FEDERAL TRANSIT ADMINISTRATION

PROJECT MANAGEMENT OVERSIGHT PROGRAM

Contract No. DTFT60-04-D-00015

Project No. DC-27-5037

FTA Task Order No. 9

CLIN 0003 / Subtask 15: Final Monitoring Report

Grantee: North County Transit District (NCTD)

Oceanside-Escondido Rail Project

Final Monitoring Report – September 2009 (FINAL)

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# LIST OF ACRONYMS

|  |  |  |
| --- | --- | --- |
| BFMP | ▪ | Bus Fleet Management Plan |
| BNSF | ▪ | Burlington Northern Santa Fe |
| CM | ▪ | Construction Manager |
| COP | ▪ | Certificate of Participation |
| CSUSM | ▪ | California State University at San Marcos |
| CU | ▪ | Contract Unit |
| DMU | ▪ | Diesel Multiple Unit |
| EIR | ▪ | Environmental Impact Report |
| FFGA | ▪ | Full Funding Grant Agreement |
| FTA | ▪ | Federal Transit Administration |
| GO | ▪ | General Order |
| NCTD | ▪ | North County Transit District |
| NTP | ▪ | Notice to Proceed |
| PMOC | ▪ | Project Management Oversight Contractor |
| PMP | ▪ | Project Management Plan |
| QPP | ▪ | Quality Program Plan |
| REAMP | ▪ | Real Estate Acquisition and Management Plan |
| RFMP | ▪ | Rail Fleet Management Plan |
| ROW | ▪ | Right of way |
| SANDAG | ▪ | San Diego Association of Governments |
| SEIR | ▪ | Supplemental Environmental Impact Report |
| TCC | ▪ | Technical Capacity and Capability |
| TIP | ▪ | Task Order Implementation Plan |
| VMF | ▪ | Vehicle Maintenance Facility |

## EXECUTIVE SUMMARY

### Introduction

The purpose of the Final Monitoring Report is to provide the Federal Transit Administration (FTA) with summary documentation of the Project Management Oversight activities associated with the Oceanside-Escondido (SPRINTER) Rail Project. The Final Monitoring Report documents the Project history in general, and more specifically, the period of project implementation monitored by Jacobs, the Project Management Oversight Contractor (PMOC) for the FTA, during its current Work Order commencing on September 20, 2004 and continuing through September 20, 2009. Prior to the current Task Order, Jacobs provided oversight of the SPRINTER Project under a previous contract from February 23, 2001 through September 19, 2004. This report provides a description of the project, major historical milestones, funding summary, principal PMOC activities and benefits, open issues, and significant lessons learned. The report also reviews project budget, funding, schedule, organization and Project Management Plan. The Final Monitoring Report conforms to the FTA’s Project Management Oversight Operating Guidance No. 15, dated April 9, 2004, and is in compliance with FTA’s Project Management Oversight Contract Statement of Work.

### Project History

An Environmental Impact Report (EIR) for the SPRINTER Project and an EIR for the California State University at San Marcos (CSUSM) alignment were published and certified in 1990 and 1991, respectively. An Environmental Assessment/Subsequent Environmental Impact Report (SEIR) was completed in early 1997. The North County Transit Development Board certified the SEIR in March 1997 and FTA issued a Finding of No Significant Impact in October 1997. FTA approved the Project for entry into final design in February 2000. A Full Funding Grant Agreement (FFGA) was awarded on February 26, 2003, and major construction work began in September 2004.

### Project Description

The SPRINTER Project involved the conversion of an existing freight rail corridor into a Diesel Multiple Unit (DMU) transit line. The corridor extends 22 miles from the coastal City of Oceanside, through the Cities of Vista, San Marcos, and unincorporated portions of San Diego County, to the City of Escondido. The total project length is 23.7 miles, including 1.7 miles of new right-of-way to serve the campus of California State University San Marcos. Of the 23.7 miles, 13.9 miles are single track and 9.8 miles are double track over three passing sidings. The passenger rail has exclusive use during pre-defined operational schedules, under the terms of a FRA shared-use waiver based on temporal separation. . The project included 15 stations, the procurement of 12 DMU vehicles, and construction of a Vehicle Maintenance Facility. It should be noted that this New Starts Project was completed for a cost of $22 million per mile, as compared to an average of $60-80 million per mile for a typical at-grade light rail system.

### Funding Summary

On February 26, 2003, FTA executed an FFGA committing a total of $152.1 million in Section 5309 New Starts funding to this Project. Congress has appropriated all committed Section 5309 funds for this Project. Any additional funding required to cover budget shortfalls was provided through local sources.

### Project Budget

The original FFGA budget for the Project was $351.5 million. However, an FFGA Amendment was executed with a revised budget of $484.1 million.

Although there are still some cost-related items to be resolved, the FFGA Amendment budget of $484.1 million should be met. NCTD has prepared a detailed estimate-at-completion that indicates a final project cost of $478.4 million. This amount appears to capture the remaining cost risks adequately. However, until all project-related items are resolved, final actual costs will remain uncertain. The cost-related items that remain unresolved include the following:

* OCIP
* DSDC contract dispute
* Reconciliation of New Starts eligible costs vs. local/reimbursable costs

### Project Schedule

The FFGA Revenue Operations Date was December 31, 2005. The FFGA Amendment Revenue Operations Date was July 1, 2008. On March 9, 2008, NCTD began revenue service with the exception of the eastbound platform at the Escondido Avenue Station, which was held out of service due to a CPUC platform clearance gap issue. A “bus bridge” was used so that full transit service could still be provided along the entire corridor. All work at this station was completed in September 2008, at which time full SPRINTER revenue service was available along the entire system.

### Principal PMOC Activities/Benefits

The Jacobs PMOC team, in accordance with FTA guidelines, attended progress meetings, and conducted reviews, evaluations, assessments, and interviews as prescribed in the accepted Task Order Implementation Plan. The purpose of these monitoring activities included: evaluating NCTD’s technical capacity and capability to successfully complete the SPRINTER Project; determining the status of the project; and, identifying potential issues that might develop during its implementation of the project. The PMOC objectively reviewed and reported to the FTA Region IX Task Order Manager its findings in a professional and timely manner consistent with the guidelines.

### Items to Be Resolved

The following table summarizes items that must be resolved to close out the project:

Table 1‑1. Items to be Resolved for Closeout

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Item** | **Status** | **Target Date** |
| 1 | Completion of one item on the Mainline and Stations Contract punchlist | Contractor is awaiting permits; work should be completed by end of 2009 | Dec-09 |
| 2 | Release of retention per the individual contract requirements | * Mainline and Stations Contract * DMU Procurement Contract | Oct-09  2010 |
| 3 | Reconciliation of Owner Controlled Insurance Program for Mainline and Stations Contract and San Marcos Loop Contracts | NCTD staff and OCIP consultant are working towards reconciliation with the contractor. However, as is common for OCIP coverage, this activity cannot be typically completed until almost two years after construction has ended due to the requisite period for potential insurance claims to be filed. It is anticipated that NCTD will not incur additional costs, and will likely receive some funds when closeout occurs. The EAC takes this into account. | 2010 |
| 4 | Resolution of Federal Emergency Management Agency flood map revisions for San Marcos Creek and Loma Alta Creek | NCTD and their consultants are working closely with the City and FEMA to resolve this issue. | 2010 |
| 5 | Final reconciliation of all project costs (New Starts eligible costs vs. local/reimbursable costs) | NCTD continues to address this item with the third party entities including the applicable Cities and SANDAG. | 2010 |
| 6 | Resolution of all contract document retention requirements | The NCTD Document Control Manager is addressing all issues to ensure compliance with record retention requirements. | Dec-10 |
| 7 | Resolution of contract dispute issue with Final Design and Design Services During Construction consultant (both services were provided by same consultant) | NCTD has been in discussion with consultant to address all contract issues. | Oct-10 |

### Conclusion/Recommendations

NCTD encountered many challenges on this project, including: seeking General Order deviations for the DMUs from the California Public Utilities Commission; seeking waivers from the Federal Railroad Administration; constructing the project along an active freight corridor; local funding pressures; having to develop a Recovery Plan and Amended Recovery Plan; and executing an FFGA Amendment.

The project was completed significantly over budget and more than two years beyond the original FFGA Revenue Operations Date. It took two iterations of a recovery plan before the proper tools were in place to ensure completion within the revised budget and schedule targets as identified in the FFGA Amendment. During this period, NCTD complied with all FTA requests to address the issues and, in the end, developed an effective construction management (CM) organization. They eventually developed effective processes as documented through the PMP, Quality Plan, and CM field procedures that were in place at the time the Amended Recovery Plan was approved. NCTD was also cooperative with the PMOC and receptive of the PMOC’s recommendations. This has resulted in the resolution of many of the issues discussed in this report.

As noted in Section 6.0 of this report, there are several Lessons Learned from this Project. Some general recommendations are as follows:

1. Earlier involvement of all regulatory agencies is strongly encouraged for future projects that may present “unique” challenges.
2. Project reviews of budgets and schedules must be more stringent in advance of key milestones such as the advancement of a project into Final Design or execution of an FFGA.

### Lessons Learned

NCTD and the PMOC participated in a Lessons Learned Workshop in April 2009. As a result of the workshop, the following Lessons Learned items were identified:

1. Program Manager – NCTD would have benefited from a consultant serving as Program Manager by having them:
   * Assist in developing appropriate scopes and budgets for the designer, Design Service During Construction consultant, and CM
   * Provide early and comprehensive reviews of the design effort
   * Develop and manage project controls tools including an estimate-at-completion and program level integrated schedule
   * Assisted with permitting requirements of the resource agencies
2. The execution of the FFGA proved to be premature:

* It was executed prior to Final Design being completed. NCTD should have managed the designer more closely, and the PMOC should have been more adamant that the contracts were not ready for bidding. Contracts with more refined design more closely matched budgets when bids were received. It should be noted that NCTD required the FFGA to be able to fund final design and assure BNSF that this was a viable project.
* It was executed prior to formal approval of the DMU vehicles by the CPUC. This in part resulted in cost and schedule pressure almost immediately following the FFGA execution. More definitive discussions and partnering with the CPUC prior to execution of the FFGA to ensure that the regulatory agency’s decisions were properly accounted for in the budget and schedule would have benefited the project. However, it should be noted that NCTD could not conduct a procurement for the vehicles until they had the funding locked in, and thus they could not inform the CPUC what deviations would be requested until they had the FFGA. As an example, the specific vehicle tests and submittals by the manufacturer were needed for CPUC approval. NCTD also could have crafted their procurement to allow for the car-builder to support the effort in receiving approval from the CPUC for the proposed vehicle. The FTA may consider requiring a vehicle be “approved” before an FFGA is granted in the future.
* NCTD was still negotiating an agreement with BNSF regarding “transloading”. Not having the BNSF freight issue resolved before the FFGA was executed resulted in delays of up to a year. It should be noted that BNSF was not willing to discuss the issue until it was certain NCTD had a fully funded project.

1. NCTD utilized one field office for the co-location of the designer, DSDC, CM, and NCTD staff. This allowed for near seamless interface of the project team on a day-to-day basis.
2. As a result of the Amended Recovery Plan, NCTD was required to augment their project staff. This was accomplished in part through the utilization of regional resources including San Diego Association of Governments (SANDAG) staff. This staffing promoted partnerships between the sister agencies that allowed timely resolution of project issues and leveraging of local industry knowledge.
3. NCTD and the PMOC utilized workshops that included FTA, FRA, and CPUC to address a number of project issues. These workshops generally proved to be effective in allowing all entities to voice concerns and participate in solutions of issues.
4. NCTD and the contractor implemented Executive Level Partnering. This partnering led to the resolution of many contract issues without significant schedule delay or cost. One result of the partnering was the execution of the interim settlement agreements for the Mainline and Stations Contract. When it was recognized that this contract would not be completed in time to support NCTD’s target revenue operations date of December 2007, discussion were initiated to execute an interim settlement agreement to mitigate any concerns associated with potential claims and provide the contractor with an incentive to complete the contract as needed. A second settlement agreement was executed to mitigate potential claims that were identified following the initial settlement agreement. The execution of both agreements allowed the project to meet the FFGA Amendment revenue operations date and mitigate all construction claims associated with this contract. There was additional cost associated with these agreements, but NCTD was still able to complete the project within the FFGA Amendment budget and schedule. This benefit outweighed NCTD’s costs associated with the settlement agreements.

## Overview Of The Project

|  |  |
| --- | --- |
| Report Date | September 2009 (DRAFT) |
| Project Name / Location | Oceanside-Escondido (Sprinter) Rail Project  North San Diego County, California |
| Project Sponsor | North County Transit District (NCTD) |
| Project Management Oversight Contractor (PMOC) firm | Jacobs Engineering Group Inc. |
| Person providing this report | Tim Mantych, PE (MO, IL) |
| Length of time PMOC has been assigned to this project: | Since September 20, 2004 (current contract)  Since February 23, 2001 (previous contract) |

### Introduction

The purpose of the Final Monitoring Report is to provide the Federal Transit Administration (FTA) with summary documentation of the Project Management Oversight activities associated with the Oceanside-Escondido (SPRINTER) Rail Project. The Final Monitoring Report documents the Project history in general, and more specifically, the period of project implementation monitored by Jacobs, the Project Management Oversight Contractor (PMOC) for the FTA, during its current Work Order commencing on September 20, 2004 and continuing through September 20, 2009. Prior to the current Task Order, Jacobs provided oversight of the SPRINTER Project under a previous contract from February 23, 2001 through September 19, 2004. This report provides a description of the project, major historical milestones, funding summary, principal PMOC activities and benefits, open issues, and significant lessons learned. The report also reviews project budget, funding, schedule, organization and Project Management Plan. The Final Monitoring Report conforms to the FTA’s PMO Operating Guidance No. 15, dated April 9, 2004, and is in compliance with FTA’s Project Management Oversight Contract Statement of Work.

### Project History

An Environmental Impact Report (EIR) for the SPRINTER Project and an EIR for the California State University at San Marcos (CSUSM) alignment were published and certified in 1990 and 1991, respectively. An Environmental Assessment/Subsequent Environmental Impact Report (SEIR) was completed in early 1997. The North County Transit Development Board certified the SEIR in March 1997 and FTA issued a Finding of No Significant Impact in October 1997. FTA approved the Project for entry into final design in February 2000. An FFGA was awarded on February 26, 2003, and major construction work began in September 2004. Appendix A provides a summary of the key contracts associated with this Project.

The original FFGA budget for the Project was $351.5 million, and the revenue operations date was December 31, 2005. Following the signing of the FFGA in February 2003, several significant events occurred that resulted in an increase to the project budget and an extension of the project schedule:

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. Rapid escalation of construction costs for the Vehicle Maintenance Facility (last contract to be awarded) immediately following Hurricane Katrina, and generally during this period in the construction industry.
7. DMU Procurement Costs

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 PMO 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 No. 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 $365.6 million 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 $365.6 million. This budget was based on the successful implementation of all accepted recovery strategies.

NCTD acknowledged in March 2006 that achieving the FFGA Project Recovery Plan Budget of $365.6 million 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 $38.6 million and $51.5 million. A follow-up workshop was held in June 2006, at which time the PMOC reviewed all supporting documentation to assess the NCTD estimate-at-complete.

FTA directed the PMOC to provide a full assessment of the updated SPRINTER Project budget and schedule. Spot Report No. 9 dated October 18, 2006 included the 2006 Cost Risk Assessment that identified the Top Ten Risks and presented the 80th percentile level of confidence of $484.1 million.

On July 7, 2006, FTA required NCTD to develop an Amended Recovery Plan. NCTD submitted the final Amended Recovery Plan on September 15, 2006 that identified a budget of $484.1 million. The budget increase was covered entirely by local funds. The Amended Recovery Plan budget was based on a revenue operation date of July 1, 2008. However, the ARP indicated that NCTD was working towards a target revenue service date of December 2007. The PMOC’s Spot Report No. 9 on October 18, 2006 recommended approval of the Amended Recovery Plan. FTA formally approved the Amended Recovery Plan on December 11, 2006. The FTA also directed NCTD to begin reporting all cost information against the $484.1 million budget.

An FFGA Amendment was fully executed on July 3, 2008. On March 9, 2008, NCTD began revenue service with the exception of the eastbound platform at the Escondido Avenue Station. A “bus bridge” was used so that full transit service could still be provided along the entire corridor. All work at this station was completed in September 2008, at which time full SPRINTER revenue service was available along the entire system.

A chronology of key project events leading to the FFGA Amendment is provided in Appendix B of this report.

### Project Description

The Oceanside-Escondido (SPRINTER) Rail Project included the reconstruction of 22 miles of existing railroad right-of-way (ROW) owned by NCTD between the Oceanside Transit Center and the Escondido Transit Center. New track was laid along the 22 mile ROW with three sections of passing track each 3.5 miles long. NCTD designed the project to allow for construction of a complete double track system in the future at minimal cost. Fifteen station platforms were constructed with parking, intermodal access, and passenger amenities. The project serves the Cites of Oceanside, Vista, San Marcos and Escondido, and the unincorporated area of the County between Vista and San Marcos.

The project included a 1.7 mile section of new right of way to serve the California State University at San Marcos (CSUSM) campus in San Marcos.

The project also included a new Vehicle Maintenance Facility (VMF) in Escondido. The VMF provides cleaning, service and refueling facilities for the DMUs and houses the control room for the Sprinter Service. The building was originally designed with a footprint area of 26,700 square feet but was redesigned for an increase in size in early 2004 to nearly 40,000 square feet to accommodate the length of the available Siemens DMU. The building is a clad steel portal framed building. The yard has sufficient track to store all vehicles when the system is out of service. Consistent with the multi-modal theme of the project, the corridor cities are concurrently developing a bike path immediately adjacent to the rail line from Escondido to Oceanside. In late 2003, the design consultants combined the Sprinter Mainline Project and Phase 1 and part of Phase 2 of the bike trail into one set of bid documents for the purpose of bidding and constructing these projects at the same time. The costs of the bike trail were reimbursed by San Diego Association of Governments (SANDAG).

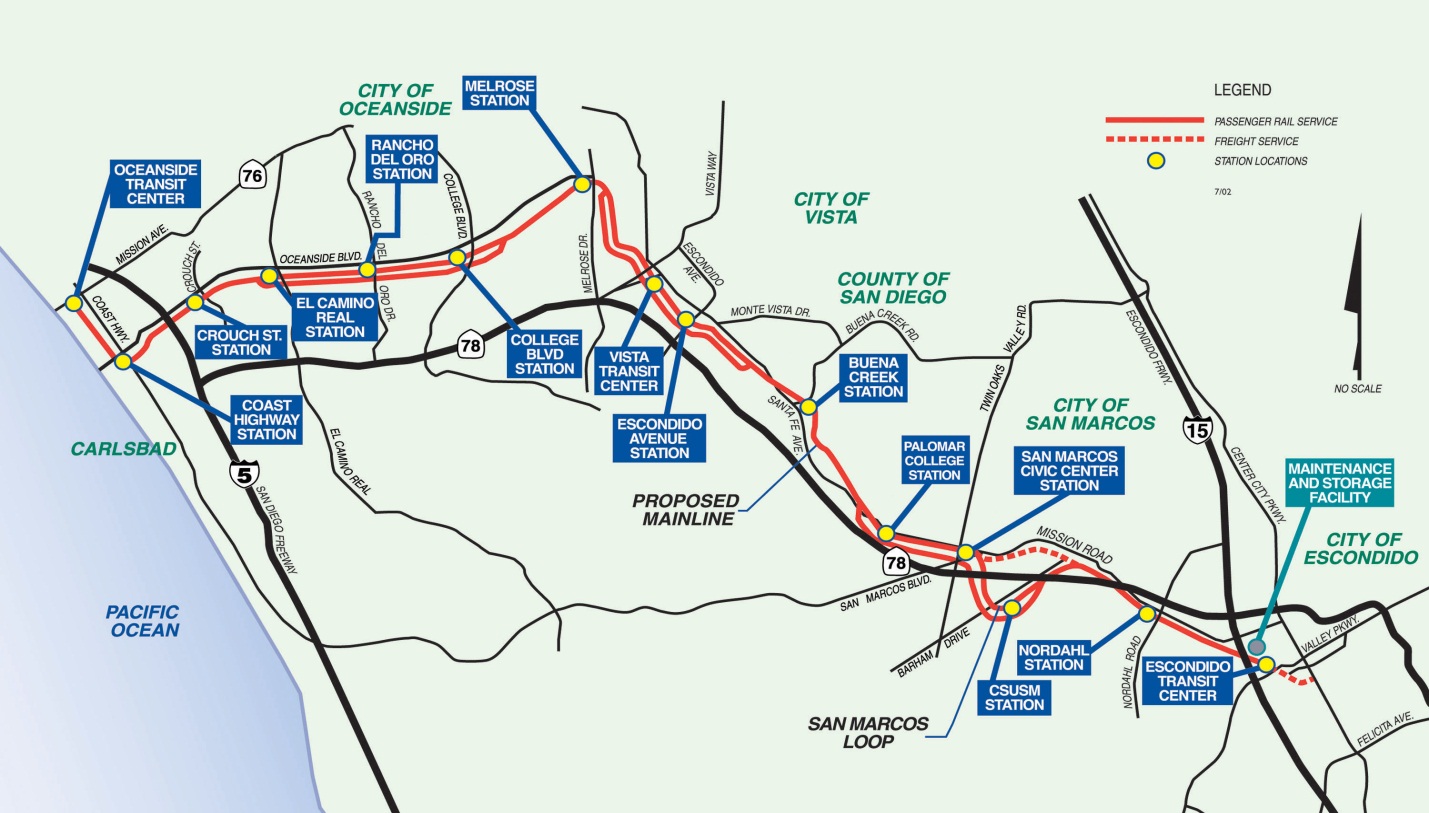
NCTD selected diesel-powered multiple unit vehicles (DMU) because it was more cost effective compared to other “light rail” vehicle technology, which would have required significant additional cost for constructing the necessary system infrastructure. A new generation of Siemens VT-642 DMUs, meeting all current emission standards, provides service along the corridor. However the vehicles did not meet all CPUC General Order (GO) 143-B requirements and a lengthy CPUC approval process was undertaken in 2003 resulting in NCTD being granted a deviation in December 2003 from certain sections of GO 143-B to use the DMU in California. The Siemens DMU is 135 feet long and has a weight of 88 tons fully laden. Each DMU provides approximately 136 seats plus standing room for up to 90 passengers giving each married pair vehicle a total capacity of 226 passengers. NCTD provides sixty-four passenger train trips, 32 in each direction, on week days with service every 30 minutes from approximately 4 a.m. to 9:30 p.m. Weekend service spans the same period, with 32 trips initially operated on an hourly headway. During 2008, NCTD was successful in obtaining a Job-Access-Reverse-Commute grant which allowed weekend headways to be improved to 30 minutes between 10:00 a.m. and 6:00 p.m.

It should be noted that this New Starts Project was completed for a cost of $22 million per mile, as compared to an average of $60-80 million per mile for a typical at-grade light rail system.

### Project Map

Figure 2‑1 presents a map of the Project.

Figure 2‑1. Oceanside-Escondido Rail Project Map



### Funding the Project

On February 26, 2003, FTA executed an FFGA committing a total of $152.1 million in Section 5309 New Starts funding to this Project. Congress has appropriated all committed Section 5309 funds for this Project. Additional funding required covering the FFGA Amendment budget came from local sources. Funding components for the Project are shown in the Table 2‑1.

Table 2‑1. Funding Sources

|  |  |  |
| --- | --- | --- |
| **Source** | **FFGA (M)** | **FFGA Amendment (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** |

### Project Budget

The original FFGA budget for the Project was $351.5 million. However, as noted in Section 2.2, an FFGA Amendment was executed with a revised budget of $484.1 million. Table 2‑2 presents the FFGA budget, FFGA Amendment budget, expenditures, and estimate-at-completion for each line item.

Table 2‑2. Project Financial Status



### Project Schedule

NCTD utilized Critical Path Method scheduling to control and analyze progress on the project. A Master Project Schedule was developed based on the following Contract Units (CU):

* CU 01 – Mainline and Stations Construction
* CU 02 – Maintenance Facility Construction
* CU 03 – San Marcos Loop Construction
* CU04 – Rolling Stock Procurement
* CU 05 – Fare Collection Procurement
* CU 06 – Project Administration
* CU 07 – Owner Controlled Insurance Program
* CU 08 – Construction Management, Testing, and Startup
* CU 09 – Design Services During Construction
* CU 10 – Final Engineering
* CU 11 – Prior Right-of-Way Acquisition
* CU 12 – Property Acquisition, Permits, and Utilities
* CU 12RW – Right-of-Way Property Acquisition
* CU 12PE – Permits and Agency Approvals
* CU 12UR – Utility Relocations
* CU 13 – Contingencies
* CU 14 – Financing Costs

In conjunction with the 2006 Cost Risk Assessment that was performed, the PMOC reviewed the project schedule 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 revenue operations date. 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 Construction Management 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 the DMU deviations from GO 143-B. The deviation from the GO was necessary due to NCTD’s procurement of DMU vehicles from Siemens, which did not fully satisfy key requirements of the GO. 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 revenue operations date.

In May 2007, NCTD executed a Final Settlement Agreement with the Mainline and Stations Contractor regarding an inefficiency claim. With this agreement, a new baseline schedule was prepared to support NCTD’s target revenue operations date of December 2007. The revised baseline schedule was approved in July 2007.

In August 2007 it was determined that NCTD’s target revenue operations date was at risk when the Mainline Contractor did not meet the first three milestones identified in the new baseline schedule. For NCTD to have begun revenue service, they had to fully complete the safety certification process to the satisfaction of the CPUC. To achieve this, all testing and training must be completed. 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 Amended Recovery Plan and the FFGA Amendment both identified a revised ROD of July 1, 2008. On March 9, 2008, NCTD began revenue service with the exception of the eastbound platform at the Escondido Avenue Station, which was held out of service due to a CPUC platform clearance gap issue. A “bus bridge” was used so that full transit service could still be provided along the entire corridor. All work at this station was completed in September 2008, at which time full SPRINTER revenue service was available along the entire system.

Table 2‑3 presents the key milestones for the Project and Figure 2‑2 presents the Project Timeline.

Table 2‑3. Project Milestones

|  |  |
| --- | --- |
| **Date** | **Milestone** |
| December 1995 | Preliminary Engineering completed |
| October 1997 | FONSI issued |
| February 2000 | FTA approval to enter Final Design |
| October 2001 | FONSI re-evaluation |
| February 26, 2003 | FFGA executed |
| December 18, 2003 | CPUC DMU Approval |
| December 30, 2003 | DMU Contract Award |
| September 21, 2004 | Notice to Proceed (NTP) for Mainline and Stations Contract |
| December 9, 2004 | NTP for San Marcos Loop Contract |
| September 30, 2005 | NTP for VMF contract |
| December 31, 2005 | Original FFGA ROD |
| November 2006 | Complete vehicle delivery |
| March 9, 2008 | Start of revenue operations (with exception at Escondido Avenue Station eastbound platform, which was addressed through use of a “bus bridge”) |
| July 1, 2008 | Amended FFGA Revenue Operations Date |
| June 24, 2008 | FFGA Amendment signed by FTA |
| July 3, 2008 | FFGA Amendment signed by NCTD |
| September 15, 2008 | Full system operational |

Figure 2‑2. Project Timeline



### Cost and Schedule Performance for the Project as completed

Table 2‑2 presents the original FFGA budget, the FFGA Amendment Budget, expenditures to date, and NCTD’s estimate-at-completion. As noted previously, the FFGA budget and schedule for the start of revenue service were not met, requiring an FFGA Amendment.

The FFGA Amendment was fully executed on July 3, 2008. On March 9, 2008, NCTD began revenue service with the exception of the eastbound platform at the Escondido Avenue Station. A “bus bridge” was used so that full transit service could still be provided along the entire corridor. All work at this station was completed in September 2008, at which time full SPRINTER revenue service was available along the entire system.

Although there are still some cost-related items to be resolved, the FFGA Amendment budget of $484.1 million should be met. NCTD has prepared a detailed estimate-at-completion that indicates a final project cost of $478.4 million. This amount appears to capture the remaining cost risks adequately. However, until all project-related items are resolved, final actual costs will remain uncertain. The cost-related items that remain unresolved include the following:

* OCIP
* DSDC contract dispute
* Reconciliation of New Starts eligible costs vs. local/reimbursable costs

### Project Management Plan

The PMP was developed to present the framework and approach adopted by NCTD for managing and controlling the procurement, design, construction, testing and start-up of the Rail Project. The PMOC reviewed the PMP in accordance with the FTA requirements codified in 49 CFR 633.25. The review of the PMP verified that NCTD has a plan addressing the organizational relationships of all project participants, a budget addressing project costs of $351.5 million, a construction schedule with a revenue operations date of December 2005, document control procedures, change order procedures, quality assurance & quality control programs, testing policies and procedures, and reporting requirements. On December 23, 1999, the FTA conditionally approved the PMP for final design.

NCTD submitted a Draft Revision 4 of the PMP to the PMOC for review to address execution of the project for the construction phase in January 2004. The PMOC provided NCTD with comments from a review of the updated PMP on March 9, 2004. The PMOC recommended that FTA conditionally approve the PMP for construction subject to NCTD providing a response to the PMOC’s comments, revising the PMP to incorporate comments, and providing the documents listed in the PMP that are stated to be developed within 30 days.

On April 19, 2004, NCTD provided the PMOC with the documents listed in the PMP that were to be developed. In addition, NCTD provided the PMOC with their response to the review comments on May 25, 2004. The updated Revision 4 was received by the PMOC on July 12, 2004.

Based on a review of Revision 4 of the PMP (dated June 2004) with regard to the requirements outlined in 49 CFR 633, the PMOC recommended the approval of the document for use during construction. FTA approved the PMP revision on August 12, 2004.

NCTD submitted DRAFT Revision No. 5 of the PMP on September 8, 2006 in conjunction with their Amended Recovery Plan. This update of the PMP was required to address NCTD’s technical capacity and capability as it related to the Amended Recovery Plan. 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 satisfied each FTA requirement for a PMP. Revision No. 5 identified a revenue operations date of July 1, 2008 and a budget of $484.2 million, which matched the FFGA Amendment. Revision No. 5 of the PMP was approved in conjunction with the Amended Recovery Plan.

### Other Management Plans

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 No. 6. The FTA accepted the QPP on August 12, 2004.

It was noted in Spot Report No. 6 that a future revision of the QPP would be required to address key requirements that were to be outlined in the CM’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 fully addressed these items.

Real Estate Acquisition and Management Plan

NCTD’s project-specific 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 was considered fully acceptable and was properly implemented.

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 was considered fully acceptable and was in accordance with the FFGA Amendment.

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 agreed to combine their BFMP with the Supplemental Information Document. NCTD submitted an update to the BFMP on April 16, 2008. The PMOC submitted a Job Memorandum April 1, 2009 based on a review of the updated BFMP. In general, the PMOC found that the BFMP meets the objectives of the FTA guidelines. However, it is the PMOC’s opinion that the BFMP will require additional revisions to reflect recent bus service changes. Any future updates of the BFMP should address the impact of this situation on the overall bus service and as related to SPRINTER implementation.

t should be noted that many State and national economic factors, which were not foreseeable during the last update of the BFMP, have subsequently occurred that have had a major impact on the NCTD system, apart from the impact of the SPRINTER. Specifically, sales tax revenues took a major dive beginning in late 2007, and the State reduced, and later eliminated, State Transit Assistance funding for operations.

NCTD will solicit assistance from SANDAG to update the BFMP to address the PMOC’s comments. NCTD will complete the Before and After Study in early 2010. Therefore, they will likely not update the BFMP until this study is complete.

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 were accepted as submitted by CPUC staff and approved by the full Commission on January 10, 2008.

Safety Certification Plan

NCTD developed a Safety Certification Plan, which was supported by five Conformance Checklists: one each for the three construction contracts; one for the DMUs; and one for the System Design Criteria. These checklists were reviewed by the CPUC with no significant comments identified. The Safety Certification Verification Report was submitted to CPUC for review in January 2008 and was approved in advance of the March 9, 2008 start of revenue service.

### Management Organization

For this project, NCTD’s approach to management consisted of NCTD executive staff, management, field and technical personnel augmented by environmental consultants and designers to prepare preliminary and final design documents and construction management consultants to provide oversight during construction. NCTD staff provided oversight for Preliminary Engineering and Final Design consultants. NCTD staff also provided oversight of the CM during construction. NCTD did not employ a Program Manager or General Engineering Consultant for this project.

Figure 2‑3 presents the NCTD organization chart for the Project.

### Ridership

As identified in the FFGA, the project was expected to serve approximately 10,300 average weekday boardings in the first year of revenue service. For NCTD’s Fiscal Year 2008 (July 1, 2008 to June 30, 2009), the total ridership on the Sprinter Line was 2,195,000. The current average daily ridership is 6,700 – 7,500, depending on when local colleges are in session, but NCTD has experienced peaks of over 8,000 during the first year of revenue service.

During the first two weeks of college in during the Fall 2009 semester, average daily ridership was 8,085 (including a special college ridership promotion during that period).

Figure 2‑3. NCTD Organization Chart (from Amended Recovery Plan)



## Project Management Oversight Activities

### Task Order Implementation Plan (TIP)

Under the current contract, the PMOC submitted a DRAFT TIP in March 2005 and a REVISED DRAFT TIP in January 2007. The PMOC established a core team of experienced personnel in management of transit agencies and projects, to provide the oversight of NCTD’s implementation of the SPRINTER Project. Selected personnel from Jacobs and subcontractors were identified to perform technical reviews within their respective areas of expertise as required.

### Initial Project Review of Grantee’s Technical Capacity and Capability

The purpose of this document was to perform a Project Management review otherwise referred to as Technical Capacity and Capability Review (TCC) in conformance with the statement of work under Jacob’s Contract. The objective of the review was is to evaluate the applicability and effectiveness of the grantee’s Project Management Plan in effecting a quality project in a timely and cost effective manner, as well as the plan’s conformance with the requirements of the Code of Federal Regulations, 49 CFR, Chapter VI, Part 633, and the FTA sponsored Project and Construction Management Guidelines 1996 and 2003 Update.

At the start of our assignment, FTA Region 9 informed the PMOC that a TCC report would not be required for this project owing to the condition that the predecessor PMOC had recently completed an assessment for the SPRINTER Project. However, when it was determined that an Amended Recovery Plan would be required, the PMOC completed a TCC review in conjunction with preparation of Spot Report No. 9 in October 2006. Specifically, the PMOC identified a need for NCTD to augment their project controls staffing. This was accomplished through addition of CM staff and the addition of local public agency staff, including that from SANDAG.

### Review of Project Management Plan and Updates

The PMP was developed to present the framework and approach adopted by NCTD for managing and controlling the procurement, design, construction, testing and start-up of the Rail Project. The PMOC reviewed the PMP in accordance with the FTA requirements codified in 49 CFR 633.25. The review of the PMP verified that NCTD has a plan addressing the organizational relationships of all project participants, a budget addressing all project costs, a construction schedule, document control procedures, change order procedures, quality assurance & quality control programs, testing policies and procedures, and reporting requirements. On December 23, 1999, the FTA conditionally approved the PMP for final design.

NCTD submitted a Draft Revision 4 of the PMP to the PMOC for review to address execution of the project for the construction phase in January 2004. The PMOC provided NCTD with comments from a review of the updated PMP on March 9, 2004. The PMOC recommended that FTA conditionally approve the PMP for construction subject to NCTD providing a response to the PMOC’s comments, revising the PMP to incorporate comments, and providing the documents listed in the PMP that are stated to be developed within 30 days.

On April 19, 2004, NCTD provided the PMOC with the documents listed in the PMP that were to be developed. In addition, NCTD provided the PMOC with their response to the review comments on May 25, 2004. The updated Revision 4 was received by the PMOC on July 12, 2004.

Based on a review of Revision 4 of the PMP (dated June 2004) with regard to the requirements outlined in 49 CFR 633, the PMOC recommended the approval of the document for use during construction. FTA approved the PMP revision on August 12, 2004.

NCTD submitted DRAFT Revision No. 5 of the PMP on September 8, 2006 in conjunction with their Amended Recovery Plan. This update of the PMP was required to address NCTD’s technical capacity and capability as it related to the Amended Recovery Plan. 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 satisfied each FTA requirement for a PMP. Revision No. 5 of the PMP was approved in conjunction with the Amended Recovery Plan.

### Summary of PMOC Findings and Observations

Based on a review of Revision No. 5 of the PMP (dated September 2006), the PMOC found that NCTD provided for adequate technical capacity and capability to execute the project in accordance with the FFGA Amendment Attachments. However, the PMOC did find at the time of the review that NCTD should develop “desktop” procedures to accurately forecast the estimate-at-completion for all line items. These procedures were developed and were added to CM Plan as referenced in the updated PMP. NCTD did have procedures in place for monthly updates of the schedule, and these procedures were found to have been adequately implemented by the CM staff.

### Monitoring Activities During Final Design, Construction, and Startup Phases

The PMOC monitoring activities are captured and catalogued in the PMOC Part 2 Monthly Reports. Table 3‑1 present a summary listing of PMOC activities in a reverse chronological order:

Table 3‑1. PMOC Activities

| **DATE** | **PMOC ACTIVITY** |
| --- | --- |
| August 25, 2009 | PMOC attended final SPRINTER Project Progress Meeting. |
| April 6, 2009 | PMOC attended a SPRINTER Lessons Learned Workshop. |
| March 3, 2009 | PMOC attended a SPRINTER Project Progress Meeting. |
| February 2009 | PMOC participated in conference calls with NCTD to discuss project issues. |
| January 27, 2009 | PMOC attended a SPRINTER Project Progress Meeting. |
| October 28, 2008 | PMOC attended a SPRINTER Project Progress Meeting. |
| September 30, 2008 | PMOC participated in a SPRINTER Project Progress Meeting conference call. |
| August 26, 2008 | PMOC attended a SPRINTER Project Progress Meeting. |
| July 15, 2008 | PMOC attended a Quarterly Progress Review Meeting. |
| June 24, 2008 | PMOC participated in a SPRINTER Project Progress Meeting conference call. |
| May 20, 2008 | PMOC attended a SPRINTER Project Progress Meeting. |
| April 22-23, 2008 | PMOC attended a SPRINTER Project Progress Meeting. |
| March 25, 2008 | PMOC attended the Quarterly Progress Review Meeting. |
| March 25-26, 2008 | PMOC performed a field review of construction documentation. |
| February 26, 2008 | PMOC attended a SPRINTER Project Progress Meeting. |
| February 27, 2008 | PMOC attended Rail Activation Group Meeting. |
| February 13, 2008 | PMOC attended Rail Activation Group Meeting. |
| January 30, 2008 | PMOC attended Rail Activation Group Meeting. |
| January 22, 2008 | PMOC attended a SPRINTER Project Progress Meeting. |
| January 16, 2008 | PMOC attended Rail Activation Group Meeting. |
| January 7, 2008 | PMOC attended the NCTD Safety Certification Presentation that was provided to CPUC. |
| January 2, 2008 | PMOC attended Rail Activation Group Meeting. |
| December 21, 2007 | PMOC participated in a conference call to discuss the project progress. |
| November 27, 2007 | PMOC attended SPRINTER Project Progress Meeting. |
| November 12, 2007 | PMOC attended Rail Activation Group Meeting. |
| November 6, 2007 | PMOC attended SPRINTER Project Progress Meeting. |
| October 2, 2007 | PMOC attended an Estimate at Completion (EAC) workshop. |
| September 24, 2007 | PMOC attended a Quarterly Progress Review Meeting. |
| September 5, 2007 | PMOC attended a Rail Activation Group Meeting. |
| August 28, 2007 | PMOC attended a SPRINTER Project Progress Meeting. |
| August 8, 2007 | PMOC attended a Rail Activation Group Meeting. |
| August 7-8, 2007 | PMOC attended the Region IX Huddle. |
| August 1, 2007 | PMOC participated in an EAC Workshop. |
| July 11, 2007 | PMOC attended a Rail Activation Group Meeting. |
| July 31, 2007 | PMOC attended a SPRINTER Project Progress Meeting. |
| June 27, 2007 | PMOC attended a SPRINTER Project Progress Meeting. |
| June 25, 2007 | PMOC witnessed the multiple unit testing of the vehicles. |
| June 25, 2007 | PMOC attended a Quarterly Progress Review Meeting. |
| June 13, 2007 | PMOC attended a Rail Activation Group Meeting. |
| May 22, 2007 | PMOC attended a SPRINTER Project Progress Meeting. |
| May 22, 2007 | PMOC reviewed documentation associated with the closeout of the Vehicle Maintenance Facility (VMF) Contract and San Marco Loop Contract. |
| May 23, 2007 | PMOC performed a follow-up review of the vehicle contract documentation. |
| April 24, 2007 | PMOC attended a SPRINTER Project Progress Meeting. |
| April 24, 2007 | PMOC participated in a Diesel Multiple Unit (DMU) vehicle workshop. |
| April 9, 2007 | PMOC witnessed the DMU Brake Rate Testing. |
| March 27-28, 2007 | PMOC attended a SPRINTER Project Progress Meeting. |
| March 19, 2007 | PMOC attended the Quarterly Progress Review Meeting. |
| February 27-28, 2007 | PMOC attended a SPRINTER Project Progress Meeting. |
| February 26, 2007 | PMOC witnessed DMU commissioning. |
| January 30-February 2, 2007 | PMOC reviewed DMU commissioning test results on site. |
| February 27-28, 2007 | PMOC attended a SPRINTER Project Progress Meeting. |
| January 23-24, 2007 | PMOC attended a SPRINTER Project Progress Meeting. |
| November 29, 2006 | PMOC attended a SPRINTER Project Rail Activation Group Meeting. |
| November 28-29, 2006 | PMOC attended a SPRINTER Project Progress Meeting. |
| November 28, 2006 | PMOC attended an NCTD Rail Safety Course. |
| October 24-25, 2006 | PMOC attended a SPRINTER Project Progress Meeting. |
| October 24, 2006 | PMOC attended a SPRINTER Project Rail Activation Group Meeting. |
| September 13, 2006 | PMOC attended a SPRINTER Project Cost Forecasting and Schedule Review Meeting. |
| September 26-27, 2006 | PMOC attended a SPRINTER Project Progress Meeting. |
| September 27, 2006 | PMOC attended a SPRINTER Project Rail Activation Group Meeting. |
| August 23, 2006 | PMOC attended a SPRINTER Project Rail Activation Group Meeting. |
| August 21, 2006 | PMOC attended the Quarterly Progress Review Meeting. |
| August 7, 2006 | PMOC assisted NCTD in the development of an Amended Recovery Plan during the week. |
| July 31, 2006 | PMOC performed a document review of the DMU Procurement Contract. |
| July 24-25, 2006 | PMOC participated in a SPRINTER Project budget and schedule workshop with NCTD and FTA. |
| July 18, 2006 | PMOC attended a SPRINTER Project Rail Activation Group Meeting. |
| June 22, 2006 | PMOC participated in a DMU vehicle workshop. |
| June 21, 2006 | PMOC attended the Rail Activation Group Meeting. |
| June 6-7, 2006 | PMOC participated in a SPRINTER Project budget and schedule workshop with NCTD. |
| May 15, 2006 | PMOC attended the Quarterly Progress Review Meeting in Oceanside, California. |
| May 17, 2006 | PMOC attended the Rail Activation Group Meeting. |
| April 24-28, 2006 | PMOC witnessed Proof-of-Design validation and test verification demonstrations of the first vehicles in Germany. |
| April 19, 2006 | PMOC participated in a Budget Workshop for the SPRNTER Project with NCTD. |
| April 20, 2006 | PMOC performed a follow-up Field Review of the SPRINTER Project. |
| March 28, 2006 | PMOC attended a SPRINTER Project Progress Meeting. |
| March 1, 2006 | PMOC attended a SPRINTER Project Progress Meeting. |
| February 28, 2006 | PMOC performed a Field Review of the SPRINTER Project. |
| February 13, 2006 | PMOC attended a Quarterly Progress Review Meeting. |
| January 25, 2006 | PMOC attended a SPRINTER Progress Meeting and conducted a site visit. |
| December 13, 2005 | PMOC attended a SPRINTER Progress Meeting. |
| November 7, 2005 | PMOC attended the NCTD Quarterly Review Meeting. |
| October 25, 2005 | PMOC attended a SPRINTER Progress Meeting. |
| September 20, 2005 | PMOC attended a SPRINTER Progress Meeting. |
| August 15, 2005 | PMOC attended the NCTD Quarterly Progress Meeting. |
| July 26, 2005 | PMOC attended a SPRINTER Project Progress Meeting |
| June 21, 2005 | PMOC attended a SPRINTER Project Progress Meeting. |
| May 16, 2005 | PMOC attended the NCTD Quarterly Review Meeting. |
| May 23-25, 2005 | PMOC performed a field review of the SPRINTER Project. |
| May 24, 2005 | PMOC attended a SPRINTER Progress Meeting. |
| April 26, 2005 | PMOC attended a SPRINTER Progress Meeting. |
| March 23, 2005 | PMOC submitted Final Draft Spot Report #8 – Risk Assessment to FTA. |
| March 11, 2005 | PMOC submitted Draft Spot Report #8 – Risk Assessment on to FTA. |
| February 8-10, 2005 | PMOC performed field review for the purpose of validating NCTD’s basis of costs contained within their Recovery Plan. |
| February 23, 2005 | PMOC attended Quarterly Review Meeting. |
| November 30, 2004 | PMOC attended SRINTER Project Progress Meeting. |

## Items To Be Resolved

### Outstanding Issues

The following table summarizes items that must be resolved to close out the project:

Table 4‑1. Items to be Resolved for Closeout

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Item** | **Status** | **Target Date** |
| 1 | Completion of one item on the Mainline and Stations Contract punchlist | Contractor is awaiting permits; work should be completed by end of 2009 | Dec-09 |
| 2 | Release of retention per the individual contract requirements | * Mainline and Stations Contract * DMU Procurement Contract | Oct-09  2010 |
| 3 | Reconciliation of Owner Controlled Insurance Program for Mainline and Stations Contract and San Marcos Loop Contracts | NCTD staff and OCIP consultant are working towards reconciliation with the contractor. However, as is common for OCIP coverage, this activity cannot be typically completed until almost two years after construction has ended due to the requisite period for potential insurance claims to be filed. It is anticipated that NCTD will not incur additional costs, and will likely receive some funds when closeout occurs. The EAC takes this into account. | 2010 |
| 4 | Resolution of Federal Emergency Management Agency flood map revisions for San Marcos Creek and Loma Alta Creek | NCTD and their consultants are working closely with the City and FEMA to resolve this issue. | 2010 |
| 5 | Final reconciliation of all project costs (New Starts eligible costs vs. local/reimbursable costs) | NCTD continues to address this item with the third party entities including the applicable Cities and SANDAG. | 2010 |
| 6 | Resolution of all contract document retention requirements | The NCTD Document Control Manager is addressing all issues to ensure compliance with record retention requirements. | Dec-10 |
| 7 | Resolution of contract dispute issue with Final Design and Design Services During Construction consultant (both services were provided by same consultant) | NCTD has been in discussion with consultant to address all contract issues. | Oct-10 |

### Outstanding Claims

There are no outstanding construction claims at this time. There is, however, an issue with regard to the Final Design Contract and Design Services During Construction Contract, both of which were awarded to DMJM (see Item No. 7 in Table 4‑1). It is anticipated that this dispute may be resolved in the near future.

### Remaining Current Funding Issues

There are no remaining federal or local funding issues related to this Project.

### Status of FFGA and Amendments

The FFGA was executed on February 26, 2003, and the FFGA Amendment was fully executed on July 3, 2008. A chronology of project events leading to the need for an FFGA Amendment is provided in Appendix B of this report.

Although there are still some cost-related items to be resolved, the FFGA Amendment budget of $484.1 million should be met. NCTD has prepared a detailed estimate-at-completion that indicates a final project cost of $478.4 million. This amount appears to capture the remaining cost risks adequately. However, until all project-related items are resolved, final actual costs will remain uncertain. The cost-related items that remain unresolved include the following:

* OCIP
* DSDC contract dispute
* Reconciliation of New Starts eligible costs vs. local/reimbursable costs

The FFGA Revenue Operations Date was December 31, 2005. The FFGA Amendment Revenue Operations Date was July 1, 2008. On March 9, 2008, NCTD began revenue service with the exception of the eastbound platform at the Escondido Avenue Station. A “bus bridge” was used so that full transit service could still be provided along the entire corridor. All work at this station was completed in September 2008, at which time full SPRINTER revenue service was available along the entire system.

### PMOC Recommendation for Resolution of Issues

NCTD had enlisted the support of SANDAG staff during implementation of the Project to augment their technical capacity and capability. It is recommended that NCTD continue to utilize these forces as needed to complete close out of all project-related issues.

## Conclusions / Recommendations

### Conclusions

NCTD encountered many challenges on this project, including the following:

* NCTD had to classify the DMU vehicle as a light rail and gain CPUC approval for deviations from the CPUC General Order governing required vehicle performance characteristics.
* NCTD sought and received several waivers from the Federal Railroad Administration.
* NCTD had to negotiate freight shipping agreements with BNSF that saved money but added time to the project. The negotiation with BNSF for “transloading” initially began with BNSF proposing a $26 million agreement to build a transloading facility, provide trucking as needed for alternate shipping, and provide total responsibility for shipping to tenants along the mainline. NCTD alternately developed a scenario that cost $4.3 million but with a resultant 2-year increase in schedule. Although $22 million was saved up front, NCTD paid additional monies to the Mainline and Stations Contractor through two Settlement Agreements that offset some of this savings.
* The State of California budget crisis resulted in delay, and possible loss, of local funds, causing NCTD to issue gap-financing bonds to progress the Project. While awaiting resolution of the State Budget in which committed state funding was withheld due to California budget crisis, the NCTD Board formed an Ad Hoc Committee dedicated to researching and pursuing various financing strategies for the project. This committee identified necessary bridge funding should the TCRP funds be delayed further and the NCTD Board approved the proposal in July 2004. NCTD has issued bonds (Certificates of Participation or COPs) to bridge the anticipated cash shortfall created by the delay in receipt of TCRP funds from the State and to provide for increased project costs, including the project contingency. NCTD’s analysis of the situation indicated that the estimated cost of the project if significantly delayed exceeded the estimated amount of project finance costs. It was more prudent in terms of effective project management, from both a cost and schedule perspective, to proceed with the issuance of COPs rather than delay the project. The $80 million in TCRP funding was subsequently received, allowing NCTD to retire $80 million of the bridge financing bonds.
* The price of materials, especially steel doubled since the completion of design and the execution of the FFGA, and the environmental approval process was challenging. NCTD confronted all challenges and managed each “unforeseen condition” in a professional manner.
* NCTD developed a Risk Mitigation Plan to address the “Top 10” cost risks to the Project, exhibiting a proactive approach in response to the PMOC Risk Assessment. Although NCTD did not successfully mitigate all Top Ten risks, as evidenced by the need for an Amended Recovery Plan, it did lead to the eventual development and implementation of effective management tools for measuring performance (as part of the Amended Recovery Plan).

The project was completed significantly over budget and more than two years beyond the original FFGA Revenue Operations Date. It took two iterations of a recovery plan before the proper tools were in place to ensure completion within the revised budget and schedule targets. During this period, NCTD complied with all FTA requests to address the issues and, in the end, developed an effective CM organization. They eventually developed effective processes as documented through the PMP, Quality Plan, and CM field procedures that were in place at the time the Amended Recovery Plan was approved. NCTD was also cooperative with the PMOC and receptive of the PMOC’s recommendations. This has resulted in the resolution of many of the issues discussed in this report.

### Recommendations

The role of the PMOC is to protect the Federal investment, while at the same time assisting the grantee to execute a successful project. As noted in Section 6.0, there are several Lessons Learned from this Project. Some general recommendations are as follows:

1. This project represented the first utilization in the United States of a “light” DMU for mass transit purposes. There were many procedural challenges in obtaining CPUC approval to operate this vehicle in the State of California. Earlier involvement of all regulatory agencies is strongly encouraged for future projects that may present “unique” challenges.
2. A construction-phase risk assessment was completed for this Project. Although significant risk elements were identified (and partially mitigated), the implementation of the risk assessment process this late in the project life-cycle (construction) proved to be inadequate. FTA has subsequently adopted a policy of implementing risk assessments in pre-PE or PE that have proven more effective in overall management of the project scope, budget, and schedule. Project reviews of budgets and schedules must be stringent in advance of key milestones such as the advancement of a project into Final Design or execution of an FFGA.

## Lessons Learned

NCTD and the PMOC participated in a Lessons Learned Workshop in April 2009. As a result of the workshop, the following Lessons Learned items were identified:

1. Program Manager – NCTD would have benefited from a consultant serving as Program Manager by having them:
   * Assist in developing appropriate scopes and budgets for the designer, Design Service During Construction consultant, and CM
   * Provide early and comprehensive reviews of the design effort
   * Develop and manage project controls tools including an estimate-at-completion and program level integrated schedule
   * Assisted with permitting requirements of the resource agencies
2. The execution of the FFGA proved to be premature:

* It was executed prior to Final Design being completed. NCTD should have managed the designer more closely, and the PMOC should have been more adamant that the contracts were not ready for bidding. Contracts with more refined design more closely matched budgets when bids were received. It should be noted that NCTD required the FFGA to be able to fund final design and assure BNSF that this was a viable project.
* It was executed prior to formal approval of the DMU vehicles by the CPUC. This in part resulted in cost and schedule pressure almost immediately following the FFGA execution. More definitive discussions and partnering with the CPUC prior to execution of the FFGA to ensure that the regulatory agency’s decisions were properly accounted for in the budget and schedule would have benefited the project. However, it should be noted that NCTD could not conduct a procurement for the vehicles until they had the funding locked in, and thus they could not inform the CPUC what deviations would be requested until they had the FFGA. As an example, the specific vehicle tests and submittals by the manufacturer were needed for CPUC approval. NCTD also could have crafted their procurement to allow for the car-builder to support the effort in receiving approval from the CPUC for the proposed vehicle. The FTA may consider requiring a vehicle be “approved” before an FFGA is granted in the future.
* NCTD was still negotiating an agreement with BNSF regarding “transloading”. Not having the BNSF freight issue resolved before the FFGA was executed resulted in delays of up to a year. It should be noted that BNSF was not willing to discuss the issue until it was certain NCTD had a fully funded project.

1. NCTD utilized one field office for the co-location of the designer, DSDC, CM, and NCTD staff. This allowed for near seamless interface of the project team on a day-to-day basis.
2. As a result of the Amended Recovery Plan, NCTD was required to augment their project staff. This was accomplished in part through the utilization of regional resources including San Diego Association of Governments (SANDAG) staff. This staffing promoted partnerships between the sister agencies that allowed timely resolution of project issues and leveraging of local industry knowledge.
3. NCTD and the PMOC utilized workshops that included FTA, FRA, and CPUC to address a number of project issues. These workshops generally proved to be effective in allowing all entities to voice concerns and participate in solutions of issues.
4. NCTD and the contractor implemented Executive Level Partnering. This partnering led to the resolution of many contract issues without significant schedule delay or cost. One result of the partnering was the execution of the interim settlement agreements for the Mainline and Stations Contract. When it was recognized that this contract would not be completed in time to support NCTD’s target revenue operations date of December 2007, discussion were initiated to execute an interim settlement agreement to mitigate any concerns associated with potential claims and provide the contractor with an incentive to complete the contract as needed. A second settlement agreement was executed to mitigate potential claims that were identified following the initial settlement agreement. The execution of both agreements allowed the project to meet the FFGA Amendment revenue operations date and mitigate all construction claims associated with this contract. There was additional cost associated with these agreements, but NCTD was still able to complete the project within the FFGA Amendment budget and schedule. This benefit outweighed NCTD’s costs associated with the settlement agreements.

## APPENDICES

**Appendix A: Summary of Key Contracts**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Contract** | **Contractor/Consultant** | **NTP** | **FFGA Budget** | **Contract Amount** | **Final Contract Amount** | **Notes** |
| Final Design | Frederic R. Harris/DMJM |  | $9.6M | $9.6M | $16.9M |  |
| Design Services During Construction | Frederic R. Harris/DMJM |  | $5.1M | $5.1M | $14.5M |  |
| Construction Management | Simon Wong Engineering, Inc. | 21-Feb-02 | $16.4M | $16.4M | $37.3M |  |
| Vehicle Procurement | Siemens | 30-Dec-03 | $40.7M | $50.6M | $52.2M | Included delivery of 12 DMUs |
| Mainline and Stations Contract | West Coast Rail Constructors (A joint venture of FCI Constructors and Fluor Enterprises) | 21-Sep-04 | $156.3M | $163.4M | $210M | Final Contract Amount includes costs associated with two Settlement Agreements that were executed to mitigate any potential for claims. |
| San Marcos Loop Contract | West Coast Rail Constructors | 9-Dec-04 | $20.3M | $23.5M | $26.0M |  |
| VMF Contract | Whiting-Turner Contracting Company | 30-Sep-05 | $9.7M | $23.6M | $24.4M | Primary reasons for this contract value exceeding the FFGA budget was that the building size was doubled so that the longer Siemens vehicles could be maintained in the facility. There were also increases in construction costs as a result of delays to the bidding and the impact of Hurricane Katrina immediately prior to the bid due date. |

**Appendix B: FFGA Amendment 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, 2005 – 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.
* December 28, 2007 – FINAL Spot Report #11 was submitted providing the FTA with an assessment of NCTD’s readiness to amend the FFGA.
* March 9, 2008 – Revenue service began.
* July 3, 2008 – FFGA Amendment was executed.
* September 15, 2008 – Complete system is operational.