

FEDERAL TRANSIT ADMINISTRATION
PROJECT MANAGEMENT OVERSIGHT PROGRAM

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Task Order No. 9

CLIN 0005:
Readiness Report to Amend the Full Funding Grant Agreement

Grantee: North County Transit District (NCTD)

Oceanside-Escondido Rail Project
Spot Report #11 – Delivered December 28, 2007 (FINAL)

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LIST OF ACRONYMS

ARP	▪ Amended Recovery Plan
BCE	▪ Base Cost Estimate
BFMP	▪ Bus Fleet Management Plan
BNSF	▪ Burlington Northern-Santa Fe Railroad
CFR	▪ Code of Federal Regulations
CM	▪ Construction Manager
CPM	▪ Critical Path Method
CPUC	▪ California Public Utilities Commission
DCN	▪ Design Change Notice
DMU	▪ Diesel Multiple Unit
DSDC	▪ Design Services During Construction
EAC	▪ Estimate at Completion
FFGA	▪ Full Funding Grant Agreement
FTA	▪ Federal Transit Administration
NCTD	▪ North County Transit District
PMOC	▪ Project Management Oversight Contractor
PMOOG	▪ Program Management Oversight Operating Guidance
PMP	▪ Project Management Plan
QA/QC	▪ Quality Assurance/Quality Control
QPP	▪ Quality Program Plan
RAG	▪ Rail Activation Group
REAMP	▪ Real Estate Acquisition and Management Plan
RFMP	▪ Rail Fleet Management Plan
ROD	▪ Revenue Operations Date
SANDAG	▪ San Diego Association of Governments
VMF	▪ Vehicle Maintenance Facility
VPI	▪ Vital Processor Interlocking

EXECUTIVE SUMMARY

A. Introduction

To support FTA's decision to amend the Full Funding Grant Agreement (FFGA) for the North County Transit District's (NCTD) Oceanside-Escondido (SPRINTER) Rail Project, the Project Management Oversight Contractor (PMOC) has assessed the project budget and schedule in light of the progress of work to date. The PMOC has reviewed the FFGA Amendment, its Attachments and its related supporting documents. Finally, the PMOC has re-evaluated NCTD's technical capacity and capability to complete the project within the scope, schedule, and budget as described in the proposed FFGA Amendment and in Revision 5 of NCTD's Project Management Plan (PMP).

This report, Spot Report #11, includes the PMOC's findings and conclusions as well as its recommendation to FTA to proceed with the FFGA Amendment.

B. Project Status

The Project is 84% complete with construction 94% complete (based on the overall Project Budget of \$484.1M). All consultant, construction, and procurement contracts have been awarded for the Project. Construction is complete on the San Marcos Loop Contract and Vehicle Maintenance Facility (VMF). The Mainline and Stations Contract is 93% complete. All 12 Diesel Multiple Unit (DMU) vehicles have been received, have been conditionally accepted, and are undergoing burn-in. Burn-in of the DMUs may extend beyond the start of initial revenue service, but this will not impact NCTD's operations since this is a warranty issue and not tied to safety certification requirements.

For NCTD to begin any revenue service, it must fully complete all testing, training, and the safety certification process to the satisfaction of the California Public Utilities Commission (CPUC). In the PMOC's opinion, it is likely that the work will be completed and the approval will be received from CPUC in mid-January 2008. In addition, the CPUC must approve NCTD's System Safety Program Plan and System Security Plan. Action on both plans has been included in the agenda for the January 10, 2008 Commission meeting.

NCTD held an inaugural celebration on December 28, 2007. They are working towards a staged opening with possibly two initial stages and a stage consisting of full revenue operations. It should be noted that the full revenue service will include the complete scope of the project and will be achieved by the FFGA Amendment ROD of July 1, 2008.

NCTD plans the first stage of revenue service to occur in January 2008. This stage will consist of a limited schedule along a portion or entire length of the corridor. This will constitute a "soft opening". It is anticipated that all twelve vehicles will be put into service during the "soft opening".

The second stage is tied to NCTD's bus service adjustments scheduled to begin by the end of January 2008. This level of service will consist of a standard schedule over the entire length of the line and will be designated as modified full revenue service since the eastbound platform at the Escondido Avenue Station will not yet be complete with construction. NCTD has developed work-around solution to ensure patrons that need access to this station have the ability to do so. NCTD has also developed a permanent design solution and has begun implementing the solution.

The operating plans for the initial stages and the full revenue service are being finalized by NCTD and their contractor Veolia. The difficulties associated with such a staged approach include potential ongoing construction activity adjacent to an active rail line. However, the operating plans take this into consideration.

The final stage consists of full revenue service and will likely occur by April 2008 pending completion of the construction at the Escondido Avenue Station.

C. Revised Budget and Schedule Assessment

The original FFGA budget for the Project was \$351.5M. The revenue operations date was December 31, 2005. Between the signing of the FFGA in February 2003 and December 2007, several significant events occurred that resulted in an increase to the project budget of \$132.6M and an extension of the project schedule of two and one-half years.

The new project budget is \$484.1M and the new revenue operations date is July 1, 2008. FTA Section 5309 New Starts funds remain unchanged at \$152.1M. NCTD is utilizing additional local and state funds to cover the \$132.6M increase.

The events that resulted in the change to project budget and schedule are outlined below and are fully described in this report:

- (1) Significant Design Issues
- (2) Grantee Technical Capacity Issues
- (3) Lean Construction Bidding Market
- (4) Escalation of construction costs as a result of added time for negotiations with Burlington Northern-Santa Fe Railroad (BNSF)
- (5) Escalation of construction costs as a result of added time to obtain California Public Utilities Commission (CPUC) approval of deviations from General Order 143-B
- (6) DMU Procurement Costs

As a result of the budget concerns, NCTD was required by FTA to develop a Recovery Plan in 2005 and subsequent Amended Recovery Plan (ARP) in 2006. NCTD submitted the final ARP on September 15, 2006 for a Total Project Budget of \$484.1M, a ROD of July 1, 2008, and no increase in FTA New Starts funds. The \$484.1M budget matched the 80th percentile level of confidence as determined by the PMOC's 2006 Cost Risk Assessment as documented in Spot Report #9 dated October 18, 2006.

This report, Spot Report #11, updates the 2006 Cost Risk Assessment to account for more current base costs and remaining risks. The PMOC determined the current level of confidence for achieving the ARP (and FFGA Amendment) budget of \$484.1M is approximately 89%. NCTD's current Estimate at Completion (EAC) is \$477.6M and is based on the July 1, 2008 ROD.

The current balance of the contingency is \$16.7M, including \$10.1M in allocated contingency and \$6.6M in unallocated contingency. The 2007 Cost Risk Assessment is based on the assumption that full revenue service will occur by April 2008. However, the 2007 Cost Risk Assessment also concluded that NCTD has sufficient contingency to address all project-related administrative costs if the ROD extends to July 2008, assuming that NCTD effectively manages all remaining risks. This conclusion was based on NCTD Management, Administrative, and Construction Management expense "burn rates". In general, the PMOC determined that the FFGA Amendment budget of \$484.1M is adequate to support the SPRINTER Project through the start of revenue service and closeout of all contracts by the end of 2008.

D. FFGA Support Documentation Assessment

FTA, through the requirements of 49 Code of Federal Regulations (CFR) 633, utilizes a PMOC to perform project document evaluations and assessments as part of the FFGA process to ensure successful project implementation within approved budgets and in accordance with approved plans and specifications. An assessment of the following documents and implementation of the work described in the documents is included in this report, Spot Report#11:

- Project Management Plan (PMP)
- Document Control Plan
- Quality Program Plan
- Real Estate Acquisition and Management Plan
- Rail Fleet Management Plan
- Bus Fleet Management Plan
- System Safety Program Plan
- Safety Certification Plan

In general, all listed support documents are acceptable and are currently being implemented by NCTD.

E. FFGA Amendment Attachments Assessment

FFGA Amendment Attachments are called for and described in FTA's Circular C5200.1A Chapter III dated December 5, 2002. The PMOC has reviewed the following NCTD FFGA Amendment Attachments. They have been updated from those in the original FFGA to reflect current conditions:

- Attachment 1 – Scope of the Project
- Attachment 1A – Project Map

- Attachment 2 – Project Description
- Attachment 3 – Baseline Cost Estimate
- Attachment 3A – Project Budget
- Attachment 4 – Baseline Schedule
- Attachment 5 – Prior Grants and Related Documents
- Attachment 6 – Schedule of Federal Funds
- Attachment 7 – Measures to Mitigate Environmental Impacts
- Attachment 8 – Before-and-After Study

The PMOC concludes that the Attachments are consistent with the FTA guidance and are considered acceptable.

F. Conclusion

The PMOC has re-evaluated NCTD's technical capacity and capability to complete the SPRINTER Project within the scope, schedule, and budget through discussions with NCTD, its consultants, and its contractors and through study of NCTD's updated documentation including the ARP, the EAC, and the proposed FFGA Amendment Attachments and other supporting documentation. Based on a thorough evaluation and document review, the PMOC has determined that the amended budget and schedule are adequate and reasonable. The PMOC determined the current level of confidence for achieving the FFGA Amendment budget of \$484.1M is approximately 89%. Based on these evaluations and findings, the PMOC recommends to FTA execution of the FFGA Amendment.

I. INTRODUCTION

To support FTA's decision to amend the Full Funding Grant Agreement (FFGA) for the North County Transit District's (NCTD) Oceanside-Escondido (SPRINTER) Rail Project, the Project Management Oversight Contractor (PMOC) has assessed the project budget and schedule in light of the progress of work to date. The PMOC has reviewed the FFGA Amendment, its Attachments and its related supporting documents. Finally, the PMOC has re-evaluated NCTD's technical capacity and capability to complete the project within the scope, schedule, and budget as described in the proposed FFGA Amendment and in Revision 5 of NCTD's Project Management Plan (PMP).

This report, Spot Report #11, includes the PMOC's findings and conclusions as well as its recommendation to FTA to proceed with the FFGA Amendment.

A. Project Description

The SPRINTER Project consists of converting 22 miles of existing freight rail alignment into a Diesel Multiple Unit (DMU) passenger light rail system. The rail project is situated along State Route 78, the principal east-west corridor in Northern San Diego County. The passenger line will run inland from the coastal City of Oceanside through the cities of Vista, and San Marcos, and the unincorporated areas of the County of San Diego to the City of Escondido. Passenger service will be provided along a joint use corridor where freight service will be operated through a shared use agreement and will be temporally separated from passenger operations. The project will also include 1.7 miles of new DMU exclusive right-of-way to serve the campus of California State University at San Marcos. Passenger rail service will be provided at 15 stations. The project is being constructed by means of three major construction contracts and two equipment procurements as well as several ancillary contracts. The delivery strategy for the construction contracts for the project is a traditional design/bid/build approach with contractor selection via low bid under State of California public contracts code requirements. The primary equipment contract involves NCTD procuring 12 DMU vehicles from Siemens.

A chronology of project events leading to the need for an FFGA Amendment is provided in Appendix A of this report.

B. Project Status

The Project is 84% complete with construction 94% complete (based on the overall Project Budget of \$484.1M). All consultant, construction, and procurement contracts have been awarded for the Project. Construction is complete on the San Marcos Loop Contract and Vehicle Maintenance Facility (VMF). The Mainline and Stations Contract is 93% complete. All 12 Diesel Multiple Unit (DMU) vehicles have been received, have been conditionally accepted, and are undergoing burn-in. Burn-in of the DMUs may extend beyond the start of initial revenue service, but this will not impact NCTD's operations since this is a warranty issue and not tied to safety certification requirements.

For NCTD to begin any revenue service, it must fully complete all testing, training, and the safety certification process to the satisfaction of the California Public Utilities Commission (CPUC). In the PMOC’s opinion, it is likely that the work will be completed and the approval will be received from CPUC in mid-January 2008. In addition, the CPUC must approve NCTD’s System Safety Program Plan and System Security Plan. Action on both plans has been included in the agenda for the January 10, 2008 Commission meeting.

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NCTD plans the first stage of revenue service to occur in January 2008. This stage will consist of a limited schedule along a portion or entire length of the corridor. This will constitute a “soft opening”. It is anticipated that all twelve vehicles will be put into service during the “soft opening”.

The second stage is tied to NCTD’s bus service adjustments scheduled to begin by the end of January 2008. This level of service will consist of a standard schedule over the entire length of the line and will be designated as modified full revenue service since the eastbound platform at the Escondido Avenue Station will not yet be complete with construction. NCTD has developed work-around solution to ensure patrons that need access to this station have the ability to do so. NCTD has also developed a permanent design solution and has begun implementing the solution.

The operating plans for the initial stages and the full revenue service are being finalized by NCTD and their contractor Veolia. The difficulties associated with such a staged approach include potential ongoing construction activity adjacent to an active rail line. However, the operating plans take this into consideration.

The final stage consists of full revenue service and will likely occur by April 2008 pending completion of the construction at the Escondido Avenue Station.

The following table provides the status of all primary contracts.

Table 1. Contract Status

Contract	Notice to Proceed Date	Current Contract Value (M)	Percent Complete	Completion Date (Forecast)
Mainline and Stations	21-Sep-04	\$208.7	93%	(Mar-08)
San Marcos Loop	09-Dec-04	\$26.0	98%	Nov-07
Vehicle Maintenance Facility	30-Sep-05	\$24.5	100%	Sep-07
DMU Vehicle Procurement	05-Mar-04	\$52.2	99%	(Feb-08)
Construction Management ¹	May-02	\$35.9	86%	(Dec-08)
Design Services During Construction ²	Nov-04	\$14.7	89%	(Feb-08)

¹The completion date of the Mainline and Stations Contract is based on non-revenue service related work extending to March 2008.

²The completion date of the CM Contract is based on the time anticipated it will take for closeout of all construction contracts.

II. REVISED BUDGET AND SCHEDULE ASSESSMENT

A. FFGA Budget

The original FFGA budget for the Project was \$351.5M. The revenue operations date was December 31, 2005. Between the signing of the FFGA in February 2003 and December 2007, several significant events occurred that resulted in an increase to the project budget of \$132.6M including contingency and an extension of the project schedule of two and one-half years.

The new project budget is \$484.1M and the new revenue operations date is July 1, 2008. FTA Section 5309 New Starts funds remain unchanged at \$152.1M. NCTD is utilizing additional local and state funds to cover the \$132.6M increase.

The events that resulted in the change to project budget and schedule are fully described below:

(1) Significant Design Issues

Approximate Impact: \$17.3M

Period: February 2004 through construction

Impacted FTA Codes: 13.71.11, 13.71.04, 13.79.00, 132-01, 133-01, 134-01

The bid documents could have been more complete and better coordinated. A large number of addenda were issued during the bid period and numerous changes were identified during construction. Compounding matters, NCTD utilized a unit price bid structure. As a result of the numerous design changes before and after award of the construction contracts, this contracting strategy resulted in significant cost impacts. The design changes resulted in extensive additional costs for the Design Services During Construction (DSDC) consultant, construction cost increases, and a corresponding increase in the level of effort by NCTD and the CM to manage the contracts.

(2) Grantee Technical Capacity Issues

Approximate Impact: \$21.8M

Period: February 2004 to October 2006

Impacted FTA Codes: 13.71.04, 13.79.00

In 2002, the PMOC reported that NCTD demonstrated sufficient technical capability and technical capacity. However, given that the issues described herein were manifested following this assessment, and the manner in which NCTD executed portions of the project, the PMOC determined additional technical capacity (resources) was needed. In general, NCTD was technically capable of completing the project as identified in 2002, but not with the problems that evolved following execution of the FFGA.

(3) Lean Construction Bidding Market

Approximate Impact: \$25.2M

Period: February 2004 to September 2005

Impacted FTA Codes: 132-01, 133-01, 13.43.02

At the time of bidding on the three construction contracts, the San Diego region was experiencing an exceptionally active construction market. Consequently there were fewer bidders for the Project than anticipated and pricing for both labor and materials was at a premium. This resulted in higher than expected bids as well as higher costs for construction change orders. In addition, as a result of the natural disaster Hurricane Katrina, there were significant impacts on the cost and availability of construction materials and labor that in turn had an affect on the SPRINTER Project, particularly with regard to the Vehicle Maintenance Facility (VMF) bids.

- (4) Escalation of construction costs as a result of added time for negotiations with Burlington Northern-Santa Fe Railroad (BNSF)

Approximate Impact: \$37.8M

Period: June 2002 to March 2004

Impacted FTA Codes: 132-01, 133-01

NCTD attempted to execute a Construction Agreement with BNSF to allow closure of the freight operations during construction. The development of the BNSF/NCTD construction agreement commenced in the summer of 2002, when NCTD and BNSF developed a conceptual plan/agreement. But at that time, the BNSF was reluctant to continue development of the accommodation plan, known as “trans-loading”, until the FFGA was executed. In December 2002, the NCTD Construction Management (CM) Consultant developed a cost estimate that indicated that a potential cost avoidance of \$26M could be realized by having BNSF vacate the track during the construction period, thus allowing a high production continuous linear track construction process. The conditions imposed on NCTD as a result of the terms of the negotiations resulted in an extension of the project duration and was viewed as more economical than the alternative of accepting excessive trans-loading costs.

NCTD completed a trans-loading agreement with BNSF, essentially an Amendment to the 1992 NCTD–BNSF Shared Use Agreement, and reached accord with BNSF on March 26, 2004, 13 months after the execution of the FFGA on February 26, 2003. The agreement allowed a freight delivery window on Friday from 6:00 pm to Monday at 4:00 a.m. per the Shared Use Agreement, but the complete closure during construction was not achieved, adding two years to the project schedule.

- (5) Escalation of construction costs as a result of added time to obtain CPUC approval of deviations from General Order 143-B

Approximate Impact: Tied to BNSF delay

Period: December 2002 to December 2003

Impacted FTA Codes: 132-01, 133-01

After detailed negotiations with vehicle suppliers, it was concluded that the DMU railcar vehicles would not comply with the CPUC General Order 143-B requirements for light rail vehicles. Thusly, a protracted development of a request for deviation from the CPUC General Order 143-B was required to allow operation of the DMU in California. This resulted in a delay of over 11 months. On December 18, 2003 the NCTD Board awarded a contract to Siemens to provide 12 DMU vehicles for a not-to-exceed amount of \$50,648,634. The CPUC also approved NCTD's request for deviation at the December 18, 2003 CPUC meeting.

By this time the project encountered a condition in which NCTD would not be able to completely close the Oceanside-Escondido rail corridor during all construction, resulting in the project time-to-construct being extended and culminating in a delay to the FFGA ROD of two years.

(6) DMU Procurement Costs

Approximate Impact: \$12.0M

Period: January 2002 to December 2003

Impacted FTA Codes: 13.13.28

Due to the limited market and relatively small order of twelve DMUs, NCTD experienced nearly a 25% increase in the cost of vehicles over the original budget estimate developed prior to the vehicle solicitation.

It should be noted that the direct impact value associated with each issue was not easily discernable in many cases. The full impact of all issues was \$132.6M, calculated as the difference between the FFGA budget and Amended FFGA budget. However, there is some overlap with regard to the impact of various issues. Therefore, the sum of the individual impacts listed above is greater than \$132.6M when also taking the unallocated contingency amount into consideration.

The following table presents the current financial status of the SPRINTER Project for each line item.

Table 2. Project Financial Status (Through November 2007)

FTA Code	Activity Description	FFGA Budget	ARP Budget	Budget Delta	Expended	Balance Remaining	EAC
131-01	REVENUE ROLLING STOCK	40,680,600	52,713,617	12,033,017	51,806,941	906,676	52,216,270
13.13.28	Rail Diesel Self Propelled	40,680,600	52,713,617	12,033,017	51,806,941	906,676	52,216,270
132-01	TRANSITWAY LINES	155,337,900	180,950,742	25,612,842	176,152,934	4,797,808	212,860,657
13.23.03	Line Equipment/Structures Misc.	79,978,000	90,859,978	10,881,978	96,694,463	(5,834,485)	124,296,178
13.23.03	San Marcos Loop	19,062,500	23,369,190	4,306,690	23,287,417	81,773	23,820,563
13.23.03	Environmental Mitigation	8,442,100	11,303,093	2,860,993	6,145,144	5,157,949	10,834,961
13.23.03	Construction Easements	500,000	5,172,064	4,672,064	5,084,925	87,139	5,243,273
13.63.01	Train Control/Signals/Grade Crossing	33,180,200	30,198,215	(2,981,985)	28,338,391	1,859,824	29,860,595
13.63.02	Communications Control	14,175,100	20,048,202	5,873,102	16,602,594	3,445,608	18,805,087
133-01	STATIONS	32,088,200	35,816,684	3,728,484	26,685,854	9,130,830	33,030,645
13.33.02	Stations-Mainline	24,885,200	32,909,132	8,023,932	24,056,590	8,852,542	30,209,964
13.33.02	Stations-Loop	1,247,300	2,907,552	1,660,252	2,629,264	278,288	2,820,681
13.33.06	Fare Collection Equipment	5,955,700	-	(5,955,700)	-	-	-
134-01	SUPPORT FACILITIES	9,726,900	25,773,824	16,046,924	24,382,477	1,391,347	24,539,129
13.43.02	Maintenance Facility	9,726,900	25,773,824	16,046,924	24,382,477	1,391,347	24,539,129
137-01	OTHER CAPITAL ITEMS	113,686,400	188,884,073	75,197,673	128,413,458	60,470,615	154,952,180
13.71.02	Final Engineering	9,600,000	17,077,536	7,477,536	16,758,861	318,675	16,936,573
13.79.00	Project Administration - Final Design	1,930,117	1,127,652	(802,465)	1,127,653	(1)	1,127,653
13.79.00	CM and Community Relations	16,434,300	32,123,637	15,689,337	27,608,177	4,515,460	35,942,239
13.7G.00	Start-up and Testing	2,299,000	2,164,354	(134,646)	2,424,468	(260,114)	5,600,000
13.71.11	OCIP	3,865,500	6,905,742	3,040,242	6,683,155	222,587	6,044,680
13.71.11	Environmental Analysis and DSDC	5,092,500	14,892,571	9,800,071	13,315,384	1,577,187	14,740,981
13.73.00	Contingencies	16,322,783	5,800,041	(10,522,742)	-	5,800,041	7,602,578
13.73.00	Risk Management Contingency	-	43,066,940	43,066,940	-	43,066,940	-
13.75.95	Utility Relocation	1,493,600	1,281,049	(212,551)	3,105,753	(1,824,704)	3,893,682
13.76.91	Real Estate - ROW	6,783,700	5,043,061	(1,740,639)	5,191,749	(148,688)	5,444,951
13.79.00	Permitting-Real Estate - ROW Prior	4,120,100	2,696,986	(1,423,114)	1,825,621	871,365	2,391,853
13.75.91	Real Estate - ROW Prior	19,230,000	19,230,000	-	19,217,215	12,785	19,217,215
13.76.91	Real Estate - ROW Prior	24,170,000	24,170,000	-	24,170,000	(0)	24,170,000
13.79.00	Project Administration - Construction	2,344,800	8,412,593	6,067,793	7,075,665	1,336,928	9,200,000
	Finance Costs	-	4,891,911	4,891,911	(90,243)	4,982,154	2,639,775
	TOTAL PROJECT COSTS	351,520,000	484,138,940	132,618,940	407,441,664	76,697,276	477,598,881

B. 2005 Recovery Plan

In January 2004, FTA Region IX directed the PMOC to perform a risk-based management review of the SPRINTER Project to classify and assess project schedule and project cost using the general principles and approach specified in FTA Operating Guidance No. 22, "Risk Assessment and Mitigation Procedures." FTA Region IX subsequently directed NCTD to prepare a Recovery Plan for the SPRINTER Project.

The PMOC's Spot Report #8 was submitted April 24, 2005. Within the report, the PMOC indicated the level of confidence for achieving the FFGA Project Recovery Plan Budget of \$365.6M was approximately 80%. NCTD submitted a Recovery Plan in April 2005. The FTA approved the Recovery Plan on June 30, 2005 with an FFGA Project Recovery Plan Budget of \$365.6M. This budget was based on the successful implementation of all accepted recovery strategies.

C. 2006 Amended Recovery Plan

NCTD acknowledged in March 2006 that achieving the FFGA Project Recovery Plan Budget of \$365.6M was at risk. The PMOC and NCTD held a budget workshop in April 2006. NCTD submitted a DRAFT Update: Cost-to-Complete Report in May 2006 that indicated the Recovery Plan Budget would be exceeded by a range of between \$38.6M and \$51.5M. A follow-up workshop was held in June 2006, at which time the PMOC reviewed all supporting documentation to assess the NCTD EAC.

FTA directed the PMOC to provide a full assessment of the updated SPRINTER Project budget and schedule. Spot Report #9 dated October 18, 2006 included the 2006 Cost Risk Assessment that identified the Top Ten Risks listed in Table 3. For Spot Report #11, the PMOC re-evaluated the risks to the project and prepared the 2007 Cost Risk Assessment. Table 4 of this report lists the current Top Five Risks.

Table 3. 2006 Top Ten Risks

Risk No.	Risk Description and Mitigation Strategies	Expected Value (M) per Spot Report #9	% Complete Through November 2007
2-101	<p>Additional Costs Due to Unknown Issues¹ NCTD executed a Claims Settlement Agreement with the Mainline and Stations Contractor in May 2007. The agreement contained two parts: (1) \$12.2M for resolution of inefficiency damages; and (2) \$3.3M for constructive acceleration to meet NCTD’s target ROD of December 2007.</p> <p>As part of the agreement, modifications were made to the remaining Intermediate Milestones. These new milestones were incorporated into a new baseline schedule that was prepared by the contractor. Constructive acceleration payments were tied to the milestones. In addition, the settlement agreement provided a mechanism to resolve some quantity adjustments.</p>	\$13.53	100%
2-102	<p>Procurement of a Separate Closeout GC Contract (1) Review similar projects to determine scope of work and magnitude; (2) Develop contract criteria; (3) Review existing contracts for potential omitted work items; (4) Maintain closeout contract scope document; (5) Develop Invitation to Bid.</p> <p><i>[At the time of this Spot Report, NCTD was anticipating the need to issue one separate closeout contract.]</i></p>	\$8.7	40%
5-003	<p>Project schedule slip – Extended construction duration/additional CM (1) CM to develop integrated startup schedule; (2) Establish new ROD; (3) Add Startup Program Manager; (4) Accept risk if there is still a schedule slip; (5) Request updated CM cost to complete based on assumption of ROD of July 2008.</p>	\$5.85	50%

2-016	<p>Train Control – Potential integration and Startup Costs, claims and delays</p> <p>(1) Receive Central Train Control proposal from West Coast Rail Constructors (Mainline and Stations Contractor) that complies with contract requirements; (2) Develop flow chart to identify all critical activities (i.e. completion of design, procurement, installation, testing, and integration); (3) Ensure signalization sub-contractor has acceptable Vital Processing Interlocking (VPI) testing quality protocol, and that contractor has acknowledged requirement to rack test all VPIs; (4) Tie to activities in contract schedule; (5) Submission of System Integration and Testing Plan would identify all project elements and provide ability to more thoroughly assess risks; (6) Contract Specifications require contractor to use industry-standard suppliers for all hardware.</p>	\$5.78	50%
2-018	<p>Communications – Potential integration and Startup Costs</p> <p>(1) Develop flow chart to identify all critical activities; (2) Tie to activities in contract schedule; (3) Confirm equipment testing plan is acceptable; (4) Assess possible need for additional contractor communications manpower.</p>	\$5.31	50%
5-006	<p>Project Schedule Slip - Additional Design Services During Construction (DSDC)</p> <p>(1) Receive recovery plan from DMJM to control their monthly costs and level of effort; (2) Review, negotiate, and accept DMJM's Recovery Plan; (3) Relocate two DMJM engineers to Field Office for increased accountability and control/availability; (4) Recover costs via Tolling Agreement and subsequent claims negotiations; (5) Complete DSDC services/complete construction.</p>	\$5.00	50%
4-100	<p>Potential Change Orders at VMF</p> <p>(1) Re-evaluate risk at contract interim milestones based on percentage of completion of contract; (2) Continue to utilize the mitigation strategies indicated in the APR-05 Recovery Plan; (3) Eliminate all discretionary change orders (i.e., changes not required by design problems, site conditions, or other outside requirements); (4) When changes are required, perform change order evaluation and value engineering in advance of issuing Design Change Notice (DCN) to minimize cost.</p>	\$2.96	100%
2-100	<p>Potential Change Orders - Transitway Construction</p> <p>(1) Continue to utilize the mitigation strategies indicated in the April 2005 Recovery Plan; (2) Eliminate all discretionary change orders (i.e., changes not required by design problems, site conditions, or other outside requirements); (3) When changes are required, perform change order evaluation and value engineering in advance of issuing DCN to minimize cost.</p>	\$2.51	25%
5-004	<p>System integration and testing more complex than planned</p> <p>(1) Develop matrix with CPUC for all interfaces (i.e. DMU, system testing, safety certification); (2) Add Startup Program Level Manager to Project Management Team with extensive new-start experience, to write detailed, integrated startup plan and oversee implementation; (3) Write detailed, integrated Startup and test plan and schedule, integrate all project activities.</p>	\$2.08	50%

3-100	Potential Change Orders – Stations Continue to utilize the mitigation strategies indicated in the April 2005 Recovery Plan.	\$1.39	60%
TOTAL		\$53.15	

¹Percent complete is 100% because Final Settlement Agreement was executed in May 2007. The agreement contains two parts: (1) \$12.2M for resolution of inefficiency damages; and (2) \$3.3M for constructive acceleration to meet NCTD’s target ROD of December 2007. Although NCTD’s EAC includes full payment for these two items, the contractor must meet all requirements of the Final Settlement Agreement to be eligible to receive payment.

In Spot Report #9, the PMOC noted that the likely project cost (including required allocated and unallocated contingencies) was \$471.6M for the 50th percentile and \$484.1M for the 80th percentile level of confidence, before mitigation. This analysis assumed that NCTD effectively and diligently managed the remaining risks.

On July 7, 2006, FTA required NCTD to develop an Amended Recovery Plan. NCTD submitted the final ARP on September 15, 2006 that identified a budget of \$484.1M. The budget increase is to be covered entirely by local funds. The ARP budget was based on a ROD of July 1, 2008. However, the ARP indicated that NCTD was working towards a revenue service date of December 2007. The PMOC’s Spot Report #9 on October 18, 2006 recommended approval of the ARP. FTA formally approved the ARP on December 11, 2006. The FTA also directed NCTD to begin reporting all cost information against the \$484.1M budget.

D. Budget

Section 1 of the ARP included a \$484.1M budget, which matched the 80th percentile unmitigated level of confidence as determined by the PMOC’s 2006 Cost Risk Assessment as included in Spot Report #9. NCTD’s current Estimate at Completion (EAC) is \$477.6M and is based on the July 1, 2008 ROD.

A workshop was held August 1, 2007 to discuss the status of NCTD’s EAC. The workshop included representatives from FTA, NCTD, the CM, SANDAG, and the PMOC. The purpose of the workshop was to provide all stakeholders with a full understanding of how the EAC is compiled each month and confirm the remaining balances of both the unallocated and allocated contingencies. Following the workshop and subsequent follow-up reviews, the PMOC prepared the 2007 Cost Risk Assessment for the project.

The PMOC used NCTD’s September 2007 EAC, stripped all contingency (allocated and unallocated), and applied reasonable ranges for any remaining risks. It should be noted that the mean risk for many of the previous Top Ten Risks is now less than \$1M at this phase of the project although many of the activities identified in NCTD’s Risk Mitigation Plan are still ongoing. This is a product of the milestones identified in the Risk Mitigation and Management Plan. It is important to understand that the 2007 Cost Risk Assessment is based on the following assumptions:

- ROD will occur one to three months past the NCTD Target date of December 2007.
- The Mainline and Stations Contractor will complete all non-revenue related work around March 2008.

- Closeout of all contracts will be completed by the end of 2008 resulting in little to no significant Project Administration and Construction Management expenditures beyond that date.
- If the ROD extends beyond the one to three month timeframe, NCTD will assess liquidated damages according to the terms of the Final Settlement Agreement if deemed applicable with no concurrent delays identified.

The result of this analysis indicated that the ARP budget of \$484.1M had an 89% probability of being achieved. The results of the 2007 Cost Risk Assessment (as outlined in Table 4 and Figure 1) also indicated that NCTD does have sufficient funds in their \$484.1M budget if the ROD extends to July 2008. This is predicated on NCTD aggressively managing all remaining risks and successfully completing the project according to the assumptions on which the 2007 Cost Risk Assessment is based.

Table 4. 2007 Top Five Risks

Risk No.	Risk Description	Expected Value (M)	% Complete Through November 2007
2-100	Potential Change Orders – Transitway construction <i>[Note: The relatively low percent complete is based on the number of outstanding contract change orders and associated values that are yet to be resolved, including numerous quantity adjustments that are pending.]</i>	\$7.4	25%
5-003	Project schedule slip – Extended construction duration/additional CM	\$1.8	25%
2-101	Train Control – Potential integration and Startup Costs, claims and delays	\$1.8	25%
2-102	Separate Closeout Contract	\$1.2	10%
2-103	Communications – Change Orders	\$1.1	50%
TOTAL		\$13.3	

It should be noted that there is not a direct linear relationship between the Current Mean Value and the percent complete. The percent complete is a function of the achievement by NCTD of those milestones that were identified in their Risk Mitigation and Management Plan. The Current Mean Value is based on the PMOC’s updated assessment of the range of risk remaining for that item.

The table below provides the range of cost probabilities as identified in the 2007 Cost Risk Assessment.

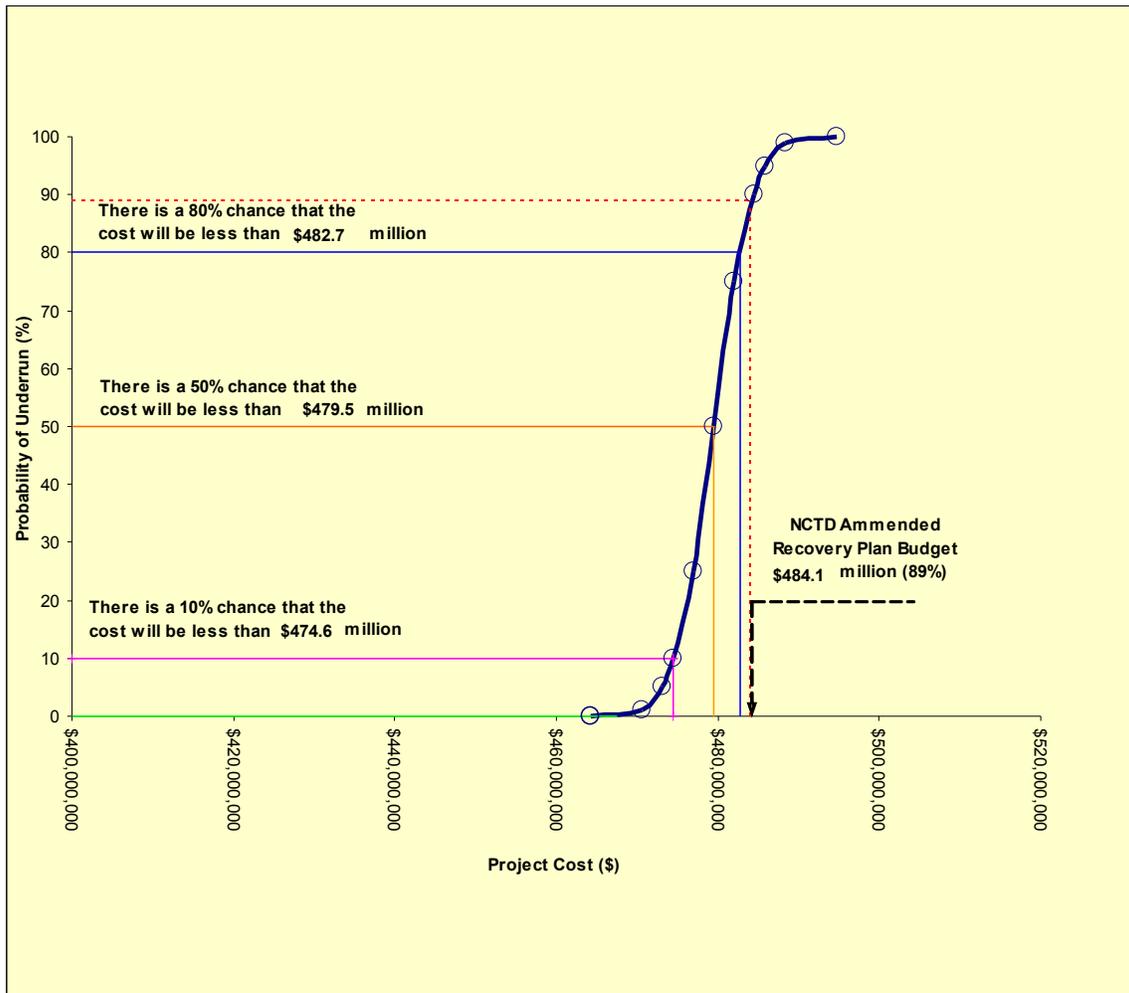
Table 5. Total Project Cost Probabilities

Probability of Underrun	Current Expected Cost
1%	\$470,553,427
5%	\$473,169,355
10%	\$474,551,616

25%	\$476,893,780
50%	\$479,485,518
75%	\$482,077,257
80%	\$482,710,793
90%	\$484,419,421
95%	\$485,801,682
99%	\$488,417,610

The figure below shows the S-curve based on the 2007 Cost Risk Assessment.

Figure 1. Probability of Underrun for Total Project Cost (S-curve)



E. Contingency

The original 2003 FFGA Budget of \$351.5M included the following contingencies:

Allocated – \$14.6M

Unallocated – \$16.3M
Total – \$30.9M

The 2005 Recovery Plan Budget of \$385.6M included the following contingencies:

Allocated – \$23.9M
Unallocated – \$10.2M
Total – \$34.1M

Under the 2006 Amended Recovery Plan (ARP), contingency budgets were again revised. Certain amounts of allocated contingency were applied to each line item, as shown in Amended FFGA Attachment 3. In addition, the unallocated contingency was increased and divided into two parts, Unallocated Contingency and Risk Mitigation Contingency, for purposes of tracking funding sources. However, both of these are categorized as FTA Code 13.73.00 – Unallocated Contingency. The ARP Total Project Budget of \$484.1M included the following:

Allocated – \$18.9M
Unallocated – \$48.9M (\$5.8M Unallocated Contingency + \$43.1M in Risk Management Contingency)
Total – \$67.8M

The current balance of contingency includes:

Allocated – \$10.1M
Unallocated – \$6.6M
Total – \$16.7M

The PMOC's 2007 Cost Risk Assessment was based on the assumption that ROD will occur between one and three months after NCTD's target ROD of December 2007. The PMOC's current assessment is that full revenue operations is likely to occur in April 2008 and that the remaining contingency should be adequate. Compare the estimated \$13.3M in remaining risks (Table 4) with the remaining contingency of \$16.7M. NCTD should have sufficient contingency to address all project-related administrative costs including closeout of construction and resolution of change orders, even if the ROD extends to July 2008, assuming that NCTD effectively manages the remaining risks. This assessment is based on studies of NCTD Management, Administrative, and Construction Management expense "burn rates".

F. Schedule

In conjunction with the 2006 Cost Risk Assessment that was performed, the PMOC reviewed the project schedule per the requirements outlined in PMOOG No. 34 to determine the validity of the reporting/forecasting of the project completion. To accomplish this, the PMOC completed the assessment in two parts: fundamental soundness and forecasting accuracy. The PMOC completed several technical exercises to assess the forecasting accuracy of the progress schedule. These exercises focused primarily on the Mainline and Stations Contract schedule since it was

the driving contract of the ROD. The PMOC determined that there were issues with the linkage. Subsequently, the PMOC recommended that additional technical resources be utilized to ensure that the project controls aspects were properly managed. NCTD added these additional resources through their CM contract.

The FFGA ROD of December 31, 2005 was in jeopardy as a result of two issues. First, there was the delay in obtaining CPUC approval for deviations from General Order 143-B. The deviation from the General Order was necessary due to NCTD's procurement of DMU vehicles from Siemens, which did not fully satisfy key requirements of the General Order. The second issue involved the "trans-loading" agreement with the BNSF that resulted in two years being added to the schedule. These delays resulted in the need to extend the ROD. The ARP and the proposed FFGA Amendment both identified a revised ROD of July 1, 2008.

In May 2007, NCTD executed a Final Settlement Agreement with the Mainline and Stations Contractor regarding an inefficiency claim. The cost impacts from this settlement, which have a maximum value of \$15.5M, have been incorporated into NCTD's EAC. With this agreement, a new baseline was prepared to support NCTD's target ROD of December 2007. The revised baseline schedule was approved in July 2007. There are no other significant claims anticipated on any of the remaining construction contracts that would adversely impact the schedule or budget.

In August 2007 it was determined that NCTD's target ROD for initial revenue service was at risk when the Mainline Contractor did not meet the first three milestone dates identified in the new baseline schedule. For NCTD to begin any revenue service, they must fully complete the safety certification process to the satisfaction of the CPUC. To achieve this, all testing and training must be complete. NCTD and the contractor subsequently coordinated to identify only those components of the system that are critical to pre-revenue operations (testing / training) and safety certification.

The ARP and the proposed FFGA Amendment both identified a revised ROD of July 1, 2008. NCTD's current target date of January 2008 for the start of initial revenue service is possible. However, all remaining construction, testing, and operator training must succinctly execute without disruption to meet this date. While the PMOC recognizes the difficulty in meeting NCTD's target date for the start of revenue service, the PMOC is confident the FFGA Amendment ROD of July 1, 2008 can be readily achieved. Based on the current trends, the PMOC is of the opinion that full revenue service will be accomplished by April 2008. Additionally, the PMOC is of the opinion that closeout of the SPRINTER Project can occur by the end of 2008 based on the current status of all contracts.

G. Cost Estimate and Schedule Linkage

The Contract Units (CUs) described in FFGA Attachment 2 – Project Description are consistent with the contract units shown in Attachment 3 – Baseline Cost Estimate and Attachment 4 – Baseline Schedule. The PMOC has verified that the cost and schedule for each Contract Unit are corroborated and represent reasonable linkages for completing the scope of the project.

III. FFGA SUPPORT DOCUMENTATION ASSESSMENT

FTA, through the requirements of 49 CFR 633, uses a PMOC to perform project document evaluations and assessments as part of the FFGA process to ensure successful project implementation within approved budgets and in accordance with approved plans and specifications. The following sections provide the PMOC's assessment of this support documentation.

A. Project Management Plan

PMOOG No. 11, titled, "Technical Review of Grantee Technical Capacity and Capability" (issued March 7, 2004) requires the PMOC to evaluate Grantee management, organization and project definition data to provide a major input to FTA in determining if the grantee possesses the technical capacity and capability to efficiently and effectively implement the proposed federal project and whether the grantee is ready to receive federal funds for further project development. To determine that the grantee has the technical capacity and capability to efficiently and effectively implement the federal project, the PMOC reviews the grantees' MP and other management plans.

In certain cases, the FTA may also require the PMOC to re-perform such services to re-establish the grantee's technical capacity and capability ("re-baseline"), as is the case for NCTD's SPRINTER Project.

The PMOC evaluates the PMP to determine that it is in conformance with:

- Applicable statutes, regulations, and FTA guidance inclusive of but not limited to the requirements of 49 CFR 633 (Project Management Oversight Final Rule) for PMPs, and FTA Circulars 5010 and 5200 as applicable
- Terms of the FFGA, including the agreed upon scope, budget and schedule
- Sound engineering and project management practices
- FTA's *Project and Construction Management Guidelines* (2003 Update)

The FTA requires that Grantees develop and implement a written PMP for all major capital projects funded by FTA. Specifically, Title 49 of the United States Code Section 5327 of Chapter 53, entitled Project Management Oversight, requires a PMP as a condition of federal financial assistance for major capital projects. The required elements of a PMP are stipulated in the CFR:

- Title 49 – Transportation
- Part 633 – Project Management Oversight
- Subpart C – Project Management Plans
- Section 633.25 – Contents of a Project Management Plan

Moreover, the grant applicant must agree to carry out the PMP approved by FTA. Nevertheless, the PMP is a dynamic document for managing the engineering, design, construction, and startup phases of a project. Periodic updating is expected as the Grantee implements the project.

At a minimum, 49 CFR 633 requires that a recipient's PMP include the following items:

- A description of adequate recipient staff organization, complete 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 such miscellaneous costs as the recipient may be prepared to justify
- A construction schedule
- A document control procedure and record-keeping system
- A change order procedure which includes a documented, systematic approach to the handling of construction change orders
- A description of organizational structures, management skills, and staffing levels required throughout the construction phase
- Quality control and quality assurance programs
- Material testing policies and procedures
- Plan for internal reporting requirements including cost and schedule control procedures
- Criteria and procedures used for testing the operational system or its major components
- Periodic updates of the Plan
- The recipient's commitment to make monthly submission of project budget and project schedule to the Secretary

Additional requirements are outlined in Section 633.27 of 49 CFR 633 (Subpart C) regarding the implementation of a project management plan as follows:

- Upon approval of a project management plan by the Secretary the recipient shall begin implementing the plan
- If a recipient must modify an approved project management plan, the recipient shall submit the proposed changes to the Secretary along with an explanation of the need for the changes
- A recipient shall submit periodic updates of the project management plan to the Secretary that include, but are not be limited to, the following:
 - Project budget
 - Project schedule
 - Financing, both capital and operating
 - Ridership estimates, including operating plan
 - Where applicable, the status of local efforts to enhance ridership when estimates are contingent, in part, upon the success of such efforts
- A recipient shall submit current data on a major capital project's budget and schedule to the Secretary on a monthly basis

NCTD’s project-specific PMP was conditionally approved for use during final design on December 23, 1999. NCTD submitted a DRAFT PMP for use during construction on January 16, 2004. The construction-phase PMP (Revision No. 4) was submitted July 7, 2004. The PMOC submitted Spot Report #6 to FTA on July 27, 2004 recommending approval of the PMP. The FTA approved the PMP on August 12, 2004.

NCTD submitted DRAFT Revision No. 5 of the PMP on September 8, 2006. This update of the PMP was required to address NCTD’s technical capacity and capability as it related to the ARP. PMOC review comments were provided to NCTD on November 1, 2006. NCTD submitted an updated Revision No. 5 on December 21, 2006. The PMOC reviewed NCTD’s updated Revision No. 5 to ensure that it satisfies each FTA requirement for a PMP. The review follows:

1. Organization and Staffing

PMP: The Project organization and management approach are primarily discussed in Section 2.0 of the PMP and addresses the following:

- NCTD agency organization charts (NCTD Directors and Rail Services Group Management)
- SPRINTER Project staff organization
- NCTD Capital Project Construction Department
- NCTD SPRINTER Project team responsibilities
- Summary of the staffing added in conjunction with the ARP to ensure adequate technical capacity of the project team
- Detailed discussion on the organizational structure specific to management of construction activities.

PMOC Comments: The updated PMP reflects the current organizational structure used to manage the project and identifies additional staffing required per the ARP. The requirement for the plan has been satisfactorily addressed. In terms of implementation, all positions were filled by November 2006.

2. Project Budget

PMP: Section 3.0 addresses the project budget, funding for the project, project administration, control of budget and schedule, cost management, and cash flow. The budget is \$484.1M for the Total Project. Funding components are shown in the following table.

Table 6. Funding Sources

Source	FFGA (M)	Amended FFGA (M)
Federal		
Section 5309 (New Starts)	\$152.1	\$152.1
Subtotal Federal	\$152.1	\$152.1

State		
Proposition 108	\$17.6	\$17.6
State Transportation Improvement Program	\$6.6	\$6.6
State Transit Assistance	-	\$5.5
State Transit Assistance – Bond	-	\$50.0
Traffic Congestion Relief Program	\$80.0	\$80.0
Subtotal State	\$104.2	\$159.7
Local		
TransNet	\$90.3	\$111.6
TransNet Extension	-	\$24.1
NCTD Capital Reserves	-	\$5.4
NCTD Bond Proceeds	-	\$26.4
Congestion Mitigation Air Quality Program	\$4.9	\$4.9
Highway Bridge Rehabilitation & Replacement Program	\$0.0	\$0.1
Subtotal Local	\$95.2	\$172.5
TOTAL	\$351.5	\$484.1

One recommendation that was included in Spot Report #9 involved the need for NCTD to develop procedures, which they call desktop procedures, to accurately forecast the EAC for all line items. NCTD tasked their CM with developing these procedures and preparing monthly EAC Reports. NCTD has added Section 3.13 to Revision No. 5 of the PMP to provide a summary of the procedures to be used in developing cost forecasts. This section is supplemented by desktop procedures that have been reviewed by the PMOC and have been subsequently incorporated into the CM Plan.

PMOC Comments: The PMP provides for a reasonable system for tracking costs of the Project. The PMP also provides fairly sufficient information regarding budget, funding and cost forecasting. This requirement has been satisfactorily addressed.

3. Construction Schedule

PMP: Figure 3.1 consists of a summary level schedule by FFGA contract unit. Section 3.9 of the PMP addresses schedule management for the overall Project. The Construction Manager (CM) Plan provides detail on the management of individual contractor schedules.

PMOC Comments: NCTD has tasked their CM with preparing reports on a monthly basis titled, “Mainline Contractor Performance Analysis” that include the following assessments:

- Critical Path Method (CPM) Analysis
- Efficiency Analysis (Earned Value Analysis)
- Manpower Analysis
- Payment Application Analysis
- Trend Analysis
- Simulated Scheduling Analysis

The CM analysis only addresses the Mainline and Stations Contract because it is the only active contract that controls the overall project critical path. These reports are thorough and valuable in assessing the forecast ROD. The PMOC has found that the Simulated Scheduling Analysis was the most beneficial tool in assessing the schedule forecast. This requirement has been satisfactorily addressed.

4. Document Control

PMP: Section 12 provides a detailed discussion on the procedures for document control and configuration management. This discussion supplements the information contained within their Document Control Plan (Revision 1 dated May 2001). In addition, the CM Plan contains construction phase procedures for record retention and document control. NCTD is utilizing Autodesk Buzzsaw for distribution of contract bidding documents. NCTD will be using Prolog Manager for electronic control of construction-phase documentation.

PMOC Comments: This requirement has been satisfactorily addressed.

5. Change Order Procedure

PMP: Section 14 of the PMP addresses change management and resolution of claims or disputes for both consultants and contractors. This includes general procedures for executing contract change orders, measures for the prevention or mitigation of claims (e.g. providing contractor with work alternatives, thorough documentation of all work progress and issues, prompt action when potential claims are identified) and procedures for the resolution of claims as outlined in the contract specifications.

The CM Plan provides specific detail with regard to procedures for management of construction contract change orders for each construction contract.

PMOC Comments: This requirement has been satisfactorily addressed.

6. Organizational Structure

PMP: The project organization is primarily discussed in Section 2.0 of the PMP.

PMOC Comments: This requirement has been satisfactorily addressed.

7. Quality Assurance Program

PMP: Section 17 of the PMP discusses Quality Management for this Project. The PMP references the Quality Program Plan (QPP) and describes quality requirements during design, procurement, construction, and startup and testing. All design consultants are required to have effective QA/QC programs in place. The design consultants must also

develop quality plans, which are subject to approval by the Quality Control Management Specialist. Contractors are required to develop and implement a Contractor's Quality Plan. Section 17.4.3 states that certain audits and surveillances of all construction activities will be conducted.

PMOC Comments: This requirement has been satisfactorily addressed. Implementation of the QPP is the responsibility of the NCTD Quality Control Management Specialist. This implementation includes field spot checks, audits, and tracking of non-compliance items. The PMOC provides reviews of supporting documentation regularly and has found the implementation to be satisfactory.

8. Material Testing Policies and Procedures

PMP: Section 15 of the PMP discusses NCTD's testing program in detail for the project. This discussion covers testing for construction and pre-revenue operations.

In addition, an NCTD consultant has developed a comprehensive Materials Testing Plan to ensure adequate quality control and assurance during construction.

PMOC Comments: This requirement has been satisfactorily addressed.

9. Internal Reporting

PMP: Chapter 2 of the PMP describes the reporting relationships for the Project organization, and Chapter 3 provides detail on the reporting mechanisms within this organization for cost and schedule control.

The PMP requires that the Project Engineers prepare a report each month covering cost and schedule status and other issues that might be of concern to senior management. The Project Manager reviews and edits the reports and distributes them to NCTD Board Members, the FTA, and the PMOC.

PMOC Comments: This requirement has been satisfactorily addressed.

10. Testing the Operational System

PMP: Section 15 of the PMP addresses the startup and testing program. The PMP discusses the role of the Rail Activation Group (RAG) and provides basic information on system integration testing and startup activities. NCTD has developed an Integrated Testing and Startup Plan for the Project. This plan is supplemented by a Systems Testing and Startup Plan and a Test Program Plan.

PMOC Comments: This requirement has been satisfactorily addressed. NCTD holds regular meetings of the RAG, of which the PMOC attends on a frequent basis. The Start-

up Manager provides monthly updates to the PMOC on the progress of start-up activities, which is satisfactory to support the Amended FFGA ROD.

11. Periodic Updates

PMP: Section 19 states that the NCTD Project Manager is responsible for the maintenance of the PMP. Updates of the document will address changes to budget, schedule, and financing. All revisions will be distributed to all recorded holders of the PMP.

PMOC Comments: This requirement has been satisfactorily addressed.

12. Monthly Cost/Schedule Reporting

PMP: Section 3.12 states that NCTD will provide a monthly progress report to the FTA and PMOC according to the requirements of the FFGA.

PMOC Comments: This requirement has been satisfactorily addressed.

Based on a review of Revision No. 5 (dated December 21, 2006) of the PMP with regard to the requirements outlined in 49 CFR 633, the PMOC recommends approval of the document.

B. Quality Program Plan

NCTD's Quality Program Plan (QPP) is organized according to the four phases of a project: design, procurement, construction, and testing and startup. The QPP addresses the FTA 15 required elements for each phase accordingly. NCTD's initial QPP, which was issued October 6, 1999, was considered fully acceptable/under revision and was being implemented during the design phase. However, the QPP required updating to address all aspects of the construction, procurement, and testing and startup phases of the project.

NCTD submitted an updated Draft QPP (Revision 2.0 dated January 19, 2004) for the SPRINTER Project to the PMOC in January 2004. The PMOC provided NCTD with review comments on March 9, 2004. NCTD submitted an updated QPP (Revision 2 dated April 30, 2004) to the PMOC on May 4, 2004.

A review was performed to determine that NCTD quality policies and procedures were developed and documented to effectively perform the technical and administrative management of the quality assurance and control program in compliance with the FTA's recommended 15 elements of a QA/QC program, as outlined in *The Quality Assurance and Quality Control Guidelines* (FTA-IT-90-5001-02.1), dated February 2002.

The PMOC recommended FTA acceptance of Revision 2 of the QPP July 27, 2004 as part of Spot Report #6. The FTA accepted the QPP on August 12, 2004.

It was noted in Spot Report #6 that a future revision of the QPP would be required to address key requirements that were to be outlined in the Construction Management Consultant's Quality Assurance Plan as well as certain aspects of the testing and startup phase of the project. NCTD submitted Revision 3 of the QPP dated May 16, 2006 that addressed these items.

It is the opinion of the PMOC that NCTD has developed a document that can be utilized to obtain quality in the design, procurement, construction, and testing and startup phases of this project. Therefore, the PMOC considers Revision 3 of the QPP fully acceptable. As noted above, the PMOC reviews the QPP products (e.g. audit reports, non-compliance reports, inspection reports) on a regular basis and has determined that NCTD's quality program is being satisfactorily implemented.

C. Real Estate Acquisition and Management Plan

NCTD's Real Estate Acquisition and Management Plan (REAMP) was completed June 2001 and transmitted to FTA and the PMOC in July 2001. The PMOC completed a review and transmitted a Review Memorandum dated October 9, 2001 to FTA and NCTD recommending conditional approval. An updated REAMP was issued January 31, 2002. NCTD's REAMP is considered fully acceptable and is being implemented.

D. Rail Fleet Management Plan

The Rail Fleet Management Plan (RFMP) was submitted August 26, 1999 and Revision 1 was submitted July 25, 2001. The PMOC completed a review and transmitted a Review Memorandum to FTA and NCTD October 7, 2001 recommending the RFMP be revised when the FRA Waiver conditions were known. The RFMP was considered acceptable for the FFGA compliance requirements. NCTD submitted an updated RFMP as part of their Cost Recovery Plan in 2005. The updated plan (Revision No. 2 dated February 17, 2005) was officially issued by NCTD on January 6, 2006. NCTD's RFMP is considered fully acceptable.

E. Bus Fleet Management Plan

The Bus Fleet Management Plan (BFMP) was submitted on December 10, 1999. NCTD noted that the BFMP would be revised in accordance with FTA's guidance on BFMPs for New Starts. NCTD revised the plan in July 2001. The PMOC completed a review and transmitted the Review Memorandum to FTA and NCTD in November 2001 recommending that NCTD identify specific positive/negative impacts on bus service route changes/additions/deletions as a result of the SPRINTER Project. NCTD re-issued the BFMP on January 31, 2002. A Supplemental Information Document was issued March 21, 2002 that provided additional information regarding financial capacity for operations, a summary of Before and After Studies, and the fleet. The BFMP, in combination with the Supplemental Information Document dated March 21, 2002, provided a fully acceptable plan. However, NCTD is to update the BFMP to incorporate the Supplemental Information Document as well as reflect any proposed bus service changes. This will be completed in advance of any bus service adjustments associated with the SPRINTER ROD. The update will be developed with support from SANDAG.

F. System Safety Program Plan and System Security Plan

The System Safety Program Plan and System Security Plan require formal approval by the CPUC since the SPRINTER is a new transit system. Both plans have been accepted as submitted by CPUC staff. Approval of both plans is to be included on the January 10, 2008 Commission agenda. If approved as expected, this timeframe would support NCTD's date for the start of initial revenue service. Therefore, it is not anticipated that the approval process will impact the FFGA Amendment ROD.

G. Safety Certification Plan

NCTD has developed a Safety Certification Plan, which is supported by five Conformance Checklists: one each for the three construction contracts; one for the DMUs; and one for the System Design Criteria. These preliminary checklists have been reviewed by the CPUC and the PMOC with no significant comments identified.

At the time of this Spot Report, the draft narrative of the Safety Certification Verification Report had been submitted to CPUC for review. The safety certification checklists that are to be included in the report are being prepared. It is anticipated that the final report will be submitted to the CPUC in early January 2008, pending completion of the integrated testing. NCTD is scheduled to present a summary of their report to CPUC management on January 7, 2008 in Los Angeles, California. Approval of the Safety Certification Verification Report can occur at any time but must be prior to the start of any revenue service. This activity could impact NCTD's target date for the "soft opening", but not the FFGA Amendment ROD of July 1, 2008.

IV. FFGA AMENDMENT ATTACHMENTS ASSESSMENT

The PMOC reviewed NCTD's FFGA Amendment Attachments in accordance with FTA's Circular C5200.1A Chapter III, dated December 5, 2002. The PMOC concluded that the Attachments are consistent with the FTA guidance.

A. Attachment 1 – Scope of the Project

Any change to the Scope of the Project as stated in Attachment 1 is deemed a major modification of the FFGA; thus, it would require a formal amendment of the FFGA in accordance with the procedures set forth in FTA Circular 5010.1C.

Attachment 1 defines the scope of the SPRINTER Project, including discussions of the transportation purposes, objectives, design features, projected ridership and basic operational functions. A review of Attachment 1 confirms there are no changes to the scope of the project as it relates to the original FFGA Attachment 1. The PMOC considers Attachment 1 acceptable.

B. Attachment 1A – Project Map

Attachment 1A consists of two SPRINTER Project maps. Both maps display the project alignment, a north arrow, major freeways, and the existing rail line service. The location map displays the SPRINTER Project and the proposed stations with respect to the Regional Corridor Map, major streets, and highways. The PMOC review of Attachment 1A confirms that the map is consistent with the scope contained in the PMP and contains the required elements as identified in the FTA guidance. The PMOC considers Attachment 1A acceptable.

C. Attachment 2 – Project Description

Attachment 2 identifies and describes each of the discrete activities necessary to accomplish the stated purpose, objective, and transportation functions of the project. Each project activity identified in Attachment 2 is ascribed to an individual contract unit. Thus, the level of detail set forth in an Attachment 2 is greater than that presented in Attachment 1. All contract units listed in Attachment 2 are carried forward to Attachments 3 and 4. There are no significant changes to Attachment 2 from that presented in the original FFGA. The PMOC considers Attachment 2 acceptable.

D. Attachment 3 – Baseline Cost Estimate

The Baseline Cost Estimate (BCE) is a critical tool for project oversight. It enables FTA and its PMOC to monitor project costs throughout all phases by comparing the Grantee's actual expenditures to the costs as originally estimated. FTA does not allow any modification of Attachment 3 to an FFGA without a formal amendment. The procedures for amending or revising an Approved Project Budget are set forth in FTA Circular 5010.1C.

Attachment 3 itemizes cost by contract unit, reflects the items eligible for federal assistance with the estimated total project cost, and encompasses all the activities listed in the project description. The BCE identifies the allocated contingency included in each line item and the unallocated contingency for the SPRINTER Project.

The amended FFGA BCE is \$484,138,940. This BCE was developed in accordance with the 2006 Cost Risk Assessment included in Spot Report #9, as verified with the 2007 Cost Risk Assessment, and is acceptable.

E. Attachment 3A – Project Budget

Attachment 3A identifies the budget for the entire SPRINTER Project by activity line item. Each activity line item is broken down into funding sources with the corresponding contract unit number. The PMOC concludes that the cost estimates shown in this attachment are consistent with the cost estimate as shown in the PMP and that NCTD has accurately shown the costs by contract unit and by funding source.

F. Attachment 4 – Baseline Schedule

Routinely, a Grantee may adjust its own internal scheduling as a project moves through design and construction toward completion. However, FTA does not allow any modification of Attachment 4 without a formal amendment. Like the Baseline Cost Estimate, the Baseline Schedule is a means for FTA and its PMOC to compare planned project implementation to actual performance. Specifically, the Baseline Schedule is a tool for tracking the major milestones in construction and the critical path leading to the ROD.

Information provided in Attachment 4 is consistent with information in Attachments 2 and 3. The Baseline Schedule reflects each of the contract units at the start and completion of the SPRINTER Project. The Baseline Schedule is presented in a Gantt chart format that highlights major milestones and the project's path toward the amended ROD of July 2008.

It should be noted that NCTD's current target date of January 2008 for the start of initial revenue service is possible. However, all remaining construction, testing, and operator training must succinctly execute without disruption to meet this date. While the PMOC recognizes the difficulty in meeting NCTD's target date for the start of revenue service, the PMOC is confident the FFGA Amendment ROD of July 1, 2008 can be readily achieved. Based on the current trends, the PMOC is of the opinion that full revenue service will be accomplished by April 2008. Additionally, the PMOC is of the opinion that closeout of the SPRINTER Project can occur by the end of 2008 based on the current status of all contracts.

G. Attachment 5 – Prior Grants and Related Documents

NCTD has updated Attachment 5 to accurately reflect the grant history. The PMOC considers Attachment 5 acceptable.

H. Attachment 6 – Schedule of Federal Funds

NCTD has updated Attachment 6 to reflect the current schedule for disbursement of federal funds. The PMOC considers Attachment 6 acceptable.

I. Attachment 7 – Measures to Mitigate Environmental Impacts

Attachment 7 provides a comprehensive list of actual and potential project impacts that will or may require mitigation. Environmental features that may affect project design and construction are also identified, and appropriate measures to address these unique features are spelled out. In general, the nature and extent of the required mitigation is adequately described in Attachment 7.

J. Attachment 8 – Before-and-After Study

FTA's final rule on major capital investment projects (49 CFR Part 611) requires that project sponsors seeking an FFGA submit a complete plan for the collection and analysis of information to identify the impacts of their projects and the accuracy of their forecasts. FTA further refers to the development of a plan which outlines data collection and analysis activities in support of the Study as the Before and After Study Plan.

The plan should cover the collection of information on five characteristics of the project and its associated transit services. The plan should further address how the data measuring the effects of the New Starts project will be collected and how the subsequent analysis of travel patterns and costs before and after implementation and operation of the project will be undertaken. Modifications to an existing plan driven by an FFGA amendment must also be reviewed for acceptability.

Attachment 8 documents NCTD's commitment to conduct a Before-and-After study. The study will measure the benefits of the SPRINTER Project and assess the accuracy of forecasts prepared during the project's development phase. Pertinent variables to be addressed at three major project milestones during the development and operation of the SPRINTER Project include project scope, service levels, capital costs, operation and maintenance costs, ridership patterns, and project content. The PMOC is of the opinion that the Before and After Plan, as identified in Attachment 8, meets the intent of the FTA guideline.

V. CONCLUSION

Under the direction of the FTA Task Order Manager for Region IX, the PMOC has re-evaluated NCTD's technical capacity and capability to complete the SPRINTER Project within the scope, schedule, and budget as identified in the proposed FFGA Amendment Attachments and supporting documentation. Based on reviews of these documents, the PMOC concludes the following:

- Technical Capacity and Technical Capability to Implement the Project – Revision No. 5 of the PMP (dated September 2006) provides for adequate technical capacity and capability to execute the project in accordance with the amended FFGA Attachments.
- Rail Fleet Management Plan (RFMP) – NCTD's RFMP has been found to be acceptable.
- Bus Fleet Management Plan (BFMP) – NCTD's BFMP, in combination with the Supplemental Information Document dated March 21, 2002, provides for a fully acceptable plan. NCTD has agreed to combine these two documents into one complete BFMP in the next update, which will be submitted in advance of any bus service adjustments associated with the SPRINTER ROD.
- Real Estate Acquisition and Management Plan (REAMP) – NCTD's REAMP provides adequate internal direction for acquiring real property for the project. The REAMP is fully acceptable and is being implemented.
- Quality Management Plan (QPP) – NCTD's QPP provides adequate internal direction to obtain quality in the design, procurement, construction, and testing and startup phases of this project. The QPP is fully acceptable and is being implemented.
- Baseline Cost Estimate – NCTD's amended Total Project Budget is \$484,138,940, which is consistent with the 2006 Cost Risk Assessment, as verified with the 2007 Cost Risk Assessment. The FFGA Amendment budget is adequate to support the SPRINTER Project.
- Baseline Schedule – The Baseline Schedule highlights major milestones and the project's path toward the amended ROD of July 1, 2008, which is consistent with the PMOC's schedule assessment as identified in Spot Report #9. The Amended FFGA ROD can be readily achieved.
- FFGA Attachments – The PMOC reviewed NCTD's FFGA Amendment Attachments in accordance with FTA's Circular C5200.1A Chapter III, dated December 5, 2002. The PMOC concluded that the Attachments are consistent with the FTA guidance in defining the project scope and description, project baseline cost estimate by contract units, and the project schedule.

Based on these evaluations and findings, the PMOC recommends to FTA execution of the FFGA Amendment.

APPENDICES

Appendix A: Project Chronology

Following is a chronology of project-related activities and milestones:

- February 26, 2003 – Execution of an FFGA for the SPRINTER Project with a budget of \$351.5M and a Revenue Operations Date (ROD) of December 31, 2005.
- November 18, 2003 – FTA requested that NCTD prepare a Project Recovery Plan following an indication that the FFGA budget was inadequate and a delay to initiating the project construction phase was inevitable.
- December 18, 2003 – The California Public Utilities Commission (CPUC) approved NCTD's request for deviation from General Order 143-B, and Siemens was awarded the contract to provide 12 DMUs.
- January 19, 2004 – NCTD submitted a Project Recovery Plan Status Report.
- January 24, 2004 – The PMOC initiated the project Cost Risk Assessment process in accordance with Project Management Oversight Operating Guidance (PMOOG) No. 22.
- February 24, 2004 – The initial Cost Risk Assessment Report, which excluded PMOC Risk Mitigation recommendations, was submitted to FTA Region IX and NCTD.
- March 8, 2004 – A Risk Mitigation Workshop was held in conjunction with NCTD to address Top Ten cost and schedule risks and determine appropriate mitigation strategies.
- March 29, 2004 – The Cost Risk Assessment Report was updated to include the PMOC Risk Mitigation recommendations resulting from the Risk Mitigation Workshop.
- June 15, 2004 – The PMOC submitted an updated Cost Risk Assessment Report to FTA that provided a statistical analysis of the cost probability level of confidence based upon the initial NCTD Recovery Plan.
- August 16, 2004 – NCTD submitted an updated Recovery Plan to FTA that included the following components:
 - Risk Mitigation and Management Plan
 - Updated Financial Plan
 - Updated Cash flow schedule
- August 25, 2004 – The PMOC prepared DRAFT Spot Report #7 that evaluated the NCTD Recovery Plan.
- September 8, 2004 – FTA met with NCTD to discuss potential cost reduction and containment measures considered by NCTD. FTA sent a letter to NCTD that stated that the NCTD must develop a Recovery Plan based on the Base Cost Estimate (BCE) established in the FFGA. NCTD met with FTA at their headquarters in late September 2004 to discuss the DRAFT Recovery Plan strategies and develop a recovery scenario.
- December 14 and 22, 2004 – NCTD submitted an updated Recovery Strategies Report.
- January 5, 2005 – The PMOC prepared a Job Memorandum that summarized findings from a review of the updated Recovery Strategies Report.
- January 19, 2005 – FTA and NCTD conducted a teleconference to discuss the proposed recovery strategies. The PMOC was subsequently tasked with verifying NCTD documentation supporting proclaimed cost savings in the Cost Recovery Plan Strategies. NCTD began updating the Recovery Plan in January 2005.

- February 8-10, 2005 – The PMOC performed a cost validation review. NCTD expanded the strategies to include supporting documentation as to the basis of the estimate and methodology for achieving the cost saving/reduction. This documentation was added to the Recovery Plan for submittal to FTA.
- February 22, 2005 – NCTD provided Revision 2 of the DRAFT Recovery Plan to FTA and the PMOC.
- March 4, 2005 – NCTD provided the Supporting Documentation for the Recovery Plan Strategies.
- March 11, 2005 – The PMOC submitted DRAFT Spot Report #8 that provided an assessment of the NCTD Recovery Plan. After receiving FTA comments, the report was updated and resubmitted to NCTD and FTA on March 24, 2005. The PMOC Spot Report addressed the supportability of NCTD cost reduction proposals and the technical acceptability of cost reduction proposals regarding standard accepted practice. NCTD revised their February 2005 Recovery Plan to eliminate disfavored cost reduction proposals and modified the plan to include only proposals found technically acceptable, that were supportable by cost data and used a sufficient basis of estimate, reasonable to the extent of not negatively impacting project function and quality. NCTD also developed specific mitigation measuring and tracking techniques to provide monthly status measurement and reporting on the success of the mitigation techniques, and the effectiveness of the cost recovery strategies proposed in the Recovery Plan.
- April 24, 2005 – The PMOC submitted Spot Report #8 (Final) to FTA. The PMOC recommended that FTA accept and approve the April 2005 NCTD Recovery Plan as the strategy and mechanism that will be utilized by NCTD for achieving project cost within the FFGA core accountability.
- June 30, 2005 – FTA notified NCTD that the Recovery Plan had been accepted with a budget of \$365.6M and a ROD of December 31, 2007. The FFGA Project Recovery Plan Budget took into account successful implementation of all accepted recovery strategies.
- August 29, 2005 – Hurricane Katrina hit the United States Gulf Coast.
- September 15, 2005 – The revised budget was formally adopted by the NCTD Board.
- September 30, 2005 – Notice to Proceed on the Vehicle Maintenance Facility (VMF) contract was issued with a contract value approximately \$7M greater than the Recovery Plan Budget. This resulted in a reduction of the unallocated contingency from \$10.2M to \$3.2M. Subsequent to the VMF contract award, the PMOC requested that NCTD update their Estimate at Completion (EAC).
- March 2006 – NCTD acknowledged that the FFGA Project Recovery Plan budget of \$365.6M was at risk.
- April 19, 2006 – The PMOC and NCTD held a budget workshop. The purpose of the workshop was to determine the validity and completeness of NCTD's updated EAC and to analyze the remaining risks to the project. It was determined that the FFGA Project Recovery Plan Budget of \$365.6M would likely be exceeded.
- May 10-11, 2006 – NCTD submitted a DRAFT Update: Cost-to-Complete Report that provided an explanation for any identified increases and presented a range of costs above the current budget for line items.
- June 6-7, 2006 – A follow-up workshop was held, at which time the PMOC reviewed all supporting documentation.

- July 3, 2006 – The PMOC submitted DRAFT Spot Report #9, assessing NCTD’s updated budget and schedule and updating the 2006 Cost Risk Assessment.
- July 24-25, 2006 – A workshop that included the FTA, NCTD, San Diego Association of Governments (SANDAG), and the PMOC was held to discuss DRAFT Spot Report #9 and NCTD’s Amended Recovery Plan (ARP).
- August 10, 2006 – The PMOC submitted DRAFT REVISION 1 of Spot Report #9.
- August 15, 2006 – NCTD submitted a DRAFT ARP.
- August 31, 2006 – The PMOC transmitted review comments to NCTD regarding the DRAFT ARP.
- September 15, 2006 – NCTD submitted the final ARP.
- October 18, 2006 – The PMOC submitted the Spot Report #9 recommending FTA approval of the ARP.
- November 7, 2006 – California voters approved the transportation bond measure, Proposition 1B. NCTD will apply for Proposition 1B funds in January 2007.
- December 11, 2006 – FTA provided NCTD with formal approval of the ARP. The FTA also directed NCTD to begin reporting all cost information against the Total Project Budget of \$484.1M.
- December 21, 2006 – NCTD Board of Directors formally adopted a Total Project Budget that correlated with the budget identified within the ARP.
- December 15, 2006 – SANDAG Board approved NCTD’s Financial Plan.
- January 2007 – NCTD prepared DRAFT FFGA Amendments. FTA updated its review of the Financial Plan.
- April 2007 – DMU Brake testing was successfully completed to confirm the vehicles meet the requirements of CPUC Resolution ST-68.
- August 1, 2007 – An EAC workshop was held that included NCTD, FTA, SANDAG, and the PMOC.
- October 1, 2007 – A second EAC workshop was held that included NCTD, FTA, SANDAG, and the PMOC.