

SHRP2 C10: Metropolitan Transportation Commission

Quarterly Report for July 2016 – September 2016 (prepared 23-Sep-2016)

SUMMARY

The three-agency group implementing Fast-Trips has continued advancing work on network development, demand preparation, route choice estimation, and software development. Past quarter highlights include: implementation of fares and route choice parameters; efforts to explore and improve algorithm performance; and kicking off route choice calibration and validation.

We have also finalized the re-scoping of transit route choice estimation (see memo here: <https://mtcdrive.box.com/v/application-ready-route-choice>) and drafted a preliminary workplan for the parallel track of work on research problem statement development. At this time, we have made significant progress on the technical scope of work, but we do not believe we can complete the work within the original timeframe from the grant application. We are therefore requesting a no-cost time extension to continue our work for another 12 months.

IMPLEMENTATION

Work accomplished for the period:

Task	Activities
Task 1 - Project Mgmt / Tech Oversight	<ul style="list-style-type: none">• Continued to meet on a bi-weekly basis on management-level updates and issues• Finalized revised approach for estimation• Drafted a preliminary workplan to define research problem statements based on the challenges we encountered in transit route choice estimation
Task 2 - Network Supply	<ul style="list-style-type: none">• Refined input data files, standards, and documentation to address issues and errors identified during preliminary model calibration & validation
Task 3 - Transit Demand	<ul style="list-style-type: none">• Supported efforts to develop validation data sets from available observed data (OBS and CHTS)
Task 4 - Transit Rider Behavior	<ul style="list-style-type: none">• Conducted multiple full-scale Fast-Trips runs and examined results; fixed bugs and issues identified from unusual results• Developed standardized format for validation data sets; started data processing• Began construction of interactive calibration dashboard

	tool using Tableau
Task 5 - Transit System Performance	<ul style="list-style-type: none"> • Supported efforts to develop calibration performance dashboard
Task 6 - Software Implementation	<ul style="list-style-type: none"> • Added fares to Fast-Trips and route choice parameters such as minimum transfer penalty and maximum number of transfers • Implemented path overlap correction, and tested relative performance of different overlap formulations • Investigated sources of excessive processing time spent on path-finding • Tested performance impact of key algorithm parameters including stochastic dispersion variable, maximum stop processing, and time window
Task 7 - Test Case Development	
Task 8 - Agency Implementation & Testing	
Task 9 - Communications and Outreach	<ul style="list-style-type: none"> • Wrote and submitted two papers to the TRB Annual Meeting • Participated in C10 coordination call • Updated project website with links to all GitHub repositories and latest standards & scripts

Schedule status:

Although we are moving at a good pace overall, we have been challenged in the past couple of months by having multiple technical task leaders out on medical leave at the same time. Other team members have had to help cover their colleagues' workload (both agency priorities and SHRP2 tasks), which has slowed progress on certain work elements. In particular, documentation work products are still lagging while team members focus on keeping up momentum on implementation activities.

As noted in our last progress report, we have decided to re-scope route choice estimation (Task 4), and to pursue a parallel track of work that will articulate research problem statements drawn from the challenges that we encountered in implementing a realistic and computationally tractable route choice estimation method earlier this year. (Note that our original scope of work called for hosting other public agencies who wished to learn more about Fast-Trips; this hosting will no longer occur under the revised scope of work.)

Our original grant application called for a total timeframe of two years. Our kickoff meeting was held in February 2015, so we had expected to complete our work in February 2017. Based on

our pace to date and the lead time necessary to pursue the research problem statement development in our revised scope of work, our current expectation is that we will need an extra 12 months to wrap up all project activities. We request a no-cost time extension of an additional year (to February 2018) in order to allow for more time to complete the work of implementing and testing Fast-Trip, developing research problem statement(s), and preparing all documentation for the project.

Expenditures and budget status:

MTC has contributed an additional \$100,000 to the project from our agency’s budget and has encumbered these funds with Resource Systems Group.

Resource	FHWA/ In-kind	Encumbered / Committed	Invoiced to Date / Expended
SFCTA	FHWA	\$310,000	\$117,400
SFCTA	In-kind	\$80,000	\$49,600
PSRC	FHWA	\$65,000	\$37,400
PSRC	In-kind	\$65,000	\$41,900
MTC	FHWA	\$83,000	\$26,600
MTC	In-kind, outside	\$198,000	\$99,900
Univ. of Texas, Austin	FHWA	\$38,500	\$2,600
Mark Hickman (Univ. of Queensland)	In-kind	\$10,500	\$0
Hood Consulting	FHWA	\$60,000	\$11,400
UrbanLabs, LLC	FHWA	\$100,000	\$10,200
To be determined	FHWA	\$43,500	\$0
<i>Total</i>	<i>FHWA</i>	<i>\$700,000</i>	<i>\$205,800</i>
<i>Total</i>	<i>In-kind</i>	<i>\$353,500</i>	<i>\$191,400</i>
<i>Total</i>	<i>All</i>	<i>\$1,053,500</i>	<i>\$397,200</i>

By the end of 2016, we are on pace to complete tasks that will bring the reimbursable total to more than 70% of the grant amount. The remaining outstanding tasks are several documentation deliverables that will likely stretch into early 2017, as well as the budget we have set aside for the research problem development activities.

We have identified more than \$80,000 in funding that can be made available for development of research problem statements. Specifically, we will be able to recover approximately \$40,000 in funds that had been intended to support transit route choice estimation (Task 4) and we will also utilize the \$43,500 in remaining grant funds that have not yet been allocated. We expect that we will require about one third of these funds to cover the activities of team members who are already under contract. The remaining funds will be made available to compensate academic collaborators, who will be brought on board through a procurement process.

Summary of the quarter ahead:

In the next quarter, we will continue to move ahead on the technical tasks and work on bringing the next wave of deliverables through the remainder of our internal review process. We expect to make significant progress on refining, calibrating, and validating our initial implementation, including our asserted route choice estimation parameters. For software development, we will continue to explore methods to enhance performance of the algorithm, and we also expect to turn our attention towards convergence criteria. The networks team and demand team will be monitoring developments on the rest of the project and will update their contributions and documentation as necessary. We will make preparations to discuss and/or present our work at the TRB Annual Meeting and we will work on our contributions for the 2017 Planning Applications Conference. We will also finalize the budget and schedule for the workplan on research problem definition, and we will begin the necessary contract amendments and new procurements.

Risks/Challenges/Obstacles:

The main risk at this point is schedule adherence. As noted above, the various delays we experienced earlier in the year and the additional procurements required to complete our revised workplan mean we will not be able to complete all tasks on the schedule contemplated in the grant application. We are requesting a no-cost time extension in order to allow additional time to execute the remainder of the scope of work.

MEASURES

Our performance measures tracking tool shows current values for all metrics, including the developments in the past quarter specifically noted below.

Implementation and Deployment:

Multiple team members participated in the quarterly C10 coordination call.

Capacity and Partnership:

A total of 23 people are now using our collaboration tools: the Asana project management system, our code repositories on GitHub, and cloud storage on Google Drive and Box.

Dissemination:

The main activities related to dissemination over the past quarter have involved preparing for upcoming conferences. Team members wrote and submitted two technical papers to the TRB Annual Meeting, and we have been brainstorming presentation and paper ideas for the 2017 Planning Applications Conference. These efforts will be reflected in our performance metrics when our work is formally presented at each event.

CATEGORY	DEFINITIONS			TOTAL	Jan-Mar 2015	Apr-Jun 2015	Jul-Sep 2015	Oct-Dec 2015	Jan-Mar 2016	Apr-Jun 2016	Jul-Sep 2016	Oct-Dec 2016
Tool Implementation and Deployment	OUTPUT MEASURE	METRIC 1	TARGET 1									
	Agency and project partners participate in all required calls/meetings.	Number of calls/meetings attended	Minimum: Participation in group kick-off, project kick-off, and 2 additional scheduled calls per year	9	2	1	1	1	1	2	1	
	Project deliverables are submitted to Volpe/FHWA on time and on schedule.	Quarterly progress reports submitted by specified due date	Quarterly progress reports submitted by specified due date.	7	1	1	1	1	1	1	1	
		Final deliverables submitted by due date	Final deliverables submitted by due date.	3	1	0	2	0	0	0	0	
	Agency identifies desirable refinements (i.e., suggestions for future research) for tools created from the C10 project.	Documentation of desirable refinements within existing project deliverables	Information about desirable refinements included within final report.	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
	Agency supplies lessons learned from participating as a C10 grantee.	Documentation of lessons learned	Information about grantee experience included within final report.	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
	OUTCOME MEASURE	METRIC 2	TARGET 2									
	Travel demand model contains new sensitivities suitable for policy analysis.	Number of progress reports that document new variables / modeling options available	At least one	0	0	0	0	0	0	0	0	
	Methodologies, work processes, key decisions, problems encountered, & lessons learned are sufficiently well documented that peers can follow the work and repeat the results.	Number of issues and lessons documented in on-line tools	At least one	0	0	0	0	0	0	0	0	
	Capacity Building and Partnerships	OUTPUT MEASURE	METRIC 1	TARGET 1								
Agency practitioners (staff, contractors, consultants) and assigned partner staff are engaged with project and familiar with results.		Number of users of online collaboration tools	Staff from each partner agency makes contributions to archive of project knowledge.	23	15	17	18	18	22	23	23	
OUTCOME MEASURE		METRIC 2	TARGET 2									
Agency and partner staff acquire additional skills and expertise.		Number of progress reports that document new skills / expertise acquired	At least one	1	0	0	0	0	0	1	0	
Improved work processes, data, analysis tools, and decision information are in use by our agencies.	Number of progress reports that document uptake of new processes, data, tools, methods	At least one	1	0	0	0	0	0	1	0		
Technology Transfer / Research Dissemination	OUTPUT MEASURE	METRIC 1	TARGET 1									
	Project data and information is shared with the academic and practitioner communities.	Number of presentations delivered (conferences, technical meetings, TRB)	1 TRB paper or poster, or participation in a panel/workshop that recounts the information	3	0	1	0	0	1	1	0	
		Number of papers/memos/articles written about the project experience	1 Presentation prior to project closeout to FHWA or other interested communities	6	0	0	0	0	0	6	0	
	OUTCOME MEASURE	METRIC 2	TARGET 2									
Peer agencies in the state/region express interest in or begin to deploy C10 tools.	Number of agencies that contact C10 team about the project and/or express plans to pursue implementation	At least one	2	0	1	0	0	0	1	0		