9**	**$7.7**	

TABLE 1A: Capital Budget Detail
February 8, 2017

Item #	Category	Project Name	Vendor	Current 2016/17 ($M)	2017/18 ($M)	2018/19 ($M)	Description
Current Clipper System (C1)							
1	**MTC Staff**	MTC Staff	MTC	1.11	1.14	1.20	MTC staff funded with capital funds
2	**Clipper Cards**	Clipper card order	Cubic	2.00	2.00	2.00	Annual Clipper card order
3	**Current System Consultants**	Technical Advisor	CH2MHill	1.00	0.80	0.60	Tech Advisor support expected to decrease as capital projects are completed and resources shift in-house; more focus on state of good repair and system operations
		Capital projects support	TBD - bench contract	0.20	0.20	0.20	As needed support from Consultant Assistance Bench, including data and reporting infrastructure improvements
			Subtotal:	1.20	1.00	0.80	
4	**Current System Enhancements**	Test bed upgrades	Cubic	0.10	-	-	Upgrades to test bed to support introduction of Phase 3 operators
		Credit card improvement initiatives	Cubic	0.30	0.20	-	Card acceptance/fraud reduction, selective card blocking
		Operator asset management tracking	Cubic	-	0.10	-	Enhancement for automated tracking of bus equipment and maintence
			Subtotal:	**0.40**	**0.30**	**-**	
5	**Current System Enhancements - Operator Requested and Paid**	AC Transit Fleet Expansion	Cubic	TBD	TBD	TBD	Cubic to provide legacy bus devices for AC Transit fleet expansion
		AC Transit/VTA/SFMTA - Expanded Limited Use Tickets for Single Ride/Passports	Cubic	0.20	-	-	Eliminate tokens/paper passes
		AC Transit - Transbay Transit Center AVMs	Cubic	0.06	-	-	Installation of AVMs at the Transbay Transit Center
		Caltrain - TVM Integration	TBD	-	-	-	Integrate Caltrain TVMs with Clipper
		Caltrain - New EMU Vehicles	TBD	-	-	-	Schedule TBD
		GG - Business Rule Simplification	Cubic	-	TBD	TBD	Implementation of new transfer rules for Golden Gate Transit
		GG - Tiburon	Cubic	-	TBD	TBD	Creation of Tiburon Ferry product
		GG - TVM Refresh	Cubic	-	TBD	TBD	TVM component refresh and potential procurement of additional TVMs for Sausalito or Tiburon if necessary
		Marin Transit - Flat Fare Implementation	Cubic	-	TBD	TBD	Conversion of business rules from dual-tag to flat fare payment
		SFMTA - New Passes	Cubic	0.25	TBD	TBD	Develop 1, 3, and 7-Day Pass (without Cable Car)
		VTA - TVM Integration	Cubic	-	TBD	TBD	Integration of new 10 new TVMs
		WETA - Richmond	Cubic	-	TBD	TBD	Equipment Installation at Richmond Ferry Terminal
		WETA - San Francisco	Cubic	-	TBD	TBD	Equipment expansion in downtown San Francisco
		Multiple Operators - New Driver Console (DC3) - Single Point Log-on	Cubic	-	0.50	-	Onboard integration of Clipper and other vehicle systems for operators with new bus devices
			Subtotal:	**0.51**	**0.50**	**-**	
6	**Infrastructure Refresh/End-of-Lifecycle**	Replace end-of-life equipment as needed	Cubic	2.00	3.50	3.50	Replace HCR3s (FY16/17) and other obsolete equipment at end of lifecycle
			Subtotal:	**2.00**	**3.50**	**3.50**	
Next Generation Clipper System (C2)							
7	**MTC Staff**	MTC Staff for C2	MTC	0.90	1.80	1.89	MTC staff funded with capital funds eligible for equipment/system replacement
8	**Replace Back End/Front End Devices**	Replace Back End/Front End Devices (not TVMs/faregates)	TBD	-	-	5.00	Replace back end systems and front end devices (retailer devices, ticket office terminals, vehicle and platform card readers, handheld readers)
9	**Integrate TVMs and Faregates**	Integrate existing TVMs and faregates	TBD	-	-	4.00	Existing TVMs and faregates will be integrated into C2. Individual operators are responsible for replacement (see Line 10). Integration estimate assumes C2 vendor supplies web-based API, all existing hardware is adequate, and no change to credit/debit gateways.
10	**Replace TVMs and Faregates**	Replace TVMs and faregates	TBD	-	-	-	Replacement of TVMs and faregates is <u>not</u> included in the scope of C2; only integration of the existing TVMs and faregates. Operators are responsible for replacement costs.
11	**Consultants**	C2 Public Involvement Consultant	MIG	0.05	-	-	C2 Public Engagement Plan
		C2 RFP Financial Evaluation	TBD	-	0.20	-	Financial evaluation and review of vendor proposals for cost realism and cost effectiveness
		C2 Strategic Planning/Advice Contract	Invoke, TBD	0.25	0.25	0.25	Strategic planning/advice during C2 procurement process
		Clipper/FasTrak Convergence	CH2MHill/Jacobs	-	-	-	Evaluation of potential opportunities for convergence of Clipper and FasTrak systems and customer service centers
		Communications	TBD	0.25	0.25	0.25	Assessment and development of strategy for Clipper communications and network
		C2 Legal Support	Thompson Coburn	0.25	0.30	0.20	Legal and contracting support for C2 procurement and implementation
		C2 Technical Advisor	IBI Group	2.00	1.70	1.00	C2 planning and procurement support
			Subtotal:	2.80	2.70	1.70	
12		**TOTAL**		**10.92**	**12.94**	**20.09**	

Clipper Staff Organizational Chart

January 2017



375 Beale Street, Suite 800
San Francisco, CA 94105

Metropolitan Transportation Commission

Legislation Details (With Text)

File #:	17-2266	**Version:**	1	**Name:**	
Type:	Report			**Status:**	Informational
File created:	1/26/2017			**In control:**	Clipper Executive Board
On agenda:	2/27/2017			**Final action:**	
Title:	Next-Generation Clipper® (C2) Request for Proposal (RFP) for Industry Review Update on the C2 System Integrator Draft RFP for Industry Review.				
Sponsors:					
Indexes:					
Code sections:					
Attachments:	4a_C2 RFP Update.pdf 4a_Handout-article-Uber-liketransitUX.pdf				

Date	Ver.	Action By	Action	Result

Subject:
Next-Generation Clipper® (C2) Request for Proposal (RFP) for Industry Review

Update on the C2 System Integrator Draft RFP for Industry Review.

Presenter:
Jason Weinstein

Recommended Action:
Information

Attachments

powered by Legistar™

Agenda Item 4a

Bay Area Metro Center
375 Beale Street
San Francisco, CA 94105
TEL 415.778.6700
WEB www.mtc.ca.gov

TO: Clipper® Executive Board DATE: February 21, 2017

FR: Carol Kuester

RE: Next-Generation Clipper® (C2) Request for Proposal (RFP) for Industry Review

This memorandum provides an update on the C2 System Integrator Draft RFP for Industry Review ("Draft RFP"). The Draft RFP for industry review was released as planned on the MTC website on January 27, 2017.

The draft RFP for Industry Review has several components, which include:

- Cover Letter (including review guidance and specific areas for feedback);
- Draft RFP;
- Draft Scope of Work (Attachment A of the RFP); and
- Draft Contract (Attachment E of the RFP).

Clipper® staff created a website for interested vendors and other parties to provide feedback on these components of the RFP. While interested parties were asked to provide feedback on all areas of the RFP, in particular, vendors were asked to focus on the following:

- Changes that might be considered to reduce project cost, time, or risk while still providing a highly functional, best-in-class system that meets or exceeds the program goals described in the document;
- The proposed design process, which would involve finalizing the system design jointly with the System Integrator;
- Requirement that the C2 System Integrator assume the operations and maintenance of the C1 system.

Other specific areas that were discussed with the Executive Board and where specific feedback was requested include:

- Minimum Qualifications and Evaluation Criteria;
- Pricing Structures;
- Hardware Purchase, Ownership, and Maintenance; and
- O&M Payment Incentives and Disincentives.

MTC and transit agency staff may continue to provide comments on the updated Scope of Work and RFP.

Also, as discussed at the December 2016 Executive Board meeting, public engagement for C2 has kicked off with the invitation for public comment on the Draft RFP. We are planning on updating the Board with initial results on public comment this summer.

Key upcoming dates for the C2 Draft RFP include:

12:30p.m., March 1, 2017	Industry Review Draft Information Webinar
4:00 p.m., April 3, 2017	Industry Responses Due
April 3, 2017 – Summer 2017	Review of Industry Responses

We look forward to updating the Clipper® Executive Board on industry response to the Draft RFP in the coming months.

Carol Kuester

Carol Kuester

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Bay Area Fair Value Commuting
An FTA MoD Sandbox Demonstration Project

Why can't I have an Uber-like public transit user experience?

Steve Raney, Feb 12, 2017, Steve.raney@jointventure.org
Short URL for this google doc: http://bit.ly/UberTransitUX

ABSTRACT: In the face of disruption, there is an expectation and need for a more customer-centered public transit user experience, seamlessly managing challenging multimodal journeys. Envisioned are many nationwide apps with Uber-like user interface features vigorously competing to serve customers. Such app competition will futureproof the user experience, comprehending advances such as intelligent agents. To bring about works-anywhere apps, regional procurements could be replaced by an open, frictionless app marketplace with a commission-based business model. Marketplace prerequisites include: federal financial/political support, streamlined fare structure, transition to cashless, adoption-accelerating fare discrimination, contactless debit cards for the unbanked and tap-to-pay turnstiles.

1. What do you expect?

You use Uber/Lyft. You grok the no-brainer user experience (UX). You could design an iPhone/Android app to make public transit just as seamless. You expect an Uber-like UX. Disruption threatens public transit, so, to stay competitive, transit needs to meet your expectations.

Uber gets you where you want to go. Public transit stations & stops don't always line up with where you want to go. A seamless app needs to glue together public and private travel modes to get you to your destination - gaps have to be filled. In some markets, more than 20% of Uber/Lyft trips are complementary first/last mile to/from public transit.

2. Tough use case: San Francisco Mission District to downtown Sacramento via four travel modes

If an app can handle this use case, then it's well on its way to the hypothetical UX ideal.

Travel mode	Start location	End location	Cost
BART	5:35pm 24th St Mission Station, 2800 Mission, SF.	5:55pm 12th St. Oakland City Cntr, 1245 Broadway	$3.70
UberPool w/ human	5:57pm (walk + 1 min wait)	6:05pm Jack London Sq.,	$4.75

driver	1245 Broadway, Oakland	245 2nd St, Oakland	
Capitol Corridor Amtrak	6:10pm Jack London Sq	8:08pm Sacramento Station, 401 I St	$29
Sacramento Regional Transit District	8:16pm Sacramento Valley Station, 5th & H,	8:26pm Archives Plaza, 1500 11th St, Sacramento	$2.75

The app pays for each travel mode, there's no fumbling around for transit/credit cards or cash. Unintelligent cards cannot compete on UX with extremely smart phones. You zoom through the BART turnstile using NFC (near field communication) tap and pay.

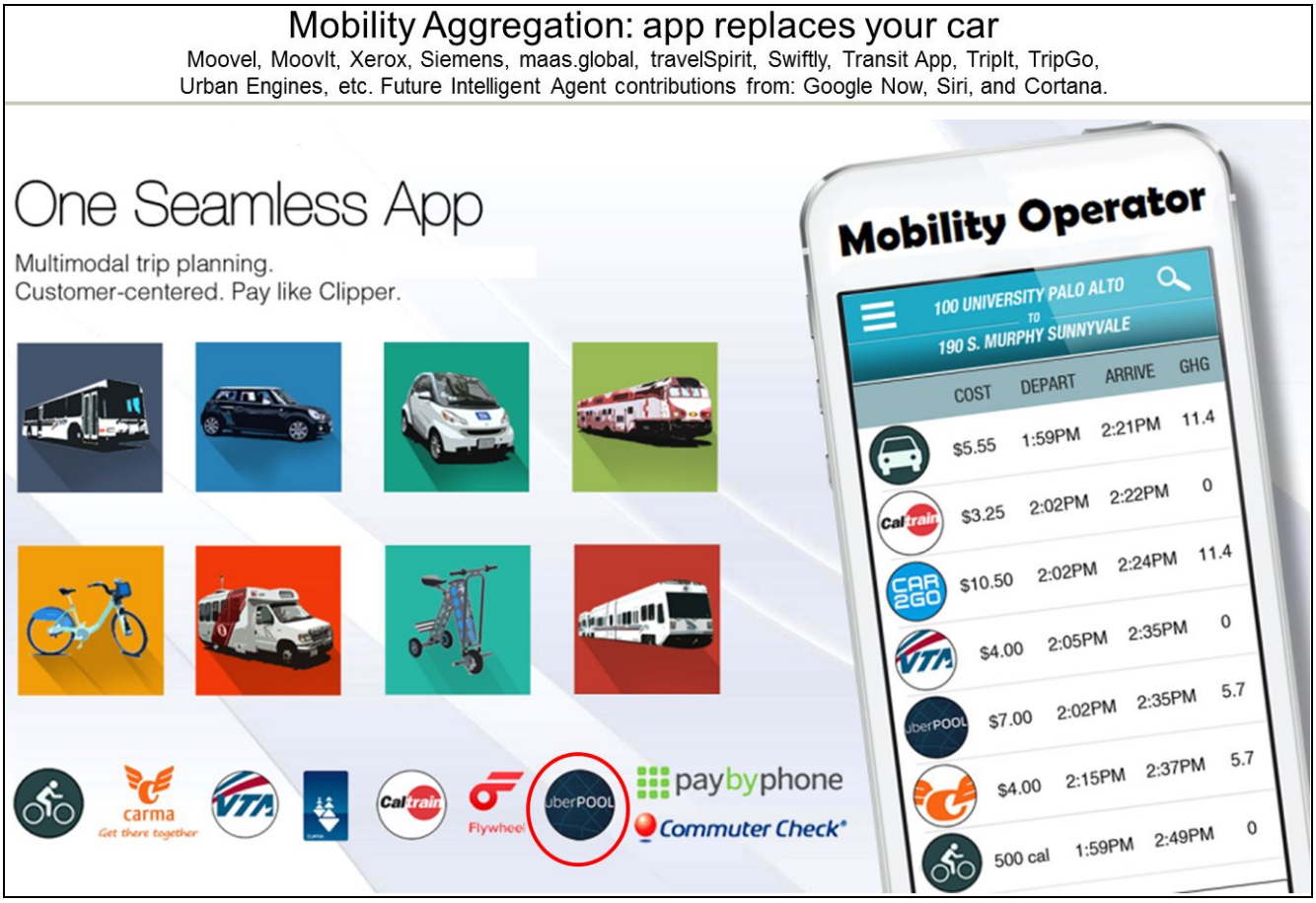
While you travel through the BART Transbay Tube, the app ensures that UberPool is waiting at the end of the BART trip, making the transfer a no-wait, no-brainer. Stress-inducing "waiting under conditions of uncertainty" is eliminated for all modes as the person/vehicle rendezvous for each mode is depicted graphically on the phone.

The seamless app transmits public/private travel service fares (money) to those services. Fares are very complex, with variable discounts, etc. A transfer between Uber and Amtrak is beneficial to both services as well as the travelers, so a discount can be applied to both fares.

This journey crosses two governmental regions, the nine-county Bay Area and the six-county Sacramento region. You need a seamless trip that works everywhere, but some regions develop their own region-only proprietary app. The US should catch up to the more seamless Japanese experience: "Apple Maps launches support for transit in Japan with iOS 10. Apple Pay users can map out and pay for their entire commute, including major train, subway, ferry and national bus lines, on their iPhone 7, iPhone 7 Plus and Apple Watch Series 2, based on updated fare and schedule information" - (from Apple press release).

3. MobAgs

The app can be called a "MobAg," for **MOB**ility **AG**gregation app, providing multimodal trip planning/support with a seamless combination of public/private transit, bikeshare, rideshare, carshare, and parking, all with on-phone payment. Apps that are part-way along the path to the ideal include Moovel (Daimler), Urban Engines (Google), Whim, Moovit (BMW owns a piece), Transit App, TripGo, Swiftly, CityMapper, Chicago Ventra, Siemens, GoLA (Xerox/Conduent), Finland's MaaS.global, and Manchester's TravelSpirit. In the ideal, you sell your car and use the MobAg to get around, with a UX as brainless as driving.



4. Future-proofing the UX

Intelligent agents {Siri, Google Assistant, Cortana} are beginning to act like your personal assistant, learning your quirks and looking out for you. These agents work “faster than real-time” because they can snoop your calendar to anticipate your needs before you do.

The public transit UX needs intelligent agent augmentation to achieve “as brainless as driving a car:”

- Ascertain if you get lost during a transfer between modes and then get you back on track.
- Wake you up so you don’t miss your stop/station.
- Understand your context, like “traveling with toddler” versus “schlepping a heavy suitcase” and only suggest reasonable travel options.
- You took the red-eye to Atlanta, a city you’ve never visited. You should be 100% confident that the app can play it by ear for you. You don’t have to look up travel options/directions before getting on the plane.
- Where appropriate, pre-book modes so you always have a vehicle/seat.
- At the end of the day at your desk, the app nudges you to pack up and ensures that you make your connections. It yells at you to sprint when needed (knowing from your wearable that you are a healthy, marathon-ready person).

For an app to work in San Francisco, Sacramento, and Atlanta, things are going to have to change. Some regions develop proprietary, region-specific apps that require a bruising six-year process to pick

a software vendor. Unfortunately, the “cycle time” for open private sector app updates is three months, not six years. Hence, six-year proprietary selection processes will need to evolve into an open, frictionless app marketplace with profits motivating active competition between many MobAgs. Further, to provide a compelling business case, the apps must access open public transit payment APIs and take a commission from each fare. Once the private sector is provided with this business case, then engineering talent will be applied with a vengeance.

5. Disruption in support of public transit expansion

As previously mentioned, some regions suffer lengthy software cycles to develop proprietary apps, whereas the private sector software landscape changes constantly, creating a public/private UX imbalance. Moving to a frictionless, future-proof marketplace allows public transit to keep up with disruptive UX breakthroughs.

Further, US public transit bus cost is about $1.01 per passenger mile. It seems likely that, beginning with small systems in about 2023, electric robovans (with robot drivers) will outcompete: ¼ the seats of a bus, $0.25 per passenger mile, 1/20 the vehicle cost, 4X the frequency, and flexible routing. If the average robovan revenue per passenger mile is $0.40, then we may see a “perpetual motion machine” of public transit growth.

Additionally, as part of a transport congestion/climate strategy, adopted California state policy calls for doubling transit ridership by 2040. Such growth requires a more-seamless UX.

Lastly, some regions have too many transit agencies to support rapid change/growth. For example, the Bay Area has 24. Because of looming disruption, agencies will need to work hard to deliver an improved UX, masking their inherent inefficiencies.

6. Stipulations

- Paying for transit with your phone is just like paying at Starbucks with an app. Proof of this occurred in Japan 15 years ago.
- From a software architecture standpoint, regional public transit apps (and payment system backends) are all about the same. Hence the architecture can be abstracted into open APIs, enabling nationwide apps. Regional governance should acknowledge this commonality between regions. Private sector app vendors can be motivated to create nationwide customer accounts. Proof of this is your own works-anywhere Uber account. The public sector org chart prevents national accounts.
- Regional app selections (procurements) stifle innovation, creating proprietary apps that can’t keep up with the pace of innovation. Vendors spend more effort preparing bids and negotiating contracts than they do writing the code after they win.

7. Open, profitable, national, frictionless, future-proof public/private collaboration

To bring an Uber-like public transit UX about:

- Regions and vendors voluntarily enter an agreement supporting open standard transit payment. For example: Four regions (San Francisco Bay Area, Sacramento, Atlanta, and Phoenix) and three MobAg vendors (Xerox GoUSA, Daimler Moovel, and Google Urban Engines) voluntarily agree to a series of commitments to bring this about. Improved UX will drive further voluntary adoption.
- A fixed commission of, say, 8% is provided to certified vendors for each public transit payment transaction. The fixed commission eliminates regional procurements and negotiations. The fixed commission is the key enabler of the frictionless app marketplace.
- As a result, the MobAg space continuously improves, future-proofing public transit user experience. Competition for the fixed commission intensifies feature set innovation to create product differentiation.
- The public sector certifies the apps to meet important requirements, with the private sector funding that certification. Certification includes a) supporting the Interoperable Open Transit Data Standard, b) third party compliance certification of EU Data Protection Directive and Payment Card Industry Data Security Standard (PCI DSS) with regular audits, c) provision of anonymized trip data to the public sector at no charge.
- The public sector maintains turnstile hardware and provides open standard hardware APIs.
- The public sector simplifies and maintains public transit fare structure, providing an open fare structure dataset.

If regions are currently in the middle of a proprietary regional procurement, they can move part-way towards the ideal. They can rank vendor bids based on moving towards an open, national solution, rewarding proposals that support multiple MobAgs and that publish open APIs used by multiple vendors.

The Federal Transit Administration and other agencies could play a role in accelerating efforts towards this UX breakthrough, providing funding to improve transit data feeds and to upgrade hardware in exchange for supporting the frictionless app marketplace.

8. Challenging prerequisites for an Uber-like UX breakthrough

- It may take federal financial and political support to bring about a breakthrough. Further, participating regions need to have a timing window that allows for a breakthrough.
- Inertial local transit agencies will be politically wrangled towards this customer-centered UX. Industry disruption may help motivate transit agencies.
- Regions will pass “increase public transit competitiveness” laws to streamline fare structures. For example, the 24 transit systems in the Bay Area have a staggering 700 fare rules. Fare restructuring will result in some agencies losing a bit of revenue, hence regions will make up such losses in exchange for agencies streamlining.
- Regions will transition to cashless public transit payment. Boston is eliminating cash transit payment. New transit lines/routes in Pittsburgh do not accept cash. You’ll refill your account on your phone, not by painfully waiting in line at an “add fare” ticket machine.
- Social equity for unbanked and phone-less will be achieved through provision of inexpensive prepaid Android phones and contactless debit cards. The debit cards are generic to US retail and are compatible with modern transit turnstiles. Contactless cards can be refilled online, at low-income service centers, and at retailers (Japan 20 years ago) and, alas, at

still-necessary-but-less-prevalent transit ticketing machines. Contactless cards are currently scarce in the US, but the open payments industry has a stated willingness to produce cards in exchange for a reduction in proprietary payment. A portion of the fixed commission could be used to ensure that unbanked / phone-less are expeditiously serviced. Also related to equity; 1) low-income travelers face more "extreme commutes" across two regions, so will benefit from works-anywhere apps, and 2) Seattle King County Metro's Orca-Lift provides a regional low-income public transit discount. This discount should be expanded to other regions.

- You will be an early adopter of next-generation MobAgs, but your neighbor Fred is a laggard. Fred is motivated by a) a fare difference in favor of new over old technology, and b) gradual removal of legacy ticket machine hardware (increased "add fare" ticket machine queue length). Fred-centric policies will be adopted. Transitioning from old to new is a hassle that may require dedicating a portion of the fixed commission to hardware upgrades - federal financial support may also be necessary.
- NFC tap and pay will get you quickly/reliably through the BART turnstile. No one wants the social stress of backing up the turnstile queue.
- In the event that a MobAg vendor goes bankrupt, a smooth customer transition will be ensured. Other risk management strategies will likely be needed.
- Pre-tax commuter transit purchase UX will be improved via MobAg.
- While MobAgs will provide national brands, plenty of screen space will be available within these apps for local public transit branding.

9. References

- Transit and Contactless Open Payments: An Emerging Approach for Fare Collection, A Smart Card Alliance Transportation Council White Paper, Nov 2011.
  NFC tap and pay should reliably transact in 400ms at each BART turnstile, using a) Offline Data Authentication (ODA), b) pre-stored value on the phone (value is communicated to the turnstile) sufficient to pass through the gate, or c) vendor taking on "first tap" risk whereby the vendor makes the public transit agency whole for any for scofflaws. Article: Tomorrow's Transactions: ODA is a good thing, and not only for transit operators (are you listening USA?)
- Please remember that smart CARDS are not intelligent like smart PHONES. Metro Magazine: Shifting to Smart Cards: A Tale of Two Cities.
- "Open tokenization" enables electronic payment: "The concept of using a non-decryptable piece of data to represent, by reference, sensitive or secret data. In payment card industry (PCI) context, tokens are used to reference cardholder data that is managed in a tokenization system, application or off-site secure facility."
- Roundup of Transportation Data Standards (and Gaps): Aaron Antrim, Trillium.
- Conceptual diagrams of fare systems for fixed-route transit, http://bit.ly/2feE95y: Aaron Antrim, Trillium.
- Open standards effort: GTFS-SUM (General Transit Feed Specification - Shared Use Mobility) open data standard effort. Founding partners include: RideScout, TriMet, CUTR, Trillium Transit, IBI, Technology Association of Oregon.
- Open standards effort: RMI's Interoperable Transit Data: Enabling Mobility as a Service.
- TRB's Transit Cooperative Research Program (TCRP) Report 177: Preliminary Strategic Analysis of Next Generation Fare Payment Systems for Public Transportation: explores attributes, implementation strategies, and applications of next generation transit fare payment (NGFP) systems. TCRP 177
- Next Generation Transit Fare Payment System : Account Based - Open Payment.

10. Comments

- I couldn't agree more with the gist of this effort. I have spoken to many transport agencies in the last few days who are stuck between a rock and a hard place with their existing ticketing systems. The huge investments in them cement the agency with a proprietary vendor and a certain technology that is state-of-the-art at the moment of procurement. As technologies are advancing (rapidly!) those new features don't get incorporated and neither do the new mobility services that are becoming available.
- Great vision. You were talking about Data Interoperability, from our experience one of the major obstacles today for your vision is Payments/Bookings Interoperability. Every vendor using their own (closed) system. Moreover every vendor wants 'to own' the customer and wouldn't like to share him/her with its competitor. Another challenge is NFC for iOS. For the best of my knowledge Apple don't allow 3rd party developers to access it and therefore it limits industry options of what can be done.
- We should begin by developing best practices for GTFS to ensure better source data. Some care should be taken in improving the GTFS standard to define **all** fixed route public/private transit fare models, including the comprehension of cross-operator transfer discounts. This GTFS definition of all fare models should be robust enough to be used by payment backends.
- It is not clear if private or public mobility will be thriving in five years. Uber is covering only 41% of their costs with fares. Some public transit fareboxes cover 70% of operating costs (capital costs ignored) while others cover only 13%: https://pbs.twimg.com/media/Ctida34UkAAKMjU.jpg. Should public transit form long-term alliances with money-losing private mobility that may not last?
- Additional compassionate use cases should be addressed for: former-drivers, seniors, eyesight-impaired, English language learners.
- The article should add an ecosystem map: MobAgs, private mobility services, payment backends, system integrators, payment systems (Android/Apple Pay, VISA, Mastercard, paypal, banks), intelligent agent platforms, MPOs, transit agencies, GTFS fare struct feed, GTFS-RT for vehicle location, etc. some vendors that are interested in regional payment procurements: Accenture, Cubic, Xerox (Conduit), Talus, Moovel, Siemens, Scheidt & Bachmann, First Data.
- The article melds the front end app, customer account, transportation service repository, and transactional back end. It might be helpful to have a "marketecture" diagram showing how this segmentation will function
- Does it make sense to be this prescriptive about the business model?
    - Response: Yes, rigidity in the business model unlocks the breakthrough and eliminates negotiation/procurement. But my viewpoint is far from the dominant paradigm.
- I think the bizmodel is too prescriptive. Google supports google maps with advertising. Perhaps the commissions aren't on transit transactions but other transactions.
    - Response: The overhead for public transit fare processing is somewhere between 5 and 20%. I have spoken to MobAg vendors about the biz model. They want "real money in the form of fare commission," not ads. There isn't another source of revenue that is compelling for them.
- Should a benefits-oriented descriptor replace "MogAg?" mobility agent? mobility butler? Easytravel? "MobAg" sounds awkward, and is reminiscent of unruly crowds, and aggravation or agriculture, bagginess.

11. Acknowledgements
Thanks for review & critique by:
- Adina Levin, Friends of Caltrain
- Steve Pepple, OpenGov
- David Witkowski, Joint Venture Silicon Valley