

A LINE BUS RAPID TRANSIT POST-IMPLEMENTATION REVIEW

PROGRAM EVALUATION AND AUDIT



November 2017

INTRODUCTION

Background

Between 2011-2012, Metro Transit studied 11 urban corridors with high-ridership bus routes that connect major destinations for implementation of enhanced bus service. Bus rapid transit – or BRT – is a package of transit enhancements like frequent service, train-like features, enhanced stations with more amenities, enhanced security and specialized vehicles that adds up to a faster trip and an improved experience.

Metro Transit's BRT/Small Starts Project Office, in partnership with Bus Operations, Engineering and Facilities (E & F), Revenue Processing, and Information Services (IS) brought this faster transit service called A Line to Snelling Avenue, Ford Parkway, and 46th Street in the cities of Saint Paul, Falcon Heights and Roseville, and Minneapolis. A Line is designed to improve travel speed, increase reliability, enhance the ride and create faster connections. A line buses provide the customers with a more open seating layout with wide back doors. Customers use off-board fare collection tools such as ticket vending machines and fare card validators before they board the bus. A Line connects riders to major shopping destinations, regional parks, and the METRO Green and Blue lines and also provides customers with affordable and premium alternative transportation thus advancing Thrive MSP 2040's desired outcomes of Livability and Prosperity.

Metro Transit used various funding sources to design, build and operate the A Line including two federal, three State, and one regional grants; all totaling to about \$27.5 million. The A Line construction contract is a unit price contract for about \$12 million with a contingency of about \$1.2 million.

The A Line is the region's first arterial BRT (ABRT) line, and opened on June 11, 2016. Metro Transit is planning several additional ABRT lines across the Twin Cities. The next line in the queue is the C Line which will run from Brooklyn Center Transit Center to Downtown Minneapolis and is currently scheduled to begin revenue operations in 2019.

Purpose

The purpose of this audit was to review whether the process to design, build and construct the A Line followed all applicable federal, state, local, and Council requirements. Further, Audit considered Thrive 2040 desired outcomes of Stewardship, Prosperity, Equity, Livability and Sustainability and also Thrive 2040's principles of Integration Collaboration and Accountability while reviewing the A Line project.

Scope

This review covered activities specific to the management of the construction of A Line from planning to completion. The review also covered warranty claim activities.

Methodology

The following methods of inquiry were used to review the processes used to design, build and operate the A Line followed all applicable federal, state, local, and Council requirements, including:

- Interviews with staff from:
 - BRT/Small Starts Project Office.
 - Contracts and Procurement.
 - Metro Transit Finance.
 - Engineering and Facilities (E & F).
 - Information Services (IS).
 - Metro Transit Police Department (MTPD).
- Review of contract documents, procurement files, finance data and invoice approval process. Audit reviewed a stratified random sample of invoices to identify any discrepancies with accounts payable data from PeopleSoft.
- Review of selected construction change orders (COs) for adherence to Council policies, procedures, and processes; and to ensure that COs are properly documented. Sampled COs were reviewed to ensure that the COs:
 - Were within limits prescribed by Council procurement policy.
 - Followed the prescribed review process including review and signature by all relevant managers.
 - Documentation was generated in the eBuilder environment and we reviewed eBuilder for CO documents.
- Review of grant documents and vendor payments.
- Review of warranty information from Bus Operations, E & F, Revenue Processing, and IS.
- Review of maintenance related guidelines and procedures for A Line shelters, including the technology maintenance responsibility matrix.
- Reviewed disadvantage business enterprise (DBE) progress reports.
- Review of lessons learned document from various stakeholders.

Assurances

This audit was conducted in accordance with the Institute of Internal Auditors' International Standards for the Professional Practice of Internal Auditing and the U. S. Government Accountability Office's Government Auditing Standards.

OBSERVATIONS

Metro Transit's use of various funding sources where in accordance with grant agreements.

Audit's review of Metro Transit's use of funding sources for the A Line project found that funds were expended as per the approved grants. In addition, both federal procurement and the Council's procurement policy were followed with regards to the use of the funds.

Summary of Funding Allocation to A Line

Source	Use	Amount
Federal Congestion Mitigation and Air Quality Grant	Buses, technology construction / purchases, fare collection equipment	\$3,709,151
Federal Formula Grant	Nine buses and construction for A- Line and staff time	\$6,060,709
Regional Transit Capital Fund	Engineering, small purchases (signage, trash receptacles, etc.), construction	\$1,695,665
State Trunk Highway Bonds	Construction and shelter purchases – No Design and Salary	\$6,000,000
State General Obligation Bonds	Engineering, construction, shelters, fare collection equipment – No Salary	\$9,000,000
State appropriation (2014 supplemental appropriations bill)	Temporary easements, construction, staff time	\$1,000,000
TOTAL		\$27,465,525

Construction Contract

Procurement and change orders (CO) were completed in accordance with federal, state and council regulations.

There was one construction contract for A Line; contract #14P259 with Global Specialty Contractors (prime contractor) is a unit price contract that is currently in the close-out process. Audit reviewed initial procurement documents and a sampled of 25 out of 39 COs and found that Metro Transit staff adhered to all federal and council policies and procedures regarding the initial procurement and contract modifications.

Contract quantities for multiple bid line items were exceeded

During Audit’s invoice review process of the prime contractor, we identified several bid line items going over the contract quantity starting from invoice #2 and continuing all the way to the last received invoice #14.

Top five bid line items over the contract quantity

Description	Contract Amount	Contract Quantity	Unit Price	Total Quantity Billed	Total Amount Billed	Cost Over	% Cost Over
Excavation Common (31)	\$26,975.00	325	\$83.00	4743	\$393,729.59	\$366,754.59	1459.61%
Common Embankment (32)	\$1,918.00	137	\$14.00	614	\$8,596.00	\$6,678.00	448.18%
Select Granular Embankment (CV) (33)	\$20,160.00	360	\$56.00	878	\$49,168.00	\$29,008.00	243.89%
Aggregate Base Class 5 (36)	\$87,472.00	1988	\$44.00	5061	\$222,704.24	\$135,232.24	254.60%
Concrete Curb Design V6 (80)	\$3,487.50	75	\$46.50	225	\$10,462.50	\$6,975.00	300.00%

Rather than capturing these overages in a timely fashion through the change order process; BRT/Small Starts office staff decided to continue to pay the invoices that included the excessive quantities and adjust the quantities at the end of the project to identify any unit price discrepancy that occurred through the construction of A Line. BRT/Small Starts office is currently working with the prime to execute the final change order which will identify any over/under quantity used in the construction of A Line.

Subcontract Management Deficiencies

The Federal Transit Administrations Best Practices Procurement Manual (the Manual) states the subcontract management is the responsibility of the grantees. The management of subcontracts usually involves three areas:

- Assurance that the prime contractor has included the required “flow-down” provisions (clauses) from the prime contract in the subcontract.
- The prime contractor’s compliance with the disadvantaged business enterprise (DBE) requirements in its prime contract, including compliance with prompt payment requirements.
- Assurance that the prime contractor has selected its critical subcontractors in a prudent fashion so as to protect the recipient’s program interests.

The BRT project office failed to fully meet any of these assurances. As stated in the Manual

“It behooves the recipient, therefore, to exercise diligence in the management and administration of these types of prime contracts with respect to the primes’ selection of its major subcontractors or suppliers. If the cost incurred by the prime is greater than necessary (for example, because of inadequate competition or a poorly negotiated subcontract), it is the recipient that will bear the higher than necessary costs. If the selected subcontractor performs poorly, the recipient will bear the cost of correcting the problems or be put in a position of having to accept a product that is substandard.”

Prime contractor over reported expenditure resulting in a \$149,329 refund.

In December of 2016, a subcontractor (DBE) working on the construction contract for A Line discovered they overreported quantities for certain bid line items and as a result overbilled the Council for \$149,329.32. The sub consultant corrected quantities on a future invoice and issued the Council a refund check in May of 2017.

Over-reported subcontractor bid line items

Description of Work	Amount
Remove Pavement (16)	\$13,700.00
Remove Bituminous Pavement (18)	\$9,500.31
Contaminate Material (30)	\$12,104.10
Granular Embankment (33)	\$49,3388.50
Agg. Base Class 5 (36)	\$48,467.76
15” RCP Sewer (48)	\$7,750.00
Construction Drainage Structure (54)	\$8,468.35
Total	\$149,329.32

Contract Management Issues

Audit identified several contract management issues:

- Incomplete paperwork from both BRT project office staff and the consultant make it challenging to determine what should be paid. Audit found that the three out of four job diaries maintained by BRT/Small Starts office staff lacked critical information including date of the visit, contractor on site, employee job classification, etc. The issue of changing site conditions was raised by the Contractor during a regular check in meeting early in construction, however, incomplete site diaries fail to record estimates in quantity variances. The Contractor billed the Council using truck logs, however these truck logs do not always record the volume of material removed from the site.
- The BRT/Small Starts office staff provided Audit with routing information for the invoice approval process. However, the current invoice approval process wasn't sufficient to detect the overstated work done before it was approved. In this case, the invoices with the overstated work was reviewed and approved by Council staff.
- Audit found that the DBE Progress/Project report for contract 14P259 did not reflect the credit from the subcontractor referenced above. Inaccurate data reported to OEO limits management's capability to verify DBE billings and payments and determination of prompt payments.
- Lack of detailed invoice combined with insufficient verifiable source documents limits management's capability to verify cost billed by the prime contractor. BRT/Small Starts office staff believes that the Council is not privy to any contracts the prime has with subcontractor; invoices between the prime contractor and subcontractor; or verification of payments made from the prime contractor to subcontractor. Invoices provided by the prime to the Council fail to identify costs associated with each of their subcontractors. As mentioned above, the FTA suggests monitoring subcontracts to ensure federal clauses are included, progress toward DBE goals are being met, and payments to subcontractors are within required timeframes.

Project Component Delivery Delays

A subcontractor who was responsible for furnishing the communication and electrical cabinets did not meet the delivery dates. This resulted in IS only having reliable power for approximately two weeks before the opening day. IS was able to get most sites operational either by original design or a work around, however IS was not able to conduct thorough system and reliability testing. As a result, IS was still working out technical issues after the A Line was in operation. A review of the construction contract revealed that a scheduled milestone for the permanent power wasn't established. During the lesson learned process, the BRT/Small Starts office agreed to engage IS earlier in the process and to have more milestones attached to pay applications for future BRT lines. Additionally, IS proposed having permanent power installed at stations 90 days prior to opening day.

Management of External Agreements

One agreement, between Ramsey County and the Council, was for the construction of the BRT station at Ford Parkway and Fairview Avenue. The work was complete within the agreement period but the county invoiced Metro Transit after the agreement expired. As a result, and after consultation with Procurement, a Purchasing Documentation Form (PDF) was completed as the mechanism for payment. A PDF is a process by which an employee gives their justification on why they went outside the current policies and procedure of procurement.

In addition, the total payment on this agreement exceeded the agreement value of \$98,863.64 by \$21,031.14. In the supporting memo attached to the PDF, the BRT/Small Starts Office staff explained that, “soon work began, it was discovered that Ramsey County had omitted communications and electrical conduit from their bid package; as such, the costs to complete this work were not included in the agreement value. The electrical and communications conduit work was required to correctly deliver the A Line stations. These additional activities were agreed to by the council authorized representative (CAR) during construction in order to keep work advancing on schedule.” The Council’s amendment process allows money to be added to a purchase order before the agreement expiration date and thus avoiding cost overruns.

Another agreement with the City of Minneapolis (that was not fully executed) was for the programming and installation of four transit signal priority controllers. According to the BRT/Small Starts office staff, the agreement was in negotiation for months but never executed and eventually cancelled by Procurement. However, the City of Minneapolis performed and completed the work in January of 2016. Costs associated with the agreement (est. \$8,000) have not been invoiced. If the city does invoice for the project costs and the Council decides to pay, BRT/Small Starts office staff will have to complete a PDF, a required form for all purchases completed outside of policy and procedure of Procurement

Warranty Records

Audit found several examples where there have been issues related to maintenance records associated with warranty claims.

E & F and IS

Metro Transit E & F and IS staff reported that there weren’t any warrantable repairs on the various A Line components and technology systems and this was confirmed by BRT/Small Starts office staff.

E & F does not have a written procedure or work instruction to help ensure that a systematic and consistent approach is taken to acquire, and review required warranty claim documentation.

IS maintains its work order log through the LANDesk system. According to IS management, warranty claims are not filed as technology components are covered through the maintenance contract with their vendors.

E & F’s current reporting system is not capable of providing complete data on maintenance work done on shelters. Also, E & F currently does not have a process in place to address warranty claims related to this contract.

Bus Maintenance

There were 13 buses ordered for the A Line launch. Audit reviewed warranty purchase documents for all 13 buses and sampled warranty expiration information for the following information:

- Bus Component
- Model
- Coverage years

- Coverage miles
- Expiration date
- Remaining Miles

Audit reviewed a “Maintenance and Warranty Claimed log report” obtained from the acting director of bus maintenance. All busses come with a 2-year bumper to bumper warranty and were under warranty at the time of this report. Any work order for bus maintenance within two (2) years will trigger a warranty claim. The supervisor for fleet service warranty determines if these automatically generated claims are legitimately warrantable. Audit found two scheduled maintenance service items that were included in the ‘Warranty Claims Logs’.

Ticket Vending Machines (TVM: Parkeon) and Fare Validators (FCV: Cubic)

There were 82 TVMs and 44 FCVs purchased for the A-Line launch. Audit reviewed warranty purchase documents for the TVMs and FCVs. All TVMs have a warranty period of two years from the date of acceptance and all the FCVs have a warranty period of 90 days from the installation of the equipment.

The current logging and reporting system doesn’t allow the user to directly link a warranty claim to a maintenance log line item. This limits management’s capability of verifying the warrantable claims submitted. Revenue Processing is working with Materials Management to solve this problem.

CONCLUSIONS

Overall, BRT/Small Starts office followed applicable federal, state, local, and Council requirements during the process of designing, building and constructing the A Line.

However, audit identified internal control weaknesses with the project offices' process to ensure that contractor invoices were validated against field observations and documentation. The project office has a process with multiple layers of review for invoices, however the invoices did not always include complete supporting documentation to support the quantities billed. This combined with inadequate documentation of Metro Transit observations on-site led to significant differences between expected quantities and claimed quantities for several contract line items. These control weaknesses place additional risk on the Council when working on fast-paced, multi-faceted construction projects like the A-Line.

Audit also identified weaknesses in the processes used by several departments to track and submit claims for warranty for a wide variety of the components used to build the A-Line. Audit reviewed warranty processes for busses, facilities, IT systems and revenue systems, and while the processes to identify and process warranty claims varied, each area could be improved to ensure that warrantable claims are identified and claimed efficiently. On-going monitoring of these claims will become more valued and more complex as arterial BRT lines expand across the region. Metro Transit will need to develop increasingly dynamic processes to match maintenance records against an ever-changing list of current warranties. These processes will necessarily require effective collaboration across departments at Metro Transit and the Metropolitan Council.

Improving the control weaknesses will help Metro Transit better meet the Thrive 2040 principals of:

- Accountability - Including a commitment to monitor and evaluate the effectiveness of our policies and practices toward achieving shared outcomes and a willingness to adjust course to improve performance.
- Integration – Integrating activities to pursue its outcomes, achieve greater efficiencies, and address problems that are too complex for singular approaches.

RECOMMENDATIONS

Program Evaluation and Audit recommendations are categorized according to the level of risk they pose for the Council. The categories are:

- **Essential** – Steps must be taken to avoid the emergence of critical risks to the Council or to add great value to the Council and its programs. Essential recommendations are tracked through the Audit Database and status is reported twice annually to the Council’s Audit Committee.
- **Significant** – Adds value to programs or initiatives of the Council, but is not necessary to avoid major control risks or other critical risk exposures. Significant recommendations are also tracked with status reports to the Council’s Audit Committee.
- **Considerations** – Recommendation would be beneficial, but may be subject to being set aside in favor of higher priority activities for the Council, or may require collaboration with another program area or division. Considerations are not tracked or reported. Their implementation is solely at the hands of management.
- **Verbal Recommendation** – An issue was found that bears mentioning, but is not sufficient to constitute a control risk or other repercussions to warrant inclusion in the written report. Verbal recommendations are documented in the file, but are not tracked or reported regularly.

1. **(Essential) - BRT/Small Starts Project Office should incorporate Metro Transit’s work instructions while developing procedures and work instruction to guide contract management for future BRT lines.** Special attentions should be given to assurance that claimed work was actually completed, invoice review process; roles and responsibilities for documenting field work; guidelines for processing change orders; and subcontractor monitoring by obtaining subcontractor agreements and invoices.

BRT/Small Starts Project Office should implement an internal control to help identify and address stale or outdated contracts or agreements to help prevent latent issues from reappearing at future dates. The control should ensure that the Project Office is able to adhere to the Council’s Procurement Policies and Procedures.

Management Response: *Findings of this review are consistent with internal observations and lessons learned from A Line construction in preparation for future lines’ implementation. Since A Line construction completion in June 2016, many steps and process improvements are in progress, as described below.*

Future projects are planned to be delivered by assigned staff from Engineering & Facilities construction group, working with established work instructions and procedures for construction contract management including change orders. Council staff has requested subcontractor contracts, agreements, invoices, and other documentation from the prime contractor for A Line construction. Project staff will work with Procurement and OEO staff to delineate responsibilities and timing for subcontract verification on future projects. The project office will also take corrective action to upgrade a tracking / monitoring tool to ensure amendments are initiated to extend agreement terms before contracts expire.

Beginning with C Line construction (scheduled for 2018 construction), significant additional project resources are planned for inspection, quality control, quantity measurement, tracking, and reporting on the Council's behalf. Construction administration consultant support has been hired to monitor quantities in accordance with project specifications and to prepare daily and monthly reporting to the CAR to aid invoice review and payment. With these reports, the assigned CAR and project manager will have robust data to validate pay applications prior to approval and payment. The application of eBuilder electronic project management software to the invoice process will provide an additional control on roles and responsibilities related to contractor payment.

In addition, project component delivery has been addressed in the C Line construction specifications. Working with IS staff, the specification requires completion of systems for IS integration 90 days ahead of the contract's revenue service date. Station pay items are tied to progress on systems completion; further, liquidated damages may be assessed on the contractor for failure to meet this and other contract milestones.

Staff Responsible: *Incorporate work instructions – Manager, Construction Services, E&F Roles / Responsibilities for field work – Manager, Arterial BRT Invoice review process – Manager, Arterial BRT Guidelines for processing change orders – Manager, Arterial BRT Subcontractor agreements and invoices – Senior Manager, BRT/Small Starts Agreements – Manager, Arterial BRT*

Timetable: *Procedures to be in place prior to planned January 2018 award of C Line construction contract.*

Thrive 2040 Principles: *Accountability*

2. (Essential) - E&F should develop Warranty Claims procedures and work instructions and maintain adequate documentation supporting warranty claims.

Management Response:

E & F: *Findings of this review are consistent with internal observations and lessons learned from A Line construction in preparation for future lines' implementation, staff will work towards enhancing current procedures and developing new ones to address deficiencies.*

- *Engineering and Facilities (E&F) does have Construction Project Close out Procedures, which provides a compilation of project warranties at the completion of construction. By the end of 2018, E&F will work to create procedures and databases to track all warranted items including materials, equipment, and projects.*
- *E&F's current work order reporting system can provide data on maintenance work to shelters. By mid-2018 E&F (specifically Facilities Maintenance) will work towards assigning a specific work order number to ABRT related projects to improve tracking of warranty claim items.*

Staff Responsible: Create procedures and databases – Engineering and Facilities (E&F)
Enhance work order tracking – Manager, Facilities Maintenance

Timetable: By 2018, E&F will work to create procedures and databases to track all warrantable items including materials, equipment, and projects.

Thrive 2040 Principles: Accountability/ Collaboration

Revenue managers should develop an internal control to verify that warrantable claims are being filed with the vendor and reconciled. Managers should also ensure that a process is in place to distinguish between TVMs and component parts that remain under warranty and those that have expired warranties.

Management Response:

Revenue Processing: Management agrees with the recommendations of the audit team. Warrantable parts are currently logged and reconciled when sent and returned to the vendor but not tracked back to the revenue device (TVM) the part was removed from.

Management will modify logs of each warrantable component by including the device the component was removed from or identified as a spare part if the component was not yet used in a TVM.

Parts from future purchases will be clearly marked to identify parts that are under warranty from the new purchase. All technicians will be aware of the markings to ensure the parts and devices under warranty are repaired or replaced by the vendor.

Staff Responsible:

Supervisor of Revenue Equipment and Repair, Electronic Revenue Equipment parts technician, Department administrative Specialist

Timetable: Full implementation will take effect January 1, 2018

Thrive 2040 Principles: Accountability/ Collaboration



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