Quality Assurance Program Plan

Revision 2, June 2010

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Approved By: [Signature]

Rick Clarke, Assistant General Manager of Capital Programs

Date
# Quality Assurance Program Plan

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1.0 Introduction

1.1 General
The Regional Transportation District of Denver (RTD) is a political sub-division of the State of Colorado, created by an Act of the Colorado General Assembly in 1969 for the purpose of planning, building, and operating a public transportation system. The District serves an area of over 2400 square miles including 38 municipalities in seven counties plus two city/county jurisdictions.

1.2 Scope
Over the next several years, RTD will be adding service to every mode of operations under a comprehensive plan known as FasTracks. The Quality Assurance Program described herein applies to the system expansion projects included within the FasTracks plan. Since planned, systematic actions are necessary to provide confidence that projects will function as specified, this Quality Assurance Program Plan (QAPP) encompasses all technical activities related to the planning, development, acquisition, testing, and start-up of these projects. For a detailed description of FasTracks project, refer to the FasTracks Plan.

The “RTD FasTracks team” is composed of RTD employees and consultants who serve as extensions of RTD staff.

The term “Contractor” is used generically within this document to refer to planning and design consultants, construction contractors, materials suppliers, design-builders, and the Concessionaire team that deliver work to the FasTracks program. This document applies internally to the RTD FasTracks team, as well as to Contractors. This plan will be included as a reference document in FasTracks program contracts. Contractors will be required to develop and submit Quality Management Plans for their work on the FasTracks program, consistent with this QAPP. Contractor specific requirements will be indicated herein by shaded text within a box as follows:

Contractors shall describe the scope of the project to which they’ve been assigned within their Quality Management Plans.

2.0 Normative Reference
This Quality Assurance Program Plan is based on ANSI/ISO/ASQ Q9001:2008, Quality Management Systems — Requirements; and U.S. Department of Transportation FTA-IT-90-5001-02.1, Quality Assurance and Quality Control Guidelines.

In addition to this Quality Assurance Program Plan, and ANSI/ISO/ASQ Q9001:2008, contractors shall reference their contract number and any additional references that are applicable within their Quality Management Plans.
3.0 Terms and Definitions

AAR – Association of American Railroads
AASHTO – American Association of State Highway and Transportation Officials
ACI – American Concrete Institute
AISC – American Institute of Steel Construction
AREMA – American Railway Engineering and Maintenance-of-Way Association
As-Built – Documented data or drawings that describe the final product
ASTM – American Society of Testing and Materials
AWS – American Welding Society
CADD – Computer Aided Drafting and Design
CAR – Corrective Action Request
CDOT – Colorado Department of Transportation
Constructability Review – An analysis to confirm that a project can be properly constructed or installed.
Contractor – A generic term used within this document to refer to planning and design consultants, construction contractors, materials suppliers, design-builders and the Concessionaire team that deliver work to FasTracks.
DBE – Disadvantaged Business Enterprise
Due diligence – The effective demonstration to others that the expected level of care and attention has been applied.
FERG - FasTracks Environmental Resource Group
FTA – Federal Transit Administration
IEEE – Institute of Electrical and Electronics Engineers
IGA – Intergovernmental Agreement
ILA – Interlocal Agreement
ISO – International Organization for Standardization
MIS – Major Investment Study
MOU – Memorandum of Understanding
NEPA – National Environmental Policy Act
Nonconformance/Noncompliance – Non-fulfillment of a requirement. NOTE: these terms are used interchangeably within this document.
OVT – Owners Verification Testing. Materials testing by an independent laboratory to verify results.
PCI – Precast/Prestressed Concrete Institute
PMC – Project Management Consultant (an extension of RTD staff)
PMOC – Project Management Oversight Consultant (oversight for FTA)
PMP – Project Management Plan, Program Management Plan
QAPP – Quality Assurance Program Plan
QMC – Quality Management Consultant (an extension of RTD staff)
QMP - Quality Management Plan
Quality Assurance (QA) – All of the planned and systematic activities implemented within the quality system, and demonstrated as needed, to provide adequate confidence that the product will fulfill quality requirements and will satisfy given needs. QA is a management tool.
Quality Control (QC) – Operational techniques and activities that are used to fulfill a set of quantitatively or qualitatively stated requirements; implementation of the quality plan.
Quality Management Oversight (QMO) – All of the systematic activities used to verify a contractor’s implementation of management plans, and delivery of compliant Work.
RFP – Request for Proposal
Quality Assurance Program Plan

RTD – Regional Transportation District
RTD FasTracks Team – The management team which includes RTD employees and consultants serving as extensions to RTD staff, which oversee the RTD FasTracks program.
U.S. DOT – United States Department of Transportation
WBS – Work Breakdown Structure

Contractors shall define any additional specific terms and definitions used within their Quality Management Plans.

4.0 Quality Management System

4.1 General Requirements
Satisfying the need for safe, efficient, cost-effective transportation services through the utilization of complex systems requires the implementation of a pro-active, systematic, authoritative quality assurance program. Early identification of conditions that affect the ability of these systems to perform satisfactorily, and timely corrective actions, are necessary to preclude problems.

4.2 Documentation Requirements

4.2.1 General
RTD’s quality management system meets or exceeds U.S. DOT guidelines. Since it is internationally recognized as a quality standard, ISO 9001:2008 Quality Management Systems - Requirements has been selected as a primary reference in developing this QAPP.

4.2.2 Quality Manual
RTD’s quality management system provides a link between international, federal, state, and local quality standards; and contractor quality plans. This link consists of a hierarchal system of documented procedures, starting with this QAPP as the top-level document.
Quality Assurance Program Plan

Additional procedures are added as necessary as the program evolves through continuous improvement, but RTD’s primary quality procedures documents are:

- RTD FasTracks Quality Oversight Program Manual (best-value contracts)
- RTD Construction Procedures Manual (low-bid contracts)
- RTD Owner’s Verification Testing (OVT) Program Manual

Primary Contractors shall submit Quality Management Plans (QMPs) for RTD approval, based on requirements of the respective contracts and this QAPP. Contractor plans shall clearly state that the provisions within the plan will flow down to its subcontractors.

For Environmental Services/Basic Engineering contracts, the QMP shall describe all quality management activities involved in delivery of the Environmental Studies (FEIS/EA/EE) and the Basic or Preliminary Engineering plans.

For Final Design contracts, the QMP shall describe all other quality management activities involved in delivering Final Design plans and specifications.

For CM/GC or Construction contracts, the QMP shall describe all quality management activities involved in materials procurement, fabrication, erection, and construction of the project elements.

For direct Procurements, the QMP shall describe all quality management activities involved in product design, manufacturing, fabrication, delivery, and commissioning.

For Design/Build contracts, the QMP shall describe all quality management activities involved in both design and construction of the project.
For Design/Build/Finance/Operate/Maintain contracts, the Concessionaire shall prepare separate QMPs for the Design/Build phase and the Operations/Maintenance phase which will be reviewed and approved separately by RTD.

4.2.3 Control of documents
RTD staff will comply with RTD's Document Control Procedures, which are included in the RTD FasTracks Project Controls Procedures manual. These procedures describe the filing system and archival requirements for project documents and data.

Documents and data shall undergo a review, and shall be approved by authorized management personnel prior to release, in accordance with the Document Control Procedures. Document Control will establish and maintain a database of all controlled documents for use in revision and distribution tracking. Further control measures will ensure that:
- a) appropriate documents are available to those performing the work
- b) obsolete documents are either removed, or marked accordingly, to safeguard against unintended use
- c) obsolete documents retained for legal purposes are identified accordingly, and filed as per the Document Control Procedures.

All incoming and outgoing correspondence will be filed in accordance with the Document Control Procedures. This system will ensure that project documents are secured, maintained, and readily retrievable for use when needed.

Changes to all controlled documents will be reviewed and approved by the same functions/personnel that approved the original document. Designated functions/personnel will have access to pertinent background information, on which to base their review and approval. Where practical, changes will be identified within the document. For more information, refer to RTD’s Document Control Procedures.

Contractors shall describe their own document control procedures within their quality plans, based on requirements from their respective contracts.

4.2.4 Control of records
Typical quality records include:
- Audit reports and audit finding reports
- Certificates of compliance
- Certifications (process, personnel, and material)
- Change orders
- Contract specifications
- Contractor submittals
- Corrective action requests
- Cost estimates
- Diaries
- Design procedures and manuals
- Design criteria
- Design review reports
RTD’s Design Review/Audit/Inspection results will be stored in a database, accessible through the internet. The output of RTD quality oversight activities will consist of formal reports that are captured in RTD Document Control, and transmitted to the appropriate contractor for action.

Quality records may be generated by the Contractor or RTD. These records will be collected, stored, and preserved in a manner which precludes damage, loss, or deterioration; in accordance with storage requirements defined in the various contracts and specifications.

Changes made to quality records must receive the same level of review and approval as the original document. Quality records are valid only if approved as required by authorized personnel.

Contractors/suppliers shall safeguard quality records during design, construction, assembly, installation, and testing. Quality records shall be submitted to RTD for review and archival in accordance with the Contract submittal requirements.

Contractors shall maintain quality records that are readily retrievable. At all times throughout the contract, quality records shall be available upon request, and may be subject to review by RTD quality assurance auditors.

5.0 Management Responsibility

5.1 Management Commitment

Executive management has demonstrated its commitment to the project by setting the goals outlined in paragraph 5.4.1. Executive level commitment is further demonstrated through establishment of the Executive Oversight Committee. Development of a quality management system is mandatory, with agreement to meet or exceed U.S. DOT guidelines. RTD’s Assistant General Manager for Capital Programs, who will oversee the FasTracks program, has established a departmental quality philosophy posted at the front of this Plan.

Contractor Quality Management Plans shall be endorsed by their Quality Assurance Manager, Project Manager, and Principle in Charge to provide evidence of their management commitment.
5.2 Customer Focus
RTD’s executive management will ensure that customer needs and expectations, as determined during the Planning/Major Investment Studies and Environmental Studies, will be continually addressed throughout the program. Environmental Studies result in locally preferred alternatives for development of new transportation infrastructure, and are developed with considerable public input. As such, these documents define RTD’s customer requirements, and form the basis for design and construction.

RTD has a dedicated Public Information and Involvement team that continually addresses customer concerns, and provides outreach to the various business, community, government, and media interests represented within the region. Additionally, RTD has sought partnerships with community groups to help ensure that program diversity goals are met.

Ultimately, as a public entity, RTD is responsible for improving the quality of life for all stakeholders within its service area. To that end, RTD will measure and report its impacts through “before and after studies” using the FTA criteria and other established metrics. Specifically, upon introduction of new transportation services, RTD will monitor its effect on:

- Mobility Improvements
- Environmental Benefits
- Operating Efficiencies
- Cost Effectiveness
- Transit Supportive Land Use and Future Patterns, and Other Related Economic Impacts

Contractors shall support RTD’s Strategic Public Information and Involvement Plan, as required by the provisions of their contract. Contractors may be required to provide a public information function for their respective project.

5.3 Quality Policy

RTD has established a quality policy for delivery of FasTracks. The following is an extract of that policy, originally approved on March 1, 2005:

Public Responsibility and Citizenship
Quality Assurance Program Plan

The FasTracks Team will contribute to achievement of RTD’s organizational mission statement by delivering safe, clean, reliable, accessible, and cost-effective transportation services that promote improved quality of life within the region. As such, we will continuously measure our impact on the community to ensure that our project is achieving the positive effects that our stakeholders desire.

Building Quality In

Within RTD, introduction of new transportation infrastructure is achieved largely through procurement of outside products and services such as design, construction, and manufacturing. It is my belief that a quality product must be built in, rather than inspected in. Therefore, we will require that each of our contractors and consultants charged with delivering products and services to RTD, will implement effective and comprehensive quality management programs. Such programs will be implemented and managed with adequate quality assurance staffing, commensurate with the complexity of the product being delivered.

Management by Fact

The FasTracks Team will strive to achieve objective, requirements-based assessments of processes and products, in order to provide feedback to our contractors, promote continuous improvement, and provide RTD with adequate confidence in the products being delivered. To the extent possible, the FasTracks Team will utilize information management tools that allow staff to capture and globally analyze these assessments, in order to make the best decisions possible relating to product acceptance.

Process Management

Although not directly involved in product delivery, the FasTracks Team has a role in attaining a quality product. Therefore, the FasTracks Team will identify its own key processes, and periodically assess its performance in these areas in order to achieve continuous improvement internally.

Contractors shall include their corporate or project quality policy within their Quality Management Plans.

5.4 Planning

5.4.1 Program Goals

RTD’s executive management and Board of Directors have established the following core goals for FasTracks, as endorsed within the FasTracks Plan:

- Provide improved transportation choices and options to the citizens of the District
- Increase transit mode share during peak travel times
- Establish a proactive plan that balances transit needs with future regional growth

RTD will report progress towards these goals and annually in the Quality of Life report.

In addition to the Board goals, in 2010 the RTD Senior Management Team established its own goals for managing the program:
Quality Assurance Program Plan

- Deliver the current scope in the most cost effective way
- Provide positive benefit to the community
- Build trust, unity and collaboration and maximize internal and external communication
- Build a safe, high-quality system

RTD has established specific goals for the Quality Oversight Program. These goals are included in the RTD FasTracks Quality Management Oversight Program Manual.

Contractors shall describe their own project and quality goals within their Quality Management Plans.

5.4.2 Quality Management System Planning

Each project, under the FasTracks program, will be managed in accordance with the RTD FasTracks Program Management Plan (PMP). The PMP, along with this QAPP and other program plans will define the approaches and processes RTD will use to ensure project delivery. Additionally, specific Project Management Plans may be developed at the corridor/project level.

All requests for proposals (RFPs) will include quality control/quality assurance requirements applicable to that particular project. Contractors shall develop quality plans based on RTD’s requirements. These plans shall be submitted to RTD for review and approval prior to beginning work on that project. Additional requirements will be based on the scope of work, and may include industry standards such as IEEE, PCI, ASTM, etc. In the event that a primary contractor subcontracts all or any portion of the work, accountability for the quality program remains with the primary contractor.

5.5 Responsibility, Authority and Communication

5.5.1 Responsibility and authority

The General Manager provides general guidance and executive level commitment to the RTD FasTracks program management team.

The Assistant General Manager for Capital Programs has overall responsibility for implementing FasTracks program to achieve schedule and budget.

The Deputy Assistant General Manager of Capital Programs is the RTD senior representative responsible for the overall implementation of all planning, design and construction work for the capital projects comprised within the FasTracks program.

Day-to-day direction of individual FasTracks corridors and projects is provided by experienced project managers who share overall responsibility for ensuring program quality requirements are met. Refer to the RTD FasTracks Program Management Plan for further description of Project Manager responsibility and appointments.

FTA Quality Assurance and Quality Control Guidelines recommend that “…the Director of Quality Assurance should report to the manager responsible for implementation of the capital projects.” Therefore, within the RTD FasTracks program, the Director of Quality Assurance reports to the Deputy Assistant General Manager of Capital Programs. In addition to
quality assurance program plan

Responsibility for administration of the overall quality management program; the Director of Quality Assurance is delegated the authority and provided complete organizational freedom to investigate quality-related activities in all areas of the FasTracks program; and to identify, evaluate, and ensure resolution of quality problems. The Director of Quality Assurance’s responsibilities include, but are not limited to:

- Reviewing RTD contracts for appropriate QA/QC program requirements
- Reviewing and approving contractor Quality Management Plans
- Providing coordination of the quality auditing program within FasTracks
- Identifying quality trends and issues to management
- Monitoring contractor quality assurance and quality control programs
- Conducting quality audits as needed
- Developing quality programs and procedures
- Interfacing with FTA and PMOC officials on quality issues
- Interfacing with contractor QA/QC staff to resolve quality program issues
- Interfacing with RTD project managers on quality issues
- Overseeing the RTD Quality Management Consultant contract

Quality Oversight Managers will be assigned at the project level to support project managers and construction managers in implementing the QMO Program, provide liaison with contractor QA managers, monitor materials testing and verification programs, and assist inspectors in planning verification inspections.

The remainder of the FasTracks program management team will be composed of RTD and other consultant personnel with specific technical specialties. CDOT will provide liaison personnel for coordination of joint agency issues. Also, individual city and county liaisons will provide coordination to the RTD FasTracks program management team to help ensure local interests are addressed along the corridors. Every member of the FasTracks program management team will perform a quality oversight role for their specific function(s). See Exhibit 1 for the FasTracks quality management organization chart.

Contractors will have primary responsibility for both quality control and quality assurance. The contractor, who has primary responsibility for day-to-day project implementation of planning, design, construction, testing, etc. has the greatest impact on overall quality within the scope of their work. Assigning the responsibility for quality assurance to the individual contractors emphasizes that the contractor is not only responsible for meeting the contract requirements, but also for taking measures to provide confidence to RTD that the requirements have been met.
Contractors, sub-contractors, and suppliers shall be structured in such a manner that:

- quality is achieved and maintained by those responsible for performance of the work.
- quality achievement is verified by persons or organizations not directly responsible for performance of the work.

The structure for any organization performing work on FasTracks is that organization's responsibility, within the limits of this Plan, and subject to approval by RTD. The organizations responsible for quality assurance shall have sufficient authority, access to work areas, and organizational freedom to: identify quality problems; verify implementation of solutions; and assure that further processing, delivery or installation is controlled until proper disposition of a deficiency, non-conformance, or unsatisfactory condition has occurred. Those functions that perform quality verification shall report to a level of management that provides sufficient authority and organizational freedom to ensure that appropriate action is taken to resolve conditions adverse to quality.

Contractors shall describe their organizational reporting structure within their quality management plans, clearly defining the relationship between the Project Manager, the Quality Manager, and other key managers. In addition, contractors shall describe the responsibilities and authorities of these managers as it relates to product quality.

Although certain QA/QC responsibilities may be assigned to subcontractors, overall QA/QC accountability remains with the prime contractor.

5.5.2 Management representative
The Director of Quality Assurance shall serve as the management representative for external and internal quality-related interfaces.

Contractor Quality Management Plans shall identify the quality manager serving as the management representative for all quality related matters.

5.5.3 Internal communication
RTD will make maximum use of its internet and intranet tools to communicate vital information both internally and externally. All team members will have access to the web site, as well as email and telephone/voice mail. Formal and informal meetings will be used to coordinate various activities and assist in the decision making process. Communication will be facilitated throughout the project by co-locating members of the FasTracks project management team from the various entities involved. The RTD FasTracks team will utilize a Partnering approach to resolve issues at the lowest possible level.

Contractors shall describe their internal communication protocols within their Quality Management Plans. Specifically, contractors shall address how information is shared between the production and quality assurance functions.
5.6 Management Review

5.6.1 General
The adequacy and effectiveness of quality programs shall be regularly and formally assessed by the management of the respective organizations. Within RTD, the Director of Quality Assurance will schedule quarterly quality management reviews with the RTD FasTracks senior management team. NOTE: Refer to the RTD FasTracks Program Management Plan for a description of the senior management team.

These quarterly reviews will provide a forum for FasTracks managers to review the quality program with respect to the established goals, and develop action plans for improvement if necessary.

The RTD Director of Quality Assurance is responsible for the maintenance and updating of this Quality Assurance Program Plan as needed. This document will be reviewed annually, as a minimum, to determine if changes are necessary.

Contractors shall describe within their Quality Management Plans the process by which their quality program results are reviewed by management, how action plans are generated and tracked, and how often this occurs. In addition, Contractors shall describe how the QMP is reviewed and updated. NOTE: Revisions shall be submitted to RTD for approval.

5.6.2 Review input
Management reviews will take into account results of measurement, analysis, and improvement processes (see section 8).

5.6.3 Review output
The output of quarterly quality management reviews will be minutes of the meeting, and improvement action plans.

The output of the annual quality plan review will be revisions to this QAPP, and possibly individual PMPs as well.

6.0 Resource Management

6.1 Provision of Resources
The Assistant General Manager, in consultation with the Director of Quality Assurance and Program Controls Manager, shall identify resource requirements needed for implementation of the Quality Management Program and review annually. This effort will include consultant work plans.

Contractors are responsible for addressing their own resource needs based on requirements within their respective contracts. Adequate resources for quality assurance/quality control activities shall be budgeted for each project, and included in the contractor’s bid.

6.2 Human Resources

6.2.1 General
RTD will select the best-qualified candidates based on the skills needed for each position.

Assignment of key personnel to the contractors’ staffs shall be subject to approval by RTD.
6.2.2 Competence, awareness, and training
Because RTD will be serving primarily in an oversight capacity, each team member will undergo training on quality assurance and auditing. Other specialized training will be conducted as needs are identified. Training needed to maintain professional certifications and credentials shall be evaluated and approved in accordance with RTD policies.

RTD will prescribe certain qualifications for contractor personnel within the terms of the respective contract. Personnel qualifications may also be included as a basis for best-value selection of contractors.

Resumes for QA staff shall be included within the contractor's quality management plans, as well as qualifications for personnel who check the work of others.

Contractors shall describe their methods for providing and documenting training on project QA procedures and standards for all personnel assigned to the project (including sub-contractors).

6.3 Infrastructure
Infrastructure requirements will be detailed within the various contracts, to be provided by the contractors, for both the RTD project/corridor teams and the contractor's staff. RTD FasTracks team members not assigned to a specific project or corridor will be centrally based where they can best provide expertise to the overall program.

6.4 Work Environment
The work environment shall be conducive to positive two-way communication between contractors and RTD; and within the RTD FasTracks team itself. It shall be designed in such a way as to allow the RTD team to exercise due diligence in overseeing the work of the contractors. Specific requirements will be included within the contract requirements, to be provided by the contractors. To the extent possible, co-location will be utilized to facilitate effective communication. The Partnering program will be used to measure the effectiveness of communications and cooperation within the teams, and to resolve issues.

7.0 Product Realization
7.1 Planning of Product Realization

Contractors will submit a detailed schedule of activities required to meet contractual requirements, as described within their respective contract.

7.2 Customer Related Processes
7.2.1 Determination of requirements related to the product
Customer requirements are identified during the EIS/EA/EE process, in which a locally preferred alternative is selected from various options. Public input is actively sought through public hearings, announcements, and comment opportunities throughout the study. Additionally, customers are encouraged to express their wishes through elected representatives governing RTD.

Contractors shall describe within their Quality Management Plans how RTD requirements are determined, reviewed, and translated into verifiable product attributes.
7.2.2 Review of requirements related to the product
Following each Planning Study or MIS, customer requirements are converted into service characteristics during the Preliminary Engineering and NEPA study process. This phase results in a preliminary design of the product; and documents the results of Alternatives Analysis, project impacts/mitigation measures, and the NEPA decision document. It is typically followed by the final design phase. Customer and community input is continually sought throughout design and construction. Dedicated staff will interface with the community through a variety of forums.

7.2.3 Customer communication
The FasTracks program management team includes a Public Information section that will focus on outreach programs aimed at four key areas:

- Community Relations
- Business Relations
- Media Relations
- Government Relations

Communication will be conducted through the project web-site, media articles, and project identity/outreach campaigns. Planning and design contractors may have public communication requirements defined within their respective scopes of work.

Construction contractors may be required to have a public information function focused on day-to-day coping with the public. In these cases, specific requirements will be detailed in the contract scope of work.

Additionally, the customer will continue to have access to traditional communication means such as telephone hot lines, public hearings, board meetings, elected official representation, a Citizens Advisory Committee, etc.

7.3 Design and Development
7.3.1 Design and development planning
Internal design and quality control will be accomplished in accordance with the RTD Engineering Design Guidelines manual. However, for most project design work RTD will solicit the services of planning and engineering contractors. Specific corridor requirements, and general RTD requirements, will be stated in the contract scope of work.

Planning and design contractors shall submit a Quality Management Plan (QMP) following Notice to Proceed (NTP). This document is subject to approval by RTD. The QMP is a detailed document which specifies planning and design procedures, documentation and forms. At a minimum, it shall address:

- Quality policy
- Quality planning
- Quality management
- Quality system procedures
Records to provide objective evidence that the system is being followed (including plan review comments)

Instructions at the job or task level

Planning or Design reviews

Contractors shall prepare written procedures consistent with the requirements of the contract and the QMP, and effectively implement the quality system and its documented procedures. At a minimum, the procedures shall include:

- Procedures for preparation, control, and distribution of the QMP
- Procedures for executive management review of the QMP
- Procedures to control and verify the design, including provisions for configuration management activities to be performed by the contractor
- Procedures for document issuance, approval and revision (Document Control)
- Procedures for the identification and, where required by contract, the traceability of deliverable items such as plan reports, NEPA documentation, drawings, specifications and design inputs
- Procedures for verification and validation of the product
- Procedures for control of nonconforming product
- Procedures for corrective/preventive actions
- Procedures for verification and control of computer programs and spreadsheets used in design
- Training processes
- Procedures for internal quality audits

7.3.2 Design & development inputs

RTD and CDOT (as applicable) design criteria will consist of written guidelines and directives. Design criteria, while not a Code, will conform to jurisdictional codes, and provide guidance and standards where existing codes are lacking. Additionally, design criteria shall also consider applicable industry standards and specifications (AAR, AASHTO, AREMA, ASTM, AISC, ACI, ASCE, AWS, PCI, IEEE, etc.) Further input will result from the design review process, and the solicitation process.

Contractors will identify design input requirements relating to the product, including applicable statutory and regulatory requirements. Additionally, design contractors shall perform ongoing adequacy reviews of the selected regulatory requirements. Contractors shall resolve incomplete, ambiguous, or conflicting requirements with the applicable entity. Contractor shall take the following steps:

- Identify what information is needed and the available sources for information
- Review all pertinent available data
Quality Assurance Program Plan

- Ensure there is sufficient information to carry out the assignment
- Where pertinent, resolve any actual or apparent conflicts with RTD, planning and NEPA commitments, and/or other appropriate authorities

The information, sources, and decisions taken shall be documented and treated as quality records, with copies provided to RTD.

7.3.3 Design & development outputs

Design contractors shall provide high quality engineering documents in accordance with published design criteria, and good engineering practices. Design output documents may be reviewed for compliance with contractual requirements by RTD, and shall be sealed by a licensed Engineer or Architect as required by Colorado state laws. The design should be cross-referenced to design input requirements to demonstrate completion of the requirement.

The contractor’s design output should be documented and expressed in terms that can be verified and validated. Design output should:

- Be in full accord with the design output requirements
- Delineate acceptance criteria
- Delineate the design characteristics crucial to the safe and proper functioning of the product (i.e., operating, storage, handling, maintenance, and disposal requirements).

The control of all design documentation outputs, including drawings, reports, and specifications, shall be an integral part of the design contractor’s document control process.

7.3.4 Design and development review

Design contractors will be used for preliminary and final design of the system.

Design reviews shall be included in the contractors’ QMPs, and shall be conducted by the contractor with RTD and local agency participation at specified milestones. They shall conduct their own internal reviews, prior to submitting a design product to RTD. Internal reviews and RTD milestone reviews shall be described in the QMP.

RTD will record the results of its design reviews in the Quality Management Oversight (QMO) database. Refer to the Quality Management Oversight Program Manual, procedure QMO-P4, Design Review, for additional information.

Specific requirements for design review will be included in the contract scope of work, and documented in the design contractor’s QMP; but examples of various types of design reviews include:

- Design Initiation: A formal and scheduled meeting between the contractor and RTD to review design status, including any changes to the Basic Configuration of the project. There will be no formal design submittal concurrent with the design initiation meeting. Meeting minutes will be kept by the contractor and a copy submitted to RTD.
- Design Progress Meetings: Scheduled design (by discipline) coordination meetings shall
be held by the contractor, with RTD representatives present to discuss design related critical issues that arise. Meeting minutes will be formally submitted to RTD.

- Released for Construction: In the case of design-build type contracts, allows the contractor to initiate construction prior to final design acceptance by RTD. Such documents will be available to RTD.

- Design Submittal: All elements within the design documents shall be complete to the level expected for that submittal, including resolution of prior review/audit comments. RTD will not accept the design until the contractor has addressed, resolved, and incorporated all review comments. The formal design submittal shall include all design plans, calculations, reports, specifications, estimated quantities, and electronic CADD files specified in the contract. A set of check prints shall be developed for formal design submittals to demonstrate that every design feature on each drawing has been checked for completeness, correctness, coordination, and compliance with applicable laws and specifications. As a QC measure, all work will be checked by someone other than the individual who performed the work, but with equivalent qualifications.

- As-Builts: Will be submitted to RTD for review to ensure completion and compliance with the contract requirements prior to final acceptance.

7.3.5 Design and development verification
Design reviews, checks, alternate calculations, performance tests, and other means used to verify the design prior to issue should be performed and documented by personnel other than those who originated the design, but with similar qualifications.

This approach, based on independent verification, will be included in quality plans of contractors performing design work. Formal documented design reviews will be planned and conducted by the design contractor. Attendees will include representatives from all technical functions, as well as RTD. The contractor will maintain records of such reviews. Copies of the meeting minutes will be formally submitted to RTD.

RTD will also perform periodic verification reviews at specified milestones to ensure that the contractor’s design meets contractual requirements. Refer to Quality Management Oversight Program Manual, QMO-P4, Design Review for additional information.

7.3.6 Design and development validation
Peer reviews, simulations, Constructability Reviews and other methods of validation should be considered by the design contractor when developing quality plans. Validation efforts may be integrated within planned design reviews. Other aspects of the design to be analyzed during design reviews include usability, reliability, maintainability, availability of materials, operability, safety, cost, aesthetics, and sociological factors. Any computer software used to perform design calculations must be validated before use, and the validation documentation maintained with the quality records. RTD project managers may supplement the review staff, as needed, with representatives from operations and maintenance.

Design contractors shall describe methods of design and development validation within their quality management plans.
7.3.7 Control of design and development changes

Design changes should be checked, coordinated, documented, and reviewed to the same level as the original design. Superseded design documents should be marked and retained for information only. Design contractors will establish procedures within quality plans, describing how design changes will be initiated, reviewed, approved, implemented and recorded in order to maintain configuration control. Such changes may originate from RTD, the designer, site or field personnel (in the case of design-build), regulatory agencies, or community inputs.

Personnel authorized to approve changes will be identified in the quality plan. Also, the contractor will maintain a master list of currently accepted design changes. If post-design changes are required, these changes shall be communicated to RTD and the construction site on a timely basis. Construction staff will not perform work without the incorporation of all approved design changes.

Design contractors shall describe methods of design and development change control within their quality management plans.

7.4 Purchasing

7.4.1 Purchasing process

Numerous regulatory and administrative controls at the federal, state, and local level govern RTD procurement practices. In addition, the General Manager of RTD issues Administrative Policies/Procedures which impact the procurement process. The overall procurement process for RTD generally has three distinct phases:

- pre-solicitation – Request for Proposal
- solicitation-award – evaluation of proposals, selection of contractor, notice to proceed
- post award – contractor management and oversight

The selection process for RTD contracts varies. Design contracts will typically be qualification based; and construction contracts will typically be based on lowest bid. Many professional service and procurement type contracts will be based on a "best value" determination. For best value determinations, an initial evaluation is conducted, on a pass/fail basis, to determine responsiveness (the degree to which the proposal addresses the RFP requirements) and responsibility (the degree to which the proposer is resourced for meeting the RFP requirements). Non-responsive and/or non-responsible proposals are rejected. In certain cases, RTD reserves the right to proceed directly with discussions with the proposers, followed by a request for Best and Final Offer (BAFO), or cancel the solicitation. However, in most cases RTD will proceed with performance of an integrated assessment of price and technical factors, with the highest ranked proposal considered as the best value. For additional information, refer to the RTD Procurement Standards Manual.

7.4.2 Purchasing information

RFPs will include Instructions to Proposers which detail how the proposal packages are to be assembled, and how the evaluation will take place. Additional documentation which may be included in the RFP includes copies of the:

- Certification Requirements
- Technical Specifications (including QA/QC program, safety program, personnel qualifications, etc.)
7.4.3 Verification of purchased product
RTD shall implement appropriate compliance auditing and/or inspection systems that provide adequate confidence throughout the duration of the contracts to verify that contractual requirements are met, including those related to quality control and quality assurance.

As a recipient of Federal funds, certain projects within the FasTracks program are subject to oversight by the Federal Transit Administration (FTA). Representatives of the FTA (to include the PMOC) shall have the right to carry out verification of RTD’s quality oversight activities on location within the corridors, or at any of the supplier locations for which Federal funds have been used. Such audits shall not be used by RTD as a substitute for its own quality oversight activities; nor shall they preclude subsequent rejection by the FTA.

7.5 Product and Service Provision

7.5.1 Control of production and service provision

Contractors will submit, for RTD approval, a Quality Management Plan (QMP) for the execution of the work and maintenance of the product. The QMP shall describe the contractor’s plan for both QA and QC of its work.

The approved QMP shall be extended through sub-contract agreements to any sub-contractors performing work on behalf of the prime contractor; or the contractor shall make provisions to approve an equivalent sub-contractor quality program. In either case, the prime contractor is responsible for monitoring sub-contractor quality assurance/quality control activities.

Contractors must obtain RTD acceptance of work-related submittals (plans, procedures, reports, shop drawings, etc.) in accordance with the Submittals section of their respective contract.

Contractors shall provide inspection of their work in accordance with the approved QMP. Inspection of critical work that will be hidden by subsequent construction/installation activities will be documented by contractor quality control staff.

Prior to beginning any definable segment of construction/installation work, contractor's will conduct a preparatory meeting to review contract requirements, approved shop drawings, and other submittal data; and to provide assurance that required quality control testing will be provided, materials and equipment conform to approved shop drawings and submittal data, and all required preliminary work has been completed. These meetings should include a member of the RTD staff, a member of the contractor's Quality Control staff assigned to inspect the work, the supervisor in charge of the work, and the individual responsible for accomplishing the work.

7.5.2 Validation of processes for production and service provision

Special processes must be controlled and accomplished by qualified personnel using approved procedures and/or instructions in accordance with applicable codes, standards or specifications, and contractual requirements. Records of procedure and personnel qualification/certification shall be maintained in project files.
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When special processes are in use, Quality Assurance personnel will verify personnel qualifications and the use of approved procedures through personal witness, and through review and audit of documentation. Records of verification will be maintained in the project files.

Contractors shall identify special processes within the test plan portion of their QMP. Controls, such as hold points, shall be identified in the test plan.

7.5.3 Identification and traceability

Contractors will establish and maintain documented procedures for identifying and controlling products delivered for use in construction/installation. Quality Management Plans shall describe traceability procedures for materials, parts, equipment, and services important to the function of safety related systems and subsystems. Instructions relating to testing and inspection shall include requirements to verify and record the identification of items, and for tracking test/retest status.

Surveillance and inspection personnel should verify and document that items are as identified in applicable certifications, approved shop drawings, and reports (qualification and functional test reports, data reports, nondestructive examination reports, etc.). Additionally, all correspondence between RTD and the contractor will be traceable to the contract number.

7.5.4 Customer property

Due to the nature of the project, RTD typically would not receive customer-supplied product. However, the possibility exists that RTD may find it necessary to enter into Intergovernmental Agreements (IGA), Interlocal Agreements (ILA), or Memorandums of Understanding (MOU) in order to obtain easements for work on state, county, city, or privately-owned property adjacent to the project. Such arrangements, to include access control and maintenance of this property, will be clearly defined within the IGA/ILA/MOU, and passed on to the construction contractor.

Contractor quality management plans shall describe controls used to protect RTD property while in their possession.

7.5.5 Preservation of product

Construction contractors will establish and maintain written procedures for handling, storage, packaging and delivery of materials, equipment, and other elements of the work.

The contractor will provide methods and means for handling and storage areas or stock rooms that prevent damage or deterioration of materials, equipment and other elements of the work pending delivery, use, or incorporation into the work. Appropriate methods for authorizing receipt and the release to and from such areas should be stipulated in the QMP.

The condition of materials, equipment and other elements of the work in storage should be assessed at regular and appropriate intervals. The contractor shall control packaging, preservation and marking processes (including materials used) to the extent necessary to ensure conformance with applicable requirements. Identification, preservation, and segregation of materials, equipment and other elements of the work will extend from the time of final source inspection or receipt, until incorporation into the work.
7.5.6 Control of monitoring and measuring equipment

Construction contractors will document their procedures for identification, control, calibration, and maintenance of inspection, measuring, and test equipment within their QMP submitted for approval.

Prime contractors shall require their subcontractors to implement equivalent procedures or adopt the prime contractor’s procedures. Contractors will control, calibrate and maintain inspection, measuring, and test equipment to ensure conformance of equipment with industry standards and other applicable requirements. Inspection, measuring and test equipment used by the contractor should be of a quality and capacity which ensures that measurements made are to acceptable levels of accuracy and precision. Contractors should, at a minimum:

- Identify the measurements to be made, the accuracy required, and select the appropriate inspection, measuring and test equipment;
- Identify, calibrate and adjust all inspection, measuring and test equipment, and devices that can affect product quality, at prescribed intervals and prior to use, against certified equipment and measurement standards of the National Institute of Standards and Technology or other similar recognized technical standards customarily accepted in the industry. Where no standard exists, the basis for calibration will be developed in writing based upon the best-available information and technology.
- Establish, document, and maintain calibration procedures, including details of equipment type, identification number, location, frequency of checks, checking methods, acceptance criteria and the action to be taken when results are unsatisfactory;
- Ensure that inspection, measuring and test equipment is capable of, and regularly calibrated to obtain, the required levels of accuracy and precision;
- Identify inspection, measuring, and test equipment with a suitable indicator or approved identification record to show the calibration status;
- Maintain current calibration records for inspection, measuring and test equipment;
- Assess and document the validity of previous measurement, inspection and test results when inspection, measurement and test equipment is found to be out of calibration;
- Ensure that environmental conditions are suitable for the calibrations, inspections, measurements and test being carried out;
- Ensure that the handling, preservation and storage of inspection, measuring and test equipment is such that the accuracy and fitness for use is maintained; and
- Safeguard inspection, measuring and test equipment and facilities, including both test hardware and test software, from adjustments, which would invalidate the calibration setting.

Where test hardware, such as jigs, fixtures, templates, patterns, or test software are used for inspection and testing purposes, they should be checked to establish they are capable of verifying acceptability, prior to release for use, and should be rechecked at regular and prescribed intervals, as required. Contractors will establish, in accordance with Good Industry Practices, the extent and frequency of such checks and maintain records as evidence of control. Measurement data shall be made available, where required by the designer, for verification that the design is functionally adequate.
8.0 Measurement, Analysis, and Improvement

8.1 General
Construction contractors are responsible for control of inspection and testing of all materials, equipment and other elements of the work prior to their delivery from a manufacturer, or during construction, to ensure compliance with the contract.

Contractors will submit to RTD as part of the QMP: the name, address, qualifications, and scope of services for each organization involved in testing. All inspection and testing should be planned, performed, and documented by qualified personnel who are independent from the work being performed.

As a verification activity, RTD will retain the services of an independent testing lab.

8.2 Monitoring and Measurement

8.2.1 Customer satisfaction
During design and construction, the public information team will utilize strategic research and planning to:

- Track stakeholder opinion
- Assess the effectiveness of communication efforts and tactics
- Track economic impact
- Pre-test messages and materials
- Provide vehicles for constant consumer input

A primary result of the evaluation will be to assess RTD’s effectiveness in establishing two-way communications with the public, and creating a successful partnership with the stakeholders.

Following the introduction of new services, RTD will undertake studies to measure its impact on the region in five key areas:

- Mobility Improvements
- Environmental Benefits
- Operating Efficiencies
- Cost Effectiveness
- Transit Supportive Land Use and Future Patterns, and Other Related Economic Related Impacts

This data will be compared to studies conducted prior to new services to determine the extent to which RTD has positively impacted the quality of life for stakeholders within the region. Measurement will be in accordance with the DOT document Reporting Instructions for the Section 5309 New Starts Criteria, and will be reported to the FTA.

8.2.2 Internal audit
RTD will monitor its key management processes through an internal quality audit program
Quality Assurance Program Plan

established with assistance of its Quality Management Consultant (QMC). Results from these audits will be analyzed during program reviews in an effort towards continuous improvement.

RTD’s key management processes are typically those processes described within the RTD FasTracks Program Management Plan, and supporting documentation. Examples include: design and construction contract management, project controls, quality oversight, public information, and inter-agency coordination.

Contractors will describe their own internal auditing procedures within their QMP for the respective project.

8.2.3 Monitoring and measurement of process
RTD’s primary method of monitoring its key processes is through the internal audits described within 8.2.2. Other methods may be established at the division or unit level.

Contractors should describe its production and management process monitoring tools, including the use of statistical techniques when applicable, within their quality plans.

8.2.4 Monitoring and measurement of product
RTD will implement procedures and processes for monitoring the work of its contractors, based on the scope for that particular contract.

For planning/preliminary engineering/NEPA studies, the Contractor shall check environmental reports and design products in accordance with their approved QMP prior to submission to RTD. RTD will review environmental study products against the checklists included in the Environmental Policies and Procedures Manual. RTD will review design products in accordance with the Quality Management Oversight Program Manual. RTD comments must be resolved to RTD’s satisfaction prior to acceptance and contract close-out.

For design-only contracts, the designer shall conduct technical checking and design review prior to submitting design products to RTD. RTD will review design products in accordance with the Quality Management Oversight Program Manual procedure QMO P4, Design Reviews. RTD comments must be resolved to RTD’s satisfaction prior to acceptance and contract close-out.

For construction contracts, shall conduct inspection and testing as required by the contract for that scope of work. Construction contractors should conduct preparatory, initial, and follow-up inspections; which should be documented in accordance with their approved QMP. Additional special inspections may be required by the specifications. Also, certain activities will require hold or witness points; beyond which work may not proceed until required inspections have been conducted, or test results evaluated. These will be addressed in the contractor’s QMP, submitted for approval by RTD. RTD will conduct its own inspection of the work in accordance with the Construction Procedures Manual (for low-bid projects) or the Quality Management Oversight Program Manual procedure QMO P5, Construction Verification Inspections (for CM/GC, D-B, or DBFOM projects.) For small projects (less than $10M), RTD will, as a minimum, require an inspection and test plan from the Contractor. RTD’s role will involve QA inspection and testing activities which verify that the contractors are effectively inspecting their work.

In the case of manufactured products, third party certifications (such as ISO, AAR, PCI, AISC, SEI, etc.) that require periodic audits by the certification agency will be taken into consideration.
when planning for the use of RTD resources. Fabricators and vendors will be required to submit QMPs appropriate for their scope of work, for approval by RTD. RTD’s role will involve QA inspection activities, as needed, to provide adequate confidence that the vendor is producing and delivering compliant work. Additionally, RTD may perform site visits, audits, first article inspections, and other on site activities as needed to ensure that the vendor is implementing an effective quality management system and that manufacturers are in compliance with special provisions such as “Buy America.”

Testing will include qualification tests, factory tests, installation verification tests, material tests, demonstration tests, systems integration tests, and pre-operation tests. RTD will provide oversight throughout the process.

For certain types of work, contractors shall retain the services of an independent testing laboratory, certified to conduct the types of testing required. RTD will monitor the work through verification testing activities conducted by its own inspectors and certified testing laboratory; however, this will not relieve contractors of their responsibility to provide for their own inspection and testing. For more information on materials testing, refer to RTD’s Owner’s Verification Testing (OVT) Program Manual, including applicable Project Specific Test Plans in Appendix B of that document.

For design-build contracts, RTD will require the Contractor to implement comprehensive quality management procedures for both QC and QA activities covering the full scope of their efforts. As such, RTD’s efforts will be focused on ensuring that these contractors are adequately implementing their management systems. RTD’s quality oversight activities will consist of design review, construction verification inspections, verification testing of materials, process audits, and management systems audits.

Prior to revenue service, RTD will ensure that nonconformances are closed, punchlist work is complete, and safety certification is approved. Certain nonconformances and/or punchlist work may be deferred, at RTD’s discretion; but they must be closed out prior to final acceptance. For DBFOM project delivery, RTD’s efforts will be supplemented by an Independent Engineer, who will issue the Revenue Service Commencement Certificate.

Manufacturers and construction contractors will submit certified inspection and testing reports to RTD for review and archival in the project files. Such reports shall be numbered sequentially and traceable to the contract, location, lot, part, and retest number (as applicable).

### 8.3 Control of Nonconforming Product

Contractors will establish and maintain procedures within their QMPs for uniform reporting, controlling and disposition of nonconformances. Procedures will be established to prevent the inadvertent use or installation of nonconforming material, equipment or other elements of the work. Control procedures should provide for identification, evaluation, segregation and, when practical, disposition of nonconforming material, equipment or other elements of the work; and for notification to the contractor’s Project Manager, RTD, and all personnel involved in the affected work. Contractors will provide access to original copies of all reports dealing with nonconforming items for review by RTD.

RTD may also identify nonconformances to the contract (see 3.0, Terms and definitions; and
8.2.4, Monitoring and measurement of product. When this occurs, RTD will document nonconformances through use of a database. A hardcopy of the report will be forwarded to document control for internal recordkeeping, and the original forwarded to the contractor for recommended disposition. RTD retains authority for final acceptance of the recommended disposition.

Nonconforming items, whether identified by the contractor or by RTD, will be dispositioned as follows:

- **REJECT**: The item is unsuitable for its intended use, and economically or physically incapable of being repaired or reworked.
- **REWORK**: The item can be brought into conformance with original requirements.
- **REPAIR**: The item can be made acceptable for its intended purpose; however, it will not meet all requirements.
- **USE-AS-IS**: The item can be used without modifications; and will continue to meet all engineering functional requirements for safety, performance, and fit.

Construction contractors will develop procedures for correcting nonconformances dispositioned as REJECT or REWORK. Any recommendation for REPAIR or USE-AS-IS may require concurrence of the Designer of Record, with analysis: 1) confirming that the work will meet its original intent with no detriment to public safety, 2) identifying any long term durability issues, and 3) proposing an equitable adjustment for acceptance of the nonconforming work. Regardless of the contractor’s recommendation, final acceptance of nonconforming work is at the sole discretion of the RTD.

Items dispositioned as REWORK or REPAIR will be inspected and verified by the contractor’s QA/QC staff, and by RTD prior to close out.

**8.4 Analysis of Data**

RTD will maintain a database of all audit and inspection findings that will allow analysis of trends, and verification of closure for all nonconformances. Based on this data, frequency of compliance audits and inspections may be increased or decreased.

RTD will analyze the data it collects during design review, construction verification inspection, and verification testing of materials. This data will be reviewed by senior management on a quarterly basis during RTD’s Quarterly Quality Management Review. For large projects in construction, the data will be summarized in a Monthly Quality Report specific to that project utilizing a quality matrix that shows areas of Steady Performance, Good Trends, Current Challenges, and Ongoing Challenges.

Contractors shall describe their data analysis procedures within their respective QMPs.

Additionally, RTD will maintain a database of information collected during “before and after” studies to determine the impacts of new services within the region. This information will be analyzed and reported in accordance with DOT document Reporting Instructions for the Section 5309 New Starts Criteria.
8.5 Improvement

8.5.1 Continual improvement
RTD will implement corrective and preventive action procedures based on the magnitude of the perceived deficiencies, and level of risk. When opportunities for improvement within RTD’s team are identified through internal audits, 3rd party audits, or other means, RTD will initiate an “Improvement Action”. This will require the responsible party to investigate the matter, and propose a solution. Improvement Actions will require follow-up to determine the effectiveness of the proposed approach. If necessary, alternative approaches will be tried until an acceptable solution has been found.

8.5.2 Corrective action
Contractors must implement corrective actions, as appropriate, when nonconformances are identified. Such action should include an investigation by the contractor to determine what caused the deficiency or nonconformity, and what will be done to prevent its reoccurrence. Root cause analysis should be used by management to identify trends, based on analysis of nonconformances and audit findings.

If RTD representatives determine that a breakdown has occurred in the contractor’s quality management system that could have an adverse impact on product quality, RTD project managers may initiate a Corrective Action Request (CAR), see RTD FasTracks Quality Oversight Program Manual. CARs indicate a negative trend or systemic problem that requires immediate attention by the contractor. The CAR shall be forwarded to the contractor, with copies sent to document control.

If the CAR proves ineffective, punitive measures may be invoked in accordance with the contract, up to and including termination of the contract.

Contractors shall describe their corrective action procedures within their quality plans submitted to RTD.

8.5.3 Preventive Action
Preventive action includes evaluation of quality programs prior contract award, effective testing and inspection programs, regular quality meetings, quality audits, sound designs, and appropriate certifications for personnel and subcontractors performing special processes.

Contractors shall describe their preventive measures within their quality plans submitted to RTD.
# Quality Assurance Program Plan

## Exhibit 2
Cross Reference Between FTA Guidelines and ISO 9001:2008

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NOTE: This table cross references the FTA Quality Assurance and Quality Control Guidelines (which were based on the international standard ISO 9001:1994) to the more recent ISO 9001:2008; which provided the criteria and format for this Quality Assurance Program Plan. All of the 15 elements of the FTA guidelines are included in the ISO standard.
The following is a list of related program documents, current as of the time this Plan was published. This list is for reference only. Verify latest revision with RTD FasTracks Document Control.

- FasTracks Environmental Policies & Procedures Manual
- FasTracks Program Management Plan
- FasTracks Project Controls Procedures Manual
- FasTracks Quality Management Oversight Program Manual
- FasTracks Strategic Public Information and Involvement Plan
- RTD Bus Transit Facility Design Guidelines and Criteria
- RTD CADD Standards Manual
- RTD Commuter Rail Design Criteria
- RTD Construction Procedures Manual
- RTD Engineering Design Guidelines
- RTD Facility Maintenance Criteria/Equipment Manual
- RTD Light Rail Design Criteria
- RTD Procurement Standards Manual
- RTD System Safety Program Plan

NOTE: Other Plans and Publications may exist at the corridor/project level, which are not listed here.