FTA Oversight Procedures

CLIN#		OP#	OP Issue Date	Description
0001	Contract and Program Support	1	6/20/2008	Administrative Conditions and Requirements
		2	6/20/2008	PMOC Implementation, Transition Plans, and Project Status Reporting
		3	6/20/2008	Special Tasks
0002	Project Management Services	11	6/20/2008	Grantee Capacity and Capability Review
		12	6/20/2008	Recurring Oversight and Related Reports (Periodic, Trip, Quarterly, Final)
		14	6/20/2008	Lessons Learned
		20	6/20/2008	Project Management Plan Review
		22	6/20/2008	Safety and Security Management Plan Review
		23	6/20/2008	Real Estate Review
0003	Technical Review Services	25	6/20/2008	Fleet Management Plan Review
		26A	6/20/2008	Buy America Review
		26B	6/20/2008	Bus and Rail Vehicle Technical Review
		32A	6/20/2008	Project Capacity Review
		32B	6/20/2008	Environmental Document (NEPA) Review for New Starts Projects
		32C	6/20/2008	Project Scope Review
		32E	6/20/2008	Project Delivery Method Review
		33	6/20/2008	Capital Cost Estimate Review
		34	6/20/2008	Project Schedule Review
		35	6/20/2008	Project Contingency and Contract Packaging Review
		40	6/20/2008	Risk Assessment and Mitigation Review
		41	6/20/2008	ADA Review - Level Boarding for Commuter Rail
		43	6/20/2008	Annual Review
		45	6/20/2008	Small Starts Review
		46.1	6/20/2008	LPA Review and Readiness to Enter PE
		46.2	6/20/2008	Readiness to Enter Final Design
		46.3	6/20/2008	Readiness to Execute or Amend FFGA
		46.4	6/20/2008	Readiness to Bid Construction Work
		46.5	6/20/2008	Readiness for Revenue Operations

U.S. DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 01 – Administrative Conditions and Requirements

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the administrative conditions and requirements associated with the performance of oversight by the Project Management Oversight Contractor (PMOC) for the Federal Transit Administration (FTA) of the planning, design, construction and revenue operations of major capital transit projects.

2.0 BACKGROUND

As part of its responsibility to prudently use public funds, FTA performs project oversight to ensure that major capital transit projects are executed professionally, efficiently, and in conformance with applicable statutes, regulations, and guidance and sound engineering and project management practices.

FTA performs oversight through its own staff and through its contractors, the PMOCs. While these Oversight Procedures are meant to instruct both FTA staff and its PMOCs, the PMOCs in fact perform most of the oversight. Therefore the Oversight Procedures refer to the reviewer as the PMOC.

In 2003 and 2004 FTA selected and awarded contracts to seventeen firms to perform oversight services for a period of five years. Today, PMOCs monitor projects costing from $100 million to multiple billions of dollars.

3.0 OBJECTIVES

FTA requires project oversight that is proactive, includes investigation of issues and conditions, dialogue and problem solving with the Grantee, and provision of professional opinions and recommendations for action. Reports that support the oversight activities should be concise and provide FTA with critical input to its decision making on project advancement and funding.

4.0 REFERENCES

The following are the principal, but by no means the only, references to Federal legislation, regulation and guidance with which the PMOC should have a good understanding as related to the Grantee's project work being reviewed under this OP: See Appendix A below.

5.0 GRANTEE SUBMITTALS

NA

6.0 SCOPE OF WORK

6.1 General Administrative Requirements and Documents

6.1.1 Contracts

Every five years, FTA issues a request for proposals for project management oversight services for its major capital projects. A group of firms is selected for award of indefinite-delivery indefinite-quantity contracts for oversight services over a period of five years for a not-to-exceed contract amount. Specific assignments for oversight work are negotiated with individual firms and are authorized through task orders, and within task orders, work orders. A PMOC may be issued one or more task orders under its contract.

The contract contains the following sections:

Section A:	SOLICITATION/CONTRACT FORM
Section B:	SUPPLIES OR SERVICES AND PRICE/COST
Section C:	DESCRIPTION/SPECS./WORK STATEMENT
Section D:	PACKAGING AND MARKING
Section E:	INSPECTION AND ACCEPTANCE
Section F:	DELIVERIES OR PERFORMANCE
Section G:	CONTRACT ADMINISTRATION DATA
Section H:	SPECIAL CONTRACT REQUIREMENTS
Section I:	CONTRACT CLAUSES
Section J:	LIST OF ATTACHMENTS TABLE

Contract Line Item Numbers (CLINs) are primarily used for administration and accounting. CLINs tie specific types of oversight activities to be performed to work or cost categories which allow FTA to determine the cost effectiveness of the services provided.

The contract includes the following CLINs:

CLIN 0001	CONTRACT AND PROGRAM SUPPORT
CLIN 0002	PROJECT MANAGEMENT SERVICES
CLIN 0003	TECHNICAL REVIEW SERVICES
CLIN 0004	OTHER DIRECT COSTS

Work shall be directed by work order not by CLINs. When services are performed, labor hours and deliverables should be billed by work order and annotated with the CLIN and SubCLIN. SubCLINs represent the lowest level of work or cost category that FTA chooses to track program costs. They are summarized below under each CLIN description.

CLIN 0001 covers services that are required by FTA in support of the PMOC's contract and the PMO program at large.

0001A	Administrative Tasks (Contract implementation plans, task order implementation plans, transition plans, project status reports, FTA events such as Annual Engineers' Conference, Annual PMO Conference, Quarterly PMO teleconferences, Transit Construction Roundtables, and other specialty meetings or conferences, etc.)
0001B	Special Tasks (Update project management oversight procedures, develop technical papers, perform special studies, etc.)
0001C	Ancillary Support (Covers unforeseeable tasks such as emergency support services and other work as directed by the Administrator)

CLIN 0002 covers Project Management Services that typically are required at regular intervals and are normally specified by FTA regional task order managers.

0002A	Grantee Technical Capacity and Capability Reviews (project sponsor technical capacity and capability reviews, project management plan reviews, project sponsor quality assurance/quality control program reviews, safety security management plan reviews, real estate acquisition plan reviews, etc.)
0002B	On-site Monitoring and Reporting (Recurring oversight–monthlies, quarterlies, trip reports, final monitoring report, lessons learned)
0002C	PMO Information Management Support and Products (Information technology support and services)

CLIN 0003 covers Technical Review Services and analysis that are normally specified by FTA headquarters project engineers and technical specialists.

0003A	Scope, Cost, Schedule Characterization Reviews (Scope, capital cost estimate, schedule analysis, value engineering and life cycle cost analysis, annual new starts reviews, etc.)
0003B	Vehicles Procurement Reviews (Fleet management plan reviews, rail and bus vehicle technical reviews)
0003C	Risk Assessments and Contingency Reviews (Risk assessment and mitigation reviews, contingency reviews, etc.)
0003D	Project Execution Readiness Reviews (Design and constructability reviews, ADA level boarding review, readiness to enter PE, FD, execute FFGA, readiness to bid construction, readiness for revenue operations – testing, start-up, etc.)
0003E	Small Starts Reviews (Small starts projects reviews – includes all technical capacity, scope, schedule, cost, etc. for small starts projects)

CLIN 0004 covers travel and other expenses such as printing.

0004A	Travel Expenses (Non-labor travel related expenses such as transportation expenses, lodging, per diem, etc. associated with any of the above CLINs)
0004B	Other Direct Expenses (Printing, shipping, materials, etc.)

6.1.2 Task Orders

FTA headquarters or an FTA regional office will identify a project or group of projects that could benefit from PMOC oversight. For award of initial task orders for oversight, FTA's procurement office will request proposals from all PMOCs that have indicated on the matrix in Attachment J-5 in the Request for Proposal an interest in performing the work and a lack of conflict of interest. Refer to Appendix D for the sample proposal format. Written proposals are due seven days after issuance of the request. The procurement office with the assistance of TPM-20 Office of Engineering will evaluate the proposals and select a contractor utilizing the "best value" approach.

In the interest of economy and efficiency, the procurement office will typically issue on a sole source basis follow-on task orders to the PMOC that was awarded the initial task order for a particular project, grantee or region. If the performance of the existing PMOC is unsatisfactory or if competing is deemed in the best interest of the government, the procurement office may compete follow-on task orders.

The total amount of all task orders awarded or issued by FTA in one year will not exceed the total amount available to FTA for oversight of major capital projects as documented in the TPM-20 Office of Engineering Program Plan. The Program Plan covers a twelve month period, therefore task orders will cover a maximum of twelve months. Task order amounts are based on cost estimates for PMOC oversight based on activities and events in the Grantee's project schedule. A task order sample is shown in Appendix B.

The PMOC is required to submit a Task Order Implementation Plan upon receipt of the task order from FTA. This plan outlines the PMOC's proposed approach to the overall task, identifies activities to be performed, and provides a schedule and cost breakdown for the activities.

All activities performed under task orders will be authorized through work orders. Some work orders will be written broadly, for example, covering all recurring oversight activities on a project (such as monthly and quarterly meetings and supporting reports). Other work orders will be written more narrowly, for example, covering reviews (such as scope, schedule, cost, and risk) on specific dates.

6.1.3 Work Orders

A sample work order format is shown in Appendix C. A work order will be based on an approved proposal by a PMOC. Refer to Appendix D for the sample proposal format.

The work order will describe the work; it may refer to certain Oversight Procedures (OP) to guide the performance of the work. It will include a not-to-exceed cost and a defined schedule. A Work Order Implementation Plan may be required by FTA for large scope work orders or for oversight activities for which there is no associated OP.

Before issuing, the COTR verifies that the work order cost is included in the authorized task order amount. The work order will refer to applicable CLINs. The cost of each work order must be tracked

separately in project status reports and in invoices, with a breakdown by CLIN. Within the PMOC's monthly or quarterly task order status reports, the estimated versus actual for each work order should be tracked as a subset of the estimated versus actual for the entire task order.

6.1.4 Spot Reports

In the previous PMO contract, "Spot Reports" were used to report on a variety of topics. In this PMO contract, the generic spot report will be required very infrequently if at all. By and large, the spot report is replaced by specific reports such as "Project Cost Review Report" or "Grantee Technical Capacity and Capability Review Report", etc.

6.2 Roles and Responsibilities

The Grantees are the project builders and owners and are fully responsible for development and implementation of the capital transit project. They are responsible for planning, design, bidding the contract documents; supervising, administering, inspecting and accepting construction; performing testing and start up.

FTA administers grants and loans to State and local public bodies, and in public-private partnerships to private entities, to acquire, construct, and reconstruct transit facilities. FTA seeks to ensure through its oversight that FTA-funded projects related to these transit facilities are executed responsibly.

The FTA Office of Engineering within the Office of Program Management (TPM) in Washington, D.C. and the FTA Regional Offices (TROs) are responsible for oversight from the time of the Grantees' application to enter preliminary engineering (PE) through final design (FD), the Full Funding Grant Agreement (FFGA), construction, substantial completion, testing, start-up, and revenue operations. As a general rule, recurring oversight and reviews of the Grantee's project management capacity are conducted by TROs. Technical reviews for scope, schedule, cost, contingency and risk, etc. are usually initiated by TPM. TPM and TRO, along with TAD (Office of Procurement), administer the PMOC contracts, task orders and work orders.

PMOCs assist FTA in fulfilling its oversight responsibilities. The PMOCs' primary FTA points of contact are FTA's task order managers and FTA's work order managers. The primary FTA staff person in Procurement is the Contracting Officer (CO) and in TPM is the Contracting Officer's Technical Representative (COTR).

The PMOCs are responsible for rigorously but non-intrusively analyzing progress on projects, positively and constructively interacting with the Grantee to solve problems, and maintaining objectivity in discussions of findings, conclusions and recommendations with FTA and the Grantee. One of the most important reviews is the assessment of the Grantees' technical capacity and capability to successfully implement projects in a quality manner – to keep projects on time, on budget, in accordance with approved plans and specifications, constructible and well managed, employing value engineering, risk assessment and risk management. In addition to the Grantees' technical capacity, the PMOCs review the planning, design, construction and operations of the project; specific project components: guideway structures, stations, maintenance and storage facilities, sitework, power, signal

and communications systems; fare collection; real estate; vehicle design and manufacturing; project quality and capacity; safety; cost estimates, schedules, assessments of risk.

After PMOCs are awarded contracts, they may be awarded task orders and work orders within task orders to perform oversight. Task orders can cover all projects in a geographic area or they can be limited to the work of a particular Grantee. Task orders issued from TPM-20 can cover special studies and research, as well as technical reviews (scope, schedule, cost) for projects.

The PMOCs' main responsibilities include:

- Investigation of project conditions and core documents; site visitation; review of pertinent documents; performance of interviews in sufficient detail as to become familiar with established project goals, site conditions, design criteria, operations plans, drawings and specifications, value engineering studies, peer and constructability reviews, schedules, cost estimates, risks, bid packages, and contracts;
- Assessment of the Grantee's management of projects and technical capacity and capability;
- Assessment of the Grantee's ability to meet goals related to design capacity, scope, schedule, budget, quality, and safety both during construction and in revenue operations;
- Identification of problems and uncertainties related to the fulfillment of program requirements;
- Recommendations and proactive problem solving with the Grantee and FTA staff, and provision of professional opinions to the FTA;
- Discussion of findings, conclusions and recommendations with the Grantee and FTA;
- Provision of supporting reports and presentations to the FTA.

In the performance of the above, the PMOCs are to accomplish, among other duties, the following:

1) Communications
   a) Develop and regularly maintain contact throughout a Grantee's organization with key personnel in planning, design and construction departments as well as operations, operations planning, procurement, legal, budgeting and real estate.
   b) Develop and regularly maintain contact with FTA task order managers and work order managers at both headquarters and the region.
   c) Maintain a log of project contacts.
   d) Coordinate with other PMOCs covering the same Grantee.
   e) Remind the Grantee of its responsibility for the project; that PMOC oversight in no way relieves the Grantee of responsibility.
   f) Provide informal communication to the Grantee on the results of PMOCs' reviews and analysis after approval from FTA. Provide draft reports to FTA and receive comments from FTA before providing copies to the Grantee. Discuss draft findings with the Grantee prior to finalizing reports.

2) Oversight assessments, recommendations, reporting

   a) Identify sources of information to allow the FTA to directly question the Grantee on the accuracy or completeness of their information. Present information without taking it out of context. Efficiently verify the information with trusted sources before presenting it as fact. Describe PMOC assumptions used to form conclusions and the methods used to come to those conclusions. Support PMOC statements, observations, findings, conclusions and professional opinions with project information, appropriate analysis and interpretation of the project information by qualified PMOC personnel with relevant and appropriate project development, design and construction experience.

   b) Based on a cost-effective mix of random and planned sampling and, in certain cases, sampling 100 percent of the information, perform quantitative and qualitative checks on Grantee information.

   c) Provide deliverables that are focused, clear, coherent, accurate, complete, objective and unbiased. Perform work in a cost-efficient manner.

   d) Specifically cost-related

      i) Regarding the Grantees' cost estimating methodologies, verify that current market conditions for bidding of construction contracts are taken into account;

      ii) Provide an estimator's opinions as to whether the cost estimate information is biased.

      iii) Describe the context of key cost assumptions and decisions by involved parties such as the Grantees, and their consultants and contractors.

      iv) State reservations about costs in construction contractors' bids or offers; provide supported opinions regarding a construction contractor's propensity to submit change orders and claims on a project.

7.0 REPORTING, PRESENTATIONS, RECONCILIATION

For many oversight activities, the PMOC is required to provide FTA with a supporting written report of findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken.

Draft reports should be submitted to the FTA work order manager via email. In addition the PMOC should post reports to an FTA website, to be identified.

After FTA approval, the PMOC may be instructed to share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

On occasion, the PMOC may be required to make presentations of project reports or other studies to FTA, the Grantee, or third party groups.

7.1 Format

Avoid repetition in the report at all cost as repetition inhibits understanding on the part of the reader. Instead, refer back to previous sections. Be concise. Provide current information and avoid long historical narratives or lists of events. Use italics and bold fonts to emphasize certain points. Use judgment to optimally portray information to aid in understanding – narratives, photographs, tables, graphs, spreadsheets, etc. Use Microsoft Word, Excel, and Microsoft Project.

Use Times Roman 12 point font unless otherwise specified.

All reports should include the following.

1) Cover page (See Appendix E for a sample cover page.)
   a) Title of Report; plain English description of what is in the report
   b) Project name and location, Grantee name
   c) Date of report, if revisions, add Rev. 1, 2, etc.
   d) Contract number
   e) Task order number
   f) Project number
   g) Work order number
   h) Oversight Procedures referenced
   i) CLIN referenced
   j) PMOC firm name, address
   k) PMOC lead person's name, affiliation if different from PMOC firm, phone, email
   l) Length of time PMOC firm and person have been assigned to this project
2) Executive Summary (one page max) – simply written summary of the PMOC's most important findings, professional opinions, conclusions, and recommendations
3) Description of PMOC personnel, qualifications performing the review
4) Table of Contents
5) Project Description (one page max)
6) Project Maps
7) Body of Report
   a) Findings (include photos of site conditions to aid in understanding)
   b) Analysis, opinions, recommendations (specify time frames for performance of recommended actions)
   c) Concluding Statement
8) Appendix
   a) Acronyms used
   b) Tables, spreadsheets, photos

APPENDIX A

References

The following are the principal, but by no means the only, references to Federal legislation, codification, regulation and guidance with which the PMOC should have a good understanding as related to the Grantee's project work being reviewed under the Oversight Procedures (OPs):

Legislative

- SAFETEA-LU, Public Law109-59

United States Code

- 49 U.S.C Section 5327, General /Intermodal Programs, Mass Trans; PMO
- 49 U.S.C Section 5309, Major Capital Investment Projects Final Rule

Regulations

- Project Management Oversight, 49 C.F.R. Part 633
- Major Capital Investment Projects, 49 C.F.R. Part 611
- Joint FTA/FHWA regulations, Metropolitan Planning, 23 C.F.R. Part 450
- Joint FTA/FHWA regulations, Environmental Impact and Related Procedures, 23
- C.F.R. Part 771
- U.S. DOT regulation, Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally Assisted Programs, 49 C.F.R. Part 24

FTA Circulars -

- C4220.1D Third Party Contracting Requirements
- C5010.1C Grant Management Guidelines
- C5200 Full Funding Grant Agreements Guidance
- C6800.1 Safety and Security Management Plan

Guidance

- FTA Master Agreement, FTA MA
  - http://www.fta.dot.gov/documents/12-Master.doc
- Project and Construction Management Guidelines, 2003 Update
  - http://www.fta.dot.gov/funding/oversight/grants_financing_104.html
- Guidance for Transit Financial Plans, June 2000
  - http://www.fta.dot.gov/publications/reports/other_reports/publications_1336.html
- New Starts
  - http://www.fta.dot.gov/planning/newstarts/planning_environment_218.html
  - http://www.fta.dot.gov/planning/newstarts/planning_environment_213.html
- Construction Project Management Handbook, December 2006
  - http://www.fta.dot.gov/publications/publications_5838.html
  - http://www.fta.dot.gov/funding/oversight/grants_financing_104.html
- Best Practices Procurement Manual, FTA, 2001
  - http://www.fta.dot.gov/publications/reports/other_reports/publications_4571.html

APPENDIX B

Sample Task Order

Federal Transit Administration

TASK ORDER No. ___

Date issued:

Summary title:	**Projects X, Y, Z by Grantee Transit Agency ABC** Located in City, Region, State/s
PMOC:	Firm name Lead person's name, title, phone, email Firm address
Contract No.:	DTFT60-0_____
Task Order:	Managed by FTA Region or Headquarters
Project No.	DC-_____
FTA Task Order Manager:	name, phone, email
Scope:	Description of scope of work Reference to FTA Oversight Procedures Reference to CLIN Numbers
Schedule:	Task order duration / End date of task order
Cost:	This is being issued under Contracting Officer authority. Services performed or products delivered under this task order are authorized by work order and billable by work order. The not-to-exceed amount is _____ for labor and expenses under this task order. Under no circumstances is the PMOC authorized to incur costs in excess of the amount above without prior authorization from the Contracting Officer.

APPENDIX C

Sample Work Order

Federal Transit Administration

WORK ORDER No. ___

Date issued: _____, 20__

Summary title: **Review of X on Project Y, Grantee Transit Agency ABC**
Located in City, Region, State/s

PMOC: Lead person's name, title, phone, email
Firm name, address

Contract No.: DTFT60-0_____
Task Order No.: ____
Project No. DC - _____
Task Order: Managed by FTA Region or Headquarters
FTA Task Order Manager: name, phone, email
FTA Work Order Manager: name, phone, email

Scope: Description of scope of work
Reference to FTA Oversight Procedures
Reference to CLIN Numbers

Schedule: Period of Performance, Schedule of Milestones, Due Dates

Cost: This is being issued under COTR authority. Services performed or products delivered under this work order are billable by work order and CLIN.

The not-to-exceed amount is _____ for labor and expenses under this work order. Under no circumstances is the PMOC authorized to incur costs in excess of the amount above without prior authorization from the COTR.

APPENDIX D

Sample Proposal Format

PROPOSAL TO FTA

Date:

Summary title: _____

PMOC: Lead person's name, title, phone, email
Firm name, address

Contract No.: DTFT60-0_____
Task Order No.: ____ if applicable
Task Order: Managed by FTA Region or Headquarters
FTA Task Order Manager: name, phone, email
Work Order No.: ____ if applicable
FTA Work Order Manager: name, phone, email

Scope: Description of scope of work; ref. to FTA Oversight Procedures, CLIN Nos.

Schedule: Period of Performance, Schedule of Milestones, Due Dates

Cost: Provide proposal breakdown including all of the information below:

CLIN	CLIN Name		Hours	Hourly Rate	Labor	OH Rate	Labor, OH	Fee Rate	Subtotal	Total	SBE	DBE/WBE
2B	On-Site Monitoring / Reporting	Name, Title per contract	15.0	$85.00	$1,275	130%	$2,933	9%	$3,196			
		Name, Title per contract	8.0	$75.00	$600	130%	$1,380	9%	$1,504			
		Name, Title per contract	0.0	$45.00	$0	130%	$0	9%	$0			
		Total Staff	23.0		$1,875		$4,313		$4,701			
		Subconsult Name	13.0	$160.00	$2,080						$2,080	$2,080
		Subconsult Name	10.0	$180.00	$1,800						$1,800	
		Subconsult Name	6.0	$170.00	$1,020						$1,020	
		Total Subconsultants	29.0		$4,900				$4,900			
		Total Labor								**$9,601**	$4,900	$2,080
4A	Travel Exp	Staff	overnight						$800			
		Subconsultants							$0			
		Total								$800		
4B	Other Direct Exp	Staff	printing, phone charges						$500			
		Subconsultants							$0			
		Total								$500		
G & A (if applicable)								5%		$526		
Total										**$11,426**		

APPENDIX E

Sample Report Cover Page

CAPITAL COST ESTIMATE REVIEW

Great City Light Rail Subway Project
Great City Transportation Authority
Region or City, State

May 1, 2008
May 22, 2008, Rev. 1

PMOC Contract Number	DTFT__-__-_-_____
Task Order Number	___
Project Number	DC-__-____
Work Order Number	___
OPs Referenced	___

PMOC firm name, address
PMOC lead person's name, affiliation if different from PMOC firm, phone, email
Length of time PMOC firm and person have been assigned to this project

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U.S. DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 02 – PMOC Implementation, Transition Plans, and Project Status Reporting

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1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) with regard to two types of administrative tasks: Implementation / Transition Plans and Project Status Reporting.

2.0 BACKGROUND

2.1 Implementation and Transition Plans

2.1.1 Implementation Plans

The PMOC is required to develop and submit for review, comment and approval an Implementation Plan at the contract, task order, and work order levels. These Contract, Task Order, or work order level Implementation Plans play a key part in demonstrating to FTA that the PMOC has achieved and maintains a readiness to perform services and produce deliverables and outcomes in a satisfactory manner that meet FTA's requirements.

Implementation Plans define how the PMOCs' services, products, deliverables, etc. will be accomplished in a manner and quality that meets FTA's requirements. Unless otherwise directed by the COTR, PMOC services, products and outcomes will be performed in conformance with the then current version of the FTA approved Implementation Plan.

The Contract Level Implementation Plan defines how multiple task orders or a combination of Regional and Headquarters task orders will be accomplished. The Task Order Level Implementation Plan defines how task order level services, products, deliverables will be accomplished. Minimize duplication between the Task Order and Contract implementation plans. Identify and explain inconsistencies. The Work Order Level Implementation Plans may be required if the work is to be performed over many months, the work is particularly complex, or if FTA has concerns regarding the PMOC's technical approach, staffing, schedule, etc.

2.1.2 Transition Plans

Transition Plans are required for Task Orders when changes in PMOC assignment necessitate. For Work Orders, Transition Plans may be required if the work is particularly complex or for other reasons indicated by FTA. FTA may require new PMOCs to replace or supplement the staff of current PMOCs when the current/resident/outgoing PMOC develops a conflict of interest with the subject project or FTA determines that it is in FTA's interests to assign a replacement or supplemental PMOC.

If the PMOC is transitioning into an on-going project, the implementation plan should address the transition efforts as directed by FTA staff.

FTA may require PMOCs to replace other outgoing PMOCs. This may arise because the current, now outgoing PMOC has developed a conflict, or FTA has determined that it is in FTA's interests to assign a new PMOC to monitor the grantee project. The outgoing and incoming PMOCs shall effectuate a smooth transition. FTA may also require the PMOC to transition onto a Grantee's project for a limited independent review without a reassignment of the resident PMOC.

Upon notice from the FTA COTR that a task order has been awarded, the designated FTA task order manager will notify the Grantee in a timely fashion. In doing so, the task order manager should address the Grantee's concerns, establish a transition dialogue between the incoming and outgoing PMOC and lastly through the exercise of the task order manager's technical direction authority, lay the groundwork and priorities for both the outgoing and incoming PMOCs. The task order manager's objective in the last element is to minimize the burden and disruption to the Grantee, and facilitate the two PMOCs, the Grantee and FTA to work as a team.

FTA's Office of Program Management will seek to achieve a transition period of least 2 months in length. FTA's Regional Office will work with the Grantee and PMOCs to arrange a transition schedule that best fits future, scheduled meetings with the Grantee including Quarterly Progress Review meetings or Triennial Review meetings.

The task order manager in coordination with the COTR and support from the outgoing and incoming PMOC will identify transition elements and develop a coordinated transition schedule in order to assure the achievement of transition milestones. Transition elements include arranging for incoming PMOC to be introduced to FTA Region, Headquarters, the outgoing PMOC, and the Grantee organization, and given a project tour; arranging for the incoming PMOC to be oriented on administrative matters such as invoicing and performance evaluations; arranging for outgoing PMOC to orient incoming PMOC to the project – project characteristics, major project issues, baseline project information between the PMOC and Grantee, and FTA's expectations.

2.2 Project Status Reporting

PMOCs are required to use management procedures in the performance of contracts, task orders, and work orders that provide for:

- Planning and control of costs and schedules
- Measurement of performance (value for completed tasks and major subtasks)
- Generation of timely and reliable information to be reported

FTA can then monitor the status of the oversight contract, task orders, and work orders; verify the reasonableness of the PMOCs' invoices considering performance; verify reported costs and expenses accrued during reporting periods, and estimate costs to be accrued during subsequent reporting periods.

Management accountability is the expectation that managers are responsible for the quality and timeliness of program performance, increasing productivity, controlling costs and mitigating adverse aspects of agency operations, and assuring that programs are managed with integrity and in compliance with applicable law.

Management controls are the organization, policies, and procedures used to reasonably ensure that (1) programs achieve their intended results; (2) resources are used consistent with agency mission; (3) programs and resources are protected from waste, fraud, and mismanagement; (4) laws and regulations are followed; and (5) reliable and timely information is obtained, maintained, reported and used for decision making.

3.0 OBJECTIVES

3.1 Implementation and Transition Plans

The Implementation Plan should demonstrate the PMOC's comprehensive, organized and well considered proposal to accomplish the assigned scope of work in a manner and quality that meets FTA's requirements. The Transition Plan is a substantive report of the essential project facts to expedite project knowledge during the transition period.

3.2 Project Status Reporting

Provide FTA with relevant progress updates on the PMOC's assigned work including completed tasks, significant issues encountered, technical and others, and a 60-day look ahead forecast in a concise report.

4.0 REFERENCES

NA

5.0 PROJECT SPONSOR SUBMITTALS

NA

6.0 SCOPE OF WORK

PMOC scope of work is awarded through Task Orders and assigned Work Orders in accordance with oversight procedures (OPs). Implementation and Transition Plans shall be provided and should include PMOCs' recommendations as to course of action. The PMOCs shall also provide Project Status Reports which will assist in FTA's efforts to improve the accountability and effectiveness of its oversight program on major capital transit projects.

6.1 PMOC Implementation and Transition Plans

6.1.1 Implementation Plans

Implementation Plans shall be provided upon request by the COTR or FTA task order manager.

1. When the PMOC has been awarded multiple task orders or a task order that requires programmatic services or products, FTA may require from the PMOC a contract level implementation plan.

2. The PMOC shall develop an integrated schedule for the work (services and deliverables) and report progress against that integrated schedule as part of task order level implementation plan.

3. Ordinarily, individual work orders will not require implementation plans, however, for complex deliverables or services where technical approach, key staffing, schedule, etc. issues or concerns exist, FTA may require the PMOC to develop a simplified, or work order specific implementation plan.

The elements of the plans are described in Section 7 and Appendix A.

FTA in its sole discretion may require the outgoing PMOC to submit or revise its task order level implementation plan in order to minimize the overlap between the two PMOCs as well as to achieve the necessary coordination with and orientation of the new PMOC.

6.1.2 Transition Plans

The Transition Plan shall be prepared by the current or resident PMOC for use by a replacement or supplemental PMOC. The current PMOC and incoming PMOC shall work together to effectuate a smooth transition.

A. The incoming PMOC shall deliver products and perform services as follows:

1. Coordinate and integrate its services and work products with the current PMOC to identify transition elements, develop schedule and milestones.
2. Establish key contacts among the personnel of both PMOCs, FTA Region and Headquarters, and the Grantee.
3. Develop a list of documents needed for transition period as applicable, including but not limited to the following:
   a. The FFGA baseline and all amendments or as applicable FFGA application materials or letters of no prejudice;
   b. Relevant grantee management plans such as Project Management Plan, QA/QC plan, Fleet Management Plan(s), etc.
   c. PMOC Lessons Learned report, Monitoring Reports, Quarterly Progress Review Meeting Reports
   d. Other documents recommended by FTA and outgoing PMOC
4. Be adequately prepared for the initial monthly or quarterly meeting, interviews, site tours, conference calls, follow-up meetings, etc. by:
   a. Conducting sufficient pre-meetings between FTA and outgoing PMOC.
   b. Providing sufficient and appropriate personnel at meetings, interviews or tours.
   c. Being prepared and knowledgeable of the content in materials prepared by Grantee, PMOC and FTA on major issues. Be aware of sensitive issues.
   d. Listening carefully, particularly to key issues/potential impacts to project progress.
   e. Promoting a “partnership” relationship and minimizing grantee impacts.
   f. Making every effort to understand the project conditions including taking project photos during tour.

5. Act in a manner consistent with FTA's direction on priorities and expectations.
    a. Conduct an adequate number of site visits, meetings, or grantee personnel interviews to be cost effective.
    b. Do not discuss the outgoing PMOC's products or services to the Grantee.
    c. Provide an adequate amount of useful inputs to the outgoing PMOC on the incoming PMOC transition activities during that period of performance when the outgoing PMOC has responsibility for project monitoring.
    d. Achieve a sufficient level of knowledge about the outgoing PMOC's oversight activities. Maintain traceability until otherwise directed by the TASK ORDER MANAGER on information or assessments developed by the outgoing PMOC.
    e. Complete familiarization with the Grantee's project, reports and information and achieve readiness to assume oversight responsibilities.

B. The outgoing PMOC's responsibilities include but are not limited to:

1. Subject to CO request, prepare a "close-out" Task Order proposal according to FTA's instructions that includes "close-out" schedules, deliverables including final report and lessons learned, transfer documents and data to the incoming PMOC and other transition elements identified above. If necessary or requested by FTA, update the Task Order Level Implementation Plan to reflect "close-out" activities.
2. Orient the incoming PMOC; facilitate introductions to the Grantee as well as their readiness to assume oversight responsibilities. Provide requested documents or assist the new PMOC in locating the information.
3. Coordinate and integrate the services and work products of the incoming PMOC with your own.
    a. Identify transition elements, develop a schedule and milestones.
    b. Incorporate the incoming PMOC's input into the monitoring reports.
    c. Maintain traceability until otherwise directed by the TASK ORDER MANAGER of information or assessments developed by the incoming PMOC.
    d. Evaluate input and work products of the incoming PMOC giving consideration to its lack of familiarity with the project.
4. Provide sufficient and appropriate personnel to participate in conference calls and meetings during the transition.

6.1.3 Schedule of Deliverables

Unless otherwise indicated by Work Order instructions Implementation and Transition Plans shall be delivered in accordance with the following timeline.

Requirement	Calendar Days after request by FTA
1) Implementation and Transition Plans	
a) Draft plan or revision of previous plan	15-21
b) Finalize plan	30
c) Readiness for meetings	30
d) Readiness to assume oversight responsibilities (transitions)	60
e) Annual resubmittal*	Jan. 20 of each year
2) Transition Plans by Outgoing PMOC	
a) Production of requested project information/documentation	15
b) Draft of "Close-out" task order implementation plan	21
c) Finalize "Close-out" task order implementation plan	30
d) Evaluations of Incoming PMOC work	15 after 1st product
e) If outgoing, final participation in meetings, conference calls	60

*Annual resubmittals are required only if plan has been in effect for more than 90 days; the resubmittals may be waived in writing by the COTR.

6.2 Project Status Reporting

The project status reports typically incorporate task order level information. On occasion, the COTR or FTA task order manager may require the PMOC to provide a project status report containing contract or work order level information. Coordinate the project status report with the monthly invoice so the report and invoice support each other. Only the Contracting Officer, Contracting Officer's Technical Representative, Task Order Manager, and Work Order Manager should be provided copies of the project status reports. Status reports are intended for FTA staff use only.

7.0 REPORTS, PRESENTATION, RECONCILIATION

The PMOC shall provide reports to FTA as required by Work Order in accordance with this OP. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel, Project, and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA upon request.

7.1 Implementation Plan - Contents

1) Cover letter
2) Table of Contents
3) List of Acronyms
4) Project Description Overview (one page)

5) Introduction to PMOC scope of work and period of performance (one page)

6) PMOC proposed Task Order Work Program: Tasks, Schedule, Staffing, Budget
   a) Summarize the budget in a table of tasks, labor hours for staff and subcontractor, and total costs. The total cost should be consistent with the task order and reflect FTA's PMOC oversight guidance. Using Microsoft Project, incorporate this information into a schedule of project phases, years, months, milestones, etc.

7) PMOC organization and approach to communications with FTA on project progress, events, etc.
   a) Include organization charts for FTA, Grantee, and PMOC personnel to illustrate lines of communication.
   b) Indicate frequency of communicating with FTA and Grantee, how this work will be coordinated and reported, both formally and informally.
   c) An example of a statement follows: "The PMOC's written communication documents will be submitted to FTA's assigned work order manager. The work order manager will distribute the documents within FTA as appropriate, collect FTA comments, request modifications from the PMOC to the documents, and distribute the documents to the Grantee. Informal verbal communication will occur directly between the PMOC and the Grantee staff, at various levels, however the FTA work order manager will be apprised of the general nature of and any material specifics developed during these contacts."

8) Procedures
   a) Cost Tracking, Invoicing, Financial Administration and Cost Control
      i) The PMOC shall describe:
         (1) The contract type and terms for all the tasks in the task order as well as identifying relevant compensation sublimits or fixed price work;
         (2) How employees' record daily project time charges and accumulated into the corporate accounting system on what basis, e.g. weekly;
         (3) Its intent to comply with FTA's billing instructions;
         (4) How invoices are generated and on what periodic basis, e.g. monthly;
         (5) When its accounting period closes, e.g. on the last Friday of the month;
         (6) How Subcontractor invoices are recorded, e.g. monthly in the corporate accounting system.
   b) Correspondence and Document Control
      i) The PMOC shall describe its approach to controlling correspondence to and from FTA; meeting FTA's task order requirements for information delivery when deliverables have been accepted by FTA; the location of PMOC project files; file maintenance and control.

9) In addition describe PMOC's proposed approach to the following:
   a) Measuring goals consistent with FTA's strategic plan for program oversight. If the PMOC is transitioning into an on-going project, the implementation plan should address the transition efforts as directed by FTA staff.
   b) Monitoring of Grantee Project Development and Implementation
   c) Ancillary Support
   d) Quality Management System
   e) Project Status Reporting / Debriefing
   f) Staff and subcontractors: Resources and qualifications

10) If plan is an update, provide progress report on Task Order responsibilities and deliverables

7.2 Project Status Reporting – Task Order Level

Project status reports at the task order level may be required monthly or quarterly as directed by the COTR. Include the following in the report, unless otherwise directed by the COTR.

1) Cover letter
   a) Contract number
   b) Task order numbers
   c) Project numbers
   d) Date of report
   e) Period covered
   f) Report distribution – to FTA Task Order Manager
   g) Percent expended of authorized amount on Task Order No. X
   h) 75% expenditure level occurred on X date or is anticipated on X date
   i) Time remaining until end date of task order
   j) Brief narrative explaining why variances between planned and actual exist in hours or costs
   k) Brief narrative describing the benefits the assigned PMOC team has brought to the major capital project being overseen. Approach this description of benefits from a "lessons learned" or lessons to be shared point of view. Consider the measurable goals that the PMOC set forth in its Implementation Plan.

2) Costs and Labor Hours –
   a) See Appendix A for sample tables and graphs. Cost and hours utilization information is to be consistent with the monthly invoices.
   b) In a table, record task order planned per month, planned to date, actual per month, and actual to date for cost and hours.
   c) In one graph show task order cost utilization for planned and actuals to date for the PMOC/subconsultants as well as for Small Business Enterprise (SBE) and Disadvantage Business Enterprise (DBE)/ Women Business Enterprise (WBE). In another graph similarly show task order hours utilization.

7.3 Project Status Reporting – Contract Level

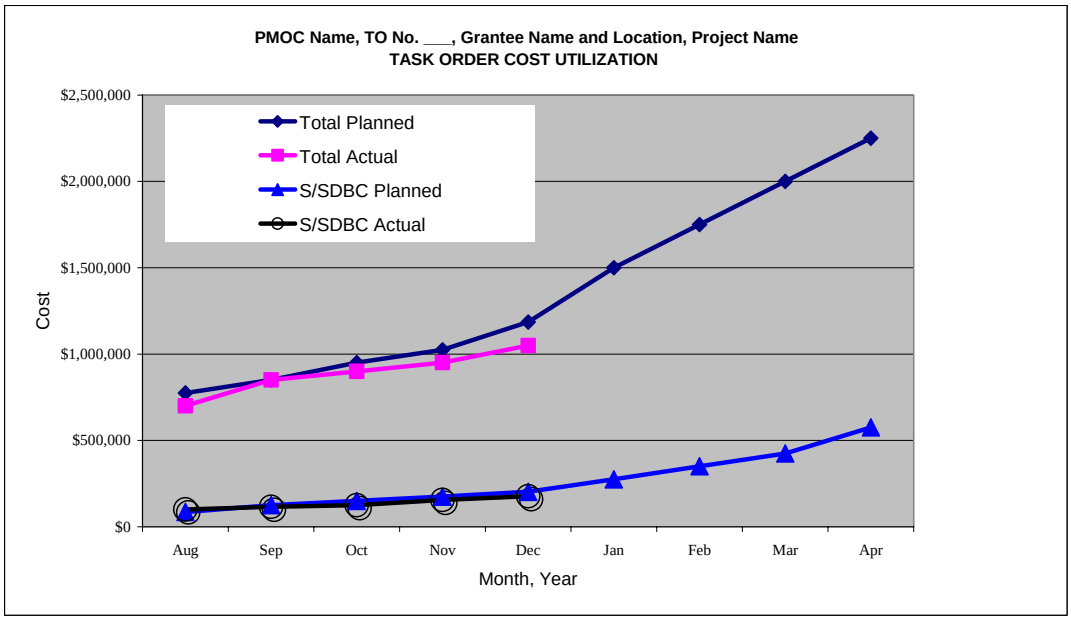
This report is to be provided at the direction of the COTR. Provide a contract level progress, status, and management report that consolidates information for all task orders issued under the contract. This report shall include the following information:

1) Listing of all active task orders
2) Listing of all inactive task orders and date of closure and final total cost
3) Percentage of contract expenditures for SBE,DBE,WBE
4) Cost summaries for each task orders including:
    a) Planned costs for full period of performance
    b) Actual costs to date
    c) Ratio of expenditures for prime contractor to subcontractors
    d) Estimate of cost to complete
    e) Notation of task orders with overruns over 10% with explanation
    f) Notation of task orders with significant issues and/or problems.

APPENDIX A

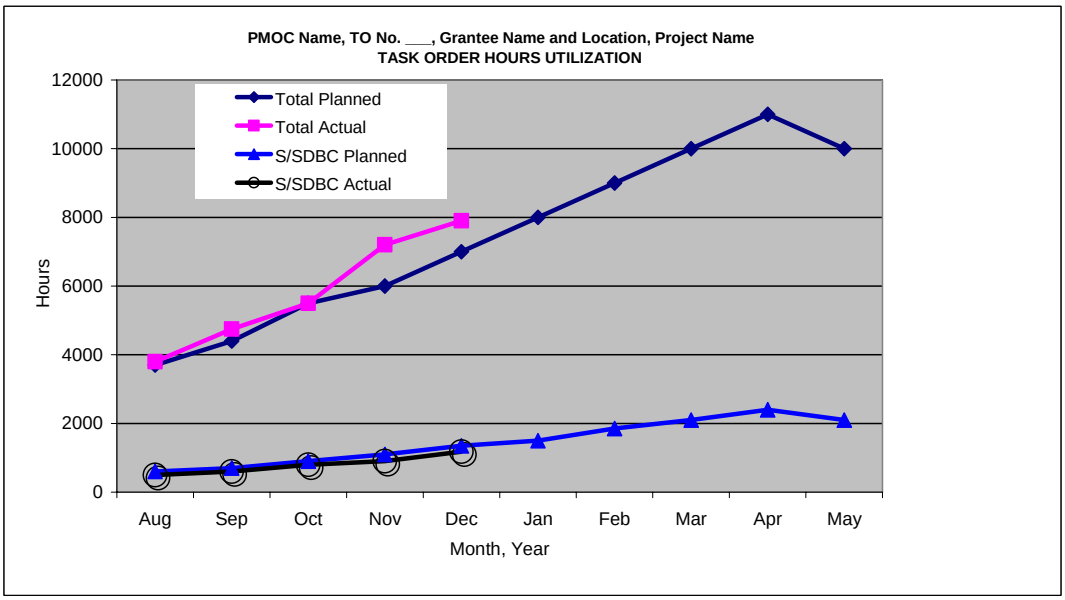
PMOC Name, Task Order No. ___, Grantee Name and Location, Project Name											
TASK ORDER COST AND HOURS UTILIZATION											
	COST						HOURS				
	MONTH	Planned per Month	Planned To Date	Actual per Month	Actual To Date		MONTH	Planned per Month	Planned To Date	Actual per Month	Actual To Date
2006	AUG	$ 775,000	$ 775,000	$ 700,000	$ 700,000		AUG	3700	3700	3800	3800
	SEP	$ 850,000	$ 1,625,000	$ 850,000	$ 1,550,000		SEP	4400	8100	4750	8550
	OCT	$ 950,000	$ 2,575,000	$ 900,000	$ 2,450,000		OCT	5500	13600	5500	14050
	NOV	$ 1,025,000	$ 3,600,000	$ 950,000	$ 3,400,000		NOV	6000	19600	7200	21250
	DEC	$ 1,185,000	$ 4,785,000	$ 1,050,000	$ 4,450,000		DEC	7000	26600	7900	29150
2007	JAN	$ 1,500,000	$ 6,285,000				JAN	8000	34600		
	FEB	$ 1,750,000	$ 8,035,000				FEB	9000	43600		
	MAR	$ 2,000,000	$ 10,035,000				MAR	10000	53600		
	APR	$ 2,250,000	$ 12,285,000				APR	11000	64600		
	MAY	$ 2,000,000	$ 14,285,000				MAY	10000	74600		
	JUN	$ -					JUN				
	JUL	$ -					JUL				
	Tables should incorporate full period of performance for the Task Order.										

APPENDIX A



Note: Graph should be scaled to incorporate full period of performance for the Task Order

	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Total Planned	775,000	850,000	950,000	1,025,000	1,185,000	1,500,000	1,750,000	2,000,000	2,250,000	2,000,000
Total Actual	700,000	850,000	900,000	950,000	1,050,000					
S/SDBC Planne	85,000	125,000	150,000	175,000	202,500	275,000	350,000	425,000	575,000	
S/SDBC Actual	100,000	115,000	125,000	155,000	177,000					



Note: Graph should be scaled to incorporate full period of performance for the Task Order

	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Total Planned	3700	4400	5500	6000	7000	8000	9000	10000	11000	10000
Total Actual	3800	4750	5500	7200	7900					
S/SDBC Planne	600	700	900	1100	1350	1500	1850	2100	2400	2100
S/SDBC Actual	500	600	800	900	1180					

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Oversight Procedure 03 – Special Tasks

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the performance and deliverables expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) for special tasks that may be required by FTA in addition to the project management and technical review services performed under other Project Management Oversight Procedures (OPs).

2.0 BACKGROUND

FTA may occasionally issue work orders to one or more PMOCs to perform special tasks for both program-wide and project-related activities. In the past special tasks assigned to PMOCs have included the development of technical papers in support of FTA's risk management program, study of factors leading to project cost increases on major capital projects, updates to the project management oversight procedures, etc.

3.0 OBJECTIVES

Utilizing the PMOCs' professional expertise in both program-wide and project-specific ways should advance the knowledge base and state-of-the-practice in the industry; improve FTA's oversight of the planning, design, construction, and start-up of major capital transit projects; and in turn, result in higher quality transit projects that meet project goals, budget and schedule.

4.0 REFERENCES

References shall be provided in the assigned work orders.

5.0 PROJECT SPONSOR SUBMITTALS

If applicable, submittals will be indicated by FTA in work orders.

6.0 SCOPE OF WORK

FTA may require the PMOC to prepare professional papers, special studies, special technical assistance, and present such papers or studies. Development of professional papers or other documents may include research and development of concepts, trends, information, etc., project investigations, examinations of agency histories, etc.

Additionally the PMOC may be required to represent FTA and lead or participate in meetings with parties including but not limited to:

- Grantees and their representatives

- Legislators, legislative staff
- U.S. DOT Secretary and staff
- Office of Management and Budget
- U.S. DOT Office of Inspector General
- Non-governmental entities and industry associations such as Transportation Research Board, American Public Transportation Association, National Transit Institute, American Society of Civil Engineers, American Institute of Architects, American Planning Association, etc.
- Community representatives
- Professional peer groups

Representation of FTA and/or PMOC leadership or participation in meetings may include:

- Preparation of advance meetings and briefings with FTA staff to discuss concepts, project issues, industry conditions or trends, etc.
- Participation in and presentations at meetings, workshops, conferences, etc.
- Development of meeting agendas
- Documentation of the results of meetings in comprehensive reports
- Debriefings, follow up papers or other documents

7.0 REPORTS, PAPERS, PRESENTATIONS

The PMOC shall provide FTA with written materials fulfilling the requirements above and as stated in the assigning work order. When applicable, follow the report formatting requirements of OP-1 or other OPs as indicated in the work order. When necessary, perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. Add other software as required but documentation and report data shall be made available to FTA.

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Oversight Procedure 11 - Grantee Capacity and Capability Review

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis, and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) with regard to the Grantee's management, organization, and technical capability to effectively and efficiently plan, develop, and implement a Federally-assisted capital project.

2.0 BACKGROUND

The PMOC shall review a Grantee's technical capability and capacity to efficiently and effectively develop a Federally-assisted project for implementation by evaluating the qualifications and organizational structure of the Grantee as well as its implementation methods, policies, and procedures. Particular attention needs to be given to the Grantee's abilities, resources, and organizational structure, either through its own staff or qualified third-party consultants, to develop and implement project plans as well as identify and manage project cost and schedule risks, real estate acquisition (as applicable), safety and security requirements, quality assurance and quality control, and other issues of Federal concern. The results of this evaluation shall serve the FTA in programmatic decisions and determinations regarding whether the Grantee has demonstrated readiness to receive Federal funds at the various project stages.

3.0 OBJECTIVES

Perform an initial evaluation of a Grantee's capacity and capability to successfully implement a major Federally-assisted capital project, and perform subsequent partial or supplemental evaluations of a Grantee's continued capacity and capability during the implementation of a project. The evaluations should cover the following:

1) Organization, Personnel Qualifications and Experience
2) Project Management Planning Documents
3) Grantee's approach to the work, understanding of the work, ability to perform the work

4.0 REFERENCES

The following are the principal, but by no means the only, references to Federal legislation, regulation and guidance with which the PMOC should have a good understanding as related to the Grantee's project work being reviewed under this OP:

4.1 Regulations

- 49 CFR Part 633, Project Management Oversight, dated 1989;

4.2 FTA Circulars

- C5010.1C, Grants Management Guidelines, 10-01-98;
- C5200.1A, Full-Funding Grant Agreements Guidance, 12-05-02;
- C4220.1E, Third-Party Contracting Requirements, 06-19-03;
- C5800.1, Safety and Security Management Guidance for Major Capital Projects, 8-1-07;

4.3 Guidance

- Terms of the Full Funding Grant Agreement and referenced documents; and
- FTA's Project and Construction Management Guidelines, 2003 update.

The PMOC shall apply other applicable regulations, policies, guidelines and circulars in determining the capacity and capability of a Grantee to advance a major capital project as relevant and necessary.

5.0 PROJECT SPONSOR SUBMITTALS

The submittals to be secured by the PMOC from the Grantee shall be appropriate with the stage of project development. Such submittals include, but are not limited to, the following:

- Organizational chart;
- Project Management Plan (PMP) and associated documents;
- Identified sources of local funding;
- Proof of legal capacity to carry out the project;
- Résumés of the Grantee's key staff, including the key staff of third-party consultants;
- Description of the internal mechanisms, policies, and procedures used to control project budgets and estimate costs, as well as a description of the estimating methodology;
- Description of project scheduling method used;
- Safety and Security Management Plan (SSMP);
- Quality Control/Quality Assurance (QA/QC) Program Plan;
- Operations & Maintenance (O&M) Plan;
- Rail and Bus Fleet Management Plans.

6.0 SCOPE OF WORK

The PMOC should review the Grantee's organization to ascertain capability to fulfill the demands of implementing a major capital project. An important aspect is the Grantee's staff's qualifications and experience and their ability to recognize and manage project risk from scope, schedule and cost.

Review of the PMP and other readiness documents is also central to the PMOC's determination regarding the Grantee's technical capacity and capability and its preparedness to advance a project into the next phase.

The FTA normally engages a PMOC to review the Grantee's technical capacity and capability prior to entry to PE and may request subsequent evaluations to verify continued capability and capacity before approval of the project to enter final design and award of the FFGA.

6.1 General Review of Grantee's Capacity and Capability

At a minimum, the following items are to be reviewed by the PMOC to reach a determination of a Grantee's capability and capacity to successfully implement a major Federally-assisted capital project:

1) Organization, Personnel Qualifications and Experience:
   a) The PMOC shall review the complete organization of the Grantee to determine the likelihood of the project management team to successfully implement the project. Determine whether the Grantee has an organizational structure conducive to effective and efficient implementation of the project;
   b) Review the assigned and supporting staff qualifications, including but not limited to review of resumes and personal interviews. Determine whether the Grantee has the appropriately qualified staff and/or third-party consultants to design the project.
   c) Determine if the Grantee staff has experience to deliver the project, given the form of project delivery method(s) it plans to use, e.g. design/bid/build, design/build, Construction Management/General Contractor (CM/GC), etc.
   d) Analyze whether the Grantee has the physical resources, such as sufficient office space, equipment and furnishings to effectively and efficiently progress the project.
   e) Determine if the Grantee has, or will have, adequate qualified personnel and facilities to maintain the project along with the Grantee's existing system.
2) PMP and other readiness documents:
   a) Ascertain whether the Grantee has drafted a Project Management Plan (PMP) and associated readiness documents appropriate for the stage of project development at the time the evaluation is taking place and, as required by FTA, whether the PMP and other readiness documents are being updated by the Grantee on an ongoing basis.
   b) Review the PMP to determine if it defines the objectives of the project and the methods and resources to be used in meeting those objectives. See the OP for PMP review for more instruction. Where the current PMP is determined by the PMOC to be adequate for the stage of project development, the PMOC is to forecast a date when the PMP will require updating.
   c) As an example of associated readiness documents: Fleet Management Plan -- If available, the PMOC shall review the Grantee's Fleet Management Plan (Bus and/or Rail) to determine that the Grantee has, or will have, a sufficiently sized fleet to service the project without acquiring a surplus or reserve fleet that exceeds reasonable requirements. Refer to other OP for instruction on performing an FMP review.
3) Grantee's approach to the work, understanding of the work, ability to perform the work
   a) Review the adequacy of the Grantee's methods, policies, and procedures for developing and updating reasonable and realistic project budgets, cost estimates, and schedules and the control mechanisms in place to monitor and ensure adherence with said budgets, estimates, and schedules;
   b) Evaluate the Grantee's ability to
      i) identify, analyze, manage and mitigate project risks, especially those involving cost, technology and schedule risks, in the project;
      ii) satisfy FTA grant reporting requirements and respond in a timely manner to specific requests from Congress, the FTA, and the PMOC for project-related information;
      iii) package, procure and manage third-party contracts in compliance with FTA and other Federal requirements;
      iv) account for project property and maintenance of project property inventory;

v) develop and implement a force account plan;
vi) develop and implement safety and security measures and a Safety and Security Management Plan;
vii) comply with contract terms of the Full Funding Grant Agreement.

c) Evaluate the Grantee's understanding of
i) its obligations under Title VI of the Civil Rights Act of 1964, the Disadvantaged Business Enterprise (DBE) Program, the Americans with Disabilities Act, etc.;
ii) the requirements associated with real estate acquisition and relocation in accordance with the Uniform Property Acquisition and Relocation Act of 1970, as amended, either with its own staff or with qualified consultants;
iii) the importance of entering into clearly defined intergovernmental and other local agreements in a timely manner to secure sources of local funding and cooperation;

4) Financial Capacity: The PMOC shall review the Grantee's plans to finance the local share of the FFGA and determine whether it has the ability to secure the required local funding. This review should also include the Grantee's contingency options in the event that alternative sources of local matching funds become necessary.

If the PMOC determines that the Grantee is inadequate or weak in terms of its 1) organization, personnel qualifications and experience, 2) Project Management Planning Documents, or 3) approach to the work, understanding of the work, or ability to perform the work, the PMOC should make recommendations for corrective action along with a time frame for these actions.

6.2 Additional Reviews of Grantee's Capacity and Capability

The FTA may authorize performance of additional reviews during the project implementation process, typically after the Grantee updates the PMP in preparation to advance to the next project stage, or as follow-up to identified weaknesses in the PMP. As part of these additional reviews and depending on the issues of concern, the PMOC could be directed to review plans such as Real Estate Acquisition Management Plans, Safety and Security Management Plans, Quality Assurance and Quality Control Plans, Risk Mitigation Plans, and Execution Plans/Cost-to-Complete Projections. The purpose of reviewing these other project plans in conjunction with a technical capacity and capability review is to determine competency to fulfill the objectives and requirements of these plans.

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall provide FTA with a written report of its findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. After FTA approval, the PMOC should share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

The report formatting requirements of OP-1 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

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Oversight Procedure 12 - Recurring Oversight and Related Reports (Periodic, Trip, Quarterly, Final)

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) as regards ongoing or recurring oversight of major capital transit projects. In addition it is to describe the expected type and quality of reports of the PMOCs' findings, conclusions and recommendations based on oversight activities.

2.0 BACKGROUND

In its major capital program, FTA oversees projects with costs ranging from $100 million to multiple billions of dollars. These projects are complex. They extend for miles and cross jurisdictional boundaries. They are fitted into existing urban, rural and railroad environments. They are designed to accommodate and transport persons while providing comfort, convenience, safety and enjoyment. These projects are meant to last decades, sometimes even centuries.

Ongoing and recurring oversight by the PMOC helps FTA to accomplish its fundamental stewardship role, provide technical assistance to Grantees in their efforts to avoid problems and capture opportunities, and meet the requirements of 49 CFR Part 633, the Project Management Oversight Rule. This rule states that "Project Management Oversight" is the monitoring of a major capital project's progress to determine whether a project is on time, within budget, in conformance with design criteria, constructed to approved plans and specifications and is efficiently and effectively implemented. The PMO rule also describes the roles and responsibilities of FTA and recipients of federal funds (Grantees) with respect to the PMO program and Project Management Plans (PMP.)

As part of the PMOC's ongoing and recurring oversight activities, written reports are required to be submitted to FTA. In addition to the instructions below, refer to OP 01 for a larger description of the PMOCs' role and report requirements.

3.0 OBJECTIVES

The objective of the reports is to provide FTA with important information gleaned from the PMOC's oversight regarding the project and the Grantees' ability to implement the project. By keeping FTA informed of findings, project status, issues of concern, and recommendations for action, the PMOC supports FTA's decision making on project advancement and funding.

4.0 REFERENCES

The following are the principal, but by no means the only, references to Federal legislation, regulation and guidance with which the PMOC should have a good understanding as related to the Grantee's project work being reviewed under this OP:

4.1 Regulations - Project Management Oversight, 49 C.F.R. Part 633

5.0 PROJECT SPONSOR SUBMITTALS

Material that should be reviewed by PMOCs as part of oversight includes:

- Grantee communications with FTA, other agencies, third parties, etc.
- Design drawings and construction documents including specifications
- Cost estimates in Grantees' original format and FTA Standard Cost Category (SCC) format
- Schedules
- Value engineering findings and recommendations reports
- Risk assessment reports
- Consultant Contracts
- Project Management Plan and sub-plans
    - Bus Fleet Management Plan
    - Rail Fleet Management Plan
    - Safety and Security Management Plan (SSMP)
    - Real Estate Acquisition and Management Plan (RAMP)
    - Quality Management Plan
    - Project Development and Project Execution Plans
    - Third-party Agreements
    - Safety and Security Management Plan and Safety and Security Certification Plan
- Construction Administration/Management files
    - Selection of project delivery methods
    - Organization and coordination of contract packages
    - Terms and conditions of construction contracts
    - Addenda to bid packages
    - Bid tallies
    - Construction contracts signed
    - Change order (includes potential Change Orders) files
    - Claims (includes potential Claims) file
    - Request for Information (RFI) logs
    - Inspection Reports
    - Meeting Minutes
    - Contract Management (CM) reports

6.0 SCOPE OF WORK

PMOC activities vary with the project phase; however, the following activities are fundamental and should be reflected in reports in every phase:

- Evaluation of Grantee's technical capacity and capability to effectively and efficiently design, build and operate the project; evaluation of Grantee's project controls for scope, cost, quality and schedule

- Review to ensure Grantee compliance with applicable statutes, regulations and FTA guidance as well as conformance with the terms and requirements of FTA approved plans or agreements (e.g. approval for entry into Final Design, Letter of No Prejudice, Full Funding Grant Agreement, etc.)

6.1 Quarterly Meetings

The Quarterly Meeting should be clearly focused on the Grantee's management of scope, cost, schedule, risk, safety, and quality. This meeting occurs four times per year and is usually conducted by the Regional Administrator.

The PMOC prepares the meeting agenda in coordination with the FTA work order manager. The PMOC is expected to be prepared and knowledgeable about the project and to participate with insightful questions, suggestions, and comments at the meeting. The PMOC should be able to explain concerns and recommendations to the project sponsor in a clear, plain, concise, credible, congenial, professional and objective manner. The PMOC may be called upon by the FTA task order manager or work order manager to meet prior to the quarterly for a briefing.

The meeting notes should accurately and completely capture the main points of discussion at the meeting without substantial changes or editing by meeting participants. After the meeting, the PMOC should submit the quarterly report to FTA within fifteen days.

The report should include notes from the quarterly meeting. Importantly, the quarterly report should provide comprehensive coverage of the project. The PMOC is to address project status and critical issues, and provide professional opinions and recommended actions.

Include in the quarterly report:

- **Cover Page** (refer to OP 01)
- **Executive Summary** (two pages max); at the following quarterly meeting, the PMOC is responsible for raising the issues in the Executive Summary as "Old Business" to verify they have been resolved, etc.
    - Status of project/how the project is doing: if things are not going well, why not and what is being done
    - Changes since the last report

- PMOC's opinion of situations and recommendations for action with identification of party responsible for resolution

- **Table of Contents**
- **Project Overview** (see Appendix A)
- **Body of the report** - for each item (1) through (8) below, include status; observations; concerns; recommendations; project maps (as required to explain); project photos (as required to explain);
  - (1) Grantee Technical Capacity and Capability
    - (a) Grantee organization, vacancies in the organization; if the organization is effective or needs to be changed to better lead the project during the current and next phase of development.
    - (b) Comment on status, adequacy, usefulness of
      - (i) Project Management Plan and sub-plans
      - (ii) Project Quality
      - (iii) Project Controls
      - (iv) Safety and Security
  - (2) Project Scope
    - (a) design, bidding, construction status
    - (b) description of contract packages, selection of delivery method
    - (c) contract terms and conditions
    - (d) concerns, recommendations
  - (3) Project Schedule status
    - (a) 90-day look ahead for important activities by the Grantee, FTA and the PMOC
    - (b) Table containing Critical Path activities through the next milestone as well as the revenue operations milestone. From quarterly report to quarterly report, one will be able to see changes in the critical path.
    - (c) Narrative explaining changes in the critical path and recommending actions to recover time
  - (4) Project Cost status
    - (a) Standard Cost Category (SCC) worksheets (Main and Inflation)
      - (i) The quarterly report should include copies of the Grantee's current Standard Cost Category (SCC) Main and Inflation Worksheets. During construction, SCC Main and Inflation worksheets for each contract should be included so the sum of the Main worksheets equals the total project cost.
    - (b) Cost to date, cost to complete
    - (c) Explanation of variances between planned and actual cost
    - (d) Information on funding sources, if required
  - (5) Project Risk, risk management, risk mitigation actions
    - (a) Indicate date of initial risk assessment and risk updates
    - (b) Include a table of top five cost risks and top five schedule risks and status of each
    - (c) Allocated contingency by amount and by percentage of construction cost
    - (d) Unallocated contingency by amount and by percentage of project cost
  - (6) Real Estate –
    - (a) Supporting information such as length of right-of-way (ROW), major stakeholders (especially railroad), and the current status of full and partial takes (estimated number of properties, acquired/appraised, etc.); information on properties that

require environmental mitigation, extensive utility work or third-party coordination, and/or relocations

(7) Vehicles – Status of design, procurement, approvals by state safety board, testing, etc.
(8) Third-Party Agreements including utilities, railroads, other agencies, etc.
  (a) List and provide status of required agreements with outside parties
(9) Any other important issues that were discussed and the results.
(10) List of Action Items (results/status of pending action items)

- **Appendices** – In general, include simple exhibits (tables, schedules, photos) in the body of the report to enhance understanding of the report. Use appendices for longer supporting information that could hinder the report's readability.
- **List of Acronyms**
- **Sign-in sheet of meeting attendees**

6.2 Periodic or Monthly Meeting Reports

Periodic typically means *monthly*, although twice monthly or every other month visits may be directed by the FTA work order manager. Periodic or monthly reports should be no more than twelve pages long and should be submitted within five days of the meeting with the Grantee. These brief reports cover PMOC activities, interactions with the Grantee, observations, evaluations, professional opinions and recommendations regarding the status and direction of the project and Grantee's technical capacity and capability to effectively implement the project. Include:

- Cover page
- Executive summary
- Of the items listed under quarterly meetings above, cover only those items necessary to inform FTA of the most important project occurrences and issues and next steps. Use narrative, photos, tables, etc as required to clearly convey points.

A *final* report is simply the last periodic report submitted to FTA, usually after construction is complete, the project is in revenue operations, and construction contracts are closed out.

6.3 Reports for Special Meetings and Site Visits

Trip reports cover only the few subject items discussed at the meeting or site visit. Trip reports should be three to four pages long and should be submitted within five days of the meeting.

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall provide FTA work order manager with written reports of its findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. After FTA approval and incorporation of comments, the PMOC should share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

The report formatting requirements of OP-1 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

The specific timing of meetings with Grantees will be defined in the scope of work in the work order issued under a task order.

APPENDIX A

Project Overview

Date: ___
Project Name: ___
Grantee: ___

Scope
Location: ___
Guideway: ___ route miles
___ relationship to grade
___ extent of shared use track, shared ROW
Stations: ___ quantity, type
Support: ___ quantity, type of facilities, location
Vehicles: ___ quantity, type

Ridership ___ Number of Average Weekday Boardings in Opening Year 20__
___ Number of Average Weekday Boardings in Forecast Year 20__

Schedule
2/03 FFGA Award
12/05 Revenue Operations Date in FFGA
7/08 Revenue Operations Date CURRENTLY
71% Percent complete Construction
74% Percentage of time elapsed based on Rev Ops Date of 7/08

Cost
$___M Total Project Cost at last milestone (e.g. FFGA Award) including $___ in Finance Charges
(43%) $____M Federal 5309 New Starts
(57%) $____M Other

$___M Total Project Cost currently including $___ in Finance Charges
(31%) $____M Federal 5309 New Starts
(69%) $____M Other

$____M Spent-to-date from Total Project Budget (incl. construction contracts)
__% Complete based on expenditures (drawdowns) from Total Project Budget of $___M

Concerns
FTA is providing close oversight of _____'s project management and execution of the construction.

U.S. DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 14 – Lessons Learned

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the analysis and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) with regard to sharing with a wider audience the experiences in planning, design, construction and revenue operations and associated lessons learned on major capital transit projects. The application of lessons learned by sponsors of future transit projects can potentially produce higher quality projects while saving time and cost and thereby increase the effectiveness of FTA's capital investment.

2.0 BACKGROUND

The Lessons Learned program has existed for more than a decade and was developed with the assistance of the Grantees, FTA and its PMOCs. However, the central repository of lessons has not been kept up to date and some lessons were only shared with project team members. When lessons were shared with a wider audience the timing of the publication was often delayed and the impact of the lesson was reduced. FTA is renewing the emphasis on the Lessons Learned program so that it can be valuable to FTA and the transit industry.

Lessons can be derived from any aspect of project implementation: design, construction, management, etc. The PMOC, in concert with the Grantee, during each project phase, should create, add to and maintain a list of lessons learned. The Lessons Learned list should include significant findings, recommendations, and new insights realized. Maintenance of the list ensures that lessons will not be forgotten and it provides ready material for inclusion in Lessons Learned reports to FTA in a timely manner. Grantee participation ensures that the lessons are accurately portrayed with the proper perspective.

FTA will publish lessons learned on its public website, www.fta.dot.gov/publications/reports. A hyperlinked table of contents will provide access to full documents (see sample in Appendix A below.) The table of contents will be continuously updated as new lessons learned are reviewed and approved by the FTA. The FTA public website front page has the option for users to sign-up for email notification of changes or updates to the website including Lessons Learned.

3.0 OBJECTIVES

The objectives are:

- To share lessons learned on major capital transit projects with the transit industry and other interested parties
- To have the lessons readily available via the FTA public website

- To increase awareness within the transit industry of pitfalls and impediments to achievement of project goals
- To make changes in FTA policies and practices when lessons learned in the field suggest that such changes may be advisable.

4.0 REFERENCES

The following are the principal, but by no means the only, references to Federal legislation, regulation and guidance with which the PMOC should have a good understanding as related to the Grantee's project work being reviewed under this OP: The references in OP 1 apply.

5.0 PROJECT SPONSOR SUBMITTALS

TBD

6.0 SCOPE OF WORK

The PMOC shall document lessons learned in the following manner:

1) At the start of each project phase (preliminary engineering, final design, etc.) the PMOC should create the framework for the Lessons Learned list. As difficult project events occur, insert potential lessons into the framework for tracking. As the project develops, review these lessons with the Grantee and FTA staff.

2) Draft a Lessons Learned report, obtain Grantee's comments and approval on the report, then submit it to FTA for review, approval, and posting to the website.

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall provide FTA with written Lessons Learned reports. If a report content requires more than one page, a one page executive summary shall be provided. Individual lessons should be descriptively titled to allow the reader to understand the lesson content through the title alone. The lessons should be succinctly written. A Lessons Learned report on a particular project may include one or more lesson, and may or may not include project background information, at the discretion of the PMOC.

APPENDIX A

Sample - Lessons Learned Table of Contents

FTA Central Lessons Learned Database Matrix Table - All Projects **SAMPLE**

LL Report # *	LL Item #	Date	Lesson Author	R*	Metro Area	Project	Brief Description of Problem	Lesson Learned (Examples are Partial List from Projects Shown; Website links are examples only)	Category of Item
1	1	Apr-06	STV, Inc.	8	Denver	TREX	Utility Relocation Coordination, if not done up-front, can cause late completions and budget overruns.	Colorado DOT has authority to direct a Design/Build Contractor to complete any utility relocation if a utility company fails to relocate facilities within agreed-to schedules. http://www.stvinc.com/fta/lessonslearned/DenverTREX	Utilities
2	1	Aug-06	Hill Intl.	4	San Juan	Tren Urbano	Grantees are not always held accountable.	Grantees must always be held accountable for quality management and contract implementation and exercise its authority as is necessary. http://www.crai.com/fta/Hill/San Juan/Tren Urbano/Lessons Learned	Quality
2	2	Aug-06	Hill Intl.	4	San Juan	Tren Urbano	Quality could use heightened involvement.	Grantees should consider contractor incentives for performance. Http://www.crai.com/fta/Hill/San Juan/Tren Urbano/Lessons Learned	Quality
3	1	Apr-07	Hill Intl.	4	South Florida	Pompano Beach Double-Track	Problems with getting D/B contractor to submit CPM schedules.	Future contracts need to include stronger language dealing with a contractor's failure to submit accurate CPM schedules and failure to follow their schedule. Http://www.hillintl.com/fta/lessonslearned/SouthFloridaPBDT	Contracts - Schedule language
3	2	Apr-07	Hill Intl.	4	South Florida	Pompano Beach Double-Track	D/B contracts can have extra costs the same as sealed bid.	For future design/build projects, the budget needs to include a larger contingency amount to allow for issues that arise during the final design stage. Http://www.hillintl.com/fta/lessonslearned/SouthFloridaPBDT	Budget - contingency
4	1	Sep-07	FTA TPM-20	All	All	All	Bids are coming in high on many projects nationwide.	Grantees should consider use of early completion incentives to stimulate greater bidder interest (more bids) and lower bids. Http://www.fta.dot.gov/TPM-20 Recommendations	Budget - incentives
**									
**									

*** R = Region number**

**** FTA will assign next available number to item in database which should also be indicated at the top of a PMOC's full Lesson Learned report.**

U.S. DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 20 - Project Management Plan Review

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) as regards a Grantee's Project Management Plan (PMP) submission, revision and ongoing maintenance (i.e., updating to keep it current and accurate). A Grantee's PMP shall describe the Grantee-approved policies, practices and procedures related to Grantee management processes that are to be focused around sound decision-making, driven by a thorough understanding and implementation of risk-informed, fundamentally sound, project strategies and plans.

The initial Project Management Oversight Program (PMOP) was the outgrowth of Congressional concern for the negative direction major transit capital improvement projects were experiencing relative to cost, schedule and the performance of finished projects vis-à-vis ridership and service characteristics. Once again, the latest legislation, SAFETEA-LU, has sought to emphasize the vital need for increasingly improved forecasting of ridership and costs for major transit capital projects. The message has been and remains that the transit industry and FTA as the steward of the Federal financial participation in such projects must find better and more effective means to deliver projects that meet realistic transit demand at an affordable cost, with budget overruns contained.

Therefore, the PMP review and analysis by the PMOC provides a major input to FTA in its determination of the adequacy of the Grantee's legal, administrative and technical capacity and capability to execute the project effectively and efficiently, including planning, design, and implementation. It provides an assessment of the Grantee's grant application and readiness to receive Federal funds for further project development.

2.0 BACKGROUND

2.1 Overview

FTA received its project management oversight mandate and funding from Congress through the Surface Transportation and Uniform Relocation Assistance Act of 1987. The Act and subsequent amendments required that a recipient (Grantee) receiving United States Government financial assistance for a major capital project must prepare and carry out a Project Management Plan (PMP) approved by FTA. A regulation to respond to this legislation was promulgated by the FTA in 1989, known as the PMO Rule, 49 C.F.R. Part 633.

Among other requirements, the PMP requirements mandate that the Grantee provide for:

- adequate recipient staff organization with well-defined reporting relationships, statements of functional responsibilities, job descriptions, and job qualifications;

- a budget covering the project management organization, appropriate consultants, property acquisition, utility relocation, systems demonstration staff, audits, and miscellaneous payments the recipient may be prepared to justify;
- a construction schedule for the project;
- a document control procedure and recordkeeping system
- a change order procedure that includes a documented, systematic approach to the handling of construction change orders;
- organizational structures, management skills, and staffing levels required throughout the construction phase
- quality control and quality assurance functions, procedures, and responsibilities for construction, system installation, and integration of system components;
- material testing policies and procedures
- internal plan implementation and reporting requirements;
- criteria and procedures to be used for testing the operational system or its major components
- periodic updates of the plan, especially related to project budget and project schedule, financing, ridership estimates, and the status of local efforts to enhance ridership where ridership estimates partly depend on the success of those efforts;
- the recipient's commitment to submit a project budget and project schedule to the Secretary each month; and
- safety and security management.

The Project Management Oversight Program (PMOP) was provided with funding resources to allow FTA the ability to secure non-agency technical resources necessary to augment and serve as an extension of FTA staff for more rigorous and timely review, approval and monitoring of:

- Activities to oversee the construction of a major project.
- Activities to review and audit the safety and security, procurement, management, and financial compliance of a recipient or subrecipient of funds under sections 5305, 5307, 5309, 5310, 5311, and 5320 of Title 49, United States Code
- Activities to provide technical assistance to correct deficiencies identified in compliance reviews and audits carried out under this section.

Through the years since, the FTA PMO Rule and its implementation have given rise to substantial refinements by recipients so as to more specifically identify the project management basis and practices each sought to codify for its own personnel, and its project consultants and contractors. In numerous cases, recipients even put agency and capital program-wide improvement projects, whether federally funded or not, under their PMP. FTA has also enhanced and refined the PMP requirements as impacting legislation and associated regulations from other Federal agencies became requirements for FTA funded projects. Furthermore, related FTA Rules, Circulars and Guidance became vital topics to be addressed in a recipient PMP, for example, "Major Capital Investment Projects", 49 CFR Part 611 and "Full Funding Grant Agreements Guidance", Circular 5200.1A.

Additionally, FTA experience with the use of a PMOC and their required reviews, investigations and monitoring created "lessons learned" both in FTA management of the PMOC and the products emanating from their oversight which are in keeping with industry standards for sound, effective and performance based project management. A PMOC employs personnel with a vast amount of hands-on project management expertise gained from working as owner's representatives or project consultants themselves. To achieve consistent application of the project management requirements and the PMOP

lessons learned, FTA commissioned the development of "Project and Construction Management Guidelines" (updated as recently as 2003). This document has become the textbook for training by the National Transit Institute of hundreds of recipient management and staff engaged to deliver quality transit capital projects, inclusive of facilities for all-bus and bus-rail transit systems across the country.

2.2 SAFETEA-LU Specifics

Section 3011 (c) (1)(B) (i) of the latest transportation statute, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act - A Legacy for Users (SAFETEA-LU, P.L. 109-59), requires that the FTA only approve a grant with applicants (Grantees) that have, or will have the legal, financial and technical capacity to carry out the project, including safety and security aspects of the project. See 49 USC 5309 (C).

Section 3011 (d) (2) (C) requires that FTA may only approve grants for projects where it has determined that (i) the proposed project will not degrade the grantee's ability to maintain and operate the entire public transportation system without requiring a reduction in existing public transportation services or level of service to operate the proposed project; (ii) the Grantee has or will have satisfactory continuing control over the use of the equipment or facilities; and (iii) the Grantee has the capability and willingness to maintain the equipment or facilities. See 49 USC 5039 (d) (2) (C).

Section 3011 (d) (3) (B) requires that as part of the above determination, FTA must analyze, evaluate, and consider the reliability of the forecasting methods used to estimate ridership and costs made by the recipient and, where applicable, the consultants to the recipient. See 49 USC 5309 (d) (3) (B).

Section 3011 (d) (5) (A) requires that a proposed project under this Section 3011 shall not advance from Alternatives Analysis to PE or from PE to FD and construction unless FTA determines that the project meets the requirements listed above and there is a reasonable likelihood that the project will continue to meet such requirements. See 49 USC 5309 (d) (5) (A).

Section 3026 (a) modified the PMP and related oversight requirements by adding the reference to Safety and Security Management as an additional element of a PMP. See 49 USC 5327 (a) (13).

2.3 FTA Circular Background

FTA's Grant Management Guidelines, FTA Circular 5010.1C, Chapter I, Project Administration and Management, describes the process and provides guidelines and procedures for management of FTA grants at 49 U.S.C. Chapter 53, inclusive of the Section 5309 Capital Program (Bus, Fixed guideway and New Start) and the Section 5307 Urbanized Area Formula Program.

Circular 5010 also notes at Chapter I, Section 3, Grantee Responsibilities for Grant Administration and Management, that the Grantee is responsible for administration and management of the grant in compliance with the grant agreement and applicable FTA circulars and regulations. Further, in that same section, it states that FTA monitors grants to confirm that Grantees establish and follow procedures that are reasonable and comply with FTA requirements. Lastly, the Grantee's responsibilities include actions that:

a) Provide continuous administrative and management direction of project operations.

b) Provide, directly or by contract, adequate technical inspection and supervision by qualified professionals of all work in progress.
c) Assure conformity to grant agreements, applicable statutes, codes, ordinances, and safety standards.
d) Maintain the project work schedule agreed to by FTA and the Grantee and constantly monitor grant activities to assure that schedules are met and other performance goals are being achieved.
e) Keep expenditures within the latest approved project budget.
f) Assure compliance with FTA requirements on the part of agencies, consultants, contractors, and subcontractors working under approved third-party contracts or inter-agency agreements.

Circular 5010 notes at Chapter 1, Section 9, Design and Construction, the following:
"Project Management Plan. A written plan is required by 49 U.S.C. Section 5327. Grantees develop and implement a project management plan for all major capital projects funded by FTA as part of the Project Management Oversight Program. This plan covers a Grantee's detailed project management strategy to control the project budget, schedule and quality."

The PMP should adhere to the requirements in FTA Circular 5200.1A Full Funding Grant Agreement (FFGA) at Chapter II, Section 5, Project Management Plan wherein it states the following:
"The Project Management Plan is central to FTA's determination of whether an applicant has the technical capacity and capability to build, operate, and maintain a new starts project."

2.4 FTA Guidelines Background

The requirements for the PMP are also defined in more detail in FTA's Project and Construction Management Guidelines, 2003 Update, ("PCM"). The purpose of the PCM is to provide guidance to Grantees (and prospective Grantees) relative to basic and fundamental project management principles and practices, and to summarize FTA requirements, best practices, and research results in the management of transit capital project development." [1]

The PCM recommends a project management approach with phases where each should 1) start with inputs or a baseline, 2) have a process that refines the project definition and generates outputs that, 3) become the inputs or baseline for the subsequent phase. By defining the requirements for each phase and sound approaches to their accomplishment, the PCM leads Grantees to define project requirements, allocate resources, perform project activities, monitor progress, and make adjustments, as required, to obtain the proper information and assure decisions are made at the appropriate time.[2]

The PCM notes further that Grantees should apply the management principles and guidance embodied in the PCM to their unique project environment through the development of a the required Project Management Plan, thereby providing a blueprint for the Grantee's approach to managing in their unique project environment.[3]

Section 2.2.3 of Chapter 2 in the PCM discusses the requirements for Project Management Plans (PMP). It notes that many, but not necessarily all, Grantee project management concepts are developed

[1] Project and Construction Management, 2003 Update, Chapter 1, pg 1-1
[2] Ibid, page 1-1
[3] Ibid, Page 1-4

initially during the Alternatives Analysis phase and should be documented in the PMP. It lists 13 elements that at a minimum are to be part of any PMP[4]; these mirror the legislative language for basic topics to be covered in a PMP.

The PCM goes on to delineate the PMP as the key document for a Grantee to:

- Demonstrate that all phases of the project have been thoroughly considered, giving thought to the methods to be used to execute the project, and the interfaces that will be created between various participants;[5]
- Define the objectives of the project, and the methods and resources proposed to be used in meeting those objectives.
- Define the overall management strategy including project control.
- Define responsibilities, authorities, and measures of performance for all parties involved.
- Recognize the role of FTA in the oversight and independent review of the project.[6]
- Address the requirement for environmental reviews and for adhering to the resulting mitigation measures in the design and construction phases. [7]
- Develop and implement a Safety and Security Management Plan (SSMP)[8]
- Plan for and justify force account utilization to support project design and implementation in accordance with FTA Circular 5010.1C .[9]
- Provide a means of organizing the project to allow for effective control and establish a detailed Work Breakdown Structure (WBS) encompassing all of the work elements for a project. With tasking in the PMP or other project master or subordinate plans developed into WBS elements.[10]

The PCM goes on to note that a major aspect, significant in assuring the success of the project development process, is the continued refinement of the PMP by the Grantee."[11]

3.0 OBJECTIVES

3.1 Fundamental Roles – Grantee, FTA, and PMOC

It is essential that the PMOC understand that the preparation of project management documentation is the responsibility of the Grantee, as is the resultant execution of the total project. FTA and its PMOC are responsible for providing the Grantee with technical assistance relative to the PMO Program requirements and, in turn, overseeing the Grantee activities to ensure federal laws and prerogatives are adequately addressed and performed by the Grantee.

[4] Ibid, Chapter 2, page 2-11
[5] Ibid, Page 2-12
[6] Ibid, Page 2-12
[7] Ibid, Page 2-14
[8] Ibid, Page 2-25
[9] Ibid, Page 2-32
[10] Ibid, Page 3-12
[11] Ibid, Page 2-32

3.2 Project Management Plan (PMP)

This is the Grantee's overarching project implementation plan that essentially spans the project period commencing at least at the completion of the Alternatives Analysis Phase (AA Phase) and continuing through the close-out of the planned capital grant for the project. This applies to a FFGA grant or any other grant made through the various available capital grant programs of FTA.

Although legislated for "major capital projects", the Project Management Oversight Program has had to be invoked for all matter of capital improvement projects as a result of new types of transit systems being planned, being advanced by agencies with little or no experience with the type of transit system funded, or being advanced by agencies whose track records have not resulted in projects being implemented within budget, on schedule or meeting the original intent of the FTA capital grant (inclusive of not only Full Funded Grant Agreement grants, but also base capital grants from the discretionary as well as the formula grant programs). The recent inclusion of what has become known as the "Small Starts" and "Very Small Starts" capital grant programs adds to the mix of projects and Grantees. As will be discussed later (see section 3.3), though no two PMPs may be the same, nor should they be, a PMP is required for every major capital project, small and very small New Starts, and significant though not routine acquisition, rehabilitation, or maintenance of vehicles (buses, passenger rail cars, ferry boats, automated people movers, or other public transit vehicles) by a recipient using technology or procurement methods:

- not utilized currently in the day-to-day operation of transit systems in this country, in the day-to-day operations of a particular recipient, or
- where a project would be advanced without sufficient recipient in-house procurement experience and technical capabilities for the size or complexity of the project.

The PMP will naturally be an evolutionary documentation by a Grantee of its policies and practices for governing its conduct of all requisite project activities, inclusive of establishing procedures for Grantee management and staff (and all third parties as applicable to project need and/or implementation techniques) that best ensure that performance is (qualitatively and quantitatively) measurable through sound design, engineering and comparable industry practices that are readily identifiable, credible and consistently applied. The PMP will identify for use, through references, specific administrative and technical procedural documents the Grantee will appropriately develop to implement the Grantee policies and practices necessary for project success as envisioned and contracted through FTA grants.

The Grantee's PMP must, if it is to be effective and meet FTA requirements for sound risk-informed project management, encompass and reveal clear understanding by the Grantee that the project (or projects) to be implemented has inherent risks. Furthermore, these risks must be fully understood so that the Grantee can prepare for potential scope, cost and schedule uncertainties which – as with most every capital facilities or equipment project - are likely to arise. Additionally, that the Grantee has prepared for and will continually monitor and have the capability to identify and respond to the uncertainties through comprehensive and performance based metrics.

To enable the effective use of performance based metrics, the Grantee must provide an initial and evolving risk management and contingency management program, and, subsequently, integrated plans to be followed. In so providing the Grantee's policies and practices relative to uncertainties in project

activity performance within the PMP, the Grantee adopts the principle of risk-informed project management coincident with the FTA's objective for the PMOP.

3.3 PMP Form and Format Discussion

Appendix A provides a typical Table of Contents for a PMP. This table of contents builds upon the legislated requirements for a PMP. Through the years since the PMO Rule was promulgated, its implementation has given rise to substantial refinements by Grantees so as to more specifically identify the project management basis and practices each sought to codify for its own personnel, and its project consultants and contractors. So, too, has FTA enhanced and refined the PMP requirements as cross-cutting legislation and associated regulations from other Federal agencies (e.g., NEPA, ADA, and Homeland Security) became requirements for FTA funded projects. Furthermore, related FTA Rules, Circulars and Guidance became vital topics to be addressed in a recipient PMP, for example, "Major Capital Investment Projects", 49 CFR Part 611 and "Full Funding Grant Agreements Guidance", Circular 5200.

FTA experience with PMPs developed by a variety of Grantees for their capital projects since the 1980s has been incorporated within this table of contents. While FTA is not rigid on the form nor the specific format used by a Grantee, each PMP is to reflect: (1) the type, size and complexity of the project; (2) the experience of the Grantee and its existing project management policies, practices and procedures; (3) the legal, financial, and technical capacity, and capability of the Grantee (and every other local and/or state public agency that is party to the project); (4) the status of project definition through each phase of development; and (5) the policies that have been adopted to ensure adequate measurement of performance toward attainment of a successful project.

With New Starts projects, the PMP may have more depth due to the type, size and complexity of the project, but in every project case a PMP becomes a foundation for FTA making the required Grantee and project "readiness" determination that federal assistance will be in keeping with the intent and guidelines of the program from which funds are to be disbursed.

3.4 Development of Grantee PMP

Inasmuch as few, if any, Grantees have all the authorities to plan, design and implement a capital project by itself, it is important to reach out and expand the players who would be well suited to being "at the table" in the development of the PMP. To become an effective overarching framework of policies and practices for project implementation, the PMP must accurately and in a comprehensive manner encompass the roles, responsibilities and authorities vested not only in the Grantee, but also other public and quasi-public agencies and organizations whose actions (or inactions) can determine likely outcomes. This is another risk element in the implementation of capital transit projects.

A method for bringing the relevant parties to the PMP development is what is referred as "scoping", a participatory process akin to the NEPA scoping process which most recipients and transportation agencies (state and local) already know. The only pause for some question is that these parties must be quickly led to understand that FTA is <u>not</u> speaking about bringing local stakeholders from the public and non-governmental sectors into this PMP development.

What this is intended to do is have local zoning and/or permitting agencies, third-party public agencies that may perform parts of the construction work, local government legal department(s), etc., at the

table for a PMP scoping workshop. In having the correct array of agencies represented to discuss the myriad of implementation points that would engender their involvement, there would be a far better likelihood that affected parties (or, even, critical players in the process) could and would both understand the project needs from them and the Grantee would better understand the needs (and real authority) these parties have. Thus, such parties as public utility agency(ies), street department, state highway department, traffic department, zoning/permitting agency(ies), fire and police departments, governmental legal department(s), etc. would be at and participate in the PMP scoping workshops.

It is envisioned the workshop(s) would also have FTA participation, through the Regional Office or PMOC, or both. The purpose here is for everyone to have the federal requirements clearly laid out, thereby taking some pressure off the Grantee when matters of "flexibility" or "betterments", for example, might be proffered by one of the participants and put the Grantee in a corner. It would also be encouraged that the end product of these workshops would be an executed Memorandum of Agreement-type (MOA) document that might be made part of the PMP, and it would be similar in nature to a "partnering agreement".

The idea is to get important, if not vital, project implementation matters on the table and fully explored and agreed, such as: (a) real estate appraisal requirements; (b) eminent domain authority and protocols; (c) alternative delivery contracting authorities and protocols; (d) negotiated v. low bid; (e) permitting submittal requirements and protocols; etc. This scoping approach could avoid embarrassing and problematic issues later by better ensuring FTA that the Grantee knows what will be required of it from others locally (and state or states where warranted) along the continuum of project development and implementation. Lastly, such a partnering-type process and summative agreement will go a great way toward avoiding pitfalls on long-term design/construction projects when political shifts or agency leadership changes inevitably occur.

3.5 PMP Conforming Procedures

The Grantee will not be required to include within the PMP the myriad of procedures to be utilized by project staff (i.e., in-house, through inter-local agreement, third-party contractor, etc.). Instead, Grantee may (and should when existing administrative, financial and technical procedures already exist that have proven in practice to provide good results) concisely define the relevant policies and performance-measurable practices it will implement in its project management and cite, by specific reference and submission, the applicable procedural document(s).

Procedural documentation such as for project financial management and accounting, human resources, cost estimating, integrated master and lower level project scheduling, QA/QC, design, construction/procurement management, inspection, document control, change control, and configuration management are to be cited relative to carrying out the Grantee policies and practices, but specific procedural manuals or processes are anticipated to be kept as separate documents.

3.6 PMP Conforming Sub-Plans

In somewhat the same manner as procedural documents called for in the Grantee PMP, a variety of sub-plans called for will normally be separately developed under the policies and practices established at the PMP level. Before discussing several of the most vital as each relate to the conduct of Grantee project management in achieving its project goals and objectives, there follows a listing of current sub-

plans that are required from FTA Grantees and are discussed in detail in other FTA Oversight Procedures, Circulars and/or guidance documents:

- Bus Fleet Management Plan
- Rail Fleet Management Plan
- Safety and Security Management Plan (SSMP)
- Real Estate Acquisition and Management Plan (RAMP)

There are several additional sub-plans to be captured within the Grantee's PMP that FTA has promulgated as means to improve upon the project management functions of Grantees, and to tie performance to metrics that allow for higher visibility and transparency within the Grantee organization. In turn, these sub-plans will assist in providing FTA with information it requires for its stewardship charge. These Grantee PMP project sub-plans are: Development Plan; Execution Plan; Risk Management Plan; and Contingency Management Plan.

The PMP and sub-plans developed hereunder must address the management objectives by establishing means and methods the recipient shall provide to quantify and qualify the objectives, and the status and results of each major activity and contract during each period of project implementation. That is to say, relevant and applicable means and methods for scope, cost, schedule, risk, contingency, technical and administrative capability and capacity, approval authority, and contracting definition and management of the project shall be addressed. In addressing these means and methods, quantitative as well as qualitative metrics must be developed by the Grantee to permit its definitive performance measurement capability, as well as make provision for the Grantee to monitor and report trends, and implement mitigation strategies.

Following is a brief introduction to the purpose and contents of the first two of these plans.

- **Project Development Plan** – This is a sub-plan of the PMP governance prepared by the Grantee that spans the completion of the AA Phase through the completion of the PE Phase. Within the PDP the Grantee will delineate specifics for PE administrative and technical activities, Environmental Impact Statement (EIS) activities, Community Relations activities, and delineation of the process and activities Grantee will use to ensure completeness and accuracy of the PE Phase work so as to meet FTA requirements for technical and financial readiness.

  This plan, or PDP, will provide the essential processes to be used, their anticipated costs and schedule, and various metrics to satisfactorily measure performance in attaining the planned delivery of products and completion. This plan must be in full conformance with the grant agreements by and between the Grantee and FTA for PE Phase work.

- **Project Execution Plan** – This is also a sub-plan of the PMP governance prepared by the Grantee that spans completion of the PE Phase and entrance into the Final Design Phase (FD Phase), through the Procurement/ Construction Phase, the pre-revenue Testing & Start-Up

Phase[12], and the Pre-Revenue/Revenue Operations Phase, to the completion of all project contracting close-out activity[13]. Within the PEP the Grantee will delineate specifics for the FD activities, the Procurement/Construction activities, pre-revenue Testing & Start-Up activities, Pre-Revenue/Revenue Operations, any Specialized project activities, and the project contracting Close-Out activities (inclusive of training, warranties, etc.).

This plan, or PEP, will provide the essential processes to be used, their anticipated costs and schedule, and various metrics to satisfactorily measure performance in attaining the planned delivery of products and completion. This plan must be in full conformance with the grant agreements by and between the Grantee and FTA.

The PDP and PEP documentation – which are also sub-plans of the PMP – must provide for the integration and correlation of all other impacting sub-plans, at a level of comprehensiveness commensurate with the respective development and execution stages of the project[14]. These two sub-plans are shown in the following graphic (Figure 1) as they relate to the totality of the project life cycle.

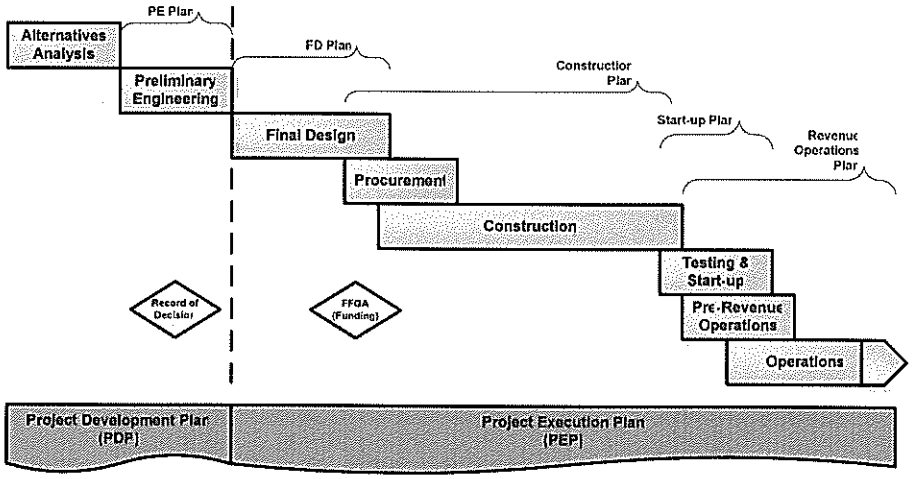

Figure 1

The other sub-plans are closely related and become integral to the PDP and PEP, and again under the governance of the Grantee PMP. FTA's objective is to work in partnership with the Grantee to ensure that Grantee's management processes are focused on sound decision-making, driven by a thorough understanding and implementation of risk-informed, fundamentally sound, project strategies. These plans are summarized below. Specific details on the PMOC responsibilities in regard to each of these plans may be found in OP-40.

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[12] Note: Commissioning is an integral part of pre-revenue testing and start-up, and the pre-revenue/revenue operations phase shall include simulated revenue service and revenue service operations, respectively. During pre-revenue service operations, FTA will verify that all systems performance levels have been met, including operational run times.

[13] Note: Another sub-plan, i.e., a Rail Activation Plan, is often developed, especially for New Starts or extension/modernization projects, and such plans intend to capture the comprehensive ingredients of the pre-revenue Testing & Start-Up Phase, and the Pre-Revenue/Revenue Operations Phase within a single documentation.

[14] NOTE: FTA's PMOC oversight procedure extant, and as may be developed/refined in the future, will be captured as regards technical and/or administrative methods of analyses or requirements and be developed for broad industry use via revisions to the "Project and Construction Management Guidelines" or through FTA Circulars.

- **Risk Management Plan** – This plan will provide disclosure of the risk assessment activities to be undertaken by the recipient over the course of the project life, and provide quantification (in time and/or costs) and qualification of those risks. In turn, the plan will provide clear and concise means and methods to be used to manage those risks, identify and deal with unforeseen risks, and reporting of all activities and results. Grantee shall clearly evidence in its PMP its commitment to implement and maintain throughout the project, an acceptable Risk Management Plan for the following:
  - Assessing (identifying and analyzing) project cost and schedule risk;
  - Developing risk-handling options inclusive of primary risk mitigation;
  - Develop a secondary mitigation plan to handle risk events or "triggered" mitigation activities;
  - Monitoring risks to determine how risks have been handled or changed; and
  - Documenting and reporting to the FTA the grantee's risk management program.

This PMP sub-plan shall include the specifics on what is to be done, when it should be accomplished, who is responsible, what is the associated cost and schedule, how will its effectiveness be measured or tested, as well as how the most appropriate risk management strategy will be selected from those options.

Separate and above the mitigation scope required by the Grantee's primary mitigation effort, the Grantee shall also commit to develop a secondary mitigation plan to handle risk events or "triggered" mitigation activities that are project phase specific. These activities arise when events occur that may include, but are not limited to, required scope changes, cost overruns, unforeseen site conditions and outside agency and force account cost and schedule impacts.

- **Contingency Management Plan** – For the purposes of the PMP document, the contingency reference in Section 13 - Baseline Cost Estimate of the FFGA, or within the budget of a non-FFGA contract, is interpreted as "total contingency" and what this plan will be directed toward. The objective of this plan is to identify at each phase, and within each phase at major milestones (e.g., negotiation of a professional services contract, opening of a construction bid), where the contingency may be potentially needed for use. It is the intent of FTA to establish a means by which recipients develop alternatives (or options) that could be advanced such that financial contingency amounts may not be necessary to mitigate potential budget overrun at points during the project's implementation.

The Grantee shall clearly evidence in its PMP its commitment to implement and maintain throughout the project, an acceptable Contingency Management Plan as an identifiable element inclusive of estimates for minimum balances and reserved portions. Grantee shall manage distribution, transfers and use of all project contingency in conformance with the requirements of this plan. This plan shall ensure that the distribution of all project contingency is appropriately controlled resulting from deliberate and sufficiently independent management action with adequate internal controls that are tested regularly. Additionally, all related transactions are sufficiently documented in a timely manner with no retroactive accounting actions. Similarly, Grantee's plan shall ensure that new contingency that is created by means of lower construction bids, contract underruns, etc. is transferred back to the appropriate contingency account in a timely manner, and identified as part of total contingency. This plan shall also describe the manner in which the Grantee shall forecast and trend the project contingency, as part of its overall progress reporting effort, in conformance with FTA requirements.

Grantee's plan shall also ensure that the amount of total undistributed contingency (inclusive of its reserve portion) throughout project implementation meets the following two requirements:

- The amount of undistributed contingency in aggregate, is at all times, above the minimums specified in the plan schedule;
- The management reserve portion is at all times above the minimums at the specified times. These time periods will be defined in terms of physical completion of planning and design ("PE", "FD"), sealed bid procurement actions for construction ("Bid") and the construction contract completion itself ("Constructed"). At the end of these specific time periods, senior Grantee management and FTA anticipate conducting joint reviews, to review among other matters, the project implementation with respect to the Contingency Management Plan and its update. As part of that process, the Grantee project organization will then seek concurrence from its governing board (or officer of entity to whom the Grantee's chief executive officer reports) for the release of the next increment from the management reserve portion of undistributed contingency.

3.7 Levels of Conformity to FTA Requirements

Levels of conformance to baseline requirements contained within a Grantee's PMP, and all sub-plans including the PDP and PEP, will be established jointly by the Grantee and the FTA. In the event that the PMOC reviews and finds insufficiencies or non-conforming elements, FTA may trigger the requirement for a Grantee to implement a recovery plan (in the worst cases), or an FTA administrative action that is deemed appropriate to the insufficiency or non-conformance to get the project back on course. In every instance of initial findings by the PMOC of insufficiency or non-conformance, there will be efforts to reconcile findings with the Grantee. Finding differences, errors and, possibly, misconceptions by and between the Grantee and FTA/PMOC is considered the optimal means to reach agreement on the subject and establish a mutually agreeable baseline for future work.

3.8 Flexibility Requirements When Alternative Delivery Mechanisms Are Introduced

It must be emphasized that this discussion of FTA objectives and role of the PMOC, regarding a Grantee's PMP, is not intended to reduce project implementation options for the Grantee. While the vast majority of New Starts projects have been and continue to use the traditional "design-bid-build" method of project delivery, the use of alternative methods for project delivery such as "design-build" (D-B) or "CM/GC" (Construction Manager/General Contractor) has been on the rise. Where such an alternative methodology is contemplated by a Grantee, the FTA guidance (and consequent PMOC task) will provide for the substitution of contractor performance metrics for specific completion criteria requirements if needed, so long as the same level and benefits of the Grantee PMP and sub-plans are delivered. Similarly, the guidance will also provide for project specific waivers if appropriate.

4.0 REFERENCES

The following are the principal, but by no means the only, references to Federal legislation, regulation and guidance with which the PMOC should have a good understanding as related to the Grantee's project work being reviewed under this OP:

4.1 Legislative
- The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, or SAFETEA-LU, P.L. 109-59

4.2 United States Code
- FTA statutes, 49 U.S.C. Chapter 53

4.3 Regulations
- Project Management Oversight, 49 C.F.R. Part 633
- Major Capital Investment Projects, 49 C.F.R. Part 611
- Joint FTA/FHWA regulations, Metropolitan Planning, 23 C.F.R. Part 450
- Joint FTA/FHWA regulations, Environmental Impact and Related Procedures, 23 C.F.R. Part 771
- U.S. DOT regulation, Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally Assisted Programs, 49 C.F.R. Part 24

4.4 FTA Circulars
- C4220.1F, Third Party Contracting Guidance
- C5010.1C, Grant Management Guidelines
- FTA Master Agreement
- C6800.1, Safety and Security Management Plan

4.5 Guidance
- Guidance for Transit Financial Plans, June 2000
- Reporting Instructions for the Section 5309 New Starts Criteria
- Interim Guidance on Design-Build
- Quality Assurance and Quality Control Guidelines
- Project and Construction Management Guidelines, 2003 Update
- Value Engineering Process Overview, January 1998

5.0 PROJECT SPONSOR SUBMITTALS

In order to assess the adequacy of a Grantee's strategies and plans to effectively and efficiently execute its project management responsibilities and obligations under FTA grants for the PE Phase, through FD, Procurement/ Construction, pre-revenue Testing & Start-Up, Pre-Revenue/Revenue Operations, and through completion of project contracting close-out activities, the Grantee is required to submit a PMP. Inasmuch as the PMP is not intended to necessarily encompass all Grantee project management documentation of practices and procedures, the PMP will most likely present policy and then refer to a named procedural document, sub-plan, etc., for specific details. Likewise, based on the phase of work, some components of the PMP may not be complete and will, therefore, not have much detail within the PMP nor yet be available as a referenced document.

5.1 Draft PMP

- Drafts of PMP referenced administrative, financial and technical management procedures and all sub-plans required.
- Cited legal documents relative to authority(ies) of Grantee and/or other local/state parties actively participating in project development and ultimate operation of the project (inclusive of interlocal agreements, memoranda of understanding, etc.).
- Plans, specifications, estimates, contracts, reports and other pertinent documentation developed for the project.

5.2 Adopted and Approved PMP, and each Sub-Plan
5.3 Subsequently adopted and approved updates of PMP and Sub-Plans
5.4 Updates of all project documentation

6.0 SCOPE OF WORK

The PMOC shall assess and evaluate the adequacy and soundness of the Grantee's PMP in conformance with FTA requirements and objectives (see OP-20 Background and Objectives), and OP-11 Project Sponsor Technical Capability and Capacity products and recommendations.

The PMOC shall assess and evaluate Grantee and material third party project information and data, and produce characterizations of the Grantee's PMP that integrate and summarize available information and data for the Federal project, providing all professional opinion, analysis, information, data and descriptive text in an accessible and understandable format.

The PMOC shall assess and evaluate the degree to which the PMP components are themselves aligned with the Grantee's overall management strategy and their effectiveness in terms of minimizing costs (and cost overruns) and schedule (and schedule slippages). That it reflects all material project activities throughout the implementation of the project[15] demonstrating a sound approach for managing the project in their unique project environment[16]. The PMOC review and its recommendations shall be developed using the following as general requirements for all PMPs in that the Grantee is required to develop and implement a PMP that demonstrates its technical capacity and ability to perform the following:

- Build, operate, and maintain the entire public transportation system without requiring a reduction in existing public transportation services or level of service to operate the proposed project.
- Effectively and efficiently, implement the project through continuous administrative and management direction of project operations. [17]

[15] In order for FTA to determine that there is a "is a reasonable likelihood that the project will continue to meet such requirements" as required by SAFETEA-LU given that the PMP is cover all material project activities and the PMP plays such a role in demonstrating the Grantee's Technical Capacity, the PMP shall cover the complete implementation of the Project.
[16] See PCM back ground....
[17] C5010, item a in Chapter I, Section 3.

- Provide, directly or by contract, adequate technical inspection, and supervision by qualified professionals of all work in progress.[18]
- Assure conformity to grant agreements, applicable statutes, codes, ordinances, and safety standards[19] as well as recognizing FTA and the PMOC's role in the oversight and independent review of the project.[20].
- Establish and maintain adequate internal control over all their project and administrative functions that affect implementation of a grant in terms of effectiveness and efficiency of operations, schedule, reliability of financial reporting (i.e., all transactions are recorded and that all recorded transactions are real, properly valued, recorded on a timely basis, properly classified, and correctly summarized and posted).[21]

The PMOC review of the Grantee's PMP should fully assess the degree to which it demonstrates that all phases of the project have been thoroughly considered, giving thought to the methods to be used to execute the project, and the interfaces that will be created between various participants. It should analyze the extent to which the PMP clearly defines the (1) objectives of the project, (2) the methods and resources proposed to be used in meeting those objectives, and (3) the overall project management strategy(ies) including Contract Packaging Strategy, project control, and the responsibilities, authorities, and measures of performance for all parties involved.

PMOC shall work with the Grantee to ensure the integration of risk-informed management into the Grantee's project development process. Similar to the basic project development process, the PMOC will utilize other OPs to interface with the Grantee's risk management efforts. The primary tools used by FTA to assess project risks are the reports generated by the PMOC in accordance with OP-40. This OP-40 document uses classical principles of risk management to provide insightful oversight, informing FTA of project status and risks as well as providing valuable recommendations to the Grantee.

The PMOC shall work in consultation with the Grantee to develop a unified list of requirements for methods and resources, management strategies including project control, and specific plans or products, responsibilities, authorities, and measures of performance for use by the Grantee in developing and implementing its PMP. The PMOC shall also integrate all relevant OP data inputs and recommendations that are available and applicable into the OP-20 product as delivered. With respect to the following OP products, the PMOC shall develop recommendations for advancing the definition/development of the project:

- Recommendations for resolving operating concept, transit capacity and level of service issues in the context of the scope, design management, etc. components of the grantee PMP.
- Recommendations for resolving project definition issues in the context of either the scope or design management components of the Grantee PMP.
- After the Record of Decision, recommendations for resolving project delivery method and contract packaging issues in the context of either the Construction Management or Project Development Plan components of the Grantee PMP.

[18] C5010, item b in Chapter I, Section 3., See also PG-08 Section H requirements.
[19] C5010, item c in Chapter I, Section 3.
[20] PCM, Page 2-12, the PMO role is in the C5010 and C5200 circulars as well as in SAFETEA-LU itself in 5327.
[21] C5010, items d thru f in Chapter I, Section 3.

- Prior to the finalized EIS, recommendations for resolving project cost estimate development or definition issues in the context of the Cost Management or other applicable components of the Grantee PMP.
- After the EIS is finalized, recommendations for resolving project cost estimate development or definition issues in the context of the Cost Management or other applicable components of the Grantee PMP.
- Recommendations for structural cost targets to be achieved upon completion of PE.
- Recommendations for resolving project schedule development or definition issues in the context of the Schedule Management or other applicable components of the Grantee PMP.
- Recommendations for Value Engineering reviews.
- Recommendations for Grantee Risk Management Plan

PMOC shall deliver recommendations for specific tasks and outcomes to discuss with the Grantee for advancing project development in general, inclusive of Transit Capacity and Level of Service, Project Delivery Method, Project Cost and Schedule, Risk and Contingency Management and Project Development and Execution Plans. PMOC should also identify additional requirements for methods and resources, management strategies including project control, and the specific plans or products, responsibilities, authorities, and measures of performance.

A primary goal of the PMP review by the PMOC is to assess the capability of the Grantee and its project management approach to take the project upon entry into PE and deliver it into Final Design with:

(1) 100% mitigation of requirements risk,
(2) substantially complete with respect to NEPA scoping, transit capacity, level of service, project definition requirements,
(3) project delivery method and contract packaging strategy selected,
(4) establishment of the cost and schedule risk baseline,
(5) risk management capacity developed and targets achieved and
(6) cost estimate and project schedule developed along planned lines and minimum contingencies targets achieved.

Presuming satisfactory completion of the PE Phase, the primary goal of the PMOC review of the PMP is to evaluate the Grantee's project execution strategy to take the project upon entry into Final Design and deliver it to the Start Up phase with:

(1) 100% mitigation of requirements, design, market and early construction risk,
(2) substantially complete with respect to definition of start up requirements,
(3) establishment of the technical risk baseline,
(4) cost and schedule risk management capacity developed and targets achieved and
(5) cost estimates, cost forecast and project schedule continue to be developed along planned lines and minimum contingencies targets continue to be achieved.

PMOC shall present recommendations for the proposed scope of the Grantee Risk Management plan consistent with the recommendations for the PDP and PEP, together with rationales for such recommendations.

PMOC shall identify and characterize the Grantee's structure and quality of the Grantee's project data reviewed for spot reports or other deliverables. The intent is to determine the extent, nature, detail and quality of the Grantee project data and the steps the PMOC took to determine its value. The PMOC shall identify and discuss the Grantee or third party data it accepted without adjustment.

The PMOC shall summarize its findings and opinion on whether the Grantee PMP demonstrates that all phases of the project have been thoroughly considered, giving thought to the methods to be used to execute the project, and the interfaces that will be created between various participants.

The PMOC shall also summarize its findings and opinion on whether the Grantee PMP has adequately and appropriately defined objectives of the Federal project, the methods and resources proposed to be used in meeting those objectives, inclusive of providing a means of organizing the project to allow for effective control with establishment of a detailed Work Breakdown Structure (WBS) encompassing all of the work elements for a project.

The PMOC shall summarize its findings and opinion with respect to the adequacy and soundness of the Grantee's overall management strategy including project control, responsibilities, authorities, and measures of performance for all parties involved.

The PMOC shall summarize its findings and opinion with respect to the adequacy and soundness of the Grantee's engineering approach for conducting environmental reviews and for adhering to the resulting mitigation measures in the design and construction phases.

The PMOC shall also summarize its findings and opinion as the adequacy of the Grantee's recognition of FTA's role in the oversight and independent review of the project in the various PMP components.

The PMOC shall summarize it recommendation as to the status of the PMP and its implementation in terms of substantially conforming with FTA's requirements or materially non-conforming with recommendations for modifications in both cases.

Present the PMOC's recommendations for a timetable for Grantee modifications to its PMP as a dynamic document.

Present the broad outlines of the PMOC's recommendations for specific management plans to make up the PMP as developed and implemented. Such recommendations will be discussed and analyzed in the context of the OP-20 Objectives.

Present the PMOC's recommendations for the PDP and PEP products in terms of risk management, contingency management, design management, requirements management, project delivery method, contract packaging strategy, etc. along with rationales for such inclusion. Such recommendations shall be adequately supported with analysis and rationales as well as identifying the current project status and timeframe of the baseline.

During the PE and FD Phases, as part of an overall budget control process, PMOC will work with Grantee to review the cost for individual construction contracts at each design deliverable (30%, 60%, 90% and 100%) to see how the most current estimates compare with budget values. These reviews will be on-going and will take place between Contingency Hold Points. Likewise, an analysis of

awarded contracts to budget will also be made. If at any point it is determined that additional shortfalls may exist, an added review of mitigation measures will take place by and between Grantee and PMOC.

During construction, the PMOC will coordinate with Grantee to review monthly the likely estimated cost at completion of each contract including all executed, pending or potential contract modifications (change orders) in comparison to the budgeted value. As in the previous paragraph, the PMOC and Grantee will evaluate if additional mitigation measures are needed and the Grantee will take the necessary steps.

Present the PMOC's recommendations for the proposed scope of the Grantee Contingency Management Plan consistent with the recommendations for the PDP and PEP products in the previous section along with rationales for such recommendations to meet the following requirements:

- Implement and maintain throughout the project, an acceptable contingency management plan that ensures that distributions of project contingency are appropriately controlled resulting from deliberate Grantee management actions; and
- All transactions are sufficiently documented in a timely manner with no retroactive accounting actions.
- New contingency that is created by means of professional services contracts (inclusive of interlocal agreements), construction bids lower than estimated, contract underruns, etc. is transferred back to the appropriate contingency account in a timely manner, and identified as part of total contingency.
- Amount of reserved contingency must be above the minimum, for the following specified time periods, also known as "FTA Hold Points". At each Contingency Hold Point, the Grantee and PMOC will review the risk model to examine potential risks remaining and to update the minimum contingency drawdown curve.
- The Contingency Management plan shall also describe the manner in which the Grantee shall forecast and trend the project contingency, as part of its overall progress reporting effort, in conformance with FTA requirements.

In all cases, use of contingency, whether or not it is above the minimum reserved contingency balance will require documented review and written approval by both the Grantee and its governing Board (or official to whom the Grantee chief executive officer reports). PMOC shall monitor and report on all use of contingency and requisite approval processing.

PMOC shall evaluate and present findings on Grantee's coordination of its Risk Management Plans and activities with its Contingency Management Plans and activities in order to ensure that the reserved contingency minimums are preserved throughout the duration of the project. Grantee's integration of such plans and activities through the creation of a "buffer zone" shall also be a matter of PMOC analysis and findings. (See OP-40 for details.)

PMOC shall monitor and report findings relative to Grantee's cost and schedule mitigation capacity and the Grantee is exercising prudent use and control of the mitigation capacities. The analysis and recommendations shall be consistent with the related PMOC products, particularly the OP-40 product.

Present the PMOC's recommendation for transitioning to the subsequent phase of the project and the continued refinement of the PMP. The PMOC shall present an outline for conducting intermediate reviews, readiness reviews using exit criteria as applicable, etc.

The PMOC shall define a surveillance plan on Grantee's development and implementation of its PMP and its conformance with all PMP requirements. This surveillance plan should present an overview of the issues, technical approach and PMOC's recommendations or course of action and shall identify sampling approaches and inspection methods as well as timelines for reporting deficiencies in Grantee performance, taking corrective actions and varying the level of surveillance depending on the Grantee's conformance to the performance standards. The purpose of the PMOC's surveillance plan is to provide the FTA with an effective tool to manage the PMOC activities and to ensure that the Grantee project implementation achieves stated objectives and targets.

In addition to the primary deliverable(s) listed above, the PMOC shall provide the following sub-deliverables. FTA may also add to this list by written direction.

- Recommendations for Conditional Approval to Enter PE/FD
- Recommendations for Project Development Agreement/FFGA

7.0 REPORT, PRESENTATION, RECONCILIATION

Each PMOC must understand that the Grantee Project Management Plan, inclusive of Sub-Plans and all other referenced documentation supporting same, represents the key project management required document for FTA to assess the legal, administrative, financial and technical capabilities and capacities of the Grantee. It is imperative that the PMOC has fullest familiarity with and understanding of the Project Management Oversight Rule (PMO Rule), as well as the various related FTA circulars and guidance, so as to ensure that it can perform a comprehensive review of the PMP, identify insufficiencies and/or areas of non-conformance, and develop findings that are supported by sound and clear analyses.

Findings contained in reports must be based on the PMOC having rigorously reviewed all aspects of the Grantee PMP, and performed the requisite research and analyses to dig below any superficiality or inadvertent statements by the Grantee of facts. Each PMOC must approach the PMP task with a risk-informed mentality and sensitivity so as to be able to best assess the Grantee PMP as documentation for the Grantee's own risk-informed day-to-day management of the project.

The PMOC shall provide FTA with a written report of its findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. After FTA approval, the PMOC should share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

The report formatting requirements of OP-1 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

APPENDIX A

Project Management Plan

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Oversight Procedure 22 – Safety and Security Management Plan Review

1.0 PURPOSE

This Oversight Procedure describes how the PMO Contractor (PMOC) shall review and evaluate the Safety and Security Management Plan (SSMP) submitted by the recipient as part of the Project Management Plan (PMP). The procedure describes how the PMOC shall assess the adequacy of the recipient's implementation of the SSMP for the specific phase addressed in the PMP. PMOC evaluations provide a major input to FTA in determining that the recipient demonstrates the technical capability to execute the project's safety and security management requirements and continues to be ready to receive Federal funds for further project development.

2.0 BACKGROUND

Section 3026 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA–LU), [Pub. L. 109–59, August 10, 2005] amended 49 U.S.C. 5327 to require recipients with major capital projects covered under 49 CFR part 633 to address "safety and security management" in PMPs submitted to FTA for approval as a condition of Federal financial assistance. Congress included this provision to strengthen the role of safety and security in all phases of major capital projects.

To implement this provision, FTA developed Circular 5800.1 "Safety and Security Management Guidance for Major Capital Projects," effective August 1, 2007, which extended requirements in FTA's Full Funding Grant Agreement (FFGA) Circular 5200.1A, Chapter II, Section 6, Safety and Security Management Plan to all projects covered under 49 CFR part 633. FTA developed additional requirements to clarify recipients' safety and security management activities in each phase of project development for each type of major capital project.

In Circular 5800.1, FTA identifies:

- Safety and security management activities to be performed by recipients (Chapter II, Paragraph 2),
- Evaluation criteria FTA will use in reviewing SSMPs and assessing implementation (Chapter II, Paragraph 3),
- The process to be used by the recipient for preparing the SSMP (Chapter III), and
- Required SSMP content (Chapter IV).

Additionally, Appendix A of the Circular provides a checklist of the types of information recipients should include in SSMPs during various phases of the FTA's planning and development process.

Circular 5800.1 applies to:

- Recipients with major capital projects, as defined in 49 CFR 633.5, initiated after August 1, 2007.

- Recipients with major capital projects, as defined in 49 CFR 633.5, involving construction of a new fixed guideway or extension of an existing fixed guideway, that are in preliminary engineering or earlier phases as of August 1, 2007.

As explained in Circular 5800.1, after August 1, 2007, previous SSMP requirements specified in Chapter II, Section 6 of Circular 5200.1A remain in effect for:

- Recipients with major capital projects, as defined in 49 CFR 633.5, involving construction of a new fixed guideway or extension of an existing fixed guideway that are in final design or later phases as of August 1, 2007.

- Recipients with other major capital projects, as defined in 49 CFR 633.5, designated by the Administrator, initiated before August 1, 2007, and applying for/receiving FFGAs.

This grandfathering provision is adopted for recipients with projects underway as of August 1, 2007 that are significantly invested in SSMPs prepared based on Chapter II, Section 6 of Circular 5200.1A and the DRAFT Guidance for Developing Safety and Security Management Plans (January 2002). Once these projects are in revenue service, the SSMP requirements in Chapter II, Section 6 of Circular 5200.1A will be phased out. Until then, FTA will evaluate conformance using Chapter II, Section 6 of Circular 5200.1A and 2002 DRAFT Guidance.

There are currently no SSMP requirements for:

- Recipients receiving capital investment grants under 49 U.S.C. 5309(e), referred to as "Small Starts" and "Very Small Starts", unless FTA's Administrator determines that a PMP is necessary.

- Recipients with major capital projects, as defined in 49 CFR 633.5, involving rehabilitation or modernization of an existing fixed guideway with a project cost in excess of $100 million, and initiated before August 1, 2007.

3.0 OBJECTIVES

The SSMP Review is conducted by the PMOC to determine if the recipient is adequately performing required safety and security management activities for its capital project, and it provides major input to FTA regarding the review and approval of the SSMP. As part of the PMP, the SSMP must be approved by FTA for the recipient to remain eligible to receive Federal funds for further project development.

3.1 Major Capital Projects Affected by Circular 5800.1

For recipients with major capital projects affected by Circular 5800.1, the PMOC's SSMP Review must:

- Determine which safety and security activities the recipient must perform, as specified in Chapter II, Paragraph 2 of Circular 5800.1 and following the process outlined in Chapter III of Circular 5800.1.

- Verify that the recipient has documented its approach to performing the required safety and security management activities in an SSMP, which is included as a separate chapter or plan referenced within the PMP.
- Verify that the recipient's SSMP includes the applicable sections specified in Chapter IV of Circular 5800.1 and meets all identified requirements.
- Verify that the recipient has the technical capacity to implement its SSMP, including adequate personnel, organization, budget and schedule.
- Determine whether the approach documented by the recipient's SSMP is being implemented, as appropriate, for the project's current stage: preliminary engineering (PE), final design (FD), application for FFGA, construction, and training and start-up.

To conduct this review, the PMOC must apply the criteria specified in Chapter II, Paragraph 3 of Circular 5800.1. As explained in Chapter II, Paragraph 3, the criteria will be applied over the lifecycle of the recipient's development process. For example, FTA does not expect a recipient preparing an SSMP with the request to enter PE to have developed comprehensive programs for each criterion. Appendix A of Circular 5800.1 lists activities FTA typically expects to see documented in each phase for different types of major capital projects.

3.2 Major Capital Projects Affected By Circular 5200.1A, Chapter II, Section 6, Safety and Security Management Plan

For recipients with major capital projects affected by Circular 5200.1A, Chapter II, Section 6, Safety and Security Management Plan, the PMOC's SSMP Review must:

- Verify that the recipient has documented its approach to performing the required safety and security management activities in an SSMP, which is included as a separate chapter or plan referenced within the PMP.
    - Required activities are identified in Chapter II, Section 6 of FTA's FFGA Circular 5200.1A, and in the DRAFT Guidance for the Development of Safety and Security Management Plans (January 2002).
- Verify that the recipient has the technical capacity to implement its SSMP, including adequate personnel, organization, budget and schedule.
- Determine whether the approach documented by the recipient's SSMP is being implemented, as appropriate, for the project's current phase.

4.0 REFERENCES

FTA Circular 5800.1, Safety and Security Management Guidance for Major Capital Projects, issued August 1, 2007. In addition, all statutes, regulations, policies, and guidance documents referenced in FTA Circular 5800.1, (section 3, References, items a. - e., p 1) apply.

5.0 PROJECT SPONSOR (RECIPIENT) SUBMITTALS

The SSMP Review is largely a document review and, therefore, calls for a large number of documents to be submitted to the PMOC by the recipient. Because the documents are such a key portion of the review, and because different recipients may, depending on the project or the regulations they are required to

follow, have different names for similar documents, the PMOC should follow the recommendations in Appendices A (SSMP Review Checklist -- Circular 5800.1), B (List of Suggested Documents), and E (SSMP Review Checklist — Chapter II, Section 6, Circular 5200.1A), and should review the Scope of Work to understand which documents may be required and how to assure they are provided within an appropriate time-frame and in compliance with relevant security provisions for their circulation.

6.0 SCOPE OF WORK

Appendices referred to or helpful in complying with this section include:

Appendix A: SSMP Review Checklist – Circular 5800.1
Appendix B: List of Suggested Documents
Appendix C: List of Possible Interviewees
Appendix D: Sample interview Questionnaire
Appendix E: SSMP Review Checklist – Chapter II, Section 5, Circular 5200.1A
Appendix F: Sample Spot Report Outline
Appendix G: Acronyms

FTA's Project Management Oversight Procedure (OP) No. 19, Simplified Spot Report Procedure, explains procedures for producing specialized assessments for recipient projects. FTA considers the SSMP Review a specialized assessment because PMOCs will conduct them as an "infrequently reoccurring" requirement when:

- For major capital projects involving construction of a new fixed guideway or extension of an existing fixed guideway, at a minimum, with the recipient's request to enter each phase of FTA's New Starts Planning and Development Process and whenever FTA requires the PMP to updated.
- For major capital projects involving rehabilitation or modernization of an existing fixed guideway with a total project cost in excess of $100 million, at a minimum, with the recipient's initial PMP submission and any other time the SSMP is updated as part of a required PMP submission to FTA.
- For major capital projects designated by the Administrator, at a minimum, with the recipient's initial PMP submission and when the SSMP is updated as part of a PMP submission to FTA.

The SSMP Review does not include on-going monitoring (i.e., monthly quarterly or bi-weekly) of the recipient's PMP/SSMP or other management plans, which is not within the scope of the SSMP Review.

FTA may require of the PMOC products or services that include more specialized assessments of recipient's safety and security management program. As part of the SSMP Review, FTA will require the PMOC to deliver products and services using the standardized procedures specified in this guidance and in conformance to individual work orders.

Whether the SSMP is a separate document or a chapter referenced within the PMP, the PMOC shall evaluate the plan based on applicable conformance requirements that will be identified in the work order.

FTA may assign an individual work order for the SSMP Review to:

- The PMOC that provides on-going monitoring of the recipient's major capital project, or
- A PMOC that specializes in the performance of SSMP Reviews.

Whether the SSMP Review is assigned to a PMOC familiar with the project or to a specialist PMOC, FTA expects that all activities will be coordinated with the PMOC providing on-going monitoring and the applicable FTA Regional Office. Specifically, the PMOC must coordinate the SSMP Review with PMP reviews conducted following guidance specified in OP No. 20, PMP Review Products and Procedures. Since the SSMP is part of the PMP, FTA's evaluation of the PMP cannot be completed until the SSMP Review is conducted.

6.1 Major Capital Projects Affected by Circular 5800.1

For recipients with projects affected by Circular 5800.1, issued August 2007, the SSMP Review will be conducted as part of the evaluation of the initial PMP submitted to FTA and at any time FTA requires an updated PMP which affects the SSMP.

6.1.1 Applicability of Safety and Security Management Activities

For the initial SSMP Review, following Chapter III of Circular 5800.1, the recipient should work with FTA and the PMOC to determine the safety and security management activities it must perform. If the recipient believes an activity specified in Chapter II, Paragraph 2 is not applicable, the recipient must explain its position to FTA and the PMOC. If FTA agrees, it will not require inclusion of the activity in the 11 SSMP sections specified in Chapter IV of Circular 5800.1. FTA anticipates this discussion will occur primarily through an in-person meeting or teleconference, though the recipient's request could be documented in a letter, email, or other correspondence to FTA for consideration.

If the recipient requests that specific activities not be included in its SSMP, the PMOC shall document the recipient's request and provide a letter to FTA recommending that FTA: accept the recipient's request, not accept the recipient's request, or ask for additional information regarding the recipient's request.

The PMOC's letter of justification for its recommendation must be provided within 30 days of the recipient's request being transmitted to FTA. If the PMOC determines additional information is needed, the PMOC must identify that information and provide a time-frame to the recipient for its submission and for the PMOC's review of the information.

6.1.2 Initial SSMP Review

The recipient is responsible for developing its SSMP as specified in Chapter IV of Circular 5800.1. Ideally, a recipient's SSMP should follow the sections and sub-sections in Chapter IV and should not include material that is not specified (such as project description, agency history, etc.). For recipients with sections or sub-sections designated by FTA as "not applicable," the phrase "not applicable" should be inserted immediately following the relevant section(s) or sub-section(s).

The PMOC should use the checklist items included in **Appendix A** of this guidance as the basis of its evaluation. Items are identified by section and sub-section, beginning with Item 1a, Safety and Security Policy Statement, and ending with Item 11, DHS Coordination. For each, the PMOC should assess how well the SSMP meets the requirements. The checklist also requires the PMOC to identify and review any

documents referenced in the SSMP to describe the recipient's approach to performing specific safety and security management activities.

Based on the degree of satisfaction with the requirements, the PMOC should rate each Item as:

- Compliant (C),
- Marginal (M), or
- Noncompliant (N).

An N rating means the FTA's intent was not adequately addressed and revision is required before the SSMP can be recommended for acceptance. An M rating means the FTA's intent was addressed but that the content is inconsistent with other SSMP sections or other plans, or that the deficiency is not so serious that it prevents acceptance of the SSMP at the current phase but should be corrected in later phases of the project. A C rating means that FTA's intent was addressed in the SSMP or referenced documents.

For each Item rated M or N, the PMOC should describe the noncompliance or deficiency and, if possible, make recommendations or suggestions to bring it to full compliance.

Appendix A of Circular 5800.1 provides additional guidance regarding the types of activities FTA expects of recipients during various project phases.

6.1.3 SSMP Adherence Review

To assess the recipient's implementation of the SSMP for specific project phases, the PMOC must conduct an SSMP Adherence Review. This Review can be divided into five activities:

- Planning the review – based on activities, documentation, committees, and responsibilities identified in the SSMP, prepare a list of documents and materials to review, individuals to interview, and sites to visit; materials not in possession of the PMOC should be requested and a delivery schedule and a schedule for the interviews and site visits should be developed
- Reviewing plans, policies, and procedures – to determine whether they are consistent with the SSMP and with the FTA's intent for management of safety and security programs
- Reviewing documentation, including memoranda, reports, records, and minutes of safety- and security-related committees – to verify that the program has been implemented and plans and procedures are being followed
- Interviewing recipient and consultant staff (senior and middle managers and consultant personnel identified in the SSMP and others with safety and security responsibilities in the agency and throughout the project) – to verify that personnel charged with carrying out the safety and security programs are aware of the SSMP and their responsibilities and are capable of meeting them
- Inspecting selected sites – to view evidence that safety and security programs are being implemented throughout the project area

6.1.3.1 Planning the Review

The recipient will be asked to supply a considerable amount of material and to schedule interviews and site visits over a relatively short time span. Based on the volume of documents and the number of people to be interviewed, the PMOC may perform the review using a small team of safety and security experts working under a project manager.

The PMOC may consider an orientation and alignment tour led by the recipient's senior project staff members, including safety and security personnel, to assist in preparation of a Document Review Plan and Checklist of Documents (see **Appendix B**)[1] and to identify interviewees. These should be discussed with the recipient and the logistics of document review and interviews resolved. It is a good practice to document this step with an informal progress report to the FTA Task Order Manager (TOM).

If the project is a rail transit or commuter rail extension or addition, or a rehabilitation or modernization project, the recipient's System Safety Program Plan (SSPP) and System Security Plan (SSP) should be reviewed to assure that the SSMP and referenced documents cover all required safety and security management activities for the project. Similar documents, which may be differently titled, should be reviewed for bus agency projects; these might include an SSPP in the states requiring one, or other safety and security related documents.

A number of documents to be reviewed may be labeled Security Sensitive Information (SSI) in conformance with 49 CRF Part 15. Since the TO will not authorize access to SSI materials, the PMOC must obtain clearance from the TOM. Once this has been approved, the recipient will be expected to provide the material, usually with password protection or a similar safeguard. Non-SSI documents can sometimes be distributed on a file transfer protocol (ftp) site if recipient and PMOC have that capability.

The schedule of site visits should be prepared after the PMOC has reviewed documents to gain a sufficient understanding of the safety and security issues of the project.

6.1.3.2 Review of Plans, Policies, and Procedures

Upon receipt, the PMOC should review in-depth all plans, policies, and procedures that make up the safety and security programs referenced in the SSMP. The PMOC must determine whether the SSMP and its supporting documents describe consistent, comprehensive, and effective safety and security programs. Supporting documents should be identified in the SSMP and the content consistent with the SSMP and with sound safety and security practice and principles.

FTA will assess the SSMPs using criteria identified in items 1 through 12 below that are also listed in Circular 5800.1, Pages II-4 and II-5. FTA gives each criterion equal weight in the review process.

(1) The assignment of responsibility for safety and security, including the process for maintaining responsibility over safety and security tasks it delegates to outside consultants and/or contractors.

[1] Appendix B lists documents and other materials the PMOC may want to examine. It is a guide; not all materials will be relevant to all projects or recipients and it is possible that some relevant materials may not be listed. The Appendix indicates which materials should be relevant at each phase and which documents are generally agency-wide or project specific.

(2) The effectiveness of the process to identify and communicate safety hazards and security vulnerabilities during each project phase.

(3) The recipient's technical capacity to support and maintain the levels of duties and responsibilities identified for safety and security activities in the SSMP.

(4) The safety and security budget and schedule, including the recipient's determination regarding the resources it requires for the safety and security activities in the SSMP.

(5) The extent to which the recipient incorporates safety and security requirements into the project's technical specifications and contract documents.

(6) The extent to which the recipient incorporates the SSMP activities and requirements into the technical direction provided to consultants, contractors and recipient personnel.

(7) The effectiveness of the approach to managing the safety and security activities of contractors.

(8) The extent to which the recipient takes documented action to address safety and security concerns in a timely and appropriate manner.

(9) The effectiveness of the approach for verifying that contractors, recipient staff, and committees built, installed, inspected, and tested all facilities, systems, and equipment in accordance with the recipient's adopted safety and security requirements, as reflected in the project's technical specifications, drawings, and contracts.

(10) The effectiveness of the recipient's process for verifying that contractors, recipient staff, and committees ensure the readiness of operations and maintenance personnel for revenue service.

(11) The effectiveness of the recipient's process for providing safety and security certification, issuing the Final Verification Report, and managing any identified restrictions or work-arounds to full safety and security certification.

(12) The effectiveness of the recipient's process for ensuring compliance with requirements specified by State oversight agencies, Federal Railroad Administration (FRA), and Department of Homeland Security (DHS) agencies, including Transportation Security Administration (TSA) and Office of Grants and Training (OGT).

6.1.3.3 Review of Project Documents

The PMOC should assess whether the safety and security programs described in the plans, policies, and procedures are being implemented. As explained in Section 6.1.3.2 above, documents will differ depending on the recipient and the project; the review may include reports of committees with safety or security oversight responsibilities, especially to determine membership, meeting schedules, document control policies, and mechanisms for tracking open issues and bringing unresolved issues to the recipient's senior managers. (See **Appendix B** for typical documents)

6.1.3.4 Interviews

Interviews are crucial for determining that those assigned responsibilities in the SSMP are aware of and understand their roles.[2] The PMOC must identify individuals to be interviewed and work with the recipient to prepare an interview schedule. The SSMP will identify those with safety or security responsibilities (by title and responsibilities) and recipient and project organization charts may identify additional interview candidates. **Appendix C** lists examples of suitable titles. The PMOC should include consultant or contractor personnel who are assigned full-time (seconded) to the project.

The interview process may take several days, depending on the number and availability of interviewees. It should begin with a meeting (an hour or less) with those who will be interviewed, the recipient's executive staff, and a representative of the FTA region. This establishes the authority for the interviews, provides for introductions, and allows the PMOC to explain the purpose and importance of the review.

Interviews should not exceed 30 minutes. They should be scheduled at 45 minute intervals to allow time for the PMOC to gather information and allow interviewees to ask questions. Questions should be prepared that are specific to each individual's role; **Appendix D** provides a sample interview questionnaire. The questionnaires should be used for recording answers and making notes. It is not recommended that interviews be tape-recorded because this may inhibit interviewees from speaking openly. If the PMOC does intend to record the interviews, each interviewee should be asked at the start of session whether he or she would prefer to speak without being recorded.

6.1.3.5 Site Inspections

Site inspections should include the proposed right-of-way, locations of proposed terminals, existing terminals, and major stations that will be part of the new system, parking lots, and rail or bus vehicle storage, repair, and maintenance facilities.

A senior project staff member or project safety officer should lead the visits. Unless scheduling is difficult, all PMOC team members should participate in the inspections. In addition to initial inspections, periodic inspections should be performed, especially during construction, to verify that safety and security procedures are being followed. Construction phase observations should include determination that contractors are wearing required personal protection equipment (PPE), that site security is in place, that precautions have been taken to protect the surrounding public and properties, and similar construction-specific safety and security concerns.

During inspections, the PMOC should examine project elements that were identified in PHAs or TVAs and should determine whether appropriate mitigations are in place or planned. The PMOC should also be prepared to identify other potential hazards and vulnerabilities.

Observations should be recorded, and, if appropriate, photographs taken.

6.2 Major Capital Projects Affected By Circular 5200.1A, Chapter II, Section 6, Safety and Security Management Plan

[2] The interviews aid both the recipient and the PMOC. The recipient's senior staff gains a better understanding of the importance of the SSMP in safety and security planning and management and the PMOC comes away assured that the SSMP reflects the roles of those overseeing the project.

For recipients with projects affected by Circular 5200.1A, Chapter II, Section 6, Safety and Security Management Plan, the SSMP Review will be part of the evaluation of an updated PMP submitted to FTA with application for FFGA or during a later project phase. These reviews will be conducted for projects that have been grandfathered from the requirements of Circular 5800.1 and must continue to follow the SSMP requirements specified in Chapter II, Section 6 of FTA's FFGA Circular 5200.1A although applicable criteria identified in Section 6.1.3.2 should be considered as the SSMP is updated at various stages of the project.

6.2.1 SSMP Review

Following Chapter II, Section 6 of Circular 5200.1A and the DRAFT Guidance for the Development of Safety and Security Management Plans (January 2002), the PMOC must conduct an SSMP review.

Ideally, the format of the SSMP should follow the sections and sub-sections specified in FTA's DRAFT Guidance and should not include material not specified (such as project description, agency history, etc.).

In evaluating the initial SSMP, the PMOC should use the checklist included in **Appendix E** of this guidance. The items are identified by section, beginning with Item 1a, Safety and Security Policy Statement, and ending with Item 9, FRA Waivers. For each, the PMOC should assess how well the SSMP meets the requirements. The checklist also requires the PMOC to identify and review any documents referenced in the SSMP to describe the recipient's approach to performing specific safety and security management activities.

Based on the degree of satisfaction with the requirements, the PMOC should follow the rating system explained in Section 6.1.2 above for rating major capital projects affected by Circular 5800.1. Although the criteria being rated are somewhat different for the two categories of projects, the rating system is identical.

6.2.2 SSMP Adherence Review

The PMOC shall conduct an SSMP Adherence Review following the guidance provided in Section 6.1.3 above. The PMOC should apply applicable criteria identified in Section 6.1.3.2 as the SSMP is updated at various stages of the project while continuing to consider activities described in Chapter II, Section 6, of Circular 522.A (see **Appendix E**).

7.0 REPORT, PRESENTATION, RECONCILIATION

7.1 Draft Spot Report and Resolution of Findings

The PMOC should have accumulated findings with respect to the project's safety and security programs; their descriptions in the SSMP and supporting plans, policies, and procedures, and the evidence of their implementation.

These findings should be prepared as a draft Spot Report[3] and distributed to the Region and, if appropriate, the TOM. **Appendix F** provides guidance on specific areas to include in the Spot Report and provides a sample report outline. After receiving permission from the Region, a copy of the draft should be provided to the recipient. The Report should:

- State findings in descending order of importance (most important first) and recommend modifications or additional work by the recipient along with a time frame for implementation
- Contain a section assessing SSMP compliance to FTA Circular 5200.1A
- Contain a section assessing documentation and performance adherence to SSMP requirements
- Contain a section providing recommendations to improve SSMP compliance or adherence
- Include an Executive Summary
- Include, as appendices
  - a brief project description
  - a list of project acronyms
  - a list materials that support the PMOC's findings and recommendations

Subject to the TOM's approval, the draft Report should be reviewed with the recipient's Project Manager and safety and security officers and a plan developed to promptly correct any deficiencies in the safety and security programs and their descriptions in the SSMP and supporting materials. Inadequate policies and procedures should be strengthened. Poorly communicated program elements should be clarified and re-distributed. Ineffective procedures should be replaced.

The PMOC should work together with the recipient and Region to correct all deficiencies.

7.2 Final Spot Report

The PMOC should prepare a final Spot Report reflecting the resolution of all open issues and correction of all deficiencies. This report should be distributed to the Region and TOM. The FTA Region at its discretion will transmit the Final Report to the recipient.

[3] Guidance on the report format is provided in OP01.

APPENDIX A: SSMP REVIEW CHECKLIST – CIRCULAR 5800.1

App.	No.	Checklist Item	Plan Requirements	Reference	Assessment & Notes
	1.1	Safety and Security Policy Statement	• A *Safety and Security Policy Statement* is developed for the Safety and Security Management Plan (SSMP). • The policy statement endorses the SSMP and confirms the project's commitment to safety and security throughout all project development phases. • The policy statement is signed by the grant recipient's executive leadership.		
	1.2	Purpose of SSMP	• The SSMP implements the *Safety and Security Policy Statement*. • The SSMP identifies the grant recipient's management structure and activities to be performed to integrate safety and security into all phases of the project development process.		
	1.3	Applicability and Scope	• The SSMP applies to all project development activities through preliminary engineering, final design, construction, integrated testing, demonstration, and the initiation of operations. • Depending on the nature of the project, this scope may encompass the following: o System-wide Elements, o Fixed Facilities, o Safety, Security, System Assurance, Operational, and Maintenance Plans and Procedures, and o Personnel Qualifications,		

App.	No.	Checklist Item	Plan Requirements	Reference	Assessment & Notes
			Training and Drills/Exercises. • As applicable, the SSMP also includes activities to ensure compliance with requirements specified by the State Safety Oversight Agency (49 CFR Part 659) and/or the Federal Railroad Administration (FRA), and/or the Department of Homeland Security, including the Transportation Security Administration (TSA) and the Office of Grants and Training (OGT).		
	1.4	SSMP Goal	• Ensures that the final project initiated into revenue service is safe and secure for passengers, employees, public safety personnel, and the general public through a formal program of safety and security certification. • Describes how the grant recipient's executive leadership has designated personnel and committees with the responsibility: o to establish safety and security requirements for the project; o to ensure that the design, acquisition, construction, fabrication, installation, and testing of all critical elements of the project will be evaluated for conformance with the established safety and security requirements; o to verify operational readiness; and o to ensure that a mechanism is		

App.	No.	Checklist Item	Plan Requirements	Reference	Assessment & Notes
			provided to follow to completion the resolution of any restrictions to full safety and security certification.		
	2.1	Safety and Security Activities	• Identifies the specific safety and security tasks that must be performed for the project through all phases. • Includes both a text description of the activities and a matrix listing these activities and the project phases during which they will be performed. o One matrix may be prepared that combines safety and security activities by project phase, or separate matrices may be developed.		
	2.2	Procedures and Resources	• Identifies the procedures and resources that will support performance of safety and security activities throughout the project phases. • Includes procedures for the management of sensitive security information (SSI).		
	2.3	Interface with Management	• Identifies the process and lines of communication by which safety and security issues will be communicated to senior management and used by senior management in decision-making. • An organization chart showing the grant recipient's project management team and key points of interface regarding safety and security issues		

App.	No.	Checklist Item	Plan Requirements	Reference	Assessment & Notes
			must also be provided. • The organization chart shall identify the relationships from the safety and security staff and organizations to construction management, project management, and executive management.		
	3.1	Responsibility and Authority	• Identifies, by title and department, all staff, contractors, and committees assigned to manage the safety and security activities specified in Section 2 of the SSMP. o Each individual staff member must be identified by title and affiliation. o Each committee must be identified by name and acronym, with membership provided by title and affiliation. o For each authority delegated to a contractor, the grant recipient individual or committee responsible for oversight must be shown. o An organization chart must be provided.		
	3.2	Committee Structure	• Describes the organization and responsibilities of the different safety and security committees including o Safety and Security Review Committee; o Fire/Life Safety Committee; o Safety and Security Change Review Board; o Safety and Security Operations Review Committee;		

App.	No.	Checklist Item	Plan Requirements	Reference	Assessment & Notes
			o Other comparable committees.		
	3.3	Safety and Security Responsibilities Matrix	• Presents the responsibility and reporting relationships for safety and security in the form of a matrix. o Separate matrices may be used for safety and security authorities and responsibilities, or a single matrix may be used. o Individuals having authority for safety or security functions who are not part of the grant recipient staff must report to a member of that staff who is responsible for that safety or security function.		
	4.1	Approach to Safety and Security Analysis	• Describes the grant recipient's approach to the analysis of safety hazards and security vulnerabilities. • Known hazards and vulnerabilities must be: o Identified and categorized for their potential severity and probability of occurrence, o analyzed for potential impact, and o resolved by design, engineered features, warning devices, procedures and training, or other methods.		
	4.2	Requirements for Safety and Security Analysis	• Specifies the distinct types of safety and security analysis to be performed during the specific phases of the project. • Describes the mechanism for		

App.	No.	Checklist Item	Plan Requirements	Reference	Assessment & Notes
			communicating analysis results throughout the project team. • Describes the process for assuring the resolution of identified hazards and vulnerabilities.		
	5.1	Approach to Development of Safety and Security Design Criteria	• Describes the project's approach to creating suitable safety and security design criteria. • Identifies the resources, including standards prepared by such organizations as the American Public Transportation Association (APTA), the National Fire Protection Association (NFPA), Underwriters Laboratories (UL) and others that the grant recipient will use to develop safety and security requirements. • Explains how the grant recipient will identify safety and security certifiable elements and how identification of these elements will guide the development of safety and security design criteria. • Ensures that the final specifications and contract documents for the project will result in design that meets the grant recipient's requirements for safety and security and addresses the certifiable elements.		
	5.2	Design Reviews	• Identifies how safety and security		

App.	No.	Checklist Item	Plan Requirements	Reference	Assessment & Notes
			activities will be addressed during design reviews to ensure incorporation of safety and security requirements into the final project design.		
	5.3	Deviations and Changes	• Identifies procedures for ensuring that changes to safety and security design criteria are appropriately reviewed and approved prior to adoption.		
	6.1	Operations and Maintenance Personnel Requirements	• Identifies the number of personnel and their specific job classifications required to operate and maintain the project in revenue service. • Specifies the qualifications and core competencies, required by job classification, for these personnel to ensure their abilities to provide safe and secure service and to respond to emergencies. • Emphasizes special needs of front-line personnel (i.e., operators, supervisors, station attendants, and mechanics).		
	6.2	Plans, Rules and Procedures	• Identifies by name the specific safety, security and emergency plans, rules, procedures, and manuals to be developed for operations and maintenance personnel, and also provides a schedule for their development.		
	6.3	Training Program	• Lists the elements of training to be provided to employees, by job classification, to ensure their capabilities to provide safe and secure service and to respond		

App.	No.	Checklist Item	Plan Requirements	Reference	Assessment & Notes
			effectively to emergencies. • Provides a schedule for the development and offering of this training, and for completion of any qualifications or certifications required by employees. • Ensures the availability of documented evidence of personnel training and qualifications/certifications.		
	6.4	Emergency Preparedness	• Identifies any exercises, drills, tabletops or other activities that will be performed to ensure the readiness of the project placed in revenue service to respond to emergencies, and how the results of these activities will be assessed (i.e., after action report or equivalent document).		
	6.5	Public Awareness	• Identifies programs that support a commitment to on-going comprehensive public awareness, for both security awareness (such as the Transit Watch "eyes and ears" program) and emergency preparedness (such as emergency evacuation instructions to riders).		
	7.1	Design Criteria Verification Process	• Describes the process used by the grant recipient to verify that safety and security design criteria have been addressed in project specifications and contract requirements and that all required inspections and tests have been incorporated into project test plans.		
	7.2	Construction Specification Conformance Process	• Describes the process used to ensure that elements of the system provided under construction, procurement and installation contracts conform to the specifications.		

App.	No.	Checklist Item	Plan Requirements	Reference	Assessment & Notes
	7.3	Testing / Inspection Verification	• Describes the process used to ensure that the as-built (or delivered) configuration contains the safety- and security-related requirements identified in the specifications and other contract documents.		
	7.4	Hazard and Vulnerability Resolution Verification	• Describes the process used to ensure that safety and security design criteria and safety and security analysis have effectively identified, categorized and resolved hazard and vulnerabilities to a level acceptable by management.		
	7.5	Operational Readiness Verification	• Describes the process used to ensure that rules and procedures are developed to effectively incorporate all safety and security requirements specified during design and identified through safety and security analysis. This includes the process to ensure that the project has provided training to personnel and is using qualified and capable operations and maintenance personnel to initiate revenue service.		
	7.6	Safety and Security Certification Requirements	• Describes the requirements that must be met to deliver final certification that the project is safe and secure for passengers, employees, public safety personnel, and the general public, including individual certificates issued for specific elements to be verified.		
	8.1	Construction safety and Security Program Elements	• Describes the requirements to be implemented by contractors and reports to be received by the grant		

App.	No.	Checklist Item	Plan Requirements	Reference	Assessment & Notes
			recipient's management for implementing and tracking construction safety and security programs and plans.		
	8.2	Construction Phase Hazard and Vulnerability Analysis	• Describes the analyses that must be done to identify and resolve or mitigate hazards or threats and vulnerabilities that may be unique to the construction phase.		
	8.3	Safety and Security Incentives	• Describes any incentives that may be in place to support implementation of the construction safety and security program.		
	9.1	Activities	• Identifies the activities that must be performed by the grant recipient to comply with State Safety Oversight Agency (SSOA) requirements implementing 49 CFR Part 659. • If the SSOA has authorities that exceed 49 CFR Part 659 minimum requirements, this section must also explain the grant recipient's approach for addressing these additional authorities.		
	9.2	Implementation Schedule	• Provides an implementation schedule regarding the performance of activities required to meet SSO agency requirements.		
	9.3	Coordination Process	• Describes the processes to be used to communicate and coordinate with the SSOA. • Identifies by title and name the grant recipient's primary point of contact working with the SSOA.		

App.	No.	Checklist Item	Plan Requirements	Reference	Assessment & Notes
	10.1	Activities	• Identifies the activities to be performed by grant recipients with projects that propose to share track with one or more FRA-regulated railroads or that will operate on, connected with, or share a corridor with, the general railroad system. • Identifies whether the grant recipient will be requesting waivers from FRA regulations or if they will be complying with them. o Each FRA regulation must be identified and the grant recipient's activity regarding that regulation must be specified.		
	10.2	Implementation Schedule	• Provides a schedule regarding the grant recipient's activities to comply with FRA regulations or to meet requirements for FRA waivers.		
	10.3	Coordination Process	• Describes the processes to be used to communicate and coordinate with FRA. • Identifies by title and name the grant recipient's primary point of contact working with FRA.		
	11.1	Activities	• Identifies the activities to be performed by grant recipients to meet requirements and programs managed by DHS agencies, including the applicable Security Directives issued by TSA.		
	11.2	Implementation Schedule	• Provides a schedule regarding the grant recipient's activities to comply with DHS requirements and programs.		

App.	No.	Checklist Item	Plan Requirements	Reference	Assessment & Notes
	11.3	Coordination Process	• Describes the processes to be used to communicate and coordinate with DHS. • Identifies the grant recipient's primary point of contact working with DHS.		

APPENDIX B: LIST OF SUGGESTED DOCUMENTS

A well-prepared SSMP will utilize, by reference, numerous other documents, including some that apply across the recipient's organization, and some that are intended just for the project. In addition, as the PMOC progresses to review the implementation of the SSMP, certain supporting materials must be examined. This second category includes organizational information about project staff on both the recipient and consultant sides; material that documents contractor responsibilities, such as contract terms and specifications; and meeting minutes, forms, and reports that confirm that prescribed safety and security procedures are being followed.

Different recipients may document their safety and security programs with plans, policies, and procedures that have different names. They may combine documents that other agencies separate and they may have no need for some documents. Indeed, during certain phases, as indicated in the Table below, some documents may not be appropriate.

The Table contains a list of documents that may have to be included in this SSMP review. The Table shows the project phases when each document is likely to apply, and whether or not the document is likely to be Sensitive Security Information (SSI). The first documents in the list are marked with a [R] to signify that they are usually recipient's agency-wide documents. The balance of the list has documents marked [P], indicating that they are usually project documents.

This list can help the PMOC prepare the document request to the recipient. Once the PMOC has customized the list to suit the specific uses of the recipient and project, it should be included in a Progress Report submitted to the TOM.

DOCUMENT (Title *and acronym; R signifies Recipient, P Project)*	SSI	Preliminary Engineering	Final Design	FFGA Application	Construction	Testing and Start-Up	NOTES
[R] System Safety Program Plan (SSPP)		Y	Y	Y	Y	Y	This will likely not exist until late construction or testing and start-up phase if it is recipient's initial project.
[R] System Security Plan (SSP)	Y	Y	Y	Y	Y	Y	This will likely not exist until late construction or testing and start-up phase if it is recipient's initial project. Distribution will be password protected, as will be all other SSI documents.
[R] Emergency Management Plan (EMP)	Y	Y	Y	Y	Y	Y	This may not exist until late construction or testing and start-up phase if it is recipient's initial project. Document may also be called Emergency Preparedness Plan or other similar title.
[R] Security and Emergency Preparedness Plan (SEPP)	Y	Y	Y	Y	Y	Y	Many recipients are combining the SSP and EMP into an SEPP. PMOC must be aware of the nomenclature within the recipient's agency to assure that proper documents are reviewed.
[R] Standard Operating Procedures (SOPs) and Emergency Operating Procedures (EOPs)		Y	Y	Y	Y	Y	Some recipients have separate EOPs and some include them in the SOPs. PMOC should review to assure conformance with SSMP to determine responsibilities for emergencies, particularly in agencies where there is no fully commissioned police force. Usually, completeness of SOPs and EOPs will increase as project moves through its phases.
[R] Quality Assurance Plan (QAP)			Y	Y	Y	Y	PMOC should review to assess QA personnel role in oversight and audit of safety and security requirements across the project phases.
[R] Design Criteria Manual (DCM)		Y	Y	Y	Y	Y	Recipient document applied to all projects. If recipient has no DCM, documents that include safety and security design recommendations and requirements,

DOCUMENT (Title *and acronym; R signifies Recipient, P Project)*	SSI	Preliminary Engineering	Final Design	FFGA Application	Construction	Testing and Start-Up	NOTES
							particularly egress, train/bus and traffic control, lighting, cameras, emergency phones, and other elements of Crime Prevention Through Environmental Design (CPTED) and Situational Crime Prevention (SCP) must be reviewed. The process for updating the DCM based on PHA, TVA, and other analyses must also be reviewed.
[R] Change and Configuration Control Procedures		Y	Y	Y	Y	Y	Document should be examined to determine how design or configuration changes that may impact safety/security will be reviewed and approved by recipient and to ensure that safety and security management personnel are involved and have appropriate sign-off authority.
[P] Project Management Plan (PMP)		Y	Y	Y	Y	Y	Key project document should be reviewed to assure it appropriately identifies the SSMP as the project's master plan for safety and security and that the SSMP content is consistent with PMP content.
[P] Safety and Security Management Plan (SSMP)		Y	Y	Y	Y	Y	The SSMP is an element of the PMP, but is a stand-alone document that must comply with the requirements of the FTA Circular.
[P] FRA Waiver			Y	Y	Y	Y	Required for some projects that involve sharing of FRA-regulated rights of way.
[P] Project Safety and Security Plan (PSSP)			Y	Y	Y	Y	Document is project-specific; it is distinct from the recipient's SSPP, and will pertain to safety/security plans and policies for all project phases. It usually contains requirements of what must be included in contractor-submitted safety and security plans. It may be called by other names, such as Capital Improvement Program Management Plan or Project Safety Program.
[P] Contractor Safety and Security Plan (CSSP)					Y	Y	Document produced by each contractor that details how the contractor will comply

DOCUMENT (Title *and acronym; R signifies Recipient, P Project)*	SSI	Preliminary Engineering	Final Design	FFGA Application	Construction	Testing and Start-Up	NOTES
							with the PSSP and/or other specific safety and security requirements identified in the bid documents
[P] Construction bid documents					Y	Y	Normally includes the general safety and security responsibilities of the contractor, obligations to maintain a safe/secure site, requirement to submit a CSSP, and any specific safety and security requirements that the contractor must comply with during portions of the work.
[P] General Architect/Engineering Contractor (GAEC) contractual requirements/procedures for identifying/resolving hazards/threats and vulnerabilities		Y	Y	Y	Y	Y	Materials determine responsibilities of GAEC, including general reporting requirements to Grantee's safety/security personnel, and division of performance authority between Grantee and GAEC for PHAs, TVAs, operating and maintenance procedures, training plans, SITP, and the like.
[P] Preliminary Hazard Analysis (PHA)			Y	Y	Y	Y	Determine comprehensiveness and roles in analyses and procedures for implementing recommendations; should be compared with GAEC requirements.
[P] Threat Vulnerability Analysis (TVA)	Y		Y	Y	Y	Y	Determine comprehensiveness and roles in analyses and procedures for implementing recommendations; should be compared with GAEC requirements.
[P] Safety and Security Certification Plan (SSCP)		Y	Y	Y	Y	Y	Document is normally created prior to PE for design certification and updated during FD for construction certification and after the start of construction for testing and start-up, training, PRO, and other safety and security certification requirements. Should be reviewed for consistency with SSMP, adequacy of certification procedures and documentation requirements, and comprehensiveness of Certifiable Items List (CIL).

DOCUMENT (Title *and acronym; R signifies Recipient, P Project)*	SSI	Preliminary Engineering	Final Design	FFGA Application	Construction	Testing and Start-Up	NOTES
[P] Project Emergency Procedures				Y	Y	Y	Project document, like other safety and security documents; may have various titles. PMOC must be aware of recipient's nomenclature to assure that proper materials are reviewed.
[P] Public Education Program			Y	Y	Y	Y	Program is relevant if safety or security issues are required in outreach efforts. (Examples: grade crossing, noise abatement, trespass issues)
[P] System Integration Test Plan (SITP)					Y	Y	Document should be reviewed for consistency with SSMP and to assure it includes needed integration tests and emergency drills, and has adequate test procedures and reporting requirements.
[R] Operations and Maintenance Plan (OMP)				Y	Y	Y	New plan for a recipient's initial rail project or revisions to an existing plan for a subsequent rail project; review for consistency with SSMP, timeliness of safety and security training requirements, and adequacy of personnel to provide required levels of safety and security after the start of revenue operations.
[R] Rail [or Bus] Fleet Management Plan (RFMP) [or BFMP]				Y	Y	Y	New plan for a recipient's initial rail/bus project or revisions to an existing plan for a subsequent project; review for consistency with SSMP and adequacy of facilities to safely maintain fleet.
[P] Training Plans and Manuals						Y	

APPENDIX C: LIST OF POSSIBLE INTERVIEWEES

As with documents, different recipients and different projects will have staff with different titles. The following list can assist the PMOC in identifying the personnel to be interviewed at a particular project:

Chief Executive

Senior person responsible for project management

Senior persons responsible for rail operations, construction, and facilities engineering

Senior safety manager(s), including those responsible for construction and system safety

Emergency preparedness manager

Senior security or police manager (may be the police chief or may be a civilian)

Agency and project managers for rail operations, risk management, construction, facilities engineering, and systems integration

Actual titles of interviewees for a past SSMP review included:

Senior Vice President, Project Management

Assistant Vice President, Technical Services

Director, Engineering and Systems

Assistant Vice President, Construction

System Integration Consultant

Safety Manager, Rail Systems

Safety Manager, Construction

Manager, Rail Operations

Emergency Preparedness

Chief of Police

Assistant Vice President, Risk Management

Senior Manager, Safety

Assistant Vice President, Facilities Engineering

Vice President, Maintenance

General Engineering Consultant

Systems Design Consultant

Light Rail Vehicle Consultant

APPENDIX D: SAMPLE INTERVIEW QUESTIONNAIRE

This is a sample interview protocol for a past SSMP Review. It is recommended that the PMOC prepare similar questionnaires, specific to the project and the responsibilities of the person to be interviewed.

Interviewee:
Title:

Interviewer: Date of Interview:

1. Describe the role you play in the overall security [or safety] of the transit system in the course of your daily, regular job activities.

   Explain any inconsistencies in your role and how it is described in the SSMP?

2. What role did you play or input did you have in development of the SSMP?

3. Explain who will provide security oversight [or safety oversight] for construction under the SSMP?

4. In relation to the SSMP, as it relates to security/safety would you describe yourself as:
   very somewhat not very knowledgeable

5. Describe your familiarity with the Agency SSPP and/or SSP? Explain how they mesh and interface with the SSMP,

6. Describe your familiarity with the functions of the Agency Security/Police Department [or Safety Department] overall or specifically in relationship to the SSMP. Describe briefly what you believe to be that department's role in the SSMP.

7. How are you notified of changes in security or safety precautions or responsibilities during the various phases of [project under review]? How would you describe the timeliness of the notification?

8. Based on your duties and your observations, what do you believe to be the most serious security or crime vulnerabilities [or safety issues] the project faces?

Why?

How do you see the SSMP addressing these issues vulnerabilities and issues?

9. Based on your duties and your observations, what do you believe to be the most serious security or crime vulnerabilities [or safety hazards] faced during construction?

Why?

How do you see the SSMP addressing these vulnerabilities and hazards?

APPENDIX E: SSMP REVIEW CHECKLIST – CHAPTER II, SECTION 6, CIRCULAR 5200.1A

SSMP Element	Compliant with DRAFT Guidelines
1 Management Commitment and Philosophy	
1.1 Safety and Security Policy Statement Requirement: Provides a signed statement -- issued by the grantee's executive leadership -- endorsing the SSMP and explaining the project's commitment to safety and security. Note:	
1.2 Purpose of SSMP Requirement: Describes the grantee's intention to use the SSMP to support the integration of safety and security into the project development process and ensure their consideration throughout this process. Note:	
1.3 Scope of SSMP Requirement: Describes the applicability of the SSMP to all project development activities through preliminary engineering, final design, construction, integrated testing, demonstration, and operations. Note:	
1.4 SSMP Goal Requirement: Identifies the grantee's intention to use the SSMP to ensure that the final project implemented into revenue service is safe and secure for passengers, employees, public safety personnel, and the general public. Note:	
1.5 SSMP Objectives Requirement: Describes how the grantee will use the SSMP to meet its goal through implementation of an integrated management system. Note:	
2 Integration of Safety and Security into the Project Development Process	
2.1 Safety and Security Activities Matrix Requirement: Identify all safety and security activities that must be performed for the project during preliminary engineering, final design, construction, integrated testing, demonstration and operations.	

SSMP Element	Compliant with DRAFT Guidelines
Note:	
2.2 Procedures and Resources Requirement: Identify procedures and resources that will support performance of safety and security activities throughout the project development process. Note:	
2.3 Interface with Management Requirement: Identify the process through which the results of safety and security activities will be coordinated with both the grantee's executive leadership and the Project Management Plan (PMP) for review and decision-making. Note:	
3 Assignment of Safety and Security Responsibilities	
3.1 Responsibility and Authority Requirement: Identify where authority resides for implementing the SSMP. Note:	
3.2 Approach to Safety and Security Responsibilities Requirement: Describe the organizational and management mechanisms used by the project to ensure the performance of safety and security activities throughout all project development life cycle phases. Note:	
3.3 Safety and Security Responsibilities Matrix Requirement: Identify specific responsibilities for the performance of safety and security activities. Note:	
4 Safety and Security Analysis	
4.1 Objectives for Safety and Security Analysis Requirement: Establish the objectives for the use of safety and security analysis techniques in the project.	

SSMP Element	Compliant with DRAFT Guidelines
Note:	
4.2 Risk Tolerance in Safety and Security Analysis Requirement: Define the project's determination of acceptable risk for safety and security analysis throughout the project. Note:	
4.3 Characteristics of Effective Analysis Requirement: Identify the characteristics of the analysis techniques best-suited for application to the project. Note:	
4.4 Requirements for Safety and Security Analysis Requirement: Specify the distinct types of analysis to be performed during specific phases of the project and the responsibilities for integrating results in engineering, design, construction, testing, and demonstration activities. Note:	
5 Development of Safety and Security Design Criteria	
5.1 Approach to Development of Safety and Security Design Criteria Requirement: Describe approach to incorporating the results of safety and security activities into project design criteria. Note:	
5.2 Approach to Specification Requirement: Identify procedures for ensuring that safety and security design criteria are specified appropriately as part of the project design process and included in project bid documents and contracts. Note:	
5.3 Design Reviews Requirement: Identify how safety and security activities will be addressed during Design Reviews to ensure incorporation of safety and security requirement into the final project	

SSMP Element	Compliant with DRAFT Guidelines
design. Note:	
5.4 Deviations and Changes Requirement: Identify procedures for ensuring that changes to safety and security design criteria are appropriately reviewed and approved for their impacts on the level of operational safety and security designed into the system. Note:	
6 Safety and Security Verification Process (including final certification)	
6.1 Design Criteria Verification Process Requirement: Describe process to verify that safety and security design criteria have been addressed in project specifications and contract requirements and that all required tests have been incorporated into project test plans. Note:	
6.2 Construction Specification Conformance Process Requirement: Describe process to ensure that elements of the system provided under construction, procurement and installation contracts conform to the specifications. Note:	
6.3 Testing/Inspection Verification Requirement: Describe process to ensure that the as-built (or delivered) configuration contains the safety- and security-related requirements identified in the applicable specifications and other contract documents. Identify key interfaces for ensuring safety and security involvement in those tests and reviews. Note:	
6.4 Risk Resolution Verification Requirement: Describe process to ensure that safety and security design criteria and safety and security analysis have effectively identified, categorized and resolved project risks to a level acceptable by management. Note:	

SSMP Element	Compliant with DRAFT Guidelines
6.5 Operational Readiness Verification Requirement: Describe process to ensure that rules and procedures are developed and effectively incorporate all safety and security requirements specified during design and identified through safety and security analysis. Also describe process to ensure that the project has provided training and is using qualified and capable operations and maintenance personnel to initiate revenue service. Note:	
6.5 Certification Requirements Requirement: Describe requirements which must be met to deliver final certification that the project is safe and secure for passengers, employees, public safety personnel and the general public, including individual certificates issued for specific elements to be verified. Note:	
7 Construction Safety and Security	
7.1 Construction Safety and Security Program Elements Requirement: Describe the requirements to be implemented by contractors and reports to be received by transit management for implementing and tracking construction safety programs and plans. Note:	
7.2 Incentives Requirement: Describe any safety incentives that may be in place to support implementation of the construction safety program. Note:	
8 49 CFR Part 659 Requirements (if applicable)	
8.1 Implementation Activities and Schedule Requirement: Identify the activities and schedule required to comply with 49 CFR Part 659 requirements. Note:	
8.2 Coordination Requirement: Identify how the project will work with the State and designated oversight agency regarding implementation of 49 CFR Part 659 requirements.	

SSMP Element	Compliant with DRAFT Guidelines
Note:	
9 FRA Waiver Process (if applicable)	
9.1 Activities and Schedule Requirement: In the event that FRA waivers are required for shared use operations, describe the agency's activities and schedule for meeting these requirements. Note:	
9.2 Coordination Requirement: In the event that FRA waivers are required for shared use operations, identify activities to be performed by the agency to support FRA and State Safety Oversight Agency review and approvals. Note:	
GENERAL COMMENTS:	

APPENDIX F: DISCUSSION OF CONTENTS OF AN SSMP REVIEW SPOT REPORT

1.0 Executive Summary

The Executive Summary should begin with a summary introduction to the project, a discussion of the project's objectives and benefits, and an indication of its current status.

It should then provide a conclusion as to the compliance of the project's SSMP to the appropriate FTA requirements and the adequacy of safety and security programs, as documented in the SSMP and supporting materials, and as implemented based on reviews of operating documents, interviews, and site inspections.

The balance of the Executive Summary should summarize the major findings of the review that support the conclusion and any recommendations for improvement.

2.0 Introduction

This section should contain three subsections: a brief introduction to the project (it can be identical to that included in the Executive Summary or somewhat more detailed); a description of the objectives of the SSMP review, and a description of the remaining sections of the report.

3.0 Information Reviewed

This section should describe the documents reviewed, the individuals interviewed, and the sites visited in the course of performing this review.

This section can best be prepared as discussions that refer to tables in an appendix to the Spot Report, with commentary as required.

4.0 SSMP Compliance Assessment

This section should open with a general assessment of the quality and compliance level of the SSMP to the applicable FTA requirements and then continue with an in-order specific assessment of how well each of the specific FTA requirements are complied with, including clear description of areas of deficiency and suggestions or recommendations for resolving deficiencies. Either at the start or end of each Item assessment, the letter C, M, or N should be shown in bold type to indicate that the Item is either compliant, marginally compliant, or noncompliant with FTA requirements.

5.0 SSMP Adherence Assessment

This section should present the results and conclusions from the review of support documentation, interviews, and site visits and indicate whether or not the SSMP requirements and safety and security programs are adequate for the current stage of the project, as planned, documented, and implemented. Findings that support the conclusion and any recommendations for improving or

resolving program deficiencies should be presented in descending order of importance. Detailed support for the findings, if required, should be placed in an appendix to the Spot Report.

Examples of the discussion of some findings and resultant recommendations are:

1) **The recipient does not have a functioning Safety and Security Working Group**. The SSMP identifies a Safety and Security Working Group (SSWG) that will be established prior to start of PE to assure that safety and security requirements, including police and fire regulations are incorporated into all phases of the design. The project is requesting entrance into PE and the PMOC has found no evidence that a SSWG exists. The Director of Safety, who would normally be either chair or co-chair of a SSWG was unable to state when a SSWG would become functional. ***The PMOC recommends that the recipient create a SSWG, as identified in the SSMP, and set a regular schedule for meetings. The SSWG should include participation from city, transit agency, and county agencies that the right of way traverses. Entry into PE should not be granted until the SSWG is formed and functional.***

2) **The recipient has not addressed egress and overcrowding on platforms during periods of heavy system use**. Overcrowding and lack of adequate egress is hazardous and introduces security vulnerabilities; neither the PHA nor TVA has addressed this issue at the stations serving the college and the high school and the design criteria are silent on maximum platform loads. These issues must be resolved with the local academic institutions, which generate increased ridership during those months that classes are in session. ***The PMOC recommends assessments of maximum passenger loads on these platforms, and the rate of flow through egress points, through formal hazard analyses and TVAs.***

Issues and Analysis

In the course of the review, the PMOC may encounter safety and security issues that can affect or be affected by the project but do not constitute Findings, as discussed, above. These should be presented as the last subsection in Section 5.0.

An example of the kind of issues that might be included is:

The PMOC identified three schedule changes that relate to project safety and security:

1) The tunnel TVA originally planned for September 2006 is now forecast to be completed in January 2007. This will delay review of the TVA by the city, delay issuance of tunnel bid package, and reduce schedule float by at least two months

2) Changes in personnel in local police/fire departments have delayed formation of the Safety and Security Working Group originally planned for April 2006. It is currently planned that the new police and fire commissioners, named in December 2006, will select their

candidates for the committee so that it can be formed and made operational in the following quarter.

3) Late changes in establishing the alignment have resulted in design delays. The TVA and Emergency Evacuation Plan (EEP) cannot be formally completed until the right of way is finalized. In the opinion of the PMOC, this delay should not affect commencement of revenue operations because the safety and security departments are participating in the design revisions on a real-time basis.

6.0 Conclusions and Recommendations

This section should first present the major conclusions reached from the assessment as to the compliance of the SSMP with FTA Circular requirements and the adequacy of grantee adherence to the SSMP, as well as the overall project safety and security program. It should then present a numbered compilation of all recommendations contained in the other sections of the report. (Each recommendation should include a parenthetical reference to the section or subsection where the recommendation was made.)

Appendices

To simplify the reading of this Spot Report, it is recommended that certain material be placed in appendices at the end of the Report. Suggested appendices are:

List of Documents Reviewed

List of Personnel Interviewed

List of Sites Visited

Members of the SSMP Review Team (including PMOC, Recipient, and Project Staff, if any)

Detailed Material in Support of Findings

Detailed Project Description

APPENDIX G: ACRONYMS

CPTED	Crime Prevention Through Environmental Design
CSM	Construction Safety Manual
EMP	Emergency Management Plan
FD	Final Design
FFGA	Full Funding Grant Agreement
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
OMP	Operations and Management Plan
PHA	Preliminary Hazard Analysis
PMO	Project Management Oversight
PMOC	Project Management Oversight Contractor
PMP	Project Management Plan
RFMP	Rail Fleet Management Plan
SEPP	Security and Emergency Preparedness Plan
SITP	System Integration Testing Plan
SOP	Standard Operating Procedure
SSCP	Safety and Security Certification Plan
SSCVR	Safety and Security Certification Verification Report
SSI	Security Sensitive Information
SSMP	Safety and Security Management Plan
SSOA	State Safety Oversight Agency
SSPP	System Safety Program Plan
SSP	System Security Plan
SSWG	Safety and Security Working Group
TO	Task Order
TOM	Task Order Manager
TVA	Threat and Vulnerability Analysis

US DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 23 - Real Estate Review

1.0 PURPOSE

The purpose of this document is to inform FTA staff and its project management oversight contractors (PMOC) and their real estate consultants of procedures to use and requirements to follow in assessing the reliability of the Project Sponsor's real estate acquisition scope, schedule and cost estimate.

2.0 BACKGROUND

The Federal Transit Administration (FTA) conducts Project Management Oversight on major capital projects. Because the Real Property Acquisition and Relocation portions of a project are critical components representing substantial risk both from a schedule and budget standpoint, FTA has determined that the PMOC team should be supplemented with a specialized real estate consultant. This real estate consultant will provide oversight to include continuous review and evaluation of grantee's process to ensure compliance with statutory and regulatory requirements including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended (Uniform Act) and applicable FTA Circulars. The Real Estate PMOC should determine on a continual basis if grantee's acquisition and relocation schedule and budget are realistic and will support the grantee's plans, specifications, master project budget and schedule. The three main areas of interest will consistently be budget, schedule and compliance.

3.0 OBJECTIVES

The following objectives are to be met in the performance of the work:

- Evaluation and continued oversight of the Project Sponsor's Real Estate Acquisition Management Plan (RAMP, see Appendix) including real estate acquisition, project scope, estimated cost, overall schedule and critical path, and specific critical elements within the Relocation Plan if applicable.

- Evaluation of the schedule for completeness, adequacy, consistency, appropriateness of level of detail given the phase.

- Identification of risks inherent in the schedule and evaluation of the impact of these on project scope and cost.

- Characterization of the Project Sponsor's ability to meet the requirements of Federal laws, regulations, and guidance when acquiring real estate.

- Determination of Project Sponsor's compliance with all governing requirements during the implementation phase of the real estate acquisition program including the timely reporting of recommended improvements and "best practices" that were observed.

4.0 REFERENCES

The following policies, guidance documents and circulars apply to the Project Sponsor's work to be overseen under this Oversight Procedure:

- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Pub. Law 91-646; 42 U.S.C. 4601, et seq.). http://www.fhwa.dot.gov/realestate/row_legs.htm
- Implementing Regulations 49 CFR Part 24. http://www.fhwa.dot.gov/realestate/row_legs.htm
- FTA Circular 5010.1C, Grant Management Guidelines, Chapter II, (Management of Real Property). http://www.fta.dot.gov/planning/planning_environment_5937.html

5.0 PROJECT SPONSOR SUBMITTALS

The following is a non-exclusive list of documents and other information which should be readily available to the Real Estate PMOC in order to perform reviews:

- Project Sponsor's Real Estate Acquisition Management Plan (RAMP) - This document is the vehicle with which the Project Sponsor demonstrates its ability to conduct the real estate activities in compliance with federal statute, regulation and guidance. It should include information relating to real estate acquisition, project scope, overall schedule and critical path, and specific critical elements within the Relocation Plan if applicable.
- Project Sponsor's Real Estate Policies and Procedures Manual
- Real estate planning, budgeting, scheduling, tracking and reporting documents
- Appraisals and appraisal reviews
- Acquisition files including offers, negotiations and contact logs
- Relocation files including notices, inventories, determinations, claims, payments and contact logs
- The organization chart demonstrating the Project Sponsor's Real Estate Department's role and position in the overall Project organization
- Names and experiences of the Project Sponsor's Real Estate staff
- Line of authority including Project Sponsor's consultants and contractors
- Names and experiences of the Right of Way consultants (if any) who will be working the project and how they fit within the Project Sponsor's Real Estate Department Organization chart

6.0 SCOPE OF WORK

Review the project real estate schedule and cost estimates at specific points in project development as directed by FTA or on an ongoing basis. Tailor the review to the information and materials available at

the time. During preliminary engineering, it is critical that potential real estate problems are identified and probable solutions determined. More elaborate schedules will be generated by the Project Sponsor as time goes on and the schedule review should reflect the increase in information provided. One example may be, in final design, the review would include close scrutiny of specific milestone dates, validity of cost estimates and the Project Sponsor's adherence to the RAMP. Or, in the case of a Small Starts project or projects other than New Starts, adherence to the requirements of 49 CFR Part 24 should be reviewed.

The PMOC's real estate consultant shall obtain from the Project Sponsor the RAMP, latest schedules produced and supporting scope and cost information. The RAMP should be reviewed at various stages in the development of the project and should contain the following information at these stages of the NEPA Process:

- Prior to selection of **Locally Preferred Alternative** during or before the **draft environmental impact statement** (DEIS) process, the RAMP should be in an early stage of development and should contain information demonstrating an adequate staff organization complete with well defined reporting relationships, responsibilities, job descriptions and job qualifications.

- Prior to FTA's approval to enter **Preliminary Engineering,** the RAMP should also contain: a map highlighting the parcels proposed to be acquired; a list of and written description of proposed total and partial acquisitions; a list of and written description of the anticipated number of residential and non-residential displacements/relocations; a list of and written description of the impacts due to the acquisitions and displacements/relocations; a schedule and cost estimate for the acquisitions and displacements/relocations.

- Prior to FTA approval to enter into **Final Design**, the information in the RAMP should be refined. The schedule should portray the critical path. The RAMP shall demonstrate that adequate relocation planning has been accomplished per 49 CFR Section 24.205, including recognition of problems associated with displacement and an evaluation of program resources available to carry out timely and orderly relocations.
- Prior to FTA award of the Full Funding Grant Agreement (FFGA), the information in the RAMP should be further refined and third-party agreements should be made. The schedule should portray the critical path.

The PMOC's real estate consultant will provide oversight to the extent needed to ensure compliance with statutory, regulatory and circular requirements. With consideration of the laws, regulations, policies, circulars, guidance documents, and practices that apply to the Project Sponsor's work, the real estate consultant should at a minimum:

- Review and analyze all pertinent information available for reasonableness within the scope and cost parameters; for completeness, adequacy, consistency, appropriateness of level of detail given the phase
- Identify real estate acquisition program risks
- Be a full service company having experience in early right-of-way (R/W) planning and having a working knowledge in the four major areas of Uniform Act compliance (Appraisal, Acquisition, Relocation and Property Management)

- Have a working knowledge of 49 CFR Part 24 and FTA Circular 5010.1C and FTA Project Management Oversight Program Guidance
- State findings in descending order of importance (most likely, largest consequences, least likely, moderate consequences) and make recommendations for modifications.

7.0 REPORT, PRESENTATION, RECONCILIATION

Real Estate PMOC will document findings in a written report and present findings to FTA headquarters and regional staff and the Project Sponsor either in *a teleconference or in person.* In an extended working session, findings will be reconciled with the Project Sponsor so that disagreements if any are reconciled to the extent possible.

8.0 APPENDIX

8.1 A Model for the development of a Real Estate Acquisition Management Plan

8.1.1 Introduction.

- Short history of pertinent elements of project
- Control agreements; intergovernmental contracts, pending solicitations, etc
- Legal requirements; Uniform Act, various state laws, local requirements, etc.
- Geographical description of project
- Physical description of proposed acquisitions; number of parcels, total acquisitions, partial acquisitions, anticipated number of relocations; etc.
- General outline of process; and authority to condemn

8.1.2 Organizational Structure

- Identification of staff functions
- Identification of contractual functions
- Identification of plan source; process for plan changes, corrections, modifications as a result of negotiations, etc.
- Party who can establish offer of just compensation
- Party who can authorize condemnation

8.1.2 Acquisition Schedule

- Set out the timeframe for acquisition and relocation; total length of time needed
- Date for initiation of negotiations for project
- Difficulties and potential delays
- How will progress reporting be handled and who will receive this information
- Identification of a critical path for right of way

8.1.3 Real Estate Cost Estimate

- Background of estimate; when was it done; what was the basis of the estimate
- Need for any update of cost estimate
- How will estimate be compared to actual costs as project progresses

8.1.4 Acquisition Process

- Plans – who prepares, who can modify, what is process for considering property owner's request to modify, etc

- Ownership and title information – how is this gathered, what are the contractual requirements, are those contracts in place, what is the process to update and correct errors and omissions,

- Appraisal – who will do appraisals, what is the contracting requirements if necessary, what is the estimated duration of this task, how many copies of appraisals will be obtained, will appraisals be shared with property owners

Appraisal Review process – who will do this task, what is the scope of the task in general, what is the turn around time for this work, will the review handle updates of appraisals, will review handle modification of appraisals based on owner claims, will review be used to support administrative settlements.

- Establishment of offer of Just Compensation – who does this, what is the basis of this offer

- Negotiations – who will negotiate, what is their authority, who must approve administrative settlements and other concessions to property owners, what is the documentation required of the negotiations process, who signs letter of offer, will negotiator also handle relocation payments, how is interface between negotiations and condemnation handled, what documents will negotiator be expected to provide to legal for settlement and condemnation, will negotiator be present at closing

- Closing / Escrows – who will provide this service, how will it function, what is the estimated length of time to deposit funds to escrow for closing, what documents will be necessary, how will closings be conducted, what form of deeds will be used, how will property taxes be paid and exempted

- Condemnation – who will authorize suits, who will file, what is relationship between grantee and its legal personnel, what authority does attorney have for settlement, what are progress reporting requirements

8.1.5 Relocation

- Staffing and Administration - how will the relocation function be staffed, who is authorized to compute payments, who will approve payments, what is the relocation process to be utilized in the project, what level of advisory services will be needed, who will provide advisory services, what is the claims payment process, what is the time to pay a relocation claim, what authority and controls will be needed for advanced claims, what documentation will be retained in the files, what forms will be used

- Appeals – what is the legal requirement for administrative appeals, how will the agency establish and staff an appeal function, who is the recipient of appeal requests, what is the appeal process

8.1.6 Document Control

- How are documents filed, what length of time will original paper documents be maintained, what is the organization of parcel files, condemnation files, etc. what is the content of a typical file

- Property management – who will perform property management, what is included in the scope of work for property management, who contracts for demolition, what are contracting requirements, what are reporting requirements, statement of policy regarding rental property for extended possession by tenants and owners

- Excess property inventory and utilization plan – who will prepare and track excess parcels, what is the process to evaluate these tracts, who will determine when to sell excess, what is the disposition of proceeds, what are agency, state or local restrictions on the sale of public property

U.S. Department of Transportation
Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 25 – Fleet Management Plan Review

1.0 PURPOSE

The purpose of this procedure is to define the requirement for review of the Grantee's Fleet Management Plan. The intent of this review is to enable the FTA to determine whether the investment is justified, based on general standards for such investment, and whether the investment will result in a properly maintained and operated fleet, which will provide the full benefit of the initial investment to the public.

Together with the Project Management Plan, an applicant for Federal funding must submit rail and bus fleet management plans. FTA will not approve or disapprove the applicant's fleet management plans, per se, but the FTA Regional Office and the Program Management Oversight Contractor (PMOC) will review the adequacy of those plans as part of FTA's assessment of the applicant's technical and financial capacity.

A Fleet Management Plan should enable a transit operator to properly plan for and carry out the overall management of its entire vehicle fleet. An effective plan will address all the factors that are relevant to the operator's determinations of current and future equipment needs in light of demand, focusing on (a) vehicle life expectancy, (b) the requirements for peak and spare vehicles, (c) strategies for acquisition of new vehicles, and (d) strategies for maintenance and operations.

The purpose of fleet management plans submitted in support of an application to enter Final Design or for an Full Funding Grant Agreement (FFGA) is to ensure that the applicant's transit service will not be degraded as a consequence of the design and construction of the new starts project, and that the applicant will have adequate service to meet the transit demand for the years leading up to and following construction of the new starts project. This procedure provides a major input to FTA in its determination that the grantee fleet management plan is adequate, or could be made adequate with modifications.

2.0 BACKGROUND

FTA in a 1999 Dear Colleague letter explained that the purpose of a fleet management plan is to encourage a transit operator or grantee to properly plan for and carry out the overall management of its vehicle fleet. It also suggested an outline format to assist in FTA's review of fleet management plans and presented a general plan outline to assist grantees in preparing their plans. The letter stressed that the items in the outline section were to be viewed as minimums and not as the only items to be incorporated in the fleet management plan.

3.0 OBJECTIVES

As a minimum, the fleet management plan submitted in support of a new starts project should reflect a 15-year time frame. Logically, the historical and empirical data compiled through past and current operations of a fleet will set the starting point for certain portions of the plan. A fleet management plan should address in detail the composition of the fleet, operating conditions, maintenance, facilities, peak vehicle demand, and spare ratio. Guidance on fleet management plans may be obtained from FTA Regional Offices.

FTA recognizes that every fleet is unique to the environment in which it operates. Several years may pass from the development of technical specifications through the bid process, technical reviews, construction contractor award, engineering, prototype testing and analysis, to actual production and, ultimately, revenue service. Thus, the fleet management plan is a dynamic document. When a plan needs to be revised, for whatever reason, a draft of the revised plan should be submitted to the FTA Regional Office for review and comment.

The role of the PMOC in this process is to evaluate, based on the experience and knowledge of the qualified evaluator(s), the extent to which the grantee has met the intent of the requirement to have a Fleet Management Plan, as well as the grantee's ability to carry out the Plan. The evaluator should first examine whether all of the required factors have been included in the Plan, and then provide opinions on whether the Plan is: a) feasible, based on the resources immediately available to the Grantee, b) sustainable, based on the long term infrastructure and resources anticipated to be available to the Grantee, and c) comprehensive, based on its consideration of the required factors to properly maintain and operate the new or refurbished vehicles contemplated.

An operator of a rail system must have in its file available upon request by FTA a fleet management plan that addresses operating policies (level of service requirements, train failure definitions and actions); peak vehicle requirements (service period and make-up, e.g., standby trains); maintenance and overhaul program (scheduled, unscheduled, and overhaul); system and service expansions; rail car procurements and related schedules; and spare ratio justification.

The PMOC may be asked to:

- Share its knowledge of fleet management practices with the grantee;
- Assist in identifying materials that are crucial to the successful development of a fleet management plan;
- Provide plans that have been found complete and reasonable as models of "best practices" among grantees;
- Provide further outlines of the elements in a fleet management plan that makes it comprehensive and acceptable to the grantee's operation;
- Participate in the review of the fleet management plan to ensure the plan is comprehensive and complete in its analysis of the rail operations;

- Serve as a resource by lending its experience and knowledge of other plans that are completed or viewed as exhibiting "best practices" in the industry.

4.0 REFERENCES

Basic FTA policy on service life, replacement, and overhaul of fixed guideway rolling stock, including spare ratio, early disposition, and like-kind exchange, is set forth in FTA's Circular 9030.1C, "Urbanized Area Formula Program: Grant Application Instructions," at Chapter V, paragraphs 9-15.

5.0 PROJECT SPONSOR SUBMITTALS

The project sponsor will be required to submit its Fleet Management Plan, or a similar document, and any other supporting documentation.

6.0 SCOPE OF WORK

From time to time, FTA may require the PMOC to provide services or deliver products or outcomes during project development that continuously review and evaluate various grantee fleet management plans, processes or products as an ongoing activity in order to report findings and make recommendations as to the accuracy, adequacy and reasonableness of the grantee's Fleet Management Plan and supporting data, plans and documentation.

FTA may require the PMOC to conduct on-site inspections of equipment, facilities, data, documentation, or records to evaluate the grantee's effectiveness in implementing the fleet management plan in conformance with the grant agreement, sound operating or engineering practices, or other statutory and administrative requirements. Inspection visits may be made, for example, to follow up on information received from the grantee about an event with significant impact on the project, or to determine whether the grantee has adequately implemented the fleet management plan.

The PMOC as directed in the specific work order shall review grantee documentation, perform its own technical review and physical inspections, characterize the grantee's fleet management plan and validate the grantee's plan and operating assumptions in conformance with these procedures. The PMOC shall evaluate and assess the accuracy, adequacy and reasonableness of the grantee's Fleet Management Plan and its supporting plans and documentation using the following criteria:

1. The grantee's existing transit service in terms of level of service, operating costs, reliability, quality and support functions, will not be degraded as a consequence of the design, the manufacture of the equipment, or construction of the project; and that the grantee will be able to provide adequate service to meet the transit demand for the years leading up to and following either the delivery of the equipment/facility or construction of the project.

2. Fleet operations (present and future) as described in the plan are substantially consistent with that adopted in the Record of Decision (if applicable), sufficiently complete in detail and analysis (Fleet plan or supporting documentation) to readily demonstrate grantee's ability to maintain or improve the current level, and quality of operating costs, and reliability and quality of service for the years leading up to and following construction of the project. The plan also provides details of existing and planned vehicle procurements as well as any overhaul/rebuild programs that extend the life expectancy of the equipment.

3. The grantee has selected a sufficient time frame, (at a minimum 15-year time frame) and compiled sufficient historical and empirical data from past and current fleet operations.

4. The grantee can properly plan for and execute the overall management of its entire fleet of vehicles and related support functions and equipment, addressing all of the reasonably foreseeable factors that are relevant to the determination of current and future equipment needs. Foreseeable factors could include, but are not limited to:

    a. Additional maintenance facility requirements

    b. Accommodations for future growth

    c. Contingency for short term changes in ridership

    d. Rail vehicle life cycle maintenance

5. The grantee's management is competent and capable of providing leadership and direction on Fleet planning and operating matters including all aspects of Fleet Management Plan requirements.

6. The Plan includes: (a) definition of terms, (b) the requirements for peak and spare vehicles including schedule spares, maintenance spares, parts spares, (c) the requirements for support functions such as heavy and running maintenance, capital and operating parts inventory and information technology, (d) strategies for acquisition of new vehicles or overhauling existing equipment and tradeoffs between them, (e) strategies for maintenance and operations including reducing spare vehicles, (f) strategies for reducing operating costs and increasing service reliability, (g) description of existing system and expansion plans, both project and non-project related, (h) a schedule for the existing and procured/overhauled vehicle fleet; (i) the grantee's reliability program, past performance and plans to improve reliability.

7. The FTA provides a recommended spare ratio of 20% for Bus fleets. The following, which mirrors the guidance provided to Grantees, should be used by the PMOC in its review of a rail operator's proposed spare vehicle ratio:

    a. Spare ratio justification should consider: average number of cars out of service for scheduled maintenance, unscheduled maintenance and overhaul program; allowance for ridership variation (historical data); ridership changes that affect car needs caused by expansion of system or services; contingency for destroyed cars; and car procurements for replacements and system expansions.

    b. Cars delivered for future expansion and cars that have been replaced, but are in the process of being disposed of should be identified and separated from other spares because they unfairly inflate the spare ratio.

c. Peak Vehicle Requirement includes "standby" trains that are scheduled, ready for service, and have a designated crew.

d. Factors that may influence spare ratio are: equipment make-up (locomotive-hauled trains; married pair units or single cars; equipment design, reliability and age); environmental conditions (weather, above-ground or underground operation, loading and track layout); operational policies (standby trains, load factors, headways); maintenance policies (conditions for removing cars from service, maintenance during nights and weekends, and labor agreement conditions; and maintenance facilities and staff capabilities.

e. A template for the calculation can be found in the Circular 9030.1C, Appendix F

8. The grantee's information system reliably provides needed operating and financial data such as current estimates of maintenance facilities and vehicle operating costs, reliability and life expectancy, for decision-making and performance review.

9. Grantee in its selection and specification of vehicle equipment and systems has matched the appropriate technology with the planned transit applications for the best performance at the lowest cost.

10. Grantee estimates of costs, service levels, quality, or reliability are mechanically correct and complete, consistent with the grantee-defined methodologies and free of any material inaccuracies or omissions

11. Grantee forecasts and schedule are mechanically correct and complete, and are consistent with the plan scope and project scope adopted in the Record of Decision.

12. The PMOC will report its findings in a written statement which summarizes the overall findings, and characterizes, for the FTA, the acceptability of the Fleet Management Plan. The statement will include the PMOC opinion as to the completeness of the Plan.

7.0 REPORT, PRESENTATION, RECONCILIATION

Document your work in a written report. Present the findings, conclusions and recommendations to FTA headquarters and regional staff and the Project Sponsor either in *a teleconference or in person.* In an extended working session, reconcile findings and conclusions with the Project Sponsor so that disagreements if any are reconciled to the extent possible.

Appendix A contains a checklist of items to be reviewed by the PMOC.

APPENDIX A: RAIL FLEET MANAGEMENT PLAN CHECKLIST

	Requirement	PMOC Review Comments
		Review comments will indicate the following: Acceptable, Unacceptable, Acceptable with comment. Identify portions of the document that meet the criteria
1	**Grantee Document** ***Verify that:***	
1A	The RFMP is conformed in accordance with the Grantee's Document Control System.	
1B	Each page identifies the Revision No. and the date of the document.	
1C	The date of the Grantee's submittal is clearly identified.	
1D	The contents of the RFMP properly reflect the Table of Contents.	
2	**PMOC review of grantee's fleet description**	
	Verify description of the makeup of the present fleet, including:	
2A	The number and type of rail vehicles and busses in service	
2B	Peak vehicle requirements (service period and make-up, e.g., standby trains)	
2C	Address the spare ratio of rail cars, and the rationale underlying that spare ratio	
2D	Achieve optimal life expectancies	
2E	Details of existing and planned rail vehicle procurements	
2F	Current and future equipment needs	
2G	Grantee in its selection and specification of vehicle equipment and systems has matched appropriate technology with the planned transit applications for best performance at the lowest cost.	

	Requirement	PMOC Review Comments
3	**PMOC review of Grantee's Operations and Maintenance strategy**	
	Verify that the Operations and Maintenance Strategy addresses:	
3A	Operating policies and conditions (level of service requirements, train failure definitions and actions)	
3B	In detail the composition of facilities	
3C	Any rebuilds that extend the life expectancy of the equipment, any overhaul/rebuild programs; schedule to complete, effects on vehicle availability and useful life, etc., to the fleet	
3D	The grantee has adequately defined the preventive maintenance and schedule established for the existing and procured/overhauled rail car fleet	
3E	Enable a transit operator to properly plan for and carry out the overall management of its entire fleet of locomotives and rail cars	
3F	Fleet operations (present and future) as described in the plan are substantially consistent with that adopted in the Record of Decision (if applicable)	
4	**PMOC review of Grantee's management Capabilities**	
	Verify that the grantee's management is competent and capable of providing leadership and direction on matters of:	
4A	The requirements for peak and spare vehicles including schedule spares, maintenance spares, parts spares	
4B	The requirements for support functions such as heavy maintenance, capital and operating parts inventory and information technology	
4C	Strategies for acquisition of new vehicles or overhauling existing equipment and tradeoffs between them	
4D	Strategies for maintenance and operations including reducing spare vehicles	

	Requirement	PMOC Review Comments
4E	Strategies for reducing operating costs and increasing service reliability.	
4F	The plan discusses the grantee's reliability program, past performance and plans to improve reliability including profile monitoring and support of maintenance as well as failure rates and rail cars out-of-service as well as providing train failure definitions and actions	
4G	Grantee keeps a copy on file for review upon request updated from time to time as changes occur within the transit agency, acquisitions, replacement, rebuild/rehab, changes in headway or level of service, etc	
4H	Sufficiently complete in detail and analysis (Fleet plan or supporting documentation) to readily demonstrate (1) Grantee's ability to maintain and consistently improve the current level, operating costs, reliability and quality of revenue service for the years leading up to and following construction of the project; (the plan also provides.)	
4I	The grantee's information system reliably provides needed operating and financial data such as current estimates of vehicle operating costs, reliability and life expectancy, for decision-making and performance review.	
4J	The plan defines system and service expansions.	
5	**Project Impact Assessment**	
	Verify that critical system elements receive comprehensive assessment:	
5A	The grantee's existing transit service in terms of level of service, operating costs, reliability, quality and support functions, will not be degraded as a consequence of the design and either the manufacture of the equipment, or construction of the project	
5B	The grantee will be able to provide adequate service to meet the transit demand for the years leading up to and following either the delivery of the equipment/facility or construction of the project	

	Requirement	PMOC Review Comments
5C	The grantee can properly plan for and execute the overall management of its entire fleet of vehicles and related support functions and equipment, addressing all the reasonably foreseeable factors that are relevant to the determination of current and future equipment needs in light of demand for service	
5D	Grantee estimates of costs, service levels, quality, or reliability are mechanically correct and complete, consistent with the grantee-defined methodologies and free of any material inaccuracies or incomplete data.	
5E	Grantee forecasts and schedule are also mechanically correct and complete, consistent with the plan scope and project scope adopted in the Record of Decision (if applicable) and the proposed Revenue Operations Date as well as free of any material inaccuracies or incomplete data.	
6	**PMOC's review of Grantee's Operations and Maintenance Plan Format**	
6	Verify that the plan is consistent with FTA's guidance specifically with respect to:	
6A	Definition of terms	
6B	Description of existing system and expansion plans, both project and non-project related	
6C	The Demand for Revenue Vehicles and Operating Spare Ratio have been calculated in conformance with FTA guidance	
6D	The grantee has selected a sufficient time frame, (a minimum of 15-years) and compiled sufficient historical and empirical data from past and current fleet operations	

Oversight Procedure 26A- Buy America Review

1.0 PURPOSE

The purpose of this Oversight Procedure is to guide FTA staff and its Project Management Oversight Contractor (PMOC) as they monitor compliance with FTA's Buy America requirements.

2.0 BACKGROUND

2.1 Overview

A number of public transit agencies fail to appreciate the nuance and complexity of FTA's Buy America Requirements. This section provides a concise overview of these requirements and the exceptions thereto.

According to Federal law, FTA may not obligate funds for a project unless the steel, iron, and manufactured goods used in the project are produced in the United States.[1] For steel and iron end products to be considered produced in the United States, all manufacturing processes must take place in the United States, except metallurgical processes involving refinement of steel additives.[2] For manufactured end products to be considered produced in the United States, all of the manufacturing processes for the product must take place in the United States, and all of the components of the product must be of U.S. origin (a component is considered of U.S. origin if it is manufactured in the United States, regardless of the origin of its subcomponents).[3] For buses and other rolling stock (including train control, communication, and traction power equipment) to be considered produced in the United States, the cost of components produced in the United States must be more than 60 percent of the cost of all components and final assembly must take place in the United States.

FTA's Buy America requirements do not apply to purchases of less than $100,000, to microprocessors, computers, microcomputers, software, or other such devices which are used solely for the purpose of processing or storing data; or to articles, materials, and supplies excepted by the Buy American Act of 1933 through its implementing regulations at 48 CFR 25.108, as amended from time to time.

FTA may waive its Buy America requirements if the FTA Administrator finds that their application would be inconsistent with the public interest, that the materials for which a

[1] 49 U.S.C. Section 5323(j)(2)(C)
[2] 49 CFR 661.5(b).
[3] 49 CFR 661.5(c).

waiver is requested are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality in certain circumstances, or that the inclusion of a domestic item or domestic material will increase the cost of the contract between the grantee and its supplier of that item or material by more than 25 percent.[4] All waivers must be approved by the FTA Administrator or his designee.

In addition to the requirements outlined above, a recipient purchasing revenue service rolling stock must conduct or cause to be conducted a pre-award and post-delivery audit as prescribed in 49 CFR Part 663.

a) "Final Assembly is the creation of the end product from different elements brought together for that purpose through the application of manufacturing processes."[5]

b) The minimum requirements for final assembly differ for bus and rail vehicles.[6]

   - Most heavy duty transit bus manufacturers use a two-stage manufacturing process in which buses are partially built abroad and then finalized in the U.S.

   - For these 2-stage manufacturing processes, FTA no longer requires that bus manufacturers install certain bus components and subcomponents in the U.S., and allow installations abroad which have been shown to be helpful to maintaining structural integrity of bus frames shipped to the U.S.

   - For that reason, FTA excludes doors, windows, axles and/or wheels, brakes and subcomponents from Buy America provisions.

c) With regard to rail vehicles, however, domestic final assembly operations, at a minimum, must include the installation and interconnection of propulsion control and cooling equipment, brake equipment, power sources for auxiliaries and controls, HVAC, communications equipment, bogie/truck assemblies (including axles, frames, motors, suspension, and wheels), and factory functional tests on the vehicles in order to qualify for Buy America.

This Oversight Procedure, document OP26A, is one of a suite of documents covering all aspects of the various duties and responsibilities of the PMOC, in support of Capital procurements. See FTA Oversight Procedures, listed below, for relevant information.

- OP 01 Administrative Conditions and Requirements
- OP 12 Recurring Oversight and Related Reports (Periodic, Trip, Quarterly, Final)
- OP 20 Project Management Plan Review

2.2 FTA's Buy America Requirements

[4] 49 CFR 661.7.
[5] 49 CFR 661.11(r).
[6] Appendix D to 49 CFR 661.11.

Although closely related to the Buy American Act of 1933, FTA's Buy America requirements are separate and distinct. The Buy American act is applicable only to purchases by Federal agencies and departments and not to grants made by Federal agencies and departments. Purchases by state and local governments with Federal funds are not subject to the Buy American Act. In 1964, Congress passed the Urban Mass Transportation Act of 1964,[7] which authorized Federal assistance for up to 80 percent of the cost of transit equipment through the Urban Mass Transit Administration (UMTA). However, while Section 9(c) of the Urban Mass Transportation Act of 1964 originally mirrored the intent of the Buy American Act and provided for use by contractors of domestically manufactured articles, this provision was repealed by the Housing and Urban Development Act of 1965.[8]

Since the Surface Transportation Assistance Act of 1978, Federal Transit Law has included a Buy America provision. Currently located at 49 U.S.C. 5323(j), with certain exceptions, this provision prohibits FTA from obligating funds for a project unless the steel, iron, and manufactured goods used in the project are produced in the United States. FTA has published its Buy America Requirements in the Code of Federal Regulations at 49 CFR Part 661.

3.0 OBJECTIVES

3.1 The primary objective of the procedure is to provide clear, consistent instructions to PMOCs engaged in overseeing Grantee's audits of Buy America content. These instructions reflect FTA's goals of economy of effort in providing dependable and accurate oversight of Sponsors, improving the quality of services and deliverables provided by PMOCs to the FTA

3.2 Other objectives of the procedure include:

(1) To provide PMOCs with clear and practical directions and tools that can be used to evaluate a Sponsor's Buy America and related certifications, as they relate to bus and rail vehicle procurements.

(2) To provide PMOCs with clear-cut and effective recommendations for how to effectively evaluate data provided to Sponsors (Grantee's) by manufacturers.

(3) To provide PMOCs with recommendations for how to proactively monitor Buy America and related provisions before vehicles are delivered and placed into revenue service.

(4) To provide PMOCs with recommendations for how and what to check in a Sponsor's files and records that will assure early detection of any deficiencies in procurement regulations.

[7] Urban Mass Transportation Act of 1964 (now known as the Federal Transit Act), P.L. 88-365, 78 Stat. 302 (1964) (codified at 49 U.S.C. Chapter 53).
[8] P.L. 89-117, § 1109 (1965).

(5) To provide PMOCs with recommended actions and recommendations for how to direct Sponsors when manufacturers are found to be deficient in Buy America or other related requirements.

(6) To provide PMOCs with clear definitions for final assembly sites along with tangible information and references to FTA regulations that will allow them to accurately evaluate Buy America audit results for compliance.

(7) To provide PMOCs with specific recommendations to ensure timely intervention when there are indications that Buy America might not be met or the Sponsor's audit is inadequate.

(8) To provide PMOCs with recommended actions where FTA intervention is required, when Buy America audits uncover deficiencies, and provide reporting protocols to be adopted.

4.0 REFERENCES

To maintain focus, and because Buy America and related requirements differ only slightly between bus and rail, the review processes described in this Oversight Procedure are intended to apply to both bus and rail procurements. Clarifications will be provided, as required, when specific issues or requirements must be considered separately for bus or rail procurements.

4.1 Pre-Award Requirements for Bus & Rail Buy America and related provisions.

4.1.1 Pre-Award Buy America Review:

(1) The PMOC must confirm that Grantee's/Sponsors have certified through Pre-award reviews that procurement of new revenue service buses, rail vehicles, and vans, with FTA appropriated funds are Buy America compliant.

(2) Pre-award review is required, before a Grantee/Sponsor can enter into a formal contract with a manufacturer.

(3) The review period begins when the Grantee/Sponsor issues the solicitation and ends before the Grantee/Sponsor signs a formal contract with the selected manufacturer.

(4) The PMOC must confirm that for Bus and Van procurements, the Grantee/Sponsor has completed 3-certifications in this Pre-award process. All three certifications must be kept together in the Grantee's/Sponsor's files for future FTA reviews.

- Buy America certification
- Federal Motor Vehicle Safety Standards (FMVSS) certification
- Purchaser's Requirements certification

(5) For the Bus portion of the Buy America Pre-Award review, the PMOC must confirm that the Grantee/Sponsor has verified that all vehicles will meet one of the following conditions:

- Buses: the cost of components produced in the United States is more than 60 percent of the cost of all components and final assembly of buses will take place in the United States, or; Grantee/Sponsor will obtain from the FTA a waiver letter exempting the buses from FTA's Buy America requirements.

- The PMOC should also confirm that the manufacturer is responsible and capable of building the bus to the Grantee/Sponsor's design and solicitation specification.

(6) For both the Bus and Rail Buy America portion of the Pre-Award review, the PMOC should verify that the Grantee/Sponsor has completed 3-certifications for bus projects and 2-certifications for rail projects, in the Pre-Award review process.

(7) Bus Projects:

- 60% for more than 10 buses or purchase price in excess of $100,000, and confirmation that final assembly of buses will take place in the United States.

- Purchaser's Requirements certification. See description of this requirement in 4.1.2, below.

- Federal Motor Vehicle Safety Standards (FMVSS) certification.

(8) Rail Projects:

- Buy America certification, verifying that rail vehicles will contain a minimum of 60% domestic products, by cost, "and" final assembly of the rail vehicles will take place in the U.S.

- Purchaser's Requirements certification. See description of this requirement in 4.1.2, below.

(9) PMOCs are reminded that Bus manufacturers who use a two-stage production process where buses are built partially abroad and partially in the U.S. are permitted to exempt the following installations from final assembly Buy America provisions.

- Axles and/or wheels
- Bus frames
- Brakes and subcomponents
- Doors and door controls
- Windows

4.1.2 Pre-Award Purchaser's Requirements Review:

(1) PMOCs must confirm that the Grantee/Sponsor has verified that the manufacturer's bid specifications are in compliance with Grantee's solicitation specifications.

(2) PMOCs must also confirm that the Grantee has verified that the proposed/selected manufacturer is responsible and capable of building the bus to the Grantee's/Sponsor's solicitation specifications.

4.1.3 Pre-Award FMVSS Requirements Review (for bus procurements):

(1) PMOCs must confirm that the Grantee/Sponsor has obtained one of the following documents.

- A letter from the bus manufacturer stating the information that is required for the FMVSS vehicle sticker will be provided or;

- A letter from the bus manufacturer stating that the buses are not subject to FMVSS requirements.

4.2 Post-Delivery Requirements Review:

4.2.1 PMOCs must confirm that Grantee/Sponsor has completed a Post-Delivery review, before a vehicle title is transferred from the manufacturer to the Grantee/Sponsor, "or", before vehicles are placed into revenue service, whichever is first.

(1) The Grantee's/Sponsor's review period begins when the Grantee signs a formal contract with the selected manufacturer and ends before the title transfer or vehicle is put into revenue service.

(2) For bus & rail vehicles, the Grantee/Sponsor may use the Pre-Award Buy America review documents to certify Post-Delivery compliance, if he is certain that none of the information has changed since the Pre-Award review. However, if the Grantee/Sponsor has any doubt, another review should be conducted.

4.2.2 As with the Pre-Award review, for the Bus Post-Delivery review, PMOCs must confirm that the Grantee/Sponsor has completed separate certifications. Again, certifications must be kept in the Grantee's/Sponsor's files for future FTA reviews. The certifications required for Bus and Rail projects are;

(1) Bus and Van projects:

- Post-Delivery Buy America certification
- Post-Delivery Purchaser's Requirements certification
- Post-Delivery FMVSS certification

(2) Rail projects:

- Post-Delivery Buy America certification
- Post-Delivery Purchaser's Requirements certification

4.2.3 PMOCs should note that for bus and rail projects, the Buy America, Purchaser's Requirements, and the FMVSS certifications, are similar to the same reviews completed for Pre-Delivery certifications, except that for Post Delivery, the review must contain "actual data" instead of the estimated data used in Pre-Award reviews.

4.2.4 PMOCs must also note that the Post-Delivery Purchaser's Requirements certification is very different from the review performed during Pre-Award.

(1) PMOCs should confirm that, for the Bus Post-Delivery Purchaser's certification, the Grantee/Sponsor has completed visual inspections and road tests to demonstrate that buses meet contract specifications.

- Grantee's in urbanized areas with populations of more than 200,000 that purchase more than more than 10 buses or vans must have an inspector in the production facility, during the final assembly process.

- Grantee's in urbanized areas with populations of 200,000 or less that purchase more than 20 buses, must have an inspector in the production facility, during the final assembly process.

- For Bus purchases outside of the criteria in 1 & 2 above, or for purchases of any number of standard production or unmodified vans, only requires visual inspection and road test upon delivery.

(2) For the Rail Post-Delivery Purchaser's certification, the Grantee/Sponsor must certify the following.

- Grantee's purchasing any number of vehicles, must have an in-plant inspector who has performed complete visual inspections and performance tests to demonstrate that the vehicles meet the contract specifications, and;

- A resident inspector was on-site in the manufacturing facility, during the final assembly period to (a) monitor the final assembly process and (b) complete a final report describing the construction activities and explaining how the construction and operation of the rail vehicles meet the contract specifications.

5.0 PMOC REVIEW OF PROJECT SPONSOR SUBMITTALS

5.1 Specification.

For Pre-Award Requirements Reviews, The PMOC must review the specification to assure there are no requirements that will impact the ability of the supplier to achieve Buy America compliance.

5.1.1 The review will include assurance that the specification includes the most up-to-date FTA approved and current wording requiring compliance with Buy America

(1) PMOCs are advised to consult the FTA Website[9] for recent changes in Federal laws governing Buy America, as the laws are under current and regular review for applicability and change.

(2) The PMOC should proactively encourage the Sponsor to include requirement for an intermediate Buy America audit in the specification, which is recommended for the midpoint of the production contract.

5.1.2 The PMOC must pay close attention to the pre-award audit report and follow or pursue any major changes that the supplier may have made that could possibly have adversely affected compliance.

(1) Example of a change that might adversely impact Buy America compliance would be closing of a U.S. vendor (or other factors leading to unavailability of needed components or equipment) necessitating change to a new vendor, in order to avoid schedule delays and/or contract default and related liquidated damages.

5.2 Examinations to confirm Buy America Compliance:

The PMOC is responsible for reviewing and reporting on the audit report and should examine the Sponsor's certifications and supporting documents, with all due diligence. Attention shall be focused on assuring the Sponsor's Buy America experts have "drilled down" to the lowest level required, in order to demonstrate that the 60% rule has been followed and the content claimed is valid.

5.2.1 The PMOC shall pay special attention to any areas where the content is marginal or comes close to the 60% requirement.

5.2.2 The PMOC shall assure that the vehicle fabrication requirements are/were met, and where there is doubt (for instance where major sub-assemblies are made out-of-country but incorporated into the domestic vehicle build cycle), that these concerns are effectively identified and brought to Sponsor's attention for clarification.

[9] www.fta.dot/laws and search for 49 CFR 661 and 663 for updates.

(1) If the Sponsor cannot justify the discrepancy, the PMOC should report this finding to the FTA for a ruling.

5.3 Intermediate Audit.

While this audit is not mandatory by FTA, it shall be encouraged, since this represents the last chance to take corrective action before the end of the production process and prior to delivery.

5.3.1 An intermediate audit or review will be conducted in the same manner as a Post-Delivery Review.

5.3.2 The PMOC should assure that both the Grantee/Sponsor and supplier understand that failure to meet Buy America can put the Grantee's/Sponsor's FTA grant in jeopardy.

5.4 Post-Delivery Review.

This section provides specific input that PMOCs can use to evaluate Sponsor's audit report. Recommendations for specific questions to ask are provided, along with suggestions for how to evaluate component/material costs, labor costs, and sub-supplier costs and locations.

5.4.1 Questions for the Post-Delivery Review:

(1) Did the Grantee/Sponsor obtain and retain Pre-Award Buy America certifications from successful suppliers for purchases of more than $100,000?

- If yes, obtain and compare supplier list from Pre-Award certification results to list of suppliers in Post-Delivery Review.

- If no, or if the list has changed, mark this as a discrepancy for discussion with Grantee/Sponsor.

(2) Did the Grantee/Sponsor conduct Pre-Award and Post-Delivery audits for its purchase of rolling stock over $100,000? Does the Grantee/Sponsor have properly completed certifications for each review in its contract files?

- If yes, proceed to next question.

- If no, mark this as a discrepancy for discussion with the Grantee/Sponsor.

(3) If the Grantee/Sponsor is purchasing rolling stock with multiple delivery dates, using options, or multi-year procurements, and, if so, has the Grantee/Sponsor performed and certified Pre-Award and Post-Award audit for each group of vehicles, before placing them into revenue service?[10]

- If yes, proceed to next question.

[10] 49 CFR 663.21, 663.31 and FTA Dear Colleague Letter of March 18, 1997

- If no, examine contract files, invoices, and other procurement documents to determine purchase dates, content of each purchase, and dates when vehicles were placed into service. Mark this item as a discrepancy for follow-up discussions with the Grantee/Sponsor.

(4) Has the Grantee/Sponsor requested and/or received a waiver for any part of its purchase of vehicles? Does the Grantee/Sponsor have the FTA approved waiver in its procurement files for PMOC review?

- If yes, PMOC must review the waiver and determine applicability to Grantee's/Sponsor's Post-Delivery Review. If acceptable, proceed to next question.

- If no, has Grantee/Sponsor been denied an FTA approved waiver for Buy America provisions? If so, mark this item as a discrepancy for discussion with the Grantee/Sponsor.

5.5 Triennial Review

The triennial review, as its name suggests, is a review of the Grantee's Buy America activities over the past three years. There are two ways that a PMOC or FTA project manager might become involved with the Grantee's triennial review:

5.5.1 As an auditor working on behalf of the FTA in conducting the review

5.5.2 As a PMOC/Project Manager for a specific procurement by the Grantee

5.5.3 In the first case, there are a number of specific issues to be addressed.

(1) Has the Grantee included a Buy America provision for all procurements of steel, iron, and manufactured products, except products with a waiver or small purchases of $100,000 or less?

(2) Has the Grantee obtained and retained Buy America certifications from successful vendors for purchases of more than $100,000?

(3) Did the Grantee conduct pre-award and post-delivery audits for its purchases of rolling stock over $100,000? Does the Grantee have properly completed pre-award and post-delivery certifications in its contract files?

(4) If the Grantee purchases rolling stock with multiple delivery dates using either options or multi-year procurements, has the Grantee performed and certified a pre-award and post-delivery audit for each group of vehicles before placing them into service?

(5) What process did the Grantee use to verify the domestic content of the vehicle, its components, and its subcomponents prior to awarding the contract?

(6) If required, did the Grantee use in-plant inspectors during the manufacturing process?

(7) Does the Grantee have a description of the manufacturing activities taking place during the final assembly of the vehicles and, for vehicles that were partially manufactured outside the United States, did the final assembly meet FTA requirements?

5.5.4 In the second case the PMOC or FTA project manager has the triennial report available to establish how the Grantee has handled Buy America issues in the past and provides some guidance for matters that require special attention.

6.0 SCOPE OF WORK

In addition to the reviews of submittals indicated above, as part of its monthly report, the PMOC shall include recommendations for FTA to take corrective action with the Grantee. Before making such a report, the PMOC shall discuss possible corrective action with the Grantee, and report the intended corrective action concurrently.

6.1 Discrepancy Type 1: Grantee/Sponsor is deficient and did not have Buy America requirements in its procurement contracts for iron, steel, or manufactured products and/or does not have an FTA approved waiver.

6.1.1 Corrective Action: PMOC must advise Grantee to revise its procurement procedures to include the Buy America provisions, including the requirement to obtain vendor signed Buy America certifications.

6.1.2 Corrective Action: PMOC shall direct Grantee/Sponsor to submit revised purchasing procedures to the FTA.

6.2 Discrepancy Type 2: Grantee/Sponsor is deficient and did not conduct all of the required review for its rolling stock procurement. Grantee/Sponsor does not have all of the required certifications in its files.

6.2.1 Corrective Action: The PMOC should advise the Grantee/Sponsor to locate and sign all missing but required certifications.

6.2.2 Corrective Action: If the certifications cannot be located, the PMOC should direct Grantee/Sponsor conduct “after-the-fact” Pre-Award or Post-Delivery audits to verify that the procurement complies with domestic content and final assembly requirements.

6.3 Discrepancy Type 3: Grantee/Sponsor is deficient and has placed vehicles into revenue service, before completing Pre-Award and/or Post-Delivery Audits.

6.3.1 Corrective Action: The PMOC should direct the Grantee/Sponsor to provide the FTA with an explanation for how/why vehicles were placed in service before completing the Pre-Award and Post-Delivery Audits.

6.3.2 Corrective Action: The Grantee/Sponsor must complete outstanding audits, without delay and furnish copies of the audit documentation to the FTA.

6.3.3 Correction Action: The Grantee/Sponsor must provide assurance to FTA that changes in its procurement procedures have been made so that future procurements will comply with Buy America requirements.

6.4 Discrepancy Type 4: The Grantee/Sponsor is deficient and has not adequately or sufficiently reviewed the manufacturer's Buy America documentation to determine compliance or intent to comply with requirements.

6.4.1 Corrective Action: The PMOC should direct the Grantee/Sponsor that it should take whatever action is necessary to obtain appropriate certifications, including performing an "after-the-fact" Pre-Award audit to prove that vehicles comply with domestic content requirements.

6.4.2 Corrective Action: For vehicle purchases that have been completed and/or put into revenue service, the Grantee/Sponsor must revise its procedure and provide assurance to FTA that it will comply with all Buy America requirements in future procurements.

6.5 Discrepancy Type 5: The Grantee/Sponsor is deficient and did not use "in-plant" inspectors or did not perform visual inspections and road tests on bus procurements, for FTA funded procurement, as required.

6.5.1 Corrective Action: The PMOC must direct the Grantee/Sponsor to provide FTA with a complete explanation for why the inspection requirement was not met.

6.5.2 Corrective Action: The Grantee/Sponsor must change its procurement procedures and assure the FTA that future procurements will comply with regulations.

6.6 Discrepancy Type 6: The Grantee/Sponsor is deficient because the manufacturer's assembly process included partial assembly outside of the U.S. and final assembly activities in the U.S. did not meet minimum requirements for compliance.

6.6.1 Corrective Action: The PMOC must direct the Grantee/Sponsor to provide the FTA with a complete explanation for not complying with the regulations.

6.6.2 Corrective Action: The Grantee/Sponsor must provide assurance that future vehicle procurements will be conducted in compliance with FTA Buy America requirements.

7.0 REPORT, PRESENTATION, RECONCILIATION

7.1 Reports.

The PMOC shall report on its review of each of the topics discussed under section 5.0, Sponsor Submittals. These reports shall include the applicable/appropriate topics listed in the checklist below, where discrepancies or principal findings are detected. The check list in Appendix A is provided for use by the PMOC.

7.2 Presentation

7.2.1 PMOCs are required to communicate with the Grantee/Sponsor and with FTA officials to report deficiencies, findings, and items of concern.

7.2.2 Presentation of official correspondence to advise or inform Grantees/Sponsors of relevant items should always be made in writing and should include the following parameters.

(8) Date of the correspondence

(9) Clearly stated subject or title for the correspondence

(10) Briefly stated background and/or purpose of the correspondence

(11) Findings, itemized with additional comments, if needed, that clearly explain how the findings are (or are not) in compliance with FTA regulations.

(12) Directions and instructions for what the next course of action or follow up is for the Grantee/Sponsor.

(13) The PMOC's name, company affiliation, method for contact, and signature.

(14) Reference for project files with specific controlled project document number, provided by the FTA Oversight Manager.

7.3 Reconciliation

Buy America findings discovered and reported by PMOCs must be reconciled with the Grantee/Sponsor. Reconciliation should involve the following actions, on the part of the PMOC.

7.3.1 Presentation of relevant findings to the Grantee/Sponsor.

7.3.2 Written request for PMOC follow up meeting with Grantee/Sponsor to allow for explanation of any discrepancies noted along with corresponding corrective actions planned by the Grantee/Sponsor.

7.3.3 When Grantee/Sponsor accepts or acknowledges deficiencies, PMOC should proactively assist with direction for corrective actions or remedies, including assistance to Grantee/Sponsor to request waivers from FTA for Buy America requirements, under certain circumstances.

8.0 APPENDICES

8.1 Sample Review Certifications[11]

8.2 Bus Pre-Award and Post-Delivery Review Requirements[12]

8.3 Rail Vehicle Pre-Award and Post-Delivery Review Requirements[13]

8.4 2007 FTA Triennial Reviews, Buy America[14]

[11] www.fta.dot.gov/laws/leg_reg_5451.html
[12] www.fta.dot.gov/laws/leg_reg_5428.html
[13] www.fta.dot.gov/laws/leg_reg_5446.html
[14] www.fta.dot.gov/FY2007TriReview/08buyamerica.html

APPENDIX A: CHECKLIST

OP Section #	Issue
5.1	Specification
5.1.1	Does the specification contain requirements that make it hard for the supplier to achieve Buy America requirements
5.1.2	Does the specification require the supplier to meet the Buy America Act and refer specifically to the relevant sections of Title 49, CFR, Sections 661 and 663
5.1.3	Does the specification call for Pre-Award and Post Delivery Audits for Buy America
5.1.4	Does the Grantee's/Sponsor's procurement documentation mandate or require an Intermediate Buy America Audit, and is the Audit planned at such a point that it will identify whether or not the procurement is on target but still allow time to take corrective action(s) if there is a risk of failing to comply?
5.2	Pre Award Audit
5.2.1	Is the Grantee's auditor experienced in Buy America Audits?
5.2.2	Are there any major assemblies or sub-assemblies identified in the Pre-Award review with Domestic content close to or below 60%?
5.2.3	Are there significant sub-assemblies with content close to 60% that are claimed as 100% in the Major Assembly
5.2.4	Has the auditor drilled down into the list of vehicle components sufficiently to demonstrate that changes at lower levels will not cause any major sub-assemblies, claimed at 100%, to not comply?
5.2.5	Will the vehicle bodies be manufactured in the US, or will they arrive as "knock down" components from abroad, requiring minor assembly work?
5.2.6	What inspection services does the Grantee propose?
5.3	Intermediate Audit
5.3.1	Has the Grantee performed an Intermediate Audit?
5.3.1.1	Is the Grantee's auditor experienced in Buy America Audits?
5.3.1.2	Are there major assemblies with Domestic content close to or below 60%?
5.3.1.3	Are there significant sub-assemblies with content close to 60% that are claimed as 100% in the Major Assembly?
5.3.1.4	Has the auditor drilled down sufficiently to demonstrate that changes at lower levels will not cause any major sub-assemblies, claimed at 100%, to not

	comply?
5.3.1.5	Are the vehicle bodies manufactured in the US, or do they arrive as "knock down" components from abroad, requiring minor assembly work?
5.3.1.6	Does the Grantee have on-site inspection?
5.3.1.7	Does the Grantee's inspection coverage include major sub-suppliers?
5.3.2	If the Grantee did not perform an Intermediate Audit:
5.3.2.1	Have there been any substantive changes in sourcing since the Pre-Award audit
5.3.2.2	Do any of the changes impact Major Assemblies with close to or below 60% domestic content?
5.4	Post Award Audit
5.4.1	Is the Grantee's auditor experienced in Buy America Audits?
5.4.2	Are there major assemblies with Domestic content close to or below 60%?
5.4.3	Are there significant sub-assemblies with content close to 60% that are claimed as 100% in the Major Assembly?
5.4.4	Has the auditor drilled down sufficiently to demonstrate that changes at lower levels will not cause any major sub-assemblies, claimed at 100%, to not comply?
5.4.5	Were the vehicle bodies manufactured in US, or did they arrive as "knock down" components from abroad, requiring minor assembly work?
5.5	Triennial Review
5.5.1	In performing a Triennial Review, the following questions are to be addressed.
5.5.1.1	Has the Grantee included a Buy America provision for all procurements of steel, iron, and manufactured products, except products with a waiver or small purchases of $100,000 or less, in its purchasing documents?
5.5.1.2	Has the Grantee obtained and retained Buy America certifications from successful vendors for purchases of more than $100,000?
5.5.1.3	Did the Grantee conduct pre-award and post-delivery audits for its purchases of rolling stock over $100,000? Does the Grantee have properly completed pre-award and post-delivery certifications in its contract files?
5.5.1.4	If the Grantee purchases rolling stock with multiple delivery dates using either options or multi-year procurements, has the Grantee performed and certified a pre-award and post-delivery audit for each group of

	vehicles before placing them into service?
5.5.1.5	What process did the Grantee use to verify the domestic content of the vehicle, its components, and its subcomponents prior to awarding the contract?
5.5.1.6	If required, did the Grantee use in-plant inspectors during the manufacturing process?
5.5.1.7	Does the Grantee have a description of the manufacturing activities taking place during the final assembly of the vehicles and, for vehicles that were partially manufactured outside the United States, did the final assembly meet FTA requirements?
5.5.2	Reviewing Triennial Report. Does the Triennial Report indicate a consistent lack of attention in specific areas?
5.5.2.1	What areas have been consistently deficient?
5.5.2.2	Have the consistent deficiencies adversely impacted the Grantee's procurement of vehicles?

US DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 26B – Bus and Rail Vehicle Technical Review

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1.0 PURPOSE

The purpose of this Oversight Procedure (OP) is to provide Federal Transit Administration (FTA) staff and its Project Management Oversight Contractors (PMOC) with guidelines for oversight of Grantees' procurements of road and rail vehicles, to proactively ensure that FTA grants are being used to obtain best value. Such oversight includes but is not limited to:

- Assurance the vehicles being procured are a good fit for the intended use;
- The vehicles represent good value for the product selected;
- Assurance the vehicles meet the specified requirements;
- Assurance that the Grantee has considered the most appropriate technologies.

2.0 BACKGROUND

The FTA has determined that guidance to PMOCs must be simplified to assure focus on the critical program elements. This document is one of a suite of documents covering all aspects of the various duties and responsibilities of the PMOC. This OP should be read in the context of other OPs including:

- OP 12 Recurring Oversight and Related Reports
- OP 20 Project Management Plan Review
- OP 41 ADA Level Boarding for Commuter Rail

Each of the above mentioned documents should be referred to when performing a technical review of a Grantee's vehicle procurement.

3.0 OBJECTIVES

In establishing this and other OPs, it is the FTA's intent to provide guidance to PMOC's and FTA staff in execution of their duties in specific areas of responsibility. This and other OPs do not in any way stand in place of the regulations, but are provided for clarity of thought, reporting, and action on the part of the persons responsible for oversight.

The primary objective of this OP is to provide clear, consistent instructions to PMOCs engaged in overseeing Grantees' procurement of road and rail vehicles. These instructions reflect FTA's goals of economy of effort in providing dependable and accurate oversight of Grantees, and of improving the quality of services and deliverables provided by PMOCs to the FTA. Other objectives include:

- Describing the separation of roles of the Grantee and its consultants, and the PMOC;
- Focusing PMOCs' attention on their duties and obligations to clearly report on the completeness and accuracy of Grantee's deliverables;

- Identifying when the Grantees actual and stated needs are in conflict;
- Assuring timely intervention when there are indications that the vehicle will not satisfy the Grantee's actual needs;
- Defining limits to PMOC and FTA intervention, and the reporting protocols to be adopted;

4.0 REFERENCES

The references provided below are not intended to be a comprehensive guide to all that governs the procurement of rolling stock, but are a minimum reading, for PMOC's engaged in the oversight of vehicle procurements, to understand and act on.

4.1 Regulations

This section addresses only Federal rules and regulations governing the procurement of rolling stock. Only the regulations most pertinent to rolling stock procurement are identified, while general regulations (such as regulations governing Interstate Commerce) are not addressed. Procurement Regulations directed at Transit are reviewed where they apply to rolling stock procurement. State regulations are not addressed in this Oversight Procedure.

4.1.1 Procurement Regulations

- FTA C4220-1F. US DOT, Federal Transit Administration. Third Party Contracting Requirements. Circular governing procurement practices allowable under Federal Regulation for sub-contracting by Federal Grantees. This circular summarizes the impact of Federal Transit Laws, Acquisition Laws, Common Grant Rules, Executive Orders, and SAFETEA-LU on third party grantees. The Laws, Regulations, and executive orders referenced in the circular are not duplicated here.

- Federal Acquisition Regulations (FAR) is used by the Federal Government in its own procurements. It provides a window into the most current thinking in Federal Procurement, and as such, can be used to supplement direction provided in the FTA circular.

4.1.2 Required Clauses in FTA Grantee RFPs

The PMOC shall verify the required clauses are in any contract for transit vehicles that use Federal funds. The required clauses can be found in the FTA's Best Practices Procurement Manual (BPPM). See references to access this document.

4.2 Essential Reference Documents

Though there are many documents and papers in the literature, the FTA Best Practices Procurement Manual (BPPM) provides a comprehensive guide to those charged with oversight of any Transit Procurement. The manual can be downloaded at:
http://www.fta.dot.gov/funding/thirdpartyprocurement/grants_financing_6037.html

The Best Procurement Practices Manual is a comprehensive guide to grantees' procurement officers in assuring compliance with Federal Requirements in procurement. It covers all aspects of procurement

including: the applicability of Federal regulations, alternative procurement practices; procurement planning; solicitation; award; DBE; Contract Clauses; the pros and cons of design versus performance specifications; Contract Administration; Close out; Disputes. It provides references to all relevant legislation, regulations, letters and circulars.

This comprehensive document provides guidance on the whole project cycle, providing further guidance on:

- Evaluation of projects at low levels of specification (below 10%), defining program goals, and relating vehicle procurements to program goals;
- Procurement methodologies leading to best value;
- Advantages and issues with performance based specifications and FTA position on this issue;
- Steps required in assuring specification compliance;
- Laws and regulations pertaining to procurement of Transit Systems using Federal Funds.

5.0 PROJECT SPONSOR SUBMITTALS

The PMOC shall develop a program of submittal review that is intended to assure the FTA's interests are protected economically, and not be a duplication of the work undertaken by the sponsor and its consultants. Under 49 U.S.C. 5325, 18 CFR 18.36(i), 49 CFR 633.17 all supplier submittals are available as sponsor submittals to the PMOC. Some of the key documents and papers that require attention from the PMOC are discussed below:

5.1 EIS/EIR

Primarily, the PMOC shall confirm that the intended vehicle does not potentially conflict with any statements made in the EIS/EIR. List any discrepancies and bring them to the attention of the grantee. Report action taken by grantee.

5.2 Grant Application

Does the vehicle under consideration fulfill the needs stated in the grant application? Pay attention to fulfilling operational needs, cost to procure vehicles, maintenance intentions, and prospects for add-on procurements. List any discrepancies and bring them to the attention of the grantee. Report action taken by grantee.

5.3 Useful Reading

In review of the Specification in its developmental stages, the PMOC should pay particular attention to:

- Comparing the vehicle being procured with the vehicle required to satisfy the EIS;
- Determining whether the payment schedule provides the leverage required to assure compliance. Special attention must be paid to payment schedules that are front loaded (even if justified on fiscal grounds) to assure that the project sponsor retains sufficient funds to maintain the supplier's attention;
- Assuring the key technical documents will be approved before hardware delivery;
- Identifying whether the vehicle to be delivered can be maintained by the resources at the grantee's disposal;

- Assuring the vehicle meet the grantee's operational requirements;
- Assuring the training program allows the vehicle to be operated and maintained by the grantee;
- Determining that qualification and acceptance criteria assure the vehicle "as delivered" meets the grantee's needs;
- Assuring that project technical issues are resolved and mitigated and that open items are resolved prior to payment of the relevant milestone.

5.4 CDRL

The PMOC shall review the Contract Deliverables Requirements List (CDRL) documents to determine whether the documents will address all of the characteristics to be demonstrated through analysis and test.

- These documents and tests shall include proof of design, maintainability, safety, serviceability, and reliability;
- CDRLs for configuration controls and management must be closely monitored to enable ongoing and timely updates on changes by the supplier.

5.5 Test Program Plan

The PMOC shall review the Test Program Plan to assure the plan is integrated with the CDRL. The PMOC must assure that, between test and analysis, the supplier will demonstrate full compliance with the Sponsor's design specification. Specifically, the PMOC shall assure the following:

- Critical specified performance criteria are demonstrated by test, by acceptable analysis, or prior agency certified test;
- Acceptance tests are sufficient to demonstrate that each vehicle is compliant through testing of representative criteria;
- The test program is valid for the vehicle and the intended infrastructure. For instance, new vehicles on new infrastructure will require different approaches, such as full system testing; existing vehicle designs previously tested on the existing infrastructure might only require vehicle testing to assure satisfactory interfacing with the existing infrastructure;
- Waivers for existing designs are evaluated fully to assure that the waiver is soundly based upon proven in-service technology used in demonstrably similar systems.

To support the Test Program Plan Review, the PMOC shall review pertinent test procedures to assure compliance:

- Test procedures should reference applicable sections of the specification to be proven;
- Test procedures are up-to-date and reflect the latest design configurations.

5.6 Design Documents

In reviewing design documents the PMOC shall assure the following:

- There is a properly sequenced plan of design that will assure compliance at the earliest possible moment, mitigating the costs of rework and dangers to the overall program schedule;

- Each document addresses the intended issues;
- Assumptions made in each document are valid and proven;
- Analytical methods used meet current professional standards;
- The grantee's review is by person's competent in the field who capable of detecting and commenting on analytical errors;
- Drawing and Configuration Control is designed to assure consistency throughout the fleet, including option orders;
- The supplier's QA program and the Grantee's oversight will assure delivery of the vehicle "as designed"

5.7 Quality Assurance

The PMOC shall review the Grantee's QA plan to assure the supplier's QA will be performed under adequate surveillance, and will pay particular attention to assure the following:

- The Grantee has qualified inspector(s) on site while production is underway;
- Both the Grantee's and the Supplier's inspection services are independent enough of production and program management to assure issues are not suppressed;
- Protocols are in place for dealing with discrepant materials and the grantee's inspector has a voice in disposal of discrepant materials;
- The Grantee's requested delivery schedule provides sufficient time to assure supplier delays will not compromise vehicle quality.

6.0 SCOPE OF WORK

In addition to the reviews of submittals indicated above, the PMOC shall, as necessary, include recommendations for FTA to take corrective action with the Grantee.

The checklists in Appendix A are provided as an assist to the PMOC.

- Before making such a report, the PMOC shall discuss any noted or observed issues and possible corrective action with the grantee, and report the issues and intended corrective action concurrently to the FTA.
- The PMOC shall pay special attention to the following key issues: This section might include a list of specific conditions that would require recommendation for corrective actions to the FTA. Such conditions might include:

    1. Schedule, issues potentially impacting schedule, and issues actually impacting schedule;
    2. Vehicle Safety Issues;
    3. Vehicle Reliability, Availability and Maintainability Issues;
    4. Issues impacting vehicle operability;
    5. Faulty or unreliable vehicle designs or systems;
    6. Known component or material deficiencies and availability of replacement parts;
    7. Other, such as payments to vendors (slow or no payments);

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall provide FTA with a written report of its findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. After FTA approval, the PMOC should share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

The report formatting requirements of OP-1 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

APPENDIX A: CHECKLIST

OP Section #	Issue	Result
5.1	EIS/EIR. Describe any conflicts between EIS/EIR and intended vehicle and Grantee's intended response	
5.2	Grant Application Review. Review the following issues with the Grantee and report discrepancies and intended grantee mitigating action:	
5.2.1	Describe any discrepancies between intended vehicle and needs described in Grant Application;	
5.2.2	Does the vehicle fulfill the operational needs;	
5.2.3	Will the intended vehicle fit the budget;	
5.2.4	Is the vehicle maintainable by the Grantee within the resources available;	
5.2.5	Will additional vehicles be required and if so has the process taken this into account;	
5.3	Specification. Review the earliest specification and the completed specification to answer the following questions:	
5.3.1	Does the intended vehicle meet the EIS requirements;	
5.3.2	Payment Schedule. Do the payment schedule and the work schedule match:	
5.3.2.1	Does the payment schedule provide the means to assure compliance at PDR;	
5.3.2.2	Does the payment schedule provide the means to assure compliance at FDR;	
5.3.2.3	Does the payment schedule provide the means to assure compliance at FAI;	
5.3.2.4	Does the payment schedule provide the means to assure compliance of Performance Testing;	
5.3.2.5	Does the payment schedule provide the means to assure compliance at Vehicle Acceptance;	
5.3.2.6	Does the payment schedule assure "as built" drawings will be delivered;	
5.3.2.7	Does the payment schedule enforce compliant and timely delivery;	
5.3.2.8	Does the payment schedule assure supplier and sub-supplier attention through warrantee;	
5.3.3	Can the intended vehicle be maintained by the resources available to the Grantee;	
5.3.4	Will the intended vehicle meet the Grantee's operational requirements;	
5.3.5	Will the required training program, and the level of Grantee staff (type and quantity) assure the grantee can operate and maintain the vehicles;	

5.3.6	Will the qualification requirements assure the vehicle performs as intended;	
5.3.7	Does the acceptance testing proposed assure the fleet will perform within acceptable boundaries without having to repeat qualification tests on each vehicle.	
5.4	The PMOC shall review the Contract Deliverables Requirements List:	
5.4.1	Does the CDRL assure that all critical performance issues are adequately analyzed, including:	
5.4.1.1	Structural strength and fatigue resistance of Body and Truck;	
5.4.1.2	Brake Performance;	
5.4.1.3	Propulsion performance;	
5.4.1.4	Dynamic performance;	
5.4.1.5	HVAC performance;	
5.4.1.6	Dynamic Envelope, loading gauge, and clearance requirements;	
5.4.1.7	Controls and Interlocks;	
5.4.1.8	Weight Management;	
5.4.1.9	Safety Management;	
5.4.1.10	Reliability Management;	
5.4.1.11	Availability Management;	
5.4.1.12	Maintainability and Mean Time To Repair	
5.4.2	Does the CDRL schedule assure that performance is proved by analysis before start of sub-assembly production	
5.5	Test Program Plan and Procedures	
5.5.1	Will the test plan validate all analyses;	
5.5.2	Will the test plan validate performance that has not been analyzed;	
5.5.3	Will the acceptance testing proposed validate production results and fleet performance;	
5.5.4	Does the test plan and CDRL assure the vehicle will perform on the actual infrastructure;	
5.6	Design Documents.	
5.6.1	Review key documents to assure:	
5.6.1.1	The document addresses the intended issues;	
5.6.1.2	Assumptions made are valid and proven;	
5.6.1.3	Analytical methods meet current professional standards;	
5.6.1.4	Grantee review is by individuals qualified in the art;	
5.6.2	Drawing and Configuration Control will assure consistency throughout the fleet, including option	

	orders:	
5.6.2.1	Is PDR consistent with the specification;	
5.6.2.2	Is FDR consistent with specification, with all issues of design and analysis closed;	
5.6.2.3	Does the FAI validate all items of production;	
5.6.2.4	Are the performance tests a full validation of the vehicle performance;	
5.6.2.5	Does vehicle acceptance validate the fleet performance within acceptable tolerances;	
5.6.2.6	Does analysis and test precede production to minimize changes after production has started;	
5.6.3	The Supplier's QA program and the Grantee's oversight will assure delivery of "as designed" vehicles;	
5.7	Quality Assurance. Review the Grantee's QA plan to assure:	
5.7.1	Grantee has qualified inspector(s) on site during manufacturing, including during pre-production of jigs and fixtures;	
5.7.2	The Grantee and Supplier reporting provides sufficient independence to allow issues to be raised;	
5.7.3	Discrepant material will be properly managed to assure it is quarantined and disposed of appropriately;	
5.7.4	The schedule is such that choices between corrective action and meeting schedule do not drive quality;	
6	Scope of Work. While undertaking the reviews detailed in section 5, The PMOC shall pay special attention to the following:	
6.1	Schedule. Issues potentially or actually affecting schedule;	
6.2	Vehicle Safety Issues;	
6.3	Vehicle Reliability, Availability and Maintainability issues;	
6.4	Issues impacting Vehicle Operability;	
6.5	Faulty or unreliable vehicle designs;	
6.6	Known component or material design deficiencies.	

These check lists are to be supplemented as needed by the PMOC.

Oversight Procedure 32A - Project Capacity Review

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) as regards the design capacity, functionality, and project definition for critical project scope elements relative to that required to accommodate forecasted conditions and required by sound engineering practices.

2.0 BACKGROUND

As demonstrated in research results published previously by Construction Industry Institute and other governmental agencies such as NASA, greater front end planning efforts lead to improved performance on capital projects in the areas of cost, schedule, and operational characteristics. Further, as NASA notes, since project definition (specifically NASA PDRI element scores) relates to risk, such efforts can easily isolate risk areas that need further work.

In a report titled *Managing Capital Costs Of Major Federally Funded Public Transportation Projects* (2006), the Transportation Research Board noted that project definition entails the:

- Conceptualization of the alternatives and the refinement of this project definition through the course of the project-development process. The inception and evolution of a project can have a large impact on the capital costs. In particular, the level of design is an important factor affecting the uncertainty of the capital costs and the subsequent variation in the estimates.

- Clear cost priorities, established early in project development, are important to cost and schedule performance. These priorities should be reflected in the initial evaluation of alternatives. Establishing clear budget and schedule constraints early in the project-development process helped contain scope creep and identify reasonable project-development schedules. However, some flexibility with respect to scope and schedule should be maintained in the project-development process in order to adapt to the more unique project conditions identified throughout the development process. This flexibility combined with appropriate budgetary targets and reasonable developmental schedules formed the successful factors in project definition.

Further:

> [t]he project definition strategies that contributed the most success to the project-definition process were a transparent development process with extensive stakeholder input, a reasonable project-development schedule that reflects sufficient time for stakeholder outreach, *a value engineering exercise at each stage that reconsiders the definition results to that point, and a*

design-to-budget approach that maintains budgetary considerations within each stage of project development. (Emphasis added.)

The point of using tools like project development risk isolation (PDRI) is to identify, characterize and precisely describe each critical element in a scope definition package. If this is performed as part of developing a project execution strategy, the scope reviews allow the PMOC to quickly develop factors that impact project risk, and then to recommend an execution strategy to address these factors. This review should comprehensively evaluate the effectiveness and efficiency of the Grantee's definition of project scope at any point during project implementation, including the basis for the design and execution approach applied to the project.

During the Preliminary Engineering phase, this effort focuses on the identification and validation of functional requirements for the project. The review defines the type of capability that is needed and evaluates various options that meet the stated need of the Grantee's proposed transit project and its benefits. At entry to final design, this review supports FTA's evaluation of project readiness for advancement and funding recommendation.

FTA's intent is to accomplish its oversight mission with PMOC deliverables that evaluate the completeness, consistency and adequacy of the Grantee's project scope definition and make recommendations to the Grantee on redirecting or reprioritizing its efforts to correct the inadequately defined areas prior to commencement or completion of Preliminary Engineering or Final Design. PMOC or Grantee efforts to analyze individual project scope elements with indications of poor definition will reveal or confirm the amount of risk each individual element brings to the project. This provides FTA with a cost effective approach in that the PMOC evaluates inadequately defined areas highlighted by the project scope. This ensures FTA's products satisfy the oversight requirement for accuracy and completeness.

3.0 OBJECTIVES

Assess and evaluate the Grantee's project using TCRP's *Transit Capacity and Quality of Service, Report 100, 2nd edition (2003) Rail Capacity Manual* and its procedures with respect to the capacity of individual rail transit system features or functions. Assess and evaluate the proposed level of service using the same TCRP manual. The capacity sections of the manual provide both planning and more detailed operations analysis procedures for assessing capacity for rail transit modes, and transit stops, stations, and terminals. A building-block approach to capacity analysis is presented, initially addressing the capacity characteristics of individual transit stops and station components, and then expansion of the concepts to address the capacity of broader transit services, facilities, and systems.

4.0 REFERENCES

The statutes, regulations, policies, circulars, and guidance documents in OP 01 apply.

5.0 PROJECT SPONSOR SUBMITTALS

Information required to accomplish this review will typically include all engineering studies, preliminary reports, drawings and other documents produced on the project to date, which describe the project details.

6.0 SCOPE OF WORK

A building-block approach to capacity analysis is to be followed. Initially address the capacity characteristics of individual transit stops and station components, and then expand the concepts to address the capacity of broader transit services, facilities, and systems.
Such analysis shall include:

1) "Line capacity" or theoretical capacity of the project is defined by TCRP Report 100 as "the maximum number of trains that can be operated over a section of track in a given period of time, typically one hour. . . The factor providing the lowest capacity—the weakest link—will constrain the capacity of a given section of a line." As the report notes, "ideally, the combination of the train signaling system being used and the station with the longest dwell time will control the line capacity. However, under less-than-ideal conditions, any number of other factors may control line capacity." The PMOC shall analyze other factors that may control line capacity including:
2) Line capacity and vehicle capacity, both relating to the number of trains that can be operated per hour, are equivalent terms for rail.
3) Station dwell time and the minimum train separation produced by the signaling system.
4) Signaling systems designed for the minimum planned train headway, rather than maximum capacity.
5) Speed restrictions due to sharp curves or steep downgrades on the approach to the station with the longest dwell time.
6) Line crossings and merges, particularly at-grade track junctions.
7) Time required to turn back a train at a terminal station, and
8) Mode-specific issues, such as light rail trains operating in mixed traffic or commuter rail trains sharing tracks with freight trains.
9) Traction power substation type and characteristics, DC distribution systems including the OCS, DC feeders, and return rails, and the power characteristics of the vehicles to be used on the system.
10) Person capacity after adjustments to line capacity.
11) Capacity modeling shall develop static and dynamically elements for traffic operations and other guideway elements such as vertical and horizontal curvature and line of sight restrictions.
12) Capacity of the project's maintenance infrastructure (as-built) such as shops, yards, secondary maintenance, component rebuilds or capital inventory requirements using a structured and methodical approach that makes maximum use of previous TRB work and other existing engineering data.
13) Capacity of the light rail transit project as required to meeting the passenger load requirements forecasted for the revenue operations date (peak hour passenger boardings) and the recommended "mature capacity" identified in TCRP 100 (ref. Page 5-49).
14) This assessment shall also address the engineering economy issues associated with determining what project elements were to be constructed at what time.

15) Step the project forward using the forecasted ridership for milestones such as opening day of service and the year of the longer-term ridership forecast. Refer also to milestones listed in the rail fleet management plan.

16) The PMOC shall determine a cost effective "build out" approach for the transit project from the revenue operation date out to a future-planning horizon such as 20-50 years into the future depending upon the useful economic life of project components.

17) PMOC shall estimate the useful economic life for major project elements. Refer to the "Build Annualized Worksheet" within FTA's Standard Cost Category (SCC) Workbook portrayed on FTA's public website for a listing of accepted useful life lengths for project components.

18) Recommendations should account for the time value of money as well as the costs associated with various construction approaches.

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall provide FTA with a written report of its findings, analysis, recommendations, and professional opinions, including a description of the review activities undertaken. In Appendix A describe project information on which the review was performed. In Appendix B describe the review methodology. After FTA approval, the PMOC should share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

The report formatting requirements of OP-1 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

U.S. DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 32B – Environmental Document (NEPA) Review for New Starts Projects

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1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis, and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from Project Management Oversight Contractors (PMOC) with regard to both the completeness of the National Environmental Policy Act (NEPA) documentation as well as the level to which environmental impacts and mitigations are reflected in the project documents. To the extent possible, the documents should provide a sound basis for the project cost estimate and schedule.

2.0 BACKGROUND

2.1 The National Environmental Policy Act (NEPA)

President Nixon signed NEPA into law on January 1, 1970, just weeks after it was enacted by Congress. NEPA was the first major environmental law in the United States and established the environmental policies of the federal government. NEPA requires agencies to assess the environmental effects of their proposed actions prior to making decisions. The environmental review process leads to the implementation of NEPA's policies through its commitment to informed decisions and citizen involvement.

In enacting NEPA, Congress directed that the policies, regulations, and public laws of the United States be interpreted and administered in accordance with the policies set forth in the Act to the fullest extent possible. The "NEPA process" or the "environmental impact assessment process" prescribed by Congress applies to all federal agencies in the executive branch.

The general process for complying with NEPA is set forth in the FHWA/FTA regulation, "Environmental Impact and Related Procedures," 23 CFR Part 771 and 49 CFR Part 622.[1] In addition to the NEPA process, other environmental laws and regulations apply, including those related to historic preservation and protection of public lands. Coordination with FTA planning and environmental specialists to develop and carry out the scoping process, outlined in 40 CFR § 1501.7 of the Council on Environmental Quality (CEQ) Regulations, before the NEPA process formally begins, ensures that all necessary environmental issues are addressed early in the planning process. In non-attainment or maintenance areas, transportation plans must contain enough information to allow conformity findings as defined by U.S. Environmental Protection Agency. 40 CFR Part 51.

[1] Projects that require preparation of an Environmental Impact Statement must also comply with the procedures outlined in 23 U.S.C. § 139.

2.2 The New Starts Process

New Starts projects proposed for funding assistance under 49 U.S.C. § 5309 must emerge from a metropolitan and statewide planning process consistent with 23 CFR Part 450. In addition, to be eligible for New Starts funding, the proposed project must be based on the results of an alternatives analysis (AA). The AA incorporates information about the benefits, costs, and impacts of alternative approaches to a transportation issue in a given corridor and leads to the adoption of a locally preferred alternative (LPA). The alternative approaches evaluated in an AA must include a no-build alternative, a baseline alternative, and an appropriate number of build alternatives. When prompted by the project sponsor, FTA will determine on a case-by-case basis whether a project's no-build alternative also satisfies the baseline alternative requirement. The LPA must be selected from the evaluated alternative strategies and formally adopted and included in the Metropolitan Planning Organization's (MPO) financially-constrained Long Range Transportation Plan (LRTP). Prior to submittal of a request for a project to enter New Starts preliminary engineering (PE), the Project sponsor must obtain FTA's approval of the baseline alternative.

Consistent with 49 U.S.C. §§ 5309(e)(6) and 5328(a)(2), FTA will approve or disapprove entry of a proposed project into PE within 30 days of receipt of a formal request from the project sponsor. A proposed project can be considered for advancement into PE only if:

- AA has been completed;
- The proposed project is adopted as the locally preferred alternative by the MPO into its financially constrained LRTP;
- Other applicable federal and FTA program requirements have been met such as FTA's evaluation of the project as described in 49 CFR § 611.9-13.

2.3 The NEPA Process for New Starts Projects

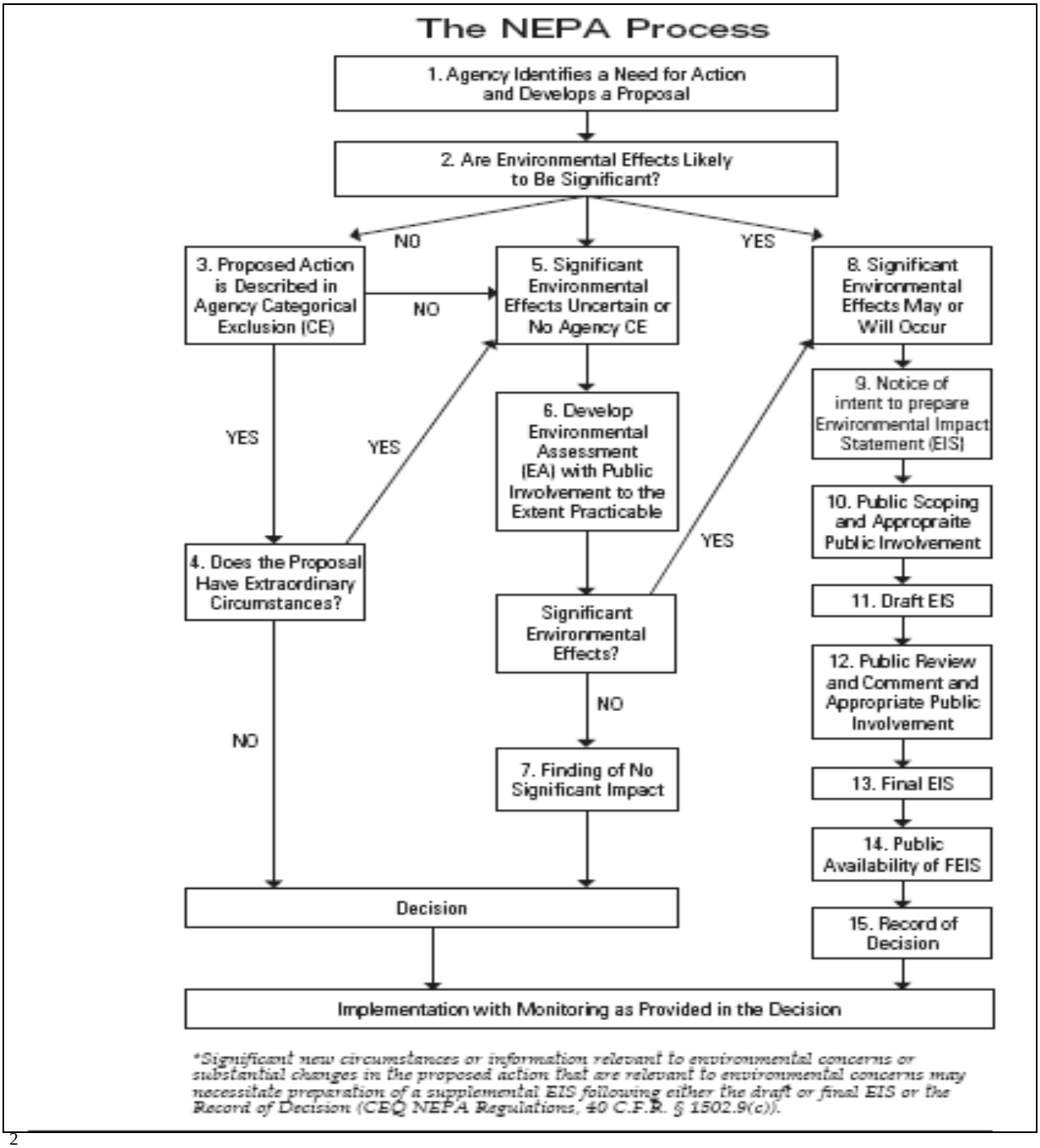
There are two approaches to conducting the NEPA process for New Starts projects:

- In the first approach, the AA provides sufficient environmental information and investment analyses to support the selection of a preferred alternative. The initial NEPA document, Draft Environmental Impact Statement (DEIS) or draft EA, is developed subsequent to and using the analysis from the AA. Therefore the initial NEPA document focuses on the preferred alternative.

- With the second approach, a DEIS or draft EA is part of the analysis contained in the AA. The range of alternatives is considered. At the time the project sponsor requests entry to PE, the locally preferred alternative will be selected but the DEIS or EA may or may not be complete.

With either approach, the Final Environmental Impact Statement (FEIS) or final EA is usually developed during PE. If a project is not categorically excluded under FTA's NEPA regulations, the NEPA process is concluded with either a Record of Decision (ROD) or a Finding of No Significant Impact (FONSI). The process must be concluded prior to approval to enter final design. The ROD or FONSI includes the decision, identifies the alternatives considered, including the environmentally

preferred alternative, and discusses mitigation plans, including any enforcement and monitoring commitments. Within the document, the agency discusses all the factors, including national policy considerations that were contemplated in its decision whether, and if so how, to proceed with the proposed action. The ROD also details all practical means of avoiding or minimizing environmental harm that have been adopted and provides an explanation of why other means were not adopted.



[2]

[2] Council on Environmental Quality, Executive Office of The President, *A Citizen's Guide to The NEPA*, Dec. 2007, pg. 8.

3.0 OBJECTIVES

During the initial environmental phase, a measure of engineering and conceptual design must be performed to support the AA and assessment of environmental impacts. After the selection of the LPA on which the draft environmental documentation is based, more advanced design work is needed to define the project and to establish the preliminary project scope, budget, and schedule. The project sponsor's request for approval of the project to enter PE is based on this information. From this point on, FTA may direct the PMOC to perform this review.

The PMOC shall assess and evaluate the project sponsor's environmental documents, project drawings, project narratives, design criteria, specifications, and material third party project information. Additionally, the PMOC shall characterize the level to which the project sponsor has reflected potential environmental impacts and mitigation, required permits and approvals, design and construction implications of the environmental impacts, and considered all major costs of the project, so that a realistic cost estimate and schedule can be prepared.

4.0 REFERENCES

The following are the principal, but not the only, references to Federal legislation, codification, regulation and guidance of which the PMOC should have a good understanding as related to the project sponsor's project work being reviewed under this Oversight Procedure (OP):

4.1 United States Code

- 49 U.S.C. § 5309
- 49 U.S.C. § 5328(a)(3)
- 42 U.S.C. §§ 4321-4347
- 23 U.S.C. § 139
- 49 U.S.C. § 303

4.2 Regulations

- 49 CFR Part 611
- 23 CFR Part 771
- 40 CFR Parts 1500-1508
- 23 CFR Part 774

5.0 PROJECT SPONSOR SUBMITTALS

The PMOC shall obtain from the project sponsor the most current versions of the following:

- Alternatives Analysis Report (prior to entry to PE)
- MPO-adopted LRTP (prior to entry to PE)
- Envirnmental documents (DEIS, EA, etc.)
- Operating cost estimate for project
- Capital cost estimate for project
- Project schedule
- New Starts submittals

- Project drawings, project narratives, design criteria, specifications
- Information on third parties, description of interface, status of negotiations/agreements
- Project Management Plan

6.0 SCOPE OF WORK

The PMOC shall assess the completeness of NEPA documentation and the level to which environmental impacts and mitigations are reflected in the project drawings and specifications so as to provide a sound basis for the project cost estimate and schedule. The PMOC shall assess the project documentation and follow these procedures:

- Review and analyze the pertinent information available for completeness, adequacy, consistency, and appropriateness of the level of detail given the phase of the work;
- Identify any and all discrepancies;
- State findings in descending order of importance (most likely -- largest consequences, least likely -- moderate/minor consequences) and make recommendations for modifications or additional work by the project sponsor along with a time frame for the performance of the work;
- Make recommendations and provide professional opinions.

Review for content as follows:

- Confirm consistency between the environmental document and the project drawings, narratives, specifications, in how the Project Scope is defined and portrayed; verify that impacts and mitigations are fully reflected in the project drawings, narratives, specifications, cost estimate and schedule.
- Review the project sponsor's operating budget to confirm that it reflects the agency's existing operation and future operation when the project is built;
- Review the project sponsor's capital cost estimate to confirm that it reflects the defined scope and schedule;
- Prior to entry to PE:
    - Confirm that the Project sponsor has considered a sufficient array of alternatives and has taken the necessary steps in AA to effectively document the selection of the locally preferred alternative and other conclusions reached.
    - Notify FTA immediately if it appears that a reasonable alternative was omitted from the alternatives analysis.
    - Confirm that the LPA was adopted into the MPO's LRTP by obtaining a copy of the plan. Verify that the Project sponsor's project scope is included and documented.
    - Verify that the LRTP is financially constrained.

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall provide FTA with a written report of its findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. After FTA approval, the PMOC should share the report with the project sponsor. In the event that differences of opinion exist between the PMOC and the project sponsor regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the project sponsor and provide FTA with a report addendum covering the modifications agreed to by the project sponsor and the PMOC.

The report formatting requirements of OP-1 apply. When necessary, the PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

U.S. DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 32C - Project Scope Review

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) as regards the review of the scope of the Grantee's project prior to advertising the project (or the first construction contract) for construction. The purpose of the review is to verify that the scope of the project represented by the totality of all contract plans and specifications is internally consistent, defined to a level appropriate for the project development phase, consistent with the estimated cost and schedule, and when applicable, consistent with the scope approved in the grantee's Full Funding Grant Agreement.

2.0 BACKGROUND

Monitoring project scope as the project moves through the various phases of development benefits cost control and management of risks inherent in the process. The scope of a transit project funded by Section 5309 funds is first established through the Alternatives Analysis (AA) process. The scope at that point is often defined in general terms by the type of transit technology to be employed, the length of the project, the number of stations, and other general characteristics. The project scope is continuously refined as it moves through the successive phases of Preliminary Engineering (PE) and Final Design (FD). The ultimate scope of the project is established in the Full Funding Grant Agreement (FFGA) entered into between the Grantee and the FTA. Any changes in the scope as defined in the FFGA are expected to be minor in nature, and any significant changes are subject to the approval of the FTA.

The scope of the project is subject to review by the FTA as part of the process of approving the Grantee's entry into Preliminary Engineering. Subsequently, the scope is reviewed as part of the process of approving the Grantee's entry into Final Design. Ideally, scope definition and refinement occurs during the PE phase. The scope of the project should be very well defined at the completion of PE, and the Final Design phase should be limited to preparing the drawings, specifications and related documents necessary for construction. In practice, however, some projects are not completely defined at the completion of PE and additional definition is provided during the FD phase. Note that the effort to define (or redefine) any particular element of project scope becomes increasingly costly and disruptive as the project moves from AA through PE and FD and into construction. The cost of a construction change order is greater and its impact on completion of the project is more significant than if the change had occurred prior to bid. For these reasons, the scope must be tightly defined prior to the advertisement for construction.

Scope definition is particularly important in the case of a design-build project. If the Grantee has selected a design-build project delivery method, the most important design document will be a performance specification. This document will determine what the construction contractor has to deliver, and once under contract, the Grantee-Owner gives up the right (subject to contractual

provisions) to make detailed design decisions. Because of the nature of a design-build contract, a change in scope that occurs after contract award is likely to be much more costly than a similar change to a project being built using a design-bid-build process. This result occurs because any scope change will affect both the design schedule and the construction schedule, which are closely tied by the design-build contract.

3.0 OBJECTIVES

The objective of this review is to verify that the overall scope of the project is complete and well defined and when applicable, that the scope is consistent with the scope in the FFGA or FFGA amendment. The scope to be reviewed includes the Grantee's internal plans and organization for project delivery; third party responsibilities; and plans and specifications prepared by the Grantee prior to advertising work for construction. If the project scope has been increased or reduced, it will be necessary to determine if the project still meets the functional requirements established upon approval of the FFGA.

4.0 REFERENCES

The following are the principal, but by no means the only, references to Federal legislation, codification, regulation and guidance with which the PMOC should have a good understanding as related to the Grantee's project work being reviewed under this OP:

4.1 Regulations

- Project Management Oversight, 49 C.F.R. Part 633

4.2 Guidance

- Project and Construction Management Guidelines, 2003 Update
- FTA Standard Cost Category Workbook (SCC) http://www.fta.dot.gov/planning/newstarts/planning_environment_2580.html

5.0 PROJECT SPONSOR SUBMITTALS

- When applicable, executed Full Funding Grant Agreement (with Attachments) and approved and pending amendments
- Project Description
- Project Management Plan
- Current Integrated Project Schedule
- Current Project Budget
- Project Implementation Plan, Procurement Management Plan or Contracting Plan
- Final Environmental Documents (FEIS, FONSI, DCE)
- Results of the most recent project risk assessment and risk mitigation plan
- When applicable, documentation submitted to gain approval to enter Final Design
- Value Engineering Report(s)
- Constructability Review(s)
- Documents describing any changes to project scope that have occurred since the FTA approved entry into Final Design
- Final Design Documents (Plans, Specifications and Estimates)

6.0 SCOPE OF WORK

6.1 PMOC Qualifications

The individual or team of individuals selected to perform this evaluation should have extensive experience in the planning and delivery of large complex federally funded transit projects. The experience should include familiarity with the issues usually presented during the construction phase of such projects.

6.2 Preliminary Document Review

Upon receipt of the assignment, the PMOC should request the specified materials from the Grantee. The PMOC may already be generally familiar with the project as a result of on-going monitoring activities. If the assigned personnel are not familiar with the project, they should review the materials in preparation for their on-sight visit.

6.3 On-site Review Meeting

The PMOC should arrange for an on-site briefing by the Grantee's project management team. The briefing should focus on any changes in the scope of the project that have occurred since the last major review milestone, e.g. commencement of preliminary engineering, commencement of final design, execution of the FFGA. The discussion of project scope should include a review of the Grantee's plan for project delivery, any changes in the Grantee's plans for managing the project through the construction, start-up, testing and acceptance phases, and any changes in external factors such as third-party agreements that would affect project scope.

6.4 Review and Assessment

The Scope Review Checklist, attached as Appendix A, provides a guide to evaluating the scope for completeness. The checklist should be used in conjunction with the project cost estimate and schedule to develop a comprehensive understanding of the scope and as a cross-check for scope omissions and conflicts.

The PMOC should address the following questions. The answers should be comprehensive, with sufficient information to allow the reader to develop a complete understanding of any significant changes in the scope of the project since the last major milestone.

1) What changes in project scope have occurred since the last major milestone e.g. commencement of preliminary engineering or final design, execution of the FFGA?
2) Have the known changes been incorporated into the documents, Project Management Plans, and the Full Funding Grant Agreement?
3) Are there any additional known or anticipated changes to scope at the time of this assessment?
4) Do the project delivery plans and construction documents reflect the full scope of the project? If not, identify any missing elements.
5) Do the current cost estimate and schedule correlate with the known and anticipated scope of the project?

6) Identify any unknown or uncertain conditions (e.g., right-of-way to be acquired, permits to be issued, third-party agreements to be finalized) that may affect the cost and/or schedule for construction and the grantee's plan and schedule for resolving these issues.
7) Do the contract documents address these unknown or uncertain issues in a way that appropriately allocates risk and avoids incurring unnecessary costs?
8) Based on this review of the project and its current documentation, are there likely to be changes in project scope (including related cost and schedule impacts) beyond those ordinarily expected during the construction phase. If so, identify these items and discuss the grantee's plan for resolving them.
9) If the scope of the functional elements of the project has changed, e.g., longer/shorter alignment, fewer/more stations, fewer traction power substations, etc., can the revised project still meet the capacity requirements of the program and as approved in the FFGA?

The PMOC shall assess and evaluate grantee and material third party project information and data and produce characterizations of the project scope that integrate and summarize available information and data for the Federal project, providing all professional opinions, analysis, information, data and descriptive text in an accessible and understandable format.

1) Such project data can include but are not limited to scope, capacity, level of service, functionality, reliability, etc.
2) Characterizations for individual scope elements such as guideway, vehicles, systems, etc. shall be totally sufficient to provide FTA with a project or sub-project level understanding.
3) For those projects in the PE or FD phases, the PMOC shall review and characterize the Grantee's project scope in terms of its descriptions, designs, products, etc. using the checklist from Appendix A to determine that it is:
   - Substantially consistent with that adopted in the Record of Decision;
   - Sufficiently complete to support the level and quality of revenue service typically offered by the Grantee;
   - Proprietary systems or methods specified will permit a reasonable number of construction contractors with the expertise to compete for construction packages.
   - Major work details, structural element dimensions, design interfaces and physical interfaces are complete and well defined.
   - Plans and drawings are adequate in terms of content, presentation, clarity, cross-referencing and detail.
   - Roles and responsibilities of construction contractors versus those of the authority (Grantee staff and its consultant support) are also well defined.
   - Project is constructible.
4) Review and characterize the Grantee's project system and vehicle description. Determine whether the Grantee has matched appropriate technologies with the planned transit applications for the best performance at a reasonable cost.
5) In the absence of adequate scope detail for a given level of design, the PMOC shall validate project data by comparing the current Grantee assumptions to relevant, identifiable industry experience.

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC's findings should be presented in descending order of importance (most likely, largest consequences, least likely, moderate/minor consequences) and accompanied by recommendations for modifications or additional work by the Grantee along with a time frame for the performance of the work.

The PMOC shall provide FTA with a written report of its findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. After FTA approval, the PMOC should share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

The report formatting requirements of OP-1 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel, Word, Microsoft Project, and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

APPENDIX A

Scope Review Checklist

Each design package, contract or budget unit, or scope element is to be reviewed against these criteria as applicable[1]. Language in the review shall incorporate as much of this terminology and concept as practical and consistent with grantee's project design or construction plan.

General Design and Construction for Guideway, Stations, Support Facilities, Sitework

- Site investigation
  - Pre-construction site reconnaissance visits have been made;
  - Site boundary and existing conditions surveys are complete;
  - Geotechnical investigations are complete.
  - Design in response to geotechnical and other below-grade conditions is appropriate.
    - Ground subsidence, ground modification and structural protections issues have been identified and resolved;
    - Rock characteristics (fracture planes, hardness and cleavage) have been established in the form of at least two parameters for the design of the rock support in the station caverns, the crossover caverns, the TBM tunnels, drill/blast tunnels, etc.
    - Subsurface exploration or laboratory testing program, review of building types and foundations and methods of construction are completed.
    - Mass balance diagrams complete for vertical alignments on fill or cut;
    - Identification of buried structures and utilities;
    - Identification of contaminated soils and other hazardous material on site and provision for removal or remediation has been made.
- Civil, Structural, Architectural, Trackwork, Sitework documents possess a comparable level of definition, clarity, presentation and cross-referencing. Design, construction, system and vehicle interfaces are well known and defined. Design Reports, Concept of Operations Report, and configuration studies are adequate and complete. Work descriptions and definitions used in designs and specifications are consistent and uniformly applied. The project is constructible. Adequate construction access and staging areas are defined.

Contracting Strategy and Packaging

The Grantee's construction planning whether at a project or contract package level has sufficiently analyzed and adequately addressed the following elements:

- Availability to and use by the construction contractor of site investigations and geotechnical studies.
- Adequacy of the General Conditions of the Contract with respect to requirements for site access, schedule, unit prices, additional compensation, liquidated damages, unforeseen conditions including geotechnical, the construction contractor's design/engineering scope of work, mobilization costs, cash flow in general, bonds, insurance, taxes, maintenance and

[1] Not every project will include every item in the list above.

warranty provisions, contractor field management and supervision and socio-economic requirements, among other things.

- Market conditions
  - Market conditions for the state/regional/local construction economy for the general contractors/subcontractors on public works and private;
  - Market conditions for the national construction economy for transit general contractors/subcontractors.
  - Availability of labor for various trades such as electricians, etc.
  - Availability of major materials at the bulk commodity level (fuel, cement, steel, copper, plywood/lumber, etc.) and the finished component level (traction power supply and distribution, train control elements, vehicles, microprocessor equipment, etc.)
  - Availability of construction equipment/sequencing/timeframe requirements for specially designed, or project specific equipment such as cranes, launching girders, pre mix plants, barges, etc.
- Accessing and occupancy of project construction sites
  - Transportation of project materials to the various jobsites/access points/laydown areas.
  - Local community restrictions and accommodations.
  - Temporary Construction/Facility requirements and mobilizations.
  - Weather impacts or concerns and protection of the work.
  - Special projects requirements such as permits, environmental inclusive of wetlands, site availability or work day or track window requirements; impacts such as transportation, social and economic conditions, public open space, historic and archaeological resources, air quality, noise and vibration, contaminated materials and natural resources.
- Grantee's construction contract package planning has sufficiently analyzed and adequately addressed the following elements:
  - Contract packaging for Third-party construction contracts has been structured to maximize competition;
  - Contract packages have been kept small enough to allow mid-sized contractors to bid without teaming as joint ventures (which tends to yield higher costs);
  - "Procurement only" contracts have been minimized, recognizing there is a higher claims risk when the installation contractor does not have full control of the materials;
  - Third party procurement contracts have been utilized only where long lead-time items will impact project schedule if purchased by construction contractor;
  - Force Account procurement contracts have been utilized only in cases where agency has substantial market leverage or "purchasing power";
  - Incorporated advance utility / utility relocation contracts, utilizing significant float for these delay-prone activities; cost effectiveness of identifying waste sites / borrow sites to be used at contractor's option as well as advance agreements with utilities and agencies have been negotiated (for TBM power supply, for example), to again be utilized at contractor's option.
  - Contract packaging and project schedule have been coordinated to minimize overextension of agency force account personnel, critical third party (inclusive of Utilities and Fire/Life safety test witnessing or installation work;
  - Timing of major bid activity, within schedule constraints, will be managed to maximize contractor competition, with consideration to other major project(s) status in the region such as highway or redevelopment projects;

- Development of strategies for minimizing costs for workers compensation insurance (the largest insurance cost in construction) such as pre-qualifying contractors with their safety "mod" limited to 1.0 or lower and other prequalification criteria, such as unresolved claims history;

- Tradeoffs have been considered between large size contracts which are often more efficient due to coordination and scheduling constraints and small contracts that can attract industry interest and increase the number of bidders;
- Construction industry information sessions have been held after advertisement in industry publications in order to attract regional, national, and international contractors.

SCC 10 Guideway and Track elements

Major or critical engineering decisions and design solutions are defined including rehabilitation or reuse of existing infrastructure, structures, facilities or systems including but not limited to the following:

- Major or critical work details, structural element dimensions, design interfaces and physical interfaces are complete and well defined in terms of drawings, standards, criteria, specifications and contract package scopes.
- Structural systems are established and dimensioned to show number of spans, span length, substructure design, etc.
- Work descriptions and definitions used in designs or specifications are consistent and uniformly applied.
- Trackwork is advanced to a level where single line schematics of the track layout, plan and profile drawings, dimensioned layouts of turnouts and crossovers, and tabulations of track geometry (horizontal and vertical curve data) have been defined; alignment of tunnel structure referenced to the center line of track and base of rail; guideway sections inclusive of tunnel and station cross sections consistently show the distance from centerline of track to critical clearance points such as walls, walkways and edges of platforms.
- Special trackwork is adequately defined.
- Tunnels are well defined in terms of access and egress, construction access and laydown, openings for stations, passage chambers, ventilation or emergency adits, sections and profiles depicting cross sections of major tunnel features; cross checked to adjacent building foundations and coordinated with the vehicle's dynamic envelope, walkways, lighting, systems elements such as ventilation, communications and traction power and egress.

SCC 20 Stations, Stops, Terminals, Intermodals

- Major or critical engineering decisions and design solutions are defined including rehabilitation or reuse of existing structures, facilities or systems including but not limited to the following:
    - Station architecture is established. Building footprints are defined as is site access and egress to the public way for pedestrians, bicycles and motorized vehicles; station building floor plans show vertical circulation systems including stairs, elevators, escalators, dimensioned platforms, support spaces for mechanical and maintenance access; agent area, fare gate area, etc.; building sections and elevations illustrate the relationship of the station to grade (below, on-grade, elevated structure); mechanical, electrical and communications systems are described including station and track area

drainage, piped utilities, heating ventilation and air conditioning, smoke evacuation, power and lighting for the station, fire/life safety including NFPA 130 requirements and security systems, passenger information systems (PIS), fare vending machines, etc. ADA level boarding between car and platform is addressed.
    - Structural system is established and dimensioned.
    - Design interfaces among disciplines are defined on drawings, in standards, design criteria, specifications and contract package scopes.
    - The drawing package consists of site plans, floor plans, longitudinal and cross sections, elevations and details illustrating typical and special conditions; finish schedules;

SCC 30 Support Facilities: Yards, Shops and Admin Buildings

- Major or critical operational, maintenance (heavy and light, wayside, facilities and vehicle), fire/life safety, security and logistics (spares, rebuild, training, documentation) requirements whether in the existing system or extension that result from the project have been defined.
    - Support facility architecture is established. Building footprints are defined as is site access for pedestrians, bicycles and motorized vehicles; building floor plans show vertical circulation systems including stairs, elevators, work bays, support spaces for mechanical and maintenance access, etc.; building sections and elevations illustrate the relationship to grade (below, on-grade, elevated structure); mechanical, electrical and communications systems are described including drainage, piped utilities, heating ventilation and air conditioning, power and lighting, fire/life safety including NFPA 130 requirements and security systems.
    - Structural system is established and dimensioned.
    - Design interfaces among disciplines are defined on drawings, in standards, design criteria, specifications and contract package scopes.
    - The drawing package consists of site plans, floor plans, longitudinal and cross sections, elevations and details illustrating typical and special conditions; finish schedules;

SCC 40 Sitework and Special Conditions

- Major drainage facilities, flood control, housing types, street crossings, traffic control, utilities, are defined and physical limits and interfaces identified, based upon site specific surveying with digitized data integrated into alignment base mapping, plan profiles.
- Major or critical engineering decisions and design solutions are defined including rehabilitation or reuse of existing structures, facilities or systems including but not limited to the following:
    - Pre-construction, site reconnaissance, geotechnical and soil resistivity surveys are complete;
    - Ground subsidence and structural protections issues have been resolved;
    - Structural elements are advanced beyond simple span design, or simply supported.
    - Major or critical work details, structural element dimensions, design interfaces and physical interfaces are complete and well defined in terms of drawings, standards, criteria, specifications and contract package scopes.
    - Mass balance diagrams complete for vertical alignments on fill or cut supported by complete site specific surveys and soil investigations, identification of buried structures and utilities; Taking into account the presence of contaminated soils which would have

to then be backfilled or would otherwise be unavailable for backfilling somewhere else on the project, or lack adequate construction access.
    - Access and staging areas are defined.

SCC 50 Systems

- System (Wayside and Facilities), Trackwork (Running and special)and Vehicle (revenue and non-revenue) descriptions, functionalities, reliabilities, technology (level identified and cost effectiveness known) and performances are defined to the level of major equipment (including the control room, substations , crossings, tunnel ventilation and traction power) is well defined and identified in terms of specifications, bills of materials, standard drawings and specifications, general arrangements and standard details, and single line drawings (similar to industry process and instrumentation diagrams, high level logic design).
- Signaling and Train Control
    - Operations analysis has determined the most efficient location of interlockings based on track layout, headways, train lengths, braking tables as well as requirements of each interlocking and its control limits.
    - Track plans have been sufficiently developed to define and identify vertical grades, horizontal and vertical curves, elevation, station platforms, switch point stationing, rail bonding and connection requirements as well as typical track circuit drawings.
    - Site specific requirements are defined (for signal structural work) and location drawings for signal enclosures
    - Central instrument rooms (CIR), central instrument huts (CIH), central instrument locations (CIL), relay rooms; locations and sizes as well as room layouts (relay, termination, central instrument, power) are identified and defined.
    - Signal cable routing methodology as well as power supply and distribution are identified and defined
    - Software and interface requirements (to facilities, existing system, and other system elements) are identified and defined
    - Maintenance, testing and training requirements are identified and defined (factory acceptance, site acceptance, field integration, start up, etc.)
- System Description
    - Built-in-place substations are identified, numbered and located with approximate spacings along the system route, ratings (MW) as well as the details (e.g. three phase nominal 12.47–13.2 kV distribution circuit [name utility] and any exceptions.
    - Nominal (full-load Vdc) project voltage is identified and basis of design and choice of project nominal voltage relative to system voltage is identified, voltage drop minimization, maximization of vehicle propulsion system performance, and train regeneration issues have been addressed.
    - Overhead contact system (OCS) is defined including conductor sizes relative to existing parts of system, as well as any supplementary parallel feeders to meet design requirements for substation out of service scenario.
    - AC Switchgear type (i.e. indoor, metal clad vacuum circuit type breaker,etc.), ratings (i.e., 15 kV, 500 MVA, etc.), relay protections provided (Phase overcurrent protection, Ground overcurrent protection, Negative sequence voltage relay, Rectifier overload relay, AC lock-out relay,etc.)

- Traction Power Transformer type (i.e. vacuum pressure impregnated dry type,etc.), ratings (i.e., 1110 kVA 65°C rise at 100% load, three phase, 60 Hz., ANSI and NEMA standards for extra heavy-duty service).
- Power rectifiers are matched and assemblies capable of providing a stated output such as .." twelve pulse, 825 VDC output at rated 100% load with the overload capabilities as specified in NEMA RI-9 for extra heavy-duty traction service." Harmonics in the utility power lines and the interference voltages due to residual ripple issues have been addressed in the design.
- DC Switchgear basis of design and choice of switches, busses and feeder breakers is identified and equipment list is complete.
- Programmable Logic Controller (PLC) system if provided, integrates and control intercubicle functions and provides control, monitoring, and data logging at each substation.
- Substation grounding system basis of design and choice of separate AC and DC ground mats as well as stray current monitoring or testing, lightning arresters and protective relays and fault current contribution from the AC equipment to the DC equipment issues and utility system faults have been addressed.
- Minimum voltage at the pantograph is identified and basis established for locations during the sustained FFGA project headways with substations operating, or with ".." substations out of service. If substations are required, under voltage conditions are identified with one substation out of service and the operation plan identifies mitigation measures.
- Overhead Contact Systems (OCS) are identified in terms of Single Contact Wire Auto Tensioned, Simple Catenary Auto Tensioned and Balanced Weight Anchor Assemblies and issues associated with temperature variations are addressed as structures identified. Tensions for the contact wire and messenger wire are defined; maximum distances between tensioning points is identified depending on the amount of curves and the individual track configuration, reduced to ensure the auto tensioning effect of the wheel assembly; mid-point anchor installation details and locations identified to reduce the along-track movement of the OCS equipment and minimize the work in case of a conductor breakage; OCS is sectionalized to provide isolation of the OCS section at each substation and basis for design is established and design issues associated with Insulated overlaps, section insulators, electrical continuity, overlaps and at crossover locations are addressed. Substation buildings, including low voltage substation AC auxiliary electrical system and facility electrical equipment such as AC panel boards, heating and ventilation systems, transformer partitions, embedded conduit work, utility instrument enclosure, door intrusion switches, lighting, and substation ground mats are built into or coordinated with the Civil contracts in advance of the associated system contract.

- Major or critical engineering decisions and design solutions are defined including rehabilitation or reuse of existing structures, facilities or systems including but not limited to the following:
  - Pre-construction, site reconnaissance, geotechnical and soil resistivity surveys are complete;
  - Ground subsidence and structural protections issues have been resolved;
  - Structural elements are advanced beyond simple span design, or simply supported.

- Major or critical work details; structural element dimensions, design interfaces and physical interfaces are complete and well defined in terms of drawings, standards, criteria, specifications and contract package scopes.

SCC 60 ROW, Land and existing improvements

- Major drainage facilities, flood control, housing types, street crossings, traffic control, utilities, are defined and physical limits and interfaces identified, based upon site specific surveying with digitized data integrated into alignment base mapping, plan profiles.
- Right of way drawings and lists that identify the full takes, 90% of partial takes and easements; fully coordinated with mass balance diagrams, structures and facilities, utilities and base maps; identification of major or critical eminent domain issues; identification of street or rail crossings that can be closed and construction easements, access and staging areas are defined; referenced to property/building lines and approximate corridor/footprint width.
- Row requirements are separately identified for Guideway, Facilities and Utilities in terms of both acquisition and easements. Two step acquisitions, namely acquisition of easements first and then acquisition of the property, are identified with rationales for use.

SCC 70 Vehicles

- Vehicle (Revenue and non-revenue) descriptions, functionalities, reliabilities, technology and performances are defined and drawn to the upper level of assembly, major equipment, general arrangements of cabin and cab:
- System Functional Description has been developed and advanced to include the following:
  - Definition of the subsystems that constitute the overall system
  - Description, graphic depiction of each interface between subsystems
  - Description of how each subsystem will meet the requirements of the Specification.
- Materials Specifications has been developed and advanced to include lists of qualified materials, such as brake shoe composition, electric components, refrigerants, lubricants, cleaners, paints/coatings, wiring, etc.
- Testing requirements have been developed and advanced to include the following:
  - High level Test Program Plan for both production and on-sight acceptance should be underway (including requirements for factory inspection and testing, First Article and Pre-shipment inspections, static and dynamic testing and conditional acceptance).
  - Maintenance and Training Requirements should be defined and identified including development of maintenance and training requirements for new system elements.

SCC 80 Professional services

- Costs associated with construction – building contractors' management, labor, indirect costs, overhead, profit, insurance should not be included in SCC 80 but in SCC 10 through 50 as appropriate. Contract package scopes and cost estimates should reflect this.
- The roles and responsibilities of Grantee's professional consultants (design, engineering, and construction management) may be distinguished from Grantee's own professional staff and manual labor. When Grantee's manual labor, equipment and facilities are used to facilitate construction or to assist in construction of the project, a Force Account Plan and cost estimate should be provided.

U.S. DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 32E - Project Delivery Method Review

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) with regard to the Grantee's plan for project delivery.

This review is meant to determine whether the delivery method or methods selected are appropriate to the project or corresponding project element and whether the Grantee has the technical capacity and capability to successfully implement the selected methods. For these purposes, Project Delivery Method is defined as the overall approach selected by the Grantee to contract for those services necessary to place the project in revenue service. The proposed definition would include engineering services, construction services, procurement of vehicles, procurement of "owner furnished materials" such as rail materials or other long lead-time items, and potentially the operation and maintenance of the completed system. The definition would also include the segmentation of the project into logical segments or contract packages and the procurement method selected for each package.

2.0 BACKGROUND

The typical New Start project is the sum of several discrete elements, including but not limited to professional services such as engineering and construction management, equipment such as rail transit or bus rapid transit vehicles and non-revenue vehicles; materials such as rail and ties, the construction of various things ranging from the rail way or road way to stations to maintenance facilities, the acquisition of rights-of-way, the administration and management by the grantee's staff, and insurance. The largest proportion of the project's budget is associated with the design, and construction or acquisition of the capital elements of the project, including those services necessary to design the facilities. The focus of this review is on the Grantee's plan for acquiring the capital elements of the project.

A variety of project delivery methods or contracting techniques are available to Grantees. The most common method involves the use of a design consultant to prepare drawings and specifications which are attached to contract documents and then used to solicit competitive bids for construction. This is often referred to as design-bid-build. Other alternative contracting methods include design-build, design-build-operate and maintain, and the construction manager at-risk or construction manager/general contractor (CM/GC) approach. All of these delivery methods are viable and have been used successfully, however, some work better than others in particular situations. For example, a transit station parking garage might be a good candidate for design-build because the owner's primary concern is functionality, whereas a church would not be a good design-build candidate because of the parishioners' need for control of the ornate architectural design.

It is important to select a project delivery method that can best satisfy the goals of the Grantee. Those goals could include rapid construction, lowest constructed cost or a unique innovative design, among other things. It is also important to consider the technical capacity and capability of the grantee. Different staffing levels and skill sets are required to successfully manage a design-bid-build approach versus a design-build approach. An agency embarking on its first rail project will face many decisions that will require careful consideration. A traditional design-bid-build approach can provide more opportunities and time to consider those decisions without necessarily impacting the project schedule. Using a design-build approach, however, will require the grantee to make decisions at the outset as part of the preparation of the performance specifications. A delay in making those decisions may negate the perceived schedule advantage offered by the design-build approach.

The overall strategy for delivering the completed project should be developed early in the Preliminary Engineering phase. These decisions should start with the identification of the key objectives of the grantee. There may actually be multiple objectives that apply to either the overall project or some selected elements. Knowing these objectives is vital to the selection of the proper project delivery method. Once the objectives are known, they can be matched against the various delivery methods to determine which method or methods best accomplish the stated objectives. This comparison should also take into account the physical characteristics of the project, including the amount of right-of-way to be acquired and the number of individual parcels affected, whether development involves negotiation of rights with a freight railroad, the number of political jurisdictions involved, the need for a tunnel or significant aerial structures, etc. All of these factors play into the ultimate selection of the project delivery strategy and methods. Once these decisions have been made, it is vital that the grantee tailor the contract documents and procurement process to match the selected delivery method(s). The use of the incorrect form of contract for a specified delivery method or failure to consider the time necessary for a negotiated procurement will have serious negative consequences for the grantee.

The development of the project delivery strategy during the PE phase is important because the final design phase of the project is directly linked to the strategy. The design consultant must know at the proposal stage whether he is going to completely design the facilities for use in a competitive bid situation or if he is going to produce one or more performance specifications for design-build packages. Further, if competitive bidding is the selected approach, it will be important to identify how many construction contract packages are expected to be produced. The project development strategy is also directly linked to the grantee's project management approach and staffing decisions.

3.0 OBJECTIVES

The objective of this review is to verify that the grantee has developed a rational plan for project delivery; that the plan is based on satisfying the grantee's objectives for the project or its individual parts; that the plan is based on the unique characteristics of the project; that the plan was developed with consideration of the current and expected conditions of the local and national construction market place; that the project delivery method(s) chosen are appropriate for the associated project element; and that the plan takes into account the grantee's technical capacity and capability.

4.0 REFERENCES

The following are the principal, but by no means the only, references to Federal legislation, regulation and guidance with which the PMOC should have a good understanding as related to the Grantee's project work being reviewed under this OP:

4.1 United States Code

- 49 U.S.C. Section 5327

4.2 Regulations

- Project Management Oversight, 49 C.F.R. Part 633

4.3 FTA Circulars

- C4220.1, Third Party Contracting Requirements

4.4 Guidance

- Project and Construction Management Guidelines, 2003 Update
  - 2.2.6 Project Risk Analysis and Procurement Planning
  - 4.2 Construction Procurement Considerations
  - 4.2.1 Construction Contract Bid Documents and Requirements

5.0 PROJECT SPONSOR SUBMITTALS

- Project Description
- Preliminary Plan Set
- Project Cost Estimate
- Project Schedule
- Project Management Plan
- Project Implementation Plan, Procurement Management Plan or Contracting Plan
- Results of any project risk assessments

6.0 SCOPE OF WORK

6.1 PMOC Qualifications

The individual or team of individuals selected to perform this evaluation should have extensive experience in the planning and delivery of large complex capital projects. The experience should include the use of a variety of delivery methods. The individual(s) should be familiar with the advantages and disadvantages inherent in the various techniques, and the factors that would influence the choice of a particular delivery method. Ideally, the individual(s) should have managed the actual construction of multiple projects using a variety of contracting methods.

6.2 Preliminary Document Review

Upon receipt of the assignment, the PMOC should request the specified project documents and other materials from the Grantee. The PMOC may already be generally familiar with the project as a result of on-going monitoring activities. If the assigned personnel are not familiar with the project, they should review the materials in preparation for their on-site visit.

6.3 On-Site Review Meeting

The PMOC should arrange for an on-site briefing by the Grantee's project management team. The briefing should include a point-by-point discussion of the project delivery strategy. The presentation should include:

- discussion of the project objectives
- the delivery and packaging methods considered
- any state law constraints on contracting methods
- the process that was used to develop the strategy
- the selected strategy and packaging plan
- the implementation schedule showing each major element or package and associated preparatory and subsequent events
- significant risks affecting the selection
- the proposed procurement process for each type of delivery method and the steps being taken to develop appropriate contract documents
- the Grantee's approach and proposed staffing to manage implementation of the strategy

6.4 Review and Assessment

The PMOC should address the following questions in its report. With consideration of the laws, regulations, policies, circulars, guidance documents, and practices that apply to the Grantee's work:

- Review and analyze the pertinent information available for completeness, adequacy, consistency, and the appropriate level of detail given the phase of the work.
- Identify any and all discrepancies, shortcomings or fatal flaws.
- State findings in descending order of importance (most likely, largest consequences, least likely, moderate/minor consequences) and make recommendations for modifications or additional work by the grantee, including a time frame for the performance of the work.

The answers should be comprehensive, with sufficient information to allow the reader to develop an informed opinion regarding the adequacy and appropriateness of the Grantee's plans and whether the Grantee has the technical capacity and capability to successfully execute the strategy.

- Does the grantee have a comprehensive project delivery strategy?
- Was the process used to develop the strategy sound?
- Is the grantee's strategy likely to satisfy the overall project objectives as well as the unique objectives of individual elements?

- Did the selected delivery method(s) consider relevant risks associated with the project element(s)?
- Is the selected delivery method or methods appropriate for use with the particular project element?
- Is the strategy, including contract packaging plan, appropriately documented in the Project Management Plan?
- Does the project schedule reflect the project delivery strategy, including sufficient preparation time?
- Does the grantee currently possess, or have a plan to acquire, the staff resources to successfully execute the project delivery strategy?

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall provide FTA with a written report of its findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. After FTA approval, the PMOC should share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

The report formatting requirements of OP-1 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

Include the following in the report:

- Executive Summary – Clearly stated conclusions
- Introduction / Objectives
- Review procedures and personnel (including capsule of reviewer qualifications)
- Summary of Project Delivery Plan
- Consistency with Project Plans
    - Consistency with Contracting Plan
    - Consistency with Master Schedule
    - Consistency with Budget
- Grantee's technical capacity and capability to successfully implement the project delivery plan
    - Staffing
    - Procurement policies and processes
- Conclusions and Recommendations

U.S. DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 33 – Capital Cost Estimate Review

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) with regard to the:

- Soundness of the Grantee's estimating methods and processes compared with proven professional quantity surveying and cost estimating practices for projects of this scale;
- Congruence of the project cost estimate with the project scope and schedule, i.e. do these three elements fully reflect each other;
- Reliability of the estimate for procurements, contract bids, and contract closeout, i.e. will the project budget prove to be adequate at these milestone events.

2.0 BACKGROUND

Congress and FTA's good stewardship insist that a Grantee's cost estimates be reliable. The path to increased cost reliability is the application of sound engineering practices and professional experience and judgment to the development of project information. At the beginning points of project phases, such as preliminary engineering and final design, and at other points in project development, a thorough reevaluation of the scope, schedule and cost is performed to confirm and reconfirm the cost estimate's reliability.

3.0 OBJECTIVES

FTA's objective is to assess the consistency of cost estimating information, understand its characteristics and descriptions as well as the correlation between the estimated quantities and the quantities shown on the design or contract documents. The Grantee's cost estimate should reflect the scope in these documents.

The PMOC is to review and characterize the cost estimate and its supporting information. The first time this review is performed, usually prior to entry of the project to preliminary engineering, a "baseline" is established, i.e. a point from which future estimates are measured. Later, when contract packages are conceived, the PMOC will evaluate the estimated costs in packages, and consider related General Conditions of the construction contract and other elements specific to the packages. FTA may direct the PMOC to perform this review prior to issuance of documents for bid, or during construction to assist the Grantee in deciding whether or not to reduce scope or enact other cost control measures or mitigations.

4.0 REFERENCES

The statutes, regulations, policies, guidance documents and circulars in OP 01 apply.

5.0 PROJECT SPONSOR SUBMITTALS

At a minimum, the PMOC is to obtain the Grantee's current cost estimates and supporting information, environmental documents, project drawings, specifications, narratives, design criteria reports, the project schedule, information on real estate, and vehicle procurement.

6.0 SCOPE OF WORK

FTA may direct the PMOC to perform any or all of the following:

- A full project level cost characterization
- A limited cost element review
- Development of a cost estimate baseline
- Performance of specialized quantitative cost modeling or assessments, surveillance reporting or trends analysis;
- Reevaluation of project cost information on a periodic or event driven basis
- Presentation to the Grantee of findings, analysis, recommendations, and opinions
- Participation in a workshop with the Grantee to discuss the project

6.1 Basic Review

The Grantee's cost estimate shall be reviewed for the following:

- Mechanically correct and complete
- Free of any material inaccuracies or incomplete data
- Consistent with relevant, identifiable industry or engineering practices
- Uniformly applied by the sponsor's cost estimators and consistent in its method of calculation
- Consistent with available design documents
- Consistent with the project scope described in NEPA document, Record of Decision, or other base documents
- Characterize the level of estimating:
    - Level 1: Characterize the line quantities and nature of the estimate as being:
        - the product of unit cost and quantity (Unit costs are defined when the estimate separately identifies direct and indirect cost components.)
        - a cost estimating relationship (CER); (Unit pricing is classified as CER.)
        - a lump sum (sometimes referred to as an "allowance" or "plug number")
    - Level 2: Subdivide Level 1 as follows:
        - quantities indicated in both the design documents and the cost estimate
        - quantities indicated only in the cost estimate
        - quantities indicated only in the design documents
    - Level 3: Subdivide Level 2 into the following subcategories:
        - Cost to Cost CERs
        - Non-Cost to Cost CERs

    - Level 4: Subdivide Level 3 as follows:
        - Project direct costs
        - Escalation of materials and labor
        - Total project allowances
        - Project indirect costs
        - Construction contractor profit
        - Total project contingency (allocated or unallocated, hidden or exposed)
        - Total inflation costs (nationwide change in costs over time)
- Characterize the nature of the support for the estimated element, i.e. how was it derived
- List the number of estimate lines per data element

The PMOC shall make a statement regarding the over/understatement in the sponsor's cost estimate and shall support its statement with its own spreadsheets and calculations. The PMOC shall assess the integration and traceability of the estimate into the defined scope of the project for purposes of identifying a "baseline" or initial project estimate. The PMOC shall assess the escalation of material and labor costs, as well as the inflation of costs from the Base Year to the Year of Expenditure cost (YOE), and the soundness of the economic forecasts and factors used, noting the use of different rates or costing techniques within the estimate.

6.2 Specific Reviews

Parametric Project Cost Estimate Review (refer to Appendix A)
The PMOC shall characterize the Grantee's parametric estimate of project cost to determine that it:

- Identifies the key input drivers and explains their relative impact on the estimate
- Adequately provides and supports the data and inputs used in calibration
- Demonstrates that the model utilizes historical costs that are calibrated to current conditions within a reasonable degree of accuracy
- Explains any adjustments to the model or to the key inputs, and provides adequate rationale for such adjustments
- Demonstrates that the calibrated model produces reliable estimates in comparison to some other benchmark (e.g., actuals, comparative estimates)

Definitive Project Cost Estimate Review (refer to Appendix B)
Review and characterize the Grantee's cost estimate using the checklist from Appendix B. Determine that the estimate is updated to reflect actual construction contractor pricing and work quantities. Assess and evaluate construction contract package elements and the impact of the terms in the General Conditions of the Contract on the anticipated bid price. Describe and characterize the Grantee's construction contract package information as follows:

- Requirements for specific services such as QA/QC or scheduling, appropriately allocated to each contract and evident in bidding documents
- Restrictive schedule or mobilization requirements that would materially affect bid prices
- Identification of construction contract elements or contract language that would reasonably serve as a basis for additional compensation, which are not part of a scheduled payment item
- Geotechnical data
- Pricing approach to changed conditions
- Unit pricing and allowed variability in unit pricing

- Support for the Grantee's cost estimate for the construction contractor's general conditions

The PMOC shall develop an independent detailed cost estimate of the construction contractor's general conditions for the systems work and for the three largest construction contracts, and shall compare and contrast and make recommendations of change to the Grantee's estimate.

Comparison between Grantee's Project Cost Estimate and FTA Database (to be provided)
Using FTA's cost database, assess and evaluate the Grantee's project estimate, specifically identifying variances in unit costs and quantities from database averages, analyzing each variance. Provide a detailed discussion of the scope or cost drivers for each variance.

During Final Design, Pre-Bid, Post-Bid: Market Conditions Review
During project implementation, the Grantee will receive bids or offers that may have a significant impact on the project budget. Based upon material thresholds established with FTA, the PMOC shall analyze project information and provide context for programmatic decisions by FTA.
Address the following Pre-Bid:

- Identify, organize, characterize, and analyze substantive construction contracts and equipment procurements.
- Describe the Grantee's contract packaging strategy, it's relationship to the project cost estimate, and the rationale (political, economic, engineering, etc.) for the contract packaging strategy.
- Characterize and evaluate the material elements of the project risk assessments as available, (namely, scope, cost and schedule reviews, risk registers) and correlate these with the contract packaging strategy analysis, bid/bidder information, market conditions information, etc.

Address the following Post-Bid:

- Correlate and analyze bids or proposal amounts against the estimated values for each bid or proposal. Assess the impact of each on the overall estimate, risk assessments, cost risk-cost ranges and risk mitigations.
- Characterize and evaluate the Grantee's bid process (plan sets distributed, pre bid conference attendance, bid question activity, exit conferences, telephone interviews, analytical products, bid tabulations).
- Where significant variances between bid received and estimates are discovered:
    - Trace variances on bid tabulation elements back to the cost estimate and risk register.
    - Sample unit cost and quantity information to evaluate the reliability of estimate compared with bid pricing; obtain independent market data and adjust as necessary to compare to pricing and estimate. Sample scope elements from the contract documents to support conclusions.
    - Develop an estimated allocation between unit cost and quantity variance.
    - Organize causal factors into groups such as market factors, general conditions, risk transfers, etc.

During Construction -- Assessment of Grantee's Cost Estimate
Characterize the Grantee's estimate of the project cost to complete the project. Describe the level to which it:

- Is integrated with and makes adequate use of the Grantee's previously developed supporting documentation for the estimate
- Reflects the Grantee's change order experience on the project.

7.0 REPORT, PRESENTATION, RECONCILIATION

Refer to Appendices C and D below.

The PMOC shall provide FTA with a written report of its findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. After FTA approval, the PMOC should share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

The report formatting requirements of OP-1 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

APPENDIX A

Parametric Estimating

The term “Parametric”, as applied to estimating, denotes determination of the position of the estimate for a new project within the limitations of cost parameters developed by cost experience on similar previous projects. The DOD and International Society of Parametric Analysts (ISPA) defines “parametric estimating” as a technique that “...develops estimates based upon the examination and validation of the relationships which exist between a project's technical, programmatic, and cost characteristics, and the resources consumed during its development, manufacture, maintenance, and/or modification.”

ISPA goes on to note that practitioners use a number of parametric techniques to estimate costs, including cost estimating relationships (CERs) and parametric models. ISPA defines a CER as a mathematical expression, which describes how the values of, or changes in, a “dependent” cost variable are partially determined, or “driven,” by the values of, or changes in, one or more “independent” variables. In practice, CERS are usually derived using a single, independent cost variable. Since a parametric estimating method relies on the value of one or more input variables, or parameters, to estimate the value of another variable, a CER is actually a type of parametric estimating technique.

ISPA defines a cost CER as one in which cost is the dependent variable. In a “cost-to-cost” CER the independent variables are also costs. The cost of one element is used to estimate, or predict, that of another.

In a non cost-to-cost relationship, the CER uses a characteristic of an item to predict its cost. Examples are CERs that estimate the quantity of revenue vehicles as a function of guideway mileage (independent variable), or the design engineering costs from the number of engineering drawings (independent variable) involved.

APPENDIX B

Cost Estimate Review Checklist

The components of the cost estimate are to be reviewed against these criteria. Structure the review to incorporate as much of this terminology and these concepts as practical and consistent with Grantee's project design or construction plan.

Review of Grantee's cost estimate shall indicate whether:

- estimate was developed by those with substantial experience in the type of construction under consideration;
- Sufficient judgment was applied to forecast design development, especially during early design stages;
- evidence exists indicating sufficient collaboration with design team, especially in the application of value engineering.
- the Work Breakdown Structure has been formatted to conform to the FTA Standard Cost Categories (SCC).

The PMOC shall further consider the following category-specific items:

- SCC category 10-50: Fixed Construction
  - Construction Materials
    - Quantities have been calculated with appropriate conservatism to accommodate development to a more advanced stage of design if appropriate
    - Allowances for material quantities have been included for commodities which cannot be fully quantified at the present level of design
    - Unit Prices have been developed using the best available local market information;
    - Project sales tax exemption status has been established and incorporated in materials costs
    - Quotes have been obtained for specialty and price-sensitive materials
    - Data-base materials costs have been updated to reflect market volatility
  - Construction labor
    - Local wage rates, fringe benefits, and work rules are incorporated
    - Local payroll taxes and insurance rates are incorporated
    - Holiday / show-up / vacation pay is incorporated
    - Crew productivity is appropriate and conservative for the task under evaluation
    - Availability and variability of utility and railroad outages and "track time" have been incorporated in a conservative manner in determining the crew productivities for impacted work
  - Construction equipment
    - Local equipment rental rates and current fuel costs are incorporated
    - Quotes have been obtained for specialty equipment (TBM's, etc) and currency adjustments as applicable have been made.
  - Escalation for Construction Materials, Labor and Equipment
    - Confirm that adequate escalation rates have been applied to estimates of material, labor and equipment costs to anticipate prices at the time of project bid. Cost escalation can be due to increased global or local demand (example is China's construction boom results in high demand for copper, steel, cement) or reduced

supply (example is the reduced labor pool in neighboring states when construction workers flocked to New Orleans after Hurricane Katrina).

- Special considerations
  - Utility and Railroad labor, equipment, and overhead rates have been verified and incorporated in third party or "force account" work pricing, as well as local utility/RR work and safety rules
  - Special consideration has been given to support operations and facilities for tunneling operations, facilities to support operations in contaminated/hazardous materials, etc.
- Construction Indirect Costs, Multipliers for Risk etc.
  - Contractor indirect and overhead costs are advanced beyond a percent of the associated construction direct costs and should be analyzed based on field and home office indirect costs such as contract duration, appropriate levels of staffing (including project managers, engineers, safety engineers, schedulers, superintendents, QA/QC engineers, craft general foreman, labor stewards / nonproductive labor, warehousing, project trucking, survey layout, purchasing, timekeeping, etc.), mobilization / demobilization costs, equipment standby / idle time costs, reviewer office / lab / tool facilities, safety equipment, QA/QC testing equipment, temporary utilities (sanitary / power / light / heat), jobsite and public security measures, etc.
  - Appropriate costs have been included for payment and performance bonds and special insurance requirements (RR protective, pollution liability, etc.).
  - Other construction insurance costs and/or project-wide coverage (Owner Controlled Insurance Policy) has been included based on quotes from appropriate carriers.
  - Contractor profit / risk costs have been incorporated that reflect the expected level of competition by contract package (higher profit margin where few competitors will bid).

- Cat. 60 - Real Estate
  - Costs for related professional services (both contracted and in-house legal, appraisal, real estate and relocation consultants) and costs for the real estate and relocations themselves have been included. Check that easements, acquisitions, inspections, takings, etc. have been appraised or estimated by qualified professionals familiar with local real estate markets and practices. Include costs for taxes.
- Cat. 70 - Vehicles
  - Costs for professional services (both contracted and in-house) for vehicle design and procurement as well as construction of prototypes and vehicles have been estimated using current purchase prices for similar vehicles or quoted prices from manufacturers. Costs for spare parts and project requirements for non-revenue support vehicles are included. Costs for maintenance/support facilities should be in SCC 30.
- Cat. 80 - Professional Services
  - Costs for all professional services (both contracted and in-house) throughout the project life (PE, FD, Construction, start of revenue operations) including design services, design administration, community outreach coordinators, project management, construction administration, legal services, accounting and record keeping, claims analysis, surveying, geotechnical investigations, geotechnical and materials testing during construction, etc.
  - Refer to Grantee's contracts for services.

    - Confirm that cost estimates are based on realistic levels of staffing for the duration of the project through close-out of construction contracts.
    - Confirm that costs for permitting, agency review fees, legal fees, etc. have been included.
- Allocated Contingency
    - Confirm that adequate contingency has been allocated to each of the SCC categories based on the perceived risk inherent to each.
- Cat. 90 - Unallocated Contingency
    - Confirm that adequate contingency has been added to the total project cost based on the perceived project risk.
- Cat. 100 – Finance Charges
    - Confirm that finance charges are included if necessary. Ensure that the Grantee and FTA's Financial Management Oversight Consultant review the reasonableness of the amount of finance charges.
- Inflation
    - Confirm that adequate inflation rates have been applied to Base Year project costs to anticipate costs at procurement or bid time for contracts. The Year of Expenditure costs should be developed thoughtfully. Reference indices that may be useful are the ENR Building Cost Index and Construction Cost Index, some with regional cost databases.

APPENDIX C

Report Contents and Format

1) Table of Contents
2) Executive Summary (3 pgs. max)
3) Project Background
   a) Project description and information, including subsections for Project Delivery Method, Contract Packaging Strategy, construction phasing/sequencing
4) Methodology
   a) Describe the methodology used to deliver PMOC's sampling plan
   b) Present, discuss, and thoroughly demonstrate the PMOC's approach to identifying allowances and latent (hidden) contingencies
   c) Evaluation Team - Separately present PMOC and Grantee organizations
5) Review and Analysis of Project Cost
   a) Patent (exposed) contingency information may be included as a separate column in order to reconcile this information to the project cost estimate.
6) Review and Analysis of Correlation in Project Quantities
   a) Present analysis of the correlation of design document quantities with those in the cost estimate; also present recommended adjustments to the Grantee's cost estimate.
7) Review and Analysis of Construction General Conditions Costs
   a) Present the assessment and evaluation of the General Conditions of the construction contract, referring to proposed construction contractor requirements, and characterized by contract package. Contrast Grantee's general conditions cost estimate against PMOC's independent cost estimate independent estimate for the systems work and the three largest construction contracts.
8) Review and Analysis of Escalation and Inflation Rates
   a) Review and evaluate the application of escalation rates to costs for materials, labor and equipment. Consider the adequacy and reasonableness of the rates, the soundness of the economic forecasts. When necessary, recommend adjustments to the Grantee cost estimate.
   b) Review and evaluate the application of inflation rates to the Base Year dollars to arrive at Year of Expenditure dollars. Consider the adequacy and reasonableness of the rates, the soundness of the economic forecasts. When necessary, recommend adjustments to the Grantee cost estimate.
9) Review and Analysis of Sponsor Allowances and Identification of Latent Contingency
   a) Present the basis for the PMOC's review and evaluation of the general uniformity and reasonableness in the Grantee's use of allowances.
   b) Present the review and evaluation of certain cost elements in the Grantee's cost estimate that are functionally equivalent to contingency but not identified as such.
10) Review and Analysis of Project Cost Estimate Classification
   a) Present the basis for the review and evaluation of the general uniformity and reasonableness in the sponsor's use of allowances.
11) Conclusion
   a) Summarize findings
   b) Make recommendations for adjustments to the estimate along with time frames for implementation
   c) Include information related to the Cost Estimate Review Checklist (Appendix B)
   d) Summarize overall project risk

12) Appendices
    a) Grantee Project Information - Identify and characterize the structure and quality of the project information. Examine the extent, nature, detail and quality of the information and the steps the PMOC took to determine its value. Identify and discuss Grantee or third party information and indicate whether the PMOC accepted the information with or without adjustment.
    b) Grantee's Project Cost Estimate
    c) Project Cost Estimate Classification
    d) Detailed Cost Item Review
    e) Detailed listing of identified risks
    f) Other appendices as necessary or directed.

APPENDIX D

Sample Report

TABLE OF CONTENTS
Etc.

METHODOLOGY

The PMOC received the detailed cost estimates that sponsor had completed on the project as of [date]. The cost values in this report are based on this version of the cost estimate, and a summary by FTA Standard Cost Category is provided as **Exhibit D-1**.

This cost estimate reflects the level of design completed through [project stage]. This estimate includes the cost build-up at the [item or element] level of detail. The individual item cost estimates were calculated from a corresponding quantity and unit cost estimate based on the level of project definition or design to date. There are also lump sum and cost estimating relationship line items for additional individual line items. The reviewer found that there was a sufficient amount of documentation included in the cost estimate to determine its development and to incorporate that data into the review process and analysis results. The PMOC utilized a population stratification and sampling technique to select the individual cost items from this cost estimate to effectively achieve the objectives of this risk assessment.

The purpose of the proposed cost item sampling plan is two-fold: 1) to assure that the estimate is based on readily identifiable assumptions and reliable data, and 2) to use the results of the sample review to identify potential risk factors, and subsequently, their potential cost impact. The required criteria will include completeness, unit cost basis, and unit cost and quantity reasonableness. Potential cost escalation within each cost item will require some response from the sponsor from re-estimation or redesign, to mitigation of unique project development aspects.

For the cost estimate analysis, the sample size (the number of cost items reviewed) was based on the sampling plan described in the PMOC's Implementation Plan and adapted to these specific characteristics of the cost estimate. A representative sample, or number of cost items, was selected for detailed cost review based on several factors, including such considerations as population size, document category, cost and schedule risk involved, dollar value, and the relative importance of the item.

The sponsor cost estimate was provided in contract packages representing each of the 5 Line Segments and the 11 individual stations within the Stations Contract. In addition, there are 6 Breakout Contract packages that were included in the cost estimate at the same level of detail and definition as the Line Segment and Stations Contract packages. These individual cost estimates were combined into a single spreadsheet that represents the entire project cost estimate by the consistent line item definitions. The Sponsor also provided a corresponding cost estimate that cross-walked the contract package estimates into the FTA Standard Cost Categories (SCC). The cost items within the contract package estimate were examined to stratify the cost item population into 6 distinct subgroups for the detailed analysis of the cost estimate, as described in Table IV-I. The number of cost items in the contract package, the sampling rate or percent, and the sample size of each subgroup are also presented in this table also.

This sample of 118 cost items was selected randomly from each of the corresponding cost item strata defined above. Lump sum, unit cost and cost estimating relationship cost items were segmented by amount into the larger and smaller values. Sampling rates selected for each cost item segment were based on a higher sample rate for the higher cost items and a lower rate for the lower cost items. The overall sampling rate objective was established at 15%. The specific sampling rates for each cost item category were selected to fulfill the overall objective and emphasize the higher cost items with the higher sampling rates. Random selection was completed through assignment of unique cost item numbers and a random number generator selection from each of these strata. The combined sample size of 17% exceeds the cost item objective of 15%. The specific cost items selected were provided to the cost evaluation team for the detailed analysis.

The PMOC team reviewed the various cost documents provided by the sponsor. The following outline describes the steps applied to review the Project Cost Estimate:

1) Characterization or Stratification of Cost Items
   a) Characterize estimate data into one of three cost item categories or classifications -- Lump Sum, Unit Cost or Cost Estimate Relationship.
   b) Select sample totals based on individual sampling rates for each category.
   c) Identify cost items for detailed review based on random selection of individual cost items.
2) Mechanical Check of Estimate
   a) Mathematically sum all lump-sum prices, unit price and quantity calculations, and cost estimating relationships to confirm the sponsor's total cost estimate.
   b) Perform a mathematical check of all sampled unit price or quantity calculations.
   c) Mathematically check the cross-walk and cost sums from the contract packages to the FTA Standard Cost Categories.
3) Comparison to Industry Standards
   a) Review sampled unit prices and quantities for conformance to industry standards, regional variations or other unique characteristics.
   b) Check sampled unit costs of similar items used in differing conditions to ensure local conditions and difficulty factors were considered in the individual estimated units.
   c) Check sampled quantities to confirm basis of calculations from design documents.
4) Correspondence with Scope Review
   a) Cross check sampled quantity estimates with the project scope contained in the design documents to determine degree of correlation between the design deliverables and the project cost estimate down to the 2nd level WBS.
   b) Perform general "Overview" of total estimate to give it a "sanity check" and ensure that all major components appear.
   c) Review sample quantities for reasonableness and to be representative of industry standards and the design scope of work with respect to major components.
5) Evaluate Contract Package Elements
   a) Assess certain contract package elements as to requirements and associated reviewer payments, characterizing elements as:
      i) Contract requirements for specific services such as QA/QC and scheduling that would be material elements in the development of bids;
      ii) Elements of contract language that would reasonably serve as a basis for additional compensation not part of a scheduled payment item;
      iii) Restrictive schedule or mobilization requirements that would be material pricing elements in developing a bid;
      iv) Geotechnical data and pricing approach to changed conditions;

v) Unit pricing and allowed variability in unit pricing.

6) Supporting documentation and assumptions for sponsor's general conditions cost estimate.
   a) Develop an independent, detailed general conditions cost estimate of the three largest construction contracts and of the systems work.
7) Escalation and Inflation Review
   a) Building up from the second SCC level, evaluate uniformity of application of escalation and inflation factors.
   b) Compare escalation and inflation factors used by sponsor to Producer Price Index data from the Bureau of Labor and Statistics (http://www.bls.gov) and other sources such as ENR, Means, Richardson, etc. to ensure adequate escalation and inflation cost is included to carry the project to the mid-point of construction (the assumed time when contract unit awards will be complete).

REVIEW AND ANALYSIS OF PROJECT COST

The PMOC team reviewed the cost estimate documentation supplied by sponsor, including packages for line contracts, stations contracts and breakout contracts (the list of documents reviewed is provided in Appendix). Sponsor provided the cost estimate for each contract package in electronic format and the estimate backup documentation in hard-copy format. The cost estimate and backup documentation reviewed was dated [date] . A summary of the [title of Grantee cost estimate] is provided as Appendix [XX]. The backup documentation was well organized and presented in a clear and concise manner. Having both the electronic files and hard-copy documentation facilitated the cost item review and analysis, as well as permitted the tracking of costs and quantities from the individual line items to project or contract cost estimate to ensure proper traceability and application.

A randomly selected group of project quantities, unit costs, CERs, and lump sums was reviewed and validated, and the mechanical checks were deemed to be reliable and mathematically correct. Consequently, the level of document and estimate detail is commensurate for a project at this stage of design.

Cost Item Classification

The approach for planning the cost item analysis for this risk assessment was to identify and categorize each cost item in the sponsor's estimate. The cost items of the estimate were analyzed and categorized by: 1) Unit Cost or Quantity supported or not supported on the design deliverables, 2) Cost Estimating Relationships (CER), and 3) Lump Sum. The cost items were further categorized by large and small, determined by a break point of $1 million. Cost items are large if their value is greater or equal to $1 million, while items lower than this are considered small cost items. A summary of the Grantee's cost estimate, including PMOC's recommendations, classified into unit cost, CER and lump sum is provided in Appendix [XX]. This estimate classification also categorizes the budget by: a) Drawings/Specifications, b) Schedule (includes escalation), c) Design Report, and d) General Conditions. Costs are classified into these categories on the basis of their estimate (how it was derived) and the extent of project definition.

Mechanical Check

Quality and mathematical checks for accuracy and traceability were performed at both a micro and macro level on the Project Cost Estimate. Individual line items for the Line, Stations, and Breakout Contracts were checked and summed to confirm the title level subtotals. This was performed manually with a calculator and electronically by reviewing the spreadsheet formulas. These computed subtotals were

consistently accurate. In addition, these subtotals were then traced and verified that they indeed "rolled-up" correctly to the applicable total construction costs. Once the total construction costs for the Line, Stations, and Breakout Contracts had been confirmed, the proper application of additional project mark-ups (non-construction costs, contingencies, escalation, etc.) was verified to be mathematically correct.

Furthermore, the quantities and costs for select individual line items of each of the contracts comprising the Line Contracts were spot-checked to ensure the proper addition and calculation of the total quantity and costs shown in the Line Contract. For example, quantities and costs for various construction line items of Contracts Nos. 88-H035, 88-H034, 93-H046, 155-H025, and 63-H137 were checked to confirm the total quantities and costs shown in the summary of the Line Contracts estimate were calculated accurately. Likewise, the quantities and costs for various construction line items of the New Marin, East Main Street, East Street, Cedar, Newington Junction, Elmwood, Flatbush Avenue, New Park Avenue, Park Street, Sigourney Street, and Union stations were validated to ensure that the total quantities and costs depicted in the summary of the Stations Contracts estimate were properly computed. Similarly, the quantities and costs for various construction line items of …Access Road, Flatbush Avenue, Railroad Relocation, Laurel Street, Broad Street, and Interstate E.B. Off Ramp to Capitol Avenue estimates were verified to assure that the total quantities and costs presented in the summary of the Breakout Contracts estimate were added correctly. These calculations were determined to be accurate and estimated to be correct within 1%.

Implicit in these exercises, additional mechanical checks were performed that included verifying the calculation of the cost estimating relationships, and confirming that the quantities and unit costs were extended/multiplied properly. These computations were deemed to be mathematically accurate within 1%.

Additional details of mechanical checks performed on lump sums, cost estimating relationships, quantities, and unit costs are also discussed in the subsequent report sections.

Comparison to Industry Standard Costs

The cost items of the [title of Grantee's cost estimate] that were examined included unit costs, quantities, cost estimating relationships (CERs), and lump sums. These cost items were reviewed for consistency with relevant, identifiable industry or engineering practice, as well as for proper mathematical calculation and application, and traceability more detailed estimate backup information.

The PMOC compared the sponsor's Project Cost Estimate items with the following cost references:

- [Grantee's] Weighted Unit Price Report, January 1, 2003 to December 31, 2005;
- [Grantee's] Preliminary Cost Estimating Guidelines, January 2006;
- [Grantee's] Conceptual Estimate guidelines, 2002; and
- RS Means 2006 Heavy Construction Cost Data
- Richardson's 2006 Heavy Construction Cost Data

[Grantee's] Weighted Unit Price Report has been prepared to provide weighted unit prices of [list of specific construction items] for the purpose of comparison and evaluation of cost trends and the preparation of preliminary cost estimates. The weighted unit costs have been developed from bids on contracts for the period January 1, 2003 through December 31, 2005 and show only the items bid.

Sponsor's Cost Estimating Guidelines contain typical price ranges of some of the more commonly used items in sponsor projects.

The unit costs were also checked with [commercial cost index] Heavy Construction Cost Data. The unit costs in this reference source were adjusted to reflect [local area] pricing by using the respective city indices. These indices represent relative construction factors (or multipliers) for material and installation costs, as well as the weighted average for total-in-place costs for each CSI Master Format division. The [commercial cost index] Weighted Average Total (Material plus Labor) City Cost Indices for [local reference] were used to adjust [commercial cost index] unit costs to these [local reference] cities.
It should be noted that in the PMOC cost review, the sponsor unit costs were initially assumed to be unburdened, and as such compared favorably with [commercial cost index] values and industry norms. In confirming such inferences with the sponsor unit costs are known to be unburdened with General Conditions cost, they are low when compared with the previously mentioned sources and pose significant cost risk.

[Grantee] does not allow a separate line item for General Conditions and typically incorporates the costs for General Conditions in their project estimate unit costs, with some items addressed as specific line items or cost percentage add-ons. [Grantee] addresses Mobilization, which can be included in General Conditions, as a separate line item.

Specific cost items reviewed are identified in Appendix [XX].

Cost estimate quantities used in the design were developed with [software name], and were based on the application of guidance from the above mentioned references as well as other sources such as sponsor's Surveys and Mapping, supplemental field surveys conducted by [consultant name], and inspection reports provided by [consultant name] for [named bridges]. Quantities were also based on coordination and advice from sponsor, and on engineering judgment.

Cost estimate totals for minor items and Lump Sum/Miscellaneous Items were generated mainly by either cost CER or lump sum. Quantities for these items were also based on coordination and advice from sponsor, and on engineering judgment.

Potential Cost Impacts

General Conditions
General Conditions are generally defined to include such items as traffic control and rerouting, specialized equipment, temporary utility connections and service. Grantee does not allow a separate line item for General Conditions and typically incorporates the costs for General Conditions in their project estimate unit costs, with some items addressed as specific line items or cost percentage add-ons. Grantee addresses Mobilization, which can be included in General Conditions, as a separate item.

As discussed above, the unit costs are now known to be burdened with General Conditions cost, as such they are low when compared with the previously mentioned sources and pose significant cost risk. It is recommended that General Conditions be applied at a rate of 20% for guideway and track items (SCC-10) and at a rate of 10% for sitework items (SCC 40). Cost estimates for stations (SCC-20), support facilities (SCC-30), and systems (SCC-50) should be considered to include the cost of General Conditions within the cost allowances included. Mobilization should also be backed-out of the SCC-40 category, as it currently is rolled up in the cost estimate, and be applied at a rate of 7.5% to all affected line items throughout the SCC categories.

SCC-10.02 Earth Excavation

Although a unit cost of $10.50 per cubic foot (cf) was used in the project cost estimate for the earth excavation, sponsor's January 2006 Preliminary Cost Estimating Guidelines recommends a range from $10.00/cy to $16.00/cy for earthwork quantities greater than 5,000 cy.

Consequently, a potential cost risk as high as approximately $1,291,000 [($16.00/cf - $10.50/cf) x total quantity] is calculated when considering the estimated earth excavation quantity of 234,740 cy.

SCC-10.04 Guideway: Aerial Structure

Nineteen bridge structure estimates were prepared by Grantee using a detailed approach that included the quantity and unit price of the major structural and bridge components . The steel, including structural steel, reinforcing bars, and piling, and concrete were the major cost items in each estimate. The unit costs for reinforcing bars (epoxy and non-epoxy coated) and the steel piling conformed to the sponsor Preliminary Cost Estimating Guidelines.

The bridge estimates used $400/cy for Class A concrete and $600/cy for Class F concrete. The January 2006 Grantee Preliminary Cost Estimating Guidelines recommended the following ranges for these concrete types:

Class A	$350 - $700/cy
Class F	$450- $800/cy

Thus, the estimate's concrete unit costs fell with the recommended ranges, but at the lower end. [Note that in this example, analysis is missing and leaves the reader questioning whether the costs should have been adjusted higher.]

Likewise, the $2.25/lb for structural steel that was used in the bridge estimates compared favorably with the January 2006 sponsor Preliminary Cost Estimating Guidelines of $1.80/lb to $3.00/lb. However, this range of unit cost also translates into a substantial cost variance.

Although the structural steel and concrete unit costs were within the recommended ranges of Grantee Guidelines, a potential risk is the current market pricing and volatility of steel and concrete unit costs. Significant cost impacts can be realized if the high-end unit cost for both items is employed in the bridge estimates. In an attempt to quantify this market risk, the higher end unit costs for Class A concrete ($700/cy), Class F concrete ($800/cy), and structural steel ($3.00/lb) were used in the bridge estimates. Table V-2 compares the Preliminary Design Project Cost Estimate and the newly created estimates using the higher structural steel and concrete unit costs.

[Include Table V-2. Comparison of Bridge Cost Estimates, or similar as required.]

Given the above discussion concerning the structural steel and concrete unit costs, a potential cost impact (or positive variance) of approximately $11.33 million exists. This represents 22.3% of the bridge costs in the Preliminary Design estimates. Consequently, current market pricing for concrete and steel, including structural steel, reinforcing bars, and steel piling, should be obtained to confirm any variances with the respective unit costs, and the estimate updated to reflect these latest costs.

SCC-40.06 Concrete Sidewalk

Although a unit cost of $8.00 per square foot (sf) was used in project cost estimate for the concrete sidewalks, Grantee's Weighted Unit Price Report indicates a historical range from $5.40/sf to $15.45/sf, with an average unit cost of $10.80/sf for concrete sidewalks.

Consequently, by employing a $15.45/sf unit cost, a potential cost impact of up to approximately $985,600 [($15.45/lf - $8.00/lf) x total quantity] is computed when considering the estimated concrete sidewalk quantity of 132,300 sf.
Additional discussion for this item is provided in Appendix [XX].

SCC-50.02 Traffic Signals and Crossing Protection
Approximately 15 new traffic signals were used on the project. Specifically, two signals were priced at $120,000 and thirteen were priced at $90,0000, thus totaling $1,410,000. According to sponsor's Preliminary Cost Estimating Guidelines, a new signal can range from $70,000 to $100,000 per intersection. Furthermore, [commercial cost index] 2006 Heavy Construction Cost Data shows completely installed traffic signal systems ranging from $164,350 ($157,500 x 1.0435) to $219,150 ($210,000 x 1.0435) depending if the system has right or left lane controls. The value of 1.0435 represents the [commercial cost index] 02 – Site Construction Average City Cost Index for [locality].

Although, the $90,000 traffic signal unit cost falls within the acceptable cost range, it is 11% less than the maximum recommended by Grantee's Guidelines. More importantly, the $90,000 traffic signal unit cost is 83% to 144% less than the … signal systems' costs (with [locality] cost indices applied).

It should also be noted that the Grantee's traffic signal unit costs (from their Preliminary Cost Estimating Guidelines) are burdened with the General Conditions costs. By contrast, the [commercial cost index] unit costs do not include general conditions mark-ups, but do consider a location index factor for [locality]. Therefore, the percentage variance of the Grantee's and [commercial cost index] traffic signal unit costs will be greater than the 83% to 144% mentioned previously if any general condition costs are included for the [commercial cost index] unit costs.

Given the above discussion and considering a high-end benchmark cost of $219,150 for all the 15 traffic signals used on this contract, the potential cost impact could be as high as $1,877,250 [(15 @ $219,150) - $1,410,000] plus the appropriate general conditions mark-ups, if any.

REVIEW AND ANALYSIS OF CORRELATION IN PROJECT QUANTITIES

The PMOC has reviewed the cost estimates based on the current project scope. Certain scope items having specific cost increase risks are identified below.

Currently, there are no support facilities planned for this project. The scope review identifies the potential for cost increases due to the need to provide support facilities (SCC-30). An allowance of $1.5 million is suggested, which would allow for procurement of special and additional tools, and/or the addition of a bus maintenance bay. [Note that in this example, the PMOC should indicate its opinion of the adequacy of this suggested allowance.]

The scope review also identifies the potential that the current cost allowance for systems (SCC-50) underestimates the scope necessary for communications, and that no cost is budgeted for control center or fare collection provisions. An increased communications allowance of $1.5 million is suggested, with a further $1.5 million allowance for the other scope items noted.

The scope review identifies risk in the overall budget for ROW (SCC-60) based on the present lack of progress in this area. The current ROW cost estimate of $15 million is based upon previous designs and does not include the [name of railroad] ROW or current design revisions. Sponsor is currently developing a more recent cost estimate, which includes the [name of railroad] property. However, these estimates are considered very preliminary, based on the fact that ROW plans have not been developed at this time. It is therefore proposed that the baseline cost estimate associated with this item be adjusted to reflect these issues and the potential cost impacts. However, these adjustments and associated risks should be tweaked at mitigation benchmarks as the project moves forward and as sponsor continues to work on the development of ROW plans and appraisals, which sponsor estimates to have completed by the end of 2006. Future progress also includes the completion of the [name of railroad] agreement and a better understanding of complex acquisitions and relocations.

The scope review indicates that the risk associated with these scope items may not be included in the final design estimate. Therefore, it is suggested that the final design cost (SCC-80.02) be increased by 30%. Uncertainty over the final design firms and their inclusion of insurance costs also suggests that budget should be included for insurance, with a suggested figure of $1.5 million.

REVIEW AND ANALYSIS OF GENERAL CONDITIONS COSTS
Etc.

REVIEW AND ANALYSIS OF ESCALATION AND INFLATION RATES AND APPROACH

Escalation is the term for increases in the cost of material, labor and equipment due to global or local increases in demand for those materials, labor and equipment. Related but different, inflation is the term for increases in the cost of equipment, material, labor, and other cost items due to nationwide changes in the value of money over time. These phenomena were treated separately.

Inflation and deflation multipliers are used to estimate the future cost of a project or to bring historical costs to the present. Most cost estimating is performed in "current" year dollars and then escalated to the time when the project will be accomplished. Since the duration of large construction projects extends over several years, it is necessary to have a method of forecasting or predicting the funds that must be made available in the future to pay for the work. Accordingly, predictive or forecast escalations indices are used to produce an estimate of the future cost of the construction project.

The Preliminary Design Project Cost Estimates prepared for the [name of project] were initially estimated in year 2006 dollars. In order to reflect year-of-expenditure (YOE) dollar values, these year 2006 capital costs were inflated to year-of-expenditure by using an approximate project implementation schedule and an inflation index to account for the rising prices of transit construction. The project implementation schedules were provided by [Grantee] and a 4% annual escalation rate was used for this effort.

The project implementation schedule was approximated for the major project phases as follows:

- The design phase is approximately 2.25 years in duration spanning October 2006 to December 2008.
- The construction phase for the Breakout Contracts is 2 years from January 2008 to December 2009.

- The construction phase for the Line and Stations Contracts is approximately 3 years spanning from the 1st quarter of 2009 to December 2011.

Thus, the duration for the design phase is 2.25 years and the total construction phase duration is approximately 4 years. The total project duration is from October 2006 to December 2011, or 5 years and 3 months (5.25 years).

These summary project performance schedules for the design and construction phases allow the estimates to be escalated to more fully represent the likely YOE estimates for each phase. Consequently, these project expenditure schedules were used to escalate the year 2006 dollar estimates to the more likely year-of-expenditure.

The project schedule in its current form lacks the detail to determine the validity of the longest path of the project. Critical areas such as right-of-way acquisition, utility relocation, wetland mitigation and construction are insufficient in detail to confirm if the schedule is reasonable and to estimate a probability of schedule slippage.

The methodology used in the [title of Grantee's estimate] to account for the effects of inflation is sound. A cost loading by Standard Cost Category items was performed for each year of the design and construction year. In other words, between the base year of 2006 and the end of construction of 2011, the standard cost category work items from the Line, Stations, and Breakout Contracts were estimated in 2006 dollars and then these cost items were segregated/time-phased according to the anticipated year of performance. Once these out-year design and construction costs for all contracts were calculated and allocated according to expected year of expenditure or performance, the appropriate escalation factor (4% compounded annually) corresponding to that year was applied.

The second issue in this conversion of year 2006 dollar costs to the YOE costs is the inflationary index to be applied. As previously mentioned, the [Grantee's] Project Cost Estimates use a 4% compounded annual inflation factor. The indices available to review and compare the accuracy of this percentage included the following:

- FTA Transit Price Index – Study was published in 1995 and completed by [name of consultant]. The study developed a transit specific index to estimate the future effects of inflation on major transit capital projects. The index for heavy construction projects was 3.5% over the next twenty-year period covering these project development schedules.

- [Commercial cost index] Heavy Construction Cost Data Historical Cost Indices – Annual report identifies cost impacts for various heavy construction projects. This report indicates an the average cost increase (index increase) of 3.6% for overall heavy construction projects over the past six and a quarter years in the 2000 decade (2000 – first quarter 2006).

- Engineering News Record (ENR) – This magazine produces a construction cost index that is reflective of actual cost change rather than a forecaster of future change. Nevertheless, it offers some insight into the most recent cost change in the heavy construction field. The ENR Construction Cost Index has a materials and labor component. Based on the ENR June 2006 Construction Cost Index, the percent change of construction costs over the past year is 3.8%.

- Producer Price Index (PPI) – This index is prepared by the U.S. Department of Labor, Bureau of Labor Statistics. It tracks producer price data by industry and develops the index from these prices. The Producer Price Index is a family of indices that measure the average change in the selling prices received by domestic producers of goods and services. The most pertinent index available for this project application is the Highway and Street Construction Index. The average annual increase of this index from 2000 to 2005 is 5.05%.

These four indices are all constructed using differing methods. They measure the effects of price change in various portions of the economy. The most relevant portions of the economy for this application of escalating transit estimates are the heavy construction field and highway construction. Certain indices are historical, documenting actual price change. Other indices are predictive, estimating future change in prices or costs of various goods and services. These four indices represent the wide range of available indices and associated values.

The FTA Transit Price Index is a predictive inflation index. This means that it converts its historical price change research into forecasting future price change. The other three indices are historical indices that document actual price change in the economy.

The [commerial cost index] Heavy Construction Cost Index and the Engineering News Record Construction Cost Index are both developed for general heavy construction and do not include the more unique systems requirements typically found in transit projects. The FTA Price (Cost) Index was developed from the detailed DRI/McGraw Hill forecasts for the more specific transit capital project requirements. As such, FTA may provide better estimates for this exercise.

As is evident from above, the [commercial cost index] Cost Estimates' annual inflation factor compares favorably and falls within the range of the other four indices surveyed. Only the PPI Highway and Street Construction Index is greater, at 5.05%.

Potential Escalation Risk Elements

Given that the escalation application method is sound, the main risk factors to the escalation costs are the escalation percentage and the projected design and construction schedule. If the escalation percentage were to increase due to economic and market conditions, the escalation costs will increase accordingly. Furthermore, if the design and construction schedule were to be extended or delayed, the corresponding design and construction costs would occur in different out years than currently estimated and the applied effective/compounded escalation factor would be greater for the new years than the previously estimated years.

Therefore, various risk scenarios exist. Singularly, either the escalation percentage can increase or the design and construction schedule can be extended. A worst case scenario would occur if the escalation percentage was greater than the anticipated 4.0% and the design and construction schedule was to slip. As a result of any of these scenarios, the escalation costs would be greater than the $56,691,000 reflected in [Grantee's] Cost Estimate Summary.

The annual escalation of 4% used in the [Grantee's] Project Cost Estimates compares favorably with the various representative benchmarks previously discussed. However, if an escalation percentage of 5.05% is used as reflected in the PPI Highway and Street Construction Index, the project's escalation cost would increase by approximately by $17,350,000 (or 30.6%) to $74,045,000.

This escalation amount was computed as follows. The escalation costs of $56,691,000 in the Preliminary Design Project Cost Estimate Summary represents 14.4% of the Project Subtotal plus Project Level Contingency ($393,434,258). Furthermore, a 1.04 factor (4% escalation) compounded for 3.5 years yields approximately 1.147 (or 14.7%). Therefore, a 1.0505 factor (5.05%) compounded for 3.5 years is equivalent to 1.1882 (or 18.82%). By applying this 18.82% to $393,434,258, an escalation cost of $74,045,000 is computed.

As noted previously, the implementation schedule has a measurable impact upon the eventual capital cost of the completed projects. Any delays or slippage to the schedule in the performance of the design and construction activities will result in higher costs than estimated. As such, if these schedules are extended, the costs will likely increase from these estimates.

The most common delays are those that are outside of the [Grantee's] control, such as weather, utility relocation and right-of-way acquisition. The current schedule for this project lacks sufficient detail in these areas to estimate the probability of any delay with reasonable accuracy.

However, by reference to the "Managing Capital Costs of Major Federally Funded Public Transportation Projects - Final Report," June 2006, Transit Cooperative Transportation Research Program, the average delays for federally funded public transit projects were 1.0 year for design and 0.8 year for construction. Thus, an average delay of 1.8 years was used for this project to estimate any additional escalation impacts.

By considering only a design and construction schedule delay and/or extension of 1.8 years, the project's escalation cost would increase by $34,213,000 to $90,904,000. This escalation amount was computed as follows. The escalation costs of $56,691,000 in the [Grantee's] Cost Estimate Summary represents 14.4% of the Project Subtotal plus Project Level Contingency ($393,434,258). Furthermore, a 1.04 factor (4% escalation) compounded for 3.5 years yields approximately 1.147 (or 14.7%). Therefore, a 1.04 factor (4.00%) compounded for 5.3 years (3.5 yr + 1.8 yr) is equivalent to 1.2311 (or 23.11%). By applying this 23.11% to $393,434,258, an escalation cost of $90,904,000 is computed, which yields a $34,213,000 variance with the estimated escalation cost of $56,691,000 used in the [Grantee's] Project Cost Estimate Summary.

A worst case scenario for the escalation cost impact could be calculated with an escalation percentage of 5.05% and an extension or delay of the design and construction schedule by 1.8 years. Accordingly, the escalation impact would be $60,699,000. This escalation variance was calculated as follows. A 1.0505 factor (5.05% escalation) compounded for 5.3 years (3.5 yr + 1.8 yr) yields approximately 1.2984 (or 29.84%). Applying this 29.84% to $393,434,258 (Project Subtotal plus Project Level Contingency) results in an escalation cost of $117,390,000, or a $60,699,000 variance with the estimated escalation cost of $56,691,000 used in the Preliminary Design Project Cost Estimate Summary.

In summary, the escalation costs variance has the potential to range between $17,350,000 and $60,699,000.

APPENDICES

PROJECT COST ESTIMATE ([date of estimate])

Exhibit D-1 summarizes the [Grantee's] Project cost estimate, dated June 2, 2006, by FTA Standard Cost Categories. As of the writing of this report, a more recent cost estimate has been provided by [Grantee], dated June 6, 2006, which decreased the Preliminary Engineering budget (SCC-80) by [$XX] million. This consequently decreased the contingencies (SCC-90) and escalation (SCC-100) costs. However, the PMOC cost review was performed on the June 2, 2006 Grantee cost estimate and its backup documentation.

EXHIBIT D-1: PROJECT COST ESTIMATE CLASSIFICATION

DRAFT

Estimate Classification	Quantity	UM	*n*	Unit Pricing	*n*	CER	*n*	Lump Sum / Allowance	Σ_n	Total	Percent *n*	Percent $
Percent Of Total			88.7%	43.0%	1.4%	22.4%	10.0%	34.6%				
10 GUIDEWAY & TRACK ELEMENTS (route miles)	9.40	RM	258	$ 73,570,533	4	$ 38,348,813	29	$ 59,196,427	291	$171,115,773		
Drawings / Specifications			257	$ 63,214,438	3	$ 32,950,675			260	$ 96,165,113	89.3%	56.2%
Schedule (Includes Escalation)			1	$ 10,356,094	1	$ 5,398,138	1	$ 8,332,735	3	$ 24,086,968	1.0%	14.1%
Design Report				$ -		$ -	28	$ 50,863,692	28	$ 50,863,692	9.6%	29.7%
GCs				$ -				$ -	-	$ -	0.0%	0.0%
Percent Of Total			54.3%	28.1%	11.4%	18.0%	34.3%	53.8%				
20 STATIONS, STOPS, TERMINALS, INTERMODAL	11.00	EA	19	$ 7,299,565	4	$ 4,683,534	12	$ 13,967,320	35	$ 25,950,418		
Drawings / Specifications			18	$ 6,272,000	3	$ 4,024,229			21	$ 10,296,229	60.0%	39.7%
Schedule (Includes Escalation)			1	$ 1,027,565	1	$ 659,304.4	1	$ 1,966,190	3	$ 3,653,059	8.6%	14.1%
Design Report				$ -		$ -	11	$ 12,001,130	11	$ 12,001,130	31.4%	46.2%
GCs				$ -				$ -	-	$ -	0.0%	0.0%
Percent Of Total			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.40	RM	-	$ -	-	$ -	-	$ -	-	$ -		
Drawings / Specifications						$ -			-	$ -	$	$
Schedule (Includes Escalation)				$ -		$ -		$ -	-	$ -	$	$
Design Report				$ -		$ -		$ -	-	$ -	$	$
GCs				$ -				$ -	-	$ -	$	$
Percent Of Total			48.3%	42.1%	32.8%	47.9%	18.9%	10.0%				
40 SITEWORK & SPECIAL CONDITIONS	9.40	RM	115	$ 34,909,305	78	$ 39,674,285	45	$ 8,243,518	238	$ 82,827,108		
Drawings / Specifications			114	$ 29,995,357	77	$ 34,089,602	44	$ 7,083,134	235	$ 71,168,093	98.7%	85.9%
Schedule (Includes Escalation)			1	$ 4,913,948	1	$ 5,584,682	1	$ 1,160,385	3	$ 11,659,015	1.3%	14.1%
Design Report				$ -					-	$ -	0.0%	0.0%
GCs				$ -					-	$ -	0.0%	0.0%
Percent Of Total			9.8%	9.8%	7.8%	23.2%	82.4%	67.0%				
50 SYSTEMS	9.40	RM	5	$ 2,459,937	4	$ 5,847,541	42	$ 16,888,973	51	$ 25,196,451		
Drawings / Specifications			4	$ 2,113,650	-	$ -	-	$ -	4	$ 2,113,650	7.8%	8.4%
Schedule (Includes Escalation)			1	$ 346,287	1	$ 823,163	1	$ 2,377,473	3	$ 3,546,923	5.9%	14.1%
Design Report				$ -	3	$ 5,024,379	41	$ 14,511,500	44	$ 19,535,879	86.3%	77.5%
GCs				$ -		$ -		$ -	-	$ -	0.0%	0.0%

EXHIBIT D-1: PROJECT COST ESTIMATE CLASSIFICATION *DRAFT*

Percent Of Total			0.0%	0.0%	50.0%	9.1%	50.0%	90.9%				
60 ROW, LAND, EXISTING IMPROVEMENTS	9.40	RM	-	$ -	2	$ 2,107,818	2	$ 21,078,182	4	$ 23,186,000		
Drawings / Specifications				$ -		$ -		$ -	-	$ -	0.0%	0.0%
Schedule (Includes Escalation)				$ -	1	$ 107,818	1	$ 1,078,182	2	$ 1,186,000	50.0%	5.1%
Design Report				$ -	1	$ 2,000,000	1	$ 20,000,000	2	$ 22,000,000	50.0%	94.9%
GCs				$ -		$ -		$ -	-	$ -	0.0%	0.0%
Percent Of Total			0.0%	0.0%	50.0%	9.1%	50.0%	90.9%				
70 VEHICLES (number)		A	-	$ -	2	$ 1,475,182	2	$ 14,751,818	4	$ 16,227,000		
Drawings / Specifications				$ -		$ -		$ -	-	$ -	0.0%	0.0%
Schedule (Includes Escalation)				$ -	1	$ 224,182	1	$ 2,241,818	2	$ 2,466,000	50.0%	15.2%
Design Report			-	$ -	1	$ 1,251,000	1	$ 12,510,000	2	$ 13,761,000	50.0%	84.8%
GCs				$ -		$ -		$ -	-	$ -	0.0%	0.0%
Percent Of Total			0.0%	0.0%	80.0%	89.3%	20.0%	10.7%				
80 PROFESSIONAL SERVICES		RM	-	$ -	8	$ 72,996,814	2	$ 8,779,666	10	$ 81,776,479		
Drawings / Specifications				$ -		$ -			-	$ -	0.0%	0.0%
Schedule (Includes Escalation)				$ -	1	$ 6,482,377	1	$ 779,666	2	$ 7,262,043	20.0%	8.9%
Design Report			-	$ -	7	$ 66,514,437	1	$ 8,000,000	8	$ 74,514,437	80.0%	91.1%
GCs				$ -		$ -			-	$ -	0.0%	0.0%
90 UNALLOCATED CONTINGENCY			-	$ -	2	$ 21,342,960	-	$ -	2	$ 21,342,960		
Drawings / Specifications									-	$ -	0.0%	0.0%
Schedule (Includes Escalation)					1	$ 2,721,995			1	$ 2,721,995	50.0%	12.8%
Design Report					1	$ 18,620,965			1	$ 18,620,965	50.0%	87.2%
GCs									-	$ -	0.0%	0.0%
100 FINANCE CHARGES			-	$ -	-	$ -	-	$ -	-	$ -		
Drawings / Specifications									-	$ -		
Schedule (Includes Escalation)									-	$ -		
Design Report									-	$ -		
GCs									-	$ -		
Percent Of Total			62.5%	26.4%	16.4%	41.7%	21.1%	31.9%				
Grand Totals	9.40	RM	397	$118,239,340	104	$186,476,946	134	$142,905,904	635	$447,622,189		

US DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 34 Project Schedule Review

1.0 PURPOSE

The purpose of this oversight procedure is to identify, characterize and describe the state of sponsor's scheduling process and schedule documents against sound engineering practices and project goals.

FTA's intent is to accomplish its oversight mission with deliverables that evaluate the completeness, consistency and adequacy of the sponsor's Project Management Plan and supporting documents and to make recommendations to the sponsor on redirecting or reprioritizing its efforts to correct any inadequately defined areas.

OP-34 deliverables are intended to provide evaluation of a critical aspect of the effectiveness and efficiency of the sponsor's project implementation during any phase of the project life cycle, including design and execution. This and similar evaluations are important considerations in determining funding recommendations.

2.0 BACKGROUND

The concept in the schedule review is to identify, characterize and describe each critical element in a project schedule. Sound scheduling provides for sound project planning. Schedule reviews also develop an understanding of factors impacting project risk and thereby assisting in successful execution of the sponsor's project. The operative concept in the schedule review and associated tools such as OP-40, is to identify, characterize and precisely describe each critical element in the project schedule. If this is performed as part of preparing a project execution strategy product such FTA's OP-20, the schedule review allows the Contractor to quickly develop factors impacting project risk and thereby, establish recommendations for successful execution of the Grantee's project.

OP-34 deliverables are intended to be fully sufficient to evaluate the effectiveness and efficiency of the Grantee's project implementation during any phase of the project life cycle, inclusive of the basis for initial Grantee project recommendations, and the basis of the project design and construction execution.

These deliverables should assess the overall progress of the program, utilizing engineering methods and judgments based on fundamental concepts and practices such as earned value. These reviews are valuable to uncover any variances from the Full Funding Grant Agreement (FFGA), including variances in physical percentage completion and rates of expenditures.

3.0 OBJECTIVES

FTA's objective is to determine whether the sponsor's project schedule is sufficiently developed to establish the validity of the longest path of the project (leading to the Revenue Operations Date), that critical areas such as right-of-way acquisition, utility relocation, wetland mitigation and construction are sufficient in detail to confirm if the schedule is reasonable, and to estimate a probability of schedule slippage.

The reviewer is to validate the usefulness of the schedule as a project management tool, identify problems, provide technical assistance, and actively solve schedule problems with the project sponsor. In a report to FTA and the project sponsor, the reviewer is to document its findings, professional opinions and recommendations and reconcile these with the sponsor.

In addition, identification of individual project schedule elements that indicate poor definition, uncertain constraints, or insufficient sequencing will reveal risk to the project. This provides FTA with an effective approach to accomplish risk management in that the reviewer evaluates the inadequately defined areas and makes recommendations as to their disposition. This ensures FTA's risk products satisfy the oversight requirement for accuracy and completeness.

Deliverables should be commensurate with the overall progress of the program, taking into consideration actual progress and expenditure data. Variances from the Project Management Plan and the planned Full Funding Grant Agreement (FFGA) should be thoroughly discussed.

4.0 REFERENCES

4.1 Regulatory

[NOTE: FURTHER REFERENCES AND LIVE LINKS TO BE ADDED]

The statutes, regulations, policies, guidance documents and circulars in the Appendix in OP 01 Administrative Conditions and Requirements apply. Particular attention should be given to OPs 32, 33, 35, and 40.

4.2 Appendices

The following Appendices are included this guidance:

8.1 - Sample Section with Data Table

8.2 - Typical Construction Sequencing

5.0 PROJECT SPONSOR SUBMITTALS

In advance of performing the review, meet with the project sponsor and its staff and consultants, discuss the purpose of the review, and obtain information as required, including but not limited to, the sponsor's schedule development and control process, the latest schedules produced and supporting scope and cost information. Information should be received in either electronic or hard copy form, appropriate to the type of information developed, and archived in accordance with current FTA procedures.

6.0 SCOPE OF WORK

The Contractor shall perform the following as part of the products or services delivered under this procedure, and as specifically directed by Work Order. Such Work Orders may reconfigure parts of the following deliverables, add additional deliverables, or otherwise accommodate re-assessments or specialized analyses.

6.1 Project Schedule Review

The Contractor shall assess and evaluate sponsor's scheduling procedures and information in accordance with the following. The list of items below indicates minimum requirements, to be supplemented by the Contractor's experience and as appropriate for project and phase.

6.1.1 Technical review

A) Consistent with relevant, identifiable industry or engineering practices,
B) Mechanically correct and complete,
C) Free of any material inaccuracies or incomplete data,
D) Appropriate level of detail given the project phase,
E) Phasing structure is logical and appropriately detailed with tasks,
F) Level of detail is uniformly applied by phase,
G) Fully identified activities and durations,
H) Design and construction activities and relationships are adequately identified,
I) Top-level summary included to facilitate understanding of detailed schedules,
J) Schedule detail beneath the 'hammock' or summary level is task based,
K) Sequencing, through the use of predecessors and successors, is identified for all material tasks,
L) Sufficient development to determine the validity and stability of the project critical path,
M) Float is identifiable and reasonable,
N) Schedule control methods are adequately described,
O) Approach to and use of additional scheduling tools, such as work breakdown structure, responsibility, cost loading, resource loading, etc.

6.1.2 Project Activities and Constraints

A) Schedule follows an expected work sequence, such as that listed in 8.2, Typical Construction Sequencing,
B) Complexity of sequential relationships is consistent with phase of project,
C) Activities and durations are consistent with the project scope adopted in the Record of Decision or NEPA documents as applicable and the proposed Revenue Operations Date,
D) Contract procurement processes and durations are adequate and complete as well as fully integrated with associated design and construction activities,

E) Lead times and durations for equipment and material manufacturing and delivery are adequate and complete,

F) Logic for the physical construction constraints, such as transportation or access point restrictions, and temporary construction have been considered and are reasonable,

G) Seasonal weather variations are accounted for,

H) Labor and material availability have been factored into construction durations,

I) Work efforts of similar nature that occur concurrently are identified and reasonably sequenced in the schedule to assure similar work activities can be accomplished with available labor and materials,

J) Phasing due to planned right-of-way acquisition provides sufficient work area(s) for efficient use of resources,

K) Adequately and completely reflects sponsor procurements, schedule and cost forecasts, and construction change orders,

L) The Contractor shall assess and evaluate the proposed schedule duration to at least three other similar projects from the FTA database and analyze the variances down the SCC level.

6.1.3 External Activities and Constraints

A) Schedule contains a full range of activities including FTA related approvals (DEIS, FEIS, LONP, FFGA); procurement and performance of civil/facilities and systems final design; right-of-way acquisition; wetland mitigation; utility/agency agreements; utility relocation; civil and systems contract procurement; civil and systems construction; agency operations and maintenance mobilization; and integrated pre-revenue testing,

B) Activity durations include adequate time for project reviews by applicable local, state and federal jurisdictions and affected third parties,

C) FTA review periods, including milestones and activities leading to the FFGA such as development of Risk Management Plans, Safety and Security Management Plans, Project Development and Execution Plans, etc.

D) Funding milestones from non-FTA sources

6.1.4 Risk Identification

A) Embedded schedule contingencies are identified and assessed as adequate relative to project duration,

B) Identify and separately list risks discovered in the schedule review and evaluate the potential impact of these risks on the schedule, scope, and cost,

C) Estimate a probability of schedule slippage for critical path activities.

7.0 REPORT, PRESENTATION, RECONCILIATION

Prepare a written report in the format discussed below. Attach the sponsor's most current SCC schedule. Embed references to, or exhibits from, sponsor's schedule to explain your analysis, findings, and recommendations.

Present the findings, conclusions and recommendations to FTA headquarters and regional staff and the Project Sponsor either in a teleconference or in person. In an extended working session, reconcile findings and conclusions with the Project Sponsor so that disagreements if any are reconciled to the extent possible.

Integrate and summarize available information and data for the project, providing professional opinion, analysis, information, data and descriptive text in an accessible and understandable format. Opinions shall be supported by data tables similar in nature to those depicted in 8.1.

7.1 Reporting Format

Reference the general requirements contained in OP-01.

7.2 Spot Report Contents and Format

Unless otherwise directed by the WOM or COTR, the delivered Spot Report will be sectioned as follows:

7.2.1 Primary Deliverable

I) Executive Summary

- Unless otherwise directed by the COTR/TOM, not to exceed 3 pages.

II) Project Background

- Project descriptions and data shall be consistent with the Monitoring report guidance, current monitoring report and the most recent FTA New Start profile. Notwithstanding the foregoing, the TOM or COTR may direct the Contractor to use an identifiable draft version of these materials.

III) Methodology

- Describe the methodology used to develop information and documentation used in subsequent analyses,
- Present, discuss, and thoroughly demonstrate the Contractor's approach to identifying schedule contingency.

IV) Review and Analysis of Project Schedule

- Assessment and evaluation shall be in 7 subsections: Critical Areas of Concern and Risks, Schedule, Technical Reviews, Resource loading, Project Calendars, Interfaces and Project Critical Path,
- Data tables and histograms are to be provided within individual sections; see 8.1 for samples,
- Present the review and evaluation of schedule elements in the Grantee's project schedule that are functionally equivalent to schedule contingency but not identified as such, including forced float or dummy activities,
- Present and discuss an analysis of the sponsor's proposed critical path for the project schedule including an assessment of its validity and the reasonableness of

activity durations. Critical path float is to be assessed. Data tables and histograms are to be provided.

V) Conclusion

- Summarized discussion of findings,
- Recommendations and time frames for adjustments to the Project Management Plan,
- Schedule Review checklists for design and construction reviews,
- Summarize overall project risk.

VI) Appendix: Sponsor Project Data

- This section shall identify and characterize the sponsor's structure and quality of the sponsor's project data for this report. Examine the extent, nature, detail and quality of the sponsor's project data and the steps the Contractor took to validate the information. The Contractor shall identify and discuss that Grantee or third party data it accepted without adjustment,
- Detailed listing of identified risks,
- Other Appendices as necessary or directed.

8.0 APPENDICES

8.1 Sample Section with Data Table

8.1.1 Technical Review Example

This section reviews the preparation and presentation of the project schedule for its technical correctness and the completeness of its preparation as a critical path method based scheduling tool that can be successfully used to model and monitor the project.

The schedule was generated and submitted in [software format] (example— *Project Management, Release 5.0*). [Software] is customarily used and accepted for project scheduling in the construction industry. A hard copy of the schedule and a written narrative titled "Basis of Schedule Development" were also submitted.

There are two predominant calendars in use. The majority of the physical construction activities are based on a five day work week with non-work days for holidays and weather delays. The design and other activities are on a calendar that is based on a five day work week with non-work days for holidays. Additional calendars are used in the schedule for other specific types of activities. Following is a listing of all the calendars, and the activity usage of each:

Calendar Name	**Number of Activities Assigned**	**Number of Activities on Critical Path/ Total Duration**	**Number of non-critical activities with less than 30 days float/avg. float**
Const. 5 Day w/Union Holiday & 30 weather days	2649 activities		
Engineering/Procurement/Permit Calendar	1555 activities		

DTP/DTE Business Days	446 activities		
Standard 5 Day Work week	100 activities		
Winter Outage Calendar w/30 weather days	21 activities		
5-Day Week, 2-shift	10 tunneling activities		
7-day workweek Test/Commission …Yard Modification Pre-Revenue Operation Start Revenue Operations	9 activities		
54 hour Outage calendar	5 activities		
Weekend Outage Calendar w/30 weather days	4 activities		
NATM Tunneling w/Union Holiday & 30 weather days	2 activities		
TOTAL	4801 activities		

8.2 Typical Construction Sequencing

A typical transit project schedule should demonstrate the following broad sequencing; note that a full schedule will contain significantly more detail, and the chronological phases noted below may overlap in time:

- acquire right-of-way
- relocate utilities
- construct roadway improvements
- under-drains
- duct banks and catenary pole foundations
- construct station platforms and finishes
- install trackwork
- install systems components
- communications, signals
- traction electrification
- fare collection.

Oversight Procedure OP-35 Project Contingency and Contract Packaging Review

1.0 PURPOSE

To support FTA programmatic decisions as to the adequacy of Project Contingencies and third party contractual risk allocations and the soundness of Grantee management decisions regarding the development of risk allocations and usage of contingencies.

To obtain the Project Management Oversight Contractor's (PMOC) products that identify, characterize and analyze project contingency availability, status and forecasts for critical project scope milestones relative to that expected under forecasted conditions and sound engineering practices.

The OP-35 products support FTA's programmatic goals for ensuring that Grantee management processes include a thorough understanding and implementation of risk informed, fundamentally sound project strategies.

2.0 BACKGROUND

The role of theOP-35 product is to identify, characterize and precisely describe critical elements of responses to project risk, including establishment of project cost and schedule contingencies, and contractual risk allocations. These products complement other risk information products, especially including those in OP-40. These procedures are to be applied in consideration of project cost and schedule as well as other technical parameters such as service reliability. OP-35 deliverables are intended to be fully sufficient to evaluate the adequacy, effectiveness, and efficiency of the Grantee's management of contingency and contract packaging at any point during project implementation.

2.1.1 Cost and Schedule Contingency

FTA has developed a significant amount of program experience to offer guidance to PMOCs and Grantees as to establishing various forms of contingency. In addition, studies such as TCRP's 2005 report on "Managing Capital Costs of Major Federally Funded Public Transportation Projects" have evaluated cost and schedule variances on transit projects. These TCRP parameters were used to develop the requirements for the OP-35 products.

2.1.2 Contractual Risk Allocation

The Grantee's choice of project delivery method and contracting strategy is integral to the Grantee's Project Management Plan. This plan should demonstrate the Grantee's technical approach and trade-off analyses to obtaining the optimum allocation of risk that will achieve the preferred balance of project goals, including lowest overall project cost.

FTA's *Project and Construction Management Guidelines* note that risk should be considered in

selection of project delivery method, such that the likelihood of success is optimized. A companion operational procedure, OP-40, additionally contains provisions designed to discover, analyze, and suggest approaches toward project delivery methods and contracting strategies that will ultimately assist in the delivering the most successful project.

The fundamental principles involved in the OP-35 contractual risk review is that risks should be allocated among the parties in proportion to their ability to manage the risks and absorb the consequences; that any transfer of risk to a third party is done so on an equitable basis of compensation given for risk accepted; and that risk remaining with the Grantee is fully recognized and an effective risk response plan has been developed.

The Grantee's project delivery methods and contracting plans, including its proposed terms and Conditions, should offer a holistic approach to ensuring that all forms of third party compensation, especially non-competitive, negotiated compensation, is aligned with the principles above and actively supports successful implementation of the project.

3.0 OBJECTIVES

FTA's programmatic objective in the delivery of OP-35 products is to obtain the PMOC's recommendations as to the minimum contingency balances required to ensure completion of the Federally assisted project, as well as obtain characterizations and recommendations of contractually-allocated risks. These products deliver inputs critical to the development of OP-40 project strategy products that in turn support FTA's achievement of its enterprise objectives.

4.0 REFERENCES

The statutes, regulations, policies, guidance documents and circulars in OP 01 Administrative Conditions and Requirements apply.

5.0 PROJECT SPONSOR SUBMITTALS

The PMOC shall obtain appropriate documentation to adequately investigate the project and complete the work described herein; such documentation may include the Project Cost Estimate, FFGA Baseline Cost Estimate (BCE) line items, project schedules, management plans, contracting plans, and other documentation as required.

6.0 SCOPE OF WORK

Subject to the issuance of individual work orders, FTA may require the PMOC to perform the following subtasks as part of the products or services delivered under this guidance.

Such work orders may reconfigure parts of the subtask deliverables, add sub deliverables, or otherwise accommodate development of project strategies inclusive of contingency management baselines, periodic reviews or "refreshments", specialized quantitative capacity modeling or assessments, surveillance reporting and trends analyses.

The requirement for contingency in the Grantee project may change as project implementation proceeds and information becomes available. Therefore, throughout the project lifetime, such work

orders may direct the PMOC to reevaluate the use or management of project contingency or contract packaging strategies on a periodic or event driven basis.

These OP-35 procedures are to be developed in concert with and to complement information from several additional operational procedures, especially including OP-32, OP-33, OP-34, and OP-40. Definitions and data established in those operational procedures are key elements of this OP-35.

6.1 Project Cost Contingency Review

The PMOC shall fully identify, describe, and analyze the adequacy of the grantee's cost contingencies. These forecasts shall be developed as a synthesis of both a "forward pass" establishment of contingency targets, using historically-developed parameters; and a "backward pass" establishment of contingencies using project-specific information. These two approaches shall be used to establish an overall minimum contingency curve, as described below.

6.1.1 Forward Pass Cost Contingency Analysis

The PMOC shall develop a "forward pass" set of minimum recommended cost contingency values for each of the following milestones, utilizing the recommended values. If the PMOC believes that the recommendations should be adjusted due to unique project conditions, any such adjustments should be explicitly highlighted and justifications provided.

- At Entry into Preliminary Engineering, the working target for total contingency (defined as the aggregate of allocated and unallocated cost contingency, net of allowances and financing) is 30%.
- At Entry into Final Design, the working target for total contingency is 20%.
- At the award of a FFGA, the working target for total contingency is 15%.
- At 90-100% bid for the Grantee, or 90-100% subcontracted for the prime contractor in an alternative project delivery method, the working target for total contingency is 10%.
- At 50% physically complete for Construction, the working target for total contingency is 5%.

6.1.2 Backward Pass Cost Contingency Analysis

The PMOC shall develop a "backward pass" set of recommended cost contingency values that represent the minimum amount of total cost contingency expected to be necessary at Project Milestones (see OP-40) and as also consistent with forward pass milestones. Total cost contingency includes scope changes or clarifications as well as schedule changes or delays. The PMOC shall develop estimates of minimum total cost contingencies based upon Grantee's technical capacity, project delivery method management plan, and project strategy (if any).

The following considerations shall be made in development of the backward pass contingency values:

- At the Revenue Operations Date (ROD), the demand for total cost contingency has been

reduced to a minimum requirement for scope changes or clarifications and schedule delays or changes. The PMOC shall evaluate the Grantee's experience and other New Starts projects to identify an amount sufficient to close out punch list work, additional work orders, etc. The working target for this point is 1-3% total contingency with a relative weighting of 0-1% for schedule delay costs and the remainder for other costs.

- At the point that the project construction procurement is "substantially complete" (90-100% bid for either prime contracts or 90-100% subcontracted for Alternative Project Delivery Method), the project is exposed to cost changes in the range of 12%. Schedule delays at this point can average 20% of the construction phase duration, or 4% of project costs, or 16% in aggregate versus 10% as the forward pass working target.

- For any delay duration greater than 9 months, the PMOC shall assume 3 months each of demobilization and remobilization with a variable standby period in between.

6.1.3 Cost Contingency Curve

The third step is to reconcile the two sets of coincident cost contingency data (forward pass and backward pass) in the range of the project schedule just after award of the FFGA to 50% construction completion, in order to develop contingency minimums for those project milestones.

The PMOC shall then develop a cost contingency curve and graphics for reporting and for use as inputs in related products, such as OP-40 and OP-20.

6.2 Project Schedule Contingency Review

The PMOC shall fully identify, describe, and analyze the adequacy of the Grantee's schedule contingencies. The schedule contingency review shall be developed similar in manner to that of the "backward pass" used in the cost contingency review; that is, recommended schedule contingency amounts are developed through consideration of project conditions, accumulating minimum schedule contingencies from the end of the project toward the start of the project. The PMOC shall make recommendations as to what minimum amounts of schedule contingency are recommended for inclusion in the Grantee's Project Management Plan and supporting schedules.

6.2.1 Schedule Contingency Analysis

The PMOC shall "step back" sequentially through various completion milestones for the project and shall estimate the minimum amount of schedule contingency required to complete the project on schedule, in consideration of risks identified through OP-40 analyses and other potential schedule delays.

The schedule contingency recommendations shall be developed using these fundamental assumptions:

- At the Revenue Operations Date (ROD), schedule contingency requirements have been reduced to a minimum requirement or possibly eliminated.

- At the point of 100% complete with bid (for Design-Bid-Build) or 100% subcontracted (for

Design-Build or CM-GC), the project should have sufficient schedule contingency available to absorb a schedule delay equivalent to 20% of the duration from Entry into FD through Revenue Operations.

6.2.2 Schedule Contingency Curve

The PMOC shall then develop a cost contingency curve and graphics for reporting and for use as inputs in related products, such as OP-40 and OP-20.

6.3 Contract Packaging Review

The PMOC shall fully identify, describe, and analyze the Grantee's individual contract packages and anticipated or actual pricing/compensation components inclusive of overheads, contingency and "contingency like" components, and any negotiated profit/fee values. The PMOC shall assess and evaluate the degree to which such pricing/compensation components are themselves aligned with the Grantee's project strategy/risk management plan and their effectiveness in terms of minimizing costs (and cost overruns) and schedule (and schedule slippages).

6.3.1 Contract Packaging Strategy

The PMOC shall review Grantee's Project Management Plan and supporting documents to characterize and provide a report of the sufficiency of Grantee's design and construction procurement and contract packaging strategies.

6.3.2 Contractual Risk Allocation

The PMOC shall review the Grantee's contract packaging strategy to discover proposed or actual allocation of risk between Grantee and third parties, and shall develop a comprehensive schedule of contractual risk assignments, including:

- Risks explicitly assigned through contract scoping language, including instances of work assignments where risk consequences are apportioned among several parties, including Grantee; partial apportionment of risk liabilities should be exposed.
- Risks implicitly assigned through industry customs, legal precedent, or statutory authority.
- Contractually-established risk mitigation pools, such as contingency of any type, management reserves, undistributed budget, incentive fees, variable profits, etc.; state where such pools are subject to shared savings provisions.
- Contractually-expressed limitations to liability of known risks, as available to any party.
- Significant known risks for which no contractual assignment is apparent, especially those for which the Grantee will suffer liability.
- Significant insurance provisions that affect the assignment of liability of risk.

6.3.3 Contractual Risk Allocation Assessment

The PMOC shall identify, assess, and evaluate proposed contractual allocations of risk, and shall comment on the potential cost-to-benefit balance and effectiveness of such assignments. Where actual assignments have been made, the PMOC shall evaluate amounts of liability that remain with Grantee, including potential incapability of the third party to sustain its assigned liability if faced with a loss.

It is the intent of this assessment to judge whether any contractual risk allocation provides a fair and reasonable trade off against the actual costs of foreseeable risk events, offers the opportunity to reduce total project cost, and does not represent risks which would be more reasonable for the Grantee to retain or accept.

Such review comments shall consider the following:

- A risk has been assigned to the party most capable of performing the activities necessary to reduce the risk.
- The ability of the Grantee or a third party to effectively perform activities necessary to reduce manageable, assigned risks.
- The ability of the Grantee or a third party to withstand the consequences of assigned risk liability.
- Safeguards in place, such as bonding or insurance, to protect Grantee in the case of failure of a third party to withstand the consequences of contracted risk liability (that is, where Grantee may become unexpectedly liable for previously transferred risk); alternatively, an assessment of risk liability that would remain with Grantee in the case of third party failure.
- Instances where the consequence of significant risk is held by a party unable to control the outcome of the risk event.
- Instances of significant risks that appear unconsidered in the contract packaging strategy.
- Impacts to project costs, especially where costs are increased due to allocation of risk consequences to a third party.
- Recommended adjustments to prior-developed cost and schedule risk models if affected by contractual risk allocations.
- The ability of the Grantee's organization to effectively evaluate the cost-to-benefit balance between retaining or contracting significant risks and their consequences.
- Instances where the expected value of the contractually assigned risk liability appears unbalanced to the offsetting change in contractual compensation, especially in negotiated situations. This evaluation should include the following:
    - The degree to which such allocated risks are foreseeable and quantifiable and the

degree of understanding among the parties involved, of uncertainties in quantifications of the risks.

- Estimation of the expected value of the risk, including reasonable compensation for profit as compensation for risk acquisition (the "risk neutral point" or "neutral point"). It shall be assumed that competitive, market-based pricing defines the risk neutral point as such compensation or pricing that neither contributes to nor detracts from the third party's risk liability and indirectly, the Grantee's overall project risk. The PMOC shall assume that 4% represents a profit or fee that is at the neutral point.

- Estimation of the difference between the anticipated negotiated compensation for risk acquisition and the equivalent neutral point. Such difference shall be expressed as the ratio of the difference between the neutral point and the proposed compensation amount, divided by the neutral point. This ratio is herein called the transfer rate.

    - Transfer rates above 75% represent an increasing potential for third-party risk acceptance and a decreasing amount of Grantee risk sharing, as well as requiring less of an explicit description of allocated risk. Transfer rates over 75% are to be considered as increasingly effective but offering less value to the Grantee.

    - Transfer rates below 75% of the risk's expected value represent a potential increasing amount of risk to third parties and a potential of unexpected retained risk by the Grantee, perhaps indicating some ineffectiveness of the risk allocation. This potential for increased Grantee risk may arise from construction case law precedent and may be unrecognized or undisclosed by project participants.

    - Transfer rates below 25% are to be considered ineffective.

As appropriate, the PMOC shall make recommendations to achieve a more effective risk allocation strategy, to develop more effective negotiations for allocated risks, or to otherwise improve the value added by choice of project delivery method.

7.0 REPORT, PRESENTATION, RECONCILIATION

7.1 Cost and Schedule Contingency Reports

Unless otherwise directed by the FTA, the delivered Spot Report will be sectioned as follows:

Executive Summary

Unless otherwise directed by the COTR/TOM, not to exceed 3 pages.

Project Background

Project descriptions and data shall be consistent with the Monitoring report guidance, current monitoring

report and the most recent FTA New Start profile. Notwithstanding the foregoing, the task order manager or COTR may direct the PMOC to use an identifiable draft version of these materials.

Review and Analysis of Project Contingency

Conclusion

Recommendations

- Scope Review checklists for design and construction reviews.
- Recommendations for Conditional Approval to Enter PE/FD
- Recommendations for Project Development Agreement/FFGA.

Appendix A: Grantee Project Data

This section shall identify and characterize the Grantee's structure and quality of the Grantee's project data reviewed for the spot report or other deliverables. The intent is to determine the extent, nature, detail and quality of the Grantee project data and the steps the PMOC took to determine its value. The PMOC shall identify, and discuss Grantee or third party data it accepted without adjustment.

Appendix B: Methodology

The purpose of this section is to describe the PMOC's methodology.

Include other appendices as necessary or directed.

7.2 Contractual Risk Allocation Report

Unless otherwise directed by the FTA, the delivered report will be sectioned as follows:

Executive Summary

Unless otherwise directed by the task order manager or COTR, not to exceed 3 pages.

Project Background

Project descriptions and data shall be consistent with the Monitoring report guidance, current monitoring report and the most recent FTA New Start profile. Notwithstanding the foregoing, FTA may direct the Contractor to use an identifiable draft version of these materials.

Sub sectioning shall also include Guideway Components, Project Delivery Method, inclusive of the proposed Contract Packaging Strategy, and, as applicable, Master Planning for the Corridor.

Review and Analysis of Contract Package Level Cost Mapping

The first subsection shall identify and characterize the subject contract package pricing/compensation into cost accounting categories such as subcontracted direct costs, contractor direct labor, direct material, direct equipment, field and home office overheads, project contingency, engineering, construction

management labor and profit/fee. Such characterizations shall be adequately supported with analysis and rationales.

The second subsection shall assess, evaluate and estimate the effective mitigation capacity of the subject contract package pricing/compensation components.

Data shall be presented in a tabular format as applicable.

Review and Analysis of Transferred Project Risk Mapping

The section shall identify and characterize the project risk set that is identified as being allocated to the third party contract using Grantee or PMOC developed risk sets such as OP-40 models. Such characterizations shall be adequately supported with analysis and rationales. The objective is to present FTA with an estimate of the aggregate amount of eligible risk that is being transferred in terms of its expected value as well as what amount of residual risk is still being retained by the Grantee.

Data shall be presented in a tabular format as applicable.

Review and Analysis of Transfer Rate

This first subsection shall present those transferred risks that the PMOC found occurred in the range of 25-75%**.** The PMOC shall estimate the aggregate amount of Grantee risk for this class relative to the cost of the contracted mitigation capacity.

The second subsection shall present those transferred risks that the PMOC found occurred in the range of less than 25%**.** The PMOC shall estimate the aggregate amount of Grantee risk for this class relative to the cost of the contracted mitigation capacity.

The third subsection shall present those transferred risks that the PMOC found occurred in the range of more than 75% with special attention to those risks transferred at greater than 100%**.** The PMOC shall estimate the aggregate amount of Grantee risk for this class relative to the cost of the contracted mitigation capacity. Again, with special attention to those risks transferred above 100%.

Data shall be presented in a tabular format as applicable.

Review and Analysis of Value to Project

This section shall identify and characterize the PMOC's opinion as to the value of the project risk set that is identified as being allocated to third party contracts. Such characterizations shall be adequately supported with analysis and rationales. The objective is to present FTA with an estimate of the aggregate transfer rate and its effectiveness as well as what amount of residual risk is being retained by the Grantee.

The PMOC shall also make recommendations as to the way in which this value can be increased or its associated cost can be decreased.

Data shall be presented in a tabular format as applicable.

Conclusion

Recommendations

- Scope Review checklists for design and construction reviews.
- Recommendations for Conditional Approval to Enter PE/FD
- Recommendations for Project Development Agreement/FFGA.

Appendix A: Grantee Project Data

This section shall identify and characterize the Grantee's structure and quality of the Grantee's project data reviewed for the spot report or other deliverables. The intent is to determine the extent, nature, detail and quality of the Grantee project data and the steps the PMOC took to determine its value. The PMOC shall identify, and discuss that Grantee or third party data it accepted without adjustment.

Appendix B: Methodology

This purpose of this section is to describe the PMOC's methodology.

Include other appendices as necessary or directed.

Oversight Procedure 40 – Risk Assessment and Mitigation Review

1.0 PURPOSE

This Oversight Procedure supports FTA programmatic decisions made under uncertainty in a project delivery environment where transit projects are complex and inherently risky.

To obtain FTA Project Management Oversight Contractor (PMOC) produced products that reflect a disciplined process, structured deliverables, individual competency, team functionality and rigor of practice; based upon comprehensive systems analysis with analytical support; repeated periodically as the project advances and new data or information becomes available.

2.0 BACKGROUND

The role of the OP-40 product is to establish a programmatic management baseline for evaluating the reliability of the grantee project cost estimate and schedule and attendant components, given the various elements of uncertainty associated with the effectiveness and efficiency of the grantee's project implementation, the project scope, and the surrounding project conditions.

3.0 OBJECTIVES

These products and services support FTA in making programmatic decisions under uncertainty, for projects using traditional or alternative project delivery methods.

4.0 REFERENCES

The statutes, regulations, policies, guidance documents and circulars in OP 01 Administrative Conditions and Requirements apply.

5.0 PROJECT SPONSOR SUBMITTALS

The PMOC shall obtain appropriate documentation to adequately investigate the project and complete the work described herein; such documentation may include the project cost estimate, FFGA Baseline Cost Estimate (BCE) line items, project schedules, management plans, and other documentation as required.

6.0 SCOPE OF WORK

6.1 PMOC Oversight Plan

The PMOC shall develop, submit or resubmit for review, comment and approval a plan for providing surveillance of the Grantee's performance in risk management, that defines how such services or products will be accomplished in a manner and quality that meets FTA's requirements. This

surveillance plan should present an overview of the issues, technical approach, and PMOC's recommendations or course of action and shall identify sampling approaches and inspection methods as well as timelines for reporting deficiencies in Grantee performance, taking corrective actions and varying the level of surveillance depending on the Grantee's conformance to the performance standards. The purpose of the PMOC's surveillance plan is to provide the government with an effective tool to manage PMOC performance and to ensure that the Grantee project implementation achieves risk management objectives and targets.

6.2 Cost Risk

The PMOC shall use its professional judgment to identify, assess and evaluate the uncertainties in the Grantee's cost estimates, in terms of the project's social, political, legal, financial and physical environment. Such evaluation shall be based on the PMOC's review of the Grantee's structure, and the project's scope, schedule, cost estimates, and delivery process, including prior reviews conducted under other Operational Procedures. Further, the PMOC will document and report its recommendations for responding to identified items of likely risk, including recommendations of adjustment to the Grantee's Project Management Plan.

The process of evaluation of cost risk generally includes at a minimum, identification of potential risk events (6.2.1), and may include, as directed by the FTA work order manager, such additional items as cost and/or schedule risk assessment modeling, risk management oversight, or other specialized services as described below or as required to respond to specific project conditions.

6.2.1 Cost Risk Event Identification

6.2.1.1 Risk Events

Risk events are individually identified contingent, or unplanned, events that may occur and which may create a plan variance and may be cause for special management scrutiny or action. Such events, or a combination of such events, do not represent all risk present on a project, and the identification or disposal of risk events may only become possible as the project proceeds through its various phases. Therefore, risk event identification may require periodic updates as a project progresses.

6.2.1.2 Risk Categories

Risk shall be characterized as belonging to any of the following categories, which are listed in chronological order. Generally, risk is categorized as associated with the category during which the risk may be earliest and best mitigated; these categories are listed below.

Requirements Risk is associated with all project development activities from earliest concept through Alternatives Analysis.

Design Risk is associated with all design-related activities occurring after Alternatives Analysis. Substantially complete design risk is indicated when no material design-related non-conformances are detected through OP-32 reviews; OP-33 reviews indicate that 95% of all construction direct costs are shown on both design deliverables and cost estimate; and OP-34 reviews indicate that no project level critical path element or procurement activity exceeds 45 calendar days in duration.

Market Risk is related to procurement of construction services, materials, and equipment.

Construction Risk is subdivided into: Early Construction Risk (composed of Geotechnical/Utility activities, usually associated with 20% complete), Mid-Range Construction Risk (associated with coordination of contractors, etc.), and Start-Up/ Substantial Completion Risk (associated with 90% complete).

Although each of these categories of risk is associated with a particular project phase, if a risk event is not disposed of during a particular phase, it may survive as a risk exposure into a following phase.

6.2.1.3 Risk Register

The PMOC shall develop enumerated lists of identified Risk Events (Risk Register), which shall include a description of the potential risk event; its potential consequences and likelihood of occurrence; Risk Category; contract package; source document(s); and potential actions to mitigate the risk. The Risk Register is unlikely to be a collectively exhaustive representation of total project risk. Therefore, the Risk Register alone is insufficient to quantify risk, where a project-level risk model is required.

6.2.2 Cost Risk Assessment

The Risk Assessment procedure consists of sequentially reducing, adjusting and conditioning Grantee and third party cost or schedule data in combination with prior, programmatic experience to empirically estimate parameters for the assumed risk distribution(s); and then utilizing these parameters as necessary to simulate the magnitude of risk and establish the potential responses to manage the risk. The PMOC shall obtain current documents, reports, and observations developed through prior analysis of the Grantee's organization, and the project's scope, cost estimate and schedule.

6.2.2.1 Project Milestones

Risk assessments shall be developed, at a minimum, for each of the following time-based project milestones, where such milestones reflect future events:

Entry in Preliminary Engineering;
Entry into Final Design;
FFGA award;
40% of the contracted value has been bid and contracted;
20% construction;
50% construction;
75% construction; and
90% construction.

Such milestones may be modified to reflect the specifics of the Grantee's schedule, such as overlapping project phases. Where such milestones are more than one year apart, the PMOC shall develop supplemental milestones.

6.2.2.2 Standard Cost Category (SCC) Risk Assessment

Cost Risk Assessment Worksheet The FTA has developed a cost risk assessment worksheet template that contains the required formats and bases of calculations to properly execute the cost

risk assessment described herein; the PMOC shall obtain this Cost Risk Assessment worksheet and fully familiarize itself prior to undertaking the work of this section.

Stripped Cost Estimate Based upon analyses performed in accordance with OP-33, the PMOC shall adjust Grantee's Preliminary or Base Cost Estimate to remove all contingency funds embedded therein. Such contingency funds to be removed may include both unallocated funds (usually applied as a percentage of summary costs) and allocated (usually applied as increases to individual estimate line items). Both patent (and exposed) contingency funds and latent (or hidden) contingency funds shall be identified; the identification of latent contingency funds will likely involve interviews with the Grantee. Further, particular attention should be paid to contingent funds that may be embedded within estimates of inflation or escalation.

Once identified, these contingency funds shall be quantified and removed from the estimate to form a Stripped Cost Estimate.

Adjusted Cost Estimate Utilizing scope, cost, schedule, etc. information developed in prior-performed Operational Procedures, the PMOC shall appropriately revise the Stripped Cost Estimate, increasing or decreasing the various estimate line items to produce an Adjusted Cost Estimate. Care should be taken to identify whether items so adjusted should also become elements of the Risk Register developed in 6.2.1. Any such adjustments and their rationale shall be fully documented. Note that the adjusted estimate, at a minimum, shall include one level of breakdown below the lowest level of Standard Cost Categories (SCC Cost Elements).

SCC Cost Element Ranges Utilizing the procedures outlined below, the PMOC shall establish likely ranges of cost for estimated line items, or elements, within Standard Cost Categories (SCC)—spanning the range of 10% likelihood to 90% likelihood; that is, the range from which there is only a 10% chance of cost underrun to the point at which there is 90% likelihood that costs will be lower. For the purposes of this SCC Cost Element Range assessment, it shall be assumed that the probabilistic range of cost follows a Lognormal Probability Distribution curve.

Lower SCC Cost Element Range Establishment The Adjusted Cost Estimate (with contingency funds removed) for each SCC Cost Element is to be established as the lower (or 10%) value of the SCC Element Cost Range.

Upper SCC Cost Element Range Establishment The PMOC shall establish the Upper SCC Cost Element Range value through multiplying the Lower SCC Cost Range value by a range factor (hereinafter referred to as the Beta Range Factor or BRF); i.e., 90th percentile = BRF*10th percentile.

Beta Range Factor Establishment The PMOC shall establish the Beta Range Factor values through a process of initially utilizing the guidelines indicated below, and then varying the developed Beta Factors based upon specific project attributes (including those noted in the Risk Register), in consultation with the Grantee and FTA work order manager.

Beta Range Factors are sums of Risk Category factors; i.e., total risk for an SCC Element is the sum of individual Risk Category Factors for Requirements Risk, Design Risk, Market Risk, and Construction Risk, added to a base factor of 1.05. The base factor indicates a minimum level of risk for a project. These factors are presented in Table 1 and Figure 1. Note that at any given point in a project, SCC

Category or sub-category cost elements may exhibit varying levels of risk category.

Table 1 - Beta Range Factors by Risk Category

Risk Category	**Risk Category Factor**	**Risk Category sub-Factor**
Requirements Risk	Per WOM direction	
Design Risk	0.50	
Market Risk	0.25	
Construction Risk	0.70	
Early Construction		0.40
Mid Construction		0.15
Late Construction		0.15

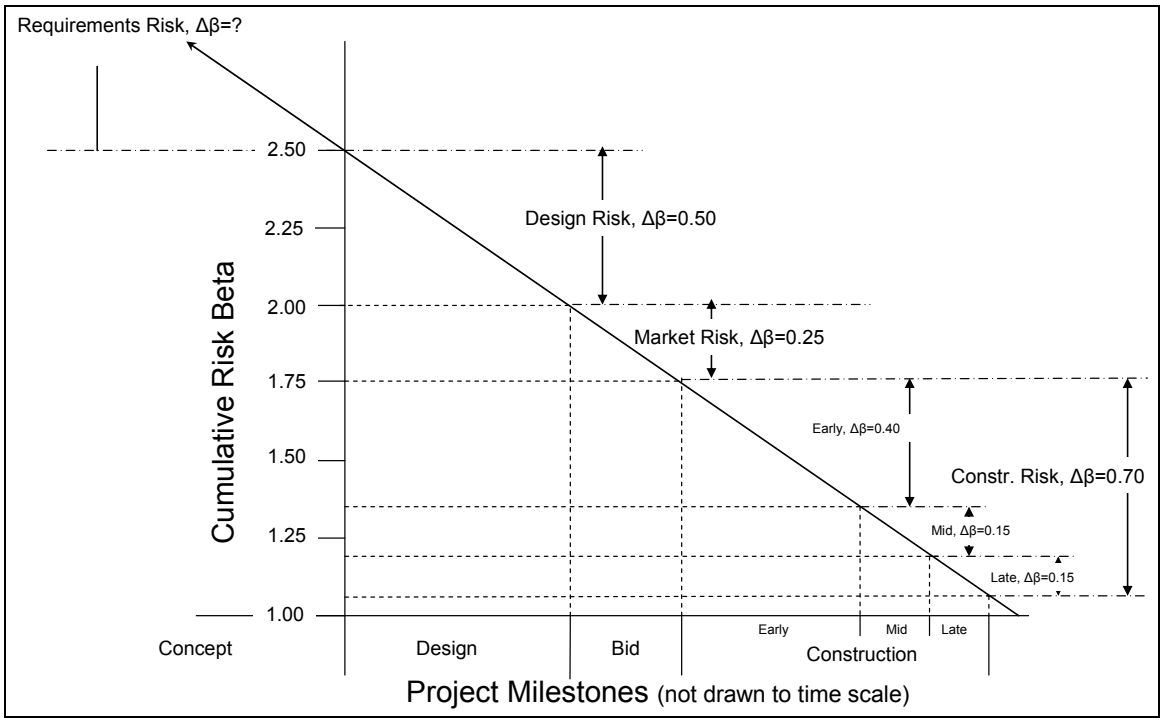


Figure 1 - Beta Risk Factor by Project Milestone

The following guidelines apply for cumulative Beta Range Factors (BRF):

SCC10 thru 50, with the exception of SCCs 40.02 thru 40.04:

A BRF above 2.5 implies uncertainty associated with project requirements;
A BRF of 2.5, implies all Requirements Risks have been mitigated;
A BRF below 2.5 but above 2.0 implies increasing mitigation of Design Risk. The fundamental premise is that the Beta Range Factor directly correlates to the percentage of design completion (0% with a β of 2.5 and 100% with a β of 2.00);

A BRF below 2.0 but above 1.75 implies the existence of Market Risk (bidding risk), indicated by uncertainty associated with reliable market data short of a project specific firm price;
A BRF below 1.75 but above 1.35 indicates uncertainty associated with Geotechnical/Utility or similar activities exist. This is usually associated with activities occurring during the first 20% of construction. Full mitigation of risk during this period for simple LRT stations that are the equivalent of bus pads is indicated by a BRF of 1.35, while full mitigation of risk for certain elements such as guideway or systems is indicated by a BRF of 1.50.
A BRF between 1.35 and 1.20 (or between 1.50 and 1.20 for certain elements such as guideway or systems) indicates uncertainty associated with mid-construction risks inclusive of major claims, delays, impacts, etc., usually associated with 75% complete, have been mitigated; β's below this range imply increasing mitigation in the areas of normal change order activity.
A BRF between 1.20 and 1.05 indicates uncertainty associated with late construction activities, including activities through start-up and substantial completion.
A BRF of 1.0 implies that there is no risk or uncertainty of any kind associated with this item and represents the perfectly mitigated state of a project scope item.

SCC40.02 thru 40.04 and SCC60:

BRFs shall be estimated at 50-75% greater than that of SCCs 10 through 50 discussed above.

SCC70:

BRFs shall be estimated at 75% greater than that of SCCs 10 through 50 discussed above.

SCC80:

BRFs shall be estimated greater than that of SCCs 10 through 50 discussed above, and shall also be cross checked to accommodate the potential for project delay in the resultant 90th percentile estimate.

Mean (or 50% Likely) Cost Element Value Establishment The mean and variance of the suggested range distribution are fully determined using the assumed lognormal distribution, the 10th percentile estimate and the BRF. These calculations are modeled in the FTA Cost Risk Assessment Worksheet.

Project Delivery Method For traditional project delivery methods, the PMOC shall use the above recommendations and procedures. Project Delivery methods affect the timing and scope of risk sharing but not the sequence of risk mitigation as discussed in OP-35.

Traditional project delivery methods (Design-Bid-Build) transfer or share risk at the completion of design and market risk mitigation. Alternative project delivery methods such as Design-Build transfer or share some components of requirements, design, and market risk prior to the completion of all design and requirements risk, often sharing the market risk of subcontracting

with the construction contractor. The effect of such alternative project delivery methods should be considered in consultation with the FTA work order manager.

The extent and effectiveness of third party risk transfers and sharing is a component of the OP-35 product.

SCC Category Cost Range Establishment SCC Cost Elements within an SCC Category are assumed to be positively correlated and therefore the total SCC Category Cost Range for a given SCC category is the sum of the ranges of the individual SCC Category Elements. These calculations are modeled in the FTA Cost Risk Assessment Worksheet.

6.2.2.3 Project Cost Risk Assessment

Project risk is an aggregated amount of the risk associated with all of the SCC Category Cost Ranges. It is assumed to be normally distributed and partially correlated at 33% of the difference between the fully correlated and fully independent cases. Example worksheets with the appropriate calculations are available from the WOM.

As directed by the COTR/WOM, the Project level risk model shall be successively modeled and iteratively advanced at each future Project Milestone.

The PMOC shall also produce a separate chart that lists the SCC/BCEs with their assessment data ranked by their variability in terms of the standard deviations and percentage effect on the overall budget. The PMOC will then perform additional assessments and present, in a narrative format, its analysis on those project elements with the largest variability in cost in order to identify the cost, schedule and technical risk drivers.

The work order manager or COTR may direct the PMOC to perform additional analysis of covariance/correlation in the form of logic diagrams, matrices, etc. In addition, development of a second risk transfer curve that represents the PMOC's estimate of risk transferred to third party project participants, using information developed in the OP-35 may be required, as directed by the work order manager.

6.3 Project Schedule Risk

The PMOC shall use its professional judgment to identify, assess, and evaluate the uncertainties in the Grantee's project schedule, in terms of the project's social, political, legal, financial and physical environment. Such evaluation shall be based on the PMOC's review of the Grantee's structure, and the project's scope, schedule, cost estimates, and delivery process, including prior reviews conducted under other Operational Procedures. Further, the PMOC will document and report its recommendations for responding to identified items of likely risk, including recommendations of adjustment to the Grantee's schedule and Project Management Plan.

6.3.1 Schedule Risk Event Identification

The PMOC shall identify and document the uncertainties in the project schedule using information provided by the Grantee. Such assessment shall generally be conducted in a manner similar to that outlined for Cost Risk Identification (see 6.2.1, above). Special attention should be focused on the interrelationship between identified Cost Risk Events and Schedule Risk Events.

Risk Events identified shall be reported in a format similar to the prior-established Cost Risk Register, using similar numbering and categorization schemas. Where appropriate, this listing will contain cross-references to the Cost Risk Register.

6.3.2 Schedule Risk Assessment

The PMOC shall assess the likelihood of project completion within the timeframes estimated on Grantee's schedule. This assessment shall include: evaluation of activity durations, including statistical information such as range, mean, minimum and maximums, and whether such durations are appropriate for the project phase; identification of critical and near-critical paths and the relationship between those paths and identified risk events; identification of hidden and exposed time contingencies and their role in schedule risk mitigation; and identification of logic relationships designed to provide risk mitigation. The FTA may direct other similar analyses.

Based upon its findings, the PMOC shall assess the sufficiency of the Grantee's sequencing and schedule to cause project completion within targeted completion dates, including any interim milestones. Based upon the assessment, the Contractor shall provide recommendations for adjustment to the Grantee's schedule and Project Management Plan to reduce risk of not meeting the project's schedule goals.

6.4 Performance and Safety Risk

Subject to the issuance of individual Work Orders, the PMOC shall identify, assess and evaluate the uncertainties in the Grantee's project that are not directly related to project cost or schedule such as technical performance of systems, vehicles, etc. in terms of system reliability (mean time between failure, etc.) or safety in terms of reportable accidents, etc.

The PMOC shall develop its approach for risk assessments of this Section and shall review the approach and receive WOM approval prior to executing this work. In general, such risk assessments shall conform to the principles outlined for cost and schedule assessments, detailed within this Oversight Procedure; however, these risk products shall be tailored to the specific requirements of the project, considering stage of project development and project scope.

Upon completion of these risk assessments, the PMOC shall provide recommendations for adjustment to the Grantee's Project Management Plan.

6.5 Contract Packaging Risk

As part of an individual work order, the FTA may direct the PMOC to develop specialized risk management products for cost and/or schedule, on a non-recurring basis. Examples of such products are PMO reviews of Grantee project deliverables produced in conformance with approved project management plans or sub plans. Using data inputs regarding contingency and scope, the PMOC shall analyze the Grantee's proposed contract language for its effectiveness in meeting the proposed allocation of risk developed as part of the Grantee's Project Delivery Method.

6.6 Risk Mitigation

6.6.1 Risk Mitigation Recommendations

The PMOC shall develop risk mitigation recommendations for changes to the Grantee's Project

Management Plan; these recommendations shall be developed in accordance with the following, and shall be organized appropriately by Risk Type, Mitigation Structure and Mitigation Type as described below.

6.6.1.1 Risk Types

Risk recommendations associated with Risk Events shall be classified as technical, schedule or cost risk, or some combination thereof.

Technical Risk is performance risk that is manageable by the Grantee and its consultants and contractors; unresolved technical risk may threaten the planned schedule and/or budget. For example, construction-phase technical risk events may include those associated with the uncertainty surrounding mobilization of a tunnel boring machine and its planned production rates. If output, reliability, availability, etc. do not meet plan, the variance may impact schedule or cost. Failure to successfully mitigate such technical risk within the technical risk mitigation framework can, in short measure, exceed the ability of the project schedule to absorb the impact. If the schedule mitigation fails, the cost mitigation framework is stressed in turn to absorb the impact of added production costs and schedule delays that it may or may not be able to contain.

Schedule Risk is fundamentally risk to the project schedule and may additionally threaten the project budget. Delays to the project critical path will directly delay the project, and significant reductions to schedule float will reduce the ability of the project to withstand schedule change. Failure to successfully mitigate such schedule risk can, in short measure, exceed the ability of the project schedule to absorb the impact of delay. If the schedule mitigation fails, the cost mitigation framework is stressed in turn to absorb the impact of schedule delays that it may or may be able to contain.

Not all schedule risk is driven by technical risk, but all technical risk drives schedule risk.

Cost Risk is fundamentally about risk to the project budget. Risk events associated with cost risk may additionally threaten the planned schedule.

6.6.1.2 Mitigation Structure

Mitigation structure refers to varying levels by which the Grantee and its consultants and contractors may respond to the risk events and assessed risk levels identified through prior products of this OP-40. This structure consists of three parts: Primary Mitigation, Secondary Mitigation, and Tertiary Mitigation.

Primary Mitigation occurs throughout the various project phases and is the result of the planned actions of the Grantee and its consultants and contractors as described in the Risk Management Plan portion of the Project Management Plan, as supplemented with the PMOC's recommendations resulting from this OP-40. Such activities are scheduled at the earliest phase during which the mitigation activity may occur, and are expected to be completed on a timely basis to achieve the cost-risk parameter targets at the end of that phase, as developed in 6.2.2. Examples of scheduled mitigation might be completing design, or a geotechnical survey, etc.

Secondary Mitigation consists of pre-planned, potential scope or process changes that may be triggered when risk events occur that exceed certain phase-based targets, described further below.

Example events that may incur secondary mitigation include construction bids that are significantly over the estimate, or unexpected geotechnical hazards that are encountered, etc., such that the change is likely to cause a significant over-budget condition. Such "triggered" mitigation enables the Grantee to make cost reductions in a planned and orderly process and preserves contingencies for use later in the project.

Tertiary Mitigation consists of adjustment to the project budget by means of supplementing or "recharging" the project funds. Tertiary mitigation generally is a last-resort reaction to incurred risk, occurring only when primary and secondary mitigation has been exhausted. Tertiary mitigation should only be recommended upon consultation with and approval of the FTA. Such "recharge" mitigation enables the grantee to take further steps in a planned and orderly process and ensures secondary mitigation capacity meets minimum requirements in the next phase.

6.6.1.3 Mitigation Types

The PMOC shall organize risk mitigation recommendations into four categories—Risk Transfer, Risk Avoidance, Risk Reduction, or Risk Acceptance.

Risk Transfer occurs when the consequences resulting from a risk event become the liability of a party other than the Grantee; this may include a partial transfer (or risk sharing). The PMOC shall clearly identify those risks that can be shared with or transferred to a third party such as a contractor, consultant, or other governmental organization in the form of contract requirements, warranties, or insurance policies, etc. The recommendation may also be to reallocate scope in such a manner as to transfer risks to scope elements or contract packages that are better suited to mitigate risk.

Risk Avoidance is available when a project element that is associated with certain potential risk may be alternatively delivered through a less-risky process or design, or may be eliminated altogether. The PMOC shall clearly identify those risks that can be avoided or eliminated.

Risk Reduction is a planned action that will either reduce the consequence or the likelihood of a risk event. The PMOC shall clearly identify the root cause of the risk event, how the root cause will be reduced by implementing the PMOC's recommendation, and who the PMOC recommends within the Grantee organization or project team to carry out the risk mitigation scope element. The PMOC will also recommend progress-reporting intervals for tracking the performance of mitigation measures as well as any integration with the Grantee's overall program schedule and resource loading. All material assumptions shall be identified along with their rationales.

Risk Acceptance results from the recognition, in the PMOC's opinion, that further reduction of a particular risk would only come at the expense of unacceptable scope reduction or cost increase, etc. The PMOC shall clearly identify those risks that it recommends the Grantee accept as inherent to the project. Risk Acceptance often involves the consumption of project contingency funds, project schedule float, or an increase in either project budget or schedule.

When providing recommendations, the PMOC shall only suggest Risk Acceptance when neither Risk Avoidance, Risk Reduction, nor Risk Transfer is available. However, PMOC recommendations shall recognize that there is a point in the implementation of the Grantee's project ("break point") where mitigation becomes increasingly difficult to effect and beyond which Risk Acceptance through the use of project contingency funds is the only effective means to treat project risk. This "break point"

between risk reduction and risk acceptance typically occurs at the point where all market risk has been mitigated, or early construction risk (geotechnical/utility) has also been mitigated, whichever occurs later. Prior to this "break point", unless otherwise provided for in a project strategy plan, triggered mitigation is the first line of defense in order to preserve and the minimum contingency balance must be met in order to provide sufficient funds for the completion of the project, or revenue operations consistent with Project Strategy parameters defined in later deliverables.

6.6.2 Primary Cost Risk Mitigation Recommendations

The PMOC shall develop a unified list of cost mitigation activities, including scope, deliverables, and outcomes, based upon products previously developed through this OP-40 and other OPs. This list shall be entitled "Primary Mitigation Deliverables and Outcomes". This list will serve as a means to provide recommendations and to monitor the reduction of project cost risk. The PMOC's evaluation of these Grantee's activities as recommended shall be performed as part of 6.7 Specialized Risk Management products.

6.6.3 Primary Schedule Risk Mitigation Recommendations

The PMOC shall develop a unified list of schedule mitigation activities, including scope, deliverables, and outcomes, based upon products previously developed through this OP-40 and other OPs. This list shall be integrated with the list entitled "Primary Mitigation Deliverables and Outcomes", developed in 6.6.2, above. This list serves as means to provide recommendations and monitor schedule risk to the project. The PMOC's evaluation of the Grantee's activities as recommended shall be performed as part of 6.7 Specialized Risk Management products.

Schedule risk mitigation recommendations shall recognize that schedule risk is focused on the homogeneity and stability of the project critical path. A critical path is homogeneous when its activities are mapped out using a histogram and demonstrate a mode and mean activity duration that is within 10% of each other. A critical path is ideally stable when all delays on other paths consume their path float but do not result in a project delay and no event has consumed all float, becoming critical.

Schedule risk mitigation recommendations should specifically treat both critical path and non-critical path activities. Frequent changes in the configuration of the project critical path are disruptive and degrade the grantee's ability to efficiently and effectively implement the project. The role of schedule mitigation is to protect the critical path from non-critical path activities becoming critical themselves.

The primary objective of schedule risk management is keeping a necessary amount of path float between the project critical path and all of its intersecting paths, i.e. to "buffer" the critical path and thus preserve its stability. The secondary objective of schedule risk management is to keep technical risks off of the project critical path, or minimize their duration if they are critical path activities.

High risk project work elements are to be executed as early as possible in the project schedule such that their negative outcomes can be mitigated by triggered mitigation and not by the application of project contingency.

6.6.4 Secondary Risk Mitigation Recommendations

The PMOC shall develop recommendations for activities to accomplish Secondary Risk Mitigation. These recommendations shall include both the targeted magnitude of the cost or time savings expected, as well as a description of the scope, deliverables, and outcomes of the activity. The contractor will also recommend progress-reporting intervals for tracking the performance and management of such mitigation capacities; as well as any integration with the Grantee's overall program schedule and resource loading. All material assumptions shall be identified along with their rationales. Such recommendations are to be established as distinct from any concurrent value engineering activities.

Value Engineering (VE) is a formal, systematic, multi-disciplined process designed to optimize the value of each dollar spent. The objective of VE is to satisfy all required functions at the lowest total costs (capital, operating and maintenance) over the life of the project consistent with the requirements of performance, reliability, maintainability, safety and esthetics. The VE process generates a list of alternative methods for performing the required functions involved in the targeted areas of the design represented by any given scope element that when taken as an aggregate, are likely to achieve a project cost-reduction objective. The result is change in the physical or technical aspects of project. VE recommendations if accepted by the Grantee are implemented on a non-contingent basis.

Secondary Mitigation is also a formal, systematic, multi-disciplined process but it is designed to achieve a cost-reduction objective in targeted areas of the design, construction general conditions, etc. with or without a material reduction in transit capacity, level of service, or revenue vehicles. Secondary Mitigation and Value Engineering both can result in reductions to Project Scope, transit capacity, level of service, etc. and thereby Project Cost (and Project Schedule as applicable). Secondary Mitigation is reduction(s) in project scope that might, in certain circumstances, merit reinstatement back into the project, i.e. "mitigation recapture". Secondary Mitigation is fundamentally different than Value Engineering.

Mitigation Targets are amounts of secondary mitigation that are recommended to be developed on a phase-by-phase basis. These targets are developed upon the result of the Cost Risk Assessment developed in 6.2.2. The Mitigation Target for a given phase is a percentage of the difference between the project budget and either: 1) the 90th percentile forecast at each of the Project Milestones (see 6.2.2.1), or 2) an adjusted target that includes contingency values established through OP-35. Table 2 provides the initial recommendation for percentages to apply to the difference (or "gap") between the budget and 90th percentile forecast. The PMOC may, with the FTA work order manager's approval, modify these targets based upon overlapping Grantee milestones, or develop additional targets due to additional milestones lying between these targets.

Table 2 - Mitigation Target Percentages

Milestone	Target
Entry in Preliminary Engineering	10%
Entry into Final Design	30%
FFGA award	50%
40% bid	60%
20% construction	70%
50% construction	80%

75% construction	85%
90% construction	90%

6.7 Specialized Risk Products

As part of an individual work order, the FTA may direct the PMOC to develop specialized risk management products for cost and/or schedule, on a non-recurring basis. Examples of such products are PMO reviews of grantee management deliverables produced in conformance with approved project management plans or sub plans such as risk management plans, contingency management plans, etc.

6.8 Recurring Risk Products

As part of an individual work order, FTA may direct the PMOC to develop risk management products for cost and/or schedule, on a recurring or periodic basis such as supplements to the Monitoring reports.

7.0 REPORT, PRESENTATION, RECONCILIATION

Prepare a written report in the format discussed below. Attach the sponsor's most current SCC estimate, schedule, and other related documents. Embed references to, or exhibits from, Grantee's estimate, schedule or other documents to explain your analysis, findings, and recommendations.

Present the findings, conclusions and recommendations to FTA headquarters and regional staff and the Grantee either in *a teleconference or in person.* In an extended working session, reconcile findings and conclusions with the Grantee so that disagreements, if any, are reconciled to the extent possible.

Integrate and summarize available information and data for the project, providing professional opinion, analysis, information, data and descriptive text in an accessible and understandable format. Opinions shall be supported by data tables prepared in a professional manner

7.1 Reporting Format

Reference the general requirements contained in OP-01.

7.2 Report Contents and Format

Unless otherwise directed by the FTA work order manager or COTR, the delivered report will be sectioned as follows:

Table of Contents Utilize (in MS Word) an automatically-created Table of Contents, with sections hyperlinked back to table of contents; including appendices.

List of Figures and Tables

Executive Summary

Project Background Project descriptions and data shall be consistent with the Monitoring report guidance, current monitoring report and the most recent FTA New Start profile. Notwithstanding the foregoing, the work order manager may direct the contractor to use an identifiable draft version of these materials. Ridership shall include peak hour ridership data. Sub-sectioning shall also include Guideway Components, Project Delivery Method, proposed Contract Packaging Strategy and, as applicable, Master Planning for the Corridor.

Methodology This purpose of this section is to describe the PMOC's methodology used to deliver the sampling plan, risk management products with separate sections for risk assessment, and mitigation forecasts. This shall present, discuss, and thoroughly demonstrate the contractor's approach to developing the 10th percentile estimates. Subsection as appropriate, divided into subtasks.

Risk Identification for SCC/Baseline Cost Estimate Units The purpose of this section is to present a synopsis of the capacity, scope, cost, schedule and contingency findings in other PGs. Present the cost estimate adjustments and selection of beta values for the Category Cost Risk Assessment; cost estimate adjustments shall identify whether there are mitigatable components. The Contractor shall present detailed data and analysis in a separate appendix as necessary in order to maintain readability of the report.

All recommendations shall be adequately supported with analysis and rationales as well as identifying the current project status and timeframe of the baseline. The analysis shall be consistent with the Risk Mitigation structure and segregate risks into requirements, design, market and construction risk sub sections.

A Risk Register shall be delivered as a separate appendix in the form of Excel or Access data tables.

Risk Management Baseline The purpose of this section is to present the contractor's initial Project Cost Risk Assessment, for comparison, throughout the future phases of the project.

Risk Mitigation Framework The purpose of this section is to present the contractor's recommendation for specific risk mitigation/transfer/sharing efforts by the grantee to reduce the perceived risks and potential variability of costs through each of the project milestones. The PMOC's narrative should allow FTA management and the Grantee to maintain focus upon these risk mitigation/transfer/sharing efforts as the means to maintain the baseline cost estimate and avoid the potential cost escalation from these potential project risks.

A subsection shall be included for each Mitigation Milestone that addresses:

- Basis for Project Risk Status forecast.
- Requirements risk status, Design risk status, Market/bid Risk status, Geotechnical/Utility Construction Risk status, Mid Range Coordination Construction Risk status and Start up risk.
- Mitigation Objectives
- The PMOC shall present its model-based simulation of grantee implementation (expected outcomes achieved) of all identified mitigation activities/deliverables at each of the

milestones, the value of expected mitigation at this milestone measured by comparing the change in values forecasted by model at this and the previous milestone.

An example statement in this subsection is:

"For this milestone, the risk model forecasts a mean value of $664.1 million and a variance of $92.1 million, compared to $729.0 million and $107.3 million, respectively, from the Q3 2006 baseline milestone. Thus, the expected value of "perfect" mitigation at Q4 2006 – Entry into Final Design is equal to $64.9 million in mean value and $15.2 million in variance."

- Basis for Project Risk Treatment Status.
- Primary Mitigation: Time phased, or scheduled mitigation with milestones.
- Inclusive of PMP or other management plan sub-deliverables.
- Such mitigation scope shall be segregated by Requirements, Design, Market/bid, Geotechnical/Utility Construction, Mid Range Coordination Construction, and Start up. Further, Risk Elements within this segregation will be uniquely identified for tracing disposition that will preserve the characteristic as a requirements risk, etc.
- There shall be a data table that presents the effect of mitigatable components of cost estimate adjustments and entrance and exit beta values as well as the associated mitigation scope element.
- Reported reductions of risk in the form of Beta cannot be combined. An example is reporting a reduction in Beta for both requirements and design risk instead of separate reporting and disposition.
- Secondary Mitigation: Event based or "triggered" mitigation.
- Qualifying events.
- Tertiary Mitigation: recharge activities.
- Basis for surveillance plan activities and outcomes.
- Plan for testing the implementation and effectiveness of Grantee mitigation measures and external effects on the Federal project.
- Conclusion.
- Appendices as required, including Risk Register Summary and Analysis

The purpose of this section is to present the level 3 model and forecast as well as contractor's analysis, inclusive of parameter specifications from the level 1 model.

This section shall also present an integrated discussion of cost and schedule risk for the

project as well as the top ten cost and schedule risks.

- Appendix: Grantee Project Data

This section shall identify and characterize the grantee's structure and quality of the grantee's project data reviewed for the spot report or other deliverables. The intent is to determine the extent, nature, detail and quality of the grantee project data and the steps the PMO contractor took to determine its value. The contractor shall identify and discuss that grantee or third party data it accepted without adjustment.

8.0 SUBDELIVERABLES:

In addition to the primary deliverable(s) listed above, the PMOC shall deliver the following sub-deliverables. The FTA work order manager or COTR may also add to this list by written direction.

8.1 Scope Review Checklists for Design and Construction Reviews.
8.2 Recommendations for Conditional Approval to Enter PE/FD
8.3 Recommendations for Project Development Agreement/FFGA.

Oversight Procedure 41 – ADA Review – Level Boarding for Commuter Rail

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) regarding compliance by commuter rail projects with the level boarding provisions of the regulations issued by the U.S. Department of Transportation implementing the transportation provisions of the Americans with Disabilities Act (ADA) of 1990 (49 CFR Parts 27, 37 & 38).

2.0 BACKGROUND

The intent of level boarding is to provide equal and non-segregated access to passengers with disabilities using public transit systems. The U.S. Department of Transportation (DOT) addresses the topic of level boarding through its regulations that have been adopted, which specifically detail the standards for accessible transportation facilities, as mandated by the ADA.

The term "level boarding" refers to station platforms that are coordinated with the level of the floor and the entry doors of railcars used on the system. It does not connote a specific measurement above top of rail (ATR). However, typical passenger car floor heights usually range from 17.5-inches ATR to 52-inches ATR. Platforms should be constructed 3 inches below the new level of the rail car floor height to account for the load, normal wear, and tolerances.

Additionally, it must be recognized that level boarding does not necessarily require that the platform gap standards contained in the ADA accessibility standards be met. Given the dynamic clearance requirements of standard freight and passenger railcars, and accounting for wheel-truing, suspension settling and track wear and settling, level boarding will most likely involve gaps that exceed the ADA standard, but can be crossed easily by ambulatory passengers without hazard, and can be easily spanned by short bridge plates when necessary.

Where a commuter rail system operates over tracks used by another passenger railroad (i.e., intercity, Amtrak, or another commuter rail system), the design of the station platforms should be coordinated among the various users of the line if station platforms are to be shared. Where floor heights differ, the platform should be coordinated with rolling stock having the lowest floor and entry height to avoid stepping down from the platform to board. This may require alternative boarding methods for other rolling stock at that particular station platform. Project Sponsors must also determine whether the corridor and trackage to be used has been designated as a Federally-designated high-speed rail corridor, which is subject to additional requirements for platform configuration.

If a commuter rail system operates over tracks used, controlled, and/or owned by a freight railroad, the presence of freight traffic alone does not constitute infeasibility of level boarding. Project Sponsors must review actual dynamic clearance requirements for the type of equipment and cargo carried over

the tracks in question, normal and over-dimension (including U.S. Department of Defense Strategic Rail Corridor Network), and the history and nature of over-dimension movements. Where an actual conflict exists with a specific station platform height, care should be taken to determine whether a lower platform height corresponding with lower-floor and –entry rolling stock is possible.

Project Sponsors should take into account construction of station platforms on curves due to issues that make it impossible to achieve level boarding since this situation results in significant gaps that exceed the dimensions usually allowed for level boarding at station platforms. Ideally, station platforms should be constructed on tangent track. Though, if necessary, platforms could be on a mild curve of no more than 1 degree 40 minutes with little or no super-elevation.

As outlined in the DOT's Level Boarding Guidance dated September 1, 2005, if full level boarding meeting the gap requirements (3-inch horizontal gap and 5/8-inch vertical gap, or 1.5-inches for existing vehicles operating in new stations) is not possible, other choices are offered in a hierarchal order of preference:

1) High-level platforms in conjunction with short bridge plates providing access to each car.
2) Car-borne or station-based lifts serving each accessible car.
3) Gauntlet or bypass tracks where necessary to accommodate over-dimensioned freight loads along high-level platforms.
4) Mini-high platforms.

3.0 OBJECTIVES

The objective of this review is to ensure compliance with ADA level boarding starting with project planning (site planning of stations and platforms), and continuing through design and construction. This review is meant to bring to light as early as possible perceived impediments to compliance, serve as a platform for the generation of ideas and recommendations for removal of impediments so that compliance can be achieved.

4.0 REFERENCES

The following are the principal, but by no means the only, references to Federal legislation, regulation and guidance with which the PMOC should have a good understanding as related to the Grantee's project work being reviewed under this OP:

4.1 Regulations

- 49 CFR Parts 27, 37 & 38: U.S. Department of Transportation regulations implementing the transportation provisions of the ADA.
    - The Department issued a Final Rule adopting new accessibility standards effective November 29, 2006. Through this final rule, the Department amended its ADA regulations to adopt, as its regulatory standards for accessible transportation facilities, the new Americans with Disabilities Act Accessibility Guidelines (ADAAG) issued in 2004 by the Access Board as well as the Board's subsequent technical amendments. Important to the design of transit stations are paragraphs 206.3 regarding the location of accessible routes relative to general circulation paths, and 810.5.3 regarding the

coordination of platform and rail car door height. Paragraph 810.5.3 also contains language correcting a misunderstanding of 49 CFR 38.71(b)(2) concerning light rail.
  - http://www.fta.dot.gov/civilrights/ada/civil_rights_5936.html

4.2 Guidance

- The Department of Transportation issued Disability Law Guidance, Full-Length, Level-Boarding Platforms in New Commuter and Intercity Rail Stations on September 1, 2005 (http://www.fta.dot.gov/civilrights/ada/civil_rights_3890.html).
  - This two-page document is the DOT's interpretation of its existing pertinent regulations, 49 CFR parts 27, 37, 38. The guidance includes this summary statement: "…the norm for new commuter and intercity rail stations is a platform running the full length of the passenger boarding area of the station that permits level boarding to all accessible cars of trains stopping at the station. Level boarding for all cars of a train is significant because, if passengers with disabilities are unable to enter all cars from the platform, the passengers will have access only to segregated service. It would also, in the case of Federal Transit Administration (FTA) and Federal Railroad Administration (FRA) assisted projects (including Amtrak), be inconsistent with the requirement of the Department's section 504 regulation (49 CFR §27.7), which requires service in the most integrated setting reasonably achievable."

4.3 Reference Documents

- Federal Railroad Administration document dated March 7, 2006, Factors Associated with Railroad Passenger Car Clearances to High Platforms for Intercity and Commuter Rail Systems (http://www.regulations.gov/fdmspublic/ContentViewer?objectId=09000064802bff3f&disposition=attachment&contentType=pdf). This document describes real world conditions that can preclude achieving and maintaining required maximum horizontal and vertical gaps between rail cars and platforms. The FRA submitted this document to the rulemaking docket for the Department's February 27, 2006 Notice of Proposed Rulemaking (NPRM) to update requirements under its ADA regulations.

- Map of existing Amtrak equipment type by route (Appendix B below).

- The following reference information on freight railroad and Amtrak clearance envelopes is available for use by the PMOC and Project Sponsor. Obtain the most current version of this information from the appropriate agencies.

  - Association of American Railroads (AAR) Manual of Standards and Recommended Practices – Plate E – Clearance diagram that defines the clearance envelopes for limited interchange service.
  - AAR Manual of Standards and Recommended Practices – Plate L – Locomotive Diagram for Interchange Service. (Diagram defines the clearance envelopes for freight locomotives intended for interchange service)
  - U.S. Department of Defense Strategic Rail Corridor Network (STRACNET) clearance envelope diagram.

5.0 PROJECT SPONSOR SUBMITTALS

- Obtain from the Project Sponsor the answers to the questions in Appendix A, FTA Request for Information. With these answers, DOT (Office of the Secretary of Transportation [OST], FTA and FRA) and the PMOC can gain a full understanding of the project conditions and can better assist the Project Sponsor in achieving compliance with the level boarding requirements of the ADA.
- Obtain the Project Sponsor's level boarding package. The Project Sponsor's level boarding proposal should be provided to the PMOC at the earliest point possible in the project's development. It is optimal to review the Project Sponsor's level boarding package with the request for entry to preliminary engineering. The level boarding package contains supporting information to justify the proposed method of achieving level boarding. Forward copies of this package to DOT's Level Boarding Team. The Project Sponsor's package should include the following information as a minimum:

    - Cover letter
    - Proposed right-of-way width at each station;
    - Horizontal gap between platform and vehicle at each station;
    - Vertical gap between platform and vehicle at each station;
    - ADA level boarding compliance options at each station (i.e., potential for a bridge plate or other device to span horizontal and/or vertical gap to meet ADA level boarding requirements, potential for gauntlet track or bypass track, etc.) and reasoning why the various compliance options are feasible or infeasible.

6.0 SCOPE OF WORK

6.1 Prior to approval to Enter Preliminary Engineering

It is essential and expected that level boarding be reflected in the site plans and station plans and sections developed during Alternatives Analysis and Conceptual Engineering phase. In addition, the review of the Locally Preferred Alternative (LPA) prior to entering PE requires that level boarding be reflected in the project documents provided for review.

6.2 During Preliminary Engineering

A level boarding solution must be submitted to and accepted by FTA prior to FTA's approval of the project into Final Design.

Request and review the information from the Project Sponsor listed in Section 5.0 above in order to determine if the project meets the DOT's ADA level boarding guidance, or if there are perceived impediments to compliance.

Upon receiving and reviewing documents provided by the Project Sponsor, a workshop should be conducted with the Project Sponsor to inform and educate, as well as provide technical guidance on viable level boarding solutions and possible options to meet the level boarding requirements. Technical guidance could include assisting the Project Sponsor to ensure that they locate the correct vehicle and

communicate with the vehicle manufacturer about its design, manufacture feasibility and timing; or to ensure that a realistic schedule is produced in a reasonable period so that opportunities for action are not foreclosed.

Review the Project Sponsor's package outlining its proposed method to meet the DOT's ADA regulations concerning level boarding for all stations.

6.3 Final Design, FFGA, Construction, Revenue Operations

Upon a determination of feasibility by FTA, review the project's plans and specifications, and conduct site visits during construction and revenue operations to verify compliance with the Project Sponsor's approved level boarding solution for all stations.

6.4 General Information

Concept of "undue burden"
Additional costs associated with achieving level boarding are generally not a factor in the DOT's determination of feasibility. However, if these costs become so high that they create an "undue burden" to the Project Sponsor, these costs would be considered in the DOT's determination of feasibility. (Undue burden means that some burden is "due" or expected of the Project Sponsor. An increase to costs may not rise to the level of undue burden or infeasibility.) There is no specific cost threshold for an "undue" burden.

DOT's Level Boarding Team
DOT's Level Boarding Team includes representatives from OST, FTA and FRA. The primary points of contacts are as follows:

- OST: Assistant General Counsel for Regulation and Enforcement, Office of General Counsel 202-366-4723
- FTA: Director, Office of Civil Rights, 202-366-4018
  Chief Counsel, Office of Chief Counsel, 202-366-4063
  Associate Administrator, Office of Program Management, 202-366-4020
  Associate Administrator, Office of Planning & Environment, 202-366-4033
- FRA: Program Manager, Railroad Operations, Office of Railroad Development, 202-493-6381
  Program Manager, Environmental Programs, Office of Railroad Development, 202-366-6381
  Associate Administrator, Office of Railroad Development, 202-493-6381

The Level Boarding Team is a valuable resource that can help the Project Sponsor, PMOC, FTA regional and headquarters staff (i.e., New Starts Team members) identifies and resolves level boarding issues. Failure to communicate with the Level Boarding Team can result in project delays (usually at the most inopportune time).

The determination of feasibility or infeasibility of the Project Sponsor's level boarding proposal will be made by FTA after recommendations from FRA and DOT.

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall provide FTA with a written report of its findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. After FTA approval, the PMOC should share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

The report formatting requirements of OP-1 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

APPENDIX A

FTA Request for Information

- to support compliance with DOT ADA Regulation for Level Boarding, dated January 19, 2007, revised September 11, 2007

1) Train Route / Service / Operations

a) MAP
   i) On maps of the alignment, indicate the existing and proposed routes for each below.
      (1) Commuter rail
      (2) Normally-wide freight
      (3) Over Dimensional (OD) freight
      (4) Amtrak
   ii) Identify which components of the guideway, stations, and support facilities are included in this project.
   iii) Identify interconnections between the commuter rail's, Amtrak's (where applicable) and the freight railroad's tracks and local industries served by the freight railroad.
   iv) Identify where tracks will be shared among commuter rail, Amtrak, and/or freight traffic
   v) Identify which stations/platforms are to be shared by commuter rail and Amtrak.
   vi) Identify the location of the storage yard and service facility on the map.

b) TABLE – Indicate the number of anticipated trains per day of each type, time periods, headways, etc.
   i) Commuter rail
   ii) Normally-wide freight
   iii) OD freight
   iv) Amtrak

c) MODEL – Model the train service for the commuter rail and freight railroad service and verify that the desired service levels can operate on the existing track configuration.

d) LOGS – Provide copy of actual logs showing the number of OD freight trains per year for past ten years. Indicate the commodity carried in these vehicles and actual width of freight carried.

2) Land, ROW, Easements, Other Agreements

AGREEMENTS – Describe the proposed agreement or preferably provide a draft of the agreement between the commuter rail agency and the freight railroad explaining the terms regarding

a) Land ownership or lease, for example:
   i) Will the commuter rail agency purchase the right-of-way from the freight railroad?
   ii) Will the commuter rail pay the freight railroad to operate on its tracks?
   iii) What are the terms of the operating agreements between the commuter and freight railroad?
   iv) What rights does the freight railroad retain to operate normally wide and over-wide loads?

b) Responsibility for track, signal, station, support facility, and vehicle construction

c) Responsibility for land, track, signal, station, support facility, vehicle maintenance and operations

3) Passenger Vehicles

a) Describe the commuter rail consist – number and type of cars (new and existing).

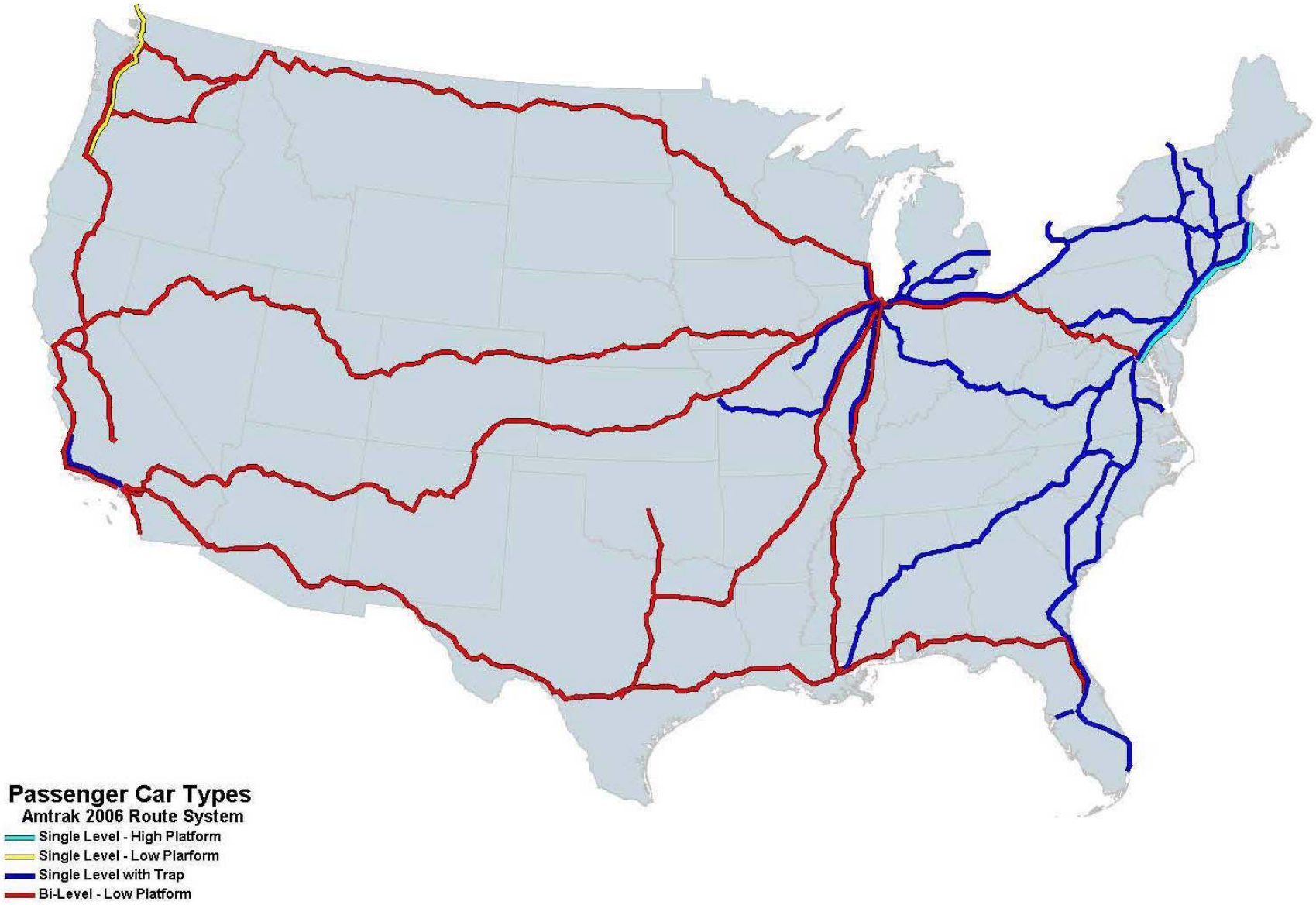
b) For each car in the commuter rail and the Amtrak consist (where applicable), provide
   i) Manufacturer name, model, year built
   ii) floor height above top of rail at the vehicle entry points
   iii) floor plan drawing of car including seating layout

c) For new cars, provide a table to illustrate the alternative passenger car manufacturers, styles, and floor heights that have been considered
d) For the commuter rail and the Amtrak vehicles (where applicable), based on shimming or automatic leveling, calculate
    i) The maximum possible change in the vertical dimension from top of rail to the floor height due to wheel wear (new to condemned condition.)
    ii) the vehicle widths both static and dynamic (vehicle in motion) from track centerline at 0 to 51-inches above top of rail
e) For each type of commuter rail vehicle, indicate the number of wheelchair spaces to be provided.

4) **Clearance Requirements; Expected Design, Construction, and Maintenance Tolerances**
a) Provide the actual dynamic clearance requirements, based on a representative sampling of freight loads (normally-wide and overly-wide if any) to fixed obstructions (such as platform) for the following vehicles in motion. Differentiate between the load being carried and the vehicle carrying, indicate horizontal clearances from track centerline and vertical clearances from top of rail at all levels between 0" ATR and 51" ATR. Note that actual vehicle dynamic clearances may differ significantly from railroad setback standards for fixed obstructions.
    i) Commuter rail vehicles
    ii) Amtrak vehicles
    iii) Freight railroad's normally-wide vehicles (specify which AAR plates A-F, H, L apply)
    iv) Freight railroad's overly-wide (over-dimensioned -- OD) vehicles (if applicable provide dimensioned outline-drawings for each of these vehicles and the freight load being carried)
b) Provide requirements for horizontal and vertical clearance to fixed obstructions stemming from other sources such as the commuter rail agency's operating agreements with freight railroad, state clearance requirements, etc., at all levels between 0" ATR and 51" ATR.
c) Provide horizontal and vertical design, construction and maintenance tolerances to be expected for the commuter rail platform, track, and trackbed, at all levels between 0" ATR and 51" ATR. Indicate which class of track will be constructed along the commuter rail station platforms.

5) Stations/Platforms:
a) DRAWINGS
    i) Provide a dimensioned drawing of a typical commuter rail station platform including the proposed commuter rail consist along the platform.
    ii) Assuming that the track is to be shared by the commuter rail, Amtrak, and normally-wide freight vehicles, and given the dynamic clearances and tolerances required to accommodate these three (as described above), indicate where is the shortest possible horizontal dimension from track centerline to the face of a full-length platform that provides level boarding to the commuter rail vehicles? To the Amtrak vehicles (where applicable)? Provide clearances for all levels between 0" ATR and 51' ATR.
    iii) Generate design alternatives including gauntlet tracks, flip-up platform edges, etc., to accommodate OD freight service where it occurs along the commuter rail alignment.
    iv) Provide a site plan drawing for each station area, scaled at 1" = 40', indicating the path of travel from the public way, (public street and sidewalks, parking, and bus stops) for persons with disabilities as compared with persons without disabilities, to the station entrance and the commuter rail vehicle boarding areas

APPENDIX B


Passenger Car Types
Amtrak 2006 Route System
Single Level - High Platform
Single Level - Low Plarform
Single Level with Trap
Bi-Level - Low Platform

U.S. DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 43 – Annual Review

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) as regards the reliability of the Grantee's project scope, capital cost and schedule as submitted to FTA for annual evaluation and/or recommendation to Congress.

2.0 BACKGROUND

The number of project sponsors seeking New Starts or Small Starts funding has grown significantly over the years so that the amount sought exceeds the funding available. To ensure that FTA's funds are well used, Congress requires that FTA report every year on the status of projects approved into FTA's pipeline. This annual monitoring is meant to ensure these projects meet their goals and stay on-time and on-budget.

Federal transit law requires that FTA evaluate and rate New Starts projects on project justification, cost-effectiveness, and local financial commitment prior to approving projects into a subsequent phase or making a recommendation to Congress for project funding. Evaluation and rating occurs when a project sponsor requests entry into a subsequent project phase. The request may or may not be coincident with FTA's required annual report to Congress. The report includes the status of each project, ratings, recommendations for funding in the next fiscal year, and supporting information.

3.0 OBJECTIVES

The PMOCs are familiar with the projects and are FTA's best resource for insights regarding the projects. Therefore, the PMOC is to perform the review described below to provide findings, conclusions, and recommendations regarding the reliability of the Grantee's project scope, schedule and cost estimate as a critical input to FTA's annual project evaluation. The PMOCs are to make a statement of the potential cost range (lower / upper bound and most likely,) and describe uncertainties. For areas of significant uncertainty, PMOC are to recommend additional investigation, planning or design work by the project sponsor or other parties, with a schedule for the accomplishment of the work. (Note: The Grantee's cost estimates are inputs into project cost-effectiveness calculations and financial plans.)

4.0 REFERENCES

The following are the principal, but by no means the only, references to Federal legislation, codification, regulation and guidance with which the PMOC should have a good understanding as related to the Grantee's project work being reviewed under this OP:

4.1 Legislative

- The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, or SAFETEA-LU, Pub.L. 109-59, as amended.

4.2 United States Code

- 49 USC 5309, most recently reauthorized by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in August 2005. SAFETEA-LU directs FTA to evaluate and rate candidate New Starts projects as an input to federal funding decisions and at specific milestones throughout each project's planning and development. SAFETEA-LU further supports a comprehensive planning and project development process which New Starts projects must follow.

5.0 PROJECT SPONSOR SUBMITTALS

Obtain the following from the Grantee:

- Project narratives/descriptions
- Environmental impact studies and mitigation plans
- Diagrams, drawings, plans, profiles, cross section drawings, special design studies, graphics
- Specifications, design criteria reports
- Capital cost information including:
  - Estimating methodology memo (refer to Appendix A)
  - Complete cost estimate in project sponsor's original format including
    - Calculations for construction escalation by commodity type
    - Calculations for inflation by year
  - Complete cost estimates in FTA's Standard Cost Category (SCC) format. The SCC worksheets serve as a reporting format. They summarize the actual cost estimate. (Obtain from the project sponsor the same version of the worksheets the project sponsor has submitted or will submit to FTA for the annual review.)
- Schedule information in project sponsor's original format and in SCC format
- Risk assessment and mitigation report, when a risk assessment has been conducted
- A copy of the PMOC annual review from previous year

6.0 SCOPE OF WORK

Meet with the project sponsors regarding project conditions and current developments.

1) On an introductory page of your report, provide the following information:
   a) Date of your report
   b) Project name and location
   c) Project sponsor
   d) PMOC firm
   e) Person (and affiliation if different from PMOC firm) providing this report
   f) Length of time PMOC firm and person have been assigned to this project

2) Describe the history and basis of the cost estimate for the project.
   a) Verify that the cost estimate in its original and SCC formats are consistent. Identify discrepancies between the content in the two formats.
   b) Indicate the date of the SCC Workbook (see "Today's Date" on the BUILD Main); attach the

Excel file of the SCC Workbook to your email with the report

c) Explain reasons for increases in the cost estimate and any updates
d) Example:
   i) "The estimate was originally done in (year of estimate) when the project sponsor requested entry to final design. It could be characterized as a "bottom up" estimate as it was done from scratch and based on a very complete preliminary engineering set of documents. It made wide use of quantities, unit costs (it separated direct from indirect costs.) The estimate was $250 million in 20-- Base Year dollars and $300 million in Year of Expenditure (YOE) dollars. The current estimate was updated in (date) to $310 million YOE. The increase of $10 million is attributable solely to an inflation rate correction. Based on the June estimate, the Grantee's SCC worksheets dated (include date), submitted as part of their New Starts submittal, indicate $310 million YOE."
e) For all of the following questions, refer to the cost estimate and schedule both in their original format and in the SCC format. Also refer to the drawings and other project documents listed above.

3) Cost estimate in (year) Base Year Dollars.
   a) Characterize the scope and level of scope definition that formed the basis for the project sponsor's current capital cost estimate. Has the original project scope since the original cost estimate been changed? If the scope has changed, do the current cost estimates reflect the change?
   b) Assess and evaluate the capital cost estimate. Make recommendations where appropriate for change of approach or additional work.
      i) Check the estimate's internal consistency (does it add up?)
      ii) Check the estimated quantities through comparison with drawings
      iii) Check the unit costs through comparison with recent similar bid prices
      iv) Check the reasonableness of pricing escalation for specific construction elements and commodities based on current conditions
      v) Check the reasonableness of the cost estimate for and assumptions behind the General Conditions of the Contract in terms of allocation of risk to the project sponsor, the construction contractors, etc.
      vi) Have important changes occurred since the project sponsor's actual cost estimate was prepared that would render the estimate less valid? How does the project compare with the project reviewed by the PMOC in past years?
      vii) Identify sources of uncertainty and related potential for cost increase. Estimate the cost and time impact of these uncertainties. Uncertainties may include unresolved issues or inadequate project definition associated with the design and construction scope; the political, institutional and project management context of the project; procurement conditions, contracting methodology, bid climate; methodology of developing the capital cost estimate itself; perceived biases in the estimate; funding sources / financing mechanisms; cost of inflation or change in the value of the dollar over time.
      viii) Check the amount of allocated contingency for specific line items. Has allocated contingency been used to target perceived uncertainties in scope, schedule or cost in a specific line item? In your opinion, is the total allocated contingency as a percentage of total base year dollars and project scope adequate? Is the contingency adequate to cover unforeseen conditions in all project areas and remain in reserve until construction is well underway?

4) Cost estimate in year-of-expenditure (YOE) dollars
   a) Comment on the fit between the YOE schedule for expenditures compared with the project schedule for design and construction.
   b) Comment on the reasonableness of construction escalation for specific commodities that may be included in the YOE cost.
   c) Is the assumed rate of inflation used for each year of the project reasonable?
   d) Identify uncertainties introduced through the development of the YOE cost estimate.
   e) On the Inflation Worksheet, verify that "base year" costs have been spread across the top part of the worksheet in accordance with the project schedule. The base year cost is (year) year dollars -- as if the project was planned, designed and implemented entirely in (year). Compare the rates of inflation inserted by the Grantee this year compared with last year. For past years, verify that the actual dollar amounts expended have been inserted in the YOE (bottom) section of the worksheet and are inflated in the top section.

5) Project Schedule. Comment on the overall reasonableness of the project schedule. Assess the proposed durations for each phase, giving consideration to the national, local, and agency-specific track records for implementation of similar projects. Identify sources of uncertainty. Identify potential obstacles or uncertainties that could affect the schedule such as utilities and real estate acquisition.

6) Develop a concluding statement in 500 words or less:
   a) Briefly describe your findings on project scope, schedule, and cost.
   b) Provide a professional opinion regarding the reliability of the project scope, schedule and cost.
   c) Make a statement of potential range of cost (lower, upper bound and most likely.)
   d) Characterize the top three uncertainties in terms of likelihood (probable, improbable) and their consequence (catastrophic, significant, marginal.)
   e) For areas of significant uncertainty, recommend additional investigation, planning or design work by the Grantee or other parties, with a schedule for the accomplishment of the work.

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall provide FTA with a written report of its findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. After FTA approval, the PMOC should share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

The report formatting requirements of OP-1 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

APPENDIX A

Memo regarding Cost Estimating Methods

The Grantee should develop a memo regarding its cost estimating approach as part of the alternatives analysis work and should update it with each subsequent estimating effort.

The cost estimating methods memo should explain the structure of the cost estimate, assumptions, other projects as precedents, and reference points. The memo should describe the approach to cost information development -- parametric, use of aggregated unit costs per lineal foot of cross-section, use of segments to estimate similar construction conditions within a complex alignment, etc.

If multiple parties are estimating parts of the project, this memo helps to ensure consistency of approach.

The memo should note considerations important to the estimate such as characteristics of the physical context, site constraints, design parameters, institutional constraints, contracting and procurement plans, project schedule, etc.

The memo should include a plan to track throughout the project life both the cost estimate in original format (and construction contractor's cost breakdown) and FTA's Standard Cost Category (SCC) format. The SCC worksheets are provided on FTA's website for the reporting of capital costs.

U.S. DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 45 – Small Starts Review

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) as regards Small Starts projects: the reasonableness, quality, completeness, and reliability of the project scope, cost, and schedule and the technical capacity and capability of the Grantee to execute the project. This PMOC may be directed to perform this review at various milestones during the project development, including:

- Approval for entry into Project Development (first design phase)
- Approval for a Project Construction Grant Agreement (PCGA) / funding
- When issues arise that may impede project progress or successful implementation

2.0 BACKGROUND

FTA conducts oversight of major capital projects receiving federal funds to assess Grantee compliance with federal requirements and ensure projects are completed within budget and on schedule. The project management oversight (PMO) program also has an important role in providing technical assistance to Grantees, helping them address problems and other issues that arise during the various phases of project development, from preliminary engineering through construction and start-up.

Initially, prior to the passage of SAFETEA-LU, formal oversight was limited to New Starts projects (Major Fixed Guideway Capital Investments) funded through 49 U.S.C. Section 5309 and generally with a capital cost of at least $100 million and $25 million or more in Section 5309 program funding, although most projects exceeded these thresholds. SAFETEA-LU amended the Section 5309 program to provide funding for a new category of projects designated Small Starts (Capital Investment Grants) in addition to New Starts.

Small Starts are smaller in scale than New Starts and/or are requesting a lower level of Section 5309 program funding. Small Starts projects are defined as projects requesting under $75 million in Section 5309 Capital Investment Grant funding with a total cost of less than $250 million, both in year of expenditure dollars (YOE). The Small Starts program is designed to fill a funding gap in Section 5309 funding and offer streamlining of project approvals, including Small Starts project evaluation and rating.

Small Starts projects can vary considerably in size—from tens to hundreds of millions— and the level of oversight that FTA requires can also vary. Some projects may only entail a general overview of the Grantee's project development program. Others may involve periodic targeted reviews at certain milestones. Larger, more complex projects may have continuing oversight at intervals directed by FTA. The work order will indicate the frequency and type of review.

The PMOC will provide technical oversight support to FTA in many of the same ways it does for a New Starts project, such as determining the completeness and quality of engineering designs; the reasonableness and general accuracy of cost estimates; the reasonableness of the project schedule. The PMOC may be directed to assess the ability of the Grantee to execute the project (technical capacity and capability) and provide technical assistance to the Grantee. In this respect, oversight procedures for New Starts projects are applicable to Small Starts, with the proviso that the level of effort is likely to be less. Refer to other oversight procedures

3.0 OBJECTIVE

The objective is to evaluate Small Starts projects to ensure:

- The scope of the project indicated in the engineering design and cost estimate is consistent with the purpose and need established during the environmental review phase
- Planning and design have been completed to a level commensurate with the current phase of the proposed project (e.g., entry into Project Development or award of a Project Construction Grant Agreement)
- The Grantee has in place policies, procedures and other project management programs to deliver a quality project within budget and on schedule
- Cost ceilings for Small Starts are not exceeded

4.0 REFERENCES

The following are the principal, but by no means the only, references to Federal legislation, regulation and guidance with which the PMOC should have a good understanding as related to the Grantee's project work being reviewed under this OP:

4.1 Guidance - FTA New Starts Policies and Procedures, www.fta.dot.gov/planning/newstarts/planning_environment_222.html

5.0 PROJECT SPONSOR SUBMITTALS

In order to show that the proposed project qualifies as a Small Starts project, and to demonstrate consistency among the scope, cost and schedule, the Grantee will submit:

- Alternatives Analysis, Locally Preferred Alternative report
- Environmental impact studies, if applicable (EIS/ Record of Decision; Environmental Assessment/Finding of No Significant Impact; or Categorical Exclusion)
- Project narratives / descriptions
- Diagrams, drawings, plans, profiles, cross section drawings, special design studies, graphics
- Specifications, design criteria reports
- Cost estimate in original format and in FTA's Standard Cost Category format (SCC)
- Capital cost estimating methodology memo (refer to Appendix A)
- Third-party agreements, including memoranda of agreement/understanding (e.g., utilities, governmental agencies, educational institutions, railroads)
- Value engineering studies, as applicable
- Previously conducted or current risk assessments, if any.

- Project Schedule (Master Schedule and supporting documents)
- Project funding strategy
- Operating and maintenance cost estimates and estimating methodology memo

For assessment of the Grantee's technical capacity and capability to execute the project, the Grantee will provide:

- Project Management Plan, related policies and procedures, and documentation of other project controls that will be used to design, construct and operate the project
- Project implementation (contracting) plan, if required
- Fleet management plans, if required
- Project operations plan.
- Real Estate Acquisition and Management Plan, if applicable

The Grantee will at the request of FTA and/or the PMOC provide other information relevant to the project scope, schedule and budget and Grantee roles and responsibilities for project development.

6.0 SCOPE OF WORK

FTA will define the scope of PMOC services to be performed in the work order issued to the PMOC. The following is a list of tasks, some or all of which the PMOC could be directed to perform in support of FTA's oversight of a Small Starts project.

In advance of performing the work, the PMOC should meet with the Grantee and its staff and consultants, discuss the purpose of the review, and obtain necessary information.

6.1 Entry into Project Development or Award of PCGA

Prior to FTA approval of project to enter Project Development and prior to approval of a PCGA:

1) Obtain an understanding of the project and evaluate the reliability of the project scope.
   a) If directed by FTA, through a site visit, perform an on-the-ground check of physical conditions. Verify project fit with local conditions through study of project planning diagrams, jurisdictional zoning and transit-oriented development maps, and concept design drawings.
   b) Review and characterize the systems and vehicles to confirm the appropriateness for the transit application to achieve stated performance levels (i.e., system capacity requirements versus design capacity).
   c) For projects requesting approval to enter Project Development, perform a consistency check of the engineering design and capital cost estimate relative to project information presented in the environmental document or comparable project background information provided by the Grantee. Normally, approval to enter Project Development would occur with preparation and circulation of the draft environmental document. (To receive approval to enter Project Development, a project must have completed Alternatives Analysis and NEPA scoping, adopted an LPA, with the LPA included in the local MPO's long range plan, and received a medium or better rating from FTA.) At the completion of the environmental process (ROD, FONSI or Categorical Exclusion), perform a consistency check of the environmental document, the project design and capital cost estimate.

d) Review the Grantee's project design documents for clarity, accuracy, and level of detail for a project at the current phase of project development. Review findings of value engineering and risk assessments if any have been performed.

2) Evaluate the reliability of the project cost estimate.
   a) Review the estimate in its original format and in Standard Cost Category format (SCC)
   b) Evaluate the Grantee's estimating methodology.
   c) Verify the "base year" of the estimate.
   d) Discuss with Grantee its assumptions regarding escalation of materials and labor.
   e) Discuss with Grantee its assumptions regarding inflation over the project life and the level of associated uncertainty.
   f) Evaluate the capital cost estimate in relationship to the scope. Make recommendations where additional detail or other information is needed.
      i) Check the estimate's internal consistency (does it add up?).
      ii) Spot check estimated quantities and unit costs.
      iii) Evaluate the reasonableness of escalation for commodities and labor.
      iv) Identify sources of uncertainty and related potential for cost increases.
      v) Check the adequacy of the allocated contingency for specific line items.
      vi) Check the adequacy of the unallocated contingency.
   g) Verify the match between the YOE costs and the project schedule.
      i) Evaluate the reasonableness of inflation rates used over the project life.

3) Evaluate the completeness, level of detail, and reasonableness of the project schedule.
   a) Address the number of activities, logic and logic ties, the critical path, general internal consistency of the schedule, and the scheduling assumptions adopted by the Grantee.
   b) Address durations for each phase of work in relation to the completion of similar work by other agencies, if known, and the Grantee's track record for implementing similar projects.
   c) Evaluate sources of uncertainly and their likely effects on the schedule should be described.

4) Describe and evaluate the Grantee's technical capacity and capability to undertake and successfully complete the project, including its management structure, staff and consultant organization and experience, professional skills and project experience.

      i) Evaluate the Grantee's project management plan (PMP) for compliance with FTA requirements and best management practices. This includes the adequacy of the Grantee's strategy to deliver the project within budget and on schedule and with project controls adequate to design, construct, test and start up a quality system that assures the safety and security of the riding public.

5) Specifically, at approval to enter into a PCGA, verify that the Grantee has:

   a) Updated the PMP through construction and start-up and incorporated risk management.
   b) Completed drawings, specifications, and bid documents as required by the project design and method of procurement.
   c) Resolved and received FTA's agreement to right-of-way acquisition and relocation agreements, and other agreements with third parties such as freight railroads, Amtrak, utility companies, and other governmental agencies.

d) Assessed safety and security issues and has a written sign-off by the State Safety Oversight Board
e) A System Safety Program Plan (SSPP) or Safety and Security Management Plan (SSMP) in place
f) Determined the funding sources and local share contribution.
g) Demonstrated financial capacity to operate and maintain the project once built. This assessment is normally made by others.
h) Analyzed remaining uncertainties and proposed mitigations.
i) Provided for third party interfaces such as for real estate acquisitions and relocations (conforming to the Uniform Relocation and Real Property Acquisition Act), utilities, freight railroads, Amtrak, etc.

6.2 Construction

During construction at intervals requested by FTA:
1) Evaluate the progress and quality of construction and testing against the scope, schedule and cost estimate.
2) Note construction issues that could affect within-budget and on-schedule project completion. The PMOC shall assist FTA and the Grantee in developing and implementing project recovery plans in the event performance is significantly below targets.

6.3 Other

FTA may direct the PMOC to perform certain of these tasks at other milestones during project implementation. For instance, on larger Small Starts projects, FTA evaluates the features and Small Starts qualifications of the grantee's locally preferred alternative (LPA). This occurs prior to entry into Project Development. When requested, the PMOC will assist FTA in technical aspects of the review, such as the relationship of the LPA scope to conceptual designs, preliminary cost estimates, project risks, and other issues.

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall provide FTA with a written report of its findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. For areas of significant uncertainty, recommend additional investigation, planning or design work by the Grantee or other parties, with a schedule for the accomplishment of the work. After FTA approval, the PMOC should share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

The report formatting requirements of OP-1 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

APPENDIX A

Memo regarding Cost Estimating Methods

The Grantee should develop a memo regarding its cost estimating approach as part of the alternatives analysis work and should update it with each subsequent estimating effort.

The cost estimating methods memo should explain the structure of the cost estimate, assumptions, other projects as precedents, and reference points. The memo should describe the approach to cost information development -- parametric, use of aggregated unit costs per lineal foot of cross-section, use of segments to estimate similar construction conditions within a complex alignment, etc.

If multiple parties are estimating parts of the project, this memo helps to ensure consistency of approach.

The memo should note considerations important to the estimate such as characteristics of the physical context, site constraints, design parameters, institutional constraints, contracting and procurement plans, project schedule, etc.

The memo should include a plan to track throughout the project life both the cost estimate in original format (and construction contractor's cost breakdown) and FTA's Standard Cost Category (SCC) format. The SCC worksheets are provided on FTA's website for the reporting of capital costs.

U.S. DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 46.1 – LPA Review and Readiness to Enter PE Review

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) as regards the reliability of the project scope, cost, and schedule of the Locally Preferred Alternative (LPA) and readiness of the project to enter preliminary engineering (PE).

2.0 BACKGROUND

When a Grantee requests entry to PE for a proposed project, FTA undertakes a number of reviews. This review by the PMOC provides FTA with critical input – assessment, conclusions, recommendations, and professional opinions substantiated with project information and comparative industry bench marks -- regarding the reliability of the project scope, cost, and schedule of the LPA. This review also includes an analysis of the adequacy of the Grantee's technical capacity and capability to perform preliminary engineering work to develop the LPA into a project. Also, Grantee submittals are reviewed to verify the Grantee's compliance with applicable Federal requirements and FTA program requirements.

Consistent with 49 USC 5309(e) (6) and 5328(a) (2, 3), FTA approves/disapproves the entry of a proposed project into PE within 30 days of receipt of a formal request from the Grantee provided the following actions have been completed:

- The Alternatives Analysis was completed and the LPA was selected in accordance with the National Environmental Policy Act of 1969 (NEPA);
- The LPA has been incorporated by the Metropolitan Planning Organization (MPO) into its financially constrained metropolitan transportation plan;
- The Grantee demonstrates adequate technical capacity and capability to carry out preliminary engineering for the proposed project;
- Other applicable Federal requirements and FTA program requirements are met.

FTA's approval is based on the results of its evaluation as described in 49 CFR Sec. 611.9-611.13. At a minimum, a proposed project must receive an overall rating of "Medium" to be approved for entry to PE. The PMOC's performance of this review as documented in a written report is critical input to FTA evaluation and decision making.

3.0 OBJECTIVES

With intense competition for limited Federal New Starts funding, project admittance into the New Stars pipeline is carefully considered. Project Sponsor submittals must undergo a thorough review to ensure that projects entered into preliminary engineering are meritorious and have a high likelihood of

successful completion. This review helps FTA to make these determinations and helps to establish a level playing field for rating these projects.

The project at the time of this review is in an early stage of development. In fact in most cases, the project has just emerged as the preferred alternative from an analysis of many mode and alignment alternatives. However, significant information should be available for the PMOC to undertake a qualitative and quantitative review.

The PMOC is to synthesize the findings of its review, describe the project, provide FTA with a well-grounded professional opinion as to the reliability of the scope, cost, and schedule of the LPA, describe uncertainties, and make a statement of the potential cost range (lower/upper bound). For areas of significant uncertainties, the PMOC is to recommend additional investigation, planning or design work by the Project Sponsor and stipulate a time frame for accomplishing the work either prior to or after FTA's decision regarding project entry into PE. The Project Sponsor's technical capacity and capability to preliminary engineer the project should be assessed and deficiencies with recommended remedies should be provided.

4.0 REFERENCES

The following are the principal, but by no means the only, references to Federal legislation, codification, regulation and guidance with which the PMOC should have a good understanding as related to the Grantee's project work being reviewed under this OP:

4.1 Legislative
- Surface Transportation and Uniform Relocation Assistance Act of 1987, P.L. 100-17
- The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, or SAFETEA-LU, Pub.L. 109-59

4.2 United States Code
- FTA enabling statutes, 49 U.S.C. Chapter 53, Section 5327

4.3 Regulations
- Project Management Oversight, 49 C.F.R. Part 633
- Major Capital Investment Projects, 49 C.F.R. Part 611
- Joint FTA/FHWA regulations, Metropolitan Planning, 23 C.F.R. Part 450
- Joint FTA/FHWA regulations, Environmental Impact and Related Procedures, 23 C.F.R. Part 771
- U.S. DOT regulation, Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally Assisted Programs, 49 C.F.R. Part 24

4.4 FTA Circulars
- C4220.1F, Third Party Contracting Requirements
- C5010.1C, Grant Management Guidelines
- FTA Master Agreement
- C6800.1, Safety and Security Management Plan

4.5 Guidance
- Guidance for Transit Financial Plans, June 2000
- Reporting Instructions for the Section 5309 New Starts Criteria

- Interim Guidance on Design-Build
- Quality Assurance and Quality Control Guidelines
- Project and Construction Management Guidelines, 2003 Update
- Value Engineering Process Overview, January 1998

5.0 PROJECT SPONSOR SUBMITTALS

In advance of performing the review, the PMOC should meet with the FTA Regional Office, the Project Sponsor and their consultants, visit the project sites, discuss the purpose of the review, and obtain and study the available project documents:

To verify the status of the LPA

- MPO adopted Long Range Transportation Plan
- Transportation Improvement Program

Narrative and drawing material

- Written project narrative, project description
- Project sponsor's New Starts submittal
- Final Alternatives Analysis Report
- Environmental studies, Draft Environmental Impact Statement, Environmental Assessment
- Design Criteria, Design Standards
- Planning diagrams and drawings, materials used in public presentations
- Plans, profiles, cross sections, special studies for locations with large uncertainties Cost and schedule information
- Capital cost estimating methodology memo
- Cost estimate and back up detail in Project Sponsor's original format
- Schedule in hard copy and acceptable electronic format i.e. Primavera, .PRX, etc.
- Cost estimate and schedule in FTA's Standard Cost Category format
- Operating and Maintenance Cost Estimates and Assumptions
- Transit Agency Operating and Capital Budget

Other Documentation

- Project Sponsor Organization and Staffing
- Project Management Plan
- Operating Plan
- Rail Fleet Management Plan
- Bus Fleet Management Plan
- Risk Register and Mitigation Plan
- Contracting Plan for Preliminary Engineering
- Contingency Management Plan (identifying significant areas of uncertainty in scope, cost, and schedule)
- Real Estate Acquisition Management Plan
- System Safety and Security Management Plan
- Quality Assurance/Quality Control Plan
- Third Party Agreements and Permits

6.0 SCOPE OF WORK

The PMOC should form a competent team of subject matter experts with prior experience to fulfill the requirements below:

1) Setting the groundwork

   So that this review is undertaken at the appropriate time, the FTA Regional Office should confirm that the Project Sponsor's materials are developed to the level required at entry to PE. The PMOC should coordinate with the Regional Office to make the initial interview, project discussion and site visit with the project sponsor and to obtain from the project sponsor the materials to be reviewed.

   The PMOC should verify that the Final Alternative Analysis Report (AA) indicates that the project sponsor has considered all reasonable alternatives. In particular, the PMOC should verify that a transit mode was not overlooked leaving the LPA open to later challenge.

   The PMOC shall verify that the Notice of Intent for the environmental review has been issued. If an environmental document has been produced, a Draft Environmental Impact Statement (DEIS) or Environmental Assessment (EA), the PMOC shall verify that impacted third parties have been notified of the project and provided with an opportunity to review and comment. For each impacted third party, the PMOC shall coordinate with FTA's Regional Office that the correct representative has been identified and the correct address has been used.

   The review should verify that the project is adopted into the MPO's financially constrained Long Range Transportation Plan and the Transportation Improvement Plan and identify which year the LRTP and TIP call for the project to be funded.

2) Project Scope

   The PMOC should review the project scope in relation to the Draft Environmental Document, Operating Plan, Design Criteria, Schedule and Budget including an evaluation of the mitigation measures as follows:

   a) Assess the Project Sponsor's fundamental reasons for the project and for selecting this alternative from the alternatives considered. Confirm that all reasonable modes were considered by the Project Sponsor in its alternatives analysis. Comment on the project assumptions that have led to scope decisions (relationship between the transit project and existing or future residential/commercial development, ridership in the forecast year, operating plan, infrastructure and vehicle capacities, project implementation schedule, and life cycle considerations, etc.)
   b) Through a site visit, perform an on-the-ground check of physical conditions. Verify project fit with local conditions through study of project planning diagrams, jurisdictional zoning and transit-oriented development maps, and concept design drawings.
   c) Study and evaluate the project documents (narratives, design criteria, planning diagrams, plans and profile drawings, aerial photos, and environmental studies) for completeness including:
      (1) Spatial and functional aspects of the project
      (2) Compliance with applicable statutes, regulations, guidance and policies, including but not limited to, the level boarding provisions of the Americans with Disabilities Act.

(3) Appropriateness of the proposed infrastructure, systems and vehicles for the transit application to achieve stated performance levels
(4) Identification of perceived gaps, omissions, and/or inconsistencies
(5) Consideration of possible alternative approaches or value engineering options
(6) Identification of uncertainties in the project scope, schedule or cost and their potential impacts

d) If adequate graphic or written scope description is not available, recommend additional work by the Project Sponsor, and a time frame for completion.

3) Project Design Capacity

The PMOC should assess the capacity of the project to operate and accommodate ridership in the twenty to twenty-five year forecast, based on the requirements of the operating plan. At the minimum, consider the Project Sponsor's fleet size, station platform lengths, track configurations, signal, power, communications systems, and maintenance facilities.

4) Project Capital Cost

The PMOC should review and assess the project cost estimate accuracy, in comparison to similar projects completed in recent years, and industry accepted indices and benchmarks as follows:

a) Introduction
i) Review the estimate in its original format and in Standard Cost Category format (SCC)
ii) Include the names of the firm(s) that prepared the estimate
iii) From the SCC Main Worksheet, provide the date shown; verify that the "base year" reflects the current year
iv) On the Inflation Worksheet, verify that a supportable rate of inflation is inserted for each project year

b) In base year dollar terms
i) Describe the methodologies of developing the cost information, and assess the appropriateness of the methods. The following are examples of possible methods which could be utilized:
(1) Parametric estimating (Using aggregated unit costs based on similar past projects)
(2) Establishing Cost Estimating Relationships (CERs are costs established as a percentage of another cost. This other cost, or the basis, is identified.)
(3) Identification of typical construction conditions (such as typical cross-section) as a basis for estimating, and applying aggregated unit costs (cost per linear foot of cross-section) based on similar local projects in the recent past.
(4) Costing as products of discrete unit costs and quantities
(5) Lump sum costing
ii) Review the cost estimate for:
(1) Consistency with project scope and material quantities, as verified against the drawings
(2) Validity of the unit costs, as verified against recent similar construction bids
(3) Completeness and mechanical correctness (does it add up?)
(4) Adequacy of the allocated contingency for specific line items, and the unallocated contingency relative to total project cost

(5) Adequacy of the total of the allocated and unallocated contingencies, as a percentage of the total base year dollars, based on the risks outlined in the Grantee's Risk Register and the PMOC's assessment

iii) Assess the reasonableness of the assumptions for construction escalation (materials, commodity and labor pricing), and inflation, both of which cannot be accurately forecast, and are beyond the staff's control.

c) In year-of-expenditure dollar terms
   i) As translated into the inflation rate for each year of the project (refer to Inflation Worksheet), and the year-of-expenditure costs, assess the reasonableness of the assumptions for 1) construction escalation (materials, commodity and labor pricing) and 2) inflation.
   ii) Identify uncertainties that have been introduced through the development of the Year of Expenditure (YOE) cost estimate. Estimate the cost and time impact of these uncertainties.

d) In conducting the review above, consider the following:
   i) The political, institutional and project management context of the project, with the understanding that these will most likely change during the duration of the project.
   ii) Unresolved issues or agreements for shared responsibility or joint use
   iii) Restrictive schedule or mobilization requirements
   iv) Geotechnical and environmental - level of site investigations performed
   v) Real Estate and Right of Way takings and anticipated relocations
   vi) Possible procurement scenarios, contracting methodologies, and anticipated bid climate
   vii) Perceived biases in the cost estimate
   viii) Potential costs due to the availability of commodities or labor, and escalation factors used
   ix) Potential costs due to change in the inflation rate, and inflation factors used
   x) Any other project risks

5) Project Operating and Maintenance Costs

The PMOC should review the Project Sponsor's estimates of and assumptions used in developing the project's operating and maintenance costs. Estimates should be analyzed in comparison with existing recently completed projects of similar size.

6) Project Risk

The PMOC should review the Project Sponsor's Risk Register and Management Plan, and will independently identify potential risks due to optimistic assumptions, or value engineering. Identify sources of uncertainty and their potential impact on the schedule and cost, especially in relation to contingency. (Uncertainties may include, but are not limited to, unresolved issues, changes or inadequate project definition associated with the design, mitigation measures and construction scope; the political, institutional and project management context of the project; third party and real estate acquisition issues, procurement conditions, contracting methodology, bid climate; methodology of developing the capital cost estimate itself; perceived biases in the estimate; availability of and changes in funding sources / financing mechanisms; cost of inflation or change in the value of the dollar over time.)

7) Project Schedule

The PMOC should assess the accuracy of the schedule in form and substance. Consider the durations and logic of the activities in relation to those of other Project Sponsor's, and the Project Sponsor's track record for implementing similar projects with FTA finding. Identify sources of uncertainty or missing activities on the schedule, and their potential impact on the schedule. Evaluate the adequacy of the scheduling software for this stage of the project. Identify the potential cost impacts of the schedule risks.

8) Project Management Plan

The PMOC should evaluate the Project Sponsor's Project Management Plan (PMP) to assure it complies with FTA's guidelines. The plan shall include: project overview; organization and staffing; project management and controls; planning/conceptual design phase management; final design phase management; construction phase management; close out phase management; quality management; risk management; procurement; contract administration; and communications. The PMP at this stage of project development must have detailed sections of project organization and staffing, project budget and schedule, quality assurance/quality control, risk management, and project controls, with supporting procedures as necessary. These procedures include Document Control Procedures, Change Order Procedures, Material Testing Procedures, Internal Reporting Procedures, and Operational Testing Procedures. Other sections related to the construction phase may not require the same level of detail, unless, the Project Sponsor anticipates receiving early construction packages, through use of the Letter of No Prejudice (LONP).

9) Project Sponsor's Technical Capacity and Capability

The PMOC should evaluate the Project Sponsor's capacity and capability to undertake and successfully complete the PE Phase, through review of the Project Management Plan, relevant project documents, and interviews with key project team members and stakeholders. The capacity areas to be evaluated are: management structure; community, political and institutional support; staff and consultant organization; along with professional skills and experience to effectively implement the proposed project, in conformance with sound engineering and project management practices. In particular, review and assess the qualifications of the staff and consultants that have prepared the documents submitted to date, including conceptual design, cost and schedule.

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall provide FTA with a written report of its findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. After FTA approval, the PMOC should share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

The report formatting requirements of OP-1 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as

Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.

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Oversight Procedure 46.2 – Readiness to Enter Final Design

1.0 PURPOSE

The purpose of this Oversight Procedure (OP) is to provide guidance that reflects FTA's program requirements for projects to advance into the final design phase of project development. This OP describes tasks and information required of FTA's Project Management Oversight Contractor (PMOC) as they perform reviews of Grantees' projects, thereby assisting FTA in its determination to approve a Grantee's request to enter final design.

2.0 BACKGROUND

Consistent with 49 USC 5309(e)(6) and 5328(a)(3), FTA will approve/disapprove entry of a proposed project into final design within 120 days of receipt of a formal request from the project sponsor(s). A proposed project can be considered for advancement into final design only if the NEPA (National Environmental Policy Act) process has been completed; a New Starts submittal has been accepted by FTA and the project is rated favorably; approval to enter preliminary engineering (PE) was received from FTA and design to approximately the 30 percent level ("schematic design"[1]), has been prepared; a project cost estimate and detailed schedule have been issued; and the Grantee can demonstrate adequate technical capacity and capability to carry out final design ("design development"[2]) for the proposed project, among other requirements. All applicable federal and FTA program requirements for PE and readiness to enter final design must have been satisfied (see 3.0 References).

FTA's approval will be based on the results of its evaluation as described in 49 CFR Sections 611.9-611.13 (Code of Federal Regulations, Title 49— Transportation). The FTA Office of Program Management (TPM) works closely with the Office of Planning and Environment (TPE) in determining whether a Grantee is ready to enter final design. TPM, Office of Engineering (TPM-20), has a critical role in determining technical readiness to enter final design as opposed to TPE's role in evaluating whether environmental and planning requirements have been satisfied.

2.1 NEPA Requirements

NEPA requirements for completion of PE include preparation of an environmental impact statement (EIS) where effects from a proposed project are significant or a Finding of No Significant Impact (FONSI) and accompanying environmental assessment (EA) where effects are less than significant. With preparation of an EIS, FTA in approving the preferred project issues a Record of Decision (ROD). The ROD describes the scope of the projected and committed mitigations to reduce the effects of identified impacts. A **New Starts submittal** (or Small Starts if the project is under $250 million and the sponsor is requesting no more than $75 million in program funds) allows FTA to evaluate

[1] Schematic design involves the preparation of studies to determine project requirements, including the scale and relationships of project components.
[2] Design development is the stage subsequent to schematic development, which establishes the detailed requirements of a project including all construction elements.

performance of various aspects of the project, including user benefits as opposed to capital and operating costs, local financial commitment, land use and economic development effects, and other factors. Section 5309(d)(1)(B)(ii) directs FTA to consider proposed New Starts projects for Full Funding Grant Agreements (FFGA) and proposed Small Starts for Project Construction Grant Agreements (PCGA) only if they receive a *Medium, Medium-High*, or *High* overall project rating (See:http://www.fta.dot.gov/planning/newstarts/planning_environment_2620.html).

2.2 Preliminary Engineering Design Requirements

Progress towards completing the project design and the corresponding cost estimate and schedule to build the project must be satisfactory. As noted, **PE** generally requires design detail to 30 percent and capital cost estimate detail based upon (a) quantities of work established in the plans and (b) for all other costs (vehicles, equipment, land/right-of-way, administrative costs, consultant and other support, finance costs, etc.) a reasonable level of line item detail. The master schedule should include sufficient detail to identify all significant activities, their durations, and logical ties to other activities. Section 6.0 Scope of Work provides direction for determining whether the level of detail in the PE plans, cost estimate and schedule is sufficient as well as what other information is required to demonstrate technical readiness to enter final design.

2.3 Grantee Readiness: Technical Capacity and Capability

Whether the Grantee has the necessary management approach and organizational structure, internal and external controls, and other resources available to administer a project—**technical capacity and capability**—is another important aspect of readiness to enter final design. The procedures for making these assessments are established in other guidance (see 4.0 References). The Grantee should document its program for project management in a current Project Management Plan for at least the design phase of project development (the PMP would incorporate provisions for construction as that phase approaches).

At the conclusion of PE a project is likely to be subject to a formalized risk assessment that will evaluate whether the grantee has incorporated risk-based methods into its approach to project management. FTA guidelines also call for the Grantee to evaluate the project design through a formal, independent value engineering process during or at the close of PE. Both the risk assessment and value engineering processes are to be incorporated in the PMP, which describes their purpose and objectives, summarizes findings, and presents the action plan resulting from each process (e.g., Project Risk Management Plan for a risk assessment). The assessment of readiness to enter final design conducted under OP 46.2 incorporates findings of the risk assessment and value engineering programs.

3.0 OBJECTIVES

FTA desires the PMOC's professional and well reasoned findings and recommendations regarding the readiness of the Grantee to enter and complete the final design phase. Findings and recommendations shall pertain to:

1) The completeness, quality, and accuracy of engineering design, the project schedule, and the project capital cost estimate at the conclusion of PE.

2) The Grantee's program for advancing the design, schedule, and cost estimate to the point of having available construction-ready bid documents.[3]

3) The Grantee's ability to execute final design and construction (i.e., technical capacity and capability) and whether the Grantee has adopted a risk-based management approach to project implementation that incorporates findings of a project risk assessment.

4) Whether the Grantee has in place other project controls and management policies and procedures to execute the project, including those for maintaining quality control/quality assurance of products and services; the safety and security of project design, construction and operation; and, acquisition of required rights-of-way, among other policies and procedures.

5) Satisfied other FTA requirements for readiness to advance to final design.

This information, combined with findings from environmental, New Starts, financial, and other FTA-directed reviews will support FTA's determination on whether or not to approve Grantee entry into the final design phase of project development

4.0 REFERENCES

The following policies, guidance documents, and circulars apply to the performance of this OP and should be consulted by the PMOC as necessary to support a recommendation on the Grantee's readiness to enter final design.

- 49 USC 5309, (See Section (e), and 49 USC 5309(e)(6) and 5328(a)(3), Parts Sections 611.9-611.11)
- U.S. Department of Transportation, Federal Transit Administration. *Project and Construction Management Guidelines 2003 Update.* May 2003. (See Chapter 2 Section 2.4, and Chapter 4)
- National Transit Institute. Rutgers, The State University of New Jersey. *Management of Transit Construction Projects* (seminar and course materials)
- *Risk-Informed Project Oversight at the FTA*, David N. Sillars and L. Brian Ehrler. August 2007
- For information on FTA New Starts Policies and Procedures see specific references at: *www.fta.dot.gov/planning/newstarts/planning_environment_222.html*

Oversight Procedures, including but not limited to:

- OP No. 11: Project Sponsor Capacity and Capability
- OP No. 16: Design and Constructability Reviews
- OP No. 20: Project Management Plan Review
- OP No. 21: Quality Assurance / Quality Control Plan Review
- OP No. 22: Safety and Security Plan Review
- OP No. 23: Real Estate Acquisition and Management Plan Review
- OP No. 25: Fleet Management Plan Review
- OP No. 32: Scope
- OP No. 33: Capital Cost Estimate
- OP No. 34: Schedule Review
- OP No. 40: Risk Assessment and Mitigation Review

[3] For projects intended to be implemented through alternative delivery methods, such as design-build, design-build-operate, etc. where the selected construction contractor will complete the design after some point, the Grantee would advance project or project component design to the bid stage and not to completion.

- OP No. 39: *Value Engineering*

5.0 PROJECT SPONSOR SUBMITTALS

A number of documents and other information are to be provided by the Grantee for the PMOC to examine in carrying out this OP. These include, but are not limited to, the following:

- Final Environmental Impact Statement (or FONSI/Environmental Assessment)
- Record of Decision for EIS, including project effects mitigation plan
- Recently adopted and any revised versions of Grantee's operating budget
- Project master schedule, including electronic files in the scheduling software
- PMP
- Quality Assurance/Quality Control Plan
- Safety and Security Management Plan
- Real Estate Acquisition and Management Plan (RAMP)
- Third-party agreements, including memorandums of agreement/understanding (e.g., utilities, governmental agencies, educational institutions, railroads)
- PE plans, specifications, and capital cost estimate in Contract Unit and SCC format, including detailed back-up and capital cost methodology report
- Project's proposed implementation (contracting) plan
- Fleet management plans
- Project operations plan
- Value engineering studies
- Previously conducted or current risk assessments
- Other information relevant to the project scope, schedule and budget and project sponsor roles and responsibilities for project development.

6.0 SCOPE OF WORK

The PMOC's assessment of Grantee technical readiness to enter final design will be initiated by a task order (TO) or work order (WO) from FTA. The TO/WO may expand upon the general scope of services described in this section. For example, FTA may request further detail in conjunction with analyses that are critical to FTA's readiness determination or needed to fill in gaps in Grantee submittals. The OP 46.2 assessment may be performed in conjunction with other oversight activities. In many ways OP 46.2 is a process of integrating findings and recommendations of other reviews, as described in Section 2.0 Background and listed in Section 3.0 References.

In general, for each work item listed in this section, the PMOC will follow a similar analytical approach:

1. Review and analyze the pertinent information available for completeness, adequacy, consistency, and appropriate level of detail given the phase of the work.

2. Identify all apparent discrepancies and deficiencies.
3. State findings in descending order of importance (most likely, largest consequences, least likely, moderate/minor consequences) and make recommendations for modifications or additional work by the Grantee along with a time frame for the performance of the work.
4. For major findings, provide recommendations for the Grantee and/or FTA to implement that will address the issue or correct or mitigate the deficiency.
5. Identify action items, if any, and next steps.
6. Document the assessment, including objectives, approach/methodology, findings, and recommendations and provide back-up information in appendices or attachments to the main body of any report.

6.1 NEPA Overview and New Starts Status

The PMOC shall verify that the

- Definition of the project (i.e., scope) contained in the project ROD/FONSI and most recent New Starts submittal agree with the scope as developed in PE materials, including the approved PMP and the engineering design plans and specifications.
- Basic quantities, such as number and locations of facilities, peak and total vehicles, etc., identified in the environmental document and ROD/FONSI are the same as assumed in the current project definition.
- The current project design satisfies the capacity and operational objectives established in the approved environmental document.
- Mitigations committed to in the ROD (or project mitigation plans), when involving a physical or operational feature of the project, are incorporated—or in the process of being incorporated—into the engineering design, proposed construction program, and/or other implementation plans. Mitigations could include changes in design, use of different types of material, modified traffic control, restricted construction activities, etc.

  NOTE: Need to confirm that this is consistent with OP No. 44, or alternatively, require the review to be performed in accordance with OP No. 44 for the completion of PE/Entry to FD phase of the project

- Environmental and related early permits and approvals for project development have been executed or are in the approval process.

Assuming an OP No. 32 Scope review has been completed, results should be incorporated into this analysis. Consistency between the project as planned and as reflected in engineering design is important.

6.2 PE Plans, Master Schedule, Budget (Cost Estimate)

6.2.1 Engineering Design

The PMOC shall examine the Grantee's PE plans for clarity, accuracy, and level of detail for a project at approximately the 30 percent design level (completion of schematic design). Types of information that should be included in the PE plan sets are listed in Table 1 (pages 12 and 13). *Note for discussion by Review Committee Need to keep this and the future Table 2 consistent with FTA's May 16, 2006 "New Starts Policies and Procedures"*

- Plans should reflect the project scope established during the NEPA process and as described in the ROD or FONSI. Discrepancies or unclear scope items in the plans should be noted.

  OP 32, Project Scope Review, describes the procedures for evaluating the reasonableness and accuracy of the project design. The results of this review, if performed commensurate with the completion of PE/Entry to FD phase of the project, should be incorporated into the OP 46.2 assessment of readiness to enter final design. *Note for discussion by Review Committee: Typical for all references to other OPs: These references throughout this draft are carefully phrased to acknowledge the results of reviews performed in accordance with the related OPs, without actually deferring to them. This is due to hesitancy by some folks to make the leap of faith to assume that all of the OPs can be brought into consistency without redundancy in a timely fashion. However, it leaves guidance to the PMOC somewhat unclear since two different OPs can contain differing guidance on the same issue. The next OP 46.1 draft is adding a bracketed statement for the benefit of the PMOCs at each of these sections.*

6.2.2 Schedule

- The PMOC shall examine the grantee's latest project schedule and verify that it is in general agreement with the most recent New Starts report.
- The PMOC shall determine whether the level of detail (number of activities) and logic (activity interrelationships) are reasonable and sufficient for project design 30 percent complete. Assessment will be made of major activity and overall project durations, leading to a conclusion on whether the project can be completed as planned.
- Risks to the schedule will be identified and areas requiring clarification and/or additional detail described.
- Consistency between the time sensitive variables in the capital cost estimate, including year of expenditure assumptions, and durations incorporated into the master schedule shall be examined.

Table 2 (page 11) provides a summary of information that should be incorporated into the master schedule at the conclusion of PE. The PMOC should characterize the schedule relative to the listed parameters and recommend to the FTA areas for additional detail and improvement as the schedule is updated during final design.

OP 34, Schedule Review, describes the procedures for evaluating the reasonableness and accuracy of project schedules. The results of this review, if performed commensurate with the completion of PE/Entry to FD phase of the project, should be incorporated into the OP 46.2 assessment of readiness to enter final design.

6.2.3 Budget

- The PMOC, with assistance from FTA's financial oversight contractor, shall review the Grantee's most recently adopted capital program budget to ensure that the proposed project is accurately reflected in the budget and Grantee's Project Finance Plan and to ascertain that the Finance Plan supports execution of the project.
- The PMOC shall evaluate the project cost estimate and verify that it is in general agreement with the latest Standard Cost Category cost information contained in the Grantee's most recent New Starts submission.
- The PMOC shall determine whether the cost estimate is consistent with the project scope as defined in the 30 percent engineering design.

- The PMOC shall assess whether the estimate includes sufficient detail to establish a reasonably accurate cost for project development through construction and start-up. If based on quantities/activities and unit costs, are the quantities/activities adequately defined? What prices are lump sums versus based on market research or quotes from potential suppliers/vendors?
- Allocated and unallocated contingencies shall be identified and a professional judgment offered as to the adequacy of contingencies, given project risks, complexity, and other factors.

OP 33 Capital Cost Estimate describes the procedures for evaluating the reasonableness and accuracy of capital cost estimates. The results of this review, if performed commensurate with the completion of PE/Entry to FD phase of the project, should be incorporated into the OP 46.2 assessment of readiness to enter final design.

6.3 Technical Capacity and Capability and Other Readiness Reviews

- The PMOC shall meet with the Grantee to review the grantee's latest approved PMP.
    - The PMOC shall compare the PMP to the grantee's current and proposed organizational structure.
    - The Grantee shall provide the PMOC with the agency's organization chart and job descriptions for the key positions in responsible charge of the final design process.
    - The PMOC shall evaluate whether sufficient breadth and depth are contained in the proposed organization to successfully execute final design.
    - The PMOC shall evaluate technical capacity based on the complexity of the scope of the project, detail/number of activities and activity interrelations described in the project master schedule, the size of the project budget and also the contracting approach to the project.
    - Additionally, the PMOC will consider other resources available to the project, including from project partners, consultant support, and other non-sponsor agency resources.

  PMP review procedures are described in OP No. 20 Project Management Plan Review. The results of this review, if performed commensurate with the completion of PE/Entry to FD phase of the project, should be incorporated into this analysis of Grantee technical capacity and capability.

- The PMOC shall examine the Quality Assurance/Quality Control Plan (QAP) and verify that it is in compliance with FTA guidance documents, including *Project and Construction Management Guidelines* and *FTA QA/QC Guidelines* (latest updates). At entry to final design, the QAP shall fully address all elements governing project activities through the design phase. It should also contain, at least in outline form and to the level of detail possible, information relative to the upcoming construction phase.

  QAP review procedures are defined in OP No. 21, Quality Assurance/Quality Control Program Reviews. The results of this review, if performed commensurate with the completion of PE/Entry to FD phase of the project, should be incorporated into this analysis of Grantee technical capacity and capability.

- The PMOC shall examine the Safety and Security Management Plan (SSMP) and verify that it is in compliance with FTA guidance as provided in Circular C5800.1.

  SSMP review procedures are defined in OP No. 22, Safety and Security Management Plan Reviews. The results of this review, if performed commensurate with the completion of PE/Entry to FD phase of the project, should be incorporated into this analysis of Grantee technical capacity and capability.

- The PMOC shall verify that the Real Estate Acquisition and Relocation Management Plan (RAMP) meets federal requirements and is in agreement with the project schedule and budget.
    - If a real estate acquisition schedule is available, the PMOC shall examine the schedule and compare it to the master project schedule to ensure that parcel acquisition and availability for construction are clearly integrated. In many instances, such detail will only become available during final design itself. When that is the case, the PMOC shall identify the risks to the schedule of acquisitions and determine if the Grantee has in place processes and procedures that would support confidence the planned acquisitions can be completed prior to construction.
    - Similar to above, the PMOC shall undertake a review of the Grantee's technical capacity and capabilities to implement the real estate acquisition and relocation process. This will include a thorough review of the Grantee's organization structure and staffing plan and any consultant agreements undertaken in support of these activities.

  RAMP review procedures are defined in OP No. 23, Real Estate Review. The results of this review, if performed commensurate with the completion of PE/Entry to FD phase of the project, should be incorporated into this analysis of Grantee technical capacity and capability.

- The PMOC shall examine the Rail Fleet Management Plan (RFMP) and/or the Bus Fleet Management Plan (BFMP), and verify consistency with the project scope, NEPA documents, and the project's Operations Plan.

  Fleet Management Plan review procedures are defined in OP No. 25, Fleet Management Plan Reviews. The results of this review, if performed commensurate with the completion of PE/Entry to FD phase of the project, should be incorporated into this analysis of Grantee technical capacity and capability.

- The PMOC shall examine all available third-party agreements deemed necessary to implement the project.
    - The PMOC shall evaluate third-party agreement processes and current status of agreements. Where agreements are not available, the Grantee should provide an outline or term sheet(s). When even this information is not available, the needed agreement shall be identified and the issues and any obstacles to executing the agreements noted.
    - Types of agreements and memoranda to be reviewed include, but are not limited to:
        - utility relocation agreements (public-water, sewer, etc.)
        - intergovernmental agreements (IGA) with local entities
        - agreements with railroad companies (design, construction, operating)
        - third-party franchise agreements (gas, telephone, cable TV, other communications, power)
        - universities, colleges, other educational institutions agreements
        - public/private funding arrangements (including transit-oriented development - TOD).
    - The PMOC shall evaluate the framework and content of these agreements to ensure they conform to the needs of the project.

- The PMOC shall assess the reasonableness and applicability of Value Engineering (VE) studies. The focus should be on VE recommendations approved by the Grantee and incorporated into the project. The Grantee should identify why recommendations were or were not approved.

  VE review procedures are described in OP No. 39, Value Engineering and Life Cycle Cost Analysis. The results of this review, if performed commensurate with the completion of PE/Entry

to FD phase of the project, should be incorporated into the OP 46.2 assessment of readiness to enter final design.

- The PMOC shall assess the constructability of the project as defined in the PE design documents.

  Constructability review procedures are described in OP 16, Design and Constructability Reviews. The results of this review, if performed commensurate with the completion of PE/Entry to FD phase of the project, should be incorporated into the OP 46.2 assessment of readiness to enter final design.

- PMOC shall obtain results of completed risk assessments to evaluate the grantee's predicted adherence to the proposed project budget and schedule; risks and opportunities facing the project that should be addressed during the final design phase; the Grantee's risk management plan and whether it is being implemented as planned; the Grantee's Project Development Plan; and whether the Grantee has incorporated a risk-based management approach to project development.

  Risk assessments are to be performed in accordance with OP No. 40. The PMOC may be directed to perform a risk assessment as part of its review of project readiness to enter final design.

- The PMOC shall evaluate the content and adequacy of other readiness documents such as the project operations plan, project implementation (contracting) plan, Document Control Plan, Configuration Management Plan, and Change Control Plan. Consistency of these plans with the current scope (engineering plans), schedule and budget is to be confirmed.

As a general guide in the performance of tasks in this section the PMOC should also refer to Appendix A, which includes a checklist of activities, milestones, and documentation that should accompany Grantee completion of PE.

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall synthesize the work performed in Section 6.0 into a formal Spot Report(s) following the format and administrative requirements described in OP 01

Reports should include, at minimum, the following information and sections:

- Title page, Table of Contents, List of Acronyms
- Executive Summary
- Introduction/Background
- List of PMOCs and Data Sources/Materials
- Methodology
- Findings and Recommendations
- Conclusions
- Appendices
- References, as appropriate.

Table 1: Expected Attributes of Project Design Plans
(Completion of PE/Approval to Enter Final Design)

Design Activity	Type/Level of Design Detail (for Inclusion in PE Planset)
Design Criteria	Project sponsor accepted design standards and performance requirements
Photogrammetry	Digitized aerial photogrammetry (aerial photo background; planimetric and topographic mapping)
Renderings	Photosimulations and/or schematic renderings
Guideway Plans	Guideway (track/busway/transitway) general notes, standard abbreviations and symbols Guideway key map; horizontal and vertical controls Guideway alignment geometry (plan and profile) Guideway curve data (table and/ included in drawings) Load diagrams for structures (e.g., aerial guideway) Typical sections Guideway drainage plans, including key map, notes and symbols General layouts of (each) grade crossings Maintenance of traffic for special situations Pedestrian crossings
Guideway Structures	Bridge and wall nomenclature, symbols and abbreviations, and general notes Bridge and wall general plans Bridge foundation, abutment, bent plans, and deck plans Retaining walls, including typical wall sections Tunnel layout plans Tunnel structural plans and typical sections Tunnel excavation plans, approach wall plans and sections Other tunnel detail optional: emergency walkway, groundwater control and tunnel drainage, safety and security, fire protection, communications, lighting, ventilation
Stations and Finishes	General information, including notes and legend Station layout plans Platform details Grading and drainage plans Utilities, landscaping Access and parking plans, including paving Aerial station plans showing basic structural and architectural elements, including platform details Tunnel (underground) station plans showing structures and basic architectural details, including platform details
Right of Way Plans	Right of way limits Parcel/property acquisitions and easements, if known
Roadways	Key map showing roadway plan with signalized and other intersections Roadway plans and profiles Typical sections Drainage plans Signing plans Intersection traffic signal plans
Utility Plans	Utilities key map, list of owners, symbols, and notes Utilities plans
Environmental Mitigation Plans	On-site mitigation plans
Systems	Traction power plans, including location of substations and feeds; OCS layouts, as relevant Train/vehicle control plans, including schematic guideway layout (e.g., circuits/block diagrams) Operations control center plan, including basic layout and space allocations Communications plans, including equipment locations, and provisions for station message signs, phones, cameras, other

Table 1, continued: Expected Attributes of Project Design Plans **(Completion of PE/Approval to Enter Final Design)**	
Design Activity	**Type/Level of Design Detail (for Inclusion in PE Planset)**
Maintenance Facility	Overall site plan (existing and proposed conditions) Grading plans and site cross sections Yard/lot layout, with typical sections Access (roadway, parking) plans Utility plans Demolition, landscaping and irrigation, drainage plans, as appropriate Building/facilities plans, including footprint, basic floor plans (functional space layouts), sections Foundation and foundation section plans Safety and security, fire protection plans Basic equipment lists Traction power (OCS, substation locations) plans for rail systems
Other	Urban design/general landcaping features Architectural elements (general concepts/objectives)

Table 2: Expected Attributes of Project Schedule **(Completion of PE/Approval to Enter Final Design)**	
Schedule Activity	**Type/Level of Schedule Information**
Final Design	All major final design activities indicated. For each design discipline (civil, structural, systems, other) detail provided on scope/main tasks All early permits identified as milestone or more detailed activity if possible Carryover/incomplete activities from PE identified Milestones for 60%, 90% and 100% (or similar) percent complete indicated --Logic ties to predecessor activities shown --Required reviews and approvals indicated Logic ties between other major activities shown
Advertise and Bid	Construction packages indicated; single activity for advertise/bid acceptable Logic ties provided from design to advertise/bid and from advertise/bid to construction
Construction	Outline level of detail, including --Each construction package indicated --Five to 15 activities per package, depending upon size
Utilities	Outline level of detail, including --Which utilities affected by project --Estimated timeframe/duration of utility work --Design detail included in FD section of schedule
Real Estate	Outline level of detail, including --Several basic activities included for each construction package --Logic ties shown from design to real estate and from real estate to construction
Final Testing and Startup	Single activity indicating duration and predecessor logic acceptable For phased openings, preliminary detail (e.g., milestones) provided Placeholder for safety certification acceptable
Additional detail would be added in other areas as project proceeds until schedule is complete.	

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Oversight Procedure 46.3 Readiness to Execute or Amend FFGA

1.0 PURPOSE

The Full Funding Grant Agreement (FFGA) is a contract between the Grantee and FTA, and details the rights and obligations of both parties relative to the Project. Because of the importance and the binding nature of the FFGA, FTA requires a final review of the Grantee's readiness to enter into a FFGA or to amend an FFGA.

2.0 BACKGROUND

An FFGA creates of contractual obligation on both the federal government and the Grantee with regard to project scope, budget, schedule, funding, and other terms. Execution of a FFGA is the final step in FTA's approval of a project for implementation. Review of the Grantee's readiness is part of FTA's due diligence review prior to execution or modification of the FFGA, and protects FTA's interests by providing a final check that all of the required predecessor activities have been satisfactorily completed and required project resources are available.

The Project Management Oversight Contractor (PMOC) report that is a product of the readiness review becomes part of the package that is provided to Congress in conjunction with Congressional review of the proposed FFGA.

3.0 OBJECTIVES

The objective of the review of readiness to execute or amend a FFGA is to confirm that:

- All technical aspects of the FFGA are complete and accurate
- All required plans and analysis have been satisfactorily prepared and implemented to the extent necessary

4.0 REFERENCES

Refer to OP 01.

5.0 PROJECT SPONSOR SUBMITTALS

The following are the primary documents required for the review:

- Project Management Plan
- Bus and Rail Fleet Management Plans
- Value Engineering
- Final Design
- Quality Assurance Program Plan
- Document Control Plan

- Real Estate Acquisition Management Plan
- Railroad Agreements
- Third Party Agreements
- Private Utility Agreements
- Environmental Permits
- Safety and Security Management Plan
- Risk Assessment and Mitigation
- FFGA Attachment 1 Scope of Project
- FFGA Attachment 2 Project Description
- FFGA Attachment 3 Baseline Cost Estimate
- FFGA Attachment 3a Project Budget
- FFGA Attachment 4 Baseline Project Schedule

6.0 SCOPE OF WORK

6.1 General

With the exception of the FFGA attachments, all of the Grantee submittals should have been previously reviewed prior to final preparation for the FFGA, and any deficiencies noted to the Grantee and corrected. The scope of this procedure is to confirm that all of the documentation and analysis remains satisfactory and that there is consistency between the project documents and the proposed FFGA.

6.2 Qualifications of Reviewers

To the extent possible, the reviewers should be same individuals that performed the prior review of the project documents, and should be regular participants in monthly project reviews.

6.3 Process for Establishing Readiness

Confirm that Grantee plans and analysis are consistent with the plans and analysis that were previously reviewed and accepted by FTA. If any of the documents are revised, review the revisions and confirm that the revisions are improvements, and that there have been no material changes to project circumstances. Any last minute revisions should be highlighted to FTA.

Review and confirm that FFGA supporting attachments are complete, accurate, and consistent with other project documentation. The FFGA attachments are likely to go through many iterations; and review of each version will be required.

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall synthesize the work performed in Section 6.0 into a formal Spot Report(s) following the format and administrative requirements described in OP 01

Documentation of Grantee's readiness to enter into or amend an FFGA will take the form of a report. The purpose of the report is to provide a summary review of the due diligence findings that have proceeded the FFGA, and to convey the status of the review to FTA executive staff and congress. As

such, the spot report will largely summarize information from previously reviews of project plans and analysis, modified as necessary to reflect any changes that occurred after the earlier review.

The following is a preliminary table of contents for the spot report

List of Acronyms
Executive Summary
1. Introduction / Objectives
2. Overview
    a. Background
    b. Project Scope (Facilities and Systems) with Map
    c. Operations (Hours, Fleet, Ridership)
    d. Design Status
    e. Contract Packaging Plan
    f. Financing Plan
3. FFGA Supporting Document Review
    a. Project Management Plan
    b. Bus and Rail Fleet Management Plans
    c. Value Engineering
    d. Final Design
    e. Quality Assurance Program Plan
    f. Document Control Plan
    g. Real Estate Acquisition Management Plan
    h. Railroad Agreements
    i. Third Party Agreements
    j. Private Utility Agreements
    k. Environmental Permits
    l. Safety and Security Management Plan
    m. Risk Assessment and Mitigation
4. Cost Estimate and Baseline Budget Review
    a. Cost Estimate Assessment
    b. Baseline Schedule Assessment
5. Conclusions / Recommendation

U.S. DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 46.4 Readiness to Bid Construction Work

1.0 PURPOSE

Prior to concurring with a Project Sponsor's request to bid its first construction or equipment contract on a project, FTA requires a review by the Project Management Oversight Contractor (PMOC) of the Project Sponsor's readiness to bid work to ensure that all necessary systems and procedures are in place, and that industry best project management practices are being followed.

2.0 BACKGROUND

Issuance of designs for bid marks an important milestone in project implementation, and is a final step before the Grantee enters into construction contracts that are binding on the Grantee as well as the construction contractor. FTA review of the Grantee's readiness to bid work helps FTA ensure that the Grantee has completed all preparatory activities, is following best management practices, and is fully prepared to successfully manage the construction activities.

3.0 OBJECTIVES

The objectives of the Readiness for Bid Review is to confirm that the bid packages and supporting documentation is complete, accurate, and consistent with project management plans, and to confirm that the Grantee's organization is prepared to successfully manage the procurement and construction processes.

4.0 REFERENCES

None

5.0 PROJECT SPONSOR SUBMITTALS

The following are the primary documents required for the review:

- Construction Plans
- Construction Specifications
- Construction Contract General and Special Provisions
- Construction Cost Estimate
- Request for Bid

In addition, the following supporting documents are required:

- Project Management Plan
- Quality Assurance Plan

- Contract Packaging Plan
- Environmental documents
- Project Master Schedule
- Real Estate Management Plan
- Project Third Party Agreements
- Project Staffing Plan
- Project Budget
- Procurement Policies and Procedures

6.0 SCOPE OF WORK

This procedure has three elements:

1. Confirmation of the readiness for bidding of the complete bid package, including plans, specifications, and contract provisions,

2. Confirmation that the bid package is consistent with project management plans with respect to scope, schedule, and budget, and

3. Confirmation of the readiness of the sponsoring organization with respect to having in place the necessary qualified project staff; consistent project management plans, procurement and construction management procedures; needed interagency, third party, and real estate agreements; and required financial resources.

The accuracy of the review will rely in large part on the perception and judgment of the reviewers. Ideally the reviewers should be senior technical managers, qualified to perform the actual work that they are reviewing. Because transit projects are quite complex and interdisciplinary in nature, this means that the reviewing organization requires a broad range of capabilities -- structural plans should be reviewed by structural engineers, signaling plans should be reviewed by signaling engineers, etc.

The following table presents reviews that might be associated with a typical project. These procedures may be modified or expanded to account for the special circumstances associated with a particular project.

Confirmation of the readiness for bidding of the complete bid package is accomplished by the following specific reviews:

Review Item	**Review Objective**	**Review Method**
Construction Plans and Specifications	To confirm that the Plans and Specifications completely and clearly define the required Work	Review by qualified engineer(s) with expertise in the area(s) of design
Construction Contract	To confirm that the Construction Contract completely and clearly defines the terms and conditions under which the Work will be	Review by a person or contract administrator with experience in managing construction contracts of similar scope and complexity

	performed	
Quality assurance records	To confirm that quality assurance checks and reviews have been performed in accordance with the approved Quality Assurance Plan	Review by a person with experience in performing quality assurance reviews or audits
Construction Cost Estimate	To confirm that the estimate as prepared is consistent with the Plans, Specifications, and Contract General and Special Conditions, and that it is based upon contemporary cost information	Review by a cost estimator with experience in cost estimating, including the estimation of the construction cost impacts of contract special provisions related to risk transfer and construction limitations. Consider interview of agency / consultant estimator to confirm that they have reviewed contract terms and conditions and made appropriate allowances.

The following reviews and comparisons provide confirmation that the Bid Package is consistent with the Environmental Documents and previously accepted project management plans.

Review Item	**Review Objective**	**Review Method**
Plans, specifications, and special contract conditions with respect to Environmental Documents	To confirm compliance of the Work to be constructed with the Environmental Documents	Comparison, using qualified personnel, of the design and construction requirements of the Environmental Document with the designs and requirements of the Bid package.
Plans, specifications, and special contract conditions with respect to Contract Packaging Plan	To ensure consistency between the Bid package and the Contract Packaging Plan	Compare bid package scope with contracting plan using qualified personnel. Particular attention should be paid to risk allocation / transfers and interfaces between contacts.
Plans, specifications, and special contract conditions with respect to Project Master Schedule	To ensure consistency between the Bid package and the Project Master Schedule	Compare bid package schedule information with Project Master Schedule using qualified personnel. Particular attention should be paid to schedule contingency for delay and re-bid, and ensuring that predecessor activities will be not

		interfere with construction per the Bid Package schedule (examples: preceding contractors, utilities relocations, real estate acquisition).
Construction Cost Estimate with respect to Project Budget	To confirm that the Construction Cost Estimate plus appropriate contingencies is affordable within the overall Project Budget	Compare Construction Cost Estimate with Project Budget using qualified personnel. Contingency allocation to consider risk of costs associated to design changes, differing conditions, and delays.

The final set of reviews provide confirmation that the Project Sponsor has completed all the necessary precursors to construction, and is ready to enter the construction phase of the project.

Review Item	**Review Objective**	**Review Method**
Third Party Agreements	To confirm that necessary third party agreements are in place to support the construction.	Review third party agreements in the overall context of the project with qualified personnel. Particular attention should be provided to design standards; inclusion of betterments; and timing of reviews, permits, land transfers, and funds transfers.
Real Estate Management Plan	To confirm that all required real estate will be available when required without impacting construction.	Review of the Real Estate Management Plan by qualified personnel to ensure that the real estate required for construction can be delivered in accordance with the schedule contained in the Bid Package.
Procurement Policies and Procedures	To ensure Procurement Policies and Procedures are in place that are in compliance with federal policies, ensure a fair bidding environment, and are able to efficiently resolve issues and disputes that may arise during the course of the Construction Contract.	Review by qualified personnel of Project Sponsor's Procurement Policies and Procedures (including procedures related to advertisement, bidding, award, disputes, changes, payment, etc.)
Project Staffing Plan	To ensure that the Project Sponsor has adequately implemented a project staffing	Review by qualified personnel of Project Sponsor's plans for hiring or transferring staff to

	plan that ensures the necessary qualified staff will be available to manage and support the Work that is being bid.	support the project. If transfers of existing staff are planned, investigate who will replace transferred staff. If hiring of new staff is planned, review reasonableness of the hiring schedule relative to salary schedule and availability of staff locally.
Financing Plan	To ensure that money will be available to pay the Contractor for the Work on a timely basis	Review the funds availability in the context of all project requirements to confirm that adequate funds will be available on the schedule called out in the Bid Package. Confirm the current validity of any underlying assumptions associated with the Financing Plan (for example, that borrowing will occur at a given time).

7.0 REPORT, PRESENTATION, RECONCILIATION

The results of the **Readiness to Bid the Work for Construction** review will be documented in a spot report conforming to the requirements of OP 01. The spot report may also be augmented by oral presentations to FTA Region and Headquarters staff as required.

An outline of the material to be covered by the spot report is provided below:

Executive Summary – Clearly stated conclusions

1. Introduction / Objectives
2. Review procedures and personnel (including capsule of reviewer qualifications)
3. Readiness of Plans and Specifications
    a. Design quality
    b. Contract
    c. QA/QC
    d. Cost Estimate
4. Consistency with Environmental Document and Project Plan
    a. Consistency with Environmental Document
    b. Contacting Plan
    c. Consistency with Master Schedule
    d. Consistency with Budget
5. Agency Readiness
    a. Staffing
    b. Real estate

c. Third party agreements
d. Procurement policies and processes
e. Funding availability

Conclusions / Mitigation of any shortcomings (detailed, including dates!)

U.S. DOT Federal Transit Administration
TPM-20 Office of Engineering
Project Management Oversight

Oversight Procedure 46.5 – Readiness for Revenue Operations

1.0 PURPOSE

The purpose of this Oversight Procedure is to describe the review, analysis and recommendation procedures and reporting requirements expected by Federal Transit Administration (FTA) from the Project Management Oversight Contractor (PMOC) as regards the Grantee's readiness for revenue operations as evidenced by completed integrated testing of project components and systems. Through early performance of this procedure, the PMOC can help the Grantee to avoid "11th hour" testing, untimely surfacing of operational problems, and related postponements of the revenue operations date.

2.0 BACKGROUND

Completion of the readiness for revenue operations criteria is the ultimate proof that a transit project operates as designed as an integrated whole. Successful achievement of this goal requires expertise, experience, and planning of testing far in advance to avoid impact to construction and the contractually agreed upon revenue operations date.

Proper integration and coordination is important so that the testing process is understood by all involved stakeholders including safety personnel, operations, maintenance, engineering, the construction management consultant and the construction contractors. With proper planning, coordination, and comprehensive plans and procedures, the readiness for revenue operations testing can be implemented successfully, and the transit project can be ready for turnover to the transit agency's operations and maintenance division. It is important that all systems, subsystems, components, equipment, and materials furnished and installed conform to the requirements of the contract documents which generally include plans and specifications. Integrated testing of systems includes such elements as track and associated trackwork; train control systems; signal systems; communications; traction power systems including substations, third rails, overhead catenary systems; vehicles; grade crossing protection systems including traffic signal timing; fare collection systems; and stations.

3.0 OBJECTIVES

The objectives are to assess whether:

- All systems, subsystems, components, equipment, and materials furnished and installed conform to the requirements of the contract documents
- The entire transit system, with all interfaces, operates as indicated in the contract documents as an integrated whole and is capable of functioning effectively to provided dependable service.

4.0 REFERENCES

The following are the principal, but by no means the only, references to Federal legislation, regulation and guidance with which the PMOC should have a good understanding as related to the Grantee's project work being reviewed under this OP:

4.1 Regulations
- Project Management Oversight, 49 C.F.R. Part 633

4.2 Guidance
- Project and Construction Management Guidelines, 2003 Update

5.0 PROJECT SPONSOR SUBMITTALS

Obtain from the Grantee the following:

5.1 Contract Documents – Plans and Specifications and supporting documents as follows:
- Design Criteria and Standards
- Codes and Regulations including those mentioned above
- Relevant Policies
- Operating Rules
- Project Management Plan
- Safety and Security Plan
- Safety Certification
- Quality Assurance/Quality Control Plan
- Risk Assessment Plan

5.2 Project Master Schedule

The schedule for Readiness for Revenue Operations must be integrated into the project master schedule with time-phased activities showing the inter-dependencies between various activities and designating project performance milestones. The goal is to schedule the tests in order to avoid disruption to construction contractor activities and to the grantee's revenue operations.

Track Access. In order to avoid interfering with or delaying construction, track access must be coordinated with the contractors and the agency's operations. This would avoid any disruptions to the contractors' progress which could impact the project schedule.

Cutover. One of the most complicated parts of construction involves the "cutover" to an existing system. The interface point between the existing lines, and the future extensions presents potential for impacts to existing operations during integrated testing and startup. In developing integrated test procedures and coordinating the testing, the focus should be on minimizing the impact of integrated testing during cutover to existing operations. This must be accomplished by proper coordination to determine windows of time for integrated testing which affects the existing system and to determine the contractors' schedules and construction staging plans.

5.3 Systems/Facilities Integration and Coordination Plan

In order for Readiness for Revenue Operations to be successful, a Systems/Facilities Integration and Coordination Plan must be in place to assure that coordination among all stakeholders is accounted for, including adherence to time constraints, access for testing, and having complete documentation necessary to thoroughly test every facet of the transit system. For example if proper coordination with a stakeholder such as the Union Pacific Railroad (UPRR) is not implemented early, there can be serious delays to the testing schedule. Examples of tests involving coordination with the UPRR include:

- Clearance test for the shared transit/UPRR track along the transit corridor.
- Pedestrian crossing warning system test at stations.
- Grade crossing warning system control tests at intersections with both transit and UPRR tracks.

5.4 Test Plan

The test plan is used as a controlling document for all tests and includes the following information:

- Title of each test with reference to the respective article or section number in the contract documents
- Organization performing each test
- Test location
- Submittal date of each test procedure, test report, and certified test document
- Starting date of each test
- Completion date of each test

5.5 Test Procedures

Detailed test procedures shall be provided for each test. Each test procedure shall contain detailed step-by-step procedures for performing the test and shall include the following information:

- Title of test
- Test objectives
- Test location and date of test
- Equipment and instrumentation with accuracy and calibration data
- Test criteria including test setup with circuit diagrams and test sequence
- Test criteria including data evaluation procedures
- Test data requirements including forms and format for recording data
- Primary and supporting test agency

5.6 Test Reports

Test reports shall include the following information:

- Title of test
- Test objectives
- Summary and conclusions
- Location and date of test

- Results including tables, curves, photographs, and any additional test data required to support the test results
- Descriptions of all failures and modifications including reasons for such failures and modifications and names of individuals approving such modifications
- Abbreviations and references
- Signatures of test witnesses

5.7 Test Sequence

It is important that the tests leading to readiness for revenue operations follow the following sequence of events:

- Design Completions. All design affecting the respective equipment or work must have been approved prior to start of any test.
- Inspection. All equipment, devices, and materials must be inspected for compliance to contractual requirements before commencement of any test.
- Test Plans, Procedures and Reports. All requirements in the contract documents regarding test plans, test procedures, and test reports must be completed prior to the commencement of the next phase of test for each respective equipment, device, subsystem, or system.
- Design Tests. All design tests affecting the respective equipment, devices, and materials must be satisfactorily completed prior to proceeding to production tests.
- Production Tests. All production tests affecting the respective equipment and devices must be satisfactorily completed prior to shipment of equipment from the factories.
- Field Tests. Field tests will be performed after installation of equipment, devices, and materials at the project site. All equipment will be verified that it is properly installed, connected, and in operable condition. No equipment will be energized or placed in the operating mode until approved.
- Startup Tests. Startup tests will be performed after satisfactory completion of all field tests to verify that all equipment, devices, and materials installed will function as an integrated system in accordance with the contractual requirements.

6.0 SCOPE OF WORK

The PMOC shall assess and evaluate the adequacy, soundness, and timeliness of the Grantee's performance of the following:

6.1 Testing of all systems including the following:

- Vehicles
- Traction Power System (Substations, Contact Rails, Catenary)
- Train Control System
- Signaling System
- Communications System
- Operations Control Center
- Fare Collection System
- Tracks
- Stations
- Yards and Shops

6.2 Successful completion and recording of the following tests:

- Design Tests
- Production Tests
- Field Tests
- Individual Systems
- Integrated Tests – Static and Dynamic

6.3 Successful accomplishment of the following:

- Establishment of procedures and rules for Operations and Maintenance
- Establishment of emergency response program
- Establishment of Spares and Spare Parts Requirements & Inventory
- Receipt of Safety Certification Tests
- Receipt of Warranties and O&M manuals
- Receipt of Permits for
    - Safety and Security(including coordination with local police department(s))
    - State/County/City Codes
    - Fire Department(s)

7.0 REPORT, PRESENTATION, RECONCILIATION

The PMOC shall provide FTA with a written report of its findings, analysis, recommendations, professional opinions, and a description of the review activities undertaken. After FTA approval, the PMOC should share the report with the Grantee. In the event that differences of opinion exist between the PMOC and the Grantee regarding the PMOC's findings, the FTA may direct the PMOC to reconcile with the Grantee and provide FTA with a report addendum covering the agreed modifications by the Grantee and PMOC.

The report formatting requirements of OP-1 apply. When necessary, PMOC shall perform data analysis and develop data models that meet FTA requirements using Microsoft Office products such as Excel and Word and use FTA-templates when provided. The PMOC may add other software as required but documentation and report data shall be made available to FTA.