November 8, 2012

Subrecipient Agreement between SACOG and Sacramento Regional Transit for Regional Funds to Allow Procurement of Connect Card Related Bus Hardware

Issue: An agreement is required to pass through programmed Public Transportation Modernization, Improvement, and Service Enhancement Account (PTMISEA) funds from SACOG to Sacramento Regional Transit District (RT) to implement a hardware procurement.

Recommendation: That the Transportation Committee recommend that the Board authorize the Chief Executive Officer to enter into a subrecipient agreement with RT not to exceed $800,000 to finance the procurement of data communications hardware for RT facilities and bus fleet with programmed PTMISEA funds.

Discussion: Staff, working with the regional Connect Card Consortium (Consortium), has determined that the Connect Card requires an unanticipated investment in data communications hardware for the RT bus fleet that is not in the current Project Budget. At RT's request, the Technical Specification for the Project was written to provide data communications through an interface with the existing communications hardware on RT's bus fleet. The existing system, manufactured by Clever Devices (Clever), provides a variety of services, including automatic vehicle location and bus stop management. Technical research by project staff, engineering consultants, and RT indicated that the proposed interface could connect to the existing communications hardware on the RT busses, and the project was put out to bid based upon this assumption. However, after intensive discussions between engineering teams from Clever and INIT (the prime vendor for the Connect Card), and subsequent research and testing, it has been determined that additional hardware will be required on RT busses.

Staff and the Consortium recommend utilizing a Mobile Access Router (MAR) to provide the required data communications functionality in the RT bus fleet. MAR is a generic name for a compact, state-of-the-art communications router. The MAR would allow for seamless connection of multiple systems, less near-term technical risk, and great future flexibility. The MAR would meet and exceed the requirements for the Connect Card. This recommendation is supported by a technical assessment that is supported by RT staff, SACOG's engineering consultant, and INIT's engineering team, and is the source of the cost estimate. Hardware for data communications is required for the RT bus fleet to transfer data, information, and upgrades from the buses to the Regional Service Center. Staff believes that the MAR would be a cost-effective investment in the regional transit infrastructure. The cost of this solution is not to exceed $800,000, which is not in the project budget.

As discussed previously with the Committee, staff planned a peer review panel to provide input generally on this project and specifically to critique the MAR technology solution. The peer review panel convened on November 2, 2012, and it strongly endorsed the choice of MAR to deliver data communications on the RT bus fleet. The panel was recruited from member agencies and mid-sized regions that have or intend to deploy smart card systems. The participants included lead engineers and managers in functions that involve transit technology. Topics in the panel discussion included data communications, innovation and evolution in technology, project risks, and project management. In addition to endorsing the MAR solution, the peer

review panel offered advice and lessons learned on other aspects of a smart card deployment. The panel specifically noted that an ideal contingency ratio is 15-20 percent. While that information is consistent with staff's original recommendation not to deplete the current project contingency for this procurement, the current contingency is slightly under that ratio. As of December 31, staff projects the current $1 million contingency to represent slightly over 9 percent of the remaining budgeted project expenditures. Although this amount is below the suggested target range, staff has conducted a risk assessment and believes the contingency is acceptable at this stage of deployment. Most of the project contracts are fixed price. Moreover, the project is past the point of needing of new investments that are design driven; manufacturing is ready to commence under existing contracts and currently planned procurements. Staff also recognizes, however, that technology deployments carry cost risks that are difficult to anticipate. Staff is going to continue its analysis of the contingency, along with its Consortium partners, over the next month and will report back to the Committee with any new information. Staff will remain vigilant in managing the budget and protecting the contingency.

As noted, the staff recommendation for the MAR purchase reflects the goal of preserving the project contingency. In lieu of contingency funding, the Transit Coordinating Committee (TCC) in September endorsed a staff proposal to program $800,000 of regional Proposition 1B PTMISEA funds previously identified for RT fleet capital needs.

A subrecipient agreement with RT is required to permit RT to acquire the necessary hardware directly. SACOG already has three active PTMISEA subrecipient agreements with RT for other projects. As with all standard SACOG subrecipient agreements, RT agrees to fully comply with PTMISEA requirements. Procurement for the hardware through RT is expected to provide an efficient method to acquire the hardware, as RT procurement practices, policies and infrastructure are an excellent fit for purchasing these capital assets. A functional based specification will ensure that the procured hardware will meet all the technical requirements of the smart card system.

Approved by:

Mike McKeever
Chief Executive Officer

MM:RM:gg
Attachment

Key Staff: Kirk Trost, Chief Operating Officer & General Counsel, (916) 340-6210)
               Matt Carpenter, Director of Transportation Services, (916) 340-6276
               Robert McCrary, Senior Planner, (916) 340-6238

s:\sacog\board\transportation committee\2012\november\7-cc mar.docx 1300406

Connect Card Peer Review

A peer review of communications technology choices for the Connect Card project was held via teleconference on November 2, 2012. The panel was recruited from mid-sized regions that have or intend to deploy smart card systems. Participants are lead engineers or managers in functions that involve transit technology. Topics included data communications, innovation and evolution in technology, project risks, and project management.

Participants

<table>
<tr><td>Kyle Brimley, Utah Transit Authority</td><td>Evert Palmer, City of Folsom</td></tr>
<tr><td>Gary Galowski, Toronto PRESTO</td><td>Robert Rickman, Denver RTD</td></tr>
<tr><td>A.J. O'Conner, Portland TriMet</td><td>Dave Snyder, Utah Transit Authority</td></tr>
<tr><td>Dan Overgaard, King County METRO (Seattle)</td><td>John Toone, King County METRO (Seattle)</td></tr>
</table>

Summary Findings

1. The mobile access router (MAR) is the superior technology for delivering data communications on transit vehicles. The most prominent advantages over legacy hardware and alternative approaches include:

- MAR is proven technology that delivers consistent and reliable results. <u>Technology changes quickly,</u> and a few years ago this would have been a riskier option, but the market has adapted to the prevalence of this technology and <u>MAR is now considered the preferred approach</u>.

- MAR allows great flexibility and the ability to expand into future applications. New devices and technical application can be seamlessly accommodated with less use of proprietary engineering. Transit vehicles in Utah, Denver, and Seattle all use a MAR with good results. Denver deployed MAR throughout its bus system, and highly recommends this approach as a way to minimize future engineering costs. Portland is currently deploying the MAR onboard their system, in part motivated by plans for future smart card.

- MAR minimizes technology risk because of its inherent ability to multi-task applications and its Ethernet backbone; can handle a number of communications technologies simultaneously.

2. Reassessing technology choices during the lifetime of a project is highly recommended. Information technology is changing rapidly, and reevaluating old recommendations and exploring new options is strongly advised. Ignoring the changing technical landscape can result in outcomes that do not meet the expectations, or result in more expensive post-project fixes. Additionally, projects need flexibility to respond to external changes (political & business environment), the market (newer or cheaper technology) and other unpredictable events that requires adaption. Supportive examples were provided by both King County Metro and Toronto PRESTO.

3. The ideal ratio of financial contingency for a transportation technology project is 15-20 percent. A higher percent can easily be justified, especially if unused funds can be re-programmed. Some degree of "scope creep" is almost inevitable, whether it is due to internal or external factors. Integrating with third party systems always creates increased risk to schedule and budget. Some changes to the project scope may require additional investment but they can also be opportunities to meet or exceed project expectations. Projects experience other financial impacts from non-technical aspects of project implementation, such as legal and marketing efforts.

4. The panel was asked about lessons learned from their own projects. The topics discussed at depth included:

   • An open payments environment will pose significantly greater risks. Hardware must be robust enough to reliably handle real or near-real time communications for electronic transactions. The MAR should be an appropriate technology, but if using other applications, a higher level of functional reliability will be necessary. Security protocols for electronic payment (PCI) are very strict and will require frequent compliance audits, regardless of chosen hardware technology.

   • The Factory Acceptance Testing (FAT) is a critical milestone in a transportation technology project. To the extent possible, the test environment should fully replicate the system conditions and account for volume of transactions. All vendors should participate in the testing so integration and interfaces can be tested, and multiple FATs should be avoided.