

PMOC REPORT

OP 37 – Rail Fleet Management Plan Review

Honolulu High-Capacity Transit Corridor Project
City and County of Honolulu
Honolulu, HI

October 2011 (FINAL)

PMOC Contract Number: DTFT60-09-D-00012
Task Order No. 2: Honolulu High-Capacity Corridor Project
Project No: DC-27-5140
Work Order No. 3
OPs Referenced: OP 37

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TABLE OF CONTENTS

TABLE OF CONTENTS	i
LIST OF APPENDICES	i
1.0 EXECUTIVE SUMMARY	1
2.0 INTRODUCTION.....	3
2.1 PMOC Review Process.....	3
2.2 FTA References	4
3.0 OVERVIEW OF RFMP DOCUMENT	5
4.0 PMOC FINDINGS, OBSERVATIONS AND COMMENTS	6
4.1 General Comments.....	6
4.2 Specific Comments	6
5.0 CONCLUSION	14
APPENDICES	15

LIST OF APPENDICES

- Appendix A: Acronym List
- Appendix B: OP 37, Appendix B FMP Checklist – Grantee Compliance
- Appendix C: OP 37, Appendix C FMP Table of Contents – Grantee Compliance

1.0 EXECUTIVE SUMMARY

The City and County of Honolulu (“grantee”) is preparing to enter Final Design for implementation of a major capital initiative for constructing and activating new Honolulu High-Capacity Transit Corridor Project (“Project”) for rail service in Honolulu.

At the request of Federal Transit Administration (FTA), the Jacobs Engineering Group, Inc. (Jacobs) Project Management Oversight Contractor (PMOC) performed an evaluation of the Rail Fleet Management Plan (RFMP) document, draft dated April 2011 (with “red-lined” version of July 13, 2011), as part of the ongoing effort of the PMOC team’s oversight responsibility for the Project as related to the FTA’s grant process.

Currently, the grantee is proceeding with award the Core Systems Contract (CSC), which includes procurement & installation of systems equipment, procurement of rail vehicles, and operation and maintenance of the vehicle fleet. Much of the basis for the RFMP is dependent upon the Core System Contract (CSC) provisions, and proposed vehicle and Operations & Maintenance details included in the selected CSC proposal.

Selection of a CSC and implementation of its contract are essential and critical to Final Design, as the vehicle, systems design, and operations planning will dictate critical features of all the other contracts. The grantee has selected a CSC, but has not yet signed or implemented the contract. Since bid protests were filed with the Chief Procurement Officer on April 11, 2011, the grantee prepared the RFMP based on information provided in the selected CSC proposal. The grantee can coordinate with the selected contractor to update the next iteration of the RFMP once the contract is executed since denials of the protests have been upheld.

The PMOC utilized FTA Oversight Procedure (OP) 37 to perform the review of the RFMP and followed a process that consisted of identifying references for assessment of the plan contents and performing as needed analysis to validate calculations and claims made by grantee in the RFMP. In addition, the PMOC held conference calls with grantee staff to resolve PMOC’s comments originally included in a previous review dated June 3, 2011. Per OP 37 reporting requirements in Section 7.0, our review findings, comments, conclusion and recommendations are presented in this report and in two appendices titled:

- Appendix 1 – OP 37, Appendix B RFMP Checklist – Grantee Compliance
- Appendix 2 – OP 37, Appendix C RFMP Table of Contents – Grantee Compliance

This red-line RFMP draft dated July 13, 2011 was prepared in preparation for grantee’s entering Final Design. PMOC’s review focused on the following objectives to assess whether:

- The RFMP is generally complete in the description of the fleet management planning, and that it complies with the FTA guidelines.
- The grantee has generally complied with OP 37 Appendix B and C requirements.
- The RFMP is satisfactory to be accepted as a required deliverable for entry into Final Design.

The PMOC reviewed the July 13, 2011 red-lined RFMP provided by grantee to assess compliance with appropriate FTA Guidance and found that the document generally follows

FTA's 8-step process for Operations Spare Ratio (OSR) computation. The April 2011 RFMP revision had several key topics with limited detail or cursory information and did not fully address guidance provided in FTA reference documents; subsequent to that submission and following the June 3, 2011 PMOC report, conference calls were held with grantee staff to resolve deficiencies. The PMOC has reviewed the red-lined document and noted those items that have been resolved or the remaining that grantee has agreed to update in the next revision of the RFMP.

The PMOC anticipates that the next revision of the RFMP would be available to support to the Full Funding Grant Agreement application. That revision should address and/or provide additional detail on the following topics:

- Service operations and vehicle demand forecasting
- Planned fleet Maintenance practices and management staffing that will be provided through CSC
- Planned use of Maintenance Statistics and Maintenance Strategy as provided through the CSC
- MSF functionality and vehicle availability

In summary, this red-lined draft RFMP complies with FTA guidance. The PMOC recommends that the RFMP be accepted as Final Design deliverable.

Also, the PMOC recommends that a workshop be conducted with grantee to discuss the details needed in the next update of the RFMP to ensure compliance vis-à-vis future stages of the Project.

2.0 INTRODUCTION

The City and County of Honolulu (“grantee”) is preparing to enter Final Design for implementation of a major capital initiative for constructing and activating new Honolulu High-Capacity Transit Corridor Project (“Project”) for rail service in Honolulu.

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2.1 PMOC Review Process

The PMOC utilized FTA Oversight Procedure (OP) 37 to perform the review of the RFMP and followed a process that consisted of identifying references for assessment of the plan contents and performing as needed analysis to validate calculations and claims made by grantee in the RFMP. In addition, the PMOC held conference calls with grantee staff to resolve PMOC’s comments originally included in a previous review dated June 3, 2011. Per OP 37 reporting requirements in Section 7.0, our review findings, comments, conclusion and recommendations are presented in this report and in two attachments titled:

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The PMOC reviewed the July 13, 2011 red-lined RFMP provided by grantee to assess compliance with appropriate FTA Guidance and found that the document generally follows FTA's 8-step process for Operations Spare Ratio (OSR) computation. The April 2011 RFMP revision had several key topics with limited detail or cursory information and did not fully address guidance provided in FTA reference documents; subsequent to that submission and following the June 3, 2011 PMOC report, conference calls were held with grantee staff to resolve deficiencies. The PMOC has reviewed the red-lined document and noted those items that have been resolved or the remaining that grantee has agreed to update in the next revision of the RFMP.

2.2 FTA References

In addition to FTA OP 37, which specifically provides guidance on the review of fleet management plans, FTA regulation and guidelines for the data to be included in the RFMP are provided in the following documents:

- FTA Circular C5200.1A: Full Funding Grant Agreement Guidance
- FTA Circular C9030.1D: Urbanized Area Formula Program: Grant Application Instructions
- FTA Memorandum (1999) by Hiram Walker: "Guidance: Rail Fleet Management Plans".

FTA's objective in issuing such guidance is to encourage the Grantee to properly plan for and carry out the overall management of its vehicle fleet. It further states that the RFMP should address the key factors necessary to make effective decisions on equipment needs and future vehicle demand, including maintaining a spare ratio of rail cars based on industry "best practices" to avoid inefficient railcar investments.

To effectively assess and monitor a Grantee's rail fleet management and performance, FTA requires the Grantee to give a clear explanation of its rail system status in the past, present, and as projected in the near future in major areas, such as ridership, system description and expansion plans, service standards and load factors, passenger demand and peak vehicle requirements, details of existing and planned vehicle procurements, maintainability and reliability standards, train failure definitions and actions, and vehicle Demand/Supply Balance analysis including OSR. Each RFMP should consider a minimum timeframe of ten years from the date of the initial analysis.

3.0 OVERVIEW OF RFMP DOCUMENT

This draft RFMP is composed of the following sections:

- 1 Introduction – briefly describes the purpose of the RFMP and grantee’s objectives in defining the passenger service fleet development and maintenance.
- 2 Abbreviations and Definitions – provides a listing of abbreviations and acronyms utilized in the plan as well as definitions of terms related to the fleet of railcars and car maintenance.
- 3 Project Description – provides an overview of the planned system, including major elements, elevated alignment, planned and potential future extensions/expansion, station and guideway overviews, description of the revenue vehicles (including key parameters), and planned service hours and headways.
- 4 Demand for Revenue Vehicles – describes (through the FTA recommended eight step process) the fleet size determination, and initial fleet procurement information including anticipated vehicle utilization and overhauls anticipated.
- 5 Maintenance Plan – provides an overview of Maintenance philosophy, categorization of train failure definitions, a conceptual view of Maintenance strategy, summary intent for Preventive Maintenance (including pre-revenue, in revenue, periodic, overhauls, other systems), and Service Mode and Reliability Measures.
- 6 Rail Vehicle Maintenance Facility – elaborates on the planned Maintenance and Storage Facility (MSF), including functional areas, a site plan, and MSF vehicle capacity.

No appendices have been provided in the draft RFMP.

4.0 PMOC FINDINGS, OBSERVATIONS AND COMMENTS

The PMOC reviewed the July 13, 2011 red-lined Rail Fleet Management Plan provided by grantee to assess compliance with appropriate FTA Guidance and found that the document generally follows FTA's 8-step process for OSR computation. The April 2011 RFMP revision had several key topics with limited detail or cursory information and did not fully address guidance provided in FTA reference documents; subsequent to that submission and following the June 3, 2011 PMOC report, conference calls were held with grantee staff to resolve deficiencies. The PMOC has reviewed the red-lined document and noted those items that have been resolved or the remaining that grantee has agreed to update in the next revision of the RFMP.

Upon review of the Red-lined RFMP, the PMOC and the grantee resolved PMOC's comments provided in the June 3, 2011 report as annotated below:

4.1 General Comments

- (1) Suggest adding a page with signature blocks for author, approval, etc. for conformance verification, and a page for history of changes.

Grantee has complied.

- (2) A list of tables, charts, figures, exhibits, illustrations, etc. in the Table of Contents would be helpful.

Grantee has complied.

- (3) Suggest providing an Executive Summary to summarize the plan organization, and other key topics/details.

Grantee has complied.

4.2 Specific Comments

Section 1 Introduction

- (1) Page 1-1, 1.1 Purpose, 1st paragraph – Optional O&M period should be explained.

Grantee will include in next update; RFMP narrative acceptable at this time.

Section 2 Abbreviations and Definitions

- (1) Page 2-1, 2.1 Abbreviations – The following terms are defined, but do not appear to have been used: MMIS, PM, QA, QC, TBD.

Grantee has complied.

- (2) Page 2-1, 2.1 Abbreviations – The following terms are used, but not defined: O&M, BAFO, CSC, ADA, CCTV, HSBC, PVR (not used but should be defined)

as key in an RFMP), and OSR (not used but should be defined as key in an RFMP).

Grantee has complied.

- (3) Page 2-1, 2.2 Definitions – The terms Fixed Signal and Right of Way are defined, but do not appear to have been used.

Grantee has complied.

- (4) Page 2-1, 2.2 Definitions – The following terms are used, but not defined: Period #1, Period #2, Patronage, E-cars, M-cars, Load Factor, Minimum vs. Maximum Headway, AW2 (as well as AW0, AW1 and AW3 for clarity).

Grantee has complied.

Section 3 Project Description

- (1) Page 3-4, 3.0 – The term “dual lane track” is not a typical transit term (more appropriate for highways); suggest using “double track”.

Grantee has complied.

- (2) Page 3-4, 3.0 – There is no statement as to the number of vehicles being procured for the initial system.

Grantee has complied.

- (3) Page 3-4, 3.1.1 Planned Extensions – Suggest standardizing on capitalization of “System” vs. “system” to differentiate from the entire project versus a system element.

Grantee will consider for the next update.

- (4) Page 3-4, 3.1.1 Planned Extensions and Page 3-5, 3.1.2 Potential Future Extensions – Both sections describe future extensions and it is stated that they are not part of this RFMP update. However, the distinction between the two is not clear; aren't all of these potential expansions and extensions? Is the distinction that some are in planning and some are just ideas? Perhaps, these sections could be combined?

Grantee explained satisfactorily; no change to RFMP text needed.

- (5) Page 3-5, 3.2 Stations – Use of platform screen doors should be explained. What is the impact on vehicles and vehicle operation?

Grantee has complied.

- (6) Page 3-6, Table 3-1, Vehicle Key Parameters – Please confirm that parameters listed in the table are of the actual vehicle proposed by the selected CSC contractor; if not update the table as appropriate to provide actual vehicle parameters.

Grantee has complied.

- (7) Page 3-7, 3.5 Service Hours and Headways – Please confirm that Service Hours and Headways description is of the actual operations plan proposed by the selected CSC contractor; if not update it as appropriate.

Grantee explained satisfactorily; no change to RFMP text needed.

- (8) Page 3-8, 3.5 2nd paragraph – What is the basis for the statement: “Choices in service headways are guided by the fact that more frequent service has a greater influence on patronage than other operating strategies (such as less frequent headways with longer trains)”? Must be clarified.

Grantee has complied.

Section 4 Demand for Revenue Vehicles

- (1) Page 4-9, 4.1 Fleet Size, Step One – Peak Passenger Demand –
- Explain what is meant by “iterative process”.
 - Please identify the specific “travel demand forecasting model”.
 - Explain “Travel Demand Forecasting Model Boards Reports”.
 - Table 4-1, AM Peak hour travel demand Forecast – Suggest adding PM Peak Hour travel demand forecast for a ready reference and confirmation that AM peak (East) would be the driving demand for service. Also, reference how many hours in the peak period were used.

Grantee has complied.

- (2) Page 4-9, Table 4-1, AM Peak Hour Travel Demand Forecast – It should be noted that Section 3.5 Service Hours and Headways shown on Page 3-8 mention 4.5 minute headways in 2019, which would yield only 4,240 pphpd with two car trains versus 6,429 pphpd. Please clarify the discrepancy.

Grantee has complied.

- (3) Page 4-9, 4.1 Fleet Size, Step Two – Passenger Loading Standard – Is Comfort Loading of 159 passengers (32 seated + 127 standees) a new load standard, different from AW 2 load of 191 passengers (32 seated + 159 standees)? Please clarify and explain how this standard was developed for this new start system.

Grantee has complied.

- (4) Page 4-9, 4.1 Fleet Size, Step Three – Run Time –
- a) Page 4-9 – Please identify the simulation data/methodology model.
 - b) Page 4-10 – Table 4-2, Round Trip Times – Explain / confirm how round trip times for the headways and throughput can be maintained with vehicle performance, dwell times, passenger loading, ATC safe train separation and guideway configuration as specified for a driverless automated system.
 - c) Page 4-10, 3rd bullet – Explain the reference to TP-3.4.2.3 at least in summation form.
 - d) Page 4-10, 4th bullet – Explain the specific “design passenger loading standard” used for this estimate.

Grantee has complied.

- (5) Page 4-10, 4.1 Fleet Size, Step Four – Applying the Passenger Loading Standard
- a) Clarify “Table 4-3 applies Passenger loading standards to the peak demand...”- if it is the Comfort Load standard, then it should be so stated.
 - b) Clarify “...to meet passenger demands”; if it is “pphpd” as stated in Table 4-3, then this should be clarified in the body of the plan.

Grantee explained satisfactorily and has complied; no change to RFMP text needed.

- (6) Page 4-11, 4.1 Fleet Size, Step Five – Operating Fleet Requirement, Table 4-4, Minimum Peak Trains required –It is stated that 30 trains will be needed for Full Service Period (in 2019) to maintain 3 minute headways. Explain how this equates to the passenger capacity as shown in Table 4-5, System Passenger Capacity and in Table 3-3, Service Hours and Headways. While these calculations appear to be correct, there is a disconnect between the data shown.

Grantee has complied.

- (7) Page 4-13, 4.1 Fleet Size: Step Six – grantee may want to consider gap trains as a viable option for operation between heavy boarding stations in the peak period; especially as an automated system, dependent upon location of yard access to the mainline and location of pocket storage tracks.

Grantee explained satisfactorily and has complied; no change to RFMP text needed.

- (8) Page 4-13, 4.1 Fleet Size: Step Seven – Spare Ratio – Explain the basis for the statement “The Project has required an initial spare vehicle ratio of 15% of the operating fleet.” This proposed OSR is low and of concern.
- (9) While it is recognized that there is no operating experience for the system, an analytical methodology or logic can be used to come up with the number of spare vehicles for repairs, inspections, overhauls, major damage, etc. Additionally, the

analysis could also take into consideration spares ratio history from other systems such as Vancouver Skytrain or in Denmark with similar vehicle proposed for Honolulu.

Grantee explained satisfactorily and has complied; no change to RFMP text needed.

- (10) Page 4-13, 4.1 Fleet Size: Step Seven – Spare Ratio – The statement on second line “...those additional vehicles above the peak operating fleet that are used to replace failed operating vehicles or...” is indicative of gap or reserve vehicles, not of spare vehicles; their number should be identified in Step Six Gap Trains.

Grantee explained satisfactorily and has complied; no change to RFMP text needed.

- (11) Page 4-13, 4.1 Fleet Size: Step Eight – Total Fleet Demand – Per CSC, 80 vehicles are being procured through 2019 (though not stated in this RFMP); and based upon the demand forecast information provided in Table 4-7, it would appear that the spare ratio in 2019 will be 25% or 22.5% (dependent upon whether the reserve train is included in the PVR). Please explain.

Grantee has complied.

- (12) Page 4-13, 4.1 Fleet Size: Step Eight – Total Fleet Demand, Table 4-7 –As a minimum, two separate rows should be added, between Row 2 Total Peak Vehicles & Row 3 Total Fleet Size, to show the breakdown of maintenance spares and gap or reserve cars.

Grantee has complied.

- (13) Page 4-13, 4.1 Fleet Size: Step Eight – Total Fleet Demand – Per CSC, 80 vehicles are being procured (though not stated in this RFMP); however, Table 4-7 shows 86 vehicles will be required in 2028; and based on Total Fleet Demand, six additional vehicles would need to be procured by approximately 2025. What mechanism exists or is planned for the purchase of six of these “one of a kind” vehicles, which could be quite expensive for low quantity procurement.

Grantee revised the time frame and has complied.

- (14) Page 4-13, 4.2 Procurement
- a) First paragraph – Provide details in reference to “Core Systems Request for Proposal (BAFO #2)” with summary information for the vehicles (and for operations and maintenance); it could be provided in an appendix.
 - b) Second paragraph – Shouldn’t “(..... one spare train for all operating scenarios)” be included as part of the gap or reserve train and account for the PVR, rather than OSR?

- c) Second paragraph – It is stated in 4th paragraph that mileage per vehicle will be 500,000 miles in five years – or 100,000 miles per year. Explain how the “average annual mileage to be minimized”.
- d) Fourth paragraph – This paragraph would seem more appropriate to be included in the next section titled “5 Maintenance Plan”.

Grantee explained satisfactorily and has complied; no change to RFMP text needed.

Section 5 Maintenance Plan

- (1) Page 5-1– A staffing plan or organization chart should be included showing how CSC will perform maintenance, and what oversight will exist for grantee over CSC.

Grantee will include in next update; RFMP narrative acceptable at this time.

- (2) Page 5-1– There is no mention or description of any system for the management of maintenance elements such as work orders; data collection and analysis; tracking of reliability, mean-time-to-repair, mean-time-between-failures; parts inventory; training; manuals; or other support functions. If they are addressed in the CSC proposal, as a minimum, they should be referenced in the RFMP and summary information could be provided in an appendix.

Grantee will include in next update; RFMP narrative acceptable at this time.

- (3) Page 5-1, 5.1 Train Failure Definitions
 - a) Third line – Explain what will determine “extraordinary circumstances” and distinguish these from “critical safety failures”; and how these are identified utilizing CSC’s O&M contract with grantee oversight.
 - b) Item 3 – Clarify “parted train detection”.
 - c) It is readily apparent that safety seems to be a determining factor in handling train failures as stated. Provide a brief explanation of the relationship of grantee with the CSC, including safety certification and safety oversight issues.

Grantee has complied.

- (4) Page 5-2, 5.2 Maintenance Strategy –This section appears to deal with unscheduled maintenance or in-service failures. While the maintenance levels identified are commendable, explain how this will be implemented through the CSC O&M contract.

Grantee will include in next update; RFMP narrative acceptable at this time.

- (5) Page 5-4, 5.3 Preventive Maintenance –Periodic and Mileage Based –This section will require considerable more detail and expansion as the CSC is awarded and vehicle design progresses.

Grantee will include in next update; RFMP narrative acceptable at this time.

- (6) Page 5-4, 5.3 Preventive Maintenance –Light and Heavy Overhauls –
- a) The expected life of the vehicles should be stated and the number of overhauls to be performed, including the time it will take for a vehicle to undergo an overhaul. This would require some vehicles to be out of service, which should be reflected in the PVR and OSR.
 - b) Page 5-4, Table 5-2 Preliminary Overhaul Plan –Non-vehicle action items are best removed from this table for purposes of the RFMP; and this table may best be suited for an appendix. Also, “Full O&M Period” and “Optional O&M Period” should be defined.

Grantee explained satisfactorily and has complied; no change to RFMP text needed.

- (7) Page 5-8, 5.3 Preventive Maintenance – Other Subsystems –This section will need significant expansion as vehicle design progresses.

Grantee will include in next update; RFMP narrative acceptable at this time.

- (8) Page 5-8, 5.4 Service Mode and Reliability Measures –This section should be expanded to incorporate performance monitoring summary from the CSC O&M specifications. A summary of data monitoring including a Maintenance Management Information System (MMIS) should also be addressed here.

Grantee will include in next update; RFMP narrative acceptable at this time.

Section 6 Rail Vehicle Maintenance Facility

- (1) Page 6-1, 6.1 Functional Areas
- a) State the storage yard capacity. Also, describe shop details such as pits, lifts, wheel truing equipment, wheel presses, overhead cranes, machine shops, electronic repair, parts storage, etc.; and shop capacity for PMs, overhauls, cleaning, inspections, etc. If the shop is still under design, it should be so stated and some design criteria or minimums should be included.
 - b) Describe the functions and manpower that will be stationed in the maintenance facility, including the capacity of locker rooms, office areas, parking lots, etc.

Grantee explained satisfactorily and has complied; no change to RFMP text needed.

- (2) Page 6-4, 6.2 MSF Vehicle Capacity

- a) It appears that the yard capacity is 56 vehicles, while the procurement in CSC is for 80 vehicles. Explain how the remaining 24 vehicles will be stored in non-revenue hours without impeding movement in the MSF.
- b) Storage on access tracks to the shop will hamper vehicle movement, even in an automated yard. Clarify if the access tracks will also be automated.
- c) Typically, maintenance tracks are not considered as part of the fleet storage capacity; explain what will be the philosophy or policy in this MSF.

Grantee explained satisfactorily and has complied; no change to RFMP text needed.

5.0 CONCLUSION

The PMOC reviewed the July 13, 2011 red-lined Rail Fleet Management Plan to assess compliance with appropriate FTA Guidance and found that the document generally follows FTA's 8-step process for OSR computation. The previous April 2011 revision had several key topics in the RFMP with limited detail or cursory information, and do not fully address guidance provided in FTA reference documents; subsequent to that submission and following the June 3, 2011 PMOC report, conference calls were held with grantee personnel to resolve deficiencies. The PMOC has reviewed the red-lined document accordingly and has noted those items that have been resolved or that the grantee has agreed to update in the next revision of the RFMP.

Through the CSC, grantee is procuring 80 new "light" heavy rail vehicles to provide service through 2024; the CSC O&M portion of the contract defines activities related to service operations, planned management & maintenance of the fleet, and also provides substantial information regarding service demand; additional detail should be provided in the next update of the RFMP. Additional details on several other topics will be needed as well, such as for – service demand and operations, utilization of revenue vehicles, anticipated vehicle maintenance and availability, and fleet management.

The PMOC anticipates that the next revision of the RFMP would be available to support to the Full Funding Grant Agreement application. That revision should address and/or provide additional detail on the following topics:

- Service operations and vehicle demand forecasting
- Planned fleet maintenance practices and management staffing that will be provided through CSC
- Planned use of Maintenance Statistics and Maintenance Strategy as provided through the CSC
- MSF functionality and vehicle availability

In summary, this red-lined draft RFMP complies with FTA guidance. The PMOC recommends that the RFMP be accepted as Final Design deliverable. The PMOC also recommends that a workshop be conducted with grantee to discuss the details needed in the next update of the RFMP to ensure compliance vis-à-vis future stages of the Project.

APPENDICES

Appendix A: Acronym List

APTA	▪ American Public Transportation Association
ATC	▪ Automatic Train Control
AWO	▪ Empty Transit Vehicle Weight (Ready to run – in pounds)
AW1	▪ Empty Transit Vehicle Weight plus passenger seated load
AW2	▪ Empty Transit Vehicle Weight plus passenger seated and normal rated standing load
AW3	▪ Empty Transit Vehicle Weight plus passenger seated and full rated standing load
CFR	▪ Code of Federal Regulations
CSC	▪ Core Systems Contractor
DB	▪ Design-Build
DBOM	▪ Design-Build-Operate-Maintain
DCS	▪ Fire/Life Safety Committee
FD	▪ Final Design
FRA	▪ Federal Railroad Administration
FTA	▪ Federal Transit Administration
GEC	▪ General Engineering Consultant
HHCTCP	▪ Honolulu High-Capacity Transit Corridor Project
MDBF	▪ Mean Distance Between Failure
MOW	▪ Maintenance of Way
MPH	▪ Miles Per Hour
MSF	▪ Maintenance & Storage Facility
MTTR	▪ Mean Time To Repair
O&M	▪ Operations and Maintenance
OP	▪ Oversight Procedure
OSR	▪ Operating Spare Ratio
PE	▪ Preliminary Engineering
PMOC	▪ Project Management Oversight Consultant
PVR	▪ Peak Vehicle Requirement
QA	▪ Quality Assurance
QC	▪ Quality Control
RFMP	▪ Rail Fleet Management Plan
ROW	▪ Right of Way
TOC	▪ Table of Contents
US/U.S	▪ United States

Appendix B: OP 37, Appendix B FMP Checklist – Grantee Compliance

	Requirement	PMOC Review Comments
		Review comments will indicate the following: Acceptable, Unacceptable, Acceptable with comment. Identify portions of the document that meet the criteria
1	Grantee Document	
1A	<i>The FMP is conformed in accordance with the Grantee's Document Control System.</i>	Acceptable
1B	<i>Each page identifies the Revision No. and the date of the document.</i>	Acceptable
1C	<i>The date of the Grantee's submittal is clearly identified.</i>	Acceptable.
1D	<i>The contents of the FMP properly reflect the Table of Contents.</i>	Acceptable
2	PMOC review of Grantee's fleet description	
	<i>Verify description of the makeup of the present fleet, including:</i>	
2A	<i>The number and type of vehicles in service</i>	Not Applicable – New Start.
2B	<i>Peak vehicle requirements (service period and make-up, e.g., standby vehicles)</i>	Acceptable – Section 4.1 Fleet Size.
2C	<i>Address the spare ratio of vehicles, and the rationale underlying that spare ratio</i>	Acceptable – Section 4.1.
2D	<i>Achieve optimal life expectancies</i>	Not applicable – New Start.
2E	<i>Details of existing and planned vehicle procurements</i>	Acceptable – Section 3.4.
2F	<i>Current and future equipment needs</i>	Acceptable – Section 4.1.
2G	<i>Grantee in its selection and specification of vehicle equipment and systems has matched appropriate technology with the planned transit applications for best performance at the lowest cost.</i>	Acceptable – Validation of this requirement has been done for compliance with OP 38, through PMOC's review and report.
3	PMOC review of Grantee's Operations and Maintenance strategy	
	<i>Verify that the Operations and Maintenance Strategy addresses:</i>	
3A	<i>Operating policies and conditions (level of service requirements, vehicle failure definitions and actions)</i>	Acceptable at this time – Some information is provided in Section 5; additional detail commensurate with the Project progress to be provided in future updates.
3B	<i>In detail the composition of facilities</i>	Acceptable – Section 6.
3C	<i>Any rebuilds that extend the life expectancy of the equipment, any overhaul/rebuild programs; schedule to complete, effects on vehicle availability and useful life, etc., to the fleet</i>	Acceptable at this time – Strategy is provided in Section 5; additional detail commensurate with the Project progress to be provided in future updates.
3D	<i>The Grantee has adequately defined the preventive maintenance and schedule established for the existing and procured/overhauled vehicle fleet</i>	Acceptable at this time – Strategy is provided in Section 5; additional detail commensurate with the Project progress to be provided in future updates.
3E	<i>Enable a transit operator to properly plan for and carry out the overall management of its entire fleet of vehicle</i>	Acceptable at this time – Basic information is provided in Section 5; additional detail commensurate with the Project progress to be provided in future updates.

	Requirement	PMOC Review Comments
3F	<i>Fleet operations (present and future) as described in the plan are substantially consistent with that adopted in the Record of Decision (if applicable)</i>	Not Applicable – Record of Decision does not address details of fleet operations required in RFMP
4	PMOC review of Grantee's Management Capabilities	
	<i>Verify that the Grantee's management is competent and capable of providing leadership and direction on matters of:</i>	Acceptable at this time – Section 5 Maintenance Plan. Additional oversight detail commensurate with the Project progress to be provided in future updates.
4A	<i>The requirements for peak and spare vehicles including schedule spares, maintenance spares, parts spares</i>	Acceptable – Section 4 Demand for Revenue Vehicles.
4B	<i>The requirements for support functions such as heavy maintenance, capital and operating parts inventory and information technology</i>	Acceptable at this time – Section 5 Maintenance Plan. Additional detail commensurate with the Project progress to be provided in future updates.
4C	<i>Strategies for acquisition of new vehicles or overhauling existing equipment and tradeoffs between them</i>	Not Applicable – New Start.
4D	<i>Strategies for maintenance and operations including reducing spare vehicles</i>	Acceptable at this time – Section 5 Maintenance Plan. Additional detail commensurate with the Project progress to be provided in future updates.
4E	<i>Strategies for reducing operating costs and increasing service reliability.</i>	Not Applicable – New Start.
4F	<i>The plan discusses the Grantee's reliability program, past performance and plans to improve reliability including profile monitoring and support of maintenance as well as failure rates and vehicles-out-of-service as well as providing vehicle failure definitions and actions</i>	Acceptable at this time – Section 5 Maintenance Plan. Additional detail commensurate with the Project progress to be provided in future updates.
4G	<i>Grantee keeps a copy on file for review upon request updated from time to time as changes occur within the transit agency, acquisitions, replacement, rebuild/rehab, changes in headway or level of service, etc</i>	Not Applicable – This is a true New Starts Project, and there are no updates / changes to acquisitions, replacement, rebuilds / rehabs, headway or level of service, etc.
4H	<i>Sufficiently complete in detail and analysis (Fleet plan or supporting documentation) to readily demonstrate (1) Grantee's ability to maintain and consistently improve the current level, operating costs, reliability and quality of revenue service for the years leading up to and following construction of the project; (the plan also provides.)</i>	Acceptable at this time – Additional detail for contract operations & maintenance commensurate with the Project progress to be provided in future updates.
4I	<i>The Grantee's information system reliably provides needed operating and financial data such as current estimates of vehicle operating costs, reliability and life expectancy, for decision-making and performance review.</i>	Acceptable at this time – Additional detail for contract operations & maintenance commensurate with the Project progress to be provided in future updates.
4J	<i>The plan defines system and service expansions.</i>	Acceptable
5	Project Impact Assessment	
	<i>Verify that critical system elements receive comprehensive assessment:</i>	

	Requirement	PMOC Review Comments
5A	<i>The Grantee's existing transit service in terms of level of service, operating costs, reliability, quality and support functions, will not be degraded as a consequence of the design and either the manufacture of the equipment, or construction of the project</i>	Acceptable – Grantee's existing transit service is via bus; and upon review of the RFMP, it is PMOC's opinion that grantee's existing transit service will not be degraded " <i>in terms of level of service and reliability</i> ".
5B	<i>The Grantee will be able to provide adequate service to meet the transit demand for the years leading up to and following either the delivery of the equipment/facility or construction of the project</i>	Acceptable at this time – Some information is provided; additional detail commensurate with the Project progress to be provided in future update to substantiate that the grantee " <i>will be able to provide adequate service to meet the transit demand for the years leading up to <u>and following</u></i> " the design and construction of this project.
5C	<i>The Grantee can properly plan for and execute the overall management of its entire fleet of vehicles and related support functions and equipment, addressing all the reasonably foreseeable factors that are relevant to the determination of current and future equipment needs in light of demand for service</i>	Acceptable at this time – Some information is provided; additional detail commensurate with the Project progress to be provided in future update to substantiate that the grantee " <i>can properly plan for and execute the overall management of its entire fleet of vehicles and related support functions and equipment</i> " for the years leading up to and following the design and construction of the project.
5D	<i>Grantee estimates of costs, service levels, quality, or reliability are mechanically correct and complete, consistent with the Grantee-defined methodologies and free of any material inaccuracies or incomplete data.</i>	Acceptable at this time – Some information is provided; additional detail of grantee's estimates of costs, quality, reliability, etc. commensurate with the Project progress to be provided in future updates.
5E	<i>Grantee forecasts and schedule are also mechanically correct and complete, consistent with the plan scope and project scope adopted in the Record of Decision (if applicable) and the proposed Revenue Operations Date as well as free of any material inaccuracies or incomplete data.</i>	Not Applicable
6	PMOC's review of Grantee's Operations and Maintenance Plan Format	
	<i>Verify that the plan is consistent with FTA's guidance specifically with respect to:</i>	
6A	<i>Definition of terms</i>	Acceptable – Section 2.
6B	<i>Description of existing system and expansion plans, both project and non-project related</i>	Acceptable
6C	<i>The Demand for Revenue Vehicles and Operating Spare Ratio have been calculated in conformance with FTA guidance</i>	Acceptable – Section 4.
6D	<i>The Grantee has selected a sufficient time frame, (a minimum of 10 to 15 years) and compiled sufficient historical and empirical data from past and current fleet operations</i>	Acceptable

Appendix C: OP 37, Appendix C FMP Table of Contents – Grantee Compliance

Sample Fleet Management Plan Table of Contents	In AA and/or Requesting Entry to PE	In PE, Advanced PE, and/or Requesting entry to FD	In FD and/or Requesting FFGA	In Bid / Award and / or Construction	Grantee Compliance
Introduction	●	○	○	○	✓
Overview of Plan	●	○	○		✓
Plan Timeframe	●	○	○		✓
Definition of Terms	●	○	○	○	✓
Existing System	●	○	○	○	✓
Description of current system	●	○	○	○	✓
Inventory List	▲	○	○	○	N/A
Expansion Plan	▲	●	○	○	✓
Demand for Revenue Vehicles	▲	●	○	○	✓
Peak Passenger Demand	▲	●	○	○	✓
Passenger Load Standards	▲	●	○	○	✓
Vehicle Run Times	▲	●	○	○	✓
Peak Vehicle Calculations	▲	●	○	○	✓
Gap or Ready reserve vehicles	▲	●	○	○	✓
Spare Vehicle Calculation	▲	●	○	○	✓
Total Sum of Vehicles required out of service	▲	●	○	○	✓
Supply of Revenue Vehicles	▲	●	○	○	✓
Reconciliation of Demand vs. Supply	▲	●	○	○	✓
Existing and planned fleet procurements	▲	●	○	○	✓
Define overhaul / rebuild programs	▲	●	○	○	✓
Rebuild Schedules	▲	●	○	○	✓
Vehicle Availability	▲	●	○	○	✓
Useful Life	▲	●	○	○	✓
Maintenance and Reliability	▲	●	○	○	✓
Preventative Maintenance Program	▲	●	○	○	✓
Fleet Failure Rates	▲	●	○	○	N/A
Revenue Vehicle Demand/Supply Balance	▲	●	○	○	✓
Comparison of Vehicle Demand and Supply for duration of plan	▲	●	○	○	✓

NOTE: ▲ – Preliminary information required; ● – Element to be completed; ○ – Element to be modified or augmented with additional information as necessary.