

AGREEMENT FOR PROFESSIONAL SERVICES

This Agreement for Professional Services dated August 24, 2007 (the "Agreement"), by and between the CITY AND COUNTY OF HONOLULU, a municipal corporation of the State of Hawaii, whose principal place of business and mailing address is Honolulu Hale, 530 South King Street, Honolulu, Hawaii 96813 (the "CITY"), and PB AMERICAS INC., a New York Corporation, whose office and mailing address is 1001 Bishop Street, American Savings Bank Tower, Suite 2400, Honolulu, Hawaii 96813 (the "CONSULTANT").

WITNESSETH THAT:

WHEREAS, the CITY desires to engage the CONSULTANT to provide general engineering consultant services for the Preliminary Engineering/Environmental Impact Statement for the Honolulu High-Capacity Transit Corridor Project (the "PROJECT"); and

WHEREAS, the CONSULTANT was selected pursuant to Section 103D-304 of the Hawaii Revised Statutes, as amended, and related Hawaii Administrative Rules ("HAR"), related to the procurement of professional services;

NOW, THEREFORE, the CITY and the CONSULTANT, in consideration of the foregoing and of the mutual promises hereinafter set forth, and intending to be legally bound, hereby mutually agree as follows:

1. The CONSULTANT shall perform and complete in a professional manner all of the services required for the PROJECT in accordance with and set forth in the Contract Documents as hereinafter described, shall furnish all services, labor, goods, materials, supplies, equipment and other incidentals reasonably necessary for the successful completion of the PROJECT and work contemplated under the Contract Documents (the "Work"), and the CONSULTANT shall receive and accept as full compensation for all of the Work the price for the various items of the Work as hereinafter set forth.

2. The CONSULTANT shall complete the technical and professional services and perform the Work in accordance with:

- a. This Agreement;
- b. The Special Provisions and any attachments and exhibits thereto; and
- c. The General Terms and Conditions for Contracts for Professional Services for the City and County of Honolulu, dated 8/2000 ("General Terms and Conditions");

all of which are collectively referred to as the Contract Documents, are attached hereto and incorporated herein, and are listed in order of controlling precedence should there be any conflict in the terms of the Contract Documents, and any modifications, changes or amendments in connection therewith being specifically referred to and incorporated herein by reference and made a part hereof as though fully set forth herein.

3. The CONSULTANT shall complete the Work required under the Contract Documents as provided in the Special Provisions.

4. There will be at least three separate and distinct written notices to proceed under the Agreement. Work shall not begin until the CITY has issued the appropriate Notice to Proceed ("NTP"). Any work undertaken prior to issuance of a required written NTP will be the sole responsibility of and will be undertaken at the sole risk of the CONSULTANT, without any obligation on the part of the CITY or the Federal Government.

The first written NTP ("NTP #1") will be for work required to prepare a Draft Environmental Impact Statement ("DEIS") and the documents required by the Federal Transit Administration ("FTA") to support the CITY's application to advance the PROJECT to the Preliminary Engineering phase of the FTA New Starts project development process ("PE").

The second written NTP ("NTP #2") will be issued only after FTA approves the PROJECT's entry into PE. NTP #2 will be for continuing DEIS work and initiating Preliminary Engineering work up to a maximum expenditure dollar amount determined by the CITY.

The third written NTP ("NTP #3") will be for the remainder of the Work not already included in NTP #1 or NTP #2 and will be issued upon the CITY's determination to provide funds in a manner consistent with the requirements of Paragraph 6 herein.

Subsequent NTPs may be issued for work identified in contract amendments.

5. This is a cost plus fixed fee contract, and is subject to the provisions of this paragraph. In accordance with Paragraph VI of the Special Provisions and Section 8 of the General Terms and Conditions, the CITY agrees to pay the CONSULTANT, for the satisfactory performance and completion of the Work, in accordance with invoices received, and further as set forth in the Special Provisions attached hereto. The aggregate amount of such payments for the Work (the "Aggregate Amount") shall not exceed EIGHTY FIVE MILLION DOLLARS (\$85,000,000) for direct labor, overhead, subconsultants, and a fixed fee, inclusive of State General Excise and Use Tax. Payment shall be invoiced to the CITY in accordance with guidelines as set forth in the Special Provisions.

Such payments shall be provided from Federal and CITY funds.

Also included with the Aggregate Amount is an Allowance for Other Direct Costs of TWO MILLION NINE HUNDRED TWENTY NINE THOUSAND FIVE HUNDRED TWENTY EIGHT DOLLARS (\$2,929,528). This Allowance for Other Direct Costs is not to be exceeded without a contract amendment and any funds remaining at the end of the Agreement shall revert back to the CITY. The Allowance for Other Direct Costs is provided for expenses identified in Exhibit 2A, Schedule B to the Special Provisions and such other expenses as are specifically approved by the CITY. Payment for Other Direct Costs is subject to the terms contained in the Special Provisions. Reimbursement shall be made for actual costs incurred without markup upon submission of a copy of the vendor invoice.

The CITY agrees to establish an Allowance for Extra Work of ONE MILLION DOLLARS (\$1,000,000) which is not to be exceeded without a contract amendment. Payment for Extra Work will be negotiated and a contract amendment will be processed to reflect the change. Extra Work requested by the CITY shall be authorized as set forth in Section 5 of the General Terms and Conditions. Any funds remaining at the end of the Agreement shall revert back to the CITY.

In accordance with the paragraphs above, the total aggregate amount of EIGHTY SIX MILLION DOLLARS (\$86,000,000) (the "Total Aggregate Amount") is established as the maximum payable under this Agreement and is subject to the Special Provisions and the General Terms and Conditions, including the provisions thereof related to reducing or increasing the compensation of the CONSULTANT.

6. Notwithstanding any other provisions of this Agreement, including the provisions of Section 3.3 of the General Terms and Conditions, it is covenanted and agreed by and between the parties hereto that a sum not exceeding 50% of the Total Aggregate Amount shall be paid only out of the applicable Federal funds, and that this Agreement shall be construed to be an agreement by the CITY to pay such compensation to the CONSULTANT only out of the aforesaid Federal funds if and when such Federal funds shall be received from the Federal Government, and that this Agreement shall not be construed to be a general agreement to pay said compensation at all events out of any funds other than those which may be so received from the Federal Government; provided that, in the event the CITY determines that the anticipated Federal funds to fund this Agreement will not be available in whole or in part and the CITY does not otherwise agree to pay the CONSULTANT for services in excess of the amount of the Federal funds available, then the CONSULTANT shall not be obligated to perform any services required under this Agreement the value of which exceeds the amount of the Federal funds available; and provided further that, if, for any reason, the anticipated Federal funds to fund this Agreement will not be available in whole or in part, the CITY shall promptly advise the CONSULTANT so that the CONSULTANT may avoid, to the extent possible, work for which compensation, as provided for in this Agreement, will not be forthcoming.

7. By signing below, the CONSULTANT hereby certifies that, to the best of its knowledge and belief, cost or pricing data, as defined in Section 3-122-122 HAR, and submitted pursuant to Section 3-122-125, HAR, either actually or by specific identification in writing to the Officer-in-Charge in support of this Agreement, is accurate, complete and current as of the date of this Agreement. This certification includes the cost or pricing data supporting any advance agreement(s) between the CONSULTANT and the CITY which are a part of the CONSULTANT's cost proposal.

8. When notice is to be given to the CITY, it shall be mailed or delivered to:

Certificate

The attached contract for general engineering consultant services for the
Preliminary Engineering/Environmental Impact Statement for the Honolulu High-Capacity Transit Corridor
Project

(\$86,000,000.00)

is hereby approved as to availability and designation of funds, and certification is hereby made that there is a valid appropriation from which expenditures to be made under said contract may be made and that sufficient unencumbered funds are available in the Treasury of the City and County of Honolulu to the credit of such appropriation to pay the amounts of such expenditures when the same become due and payable.

CONTRACT NO. SC-DTS-0700001
FUND Transit Fund (690)
ACCOUNT NO. _____
690/7802-07-D (4064) \$ 30,456,000.00
690/7802-08-D (4064) \$ 55,544,000.00
\$ 86,000,000.00

HONOLULU, HAWAII

AUG 27 2007


Director of Budget & Fiscal Services 

City and County of Honolulu
Department of Transportation Services
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Attention: Director

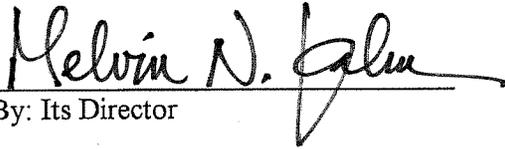
9. When notice is to be given to the CONSULTANT, it shall be mailed or delivered to:

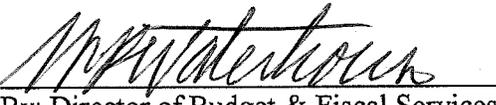
PB Americas, Inc.
American Savings Bank Tower
1001 Bishop Street
Honolulu, HI 96813
Attention: Tad Ono

IN WITNESS WHEREOF, the CITY and the CONSULTANT have executed this Agreement by their duly authorized officers or agents on the date and year first above written.

APPROVED AS TO CONTENT:
Department of Transportation Services

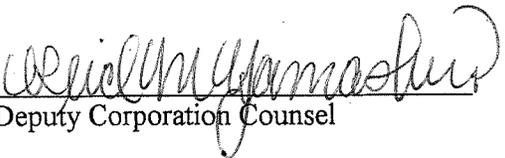
CITY AND COUNTY OF HONOLULU


By: Its Director


By: Director of Budget & Fiscal Services *ajoh*

APPROVED AS TO FORM AND
LEGALITY:

CONSULTANT
PB Americas, Inc.

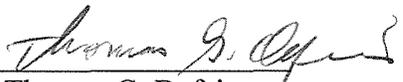

Deputy Corporation Counsel

By: 
Its: Chief Operating Officer
Federal I.D. No.

DONYA-GAYE ANDERSON
NOTARY PUBLIC-STATE OF NEW YORK
No. 02AN6124678
Qualified in Queens County 09 P.O.
My Commission Expires 3/28/07

CERTIFICATION

I, Thomas G. Defeis, Assistant Secretary of PB Americas, Inc., certify that on August 9, 2007, the Board of Directors of the Company adopted the attached resolution and that this resolution has not been revoked and that Michael A. Wilke, the President of PB Americas, Inc. is currently authorized to sign a contract for the Honolulu High-Capacity Transit Corridor Project PE/EIS between the Company and the City and County of Honolulu.


Thomas G. Defeis
Assistant Secretary

8/9/2007
Date

SPECIAL BOARD OF DIRECTORS MEETING

PB Americas, Inc.

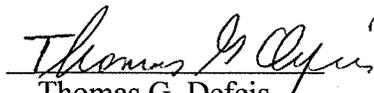
August 9, 2007

The meeting commenced with a quorum present.

The subject of the Company's doing business with the City and County of Honolulu (City) was discussed and it was:

RESOLVED that Michael A. Wilke, the President of PB Americas, Inc. is currently authorized to sign a contract for the Honolulu High-Capacity Transit Corridor Project PE/EIS between the Company and the City.

There being no further business the meeting was adjourned.


Thomas G. Defeis
Assistant Corporate Secretary



SPECIAL PROVISIONS
TO THE CONTRACT BETWEEN
THE CITY AND COUNTY OF HONOLULU
AND PB AMERICAS, INC.

GENERAL ENGINEERING SERVICES

HONOLULU HIGH-CAPACITY TRANSIT CORRIDOR PROJECT

SPECIAL PROVISIONS

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**SPECIAL PROVISIONS
TO THE AGREEMENT FOR PROFESSIONAL SERVICES**

These Special Provisions to the Agreement for Professional Services (these “Special Provisions”) shall be incorporated into and be a part of that certain Agreement for Professional Services, by and between the City and County of Honolulu (the “CITY”) and PB Americas, Inc. (the “CONSULTANT”) dated August __, 2007 (the “Agreement”). These Special Provisions and the General Terms and Conditions for Contracts for Professional Services for the City and County of Honolulu, dated 8/2000 (“General Terms and Conditions”) shall apply to, and are incorporated by reference into the Agreement, except as modified by reference herein. All defined terms in the Agreement shall have the same meaning in these Special Provisions.

I. PROJECT

The PROJECT is the Honolulu High-Capacity Transit Corridor Project.

II. SERVICES

The basic services that the CONSULTANT shall provide under the Agreement are set forth in the Scope of Work attached hereto and incorporated herein as Exhibit 1.

III. TIME

The CONSULTANT shall complete the Work required under this Agreement within 900 calendar days from the Notice to Proceed #1 (NTP #1), exclusive of the time that the CITY and other public agencies require to review the Work.

IV. LIQUIDATED DAMAGES

Liquidated damages are not applicable to this Agreement.

V. INSURANCE REQUIREMENTS

See Paragraph 4.3, Insurance, of the General Terms and Conditions.

VI. COMPENSATION AND PAYMENT SCHEDULE

A. This is a cost plus fixed fee Agreement that is subject to the General Terms and Conditions. The compensation of the CONSULTANT shall be Costs and a Fixed Fee up to the amount stated in the Agreement and shall be made in accordance with the Cost Estimate and Compensation and Invoicing/Payment Schedule in Exhibit 2.

- B. The CITY reserves the right to direct removal from the PROJECT of any CONSULTANT or SUBCONSULTANT employee for any reason and at any time.
- C. Final acceptance of the Work contracted for herein and payment thereof shall not excuse the CONSULTANT from any liability for defects in performance which may subsequently appear.

VII. MODIFICATIONS TO THE GENERAL TERMS AND CONDITIONS FOR CONTRACTS FOR PROFESSIONAL SERVICES FOR THE CITY AND COUNTY OF HONOLULU (8/2000)

The General Terms and Conditions for Contracts for Professional Services for the City and County of Honolulu (8/2000) shall apply to, and are incorporated by reference into, this Agreement, except as may be modified by reference herein.

A. DEFINITIONS

The following definitions are added:

C.F.R.

The Code of Federal Regulations.

DIRECTOR

The CITY's Director of the Department of Transportation Services or the Director's duly authorized representative.

FEDERAL GOVERNMENT

The United States of America and any executive department or agency thereof.

FIRST PROJECT

The approximately 20-mile minimum operable segment of the Locally Preferred Alternative identified by Resolution No. 07-039, FD1(c) (2007).

FTA

The Federal Transit Administration, United States Department of Transportation. The Federal Transit Administration is the current designation for the former Urban Mass Transportation Administration. Any reference in any law, map, regulation, document, paper, or other record of the United States to the Urban Mass Transportation Administration or its acronym UMTA is deemed a reference to the Federal Transit Administration.

LPA

The approximately 28-mile fixed guideway alternative selected as the Locally Preferred Alternative pursuant to Ordinance No. 07-001 (2007).

PHASE I OF THE FIRST PROJECT

The initial phase of the First Project, which is approximately six miles, from the future site of the Kroc Center development at North-South Road to the vicinity of Waipahu.

PMOC

The Federal Transit Administration's Project Management Oversight Contractor.

PMSC

InfraConsult, LLC, the CITY's Project Management Services Consultant or any successor entity.

PROJECT

All work within the scope of work as described in the Agreement executed by the parties and as further described in these Special Provisions for the Honolulu High-Capacity Transit Corridor Project and its component elements, which include the 28-mile Locally Preferred Alternative, the 20-mile First Project, and the approximately 6-mile Phase I of the First Project.

STANDARD OR REQUIREMENT

Any provision of any federal, state or local, including CITY, law, ordinance, code, rule, regulation, guideline, directive, order, circular, agreement, practice, policy, notice, plan, statement, or other standard or requirement, and any amendment or revision thereto made in the future, including any mandatory provision, term, condition, clause, representation, certification, assurance or other statement required thereunder.

U.S.C.

The United States Code.

U.S. DOT

The United States Department of Transportation, including its operating administrations.

WORK

The furnishing of all services, labor, goods, materials, supplies, equipment and other incidentals reasonably necessary to the successful completion of this Agreement.

The following definitions are modified:

CONSULTANT OR CONTRACTOR

Any corporation, partnership, individual, sole proprietorship, joint stock company, joint venture, or other private legal entity engaged by the CITY to perform the services under this Agreement.

The titles of headings of Sections, Subsections and Paragraphs are intended for convenience of reference and shall not be considered as having any bearing on their interpretation.

All words used in the singular shall extend to and include the plural. All words used in the plural shall extend to and include the singular. All words used in any gender shall extend to and include all genders.

B. DESIGNATION OF PROJECT MANAGERS

The Officer-in-Charge shall designate, in writing, a representative to coordinate the Work under this Agreement, to coordinate work under other CITY contracts with the Work under this Agreement, and to act as the liaison between the CONSULTANT and the CITY in order to assist in expediting the resolution of questions or controversies, the making of CITY decisions, and the review and approval by the CITY of documents, progress reports, requests, and other matters as required.

The CONSULTANT shall, with the approval of the CITY, designate in writing a representative, who shall maintain close and frequent communications with the CITY's representative and be authorized to act on behalf of the CONSULTANT. Any change in the CONSULTANT's representative will be made with the approval of the CITY. The CONSULTANT's representative shall be experienced and qualified in the type of work involved and shall be directly responsible for the prosecution of the Work under this Agreement.

Every effort will be made by all parties to this Agreement to retain the same representatives during the term of this Agreement in order to maintain continuity of effort and control.

C. PROMPT PAYMENT TO SUBCONTRACTORS

Prompt payment to subcontractors shall be in accordance with the Disadvantaged Business Enterprise requirements in Section VIII.F, below.

D. NO THIRD PARTY BENEFICIARY

The parties are entering into this Agreement for the sole benefit of the parties in exclusion of any third party, and no third party beneficiary is intended or created by execution of this Agreement.

E. CHANGE ORDERS

It is agreed that the notification period contained in Clause 5.1.1(c) of the General Terms and Conditions shall be thirty days.

F. DELAY

It is agreed that the notification period contained in Clause 6.2 of the General Terms and Conditions shall be thirty days.

G. AUTHORITY OF THE OFFICER-IN-CHARGE AND DIRECTOR OF BUDGET AND FISCAL SERVICES

It is agreed that the words “and binding upon parties” and “binding upon all parties” contained in Clause 6.5 of the General Terms and Conditions shall be deleted.

H. RETAINAGE

Retainage is not applicable to this Agreement.

VIII. CLAUSES APPLICABLE TO FEDERALLY FUNDED CONTRACTS

The CONSULTANT understands that Federal laws, regulations, policies, and related administrative practices applicable to this Agreement on the date signed may be modified from time to time. The CONSULTANT agrees that the most recent of such Federal requirements will govern the administration of the Agreement at any particular point in time, except if the CITY issues a written determination otherwise. To achieve compliance with changing Federal requirements, the CONSULTANT agrees to include notice in each subcontract that Federal requirements may change and that the changed requirements will apply to the subcontract as required.

A. NO GOVERNMENT OBLIGATION TO THIRD PARTIES

1. The CITY and the CONSULTANT acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying Contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this Contract and shall not be subject to any obligations or liabilities to the CITY, the CONSULTANT, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying Contract.

2. The CONSULTANT agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the subconsultant who will be subject to its provisions.

B. PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS AND RELATED ACTS

1. The CONSULTANT acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. §§ 3801 et seq. and U.S. DOT regulations, "Program Fraud Civil Remedies," 49 C.F.R. Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying Contract, the CONSULTANT certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying Contract or the FTA assisted project for which this contract work is being performed. In addition to other penalties that may be applicable, the CONSULTANT further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the CONSULTANT to the extent the Federal Government deems appropriate.
2. The CONSULTANT also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government under a contract connected with a project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 U.S.C. § 5307, the Federal Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5323(l) on the CONSULTANT, to the extent the Federal Government deems appropriate.
3. The CONSULTANT shall include the above two clauses in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the subconsultant who will be subject to the provisions.

C. ACCESS TO RECORDS AND REPORTS

1. The CONSULTANT shall provide the CITY, the FTA Administrator, the Comptroller General of the United States or any of their authorized representatives access to any books, documents, papers and records of

the CONSULTANT which are directly pertinent to this Contract for the purposes of making audits, examinations, excerpts and transcriptions. The CONSULTANT shall, pursuant to 49 C.F.R. 633.17, provide the FTA Administrator or his authorized representatives, including any PMOC, access to the CONSULTANT's records and construction sites pertaining to a major capital project, defined at 49 U.S.C. § 5302(a)(1), which is receiving federal financial assistance through the programs described at 49 U.S.C. §§ 5307, 5309 or 5311.

2. When the CITY, in accordance with 49 § U.S.C. 5325(a) enters into a contract for a capital project or improvement (defined at 49 U.S.C. § 5302(a)(1)) through other than competitive bidding, the CONSULTANT shall make available records related to the Contract to the CITY, the Secretary of Transportation and the Comptroller General of the United States, or any authorized officer or employee of any of them for the purposes of conducting an audit and inspection.
3. The CONSULTANT shall permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.
4. The CONSULTANT shall maintain all books, records, accounts and reports required under this Contract for a period of not less than three years after the date of termination or expiration of this Contract, except in the event of litigation or settlement of claims arising from the performance of this Contract, in which case the CONSULTANT shall maintain the same until the CITY, the FTA Administrator, the Comptroller General of the United States, or any of their duly authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto.

D. FEDERAL CHANGES

The CONSULTANT shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between the CITY and the FTA, as they may be amended or promulgated from time to time during the term of this Contract. The CONSULTANT's failure to so comply shall constitute a material breach of this Contract.

E. CIVIL RIGHTS REQUIREMENTS

The CONSULTANT shall include the following requirements in each subcontract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties:

1. **Nondiscrimination** – In accordance with Title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and Federal transit law at 49 U.S.C. § 5332, the CONSULTANT shall not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the CONSULTANT shall comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

2. **Equal Employment Opportunity** – Equal Employment Opportunity - The following equal employment opportunity requirements apply to the underlying Contract:
 - a. **Race, Color, Creed, National Origin, Sex** – In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e, and Federal transit laws at 49 U.S.C. § 5332, the CONSULTANT shall comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. Parts 60 *et seq.*, (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," 42 U.S.C. § 2000e), and with any applicable Federal statutes, executive orders, regulations, and Federal policies that may in the future affect construction activities undertaken in the course of the Project. The CONSULTANT shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the CONSULTANT shall comply with any implementing requirements FTA may issue.

 - b. **Age** -- In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 U.S.C. § 623 and Federal transit law at 49 U.S.C. § 5332, the CONSULTANT shall refrain from discrimination against present and prospective employees for reason of age. In addition, the CONSULTANT shall comply with any implementing requirements FTA may issue.

c. **Disabilities** -- In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, the CONSULTANT shall comply with the requirements of the U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. Part 1630, pertaining to employment of persons with disabilities. In addition, the CONSULTANT shall comply with any implementing requirements FTA may issue.

3. **Access for Individuals with Disabilities** – The CONSULTANT shall comply with 49 U.S.C. § 5301(d), which states the Federal policy that elderly individuals and individuals with disabilities have the same right as other individuals to use public transportation services and facilities, and that special efforts shall be made in planning and designing those services and facilities to implement transportation accessibility rights for elderly individuals and individuals with disabilities.

F. DISADVANTAGED BUSINESS ENTERPRISES (DBE)

1. This Contract is subject to the requirements of Title 49, Code of Federal Regulations, Part 26, Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs. The national goal for participation of Disadvantaged Business Enterprises (DBE) is 10%. The CITY's overall FY 2008 goal for DBE participation is 13.72%. A separate contract goal has not been established for this Contract.

2. **DBE Assurances.** The CONSULTANT and its subcontractors shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. The CONSULTANT shall carry out applicable requirements of 49 C.F.R. Part 26 in the award and administration of DOT-assisted contracts. Failure by the CONSULTANT to carry out these requirements is a material breach of this Contract, which may result in termination of this Contract or such other remedy, as the CITY deems appropriate.

The above paragraph must be included in each subcontract the CONSULTANT signs with a subcontractor.

3. **Listing of DBE Joint Contractors and/or Subcontractors.** The CONSULTANT shall identify all DBE joint contractors and/or all subcontractors that will participate in the Contract on the LISTING OF DBE SUBCONTRACTORS AND VENDORS form set forth in EXHIBIT 4.

4. **Prompt Payment.** The CONSULTANT shall pay all subcontractors (DBEs and non-DBEs) for satisfactory performance of their subcontracts no later than 30 days from receipt of payment by the CITY. Full and prompt payment by the CONSULTANT to all subcontractors shall include retainage, if applicable.
5. **Contract Goal.** Although the CITY has not established a DBE participation goal for this Contract, DBEs shall have an equal opportunity to participate in the Contract. By specifying a DBE participation goal on the DISADVANTAGED BUSINESS ENTERPRISE STATEMENT AND GOAL form set forth in EXHIBIT 4, the CONSULTANT agrees to adhere to the REQUIREMENTS FOR PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES (DBEs) set forth in EXHIBIT 4.
6. **Reports to the CITY.** The CONSULTANT shall submit the "DBE PARTICIPATION REPORT" reflecting payments made by the CONSULTANT to DBE subcontractors. Payments to the CONSULTANT will not be processed if the DBE PARTICIPATION REPORT is not properly completed and attached. The DBE PARTICIPATION REPORT shall be prepared in the format set forth in EXHIBIT 4.
7. **Records.** On request, the CONSULTANT shall make available for inspection, and assure that its subcontractors make available for inspection:
 - a. Records of prompt payments made in accordance with Section VIII.F.4, above;
 - b. The names and addresses of DBE subcontractors and vendors under this Contract;
 - c. The dollar amount and nature of work of each DBE subcontractor;
 - d. The social/economic disadvantaged category of the DBE firms, i.e. Black American, Hispanic American, Native American, Subcontinent Asian American, Asian Pacific American, Non-Minority Women, or Other; and
 - e. Other related materials and information.
8. The CONSULTANT shall promptly notify the CITY, whenever a DBE subcontractor performing work related to this Contract is terminated or fails to complete its work. The CONSULTANT shall also promptly notify the CITY of a DBE subcontractor's inability or unwillingness to perform and provide reasonable documentation. The CONSULTANT shall make good faith efforts to engage another certified DBE subcontractor to perform at least the same amount of work, to the extent needed to meet the contract goal set forth in EXHIBIT 4. The CONSULTANT shall obtain the CITY's prior

approval of the substitute certified DBE contractor. The CITY reserves the right to obtain from the CONSULTANT copies of new or amended proposed DBE subcontractor participation or documentation of the CONSULTANT's good faith efforts to achieve the Contract goal set forth in EXHIBIT 4.

9. The CONSULTANT shall not terminate any DBE subcontractor and perform that work through its own forces or those of an affiliate without prior written consent of the CITY.

G. INCORPORATION OF FEDERAL TRANSIT ADMINISTRATION (FTA) TERMS

1. Section VIII of the Special Provisions includes, in part, certain Standard Terms and Conditions required by the U.S. DOT, whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by the U.S. DOT, as set forth in FTA Circular 4220.1E are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Contract. The CONSULTANT shall not perform any act, fail to perform any act, or refuse to comply with any CITY requests which would cause the CITY to be in violation of the FTA terms and conditions.
2. The CONSULTANT shall include the above clause in each subcontract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties.

H. GOVERNMENT-WIDE DEBARMENT AND SUSPENSION

This Contract is a covered transaction for purposes of 49 C.F.R. Part 29. As such, the CONSULTANT is required to verify that none of the CONSULTANT, its principals, as defined at 49 C.F.R. § 29.995, or affiliates, as defined at 49 C.F.R. § 29.905, are excluded or disqualified as defined at 49 C.F.R. §§ 29.940 and 29.945.

The CONSULTANT is required to comply with 49 C.F.R. 29, Subpart C and must include the requirement to comply with 49 C.F.R. 29, Subpart C in any lower tier covered transaction it enters into. By signing the Contract, the CONSULTANT certifies as follows:

The certification in this clause is a material representation of fact relied upon by the CITY AND COUNTY OF HONOLULU (the CITY). If it is later determined that the CONSULTANT knowingly

rendered an erroneous certification, in addition to remedies available to the CITY, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment. The CONSULTANT agrees to comply with the requirements of 49 C.F.R. 29, Subpart C, throughout the Contract period. The CONSULTANT further agrees to include a provision requiring such compliance in its lower tier covered transactions.

I. LOBBYING

Contractors who apply or bid for an award of \$100,000 or more shall file the certification required by 49 C.F.R. Part 20, "New Restrictions on Lobbying." Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose the name of any registrant under the Lobbying Disclosure Act of 1995 who has made lobbying contacts on its behalf with non-Federal funds with respect to that Federal contract, grant, or award covered by 31 U.S.C. § 1352. Such disclosures are forwarded from tier to tier up to the CITY.

The "CERTIFICATION REGARDING LOBBYING," as executed by the CONSULTANT, is included in EXHIBIT 5. The CONSULTANT and its subconsultants at every tier shall comply with U.S. DOT regulations, "New Restrictions on Lobbying," 49 C.F.R. Part 20, modified as necessary by 31 U.S.C. § 1352, which requires that no Federal appropriated funds shall be used to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352.

J. CLEAN AIR REQUIREMENTS

1. The CONSULTANT shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. §§ 7401 *et seq.* The CONSULTANT shall report each violation to the CITY and understands and agrees that the CITY will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office.

2. The CONSULTANT shall include the above clause in each subcontract exceeding \$100,000 financed in whole or in part with Federal assistance provided by FTA.

K. CLEAN WATER REQUIREMENTS

1. The CONSULTANT shall comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. §§ 1251 et seq. The CONSULTANT shall report each violation to the CITY and understands and agrees that the CITY will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office.
2. The CONSULTANT shall include the above clause in each subcontract exceeding \$100,000 financed in whole or in part with Federal assistance provided by FTA.

L. FLY AMERICA REQUIREMENTS

1. The CONSULTANT shall comply with 49 U.S.C. § 40118 (the “Fly America Act”) in accordance with the General Services Administration's regulations at 41 C.F.R. Parts 301-10, which provide that the CITY and sub-recipients of Federal funds and their consultants are required to use U.S. Flag air carriers for U.S. Government-financed international air travel and transportation of their personal effects or property, to the extent such service is available, unless travel by foreign air carrier is a matter of necessity, as defined by the Fly America Act. The CONSULTANT shall submit, if a foreign air carrier was used, an appropriate certification or memorandum adequately explaining why service by a U.S. flag air carrier was not available or why it was necessary to use a foreign air carrier and shall, in any event, provide a certificate of compliance with the Fly America requirements.
2. The CONSULTANT shall include the requirements of this section in all subcontracts that may involve international air transportation.

M. ENERGY CONSERVATION REQUIREMENTS

The CONSULTANT shall comply with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conversation Act.



**EXHIBIT 1
SPECIAL PROVISIONS**

**HONOLULU HIGH-CAPACITY TRANSIT CORRIDOR PROJECT
PRELIMINARY ENGINEERING/EIS SERVICES
SCOPE OF WORK**

TABLE OF CONTENTS

- 1.0 Plans for PE/EIS Phase Inclusive of Federal Transit Administration (FTA) Acceptance
- 2.0 Plans for Final Design (or Design Build) Inclusive of FTA Acceptance
- 3.0 PE/EIS Contract Management
- 4.0 PE/EIS Team Command and Control
- 5.0 Project Controls for New Starts Capital Project
- 6.0 Environmental Impact Statement (EIS) Preparation
- 7.0 Project Delivery and Capital Plan
- 8.0 Quality Assurance
- 9.0 External Project Review
- 10.0 Safety and Security Management Plan (SSMP)
- 11.0 Land Use Planning
- 12.0 Property Acquisition
- 13.0 Operability Input to Design (Planning Elements)
- 14.0 Financial Plan
- 15.0 TheBus Interface
- 16.0 Architectural and Engineering Design Services
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- 22.0 Public Art
- 23.0 Record of Decision (ROD)
- 24.0 Project Insurance Options
- 25.0 Travel Forecasting

NOTE:

The Deliverable List included with each Task may not include all deliverables described in the Scope. In all cases the deliverables identified in the Scope will govern and will be produced by the CONSULTANT in accordance with the Agreement.

1.0 Plans for PE/EIS Phase Inclusive of Federal Transit Administration (FTA) Acceptance

APPROACH:

The CONSULTANT will prepare and periodically update a series of plans for the Preliminary Engineering/Environmental Impact Statement (PE/EIS) phase of the Project that are required for the FTA project review process. Requirements and guidance for the content of these plans are contained in various documents produced by FTA and can be found at FTA's website <http://www.fta.dot.gov>. These plans generally require specific FTA acceptance in order for the Project to be eligible for FTA New Starts funding. The required reports include at least the following sections, which may be revised from time to time, and any other information that FTA may require in the future:

SCOPE:

1.1 Project Management Plan (PMP)

Update the current PMP produced by the Department of Transportation Services' Rapid Transit Division (RTD) for the Project and produce a subordinate PMP for the CONSULTANT team. Conduct review cycles on the document with the RTD and incorporate comments from the RTD. The PMP will be produced in accordance with the most current FTA guidelines.

1.2 Vehicle Fleet Management Plan (FMP)

Using the current FMP provided by the RTD and information available from the Alternatives Analysis (AA), prepare a revised updated FMP. Conduct review cycles on the document with the RTD and incorporate comments from the RTD. The FMP will be produced in accordance with the most current FTA guidelines.

1.3 Quality Management Plan (see Task 8.0 below)

Produce and maintain a Quality Plan for the Project based upon the most current FTA guidance for such plans. Conduct review cycles on the document with the RTD and incorporate comments from the RTD. Further information on the Quality Management Plan is contained in Task 8.0 below.

1.4 Real Estate Acquisition Management Plan (RAMP) (see Task 12.0 below)

Produce a RAMP for the Project based upon the most current FTA guidance for such plans and the current real estate acquisition processes of the RTD. Conduct review cycles on the document with the RTD and incorporate comments from the RTD. Further information on the RAMP is contained in Task 12.0 below.

1.5 Third-Party Agreement Plan

Define all of the third-party agreements that will be necessary for execution of the Project and produce a plan and schedule for the development of all of the agreements. Identify the major issues to be addressed in each agreement and the anticipated costs, if any, to be incurred by the Project. Conduct review cycles on the document with the RTD and incorporate comments from the RTD.

1.6 Safety and Security Management Plan (SSMP) (see Task 10.0 below)

Produce the SSMP for the Project based upon the most current FTA guidance for such plans and taking into account the RTD's safety and security organizations. Conduct review cycles on the document with the RTD and other designated agencies and incorporate comments received. Further information on the SSMP is contained in Task 10.0 below.

1.7 Safety and Security Certification Plan

Produce an initial Safety and Security Certification Plan for the Project based upon designs progressed through preliminary engineering. Conduct review cycles on the document with the RTD and other

designated agencies and incorporate comments received. Take into consideration the processes required by the State Safety Oversight organization.

1.8 Financial Plan (See Task 14.0 below)

Produce a Financial Plan for the Project based upon the most current FTA guidance for such plans. Conduct review cycles on the document with the RTD and incorporate comments from the RTD. Further information on the Financial Plan is contained in Task 14.0 below.

1.9 Conform FTA Templates to PE/EIS Results

Produce the inputs to the 5309 New Starts Report templates as changes occur to Project information.

1.10 New Starts Report Submittal

Annually assist the RTD in preparing its submittal to the New Starts Report. Conduct review cycles on the document with the RTD and incorporate comments from the RTD.

1.11 Support to FTA Risk Management Program

Provide engineering and other support to FTA's risk management consultant during risk management studies.

ASSUMPTIONS:

N/A

SCHEDULE:

N/A – see referenced tasks for specific deliverable schedules.

DELIVERABLES:

1. PMP (Note Tasks 3.0, 4.0, and 5.0 are the basis for the PMP and budget for this effort is within these tasks.)
2. Fleet Management Plan
3. Inputs to 5309 New Starts Report

2.0 Plans for Final Design (or Design Build) Inclusive of FTA Acceptance

APPROACH:

At the end of the PE/EIS phase, the CONSULTANT will prepare an update of the following FTA required plans with a focus on the final design and design/build phase of the Project. The required documents will include, but not be limited to, the following:

SCOPE:

- 2.1 Project Management Plan
- 2.2 Vehicle Fleet Management Plan
- 2.3 Quality Management Plan
- 2.4 Real Estate Acquisition Management Plan
- 2.5 Third-Party Agreement Plan
- 2.6 Safety and Security Plan
- 2.7 Safety and Security Certification Plan
- 2.8 Financial Plan
- 2.9 Risk Management Plan

In updating these plans, the CONSULTANT will refer to the most recent FTA project guidelines covering each of these required plans. The CONSULTANT will also provide for review cycles with the RTD and incorporate comments from the CITY, the State, FTA, and various FTA consultants responsible for review and acceptance of this work.

ASSUMPTIONS:

N/A

SCHEDULE:

At end of PE/EIS Phase.

DELIVERABLES:

Update Plans 2.1 through 2.9

3.0 PE/EIS Contract Management

APPROACH:

The CONSULTANT will provide for the management of its PE/EIS work, including preparation of detailed refinements to the overall work plan that will allow for the proper project control of the work being undertaken. Once the work to be undertaken is completely refined and planned, procedures shall be developed to ensure the oversight and monitoring of the progress of the work and expenditures of budget against each task. Subtasks for management of the PE/EIS work include the following:

SCOPE:**3.1 Detailed Work Plan**

The CONSULTANT will prepare a detailed work plan for its activities that shall be subject to review and acceptance by the RTD. This work plan will include a description of the tasks to be undertaken, a designation of the persons responsible for each task, an anticipated level of effort for the task in person-hours, and a description of the interface and review requirements necessary to ensure that the task is properly coordinated within the overall scope of work. The work plan shall be subject to review cycles by the RTD and comments from the RTD shall be addressed.

3.1.1 Key Milestones

The detailed work program will identify a schedule of major milestones during the performance of the services. The milestones listed will be consistent with the RTD's intention for completion of the PE/EIS phase of the Project within 30 months from the CONSULTANT's Notice to Proceed (NTP) and shall be consistent with the RTD's intention of achieving groundbreaking for the Project in calendar year 2009.

3.1.2 Key Deliverables

The key deliverables for the PE/EIS phase will be described and incorporated into the detailed work plan. The CONSULTANT will also accommodate RTD review and respond to comments on deliverables.

3.2 Work Breakdown Structure (WBS)

The CONSULTANT will prepare a work breakdown structure to a level consistent with the work being accomplished during the PE/EIS phase. It is not intended that this structure be highly complex or detailed at this early stage in the Project, but it must be sufficiently flexible to be consistent with the needs of the Project at later phases.

3.3 Budget

The CONSULTANT will allocate the PE/EIS budget according to tasks in order to allow tracking of costs and progress toward completion of tasks. The allocation of budget to tasks is intended to be used as a project management tool permitting the RTD and the CONSULTANT to make decisions together on reallocation of task budgets as necessary for the completion of tasks.

3.4 Schedule and Cost Tracking (Primavera and Prism)

The PE/EIS schedule will be developed using Primavera software, and progress will be tracked and reported using Prism software.

3.5 Schedule Control Procedures

Schedule progress reports will be produced monthly and will include a description of variations from the planned schedule and any proposed management actions to adjust resources and/or scope to achieve project schedule objectives. Schedule progress reports will focus on work achieved in the subject reporting period and on work anticipated to be undertaken in the upcoming reporting period. Percent of schedule completion of the work will be identified.

3.6 Cost Control Management Information System (MIS)

A cost control management information system will be prepared consistent with the CONSULTANT's cost accounting system. The system needs to record costs and provide reports that allow for review and analysis of costs incurred on a timely basis, both for work incurred by the CONSULTANT itself and for work incurred by subconsultants. The cost control MIS shall also incorporate checking procedures to verify that costs allocated to the Project are consistent with contract terms.

3.7 Cost Control Procedures

Cost progress reports will be produced monthly and will include a description of variations from the planned costs incurred and any proposed management actions to adjust resources and/or scope to achieve project cost objectives. Cost progress reports will focus on costs expended in the subject reporting period, costs incurred from inception to the date of the project report, and on work anticipated to be undertaken in the upcoming reporting period. Percent of cost completion of work will be identified.

3.8 Document Control

The CONSULTANT will establish a document control system for the PE/EIS phase that will establish a permanent record of the Project and subsequently permit a person with interest in any aspect of the work to understand how it was developed and implemented. A revision tracking system will be established. The document control system will also permit the retrieval of the most current up-to-date revision of any document with regard to the Project. Finally the document control system should include provisions to make document users aware of the status of current documents. The document control system will be compatible with the RTD's document control system.

3.9 Configuration Management

The CONSULTANT will review and incorporate relevant provisions of the RTD's configuration management plan, including document control, design review, baseline system descriptions, and design change control.

3.10 Contract Administration

3.10.1 Cost Accounting

The CONSULTANT will develop and implement cost accounting procedures that are compliant with CITY, State, and FTA requirements for the Project. These procedures must allow for costs to flow seamlessly between the CONSULTANT's cost accounting system and the RTD's project controls system and include only authorized contract costs that are auditable.

3.10.2 Work Authorization

The CONSULTANT will establish a verifiable process that controls charges by consultant personnel and subconsultant personnel in the project office and in remote offices. Work will be subject to specific authorizations with enforceable budget limitations. Records of such authorizations and budget limitations will be kept in a fashion that may be periodically audited by the CITY.

3.10.3 Subcontract Administration

The CONSULTANT will develop subcontract administration procedures that are compliant with CITY, State, and FTA requirements for the Project. These procedures will address subcontracts at all tiers and ensure the incorporation of proper scopes, schedules, and budgets, as well as all required contract pass-down clauses. Administrative procedures will address such subjects as invoicing, payment, insurance verification, reporting, acceptance, and subcontract close-out.

3.10.4 Support Services

The CONSULTANT will provide support services in the project offices as requested by the RTD.

3.11 The CONSULTANT will provide project management and administrative staff to support the Project and the specific deliverables of Tasks 1.0 through 5.0.

ASSUMPTIONS:

N/A

SCHEDULE:

For duration of PE/EIS Phase.

DELIVERABLES:

1. Detailed Work Plan
2. Work Breakdown Structure for the Project
3. Budget
4. Schedule and Cost Tracking
5. Schedule Control Procedure
6. Cost Control Procedure
7. Monthly Cost Control Reports

4.0 PE/EIS Team Command and Control

APPROACH:

Working in concert with the PMP, the CONSULTANT will develop a program structure for execution of the PE/EIS tasks that will include a refinement of the organizational information contained in the PMP. Subtasks to be developed for command and control of the Project include the following:

SCOPE:

4.1 Organizational Approach

An overall organizational approach will be agreed upon with the RTD to describe how the CONSULTANT's work will be executed and which entities within the CONSULTANT parent and subconsultant structures will participate in the Project and how individuals to be assigned to the Project will be identified and mobilized.

4.2 Staffing Plan

The staffing plan for the Project will identify the proper names of staff assigned, their planned start and finish dates, and the level of effort that they will expend during their assignment to the Project, as well as whether their assignment is full-time or what percentage of their time will be used on the Project. The staffing plan will be updated periodically as the work progresses. The RTD will have the following rights with respect to staff assigned to the Project:

1. Approval of CONSULTANT-proposed changes at any level in the organization.
2. Approval of replacement staff for staff that leave the Project prior to completion of their assignment.
3. When deemed by the RTD to be in its best interests, the right to remove any staff from assignment on the Project and replacement with an alternative to be approved by the RTD.

4.3 Organization Chart

The CONSULTANT will provide a hierarchical organization chart that shows the reporting and responsibility relationships for every individual working on the Project. This chart shall be periodically updated as the work progresses and changes are made in the organization. The organization chart should also show telephone and e-mail contact information for all CONSULTANT staff.

4.4 Position Descriptions

The CONSULTANT will provide position descriptions for all personnel to be assigned to the Project full-time. These descriptions shall include general statements of the responsibilities of the position and the minimum qualification and experience needed by persons holding such positions.

4.5 Organizational Unit Charters

For each major organizational unit showing on the CONSULTANT organization chart, the CONSULTANT will include a description of the services to be provided by that unit. These charters will be tied to the Scope of Work for the overall Agreement.

4.6 Procedures

The CONSULTANT will assist the RTD in organizing and developing a Management Procedures Manual for the project office. The manual will establish a uniform approach for all staff in the conduct of operations. The CONSULTANT and the RTD will jointly select detailed procedures to be incorporated in the manual covering project management, contracting, and project administration.

4.7 Committee Structure

The Project will be organized with several standing committees (e.g., a fire/life safety committee) and ad-hoc committees established to address specific issues. The CONSULTANT will provide expertise and participation in these committees as mutually agreed with the RTD. The CONSULTANT will also develop appropriate reporting mechanisms to monitor the work of these committees and record deliberations and recommendations.

4.8 Contracting Approach

The CONSULTANT will develop subconsultant contracts in conformance with the overall Agreement. Where practical, these subconsultant contracts will be developed on a cost plus fixed fee basis (CPFF). In cases where CPFF is not practical, the CONSULTANT will recommend contracting approaches that include provisions for demonstrating fair and reasonable pricing. The RTD will approve all subcontracts.

4.9 Third-Party Interfaces

The CONSULTANT will provide support to the RTD as requested in managing third-party interfaces for the Project. This support will address both third parties (such as utilities and outside agencies) with specific agreements identified in Subtask 1.5 Third-Party Agreement Plan, as well as other third parties (such as adjacent property owners) whose interests are not covered specifically by written agreements.

ASSUMPTIONS:

30 Procedures will be developed in Subtask 4.6

SCHEDULE:

- Start: Immediately upon NTP.
- Finish: Initial deliverables for PMP will be completed November, 2007, and will be updated through the life of the Agreement.

DELIVERABLES:

1. Organizational Approach document
2. Staffing plan
3. Organizational chart
4. Position descriptions
5. Organizational Unit Charters
6. Procedures

5.0 Project Controls for New Starts Capital Project

APPROACH:

More extensive project control procedures will be required as the Project advances. The CONSULTANT will develop a detailed program that will allow the RTD to control the Project, the follow-on phases of final design, procurement, and construction. Elements of this program should be developed to allow the RTD to make informed decisions on progress and cost issues and to make corrective actions if necessary. Functions that will be necessary in this regard include the following:

SCOPE:

5.1 Detailed Work Plan

The CONSULTANT will prepare a detailed work plan which will indicate the activities which the RTD must perform to complete the follow-on phases of the Project. The activities will indicate which contractor packages will perform the work and an outline of what is to be included in their detailed work plan.

5.1.1 Key Milestones

The detailed work plan will identify a schedule of major milestones to complete the follow-on phases of the Project and in which contract packages they will be included.

5.1.2 Key Deliverables

Key deliverables for each contract package will be identified.

5.2 Work Breakdown Structure (WBS)

The CONSULTANT will develop a detailed WBS to be utilized in the follow-on contract packages.

5.3 Estimating Procedures

Estimating procedures will be developed to address methodologies to be used in estimates at the different stages of final design, engineer's estimate prior to the issuance of bid documents and change orders.

5.4 Budget

The CONSULTANT will assist the RTD in the development of the final capital budget to be utilized for the approval by the FTA of the New Starts Capital Program. They will also assist in the development of the budgets for follow-on contract packages. A detailed construction schedule will be developed. It will be cost loaded for the purpose of payment of the construction contractors.

5.5 Schedule Control Procedures

Schedule control procedures will be developed consistent with the CONSULTANT's cost accounting system.

5.6 Cost Control MIS

Develop a MIS for final design through construction.

5.7 Cost Control Procedures

5.8 Contract Administration – See Subtask 7.1

5.9 Design, Procurement, and Construction Change Procedures

Develop change procedures for implementation through final design, procurement and construction.

5.10 Design, Procurement, and Construction Claims Procedures

Develop claims procedures for implementation through final design, procurement and construction.

ASSUMPTIONS:

N/A

SCHEDULE:

- Start: July 2008.
- Finish: January 2009.

DELIVERABLES:

1. Work Plan
2. Work Breakdown Structure
3. Estimating procedures
4. Construction Schedule (cost loaded)
5. Change procedures
6. Claims procedures

6.0 Environmental Impact Statement (EIS) Preparation

APPROACH:

The CONSULTANT will prepare Draft and Final EISs and related technical reports for the Project. Necessary agency and community coordination activities that are required as a part of the processes will also be performed, including preparation of responses to all comments received on the Draft EIS during its circulation period. As work progresses on the EIS documentation, the CONSULTANT will submit progress documentation to the RTD and other project participants as appropriate and will address review comments arising from this process.

The Proposed Action for National Environmental Policy Act (NEPA) documentation is the approximately 20-mile section of the Locally Preferred Alternative (LPA) identified as the First Project or the New Start Project. The LPA extensions and branches will be included in the Draft and Final EIS documents as future actions, and the same level of analysis will be applied to the extensions and branches as for the 20-mile section. The Draft EIS and technical reports will include a No Build Alternative and up to three build alternatives. Each of the build alternatives will be a fixed-guideway alternative following a combination of alignments identified in the Locally Preferred Alternative as adopted in Ordinance No. 07-001 (2007) as clarified in the NEPA Scoping Report. The three build alternatives differ only in the section between Aloha Stadium and Middle Street. The analysis will include comparison of the impacts of up to the five classes of vehicle technology listed in the Notice of Intent (NOI). The transit technology will be selected prior to preparation of the Final EIS.

The CONSULTANT will prepare the EIS for the Project in compliance with applicable laws and requirements, including but not limited to NEPA; Section 4(f) of the Department of Transportation Act of 1966, as amended (Section 4(f)); Section 6(f) of the Land and Water Conservation Fund Act; Section 106 of the National Historic Preservation Act of 1966, as amended (Section 106); the Clean Air Act of 1970, as amended (CAAA); the Clean Water Act of 1972, as amended; the Endangered Species Act of 1973, as amended (Section 7); the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU); and the Hawai'i Revised Statutes (HRS) Chapter 343.

The CONSULTANT environmental team will conduct monthly coordination meetings through the course of the environmental process. The CONSULTANT will provide for legal review of issues related to HRS Chapter 343 and NEPA as directed by the RTD; for budgeting purposes, up to 100 hours of legal support has been assumed.

SCOPE:

6.1 Draft EIS

The CONSULTANT will prepare an Administrative Draft EIS for review by the RTD and shall incorporate agreed-upon changes. Upon RTD approval, a second Administrative Draft EIS will be prepared for FTA and cooperating agencies review. Comments and changes shall be incorporated as directed by the RTD. A proof copy will be prepared for RTD and FTA approval. Edits will be made based on comments on the proof copy and approved by FTA and the RTD. The Draft EIS will include at minimum the following sections per FTA guidance:

- i. Table of Contents
- ii. Summary
 - 1. Project Background and Purpose and Need
 - 2. Alternatives Considered
 - 3. Transportation Consequences
 - 4. Affected Environment and Environmental Consequences
 - 5. Cost and Financial Analysis
 - 6. Evaluation of Alternatives
 - 7. Comments and Coordination
 - 8. Section 4(f) (if needed)
 - 9. References
 - 10. Index
- iii. Appendices
 - 1. List of Prepares
 - 2. List of Recipients

The CONSULTANT will assemble the Draft EIS documentation, using the outputs of the AA and Subtasks 6.1 through 6.5. The report will provide an objective evaluation of the alternatives under consideration, following the NEPA process and FTA guidelines. Where appropriate, potential mitigation measures will be discussed.

As a part of the environmental documentation, tables and figures will be developed to illustrate and explain the project area characteristics, alternatives, location of impacts and comparison of impacts. The text will be written in a user-friendly manner, with the assistance of a technical editor. The Draft EIS will incorporate photos, summaries of findings at the beginning of major sections, and comparison tables.

The CONSULTANT will provide each version of the Draft EIS in paper and as an Adobe Acrobat file on CD. For budgeting purposes it is assumed that 10 paper and one CD copy will be provided of the first Administrative Draft; 25 paper and five CD copies will be provided of the second Administrative Draft; and five paper copies and one CD will be provided of the proof copy. It is assumed 200 paper copies and 200 CDs will be provided of the Draft EIS for distribution at the CITY's direction. For budgeting purposes, the Draft EIS will be in black and white with up to 20 pages printed in color.

SCHEDULE:

The first Administrative Draft EIS will be available seven months after NTP. The second Administrative Draft EIS will be available three weeks after receiving complete comments on the first Draft. The proof copy will be available three weeks after receiving complete comments on the second Draft. Distribution will occur one week after acceptance of the proof copy.

6.1.1 Project Background and Purpose and Need

The project background and purpose and need in the AA and Draft EIS Scoping Report will be reviewed and modified as needed for inclusion in the Draft EIS. It is assumed that no significant revision to the purpose and need will be warranted through the EIS process.

6.1.2 Alternatives Considered

6.1.2.1 Alternative Analysis Screening and Selection Process

This section will summarize information in the AA report. The alternatives considered during the AA and the methods used to screen those alternatives down to the short list of alternatives retained for detailed analysis in the Draft EIS will be presented.

6.1.2.2 Definition of Alternatives Retained for Detailed Analysis

The No Build alternative will be defined using the Oahu Metropolitan Planning Organization (OMPO) Oahu Regional Transportation Plan (ORTP). The three build alternatives will be detailed based on conceptual engineering completed and accepted by the RTD within 3 months of NTP. The three build alternatives for the New Start Project are:

- Fixed Guideway from East Kapolei to Ala Moana Center via Salt Lake Boulevard
- Fixed Guideway from East Kapolei to Ala Moana Center via Salt Lake Boulevard with a parallel alignment to the Airport following later
- Fixed Guideway from East Kapolei to Ala Moana Center via the Airport

The analysis of each of the build alternatives also will consider future extensions to West Kapolei, UH Mānoa, and Waikīkī. In the Draft EIS the New Start Project and the completion of future extensions will be evaluated at the same level of detail.

Separately, up to five vehicle technology alternatives will be presented. The range of vehicle technologies will be limited to those listed in the Notice of Intent (NOI). Each vehicle alternative will be described using available manufacturer's information. In addition, the effect of each vehicle alternative on the physical and operating characteristics of the overall fixed guideway system will be presented.

6.2 Environmental Disciplines to be Analyzed

APPROACH:

The CONSULTANT will conduct environmental analyses, including describing the affected environment, evaluating the long-term and construction effects of the Project, evaluating indirect and cumulative effects, identifying mitigation for project impacts, and identifying unavoidable adverse impacts. This work will build upon the work conducted for the Alternatives Analysis (AA). The work described below shall be completed to support the Draft EIS unless noted otherwise as work to be completed to support the Final EIS.

Generally, technical reports for the environmental disciplines will be produced first, and then information from the technical reports will be summarized in the Draft EIS. The technical reports will provide an overview of the discipline, including existing conditions, project impacts, and possible mitigation measures. The technical reports will be both analytic and encyclopedic in nature while the environmental disciplines will be presented analytically and concisely in the Draft EIS to support the decision-making process and be understandable to a lay audience, including local decision-makers and the public. The Draft EIS will include discussion of all environmental disciplines. At a minimum, readers of the EIS will be referred back to the technical reports where the discussion of the environmental discipline has been greatly condensed.

For budgeting purposes it is assumed that five paper copies and one CD of technical reports developed addressing the environmental disciplines shall be delivered to the RTD in draft form. The CONSULTANT shall incorporate agreed-upon changes, and it is assumed 10 paper copies and one CD of the reports shall be delivered in final form. Once all technical reports are completed, for budgeting purposes it is assumed 50 CD or DVD copies of the collective set will be provided in Adobe Acrobat format. For budgeting purposes, the technical reports will be black and white, with up to 20 pages printed in color.

ASSUMPTIONS:

Each of the technical reports will build on information prepared for the AA and will include additional information developed to evaluate the alternatives being addressed in the Draft EIS. Each of the technical reports analyzing the environment will include applicable requirements, discussion of the approach and method, affected environment, long-term and construction impacts, potential avoidance/minimization/ mitigation measures, indirect and cumulative impacts, and a summary of resource/regulatory agency and local government collaboration. The approach of the technical analysis

for each area of the environment, as well as the overall approach to cumulative impacts for all analysis, will be agreed upon in advance of the analysis.

For purposes of EIS preparation, a “design freeze” defining the project footprint, stations, right-of-way, construction phasing, and any construction staging sites will be completed and accepted by the RTD within three months of NTP. This will include a description of the proposed construction plan and construction schedule and sequencing to the level known at the time.

Travel forecasting results (Task 25.0) to be used to support the Draft EIS will be completed and accepted by the RTD within three months of NTP.

The CONSULTANT may need rights-of-entry to conduct field work. The RTD will facilitate the obtaining of rights-of-entry. All required rights-of-entry will be available within 2 months of NTP.

SCHEDULE:

Work will begin at NTP. Draft proposed methodologies will be provided to the RTD within two months of NTP. The RTD will comment on the methodologies within two weeks of receiving them.

Draft technical reports to support the Draft EIS shall be complete five months after NTP. The RTD will comment on findings of the technical reports within two weeks of receiving the draft reports to enable the comments to be incorporated into the Administrative Draft EIS. Final technical reports will be complete one month after receiving comments. Draft technical information to support the Final EIS shall be completed in the Final EIS (Subtask 6.9).

SCOPE:

The technical reports will include analysis of each of the topics listed below. Reports will be prepared as indicated under each topic.

For preparation of the Draft and Final EISs, the CONSULTANT will assess transportation-related impacts for Project alternatives; for costing purposes it is assumed these will include the No Build and three build alternatives. In addition, the FTA Baseline alternative will be evaluated where that evaluation will be required to support the New Starts process. The effects of the New Start Project and the completion of future extensions will be evaluated at the same level of detail. The analysis will address a variety of transportation topics, including estimated ridership, traffic impacts, transit characteristics, as well as impacts on parking and the non-motorized transportation system. The travel forecasting model used for the AA will also be used for the EIS. Information from the transportation effort will also be used for the FTA New Starts applications process and will include the Baseline scenario. The information will also provide direction for Project design efforts, including circulation at stations.

6.2.1 Transportation

Transportation will be a primary discipline in the Draft EIS. Many other tasks of the Project also include transportation study elements. The Draft EIS will incorporate information collected and analysis performed through many of those other tasks. General transportation will be discussed on an island-wide basis with certain elements focused down to corridor or street level discussions.

6.2.1.1 Update Travel Forecasting Model and Ridership Estimates

Travel forecasting will be completed and documented in Task 25.0. Data from the forecasts will be used for the traffic analysis and to support the environmental analyses, including air quality and noise analyses.

6.2.1.2 Transportation Impacts

Analyze and assess potential transportation impacts, including station area and corridor traffic impacts. Traffic will be assessed for the stations and surrounding areas that are included in the Project, including stations and surrounding areas along the future extensions and spurs. The assessment will range, for example, from pedestrian access at downtown Honolulu stations to traffic circulation needs, including

park-and-ride facilities at suburban stations such as Farrington Highway/North-South Road. This analysis will be documented in a *Transportation Technical Report*.

Traffic will need to be assessed for stations included in the Project, locations of support columns that may impact traffic, park-and-ride facilities, and the maintenance and storage facility. The analysis activities will include the following:

- Project Advisory Input
 - General access to Project stations, both vehicle and non-motorized
 - Park-and-ride sizing/location and access locations
 - Possible modifications to roadway, parking, non-motorized paths relating to placement of supporting columns for the Project guideway
 - Access at the Project's maintenance and storage facility
 - Activities will be coordinated with Task 11.0 – Land Use Planning, Subtask 11.2 – Circulation Interface: Traffic, Parking, Passenger Drop-off, Pedestrian, Bike, Others, and Task 13.0 – Operations Input to Design (this will be at a concept level; more detailed information will be provided with results from Subtask 6.2.1.4 (see below))
- Undertake the following traffic engineering/operations work tasks:
 - Conduct traffic impact assessments for each of the planned stations identified for the Project. The assessments will include the following:
 - Identification of Existing Transportation System (baseline conditions)
 - Performance of the Existing Transportation System
 - Transportation Demand and Travel Patterns
 - Trips
 - System-Wide Travel by Mode
 - Transit Service Impacts
 - Transit Service Plan
 - Transit Travel Times
 - Transit Travel Times versus Auto Travel Times
 - Transit Ridership
 - Exclusive Right-of-Way Analysis
 - Roadway Travel Impacts
 - System-Wide Roadway Travel Impacts
 - Screenline Volume and Level-of-Service
 - Other Transportation Impacts
 - Identification of future traffic conditions at Project stations with the implementation of the Project (horizon year 2030 and interim horizons – 2012 for 'Ewa and 2014 for Mid-Corridor), including Level-of-service of affected intersections and roadway segments
 - Identification of traffic conditions at selected Project guideway column placements (for budgeting purposes, 20 locations are assumed), including Level-of-service of affected intersections and roadway segments. The selection of these locations will be made in collaboration with others on the CONSULTANT team as well as input from the RTD.
 - Impacts of parking supply versus demand at stations
 - Impacts on pedestrian and bicycle access
 - Impacts on freight movements

- Identification of traffic conditions for the area surrounding the Project's maintenance and storage facility
- Draft and final reports documenting task results will be produced in a timely fashion to provide sufficient time for the air quality and noise analyses and reports to be completed on schedule.

6.2.1.3 Traffic-Related Modifications

Identify roadway and other traffic modifications to support access at Project stations and to mitigate traffic impacts at selected locations due to placement of guideway columns (note: these improvements will be identified conceptually and checked for design feasibility with the project design team). The detailed design work will be done in Task 16.0 – Architectural and Engineering Design Services (Subtask 16.2.8).

Identify traffic modifications at Project stations and along the corridor, including the following:

- Roadway modifications to support access to Project stations or roadway-related impacts due to columns placement
- Modifications to existing parking capacity including any agreed upon replacement of parking displaced by the Project
- Draft and final technical memoranda documenting task results
- Input to Subtask 11.2 – Station Area Access, and Task 13.0 – Operability Input to Design
- Technical input to Task 16.0 – Architectural and Engineering Design Services (Subtask 16.2.8 – Roadway, Parking Lot, and Traffic Design)
- Technical input to Task 21.0 – Public Involvement (as part of Subtask 21.1.3 – Preliminary Station Design), as well as attendance at related community meetings (this could include general public open houses, etc., but could also include one-on-one sessions with property owners/managers).

6.2.1.4 Construction Traffic Impacts

General assessment of construction traffic conditions will be made for the Draft EIS. A detailed assessment will be completed in Subtask 6.9.1.

ASSUMPTIONS:

- Within Subtask 6.2.1, characteristics of both the Project and the Baseline Alternative will be developed in a manner that will allow the following:
 - Comparisons of key features such as travel times between major locations as well as transit service headways.
 - Service headways (to be defined as part of the Operational Input to Design). For the Project, the extent of service frequency will be defined based on anticipated demand along segments as defined in the travel model.
 - For the Baseline Alternative, bus service characteristics will be defined based on anticipated growth and approved service development plan for the horizon years.
- The traffic assessments conducted for each station and segment section will result in sufficient detail to identify intersection/segment impacts and necessary mitigation efforts. Working with the RTD, the CONSULTANT will identify major issues that will need to be addressed as part of the mitigation program.
- To illustrate potential traffic and non-motorized impacts, the traffic assessment will use visual operations simulation tools. This will help explain potential impacts to the RTD staff, other stakeholders, and the general public.

6.2.2 Land Use and Development Planning

This task includes assessing long-term land use impacts, transit oriented development (TOD) potential at stations, short-term construction impacts on land use, right-of-way impacts, indirect and cumulative

impacts, as well as identifying mitigation measures and preparing the *Land Use and Planning Technical Report* to reflect the analysis. The analysis will include the following activities by the CONSULTANT.

6.2.2.1 Description of Existing Conditions

The existing conditions in the project corridor will be described generally. Conditions within ½ mile of project stations will be described in greater detail.

6.2.2.2 Identify Long-Term Land Use Impacts

Plans and policies that affect land use development in the corridor will be described and the project's consistency with them discussed.

Potential land use impacts within the corridor and station areas associated with the Project will be assessed to identify likely changes in use, accessibility, and displacement related to the Project. The assessment will consider a range of development from continuation of current trends to maximum development allowed by plan. An estimate of the potential impacts on the most sensitive land uses in the corridor will be made. The analysis will consider impacts that are reasonably foreseeable as a result of reduced travel time and/or other impacts of each alternative – based on substantive analysis, not conjecture or assertion. A summary table will be prepared to identify potential impacts for each alternative.

Mitigation measures will be identified.

6.2.2.3 Assess Transit Oriented Development (TOD) Potential

Land use effects related to TOD (Task 11.0) will be described. The CITY's TOD zoning ordinance is anticipated to be available in 2008. If it is available in draft form at the time of analysis, it will be used as a basis for projections; otherwise, a range of options will be provided that would include what would be allowed by a typical TOD ordinance. The final TOD ordinance will be documented in the Final EIS (Subtask 6.9.2); however, the analysis will not be redone; only differences between the final ordinance and the assumptions used during the analysis will be documented.

6.2.2.4 Identify Short-term Construction Period Impacts on Land Use

The CONSULTANT shall identify short-term impacts and mitigation measures related to land areas required for such activities as equipment delivery, materials storage and disposal, laydown areas, construction worker parking, access to work site, and other construction purposes.

6.2.2.5 Identify Right-of-Way Impacts

The CONSULTANT shall identify the full or partial property takes required under each alternative and prepare a summary table that identifies parcel information for full and partial takings and land area of takings for each alternative. The parcels for full and partial takings will be identified on a map for each alternative.

6.2.2.6 Identify Indirect and Cumulative Impacts

Based on available real estate market analyses (Subtask 6.2.3.1), planning policies, zoning, and physical conditions, and experience from elsewhere with the introduction of a new transit system into an area, an estimate of the potential land use development induced by the Project will be made. Cumulative effects to land use at the completion of the long-range transit plan will be estimated.

6.2.2.7 Prepare Land Use and Planning Technical Report

The *Land Use and Planning Technical Report* will be prepared including GIS maps to provide a basis for preparing the Land Use Chapter of the Draft EIS.

6.2.3 Economic Activity

This task includes the preparation of an *Economics Technical Report* addressing the direct and indirect effects of the Project. The analysis shall address the following topics:

6.2.3.1 Area Wide Market Development Demand Assessment

The CONSULTANT shall evaluate regional and corridor market demand and the consistency of the station area TOD development concepts with the estimated trends in the corridor market demand. The assessment will be based on historical growth and capture rates, existing projections of employment and population growth, including existing control totals, and estimates of growth in five-year increments through 2030. The CONSULTANT will translate the population and employment market demand estimates into potential demand for residential, office and retail demand in the corridor for five year increments.

6.2.3.2 Development Impacts of the Fixed Guideway

The CONSULTANT shall evaluate the constraining effects of the existing transportation system on future population and employment growth projections for the corridor. Based on this evaluation, the CONSULTANT will project the extent to which the proposed transit project would provide additional transportation capacity to accommodate future population and employment growth, including opportunities induced via the Project for additional growth and development, over and above the baseline market assessment. The CONSULTANT will estimate the net economic benefits of development-related project effects. This evaluation will draw on the results of the station area analyses as well as research on property value impacts of a mass transit system. In addition, an assessment will be made of No-Build throughput capacity in the corridor, and the ability of this capacity to deliver future employees to job locations will be assessed, focusing in particular on peak period commutation.

6.2.3.3 Transportation System User Benefits

Benefits to users will be estimated, such as time savings for transit and non-transit travelers, vehicle ownership and operating cost reductions, accident cost savings, and parking cost savings.

6.2.3.4 Combined Economic Benefits – Transportation System User Benefits and Development Benefits

The combined economic benefits will be estimated based on the results of Subtasks 6.2.3.2 and 6.2.3.3.

6.2.3.5 Estimating Economic Costs

Project costs will be collected, including initial project investment costs, annual operating and maintenance costs, periodic capital equipment replacement costs and major rehabilitation, and residual value.

6.2.3.6 Economic Effects during Construction

Temporary economic effects, including job creation and loss of business resulting from impaired access, will be discussed, as will multiplier effects.

6.2.4 Neighborhoods and Communities

The *Neighborhoods and Communities Technical Report* shall document and evaluate the environmental impacts of the proposed alternatives on the social environment, which includes short-term and long-term effects on disadvantaged groups, public services, community facilities, community character, cultural resources and practices, geographic continuity, housing, and economic opportunity, as well as identify feasible and appropriate measures that will avoid, minimize, or mitigate direct impacts.

Neighborhoods discussed will be those through which the Project alignment passes with neighborhoods identified using traditional neighborhood divisions rather than neighborhood board boundaries, which are too broad for this analysis. For instance, the neighborhood of Waipahu will include only the area south of Interstate H-1 instead of including Waikele, as the neighborhood board does.

The analysis will include the following topics:

6.2.4.1 Environmental Justice (EJ)

EJ must be considered in all projects, in accordance with Executive Order 12898, "identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Determine for

each alternative to what extent high and adverse impacts fall disproportionately on minority and low-income populations. The definition of minority and low-income groups will consider the work completed on the AA as well as work by the Oahu Metropolitan Planning Organization. Disproportionate affects will be determined based on comparative impacts, which will assess impacts to the minority and low-income populations compared to other groups within the corridor. Other factors may also be considered, including relative benefits that accrue to the community and the relevant number of similar existing and planned system elements in non-minority and non-low-income areas. The analysis will consider both positive and negative effects. Public Involvement (Task 21.0) will be targeted to reach affected communities and demonstrate engagement with the communities.

6.2.4.2 Public Services, Community Facilities, and Parklands

Project effects on access to and provision of public facilities, utilities, and services will be documented. Any impacts to parklands or recreational facilities will be identified, and measures to avoid, minimize, and mitigate impacts will be investigated in conjunction with Subtask 6.2.15. Available information will be used to estimate potential construction period and long-term project-related impacts to access, utilities, and emergency services. The CONSULTANT will confirm the Section 6(f) status of Aloha Stadium and other public facilities. Based on preliminary information, for budgeting, no Section 6(f) resources were assumed.

6.2.4.3 Displacements, Relocations, and Acquisitions

This section will describe potential relocations and property acquisitions for each alternative to explain the specific relocation context and characteristics, anticipated difficulties, and proposed solutions. The report will note that the acquisition and relocation program will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and relocation resources will be made available to all residential and business relocatees without discrimination.

6.2.4.4 Community Character and Cohesion

This section will describe what effect each alternative would have on community character and sense of community as it relates to social interaction, neighborhood cohesion, geographic continuity, and population growth. Information on community setting, socioeconomic characteristics, and cultural practices will be used as a basis for the analysis of community character. Information developed in the analysis of displacements and relocations will be used to evaluate the potential for reductions in economic opportunities, changes in availability of public services and facilities, and affects on housing.

6.2.4.5 Safety and Security

Using local traffic and crime data (if available), and national studies on safety and security issues associated with transit systems, the CONSULTANT shall address the potential impacts that may be associated with the Project and its alternatives. The team will describe the measures that will be taken to provide for safe and secure operation of the system. The analysis will also identify measures that may be needed to ensure safe and secure operation after construction, particularly the safety and security of the transit patrons.

6.2.4.6 Avoidance, Minimization, and Mitigation of Impacts

This section will develop strategies and measures to avoid, minimize, or mitigate direct impacts.

6.2.5 Visual and Aesthetic Resources

The *Visual and Aesthetic Resources Technical Report* shall document the effects of the build alternatives on the visual environment. Preparation of the visual impact assessment will follow the basic guidance and format as established by the Federal Highway Administration's (FHWA's) *Visual Impact Assessment for Highway Projects* (Publication No. FHWA HI-88-054). In addition, the CITY Department of Planning and Permitting (DPP) and other public and private organizations will be consulted to obtain data, refine the focus for the visual analysis, and elicit the most pertinent concerns that stakeholders have regarding safeguarding the aesthetic environment. Important view corridors will be considered in the analysis. The following basic steps in the visual impact assessment process will be completed:

- Establish the area of visual effect, including views and landscape units
- Determine viewer groups who have views to and from the proposed project alternatives
- Describe and assess the existing landscape
- Assess viewers' responses looking at and from the proposed project alternatives
- Determine and evaluate views of and from the proposed project alternatives
- Describe potential visible changes to the proposed project area and its surroundings

The first three steps will establish the existing landscape's baseline conditions and how much of the landscape unit is visible from outside the proposed project area. From this baseline, potential changes to the visible landscape and likely viewer responses to those changes will be assessed and described. Light, shadow, and glare will also be evaluated. Based on the evaluation of potential effects, mitigation measures will be identified. The analysis will include the following activities:

6.2.5.1 Consult with Agencies and Special Interest Groups

Input and feedback from agencies and community/special interest groups will be obtained to ensure that local concerns are incorporated and addressed in the analysis.

6.2.5.2 Identify Areas of Visual Effect

The area of visual effect, which includes the landscape units for the proposed project alternatives that are visible from a variety of viewpoints, will be established.

6.2.5.3 Conduct Field Surveys

Field surveys will confirm visual resource data, establish the character of the visual environment, identify viewer groups, and determine the parameters of the landscape units.

6.2.5.4 Evaluate Existing Conditions

The existing visual environment will be characterized and evaluated to establish relative importance, sensitivity, and quality of the various components within the existing visual environment in relation to the attributes of vividness, intactness, and unity.

6.2.5.5 Evaluate Potential Impacts

Evaluation of specific visual impacts will be based on four components: a change in visual quality; impacts to important visual resources; a change in light, glare, shade, or shadow; and a conflict with applicable visual policies.

6.2.5.6 Prepare Selected Simulations

Visual simulations of the build alternatives for the range of technologies being evaluated assuming for costing purposes from up to 12 key viewpoints will be used to assist in evaluating potential visual impacts, demonstrate the potential for mitigation, and provide a means of communicating the findings of the analysis.

6.2.5.7 Identify Mitigation Measures

A moderate or high (15 percent or higher) negative change to visual quality is deemed to be substantial and will require development of mitigation measures to reduce the impact.

6.2.5.8 Analyze Mitigated Conditions

Analysis of the mitigated condition will be conducted in the same manner as the analysis for un-mitigated condition. This will allow for consideration of the effectiveness of the proposed mitigation.

6.2.6 Air Quality and Energy

The *Air Quality and Energy Technical Report* shall document the effects of the proposed project alternatives on air quality and energy consumption. It shall include the following information and analysis.

6.2.6.1 Present Regulatory and Monitored Air Quality Information (Ambient Air Quality Data)

The existing ambient air quality monitoring information for the area will be collected from the Hawaii Department of Health (HDOH) and summarized. In addition, the area's attainment status under the Clean Air Act Amendments will be discussed. It is assumed the area will continue to be an attainment area.

6.2.6.2 Perform Regional Air Quality Analysis

A regional mobile source pollutant burdens analysis will be conducted.

6.2.6.3 Perform Local or "Microscale" Carbon Monoxide (CO) Air Quality Analysis

A screening level air quality analysis will compare future No Build conditions to future conditions for the Project. The screening level analysis will be based on changes in the following:

- Overall intersection volumes
- Intersection delay
- Intersection level-of-service

A detailed microscale CO analysis will be prepared at an assumed three intersections if warranted by the screening analysis.

6.2.6.4 Perform Air Toxics Analysis

Air toxics will be evaluated following U.S. DOT February 3, 2006 guidance. It is assumed that the project will be Level 2 (Project with Low Potential Mobile Source Air Toxic (MSAT) Effects).

6.2.6.5 Perform Energy Analysis

Net changes in overall transportation energy use in the study area will be assessed using daily vehicle miles traveled (VMT) and speed values calculated from the transportation demand forecasting model for the study area. Energy consumed by electrically powered transit operations for the fixed guideway alternative also will be calculated. Construction energy consumption will be estimated for each of the alternatives by estimating the energy consumed based on the magnitude of the project construction.

6.2.7 Noise and Vibration

The following effects of the Project as they relate to noise and vibration shall be assessed following FTA noise and vibration guidance:

- Noise impacts from the proposed fixed-guideway transit alternatives, including sundry sites, and technologies
- Vibration impacts from the proposed fixed-guideway transit alternatives and technologies
- Noise and vibration impacts during construction

The number of sensitive receivers affected by noise or vibration levels greater than the impact criteria will be tabulated in the *Noise and Vibration Technical Report*.

6.2.7.1 Transit Noise Assessment

The project-related noise levels for the transit and technological alternatives will be based on FTA reference sound levels unless vendor-supplied information is available to supplement FTA levels for proprietary technologies. Potential noise impacts that may be associated with alternative-related park-and-ride facilities and vehicle maintenance and storage facility operations will also be analyzed. If arterial traffic volumes would increase by more than 25 percent (a one dBA noise increase) as a result of changes in traffic patterns as a result of the Project, the associated traffic noise would also be evaluated following FTA criteria for transit projects. No noise analysis following the FHWA noise abatement criteria is anticipated and no assessment of the potential change in noise due to changes in vehicular surface traffic due to the transit system is assumed.

The noise impact analysis will be performed by combining project-related noise levels with existing noise levels. The resulting change in anticipated noise levels will be compared to the FTA criteria. Based on

the identification of potential project-related impacts, appropriate and reasonable mitigation measures will be evaluated.

6.2.7.2 Transit Vehicle Vibration Assessment

Vibration impacts expected from the Fixed Guideway Alternatives shall be determined using the detailed vibration assessment information and procedures contained in the FTA's *Guidance Manual for Transit Noise and Vibration Impact Assessment*. The FTA reference levels for a transit vehicle or, if available, vibration measurements from vehicles similar to those proposed for this Project, will be used to represent the force density level function of the train. At the Draft EIS phase, conservative assumptions will be made about soil conditions and the transfer mobility function. Further vibration analysis will be completed in Subtask 6.9.3.

6.2.7.3 Construction Noise and Vibration Assessment Methodology

Since the means and methods of construction will not be known until a contractor is selected, the analysis will be based on typical activities and equipment that would be used for demolition, excavation, and erection phases of work. Both daytime and nighttime construction activities will be analyzed since it is likely that the construction work will occur 24-hours a day. Any required noise variance for the initial construction phase would be obtained under Permitting Subtask 6.5.

6.2.8 Ecosystems and Natural Resources

This section addresses the wildlife, vegetation, and wetlands disciplines, including identification of any federally listed or state-listed threatened or endangered species as provided in the Endangered Species Act of 1973 (Section 7) or HRS regulations. The requirements of Section 7 of the Endangered Species Act will be followed. An *Ecosystems and Natural Resources Technical Report* covering these subjects will discuss existing conditions within the project study area, provide descriptions of potential impacts, and specify recommendations. The report will also include documentation of any coordination meetings and decisions with resource agencies, including the U.S. Fish and Wildlife Service (USFWS) and the U.S. Army Corps of Engineers, which has been invited to be a cooperating agency. If consultation and coordination activities indicate potential impacts on sensitive stream and coastal biota may occur as a result of the proposed alternatives, impacts to the species in question will be evaluated.

It is assumed for costing purposes that the study area will extend 100 feet from either side of the centerline of the proposed fixed guideway alignment and related facilities such as the storage and maintenance yard and park-and-ride facilities.

The following steps will be undertaken:

- Characterize general existing conditions as found during the AA
- Collect additional field work in locations where the prior survey-level analysis indicated potential resources or where rights-of-entry were not previously available
- Evaluate potential impacts (based on each proposed project footprint)
- Provide recommendations and observations on measures to avoid, reduce, or minimize any negative project impacts

The analysis will include wildlife biology, vegetation biology, and wetlands.

6.2.8.1 Wildlife Biology

A description of habitat types in the study corridor will be provided. Modified point count surveys will be conducted along the corridor in areas containing wildlife habitat, such as forests, wetlands, shrub, and parks, as well as within street trees in urban environments. The presence of native, migratory, threatened, and endangered species will be determined through the modified point count method. Any habitat along the alignment that supports such species will be identified. For sections of the corridor where protected species (federal and/or state) have previously been reported, a follow-up survey will be

conducted to determine the status of the populations. Any prior reporting will be identified through the Hawaii Natural Heritage Program database, published reports, and interviews with resource agencies.

6.2.8.2 Vegetation Biology

Previous studies, pertinent literature, and the USFWS Critical Habitat maps for Oahu will be reviewed for the project area. The Hawai'i Biodiversity & Mapping Program (HBMP) database of federal and state protected species will be reviewed and analyzed. Coordination will be conducted with federal and state resource agencies, including the USFWS and the Department of Land and Natural Resources (DLNR) to help determine potential interactions with protected species. Each section will be rated for relative abundance of introduced vegetation. For sections of the corridor where rare or endangered species have been previously reported, a follow-up survey will be conducted to establish if the plants or populations still exist. A biological assessment is anticipated to be required for endangered plant species.

6.2.8.3 Wetlands

Fieldwork will be conducted to identify, quantify, and delineate any areas within the selected corridor for ground conditions that would qualify as jurisdictional wetlands or waters of the United States. Functions and values (e.g., water bird habitat, storm water storage, and riverine watercourse) will be qualitatively determined for any wetlands potentially affected. All wetland determinations will follow the U.S. Army Corps of Engineers' 1987 *Wetlands Delineation Manual*. If wetland impacts are anticipated, consultation will be conducted with the Army Corps of Engineers and other resource agencies, as necessary. The results of the determination and delineation, analyses of anticipated impacts, and proposed mitigation will be documented.

6.2.9 Water Resources

The water quality assessment is intended to provide the necessary information to determine the Project's impact on the quality of groundwater. Surface water resources in the project area will be identified from existing maps. Areas of potential conflict with the project alternatives will be delineated and evaluated, and mitigation measures to reduce impacts will be identified. Stormwater runoff volume and level of contamination will be estimated. Stormwater control (Subtask 16.2.9) will be considered. Floodplains will be identified and any encroachments addressed. The alternatives will be assessed to determine any impacts on shoreline and coastal resources. The impact of potential land use changes attributable to the transit project will be discussed quantitatively, and it is not anticipated that there will be a need for mitigation for such impact. Construction impacts on water quality will be assessed and mitigation measures proposed. The U.S. Coast Guard will be consulted regarding navigable waters. The analysis will be documented in the *Water Resources Technical Report*.

6.2.10 Hazardous Waste and Materials

Corridor-wide data review and observations related to hazardous wastes and materials will be made and documented during the Draft EIS phase of the project. Based on the outcome of that effort, select sites and properties will be further investigated during the Final EIS phase of the project (Subtask 6.9.4).

The following tasks will be performed to support the Draft EIS so that project alternatives can be better evaluated. However, site or property-specific investigations and reports will not be completed during this phase of work, but as part of Subtask 16.2.8. This information shall be documented in the *Hazardous Waste and Materials Technical Report*. The effort will include the following activities:

6.2.10.1 Review Historical Land Use

A review of available maps and historic aerials will be conducted to identify any past business uses in the immediate project vicinity that could have a negative impact on the Project in terms of hazardous materials and wastes.

6.2.10.2 Complete Database Searches

A database search in accordance with ASTM E1527-05 will be performed. The CONSULTANT will contract with EDR to provide the database search.

6.2.10.3 Perform Site Reconnaissance

Site reconnaissance of the Project alignments will be conducted to evaluate the properties identified for further review during the review of historical maps and aerials plus the database search. The site reconnaissance will be conducted from public access areas and from within the project site, as feasible, in accordance with ASTM E1527-05.

6.2.10.4 Conduct Data Analysis and Documentation

Potential contaminant sources identified while conducting the above-noted review and analysis will be screened to determine their potential impact to the Project. Potential contaminant sources not eliminated during this screening process will be identified in a *Hazardous Waste and Materials Technical Report*. Recommendations for further evaluations during the Final EIS phase of the Project (Subtask 6.9.4) will be made. The intent of the assessment is to identify reported and obvious potential hazardous conditions that would need to be addressed or considered before proceeding with construction. The technical report will not guarantee, imply, or assert that all potential contaminant sources have been located due to the possible presence of an unlisted or unidentified contaminant occurrence.

6.2.11 Geology, Soils, Farmlands, and Natural Hazards

Based on a literature and map review, the geologic history and conditions of the corridor will be described. This information will be taken from prior studies in these areas, and it is assumed no drilling or field sampling will be undertaken to support the Draft EIS. The Natural Resource Conservation Service farmlands impact criterion will be used to evaluate any impacts the alternatives would have on farmlands. Oahu is subject to flooding, hurricanes, earthquakes, and tsunamis. The potential effect of these natural hazards on the various project alternatives will be described. Based on findings during the AA phase, the project will have little direct impact related to these disciplines; therefore, it is assumed no separate technical report will be produced and they will not receive extensive individual attention in the EIS.

6.2.12 Street Trees

Based on the tree survey conducted for the AA, the CONSULTANT shall evaluate what tree impacts are likely to occur for each alternative and for future extensions. It is assumed for costing purposes that the study area will be 100 feet from either side of the centerline of the proposed fixed guideway alignment in undeveloped areas and in developed areas that the study area will be the street on which the fixed guideway would be located. The following issues will be considered:

- Impact on existing trees (side pruning, crown raising, crown reduction, removal, replacement, transplanting)
- Pruning schedule and associated maintenance costs to determine proper clearance for a fixed-guideway system

6.2.13 Historic, Archaeological, and Cultural Resources

The historic, archaeological, and cultural analysis shall include preparation of three separate technical reports: *Historic Resources Technical Report*, *Archaeological Resources Technical Report*, and the *Cultural Resources and Practices Technical Report*. The analysis will be completed in accordance with Section 106. Compliance with Section 106 will entail consultation with the State Historic Preservation Division (SHPD). The Section 106 process will require establishing a Memorandum of Agreement prior to the Record of Decision.

6.2.13.1 Historic Resources Technical Report

The *Historic Resources Technical Report* shall document the historical resource data collection, information gathering, field visits, and analysis previously completed for the AA and newly undertaken for the EIS phase. Coordination will be undertaken to determine the area of potential effect (APE). For the purpose of this scope, the APE discussed during the AA phase with the state historic preservation division is assumed to continue to be acceptable. Additional properties are anticipated to be identified because of the anticipated change in year of completion beyond 2015, as was assumed in the AA analysis. The full build out to 2030 anticipates the addition of historic properties due to the age of these

properties and the National Register Historic Properties (NRHP) criteria of 50 years. The analysis will be completed in accordance with Section 106. Compliance with Section 106 will entail consultation with SHPD. For budgeting purposes, it is assumed that approximately 825 properties will require review, of which approximately 150 will require detailed documentation for NRHP eligibility determination.

6.2.13.2 Archaeological Resources Technical Report

The *Archaeological Resources Technical Report* shall document the archaeological resource data collection, information gathering, field visits, and analysis, both what was previously completed for the AA and newly undertaken for this effort. As part of the archaeological analysis, an archaeological inventory survey plan will be prepared following the requirements of Section 106 and HAR Chapters 13-275 and 13-276. The plan will include detailed procedures for the identification, documentation, significance evaluation, and assessment of project effect for the archaeological resources within the Project area. Appropriate consultation with SHPD and knowledgeable cultural informants, including Native Hawaiian groups and individuals, will be an important component of the plan's preparation. The plan will discuss the requirements of HRS Chapter 13-300 and HAR Chapter 6E relating to burial sites. The archaeological inventory survey plan will provide appropriate public input and agency review of the proposed archaeological resource identification effort. It will also serve to allocate the appropriate research effort for the different portions of the project.

6.2.13.3 Cultural Resources and Practices Technical Report

The cultural resources and practices identified during the AA process will form the foundation for the *Cultural Resources and Practices Technical Report* to support the Draft EIS, the Act 50 cultural impact statement, and Section 106 compliance. The Act 50 cultural impact statement and the cultural assessment will be cumulative from the AA process and not duplicative. The *Cultural Resources and Practices Technical Report* will be updated with any additional information gathered after the AA was prepared. The analysis shall include the following:

- Detail cultural practices within the study area. The location will be identified in GIS of all cultural practices along the alternative alignments based on data and information collected during the AA process and the updating process.
- Assess effects of the Project on cultural practices. The extent to which access to the identified cultural practices would be affected during construction or implementation of the Project and the nature of the identified cultural practice affected by the Project will be determined and documented by location.
- Prepare a detailed mitigation analysis for the project alternatives. Appropriate mitigation strategies will be developed in conjunction with experts.
- Conduct the Ka Pa'akai analysis. The analysis will make specific findings and conclusions as to the following: identify the scope of "valued cultural, historical, or natural resources" in the project area, including the extent to which traditional and customary native Hawaiian rights are exercised in the project area; the extent to which those resources, including traditional and customary native Hawaiian rights will be affected or impaired by the Project; and the feasible action, if any, to be taken by the CITY to reasonably protect native Hawaiian rights if they are found to exist.
- Detailed analysis for Section 106 consultation process. The efforts to contact, identify, and consult with various cultural and ethnic groups will be documented as part of the Section 106 consultation process.

6.2.14 Electromagnetic Fields

The electromagnetic fields (EMF) investigation will include a field survey of the corridor to determine if there are highly sensitive scientific, medical, military, or other sensitive receptors within a minimum of 100 feet of the alignment. At this time, no such equipment is anticipated. The *Electromagnetic Fields Technical Report* shall document the survey and provide a summary of the current state of the science on health effects of EMF and the level of impact, if any, of the Project on the community. The analysis also will note the potential for existing EMF to affect the Project, such as along Dillingham Boulevard.

6.2.15 Draft Section 4(f)

The Draft *Section 4(f) Report* shall incorporate analysis from the *Neighborhoods and Communities Technical Report* and the *Historic Resources Technical Report*. The Draft *Section 4(f) Report* will identify any land from a publicly owned park, recreation area, wildlife or waterfowl refuge, or historic site that would be used during construction or operation of the Project. The analysis will include a determination of applicability for each potential resource; coordination with the resource owner regarding significance, purpose of the land, transportation use, and mitigation or minimization options; analysis of avoidance alternatives; and measures to minimize harm.

6.3 Unavoidable Adverse Impacts

The CONSULTANT shall identify and discuss both direct and indirect unavoidable adverse impacts of the alternatives based on established and approved FTA criteria.

SCHEDULE:

The list of unavoidable adverse impacts will be included in the first Administrative Draft EIS, seven months after NTP. The CONSULTANT will alert the RTD of potentially unavoidable adverse impacts at the earliest opportunity they are identified during the impacts analyses.

6.4 Mitigation Measures

The CONSULTANT shall identify proposed mitigation measures for review by the RTD. They will be identified in the Draft EIS.

SCHEDULE:

The list of potential mitigation measures will be included in the first Administrative Draft EIS, seven months after NTP.

6.5 Applicable Permits

The CONSULTANT shall identify applicable Federal, State, and local permits, licenses, and entitlements that need to be obtained for the Project to proceed. The CONSULTANT will recommend whether the CITY or the contractor should obtain the individual permits. The identification of these items should occur as early in the environmental process as possible to facilitate the fast-track completion of the Project. At this time, it is anticipated the following permits will be required:

- Clean Water Act (CWA) Section 404 permit from the U.S. Army Corps of Engineers
- CWA Section 401 Water Quality Certification from the State of Hawai'i Department of Health (HDOH)
- CWA Section 402 National Pollution Discharge Elimination System permit for construction and dewatering from the HDOH
- Coastal Zone Management
- Special Management Area
- HDOT approval to build in right-of-way
- Noise variance
- City and County of Honolulu Building Permit (to be obtained by contractor)

The CONSULTANT shall assist the CITY in obtaining required permits for the first construction phase. The CONSULTANT will meet with permitting agencies and coordinate permitting activities to the degree necessary during the production of the EIS. The CONSULTANT will complete the required permit forms and include the required attachments, such as permit fees (to be reimbursed by the CITY) and best management practices (BMPs). Because permit submittals will be made prior to the Design-Build contract being selected, BMPs and certain aspects of the project design will not be site-specific. The cost estimate assumes that the CONSULTANT will respond to one round of comments from the approving agencies for each permit submittal. It is also assumed the CONSULTANT will set up, manage, and/or attend up to two public meetings (beyond the scope of the EIS process) required by the permitting process. It is assumed for budgeting purposes that the CONSULTANT will respond to one round of public comments following these meetings.

ASSUMPTIONS:

This scope of work anticipates assisting the CITY in obtaining permits required for the first construction phase, including those that must be obtained for the entire corridor. Permits only required for later construction phases would be obtained through a future scope of work.

SCHEDULE:

The list of applicable permits will be available at the time of the first Administrative Draft EIS, seven months after NTP. Agency coordination will be ongoing throughout the process. Permit coordination will begin at issuance of the Draft EIS and continue as needed. Permit applications will be made when sufficient design and other information is available to complete the applications. Some permits require the Draft and Final EIS be complete prior to consideration.

6.6 Circulation of Draft EIS

Once the proof copy of the Draft EIS has been approved for circulation by the FTA, the CONSULTANT shall prepare printed and CD copies of the Draft EIS for distribution. The CONSULTANT will identify the agencies, persons, and organizations to which the Draft EIS is to be distributed for comment, in cooperation with the RTD. The CONSULTANT will prepare the Notification of Availability (NOA) for publication in the *Federal Register*. The CONSULTANT will file the Draft EIS with the HRS Chapter 343 accepting authority, as determined by the RTD. For budgeting purposes, it is assumed 200 paper copies and 200 CDs will be provided of the Draft EIS for public distribution.

6.7 Public Hearings and Meetings

The CONSULTANT shall prepare notices, exhibits, distribution materials, comment forms, and other appropriate materials for presentations at public and agency meetings for the Draft EIS, and assist the RTD at public hearings related to the Draft EIS. For budgeting purposes, three hearings are anticipated. The CONSULTANT will collect comments at the meetings and via the project website. The effort of technical staff related to this task is included here. The effort of support staff is included in Subtask 21.2.3.

SCHEDULE:

Public hearings shall be held between 15 and 30 days after issuance of the NOA. The comment period will be announced as 45 calendar days starting at the NOA, but a request for a 15-day extension is anticipated and expected to be granted.

6.8 Response to Comments

The CONSULTANT shall organize the comments received on the Draft EIS and, in consultation with the RTD, prepare responses to the comments received. The CONSULTANT will use a comment tracking and response tool (PB CommentSense) to catalog comments by letter number, comment number, commenter, and subject to facilitate grouping of comments by common theme and assigning responsibility for responding. The CONSULTANT will prepare a list of the comments and responses. The CONSULTANT will prepare copies of all comments received, along with responses to each comment, for inclusion in the Final EIS. Common comments may be summarized and responded to in a common response. HRS Chapter 343 requires individual responses to comments; in this case, the response to individual comments may reference the common response. If necessary, improved, modified, or supplemental analyses may be required, and modifications to the alternatives, including the Proposed Action, may be warranted. Anticipated further analysis required to support the Final EIS is described under Subtask 6.9.

ASSUMPTIONS:

For budgeting and scheduling purposes, up to 500 comment submissions (written, EIS hearing, or web-based) are expected on the Draft EIS, with an average of five individual comments included in each

submission. It is also not anticipated that there will be a need to evaluate new alternatives or alignments, perform additional studies, engage in exhaustive coordination efforts that take more than 1 month, or affects permit timelines, etc.

SCHEDULE:

A draft response to comments shall be complete within eight weeks of the close of the comment period, assuming technical information and administrative guidance are available to address the comments by that time.

6.9 Final EIS

The CONSULTANT will perform supplemental analysis beyond that included in the Draft EIS, as needed. At this time it is assumed to include, but not necessarily be limited to, the following areas where additional information is anticipated to be available at the time of preparation of the Final EIS and where the additional information will allow for refinement of the analysis presented in the Draft EIS. For budgeting purposes, it is assumed that additional analysis will be confined to the following topics only:

6.9.1 Transportation

The transportation analysis will be updated to include any updated forecasting results and additional analysis completed subsequent to the Draft EIS. The magnitude of changes is expected to be small (less than five percent); therefore, it is assumed revisions to other topics that rely on transportation, such as air quality, would not be required.

An assessment of construction traffic conditions and preparation of a traffic plan to deal with construction-related circulation impacts will be completed. Construction impacts will be documented in a Construction-phase Traffic Report (Subtask 16.2.13). The traffic plan will involve the following:

- Development of traffic simulation models for selected stages of construction
- Assessment of impacts and development of mitigation strategies for various construction stages
- Development and analysis of traffic detour plans for various construction stages
- Identification of possible delays in bus travel times and related mitigation (e.g., additional hours to maintain current service schedules)
- Development of Transportation Management Plans to help minimize traffic or public transportation delays while supporting the construction schedule

6.9.2 Land Use

The land use analysis (Subtask 6.2.2) will be updated to reflect the latest information available on TOD planning and other changes in plans and policies for Oahu.

6.9.3 Noise and Vibration

After selection of the transit technology, the noise assessment will be reviewed and updated with any vendor-supplied noise information that is available. Soil testing will be conducted to evaluate vibration propagation. Transfer mobility functions used to determine ground attenuation will be based on point source response tests conducted at selected locations along the alignment where there are changes in soil and geology. To accurately predict the transmission of vibration through an aerial structure, a force density level test will be conducted at a similar designed aerial transit structure on the mainland, such as the Los Angeles Metro Green line, and on Oahu if warranted. The measured force density through the aerial structure will be combined with the transit technology forced density level and the measured point source responses to provide an estimate of ground vibration as it relates to distance from the fixed-guideway. Both the construction and operation vibration predictions will be confirmed using the forced density level of the selected transit technology to confirm the predicted impacts and develop specific vibration control measures.

6.9.4 Hazardous Materials

It is anticipated that sites of concern along the preferred alternative alignment where substantial new right-of-way will not be obtained will not require a Phase I Environmental Site Assessment (ESA). The sites of concern where a full Phase I ESA will not be performed will be evaluated through review of agency (EPA and/or HDOH) records to ascertain if they will or will not impact the Project or whether it is unknown. Agency files will be reviewed for the most recent site status information and the nature and extent of contamination, as well as pertinent land uses, geologic, hydrogeologic, and other information that may be used to assess potential impacts to the Project. Individual site reports will not be prepared, but sites where the assessment indicates it will impact the project or where it is unknown if the site will impact the Project will be identified in the Final EIS. For budgeting purposes, it is assumed 20 sites will receive this level of review.

Where substantial new right-of-way will need to be acquired from a site of concern, a Phase I ESA, per ASTM E1527-05, will be completed. At this time, a substantial new right-of-way is assumed to include only those locations where full project width right-of-way is taken or where more than 25 percent of a given property is being taken. Phase I ESAs will only be prepared for those properties that have been identified as being a site of concern and have a substantial new right-of-way acquisition. Many components of the ESA will have been completed during the Draft EIS. The primary outstanding component of the ESA is the review of agency (EPA and/or HDOH) records and on-site interviews. Once all aspects of a complete Phase I ESA have been performed, a Phase I ESA report will be prepared for each site. For budgeting purposes, it is assumed 20 Phase I ESA reports will be required and prepared.

6.9.5 Archaeology

The archaeological inventory survey plan (Subtask 6.2.13.2) will govern the archaeological research conducted to support the Project's Federal and State historic preservation and environmental review. This will likely include a limited pedestrian survey and extensive subsurface testing. Because of the probable diversity, distribution, and number of archaeological resources within the project area, particularly in the Koko Head portions of the project area near Downtown and Kaka'ako, this effort will not identify all archaeological resources. Instead, the fieldwork and related documentation will be a sampling of the project area to better characterize the types, locations, and densities of archaeological resources. The focus of this research will be to gather additional information to support project-related consultation regarding the treatment of the Project's archaeological resources. This consultation will help create the Project's comprehensive Section 106 Memorandum of Agreement, or Programmatic Agreement. This agreement will likely outline a phased approach that will dovetail archaeological resource identification, documentation, and mitigation with the different phases and geographic sections of the Project's construction. The development of this agreement will help conclude the Project's Federal and State historic preservation and environmental review, but will govern the treatment of archaeological resources throughout the Project's construction.

6.9.6 Final 4(f) Evaluation

The final 4(f) evaluation will include conclusion on feasible and prudent alternatives to any use of 4(f) land by the preferred alternative and minimization of the use. It will include Department of the Interior and other jurisdiction coordination and the Department of Transportation conclusion on the issue.

6.9.7 Final Environmental Impact Statement Document

The CONSULTANT will confer with the RTD to select the preferred alternative to identify in the Final EIS. The preferred alternative will identify both technology and alignment for the New Start Project.

In addition to the chapters identified in Subtask 6.1, above, the Final EIS shall include a chapter on responses to comments. The CONSULTANT will prepare and distribute printed and CD copies of the Final EIS and perform the appropriate actions for filing the EIS. The CONSULTANT will prepare the Notice of Availability for publication in the *Federal Register*. The CONSULTANT will file the Final EIS with the HRS Chapter 343 accepting authority.

The CONSULTANT will prepare a first Administrative Final EIS and final Section 4(f) evaluation for submittal to the RTD for review and will prepare a final document based on the comments received. The CONSULTANT will address comments from the RTD and prepare a second Administrative Final EIS for review by FTA. The second Administrative Final EIS is anticipated to receive legal sufficiency review by FTA. A proof copy of the Final EIS will be prepared incorporating comments received on the second Administrative Final EIS. It is assumed 200 paper copies and 200 CDs will be provided of the Final EIS for distribution at the RTD's direction.

SCHEDULE:

The first Administrative Final EIS shall be submitted for the RTD to review 12 weeks after completion of the Draft EIS comment period. The second Administrative Final EIS will be submitted three weeks after receiving complete comments on the first Administrative Final EIS. The proof copy of the Final EIS will be available three weeks after receiving complete comments on the second Administrative Final EIS. Distribution of the Final EIS will occur one week after acceptance of the proof copy.

7.0 Project Delivery and Capital Plan

7.1 Procurement Approach

APPROACH:

The RTD's current plan for the Project envisions initial design-build (DB) procurement for civil works construction over an approximately six-mile section of the Project at its Ewa (western) end (Phase 1). Maintenance facilities may be added to this Phase 1 contract or procured under a separate contract. Additionally, Vehicles, Systems and Utilities relocations will be procured under separate contracts. Other segments will be procured as follow-on contracts. Working with the RTD, the CONSULTANT will refine this approach to procurement of the overall system recommending cost effective alternatives which will meet the RTD's goals of early initial construction, priced selection of vehicle technology, a portion of the Project ready for early operations within five years and staged opening of the remaining segments.

SCOPE:

- 7.1.1 Support the RTD in Procurement Strategy Development Workshop
 - 7.1.1.1 Pre-workshop coordination with the CITY
 - 7.1.1.2 Prepare the agenda
 - 7.1.1.3 Prepare presentations describing the procurement strategy development process
 - 7.1.1.4 Keep the minutes of the meeting, including questions and responses, and outcomes/decisions
- 7.1.2 Prepare Procurement Strategy Report
 - 7.1.2.1 Compile the minutes of the workshop along with decisions reached and outcomes agreed to into a detailed report documenting the procurement strategy
 - 7.1.2.2 Distribute the draft report to the participants and solicit comments
 - 7.1.2.3 Finalize the report and distribute to project team members
- 7.1.3 Prepare Contract Unit Descriptions and Interface Control Requirements for engineering, construction, and procurement contract anticipated for the Project.
- 7.1.4 Semiannual Procurement Strategy Reassessments
 - 7.1.4.1 Prepare the agenda
 - 7.1.4.2 Prepare presentations describing procurement strategy refinements and their potential impacts

- 7.1.4.3 Keep the minutes of the meeting, including questions and responses, and outcomes/decisions
- 7.1.4.4 Compile the minutes of the reassessment along with decisions reached and outcomes agreed to into a revised report
- 7.1.4.5 Distribute the revised report to the participants and solicit comments
- 7.1.4.6 Finalize the revised report and distribute to project team members

ASSUMPTIONS:

- Basic procurement approach will be finalized through a Procurement Strategy Development Workshop with CITY personnel and decision makers that will be facilitated by the CONSULTANT.
- The outcome of this workshop will be a detailed procurement strategy document for all the required contracts, including technology, DB infrastructure, DB systems, and utilities procurements. This document will identify and lay the groundwork for:
 - Goals and Objectives for each procurement
 - Solicitation processes
 - Evaluation processes, including evaluation criteria and methodologies
 - Document and process confidentiality
 - Role of the DB firms in the Technology Selection Process
- A modified 2-Step Procurement process will be used for the Technology/Vehicle Selection. Step 1 will be based upon Technical Proposals, in response to a Performance Specification developed by the CONSULTANT. Step 2 will solicit cost proposals from the qualified suppliers of Step 1. The CONSULTANT will develop life-cycle costs for each proposal based upon a predetermined methodology.
- Design-Build contracts will be developed that utilize a 2-Step Procurement process for award of DB contracts.
- Design-Build contracts will be developed for Phase 1 (Ewa/Waipuhu/Waiawa), the Yards and Shops, and the Systems.
- Design-bid-Build (DbB) contracting approach will be used for the Utility Relocation Construction contracts. The work effort for the drawings and specifications for relocation of the utilities is included in Task 16.0. This work will include preparation of contract bid documents for work not self performed by the affected utilities, if necessary.
- The CONSULTANT will support the RTD in developing the procurement documents for the DB and technology procurements. The CONSULTANT will prepare the contract unit descriptions and interface control requirements for each procurement.
- It is assumed that the procurement process for both the DB and Technology Selection will not be challenged by any proposers, and the CITY procurement policy supports the intended procurement method.
- The CONSULTANT in conjunction with the RTD will reassess the overall system procurement strategy semiannually and make recommendations for potential alternative processes or revisions to adopted processes that will enhance the ability to meet the RTD's goals for the Project, respond to changing business or contracting conditions, and reduce cost for delivery.

SCHEDULE:

- Start: Immediately upon NTP.
- Finish: January 2010.

DELIVERABLES:

- Procurement Strategy Report
- Contract Unit Descriptions and Interface Control Requirements
- Procurement Strategy Report Revisions (5 each)

7.2 Capital Plan

The CONSULTANT will prepare and maintain a capital plan or plans for the Project and update it as required. This plan will be consistent with the FTA required Financial Plan (Task 14.0), but will specifically address the amount, timing and procedures for all capital income and disbursements planned for the construction and procurement program. The CONSULTANT shall conduct review cycles on the Plan with the RTD and incorporate comments from the RTD. Elements of the Plan include:

- Income plan
- Outflow plan
- Cash flow plan
- Treasury
- Cost accounting
- Local reporting
- Financial procedures
- Report layouts

ASSUMPTIONS:

N/A

SCHEDULE:

All procedures must be developed, reviewed, approved and in place prior to commencement of Project construction in 2009.

DELIVERABLES:

N/A

8.0 Quality Assurance

APPROACH:

The purpose of this task is to develop and implement behaviors and actions that are consistent with FTA guidelines and will result in products and services that meet the requirements of relevant internal and external agencies and ensure the quality of the Project.

SCOPE:

8.1 Management Responsibility

The CONSULTANT shall have the authority and responsibility to ensure that a quality policy is implemented and maintained to instill a culture within the project team that values quality. The Quality Assurance/Quality Control (QA/QC) Manager is responsible for ensuring and controlling quality – to identify and document occurrences of non conformance, to initiate preventive or corrective actions through appropriate responsible parties, and to verify that implementation and effectiveness of the preventive or corrective actions. Activities include the following:

- Develop a Quality Management Plan that establishes a quality policy, quality procedures, and quality measures

- Communicate the quality policy to the project team
- Ensure that the quality policy is understood, implemented, and maintained throughout the project team organization
- Provide leadership by actively participating in quality initiatives
- Provide necessary resources to accomplish quality goals
- Establish a project team structure that ensures the quality requirements are accomplished
- Make decisions that support an emphasis on quality

8.2 QA/QC Procedures and Reference Documents

The QA/QC Manager shall develop and implement written procedures for activities that affect quality in the design and procurement of the work being performed. The Quality Manager shall also develop written procedures for quality audits, preventive/corrective actions, quality training, and maintenance of quality records. The procedures should contain a statement of the purpose and scope; identify responsible parties; indicate the format and content of quality records to be maintained; and reference appropriate codes, standards, or specifications.

8.3 Design Control

The QA/QC Manager shall develop and implement written procedures to control and verify the design of the transit systems to ensure that the design criteria, other specified requirements, and requirements of the relevant regulatory agencies are met. Design control includes ensuring that the design requirements are understood, planning the design interfaces and design verification activities, executing the design verification activities, and controlling design changes through project completion.

8.4 Document Control

The QA/QC Manager shall develop and implement written procedures to ensure that all relevant documents are current and available to project team members who require them. Document control includes the review of documents by authorized personnel, the distribution and storage of these documents, the elimination of obsolete documents, and control of changes to the documents.

8.5 Purchasing

The QA/QC Manager shall develop and implement written procedures to ensure that purchased services or products conform to specified requirements; specifically, to ensure that procurement documents are clear and complete, that the supplier understands them, and that appropriate quality requirements placed on the supplier are made part of the contract.

8.6 Implementation Phase Procedures

The QA/QC Manager shall develop and implement written procedures to verify conformance of purchased products or services with the specified requirements.

8.7 Quality Records and Audits

The QA/QC Manager shall develop and implement written procedures for scheduling, performing, and documenting internal audits to ensure that the elements of the quality assurance program are functioning as intended.

ASSUMPTIONS:

Quality Audits will be performed approximately bi-monthly, throughout the Project duration.

SCHEDULE:

- Start: Draft QA/QC plan submittal.
- Finish: January 2010.
- The Quality Plan will be developed within three months after NTP.

DELIVERABLES:

- Quality Management Plan
- Quality Assurance Training Materials and Records
- Records of Quality Audits

9.0 External Project Review

APPROACH:

The CONSULTANT will participate in and support a number of reviews involving experts not otherwise directly participating in the Project. These reviews, will take place over the course of the work effort, are generally intended to bring in additional oversight or expertise with an eye towards improving the Project, reducing risk, addressing special issues or reducing Project costs.

SCOPE:

- 9.1 FTA Quarterly Reviews: The CONSULTANT's Project Manager, with key staff, will attend the FTA Quarterly Review meeting, providing comments upon progress of the Project and address issues directed to them.
- 9.2 Monthly PMO Reviews: The CONSULTANT's Project Manager, with key staff, will attend monthly PMO project reviews, providing comments upon the progress of the meeting and address issues directed to them.
- 9.3 Value Engineering Workshop:
 - 9.3.1 Prepare agenda for Value Engineering Workshop (VEW), with recommended attendees, for RTD review and comment.
 - 9.3.2 Prepare presentation materials for briefing VEW participants, highlighting known areas of high cost or construction complexity.
 - 9.3.3 Prepare minutes of the meeting.
 - 9.3.4 Prepare Value Engineering Workshop Report, summarizing the findings of the workshop.
- 9.4 Peer Reviews:
 - 9.4.1 Prepare agenda for Peer Review of the entire Project, with recommended attendees, for RTD review and comment.
 - 9.4.2 Prepare presentation materials for briefing Peer Review participants.
 - 9.4.3 Prepare minutes of the meeting.
 - 9.4.4 Prepare Peer Review Report, summarizing the finding of the Peer Review.
- 9.5 Issue Forums:
 - 9.5.1 Prepare agenda for Issue Forums on topics selected by the RTD. The CONSULTANT will recommend attendees, for RTD review and comment.
 - 9.5.2 Prepare presentation materials for briefing Issues Forums participants.
 - 9.5.3 Prepare minutes of the meeting.
 - 9.5.4 Prepare Issue Forum Report, summarizing the finding of the Peer Review.
- 9.6 Risk Management Review:
 - 9.6.1 The CONSULTANT will participate with the RTD and the FTA designated consultant in a Risk Management Review for the Project.
 - 9.6.2 The CONSULTANT will provide presentation materials relative to the Project, at the direction of the RTD/FTA.

ASSUMPTIONS:

- There will be one (1) Value Engineering Workshop, Two (2) Peer Reviews, four (4) Issue Forums, and one (1) Risk Management Review.

SCHEDULE:

Reviews will be performed at the direction of the RTD, throughout the length of the Agreement.

DELIVERABLES:

1. Value Engineering Report (1)
2. Peer Review Report (2)
3. Issue Forum Report (4)

10.0 Safety and Security Management Plan (SSMP)

APPROACH:

The CONSULTANT will develop programs to address required aspects of the System and Security Management Plan (SSMP) in accordance with FTA guidelines and requirements.

SCOPE:

10.1 Honolulu Commitment and Philosophy

A policy statement will be prepared for review and approval by the CITY for the Honolulu High-Capacity Transit System for inclusion in the Safety and Security Management Plan (SSMP). The statement will outline the transit system's commitment and philosophy to providing a safe and secure transit system for the riding public, transit employees, emergency responders, and others that may be impacted by the transit system's operations over the project lifecycle. All senior project managers involved in preliminary design for the Project will be required to concur with the commitment and philosophy.

10.2 Safety and Security Organization Development

A Safety and Security Working Group will be established prior to start of preliminary design to manage the safety and security aspects for the Project. All project staff having a safety and/or security responsibility during the preliminary design phase of the Project will be identified by name, title, and department/organization affiliation, including contract oversight in the SSMP. A Safety and Security Activities Matrix will be included in the SSMP to identify the safety/security activities by project phase, including the lead and support groups for the activities. The matrix will be updated during final design.

10.3 Safety and Security Analyses

Major inputs to the safety and security analyses come from the design data, drawings, operational plans, and concepts, and from the experience of the design team. A preliminary hazard analysis and security risk assessment will be prepared during the preliminary phase of the Project.

10.3.1 Preliminary Hazard Analysis

A Preliminary Hazard Analysis (PHA) is part of a formalized process to identify, evaluate, and control hazards.

A PHA will be conducted for the Project in accordance with FTA's *Hazard Analysis Guidelines for Transit Projects* and adapted guidelines from Mil Standard 882D. The PHA will present a detailed assessment of potential hazards that may be associated with the system and civil elements of the Honolulu High-Capacity Transit System. For each identified hazard, a qualitative risk assessment will be conducted by assigning severity and probability followed with risk categorization and ranking for acceptability or undesirability. Recommended mitigating measures will be developed. The qualitative approach to risk

assessment will aid the decision-making process for determining whether a hazardous condition should be eliminated by design, controlled by safety devices, warning devices, training and written instructions/procedures, or accepted as-is.

10.3.2 Security Risk Assessment

Planning in advance of a terrorist act, crimes that may be committed on transit property, or other security risk is essential to providing passengers and employees with a safe and secure transit environment. A security risk assessment will be conducted to evaluate the proposed transit system susceptibility to threats and to identify vulnerabilities. Terrorism intelligence and crime statistics will be gathered to support the threat evaluation. The assessment will form the bases for design measures to be incorporated to reduce or mitigate the risk of serious consequences. The severity of threat and likelihood of occurrence (vulnerability) will be combined into a risk level matrix to show the impact to the transit corridor. The risk impact will be assessed in terms of severity and consequence and probability of occurrence for a given threat. Risk categorization helps prioritize the risk impact and identify opportunities for changes to the design, procedures, and other asset controls. Additionally, the principles of Crime Prevention through Environmental Design (CPTED) will be applied to the physical environment design of the Project to reduce opportunities for violence and crime.

10.4 Safety and Security Design Criteria

Safety and security design criteria will be developed for the Project to govern the design. Safety and security design criteria will be supported by codes, standards, and commonly accepted transit industry practice. The security criteria will include the concepts of Crime Prevention through Environmental Design.

Safety and security design criteria for the Project will be generated from the following:

- Design criteria from similar transit projects
- Performance criteria specific to this Project
- "Lessons learned" from other transit agencies
- Control measures identified through the PHA
- Countermeasures identified through the threat and vulnerability security risk assessment
- Transit industry safety and security practice and reports
- Applicable safety and security codes, standards, and regulations defined by Federal, State, and local governments
- Standards developed by the American Public Transportation Association (APTA) and other standard-making boards and organizations

Additionally, the FTA's *Transit Security Design Considerations* will be used in the establishment of security design criteria for the Project.

10.5 Safety and Security Verification Process

The safety and security verification process begins with system design and continues through the start of revenue operation. Preliminary design phase activities will include the following:

- Identification of safety and security-related elements to be certified
- Identification of applicable codes, standards, and industry practice relevant to the Project
- Preparation of Design Criteria Conformance Checklists
- Verification of conformance with Design Criteria
- Coordination of fire/life safety issues with local police, fire, and emergency medical services and the design that may affect these agencies
- Resolution of all open safety and security preliminary design issues

A Safety and Security Certification Committee will be formed to monitor progress in preparing and completing the conformance checklists in a timely manner; review confirmation assessments of the

documentation that supports conformance with the safety and security requirements; and review any open items for resolution. The Committee, based on the documentation assessments and open-items, will determine whether to accept the completed checklists and open-items as-is or require additional actions to bring the checklists and/or open-items to an acceptable level. In the event the documentation or action is security sensitive, the information will be restricted only to those with a need-to-know. Representatives from the design team and from the RTD will be invited to participate. The Safety and Security Certification Committee will meet approximately monthly during the preliminary phase of the Project.

A Fire/Life Safety and Security Committee, a sub-committee of the Safety and Security Certification Committee, will be formed to discuss fire/life safety issues relevant to the transit project. Representatives from the fire department, law enforcement agencies, and emergency medical services will be invited to participate. Design recommendations made by the sub-committee will be incorporated into the Design Criteria Conformance Checklists. The committee will meet approximately monthly.

The firm responsible for follow-on final design, construction, and start-up activities must complete the verification process.

10.6 Construction Safety and Security Plan

Construction safety and security is an important aspect of the Project. A Construction Safety and Security Program specific to the Project must be developed. The SSMP will describe the requirements and form the baseline for development of the Project's Construction Safety and Security Plan. Development and implementation of the plan, however, will be the responsibility of the final design consultant or the DB contractor.

10.7 Plans for Safety and Security during Operations

Scope items pursuant to this task are covered in Task 13.0 Operability Input to Design.

10.8 State Safety Oversight and Department of Homeland Security Coordination

When the Hawaii State Safety Oversight Agency is established, the Safety and Security Management Plan will be submitted to illustrate the safety and security activities and methods for identifying, evaluating, and resolving potential safety hazards and security vulnerabilities associated with the Project. Similarly, the Safety and Security Certification Program Plan will be submitted for its review. These documents will also be transmitted to the Transportation Security Administration (TSA) Surface Transportation Inspection (STSI) for review.

Hawaii State Safety Oversight Agency and the STSI will be invited as observers to all Project Safety and Security Certification Committee meetings and provided with copies of committee minutes so they have an understanding of the safety and security issues and the measures being taken to resolve them.

ASSUMPTIONS:

The most current FTA Safety and Security Guidelines will be utilized in the development of this task.

SCHEDULE:

- Start immediately upon NTP.
- Complete SSMP December, 2007.

DELIVERABLES:

1. Safety and Security Policy Statement
2. Safety and Security Organizational Chart and Safety and Security Activities Matrix
3. Preliminary Hazard Analysis Report
4. Threat and Vulnerability Assessment Report
5. Safety and Security Design Criteria

6. Completed Design Conformance Checklists (for each major transit system element for the design phase of the project)
7. Safety and Security Certification Committee Coordination and Minutes
8. Fire/Life Safety Committee Coordination and Minutes
9. Construction Safety and Security Plan
10. Hawaii State Safety Oversight Agency and Department of Homeland Security Meeting Minutes

11.0 Land Use Planning

APPROACH:

The CONSULTANT will develop plans to create a transit corridor that reinforces and is supported by the surrounding land use. This will include extensive coordination with public and private corridor alignment stakeholders, such as, but not limited to, the CITY Department of Planning and Permitting (DPP) and other governmental entities, private citizens, and various community and business groups, as well as members of the development community and property owners.

The CONSULTANT will employ a process that will maximize access and ridership potential through proper station placement and layout. The goal is to provide for development of the station proper and surrounding community in a mutually supportive, economically beneficial, and context-sensitive manner that leverages the opportunities created by the Project.

Plans, mapping, and reports will be developed early in the PE process in conjunction with the Project's design and engineering team, and in conjunction with the land use impacts and related assessments performed in the EIS scope. Updated final versions of all plans, mapping, and reports will be submitted at the end of PE for use in Final Design.

SCOPE:

11.1 Station Area Interface Planning

The CONSULTANT will undertake station area interface planning for the Project that addresses both overall system interface issues as well as specific planning for each station area.

11.1.1 Gather existing information on plans, policies, and development for potential station areas (radius to be determined – assume ½ mile but no more than 1 mile)

11.1.2 Develop station area planning maps (radius and characteristics to be determined – assume ½ mile but no more than 1 mile)

11.1.3 Conduct Interface Discussions and Fact Finding

Discussions with public agency staff, stakeholders, and land owners will be held to gather input and verify focus of station area development planning efforts.

11.1.4 Coordinate with the Architectural Design Team (Task 16.0)

The CONSULTANT will ensure consistency in the station area interface through review, understanding, and coordination of station designs in the context of existing and proposed station area development.

11.1.5 Conduct Station Area Interface Planning Workshop(s)

This event(s) will likely be held over three to five days and will include an early assessment of station locations and station types from a land use and "community fit" perspective. This workshop will focus on ideal station locations, how proposed stations "fit" into the community, and identifying opportunities for improving connections with future development. This event(s) will be accomplished within the first three months of the Project to benefit the engineering tasks by focusing on adjacent community planning issues that may not have yet been considered or identified. It is envisioned that DPP will be invited and play a significant role providing feedback and input to the workshop.

11.1.6 Station Area Interface Report

A report will be produced that describes both systemwide and station-specific interface goals. This report will include mapping for each station, including parcel-based land use, zoning, and neighborhood-significant buildings; indicate station catchment zones for transit ridership; and identify significant issues regarding connectivity and development interfaces. (Corresponding levels of goal fulfillment, as well as neighborhood impacts and benefits, on a station-by-station basis will be addressed in Task 6.0).

11.2 Station Area Access– Traffic, Parking, Drop-Off, Pedestrian, Bicycle, Other

- 11.2.1 The CONSULTANT will produce overall “Station Access Guidelines” and a “Station Area Access Plan” for each station.
- 11.2.2 The CONSULTANT will work with appropriate CITY departments and neighborhoods to optimize station access and egress for maximum pedestrian accessibility and to develop simple, effective, and attractive multimodal interfaces to station areas. This work will be closely coordinated with the Architectural Design Team (Task 16.0) to review, understand, and coordinate station designs with station area circulation.
- 11.2.3 Both a Bicycle Plan and a Parking Plan will be components of each plan.
- 11.2.4 The CONSULTANT will work with DTS/TheBUS to enable optimal design of bus feeder interface with transit stations. (Coordinate with Task 15.0 – TheBus Interface.)
- 11.2.5 Ferry interface will be examined at the appropriate stations.
- 11.2.6 Traffic, bus, and parking information will be gathered for the proposed station areas (radius to be determined – coordinate with Task 15.0 – TheBus interface).
- 11.2.7 Discussions will be conducted with the CITY and other stakeholders to gather input and verify focus of “Circulation Interface” planning efforts.

11.3 Station Typologies and Urban Design Considerations

11.3.1 Transit System Urban Design Guidelines

The CONSULTANT, in conjunction with the RTD, will develop “Transit System Urban Design Guidelines” – a set of guiding principles to achieve a context-sensitive integration of the Project within greater Honolulu. These guidelines will address both individual station areas and the guideway along the full transit alignment and be coordinated with Subtask 16.1, Architecture. Each context through which the system passes will be defined by a series of physical attributes, such as height and style of adjacent buildings, character of the neighborhood, nearby uses, and characteristics of any required mitigation (e.g., sound barriers). Contexts will also be defined by non-physical attributes related to the planning goals for the area, development potential as defined by zoning, and other features. Each set of attributes will constitute a typology for the purposes of the guidelines; similar attributes may result in the classification of a number of stations within a typology. These guidelines will be prepared and appropriate for use by the CITY in its on-going transit-oriented development initiatives.

- 11.3.2 Audit Current CITY Ordinances: To support coordination of transportation and land uses in the corridor and to support other efforts underway in the CITY, the CONSULTANT will provide an “Audit of Current CITY Ordinances” to identify those that hinder integration of the transit project with the local community.
- 11.3.3 Work with the architectural design team (Task 16.0) to review, understand, and coordinate station design typologies with station urban design and contextual considerations.
- 11.3.4 Develop prototypical, sketch-level station area design characterizations for illustrative purposes within the guidelines.
- 11.3.5 Assign station typology designations to each station for use in assessing potential land use impacts (in conjunction with EIS Preparation, Task 6.0).
- 11.3.6 Work with the EIS team (Task 6.0) to review, understand, and incorporate various impacts and potential mitigation into the guidelines.

11.4 Stakeholder Input Report – Land Use

The “Stakeholder Input Report – Land Use” will summarize the stakeholder input for each station gathered during EIS/PE and organize that input for use in development of the Project. Developed early in the Draft EIS process, the report will be updated regularly to reflect continued public participation inputs. This will be closely coordinated with Task 21.0, Public Involvement.

11.5 Preservation and Protection Plans – Trees, Historic, Cultural, Other

The need for Preservation and Protection Plans for several resources near the Project is expected to be identified primarily in Subtask 6.4. These resources are anticipated to include both temporary and permanent considerations for the following:

- Street trees and exceptional trees
- Archeological resources
- Historic buildings and sites
- Community and cultural resources
- Critical habitat preservation
- Wetlands mitigation design

Plans related to erosion and storm water runoff are addressed in Subtask 16.2.9. All plans will need to be developed and carefully coordinated in conjunction with the appropriate governmental and regulatory entities.

11.6 Sustainable Community Impact Report

A “Sustainable Community Impact Report” will be developed following the precepts of good sustainable community design. The plans should follow, but not necessarily adhere to, the LEED-ND Program for Sustainable Neighborhoods. The report will be suitable for use by the RTD for future incorporation into existing sustainable community plans or as the basis for future sustainable practices for neighborhood program development.

11.7 FTA Land Use Requirements

Using FTA’s eight land use factors, the CONSULTANT will assess the potential “New Starts land use rating,” assuming current plans and conditions in the corridor. The CONSULTANT will also prepare a strategy paper and recommendations describing what new policies and actions by local jurisdictions would likely have the most positive impact on improving the Project’s land use rating with the least effort and risk. The CONSULTANT, as both contributors to and evaluators of the FTA land use framework, are well acquainted with its details.

11.7.1 Templates 11 and 12 Updates: The CONSULTANT will update Land Use Templates 11 and 12, as required for submission by the RTD to FTA. This will be coordinated with Subtask 1.09.

11.7.2 Compliance with FTA Guidelines: The CONSULTANT will provide the RTD with all other required land use information to be developed for the Project in accordance with FTA guidelines and requests.

11.8 Joint Development Opportunities

11.8.1 Station Area Development Potential Report

The CONSULTANT will produce a “Station Area Development Potential Report” for each station. These reports will provide a qualitative and quantitative database of information regarding project property available and suitable for development or other types of public partnerships that might be contemplated. This will be developed in conjunction with the RTD; be GIS-based; comprehensive; and capable of being continually updated as the Project progresses. Information gained from the “Audit of Current RTD Ordinances” will be used to prepare these reports to indicate ordinances that are supportive, or are not supportive, to development opportunities.

11.8.2 Land Use Review

The CONSULTANT will review land use information for the area around each proposed transit station (radius to be determined).

11.8.3 Opportunity Preservation

After an inventory of land is created (coordinate with Tasks 6.0, EIS Preparation, and Task 12.0, Property Acquisition), the team will consider issues such as construction staging, right-of-way acquisition, and full versus partial takes within the context of "tee-ing up" future joint development opportunities. The assessment will pay particular attention to identifying publicly owned land (the CITY, schools, State, Federal, transit agency, etc.) and project facilities such as park-and-ride locations to create recommendations for the best opportunities for integrating the Project with the surrounding community and, if possible, leveraging the Project to achieve multiple community objectives.

11.8.4 Joint Development Opportunities

To the extent possible, the CONSULTANT will make assessments and recommendations relating to the potential for joint development partnerships for specific transit properties, including design concepts for shared facilities, public/private station area enhancements, and connection agreement opportunities (e.g., the Ala Moana Station will require an access agreement to ensure access is maintained at times unrelated to the shopping center's schedule).

ASSUMPTIONS

N/A

SCHEDULE

- Start: within 30 days of NTP.
- Schedule will conform to the needs of other Project time-critical tasks.

DELIVERABLES:

1. Station Area Interface Report
2. Station Access Guidelines and Station Area Access Plans
3. Transit System Urban Design Guidelines and Audit of Current RTD Ordinances
4. Stakeholder Input Report-Land Use
5. Sustainable Community Impact Report
6. Completed FTA land use templates
7. Station Area Development Potential Report

12.0 Property Acquisition

APPROACH:

During PE, the CONSULTANT will establish real estate acquisition requirements for the Project under Subtask 1.04 Real Estate Acquisition Management Plan (RAMP). Task 12.0 Property Acquisition will include staffing and supporting the real estate acquisition activities outlined below in accordance with provisions of the RAMP.

SCOPE:

12.1 Land Surveying:

See Subtask 16.02.2 for scope of work

12.2 Right-of-Way Engineering:

See Subtask 16.02.10 for scope of work

12.3 The CONSULTANT will provide services to assist the CITY in appraisals and title searches. The CONSULTANT may assist the CITY in relocation services, property management, legal services, and other related activities described in the assumptions below. The budget to cover such additional services is not included in the CONSULTANT contract cost budget.

ASSUMPTIONS:

The Department of Design and Construction (DDC), Land Division will have overall Project responsibility for property acquisition, which will include the following activities:

- Title Search: Titles will be researched by the CONSULTANT to determine ownership and parties of interest. Properties held in fee simple will be researched to source (which may extend back to property held by the King). In the case of leasehold properties, the DDC will typically deal only with the owner and not the lessee(s); however, the lessee(s) may qualify for relocation services.
- Appraisal: Written statement setting forth an opinion of the fair market value (FMV) of the real estate, including cost to cure and severance damages, if applicable. An independent appraisal will be ordered for each parcel to be acquired. After the budget request authorizing the hiring of appraisers is passed by the Council, the CONSULTANT will select pre-qualified appraisers who have submitted bid proposals in response to bid solicitation packages prepared by the CONSULTANT. The selected appraisers will submit to the DDC for each parcel an appraisal report prepared in accordance with CITY appraisal requirements. Each appraisal will be reviewed by the DDC Review Appraiser prior to the appraisal being submitted to the RTD. The appraisal of any parcel valued over \$250,000 will be sent to the FTA by the RTD for review and concurrence.
- Acquisition: Acquisition of parcel through negotiated settlement or by eminent domain proceedings (condemnation). After the appraisals have been reviewed and approved, letters will be sent notifying affected property owners of their rights under the law and offering to purchase the right-of-way at the appraised value. Negotiations will be conducted by the DDC with the property owners to acquire the property. When final settlement is reached, the property owner will transfer clear and marketable title to the CITY. Once the CITY pays the negotiated amount, instruments of conveyance will be recorded at the State Bureau of Conveyances.
- Eminent Domain: If a negotiated settlement cannot be reached, Eminent Domain proceedings will be initiated and conducted in accordance with the requirements of HRS Chapters 101 and 113, and the right-of-way will be acquired through the condemnation process.
- Right-of-Way Certification: The DDC will certify the right-of-way when all property rights (right-of-entry and order of possession) have been secured.
- Temporary and Permanent Easements: All easements required for access, construction, and other such requirements for the Project will be negotiated and acquired by the DDC and paid for by the Project. Right-of-Entry agreements will be obtained by the DDC, with permission of the property owner. However, HRS Section 101-8 provides that surveyors will be permitted entry to property as needed. Preconstruction right-of-access will be handled by the DDC with support from the RTD. Demolition and removal of major improvements will be handled as a part of the CONSULTANT's contractual obligation.
- Record Keeping: Extensive records will be kept at every level of the right-of-way acquisition process. Parcel files containing detailed information on acquisition will be maintained by the DDC Right-of-Way Agents. These files contain statements and/or copies of the documents and information given to property owners, tenants, and displacees, as required by local, State, and Federal guidelines and laws. From the information provided by the DDC, Land Division, GIS files are maintained by DPP, GIS Section.

The Department of Budget and Fiscal Services (DBFS), will be responsible for the following:

- Relocation Services: DBFS, Property Management Section, Central Purchasing and Contracts Administrator will handle relocation services. For those acquisition parcels that require relocation assistance, relocation benefits will be provided in accordance with the 49 CFR Part 24, as amended on

January 4, 2005 (1970 Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally Assisted Programs).

- Property Management: When there are encroachments onto the right-of-way by adjacent property owners, registered letters are sent by the DDC to the owners notifying them of the encroachment and of their obligation to remove their property from the right-of-way. Post-construction property management functions, including the disposal of surplus land, will be handled by the DBFS, Property Management Section, Central Purchasing and Contracts Administrator. CITY procedures, State law, and FTA guidelines will govern where appropriate.

Legal services in support of property acquisition activities will be provided by others.

SCHEDULE:

1. Start: Immediately upon NTP.
2. Finish: Have FTA-approved RAMP in place and real estate acquisition and management program operational before start of Final Design.

DELIVERABLES:

(See Subtask 16.02)

13.0 Operability Input to Design (Planning Elements)

APPROACH:

The CONSULTANT will produce a comprehensive operating plan for the system, including a variety of staged opening scenarios. The CONSULTANT will conduct review cycles on the operating plan with the RTD and incorporate and address comments from the RTD.

The task will develop operational input to the Project design. The characteristics of the operating plans will be used in Task 6.0 – Environmental Impact Statement Preparation, Task 16.0 – Architectural and Engineering Design Services, and Task 19.0 – Vehicle Technology and DB Contractor Selection Process.

Information developed under Task 25.0 – Travel Forecasting, will provide major direction for the operating plan. Also, results of Task 18.0 – Transit Sub-Systems, will provide the operating plan with important guidance for performance specifications.

A variety of staged opening scenarios will be addressed by the operating plan. For EIS preparation, operating plans will be developed for three build alternatives – Salt Lake Only, Airport Only, and Salt Lake + Airport. The plans for these alternatives will need to be prepared for both the First Segment and full build-out of the system.

The task will include a series of review cycles of the operating plan with RTD staff. The plans will address or incorporate comments provided by the RTD during these review cycles.

SCOPE:

13.1 General Operating Approach for Fixed Guideway – Year 2030

Using the results of the AA as a starting point, an operating plan for the fixed guideway system will be prepared for an agreed upon horizon year. Operating plans will be developed for three build alternatives – Salt Lake Only, Airport Only, and Salt Lake + Airport. The results of the updated Travel Forecasting will provide information relating to system and segment-specific ridership. Elements of the operating plan will include the following:

- Review preliminary system sizing data from the AA. Update as necessary.
- Review and update as necessary operating policies identified in the AA, including load factors and maximum headways.

- Review ridership estimates identified under Task 25.0 – Travel Forecasting.
- Establish system running times through a simple operating model; running times will be estimated for all alternative alignments being considered in the PE/EIS.
- Develop peak period estimates for the following:
 - Operating patterns
 - Fleet requirements
 - Minimum consists (units per train)
 - Operating headways
- Expand peak period estimates to determine operating patterns and service levels throughout each service day.
- If necessary, information from the fixed guideway operating plan could indicate the need for equilibration with the travel demand model. This would result from the plan indicating a need to adjust service headways or other service characteristics to help meet estimated demand levels. This would require another model run and follow-up changes to the operating plan. Up to two equilibration efforts are included in this task for cost estimating purposes.
- Establish appropriate fleet requirements, refining vehicle fleet size calculations from the earlier phases of planning.
- Determine impact of operating plans on civil facilities.
- Produce input to operations and maintenance cost estimates.
- Provide key fixed guideway operating information that will be included in the Draft EIS.

13.2 General Operating Approach – Opening Year of the Full MOS System

Key elements of the operating plan will include the following:

- Review preliminary system sizing data from the AA.
- Review and update as necessary operating policies identified in the AA, including load factors and maximum headways.
- Review ridership estimates identified under Task 25.0 – Travel Forecasting.
- Establish system running times through a simple operating model; running times will be estimated for all alternative alignments being considered in the EIS.
- Develop peak period estimates for the following:
 - Operating patterns
 - Fleet requirements
 - Minimum consists
 - Operating headways
- Expand peak period estimates to determine operating patterns and service levels throughout each service day.
- If necessary, information from the fixed guideway operating plan could indicate the need for equilibration with the travel demand model. This would result from the plan indicating a need to adjust service headways or other service characteristics to help meet estimated demand levels. This would require another model run and follow-up changes to the operating plan. Up to two equilibration efforts are included in this task for cost estimating purposes.
- Establish appropriate fleet requirements, refining vehicle fleet size calculations from the earlier phases of planning.
- Determine impact of operating plans on civil facilities.
- Produce input to operations and maintenance cost estimates.
- Provide key fixed guideway operating information that will be included in the Draft EIS.

13.3 General Operating Approach for Fixed Guideway – First year of Revenue Operation

Using the results of the EIS as a starting point, prepare an operating plan for the fixed guideway system for the first full year of operations for the First Segment of the Project. Key elements of the operating plan will include the following:

- Review preliminary system sizing data from the EIS.
- Review and update as necessary operating policies identified in the EIS, including load factors and maximum headways.
- Review ridership estimates identified under Task 25.0 – Travel Forecasting.
- Establish operating strategy for the First Segment, which includes revenue service options, start-up testing, equipment “burn-in”, and personnel training.
- Establish system running times through a simple operating model, based upon the the operating strategy developed.
- Develop revenue schedule for the following:
 - Operating patterns
 - Fleet requirements
 - Minimum consists
 - Operating headways
- Produce input to operations and maintenance cost estimates.
- Provide key fixed guideway operating information that will be included in the Draft EIS.

13.4 Fixed Guideway and Bus Fleet Management Plans

Fixed guideway and bus fleet management plans will be prepared for the same horizon years contemplated for the various high capacity system openings. The plans will describe estimated bus and fixed guideway vehicles. The plans will also describe fleet volumes by year four years prior to service implementation and three years after start of fixed guideway service. The plans will include the following:

- Peak level of service for each year (number of vehicles required).
- Fleet average age, composition, rehab/rebuild projects, vehicle retirements, and purchase plans.
- Ridership – current and projected average daily trips and load factor policy.
- Maintenance facilities – age of facilities, capacity for existing fleet, and expansion capacity or future vehicle purchases.
- Service quality and reliability measures.
- Financial Plan relating to fleet maintenance (to be coordinated with Task 14.0 – Financial Plan of Project work plan).

This information will define the basis for TheBus operating plan.. TheBus operating plan will determine bus fleet size The information will also provide information to model mode share comparisons. This task will require headways, capacity etc., as input to the travel forecasting model.

13.5 Feeder Bus Interface

This task, to be coordinated with Task 15.0 – TheBus Interface, will identify necessary feeder bus access and operations at stations to support the overall operating plan for the fixed guideway system. Using the information on local bus access identified in the AA, this task will update information based on the operating plan for the fixed guideway system and determine operating volumes, turning movements, and other operations-related information.

In addition to feeder service configuration, the task will also identify related operations at facilities, including transit centers at Project stations. This identification will start with facilities included in the AA, but updated as necessary with any new information from the travel demand model. The facilities will be identified in a conceptual manner, but sufficient detail will be provided to support more detailed design under Subtask 16.02 – Civil Engineering Design, and Subtask 16.02.8 – Roadway, Parking Lot, and Traffic Design.

Specific items to be identified for the transit facilities are as follows:

- Number of bus bays
- Types of transit services at the facilities (express, local, etc)
- General location, including relationship with the nearby road system

The feeder bus interface will use results from Task 11.0 – Land Use Planning, and Subtask 11.02 – Circulation Interface: Traffic, Parking, Drop-off, and Pedestrian, Bicycle, and Other. Under Subtask 11.02, design guidelines, criteria, etc., for interface with Project stations and possible transit oriented developments will be discussed. These guidelines and criteria will provide important direction on potential overall access to Project stations, including local feeder buses.

The bus interface subtask will address operations relating to other components of TheBus service once the fixed guideway is implemented (e.g., consideration of continued use of long-haul express bus routes within the corridor). It will also identify bus-related volumes for Subtask 13.07.

13.6 Kiss-and-Ride/Park-and-Ride

The task will identify passenger drop-off (kiss-and-ride) and park-and-ride operations at Project stations. Results from the AA will provide initial direction for size and locations of facilities. This description will be updated as necessary based on new information from the travel demand model. Kiss-and-ride and park-and-ride access will be identified for 2013 and 2030.

While the facilities will be identified in a conceptual manner, sufficient detail will be provided to support more detailed design under Subtask 16.02 – Civil Engineering Design, Subtask 16.02.8 – Roadway, Parking Lot, and Traffic Design.

Specific items to be identified for the transit facilities are as follows:

- Number of stalls in park-and-ride facilities, number and general location of bays, including any required layover areas
- Functioning
- General locations of the kiss-and-ride and park-and-ride facilities, including relationship with the nearby road system

The kiss-and-ride and park-and-ride facilities will use results from Task 11.0 – Land Use Planning, Subtask 11.02 – Circulation Interface: Traffic, Parking, Drop-off, and Pedestrian, Bicycle, and Other. Under Subtask 11.02, design guidelines, criteria, etc., for interface with Project stations and possible transit oriented developments will be identified. These guidelines and criteria will provide important direction regarding potential overall access to Project stations, including park-and-ride and kiss-and-ride operations.

13.7 Walk-and-Ride

Using the most current results of Task 25.0 – Travel Forecasting, this subtask will identify the extent of walk access to each Project station, as well as access paths to the station. While pedestrian access paths will be identified in a conceptual manner, sufficient detail will be provided to support more detailed design under Subtask 16.02 – Civil Engineering Design, Subtask 16.02.8 – Roadway, Parking Lot, and Traffic Design. Walk-and-ride access will be identified for 2013 and 2030.

Specific items to be identified for the transit facilities are as follows:

- Need for access paths for pedestrians
- Functioning
- General locations of the paths, including relationship with the nearby sidewalk system

13.8 Service Levels

This task will identify projected service levels for both fixed guideway and feeder bus service at Project stations. Service levels will be provided for all appropriate forecast years based on project openings.

The information will be identified for three build alternatives: Salt Lake Only, Airport Only, and Salt Lake + Airport.

The service levels will use information from Subtasks 13.01 and 13.03 and will be identified in a manner so they can be included in the Draft EIS. Service information will include headways and travel times for both peak and non-peak periods. Comparisons will be made between service levels under the Project and those under the No Build Alternative.

13.9 Capacity

This task will identify projected capacity under the operating plans identified in previous subtasks. Capacity levels will be provided for all appropriate service opening dates. For 2030, the information will be identified for three build alternatives: Salt Lake Only, Airport Only, and Salt Lake + Airport.

The estimated capacity will use information from Subtasks 13.01 and 13.03 and will be identified in a manner so they can be included in the Draft EIS. Capacity information will include passenger throughput using key assumptions on load factors, estimated capacity of cars, consists, and service frequency (as identified in Subtask 13.08).

13.10 Service Recovery Plan

The CONSULTANT will develop a Service Recovery Plan for transit service after an interruption of service has occurred. The plan will specify restoration of levels of service, routes, and schedules; repairing or reopening facilities; adjustment of staff work schedules and duty assignments; responding to customer inquiries about services; and other activities necessary to restore transit service. The service recovery plan may be used for short periods when the agency is transitioning to normal service from scheduled interruptions.

13.10.1 Develop service interruption scenarios and determine recovery strategies based upon the operating capabilities of the trackway infrastructure and systems.

13.10.2 Prepare time-to-recovery tables for the various service interruption scenarios and the likelihood for such events to take place.

13.10.3 Document finding in Service Recovery Plan Report.

13.11 Power Sectionalization

13.11.1 From the operating plan and the Service Recovery Plan, determine the appropriate power sectionalization strategy to accommodate emergency response, recovery, and maintenance.

13.11.2 Coordinate with Fire/Life Safety Committee for procedures in responding to wayside emergencies.

13.11.3 Coordinate with the Traction Power Design team for appropriateness of the sectionalization strategy with the power distribution system.

13.11.4 Provide Summary Power Sectionalization Report

13.12 Reverse Running/Interlocking Spacing

13.12.1 In conjunction with the Service Recovery Plan, determine runtimes and capacity limitation for all possible single tracking scenarios.

13.12.2 Coordinate with the Track Design Team the sufficiency of the trackway to accommodate service during disruptions and determine the likelihood of events and the potential impact. Findings will be included in the Service Recovery Report.

13.13 ADA Compliance

13.13.1 Coordinate with the Accessibility Compliance Report to determine the operational staffing and other resources needed for compliance.

13.13.2 Develop maintainability staffing requirements necessary to meet the compliance requirements for the system.

13.13.3 Prepare report that describes the operational and maintenance resources requirements for ADA compliance.

13.14 O&M Testing Plan

13.14.1 Prepare outline for basic requirement for an O&M Testing Plan to be developed in final design.

13.14.2 Complete O&M Commissioning Plan.

13.14.3 Prepare outline for O&M Commissioning Plan to be developed in final design.

13.15 Complete O&M Commissioning Plan

13.15.1 Prepare outline for O&M Commissioning Plan to be developed in final design.

13.16 O&M Rule Book

13.16.1.1 Prepare outline for O&M Rule Book to be developed in Final Design.

13.17 Capitalized Training Start-up Plan

Prepare outline for Capitalized Training Program to be developed in final design, which will include the subtasks below

13.17.1 Identify training organization and resource requirements.

13.17.2 Identify supplier training for inclusion in procurement documents.

13.17.3 Identify training equipment needs for inclusion in procurement documents.

13.17.4 Prepare Capitalized Training Start-up Report

13.18 Security

Design reviews during the preliminary phase of the Project will include project security staff to ensure that security design criteria and security countermeasures identified through the security risk assessment are incorporated into the design and drawings for the Project. The reviews will also ensure that new vulnerabilities are not introduced as a result of the design.

13.19 Safety

Design reviews will be coordinated with safety staff during the preliminary design phase of the Project to ensure that safety hazards are eliminated or adequately controlled and that new hazards are not created.

Safety considerations include the following:

- System interactions
- Human factors
- Environmental parameters
- Isolation of energy sources
- Emergency responses, including emergency egress and rescue paths
- Fire sources and protection
- Equipment layout
- Lighting requirements
- Operational requirements
- Maintenance requirements

Maximum use will be made of reliability analyses and other applicable design analyses and information during the reviews.

13.20 Staffing Plan

Prepare staffing plan for revenue service using the operating plans developed for years 2013, 2017, and 2030.

13.21 Operability Assurance of PE Design

13.21.1 Document simulation studies for stations, yards, vehicle guideways, shops, and systems to ensure operational requirements of the Operating Plans are met.

13.21.2 Prepare report.

ASSUMPTIONS:

The operating plan for fixed guideway is dependent upon the following:

- Patronage estimates provided by Task 25.0 – Travel Forecasting
- Criteria and guidelines developed under Task 11.0 – Land Use Planning
- Service integration and bus/guideway transfer needs under Task 15.0 – TheBus Interface
- Design Criteria and Performance Specifications provided by Task 18.0 – Transit Sub-Systems
- Operating input will be specified for all technologies remaining under consideration and eliminated for those rejected as they are rejected

SCHEDULE:

Subtasks 13.1 through 13.9:

- Start: Immediately upon NTP.
- Finish: January 2008 for items necessary for the Draft EIS but TBD for others.

Subtasks 13.10 through 13.20:

- Start: October 2007.
- Finish: June 2009.

DELIVERABLES:

- Service Recovery Plan
- Summary Power Sectionalization Report
- O&M ADA Compliance Report
- Outline for O&M Testing Plan
- Outline for O&M Rule Book
- Capital Training Start-up Plan
- Security Related Design Comments
- Safety Related Design Comments
- Staffing plan for years 2013, 2017, and 2030

Operability Assurance Documentation Report

14.0 Financial Plan

APPROACH:

Consistent with FTA requirements and procedures and building upon the Financial Plan developed in the AA, a comprehensive Financial Plan will be developed in close collaboration with other elements of the preliminary engineering process. The Financial Plan will assess the CITY's financial capacity to implement, operate, and maintain the Project as well as the rest of the system.

SCOPE:

14.1 Financial Plan

14.1.1 Build upon the AA Financial Plan to introduce the Project and the project sponsor, as well as describe and summarize the sources and uses of funds, including any new funding source identified in addition to the General Excise and Use Tax (GET) surcharge and FTA New Starts. Close coordination with other technical teams will be critical throughout the development and refinement of the Financial Plan to ensure consistency across the entire Project.

14.1.2 Capital Plan

14.1.2.1 Refine and update the capital plan by reviewing and integrating the newly developed project capital cost estimates and implementation schedule, including potential for phased implementation; refine and update on an ongoing basis the annual GET revenue forecasts based on actual GET surcharge collections to date and any recent market trends; build upon the financial model developed during the AA phase to maximize and leverage those revenues in the most efficient way. Integrate any new assumption on annual and total receipt of New Start revenues based on feedback from FTA.

14.1.2.2 Review and integrate the newly developed system-wide capital cost estimates for TheBus and Handi-Van, through 2030; refine and update non –New Starts Federal and local revenue forecasts, as applicable.

14.1.3 Operating Plan

14.1.3.1 Review and integrate newly developed ridership and fare revenues; discuss ways to maximize operating revenues. Estimate fare revenues based on results of the ridership forecasts, including consideration of proposed fare and transfer policies, average fare, and transfer rates. Develop annual estimates of fare revenues, reflective of project implementation schedule(s) and proposed rates of bus system growth.

14.1.3.2 Review and integrate operations and maintenance (O&M) cost estimates for the Project.

14.1.3.3 Evaluate the long range system-wide operating plan and associated O&M costs estimates and the incremental burden of the Project on the CITY's finances

14.1.4 Cash Flow Analysis

14.1.4.1 Consolidate the above-mentioned forecasts into a system-wide 20-year cash flow projection, including proceeds from debt financing and corresponding finance charges. Consistent with FTA requirements, this cash flow will include at least five years of historical data. This task will be undertaken in collaboration with the CITY's Financial Advisors.

14.1.4.2 Conduct sensitivity tests on key variables affecting the 20-year cash flow, such as potential increases in capital and operating costs, alternate inflation rates, construction cost index, changes in the project implementation schedule, and the impact of alternate growth rates of key revenue sources, notably the rate of growth of the revenues from the GET surcharge and the schedule for receipt of FTA Section 5309 New Starts funding. Also to be considered are the impact of changes in level of service on ongoing capital and O&M costs, as well as on operating revenues, and the impact of increased capital costs, and GET surcharge revenue. This will be coordinated with the other elements of the preliminary engineering process.

14.1.4.3 Evaluation of FTA required performance measures to document the strength of the capital and operating plans, and evaluate the CITY financial ability to

implement the Project and maintain and expand The Bus and Handi-Van. Performance measures may include but not be limited to annual ending cash balance, ability to meet CITY reserve policies and minimum debt coverage limits, annual farebox recovery rates, and average vehicle age.

14.1.4.4 Coordination with the CITY's finance team, their financial advisors, and other team members as necessary to ensure that adequate and accurate projections and financing techniques are modeled that are consistent with other CITY financial assumptions. Assure that proposals for debt are in compliance with all debt management policies and limitations of the CITY.

14.1.4.5 Include all documentation necessary for FTA reporting (relevant enabling legislation, proof of local funding commitment, CITY's financial position).

14.1.5 Local Reporting

Support will be provided to assist CITY staff with other related reporting efforts and to support public outreach related to the Project as necessary.

14.1.6 FTA Reporting

All documentation required by the FTA for New Starts reporting related to the Financial Plan for the Project will be developed and included suitable for transmittal to the FTA at the required times over the project lifecycle. This includes assistance in securing a Letter of No Prejudice, in collaboration with the CITY and its PMSC.

14.1.7 Procedure for Maintenance of the Financial Plan

14.1.7.1 Update technical assumptions that affect the Financial Plan regularly, including changes or modifications to contract terms and data from construction progress.

14.1.7.2 Develop and implement a capital-specific and overall financial monitoring and management plan to be updated at key project milestones.

14.1.7.3 Conduct additional financial analyses, as required, to support bond issuance planning, loan facility drawdowns, anticipated construction schedules, etc.

14.1.7.4 Provide support as necessary for meetings with FTA officials related to the Financial Plan.

14.1.8 Stakeholder Communication

14.1.8.1 Assistance will be provided to facilitate coordination with key project stakeholders. Workshops will be regularly held to update key project stakeholders on the progress of the financial planning process, as well as to seek input for strategic decisions related to the development of the Financial Plan.

14.1.8.2 The Financial Planning team will assist in responding to stakeholder requests and questions from the public by preparing sensitivity analyses and other reporting tools, as appropriate, to better enable the public to understand and accept the Financial Plan assumptions and outcomes.

14.2 FTA New Starts Financial Planning Support

The Financial Plan outlined above will be updated periodically and submitted annually to FTA. It will be based on guidance published and periodically updated by FTA, including the following:

- FTA's *Guidelines and Standards for Accessing Local Financial Commitment*: This document includes the specific criteria used by FTA's financial contractors to evaluate and rate the stability and reliability of a project's operating and capital plans and the level of non-Section 5309 funding planned for or committed to the project. The intent is that a grantee could review this document and determine for itself how its financial plan would be rated.
- FTA's *Guidance on Transit Financial Plans, July 2000*: This document defines the content, scope, and format of acceptable financial plans.

- *FTA's Procedures and Technical Methods for Transit Project Planning: Chapter 8 Financial Planning for Transit*: This document expands upon the materials presented in the July 2000 Guidance on Transit Financial Plans and provides more specific guidance on developing the financial model, including revenue and cost forecasts as well as sensitivity analyses.
- *Reporting Instructions for Section 5309 New Starts Criteria*: This document provides the instructions to provide the data and supporting materials for the Local Financial Commitment element of the Section 5309 New Starts criteria.

The Financial Plan will be based on fully supportable assumptions and methodologies for development of capital and operating and maintenance costs for the Project, as well as the background transit system. Capital costs will include the proposed Project and associated maintenance and other support facilities, as well as associated bus fleet expansion and new and expanded system-related capital facilities, fleet expansion and replacement, capital maintenance, and other potential capital cost items. All Project costs will comply with FTA's Standard Cost Categories and include contingencies that are both appropriate to the level of system design development and are acceptable to FTA.

On the O&M side, the Project is a new technology for Honolulu. All inputs to the O&M cost methodology will be fully supportable and related to local labor rates, inflation, and other rates. In addition, such costs will be fully comparable with the rates currently experienced and projected for DTS' bus services. Bus system O&M costs will reflect proposed expansion of service and be based on historical rates of growth in unit costs for service.

Revenues proposed for capital and O&M will also be fully documented and based on realistic ranges of assumptions regarding revenue growth and the schedule for receipt of funding. With regard to O&M funding, assumptions and methodology for computation of future receipt of local support from the CITY and of farebox revenues will be thoroughly documented and based on realistic trends.

14.3 Financial Support for Phase I and for Proposed Extensions to the Project

In addition to maximizing opportunities for FTA New Starts funding for the 20-mile Project, the CITY intends to initiate service with a Phase I project that would be locally funded. It is understood that the CITY's goal is to retain all options in order to have the ability to use local funding for Phase I toward future match for the proposed extensions to the Project and assistance will be provided to the RTD in advocating such a strategy to FTA. Also as part of the collaboration with other elements of the preliminary engineering process, new potential opportunities for revenue will be identified, including value capture, joint development, or other private-sector participation. The potential for implementing portions of the extensions to the 20-mile Project as per the full Locally Preferred Alternative will also be evaluated.

14.4 Value Capture, Joint Development, and Public Private Partnership Opportunities

This task will focus on opportunities for public private partnerships to assist in project financing, funding, and/or cost sharing. PPP opportunities may include but not be limited to value capture, joint development, private sector financing, and potential for participation in federal programs such as the Public Private Partnership Pilot Program (PPPPP). Identification of potential revenues associated with value capture and joint development will be coordinated with land use planning and station area interface efforts in Subtask 11.0 generally and with joint development opportunities identified in Subtask 11.8 in particular.

While the FTA is no longer accepting applications for the Public Private Partnership Pilot Program (PPPPP) under the current SAFETEA-LU authorization cycle, the program will be closely monitored and any opportunity to participate in the PPPPP will be explored and shared with the RTD. Additionally, the potential for a public-private partnership will be evaluated in more general terms and included in the financial analysis as appropriate.

14.5 Financing Options Incorporating Various Debt Structures

Various approaches to project finance will be analyzed with the goal of maximizing leverage of GET surcharge revenue, either alone or in combination with other potential revenue streams.

SCHEDULE:

- Start: Immediately upon NTP.
- Finish: January 2010.

DELIVERABLES:

- Financial Model
- Financial Model Documentation and User Manual
- Financial Plans, updated as required
- Financial Component of FTA New Starts Report Submittals
- Presentations as required

15.0 TheBus Interface

APPROACH:

Under Task 15.0, interface between the TheBus service and the fixed guideway service will be defined. Information from the task will be used in Task 25.0 –Travel Forecasting, and other efforts such as service costs. The bus operations plan developed for the AA and updated with new information will serve as the basis for this task.

The interface between TheBus and the Project will include a bus operations plan that will identify bus service characteristics with implementation of the Project. The plan will incorporate service characteristics identified in Task 13.0 – Operability Input to Design, Subtask 13.5. The bus operations plan will address the 2030 horizon year under three Project alignment scenarios – Salt Lake Only, Airport Only, and Salt Lake + Airport. This information will allow bus operations information to be included in the Draft EIS.

TheBus/Project interface task will also identify physical integration of TheBus and fixed guideway service. This will be focused on transit centers at stations and will follow guidelines and criteria developed under Task 11.0 – Land Use Planning.

System-level integration between TheBus and fixed guideway will be identified in this task. This integration will include identification of changes to existing long-haul express bus routes with implementation of fixed guideway service.

SCOPE:

15.1 Feeder Bus Service Network

This task will identify the network of feeder bus routes that will serve potential fixed guideway stations. The AA identified characteristics of feeder service to stations. The characteristics will be updated with more recent information, including that incorporated in the New Starts application to FTA.

Bus access to stations will be accomplished with improved headways on local buses and community circulators. This task will update bus service information for both existing and planned routes that will serve fixed guideway stations. Information will be developed at a level to allow input to Task 25.0 – Travel Forecasting, as well as Task 14.0 – Financial Plan, Subtask 14.3 Operating Plan. Key service information items include the following:

- Route specific headways
- Route specific transit travel times
- Identification of new routes – planned under Baseline conditions
- Identification of service changes to existing TheBus routes – planned under Baseline conditions

The feeder bus networks will be provided for the following horizon years and fixed guideway alternative:

- Year 2030 – Salt Lake Only, Airport Only, and Salt Lake + Airport
- First full year of service of MOS, Salt Lake Only, Airport Only, and Salt Lake + Airport
- First full year of service for opening segment

The feeder bus information will be developed at a level of detail to allow inclusion in the Travel Demand Forecasting Model.

15.2 Bus/Transit Transfer Facilities

Under this task, planning-level information will be provided on potential bus/guideway transfer facilities (transit centers) at stations. The information will include the following for each station:

- Number of bus bays
- Types of transit services that will be provided at each transit center
- General location of the transit center
- Relationships between the transit center and nearby pedestrian paths and sidewalks
- Relationships between the transit center and any planned park-and-ride facilities at the station

The identification of transit center characteristics will need to recognize the guidelines and criteria that will be developed under Task 11.0 – Land Use Planning, Subtask 11.2 – Circulation Interface. These guidelines and criteria will help provide direction relating to station design features, including support for potential transit oriented development at or near the stations.

15.3 Bus/Guideway Operations Integration Plan

Under this subtask, an integration plan will be developed involving TheBus routes and fixed guideway service. This plan will identify modifications to both existing and planned bus routes that will occur with implementation of fixed guideway service.

The task will use as a starting point bus/guideway integration identified in the AA. Service characteristics will be updated to reflect any new information that has become available since completion of the AA. This will include information provided in the New Starts submittal to FTA.

The bus/guideway integration plan will be provided for the following horizon years and fixed guideway alternative:

- Year 2030 – Salt Lake Only, Airport Only, and Salt Lake + Airport
- First full year of service of MOS, Salt Lake Only, Airport Only, and Salt Lake + Airport
- First full year of service, opening segment

ASSUMPTIONS:

TheBus Interface task will rely on previous information developed for the AA. It will also need to incorporate criteria and guidelines identified in Task 11.0 – Land Use Plan.

SCHEDULE:

- Start: Immediately upon NTP.
- January 2008 for items necessary for the Draft EIS but TBD for others.

DELIVERABLES:

N/A

16.0 Architectural and Engineering Design Services

16.1 Architectural Design

APPROACH:

The architectural and engineering design services will commence with the development of Design Criteria that will guide and govern all project design activity. Established Design Criteria will define the parameters for the Project's facilities. The compilation of space and functional requirement programs for each facility will parallel the production of Design Criteria. The Compendium of Design Criteria (CDC), the Facility Program Requirements, and the architectural and engineering design services will commence with the development System's Design Language "Pattern Book" will represent key elements of the Project's *Basis for Design* which, once approved by the RTD, will govern the CONSULTANT's ongoing design activities. The CONSULTANT will prepare a comprehensive preliminary engineering and architectural design for the fixed guideway system. These designs will be expressed in the form of Design Criteria for each major element of the Project followed by drawings and performance specifications that shall be in sufficient detail for subsequent contract unit designers to complete designs as part of either a stand-alone design assignment or in concert with a construction or procurement contractor as part of a design-build assignment. The CONSULTANT will coordinate with the RTD such that design decisions may be reviewed both informally and formally per the Configuration Management Plan.

SCOPE:

Completed and approved Design Criteria, Facility Programs, and the System's Design Language "Pattern Book", once approved, will form a comprehensive *Basis for Design* which the CONSULTANT will use to proceed with design studies. The result of the design studies will be prototypes for each of the Project's station types and for selected support facilities. Once the prototype facility designs are fully vetted and approved by the RTD, the CONSULTANT will commence with the adaptation of those prototype designs to site-specific conditions.

16.1.1 Design Criteria

An initial task of the CONSULTANT will be the preparation of the Compendium of Design Criteria (CDC) for the Project to ensure the Project's design activities proceed governed by the applicable national, state, local, and accepted industry standards. The CDC will be used as a key element of the Project's *Basis for Design*. Representative chapters to be included in the Architectural Design Criteria section of the Compendium include, but are not limited to, the following:

- Codes and standards
- Sustainable design considerations (coordinate w/Subtask 16.1.9.3)
- Site configuration
- Station configuration
- Vertical circulation
- Materials and finishes
- Accessibility for the disabled (coordinate w/Subtask 16.1.9.4)
- Ancillary facilities
- Lighting
- Fare vending/collection
- Station and station site graphic signage (coordinate w/Subtask 16.1.9.6)
- Station appurtenances

Although it is anticipated that certain chapters of the CDC will be produced and submitted as completed, no design work will be permitted to proceed until the specific chapters governing those areas of the Project's design have been approved by the RTD. Further, the CONSULTANT will maintain and update

the CDC throughout Preliminary Engineering (PE) to reflect changes and modifications to the Project's *Basis for Design*.

DELIVERABLES:

A draft and final submission of the Architectural Design Criteria section of the CDC, including updates as appropriate throughout PE's duration.

16.1.2 Facility Programs – Space and Functional Requirements

Coincident with the preparation of the Compendium of Design Criteria, the CONSULTANT will develop definitive architectural programmatic requirements for each station site, each station, and other facilities as required. The CONSULTANT shall develop standardized Facility Program Requirement formats for the presentation and documenting of this material.

Station site programmatic requirements, developed in conjunction with the RTD and the CONSULTANT's planning input, will include pedestrian circulation and pathway linkage requirements, vehicular and bicycle circulation and parking count requirements, station entrance orientation guidance, site-specific natural and manmade features that are to be respected, public open space needs, and required fixtures and equipment such as public seating, bicycle lockers, facilities for the elderly and disabled, etc.

Station programmatic requirements will include a list of all spaces to be provided at each station, both public and station support spaces. The space requirement information shall include square footage needs, a description of any equipment to be accommodated in the space, a preliminary indication of the intended finish materials, and information defining space adjacencies that need to be accommodated in the station's layout.

Facility Program Requirements shall also be developed for the Project's support facilities, including, but not limited to, the following:

- Yard and shop facilities
- Parking structures
- Transit center passenger facilities
- Park-and-ride passenger facilities
- Traction power substations
- Tie-breaker stations (if applicable)

As with the stations, the space requirement information shall include square footage needs, a description of any equipment to be accommodated in the space, a preliminary indication of the intended finish materials, and information defining space adjacencies that need to be accommodated.

During PE, these Facility Program Requirements will be expanded to include finalized finish material requirements, electrical and mechanical systems descriptions, accommodated equipment descriptions, and other programmatic requirements. These statements of programmatic requirements will form a key element of the Project's *Basis for Design* and once approved by the RTD, may not be changed without action from the Project's Change Control Board.

DELIVERABLES:

A draft and final submission of the Facility Program Requirements, organized by each facility, including updates as appropriate throughout PE's duration.

16.1.3 Creation of the System's Design Language

The creation of a Honolulu-inspired specific architectural design language for the Project is of vital importance. Embodying Honolulu and Hawaii's rich cultural heritage in the physical forms of its facilities, while enabling a meaningful integration into their immediate environs, will engender significant civic pride in the entire transit system. Further, resulting recognizability of the system throughout Honolulu will be key to attracting riders, both local citizens and tourists.

The ultimate goal of the system's unified design language will be the achievement of iconic status for Honolulu's transit system, internationally imprinting its physical form in much the same way as the red double-decker omni-buses in London, the coffered vaults of the Washington METRO train rooms, and the "tented mountain range" of Denver International Airport.

The CONSULTANT shall develop a comprehensive design language "Pattern Book" for the Project's facilities, presented in narrative and drawing form, for presentation to and approval of the RTD.

DELIVERABLES:

A draft and final submission of the System's Design Language "Pattern Book."

16.1.4 Station and Support Facility Prototype Designs

Station prototype designs shall be developed for the following three (3) station types:

- Aerial Side Platform Station, in Roadway Median, with Crossover Bridge Below the Platforms/Above the Roadway (Three Levels: Platform, Bridge, and Grade)
- Aerial Side Platform Station, in Roadway Median, with No Crossover Bridge (Two Levels: Platform and Grade)
- Aerial Side Platform Station, Not in Roadway Median, with At-Grade Entrance(s) Below Platforms (Two Levels: Platform and Grade)

Several stations will require unique configurations and will be designed after the prototype stations are approved by the RTD. These unique station types will be modifications to the established prototypes and shall embody the design principles established during the prototype station design work.

In addition, prototype design solutions will be prepared for other Project support facilities, including a Transit Center Passenger Facility, a Park-and-Ride Passenger Facility, and a Traction Power Substation.

A "Kit-of-Parts" approach will govern the station prototype and support facilities design activity employing standard building components and systems, modularly sized structural elements and assemblies, a modular and harmonious palette of finish materials, and standardized approaches to electrical and mechanical systems within each station while allowing elements of distinction to be incorporated into the overall parties. The establishment and use of a fixed and identical structural module for all stations will act as the key ordering device for all final design and construction. It will enable a cost-effective, componentized approach to the procurement of structural members, structural assemblies, architectural fenestration, and durable architectural finish materials requiring minimal maintenance.

DELIVERABLES:

The prototype station and support facility design solutions shall be presented initially in early sketch form and ultimately in hard-line form for their final submission. The drawings shall include, but not be limited to, ground-level plans, facility plans, sections, elevations, and 3-D views. The drawings shall be of presentation quality: rendered ground-level plans and color highlighted plans, sections, elevations, and 3-D views.

16.1.5 Architectural Design Drawings – All Facilities and Sites

16.1.5.1 Conceptual Drawings

Using the prototype designs developed in the Station Prototype Station Subtask (16.1.4) noted above as the "Basis for Design", the CONSULTANT will prepare site-specific General Plan conceptual drawings for each facility in the Full-Corridor Alignment (approximately 28 miles): thirty-five (35) stations for the five technologies under consideration, plus each of the support facilities. These drawings will include small-scale site plans, station plans, sections, and elevations as required to fully describe each facility to a 10% level of design. The level of design for each of these facilities shall be sufficient to determine the right-of-way requirements and general environmental impacts for inclusion in the EIS work effort.

DELIVERABLES:

General Plan drawings, including small-scale site plans, facility plans, sections, and elevations, shall be submitted, developed to a 10% level of design, for all facilities included in the Full-Corridor Alignment. Drawing scales shall be approved by the RTD prior to the CONSULTANT proceeding with its production.

16.1.5.2 Preliminary Design Drawings

The CONSULTANT shall continue the development of site-specific General Plan preliminary drawings to a 30% level of design for each of the initial project's (approximately 20 miles) facilities: nineteen (19) stations plus the respective support facilities, including guideway, maintenance and storage facility, transit center and park-and-ride passenger shelters, traction power substations, and tie-breaker stations.

Drawings will include small-scale site plans, facility plans, sections, elevation details, schedules, and 3-D views. This 30% level design work shall incorporate and be coordinated with the relevant engineering data developed by the structural, civil, mechanical, electrical, and systems engineering disciplines. These drawings shall further identify the right-of-way and property acquisition needs of each of the facilities. These General Plans will form an integral part of the Project's *Basis for Design* guiding the preparation of the construction drawings to be prepared during the Project's Final Design Phase.

DELIVERABLES:

1. General Plan drawings, including site plans, facility plans, sections, elevations, details, schedules, and 3-D views shall be submitted, developed to a 30% level of design for all facilities included in the initial project: approximately 20 miles in length.
2. Drawing scales shall be approved by the RTD prior to the CONSULTANT proceeding with its production.

16.1.5.3 Directive and Standard Drawings

Lagging the preparation of the General Plans, the CONSULTANT will prepare Directive Drawings to be used to further define the Project's stations and support facilities. In principle, these drawings shall be used to describe similar or common design configurations and details that may be repeated throughout the Project. These Directive Drawings will enable an achievement of a 30% level design completion, will establish a standardized approach to the Project's design configuration(s), and most importantly, will be used to guide and inform a consistent design effort by Section Designers and the Final Design Consulting team.

The CONSULTANT will also produce Standard Drawings describing configurations, assemblies, materials, and details that are not to be changed or modified during the Final Design work without the express consent of the Change Control Board.

DELIVERABLES:

1. Directive Drawings describing similar or common design configurations and details that may be repeated throughout the Project's design.
2. Standard Drawings describing configurations, assemblies, materials, and details that are not to be changed or modified during Final Design.
3. Drawing scales shall be approved by the RTD prior to the CONSULTANT proceeding with its production.

16.1.6 Outline Specifications

The CONSULTANT will prepare an outline technical specification for all architectural materials, finishes, and elements proposed for incorporation in the following facility types:

- 19 stations in the initial project
- Maintenance and storage facility

- Parking structure
- Transit center passenger facilities
- Park-and-ride passenger facilities
- Traction power substations
- Tie-breaker stations (if applicable)

The format for these specifications and their level of detail appropriate for the PE phase of the work will be as agreed to and approved by the RTD.

DELIVERABLES:

Outline Specifications for all architectural materials, finishes, and elements.

16.1.7 Cost Estimating and Material Take-offs

The CONSULTANT's architectural staff shall prepare material quantity take-offs for all architectural components for the following facility types and their respective sites for the use of the project estimating staff:

- 19 stations in the initial project
- Maintenance and storage facility
- Parking structure
- Transit center passenger facilities
- Park-and-ride passenger facilities
- Traction power substations
- Tie-breaker stations (if applicable)

The format for these material take-offs and their level of detail appropriate for the PE phase of the work will be as agreed to and approved by the RTD.

16.1.8 Presentation Materials, including Scale Models and Photo Simulations

The CONSULTANT will prepare the following presentation quality materials for the RTD's use. A schedule for the production of these materials will be presented by the CONSULTANT to the RTD for approval.

16.1.8.1 Presentation Quality Drawing Materials

The CONSULTANT will prepare presentation quality drawing materials, mounted on 34" by 46" foamcore boards for each station (19) and the following support facilities: the maintenance and storage facility, the parking structure, one transit center passenger facility, one park-and-ride passenger facility, one traction power substation, and one tie-breaker station as follows:

- Rendered site plan, including landscape design
- Color highlighted floor plans
- Color highlighted sections and elevations
- Color highlighted 3-D views

16.1.8.2 Photographic Simulations

The CONSULTANT will prepare fully rendered exterior photographic simulations (before and after) for each station (19), electronic format permitting their being printed to a range of required sizes. A minimum of two photographic simulations are required for each station and each RTD-selected support facility: one at ground level and one from an elevated point.

DELIVERABLES:

Presentation Quality Drawing Materials as described above.

16.1.8.3 Architectural Scale Models

The CONSULTANT will prepare or cause to have prepared the following architectural scale models for the RTD's use:

- Large scale, models shall be constructed for each of the three (3) prototype stations specified in Subtask 16.1.4 above plus the Ala Moana Center station. These models are to be constructed of wood, Plexiglas, or similar high quality material at a scale to be agreed to and approved by the RTD.
- Small-scale, site location models shall be constructed for each station (19) and the yard and shop facility. These transit facilities, including the guideway, station, and support facilities, shall be modeled, as will the surrounding buildings and major site elements. These models may be constructed of pressboard or similar material, at a scale to be agreed to and approved by the RTD. These models shall be uniform in appearance in order to be recognized as part of a set of the Project's facility location models.

DELIVERABLES:

Architectural Scale Models as described above.

16.1.9 Reports and Calculations

16.1.9.1 Stakeholder Design Input Report

During PE, the CONSULTANT shall maintain a log of stakeholder input and comments recorded and listed for each station and each support facility. It shall be the CONSULTANT's responsibility to prepare responses to these inputs and comments to the RTD's satisfaction. When and if it is determined to reflect or incorporate such input in the design of any of the Project's facilities, a clear indication of the CONSULTANT's having done so will be pointed out in narrative responses and drawing form attached as appropriate. The CONSULTANT shall prepare a Draft & Final Stakeholder Design Input Report that shall summarize and include all such comments and responses made during the Preliminary Engineering phase of the Project. Coordinate with Task 21.0.

16.1.9.2 Fire/Life Safety Analysis Report

The CONSULTANT shall employ an independent Fire/Life Safety consultant that has significant experience with the design of fixed guideway mass transit projects to review and analyze the Project's compliance with the fire/life safety requirements of NFPA 130, NFPA 101, other applicable codes, and the Compendium of Design Criteria developed for the Project. The Fire/Life Safety consultant shall prepare a Draft & Final Fire/Life Safety Report that will identify compliance requirements and confirm that the Project facility designs comply with those stated requirements.

The Fire/Life Safety consultant shall perform station egress calculations in accordance with the provisions of NFPA 130 for each of the Project's stations to ensure their compliance. These calculations shall be presented in a standardized format acceptable to the RTD and accompanied by station plan drawings for each station indicating the emergency egress pathways/routes at each station level, as well as all fire-rated walls on those levels.

The Fire/Life Safety Report shall also address the compliance requirements of the Project's support facilities: parking structures, yard and shop facilities, traction power substations, and tie-breaker stations. The report shall present the compliance requirements for each of these facility types and confirm that their designs comply with those stated requirements.

The Fire/Life Safety Report will also, at a minimum, address the following subjects:

- Codes and criteria
- Facility construction classifications

- Fire separations
- Fire and intrusion alarm systems
- Fire suppression systems
- Standpipe/Siamese systems
- Points of safety and safe dispersal areas
- Accessible means of egress – areas of refuge

16.1.9.3 Sustainability Design Report

The CONSULTANT shall designate a LEED-certified architect to implement, manage, and monitor the Project's sustainable design initiatives. This individual will lead the effort to establish sustainable design goals and objectives for the Project's design to be incorporated into the Project's Compendium of Design Criteria: architectural, landscape architectural, civil, structural, mechanical, and electrical engineering all being governed by the tenets of sustainable design, including but not limited to the following:

- Reduced energy consumption coupled with the generation of a portion of each station and/or support facility's energy requirements through the incorporation of new-generation integrated photovoltaics in canopy structures and roofs
- Reduced potable water usage as well as a reduction in the generation of wastewater
- Reduced material usage, minimizing superfluous materials and finishes while also providing incentives for "zero-waste" construction activities
- Sustainably-informed facility site selection and design, including reduced site disturbance, innovative stormwater management design, reduction of heat islands, and incorporation of water-efficient, responsibly selected native landscape materials
- Commitment to the use of local and regional materials, recycled construction materials, and those with recycled content
- Rainwater retention for non-potable water usage: toilet flushing, irrigation, etc.
- Station and support facility designs oriented and configured to take maximum advantage of day-lighting and natural ventilation
- Incorporation of on-site rainwater retention methods, such as bio-retention cells and natural swales
- Adherence to volatile organic compound limits in all adhesives, sealants, paints, coatings, and interior finishes

The CONSULTANT shall prepare a Draft and Final Sustainable Design Report addressing the initiatives incorporated into the design of the Project's facility sites, including the impacted lands along the guideway, the Project's stations, and its support facilities to achieve compliance with the Project's sustainable design goals and objectives. This information shall be comprehensively presented in narrative and drawing form.

16.1.9.4 Accessibility Compliance Report

The CONSULTANT shall prepare a Draft and Final Accessibility Compliance Report addressing all applicable accessibility requirements for each of the Project's station sites, stations, and support facilities, all developed in conjunction with the RTD's and the CONSULTANT's planning input. The purpose of this report is to document the compliance of all Project facilities and facility sites with the requirements of the Americans with Disabilities Act Accessibility Guidelines (ADAAG), other applicable codes, and the Project's Compendium of Design Criteria.

An initial task of the CONSULTANT will be development of a detailed checklist of the many accessibility requirements to be used by the CONSULTANT's architects and engineers during the facility and facility site design work. This checklist shall be submitted to the RTD for approval and ultimately included in final form and executed for each of the Project's stations, station sites, and support facilities. The checklist shall include, but not be limited to, the requirements for the following:

- Facility site accessibility provisions and accessible routes
- Parking and drop-off area provisions

- Accessible entrances and doorways
- Ramps located within accessible routes
- Elevators located within accessible routes
- Automated fare vending and collection
- Station platform and mezzanine provisions
- Toilet room provisions
- Communication systems including telephones
- Public area signage
- Areas of Rescue Assistance (AORA)

The content of the Accessibility Compliance Report shall be coordinated with that of the Fire/Life Safety Report to ensure design compliance with the emergency egress and fire/life safety facility requirements for patrons and transit system employees with disabilities and special needs. These requirements shall be comprehensively addressed in both reports: Fire/Life Safety and Accessibility Compliance.

16.1.9.5 Art-in-Transit Report

The Mayor's Office of Culture and the Arts (MOCA) shall be responsible for implementing, administering, and monitoring the art program for the Project. Artwork to be incorporated into the Project's facilities and/or facility sites shall either be procured by MOCA for the Project or commissioned from local artists who will be responsible for the artwork's design, fabrication, and installation.

The CONSULTANT shall have the following responsibilities during PE in regard to the Project's artwork program:

- Providing input to the solicitation prospectus developed by MOCA explaining the parameters and nature of each facility or facility site for which artwork may be incorporated
- Coordinating with MOCA, the RTD, and the artists in the resolution of concerns or problems associated with incorporation of artwork within each facility or facility site
- Coordinating with MOCA, the RTD, and the artists regarding incorporation of artwork proposals into the design of facilities or facility sites and their respective PE design drawings
- Assisting the artists with estimates of interface construction costs such as mounting requirements, artwork bases etc., the costs of which shall be included in the budgets for each work of art

The CONSULTANT shall prepare a Draft and Final Art-in-Transit Report summarizing the nature, placement, and provisions made in its design work for all artwork to be incorporated into the Project.

16.1.9.6 Graphics, Signage, and Wayfinding Report/Manual

The CONSULTANT shall employ a graphic signage consultant who has significant experience in the design of graphic signage systems for fixed guideway mass transit projects to prepare a Manual of Graphic Standards for the Project.

16.1.9.6.1. Signage and Graphic System

The objective of this design effort will be to create a unified system of graphic signage that will efficiently and safely guide patrons and employees through the transit system and its numerous facilities. The following overall issues shall be dealt with initially:

- Typeface and type spacing
- System logo and symbols
- Maps – system maps, line maps, neighborhood maps, and bus maps
- Elderly and disabled signage
- Illuminated and non-illuminated signage
- Detailed design of signage elements

16.1.9.6.2. Prototype Applications

The CONSULTANT and the graphic signage design consultant shall coordinate the signage design work with the preparation of the station prototype designs, the general plan work for the station sites, and the design work for the Project's support facilities to ensure an integrated approach to signage design at all facilities. Station site signage issues shall include, but not be limited to, the following:

- Wayfinding signage to each station
- Station identification and directional signage
- Parking regulations and restrictive signage
- Traffic signage

Station signage shall include, but not be limited to, the following:

- Station identification
- Entrance and exit signage
- Directional signage
- Fare-related signage
- Restrictive signage
- Hazard-related signage
- Service room identification

16.1.9.6.3. Preliminary Designs

The CONSULTANT and the graphic signage design consultant shall prepare plan, section, and elevation drawings of each Project facility indicating the placement of signage elements in sufficient detail to enable the location and design of all interface requirements. Additionally, signage schedules for each Project facility and facility site shall be developed to enable a quantification of all sign types and their respective requirements.

16.1.9.6.4. Vehicle Graphics

Consideration shall also be given to using the graphic signage design consultant to prepare an exterior coloration/logo/signage approach to the vehicle once the vehicle technology is selected. The goal of this work is to enhance the overall vehicle's appearance, both its exterior and its interior, and unify the vehicle and the stations from a visual standpoint.

DELIVERABLES:

Draft and Final Graphics, Signage and Wayfinding Design Manual and design solution attachments as described above.

16.1.10 Landscape Architecture

16.1.10.1 Design Criteria

The initial task of the CONSULTANT's landscape architects will be the preparation of landscape design input to the Project's Compendium of Design Criteria (CDC). Representative chapters include, but are not limited to, the following:

- Codes and standards
- Sustainable design considerations
- Site configuration
- Guideway alignment configuration
- Natural features
- Hardscape materials
- Plant materials
- Irrigation

16.1.10.2 Space and Functional Requirements

The landscape architects shall fully participate in the formulation of the Functional Program Requirements for Project station and support facility sites.

16.1.10.3 Creation of Systems Design Language

The landscape architects shall provide significant input to the creation of the System's Design Language "Pattern Book."

16.1.10.4 Landscape Architectural Design Drawings – All Facilities and Sites

General Plans, Directive, and Standard Drawings shall be developed for station sites, the guideway alignment, the yards and shops facility, the transit center passenger facility sites, traction power substation, and tie-breaker station sites. The landscape architecture drawings shall use the Project's civil engineering drawings as their baseline and shall define the limits of the planted areas; limits of hardscape and pedestrian paving materials; call out site contours and grade changes; include all site features and fixtures; and indicate locations, descriptions, species, and approximate quantities and sizes of the recommended plant materials. The landscape architecture drawings shall include, but not be limited to, the following:

- Site plans
- Landscape master plans
- Paving plans
- Planting plans
- Irrigation system plans
- Material schedules

Drawing scales shall be approved by the RTD for all Landscape Architectural Drawings prior to the CONSULTANT proceeding with their production.

16.1.10.5 Outline Specifications

The CONSULTANT will prepare preliminary technical specification text for all landscape materials and elements proposed for incorporation into the Project's facility sites. The format of these specifications and their level of detail appropriate for the PE phase of the work will be as agreed to and approved by the RTD.

16.1.10.6 Cost Estimating and Material Take-offs

The CONSULTANT's landscape architectural staff shall prepare material quantity take-offs for all landscape materials and elements for the following facility types respective sites for the use of the project estimating staff:

- 19 stations in the initial project
- Maintenance and storage facility
- Parking structure
- Transit center passenger facilities
- Park-and-ride passenger facilities
- Traction power substations
- Tie-breaker stations (if applicable)

The format of these material take-offs and their level of detail appropriate for the PE phase of the work will be as agreed to and approved by the RTD.

DELIVERABLES:

1. A Draft and Final submission of the Landscape Architecture Design Criteria section of the CDC, including updates as appropriate throughout PE's duration
2. Provision of input to the Functional Program Requirements for the Project's Facility Sites
3. Provision of input to the System's Design Language "Pattern Book"

4. General Plans, Directive, and Standard Drawings for the station sites (19) and all support facilities
5. Outline specifications
6. Material take-Offs

16.2 Civil Engineering Design

APPROACH:

The CONSULTANT's initial task for civil engineering design will be the production and compilation of Design Criteria governing aspects of the design work. Paralleling this effort, the CONSULTANT will proceed with the production of base mapping, utility surveys, and geotechnical, hydrological, and hazmat investigations. The CONSULTANT will proceed with the design of facilities and structures according to the system definition developed in the initial studies after the necessary materials and data impacting the civil structure are gathered.

SCOPE:

16.2.1 Civil Design Criteria

16.2.1.1 Prepare Civil Design Criteria Report

Prepare civil design criteria report, including design standards for roadways and freeway ramps for vehicular, bicycle, and pedestrian traffic. Update design criteria report to support PE efforts after the vehicle technology has been selected. Design Guidelines will be produced for all modes. A design criteria report will be produced for only the selected mode.

16.2.1.2 Finalize design criteria for DB portion of Segment B/C

16.2.1.3 Prepare CADD Standards

Prepare separate civil and electrical standard details for utilization on CITY and state roadways. One CADD manual will cover all disciplines.

16.2.2 Surveys and Base Mapping

Alignment right-of-way (ROW) and Facility Sites Mapping will not be available for up to eight months. EIS work will be done using existing photography.

16.2.2.1 Aerial Base Maps and Right-of-Way Maps

Use the aerial base maps obtained during the AA phase and the RTD's GIS parcel information to develop the Alignment Drawings for the Draft and Final EIS.

16.2.2.2 Interim Base Maps

Conduct a data search for available CADD files and record drawings that will be used as interim engineering design base maps.

16.2.2.3 First-order Survey Monuments

Coordinate with U.S. Geodetic Survey, CITY Department of Design and Construction (DDC), Land Division, and State DOT Cadastral Section and provide first-order horizontal and vertical controls for the corridor. Re-establish missing or damaged control monuments.

16.2.2.4 Aerial Survey

Obtain low-level aerial survey of the corridor within the First Project limits for use in preparing the PE base maps at 1:20 scale.

16.2.2.5 Topographic Survey

Obtain ground topographic surveys to supplement the aerial survey for the PE base maps.

16.2.2.6 Supplemental Surveys

Obtain additional topographic surveys as needs are identified. Additional surveys may be needed for stream hydraulic analysis and at the alternative M&SF site.

16.2.2.7 Public Lands Section Lines

Upon completion of the first-order control survey, perform survey of the Public Lands Section Lines, which will provide the fundamental level of control for the location of property lines on the right-of-way maps.

16.2.3 Utilities: Investigations, Surveys, and Composite Base Maps

The preliminary engineering level of detail will be developed for the First Project segments. For non-First Project segments (including the Airport alignment), the engineering effort will be limited to that required to support the EIS.

16.2.3.1 Existing Utilities

Coordinate with the various CITY, State, Federal, and private utility agencies to obtain existing utility location and condition data. This information will be incorporated in the PE base map CADD files.

16.2.3.2 Agency Review

Submit PE base maps to local agencies and coordinate the review of existing utility locations. Continue project coordination with utility agencies, including scheduling of future CITY, State, or private utility or roadway projects.

16.2.3.3 Water, Sewer, Petroleum, and Gas Line Relocation Plans

Identify underground utility conflicts and prepare utility relocation plans on 22" x 34" sheets at a scale of 1" = 20'. Submit and coordinate design review with affected agencies. Identify points of connection for facilities services.

16.2.3.4 External Electrical/Communication Facilities

Design and prepare non-system electrical/communication plans for service connection between power and communication sources and the systems interface points.

16.2.3.5 Electrical/Communications Relocation Plans

Identify overhead and underground utility conflicts and prepare utility relocation plans on 22" x 34" sheets at a scale of 1" = 20'. Street light and U.S. Army military communication relocation information will be included in the plans. Submit and coordinate design review with affected agencies and utilities.

The preliminary engineering level of detail will be developed for the First Project segments. For non-First Project segments (including the Airport alignment), the engineering effort will be limited to that required to support the EIS.

16.2.3.6 Utility Agreements

Assist the RTD in preparing master utility agreements with private utility companies.

16.2.3.7 Traffic Signal Modification Concepts

Perform conceptual level effort to identify budgetary impacts to the construction estimate.

16.2.3.8 Traffic Signal Modification/Relocation Plans

For the Design Build segment, prepare traffic signal plans on 22" x 34" sheets at a scale of 1" = 20'.

16.2.3.9 Pot Holing and Supplemental Field Work

Provide limited field investigations to locate existing underground utilities.

16.2.4 Geotechnical: Investigations, Examinations, and Design Criteria

16.2.4.1 Initial Subsurface Exploration Program

- 16.2.4.1.1. *Develop and implement geotechnical field exploration standards*
- 16.2.4.1.2. *Compile and review existing geotechnical data*
- 16.2.4.1.3. *Conduct an initial subsurface exploration program*
- 16.2.4.1.4. *Perform field and laboratory testing*
- 16.2.4.1.5. *Evaluate geotechnical and groundwater conditions*
- 16.2.4.1.6. *Perform initial engineering evaluations and recommendations*
- 16.2.4.1.7. *Prepare detailed work plan for initial DB segment*

16.2.4.2 Geotechnical Program for DB portion of Segment B/C

- 16.2.4.2.1. *Subsurface exploration program*
- 16.2.4.2.2. *Field and laboratory testing*
- 16.2.4.2.3. *Geotechnical and groundwater evaluations*
- 16.2.4.2.4. *Engineering evaluation and design recommendations*

16.2.4.3 Additional Geotechnical Program

Based on the findings of Subtask 4.1, and development of the alignment, determine if additional explorations are needed to complete development of PE recommendations and data report.

16.2.5 Hydrological: Investigations, Examination, and Design Criteria

- 16.2.5.1 Conduct data search to obtain available drainage reports along at-grade sections and stream crossings
- 16.2.5.2 Evaluate stream-crossing impacts and, if necessary, develop topographic survey needs
- 16.2.5.3 Prepare hydrological drainage design criteria for roadway and fixed guideways. Prepare stream hydraulic and scour analysis, if required

16.2.6 Hazmat: Investigations, Examination, Recommendations. Phase I Environmental Assessment task is included in Task 6.0. This task will focus on areas identified as suspected problem areas during previous review and assessment.

- 16.2.6.1 Develop field investigation work plan, safety and health plan, and template for reporting
- 16.2.6.2 Obtain permits for traffic control, conduct field investigation, and perform laboratory analysis

16.2.7 Track Alignment Design: Plan and Profile

The preliminary engineering level of detail will be developed for the First Project segments. For non-First Project segments (including the Airport alignment), the engineering effort will be limited to that required to support the EIS.

16.2.7.1 Project definition and environmental planning assistance

16.2.7.1.1. *Conduct internal design team workshops and meetings to refine the civil design work plan. Manage and administer the civil design work plan.*

16.2.7.1.2. *The civil engineering design will evolve during the PE/EIS phase of the project with the fixed guideway design prepared for the AA being the starting*

point. Extract non-pertinent information from the AA documents and prepare AA alignment plans and profiles, typical sections, and right-of-way needs maps. Submit the documents to RTD for distribution.

16.2.7.1.3. Coordinate the design with various CITY, State, and Federal agencies that have review and acceptance responsibilities. Determine requirements for ADA and roadway reconstruction applicable to the First Project.

16.2.7.1.4. Support the RTD in coordinating design acceptance with various stakeholders and revise the design concept, as necessary.

16.2.7.1.5. Alignment drawings for the Draft and Final EIS documents. Prepare plans and profiles on aerial base maps on 11" x 17" sheets at a scale of 1" = 80'. Prepare typical sections that show the relationship between the fixed guideway and adjacent roadway facilities. Identify right-of-way needs.

16.2.7.1.6. Assist in identification of environmental and transportation impacts and development of mitigation options.

16.2.7.2 Evaluate existing facilities, coordinate with structural engineers, and design guideway and column placement to minimize short-term construction traffic impacts and long-term impacts on utilities and other roadway features.

16.2.7.3 Based on effort above, prepare preliminary track plan and profile drawings on 22" x 34" sheets at a scale of 1" = 40' showing baseline information. Detailed trackwork alignment including spiral curve and special trackwork layouts will be part of Subtask 16.06.

16.2.8 Roadway, Parking Lot, and Traffic Design

16.2.8.1 Roadway: For the Design Build segment, prepare preliminary roadway construction drawings on 22" x 34" sheets at a scale of 1" = 40'.

16.2.8.2 Ramp connections to Pearl Highlands Park-and-Ride: Coordinate with HDOT and prepare alignment plan and profile drawings on 22" x 34" sheets at a scale of 1" = 40'.

16.2.8.3 Parking Lot: Prepare conceptual layout plans and civil design for four transit centers and seven park-and-ride lots.

16.2.8.4 Traffic Analysis: Obtain traffic counts and prepare traffic impact analysis. Determine number and length of turn bays. Evaluate impacts to bicycle, parking, loading zone, and bus stop facilities.

16.2.8.5 Traffic Design:

Prepare preliminary lane configuration plans on 22" x 34" sheets at a scale of 1" = 40'. The preliminary engineering level of detail will be developed for the First Project segments. For non-First Project segments (including the Airport alignment), the engineering effort will be limited to that required to support the EIS.

16.2.8.6 Prepare additional roadway construction details for DB portion of Segment B/C

16.2.9 Storm Water Management and Drainage Design

16.2.9.1 Coordinate with CITY and State agencies to determine storm water management design criteria.

16.2.9.2 Prepare preliminary drainage layouts on 22" x 34" sheets at a scale of 1" = 40'. The plans will indicate collection, conveyance, and treatment facilities.

16.2.9.3 Prepare drainage details for DB portion of Segment B/C

16.2.10 Right-of-Way Acquisition Support

16.2.10.1 Provide RTD with support for coordination of survey, environmental, and right-of-way work.

16.2.10.2 Prepare right-of-way maps on 22" x 34" sheets at a scale of 1" = 40' as follows:

16.2.10.2.1. Compute and show the geometric relationship of the alignment to section lines and other subordinate property lines

16.2.10.2.2. Calculate right-of-way lines based on the integration of right-of-way requirements into existing property lines along the corridor

16.2.10.3 Prepare parcel sketches as follows:

16.2.10.3.1. Calculate areas for each parcel and parent tract

16.2.10.3.2. Show relevant improvements from topographic survey

16.2.10.3.3. Include field review of parcel sketch by surveyor

16.2.10.4 Prepare parcel data sheets as follows:

16.2.10.4.1. Include owner's name, address, and the tax folio number of the parcel

16.2.10.4.2. Include areas of the parcel and parent tract

16.2.10.4.3. Include legal description of the parcel

16.2.10.4.4. Include review of ownerships and parties of interest as determined by review of title search, by right-of-way engineer/surveyor

16.2.10.5 Prepare detailed parcel maps for those properties that need to be acquired, including permanent temporary easements, in the DB portion of Segment B/C.

16.2.10.6 Submit GIS files containing right-of-way information outlined in Subtasks 10.2 through 10.5 in a format conforming to RTD standards for GIS data, suitable for integration within the current system.

16.2.11 Preliminary Specifications

16.2.11.1 Prepare standard specifications for civil and non-system electrical/communication sections.

16.2.11.2 Prepare a standard spec book for the Project.

16.2.11.3 Prepare complete civil specifications for DB portion of Segment B/C.

16.2.12 Reports and Calculations

16.2.12.1 Prepare Utilities Report

16.2.12.2 Prepare Geotechnical Report

16.2.12.3 Prepare Hydrological Report

16.2.12.4 Prepare Hazmat Report

16.2.12.5 Prepare ROW Acquisition Report

16.2.12.6 Sustainable Design Report: Prepare a report documenting efforts in the development of concepts and selection of materials and systems that support a sustainable approach to civil design.

16.2.12.7 Prepare Traffic Impact Analysis Report

- 16.2.12.8 Civil Quantity for Input to Cost Estimates: Prepare draft quantity estimates for utilities, traffic signals, drainage, and roadway construction. Prepare updated quantity estimates after draft design plans have been prepared and incorporate it in the Final EIS cost estimates (Task 3.0).
- 16.2.13 Traffic Mitigation during Construction: Roadway, Safety, Vehicles, and Pedestrians
- 16.2.13.1 Prepare traffic analysis and coordinate with CITY and State transportation agencies to determine public convenience and safety requirements such as allowance for lane closure. Determine other lane closure requirements, such as need during overhead guideway construction.
- 16.2.13.2 Provide assistance in obtaining noise variances for the DB portion of Segment B/C.
- 16.2.13.3 Develop construction phasing concepts and assist in preparing construction schedules.
- 16.2.13.4 Prepare construction traffic detour phasing concepts and identify temporary and permanent reconstruction costs, such as temporary pavements, relocation of utilities, and reconstruction of sidewalks. Describe any right-of-way implications. The preliminary engineering level of detail will be developed for the First Project segments. For non-First Project segments (including the Airport alignment), the engineering effort will be limited to that required to support the EIS.
- 16.2.13.5 Evaluate temporary construction impacts to vehicular and pedestrian access to businesses and residences.
- 16.2.13.6 Prepare draft detailed maintenance of traffic plans for DB portion of Segment B/C.
- 16.2.14 Final Design for Phase I Utility Relocations: Prepare construction documents or utility task orders and assist the RTD during the bidding phase to procure a construction contractor.
- 16.2.15 Prepare conceptual and PE designs for grading, roadway access, drainage, and onsite and off-side utilities for the Maintenance and Storage Facility.

ASSUMPTIONS:

- The issues raised during the stakeholder coordination effort in Task 6.0 are assumed to be resolved within four months of NTP.
- The technology selection process is completed upon completion of the Draft EIS comment period.
- Preliminary Engineering will be performed for one M&SF site.

SCHEDULE:

- Start: Immediately upon NTP.
- Finish: January, 2010.

DELIVERABLES:

1. Draft EIS Alignment Plans and Profiles, Typical Sections, and Right-of-Way Needs Map
2. Draft and Final Design Criteria Report (Civil Section)
3. Draft and Final CADD Standards (Civil)
4. Draft and Final Standard Details
5. Draft and Final Water, Sewer, Petroleum, and Gas Utility Relocation Plans
6. Draft and Final Electrical/Communication Plans
7. Draft and Final Street Lighting Plans
8. Traffic Signal Modification Concepts and Traffic Signal Plans for D-B segment
9. Draft and Final Title Sheet, Index Drawing, General Notes
10. Alignment Plans and Profiles for Draft and Final EIS

11. Draft and Final PE Plan and Track Plan and Profile Drawings
12. Draft and Final Roadway Construction Plans for D-B segment
13. Pearl Highlands Ramp Connection Plans and Profiles
14. Draft and Final Conceptual Layouts for Park-and-Ride Lots and Transit Centers
15. Draft and Final Lane Configuration Plans
16. Draft and Final Drainage Layouts
17. Draft and Final Right-of-Way Plans
18. Draft and Final Construction Phasing Plans
19. Draft and Final Standard Specifications (Civil Sections)
20. Draft and Final Utilities Report
21. Draft and Final Geotechnical Data Report
22. Foundation Report
23. Draft and Final Hydrological Report
24. Draft and Final Hazmat Report
25. Draft and Final ROW Acquisition Report
26. Draft and Final Sustainable Design Report
27. Draft and Final Traffic Impact Analysis Report
28. 60% Design, 90% Design, and Final Utility Relocation Plans for Initial Design/Build Segment
29. Draft and Final Clearing, Grubbing, and Erosion Control Plans (M&SF)
30. Draft and Final Grading and Drainage Plans (M&SF)
31. Draft and Final Site Layout Plans (M&SF)

16.3 Structural Engineering Design

SCOPE:

ENGINEERING SUPPORT FOR THE DRAFT EIS (SUBTASKS 16.3.1 THROUGH 16.3.3):

The structural scope for initial structures development is in support of Draft EIS for the entire 29-mile LPA. The CONSULTANT will provide conceptual design structural drawings for up to five technologies under consideration, to a level that describes the basic structural configurations for each technology.

16.3.1 Structural Design Guidelines

The structural design guidelines will consist of the technical aspects of the Project necessary to compare the impact vehicle technology has on the design and construction of the Project works. The purpose of the guidelines is to develop the vehicle loads and structural performance criteria such that they are applied equally to all vehicle technologies.

Starting in October 2007, the new AASHTO, LRFD specification becomes federally mandated. During this phase, the CONSULTANT will evaluate the impacts this new code may have on the development and application of the new Project Design Criteria.

16.3.2 Guideways and Stations Structures

16.3.2.1 Provide conceptual level guideway configurations for the five technologies under consideration.

16.3.2.2 Reports

A Structural Report summarizing the structure types associated with the five different types of vehicle technology.

16.3.3 Structural Engineering Support for DEIS and Refinement of Alignments

Based on continued development of the alignment, generic station configurations and locations, and maintenance facility configuration, continue to develop the guideway, stations and ancillary facilities to a

level to support the DEIS process. Determine pier and column locations, station touch down points, and other items to assist in the determination of impacts and refinement of costs.

PRELIMINARY ENGINEERING PHASE

16.3.4 Structural Design Criteria

The structural design criteria will be developed such that, when taken in conjunction with the performance and technical specifications, will provide sufficient guidance to complete the final design of the structures. These criteria will include the following topics:

- Design codes, manuals, and regulations
- Required structural analysis techniques and verification
- Aerial guideways and bridges
- Segmental girders
- Precast and spliced girders
- Cast-in-place girders
- Corrosion protection of girders, joints, and piers
- Sound barriers and miscellaneous attachments
- Piers and abutments
- Embankments, retaining walls, and MSE walls
- At-grade guideways and track alignment structures
- Seismic and wind design of aerial guideways and bridges
- Station structures, including aerial and at-grade stations
- Station canopies
- Maintenance, yard, operations, parking, and other buildings
- Foundations and associated geotechnical requirements

16.3.5 Guideway Superstructure Study

At a minimum, three guideway superstructure girder configurations will be investigated:

- Lowest cost girder with sound barriers
- Least visually bulky practical solution
- Most practical balance between visual solution and lowest cost

Up to three scale models (foam core or equivalent) will be provided in support of the superstructure study.

16.3.6 Preliminary Engineering Design

Preliminary Engineering is for the total 20 miles, and structural support of the Final EIS is for the 29-mile LPA.

16.3.6.1 Guideways and Track Alignment Structures

The scope of work for preliminary engineering assumes the technology to be third rail and light rail vehicles. The typical aerial guideway section will be developed based on the recommendations developed for the *Guideway Superstructure Study*. The typical guideway is assumed to be erected using span-by-span construction. The average span anticipated may be approximately 110 feet and its maximum span may be approximately 150 feet. It is also anticipated that there will be a number of crossings of major streets, highways, stream beds, etc. that exceed the span capability of the typical aerial guideway. A guideway capable of accommodating these conditions to approximately a 200-foot span will also be developed.

At the guideway's crossing of the H-1 Freeway, Nimitz Highway, and their numerous interchange ramps, a special structure type may be developed with spans in excess 200 feet. A preliminary layout and associated construction techniques will be developed at this location.

Details will also be provided wherever the alignment requires the use of outrigger bents, "C" bents, or straddle bents. Two types of abutments will also be included.

16.3.6.2 Stations

Aerial stations are anticipated to be 180-foot (based on travel demand modeling) long side platform stations with the aerial guideways passing through the centerline of the station. The stations types are as described in scope section 16.1.4. Structural support for the guideway, platforms, canopies, stairs, escalators, elevators, and ancillary spaces will be developed in conjunction with the Architectural Design.

16.3.6.3 Ancillary Facilities including Yards and Shops

Preliminary Engineering for the following ancillary facilities will include:

- Park-and-ride structures and canopies
- Transit center structures and canopies
- Car parking structure(s) as determined in the project plan
- Yard facilities:
- Maintenance and Shop buildings
- Non-revenue vehicle maintenance facility
- Operation control center (OCC)

16.3.6.4 Specifications

Provide Structural and Geotechnical Performance Specifications and Technical Specifications, including Post-Tension Systems, Erection, and Grouting.

16.3.6.5 Reports and Calculations

Calculation requirements are included where applicable under the above headings. In addition, the following reports will be developed:

- Structural Report
- Input to the Sustainability Report

16.3.6.6 Project Reviews:

PROVIDE BRIEFING TO THE RTD UPON THE REPORTS DEVELOPED IN SUBTASK 16.3.6.5

ASSUMPTIONS:

- Engineering for conceptual design for the technologies under consideration will be to the level to support the DEIS.
- The CONSULTANT will consider one technology into preliminary engineering.

DELIVERABLES:

- Structural Guidelines for Vehicle Technology Selection
- Guideway Drawings, Calculations, and Quantities for Vehicle Technology Selection Process
- Station Drawings, Calculations, and Quantities for Vehicle Technology Selection Process
- Yard, Shop, and Ancillary Drawings, Calculations, and Quantities for Vehicle Technology Selection Process
- Drawings, Calculations, and Quantities for Refined Alignment Studies and the Support of the Draft EIS
- Drawings, Calculations, and Quantities for Vehicle Technology Selection Process
- Structural Design Criteria based on LRFD
- Drawings, Calculations, Quantities, and up to Three Scale Models for Guideway Superstructure Study
- Preliminary Engineering Structural Plans, Calculations, and Quantities for:

- Guideways and Track Alignment Structures
 - Stations
 - Ancillary Facilities, including Yards and Shops
- Structural and Geotechnical Performance Specifications and Technical Specifications
 - Reports and Calculations (calculations as provided above)
 - Structural Report
 - Input to Sustainability Report

16.4 Mechanical Engineering Design

APPROACH:

The CONSULTANT's initial mechanical engineering design task will be the production and compilation of Design Criteria governing all aspects of the design work. Additionally the mechanical system space and functional requirements will be developed for each of the Project's facilities.

SCOPE:

16.4.1 Mechanical Design Criteria

16.4.1.1 HVAC

16.4.1.1.1. Develop design conditions for outside

16.4.1.1.2. Develop design conditions for inside spaces

16.4.1.1.3. Perform preliminary assessment of HVAC system requirements

16.4.1.1.4. Prepare preliminary HVAC Criteria Document

16.4.1.1.5. Update HVAC Criteria Document as information develops

16.4.1.1.6. Issue Final HVAC Criteria Document for this phase

16.4.1.2 Plumbing

16.4.1.2.1. Develop building space requirements

16.4.1.2.2. Perform preliminary assessment of plumbing system requirements

16.4.1.2.3. Prepare preliminary Plumbing Criteria Document

16.4.1.2.4. Update Plumbing Criteria Document as information develops

16.4.1.2.5. Issue Final Plumbing Criteria Document for this phase

16.4.1.3 Fire Protection

16.4.1.3.1. Review NFPA 130 standard and local codes for guideway system fire protection requirements

16.4.1.3.2. Review other national standards and local codes for non-guideway facilities (such as the maintenance facility, especially the paint booth)

16.4.1.3.3. Perform preliminary assessment fire protection system requirements

- 16.4.1.3.4. *Prepare a report and presentation for the appropriate Authority Having Jurisdiction (AHJ)*
- 16.4.1.3.5. *After concurrence is obtained, provide input to Fire/Life Safety Criteria*
- 16.4.1.3.6. *Update Fire/Life Safety Criteria as information develops*
- 16.4.2 Stations, Parking Facilities, and Transit Centers
 - 16.4.2.1 HVAC
 - 16.4.2.1.1. *Perform preliminary load analysis for each structure type*
 - 16.4.2.1.2. *Develop an airflow and control diagram for each structure type*
 - 16.4.2.1.3. *Perform preliminary system selection and sizing for each structure type*
 - 16.4.2.2 Plumbing
 - 16.4.2.2.1. *Perform a preliminary water and waste assessment for each structure*
 - 16.4.2.2.2. *Develop a plumbing schematic diagram for each structure*
 - 16.4.2.2.3. *Provide information to Utilities for utility connection identification*
 - 16.4.2.3 Fire Protection
 - 16.4.2.3.1. *Identify fire protection requirements for each structure type*
 - 16.4.2.3.2. *Prepare a document showing this information*
- 16.4.3 Ancillary Facilities, including Yards and Shops: Work Effort Included in Task 20.0.
- 16.4.4 Preliminary Specifications
- 16.4.5 Reports and Calculations
 - 16.4.5.1 Mechanical Report
 - 16.4.5.2 Input to Facility Programs – Space and Functional Requirements (Subtask 16.1)
 - 16.4.5.3 Input to Sustainable Design Report (Subtask 16.2.12.6).
 - 16.4.5.4 Input to Safety Report (Subtask 17.08).

ASSUMPTIONS:

- HVAC and Plumbing Criteria will be comprehensive for the Project, including all facilities. Loading requirements will be solicited from other disciplines as necessary.
- Fire Protection Criteria will be incorporated into Fire/Life Safety Criteria. Requirements will be solicited from other disciplines as necessary, particularly for clean agent or double-interlocked sprinkler systems.
- The Mechanical Report will include recommended system types. Necessary concurrence will be able to be obtained before report is issued.
- Plumbing points of connection for building services will be identified as a nominal distance outside the building or structure line for guideway and station facilities. This is sufficient for design/build. Further detail design can be done for conventional design during the next phase.
- Specifications, although called preliminary, will be developed to a very complete level in order to support the design/build contracts, particularly the yard and shop.
- Stations, parking structures, and ancillary facilities are based on 10 prototype facilities.
- Platform screen doors are not included.

SCHEDULE:

- Start: Immediately upon NTP.
- Finish: January, 2010.

16.5 Electrical Engineering Design

APPROACH:

The CONSULTANT's initial electrical engineering design task will be the production and compilation of Design Criteria for facilities requirements. Additionally the electrical system space and functional requirements will be developed for each of the Project's facilities. Traction power analysis is covered in Task 17.0.

SCOPE:

16.5.1 Electrical Design Criteria

16.5.1.1 Power Supply

16.5.1.1.1. Define supply service voltages and level of redundancy for service, including uninterruptible power supply (UPS)

16.5.1.1.2. Prepare preliminary Power Supply Criteria document

16.5.1.1.3. Update Power Supply Criteria document

16.5.1.1.4. Issue Final Power Supply Criteria document for this phase

16.5.1.2 Facilities Electrical

16.5.1.2.1. Prepare low voltage distribution service plan for stations and ancillary facilities

16.5.1.2.2. Perform lighting study and develop criteria for street walkway and other wayside lighting issues resulting from the construction of the project

16.5.1.2.3. Develop guidelines for redundant electrical supply for stations, train control, and traction power facilities

16.5.1.2.4. Prepare preliminary Facilities Electrical Criteria document

16.5.1.2.5. Update Facilities Electrical Criteria document

16.5.1.2.6. Issue Final Facilities Electrical Criteria document for this phase

16.5.1.3 Fire and Intrusion Alarm

16.5.1.3.1. Review NFPA 130 standard and local codes for guideway system fire alarm requirements

16.5.1.3.2. Review other national standards and local codes for non-guideway facilities (such as the maintenance facility, especially the paint booth)

16.5.1.3.3. Perform preliminary assessment fire alarm system requirements

- 16.5.1.3.4. *Prepare a report and presentation for the appropriate AHJ*
- 16.5.1.3.5. *After concurrence is obtained, provide input to Fire/Life Safety Criteria*
- 16.5.1.3.6. *Update Fire/Life Safety Criteria as information develops*
- 16.5.1.3.7. *Prepare preliminary Fire Alarm Criteria document*
- 16.5.1.3.8. *Update Fire Alarm Criteria document*
- 16.5.1.3.9. *Issue Final Fire Alarm Criteria document for this phase*
- 16.5.2 Traction Power Work Effort included in Task 17.0
- 16.5.3 Track Alignment Facilities
 - 16.5.3.1 Perform preliminary load analysis
 - 16.5.3.2 Prepare single line diagrams for power and lighting
- 16.5.4 Stations, Parking Facilities, and Transit Centers
 - 16.5.4.1 Power Supply
 - 16.5.4.1.1. *Receive loading and redundancy requirements from Traction Power*
 - 16.5.4.1.2. *Perform preliminary load analysis*
 - 16.5.4.1.3. *Prepare single-line diagrams*
 - 16.5.4.2 Facilities Electrical
 - 16.5.4.2.1. *Perform preliminary load analysis for each structure type*
 - 16.5.4.2.2. *Develop a single-line diagram for each structure type*
 - 16.5.4.3 Fire Alarm
 - 16.5.4.3.1. *Develop project-wide fire and intrusion alarm schematic*
 - 16.5.4.3.2. *Develop fire and intrusion alarm schematic for yard and shops*
- 16.5.5 Ancillary Facilities including Yards and Shops: Work Effort included in Task 20.0.
- 16.5.6 Preliminary Specifications
- 16.5.7 Reports and Calculations
 - 16.5.7.1 Electrical Report
 - 16.5.7.2 Input to Facility Programs-Space and Functional Requirements (Subtask 16.1)
 - 16.5.7.3 Input to Sustainable Design Report (Subtask 16.2.12.6)
 - 16.5.7.4 Input to Safety Report (Subtask 17.08)

ASSUMPTIONS:

- Power Supply and Facility Electrical Criteria will be comprehensive for the Project, including all facilities. Loading requirements will be solicited from other disciplines as necessary.
- Fire Alarm Criteria will be comprehensive for the Project, including all facilities. If it is determined that Yard and Shops can have a separate system, that element may be separated into that facility.
- All traction power work is included in Task 17.0. The loading requirements will be used for design of the substation connection points.

- Utility connections and bulk power supply will be worked out between Traction Power and Utilities. It is assumed that Utilities will bring power to the designated connection points on the project. This task will handle the switching and interconnection to meet utility feed redundancy requirements. It is further assumed that the system should be designed to operate with one utility feed out of service.
- The Electrical Report will include recommended system types. Necessary concurrence will be able to be obtained before report is issued.
- UPS will be provided to those facilities that are essential for safe operations and cannot withstand momentary power outages and maintain operational integrity.
- Specifications, although called preliminary, will be developed to a very complete level in order to support the design/build contracts, particularly the yard and shop.
- Stations, parking structures, etc., are based on prototype structures defined in Subtask 16.1.

SCHEDULE:

- Start: Immediately upon NTP.
- Finish: January 2010.

16.6 Trackwork Design

APPROACH:

The CONSULTANT's initial trackwork design task will be the production and compilation of Design Criteria to support the finalization of the guideway design. This will closely follow the development of the guideway plan and profiles under Subtask 16.2.7 –Track Alignment Design – Plan and Profile. Significant effort will include design associated with the development of the yard storage and shop tracks for the storage facility and maintenance base.

SCOPE:

16.6.1 Trackwork Design Criteria

16.6.1.1 Main line track

16.6.1.1.1. Review preliminary Design Criteria

16.6.1.1.2. Review applicable criteria such as AREMA or from other agencies

16.6.1.1.3. Review new technologies for adoption to the Project

16.6.1.1.4. Update and issue final criteria

16.6.1.2 Maintenance facility tracks

16.6.1.2.1. Review and update the conceptual layout

16.6.1.2.2. Coordinate with the operation plan

16.6.1.2.3. Update the conceptual layout

16.6.1.2.4. Update and issue final criteria

16.6.2 Track and Track Support Designs – Main Line

16.6.2.1 Coordinate with civil designs during development of the track plan and profiles

16.6.2.2 Identify the types of track support for mainline tracks

16.6.2.2.1. Ballasted tracks

- 16.6.2.2.2. *Embedded and non-ballasted tracks*
- 16.6.2.2.3. *Direct fixation tracks*
- 16.6.2.2.4. *Other special fixation types*
- 16.6.2.3 Coordinate with designers during development of the guideway structure
- 16.6.2.4 Evaluate and recommend track support
 - 16.6.2.4.1. *Track slab /plinths on aerial guideway structures*
 - 16.6.2.4.2. *Invert design in subsurface structures*
- 16.6.2.5 Assist in the evaluation of noise and vibration (N&V) mitigation criteria
- 16.6.2.6 Assist in identifying areas in the trackway requiring N&V evaluation
- 16.6.2.7 Provide required input for the evaluation of N&V in the aerial guideway or at-grade trackway
 - 16.6.2.7.1. *N&V in ballasted tracks*
 - 16.6.2.7.2. *N&V in embedded and non-ballasted tracks*
 - 16.6.2.7.3. *N&V in direct fixation tracks*
 - 16.6.2.7.4. *N&V in other special fixation types*
- 16.6.2.8 Coordinate with systems designers for the electrical isolation and grounding requirements
- 16.6.2.9 Coordinate with systems designers for the location of the special trackwork requirements, such as track switch machines and power boxes
- 16.6.2.10 Prepare track report
- 16.6.3 Track and Track Support Designs – Storage Facility and Maintenance Base
 - 16.6.3.1 Assist in the evaluation and finalization of the location and configuration of the maintenance base
 - 16.6.3.2 Coordinate with maintenance base facilities designers for the development of the shop and storage track plan and profiles
 - 16.6.3.3 Identify the types of track support for storage facility and maintenance base
 - 16.6.3.3.1. *Ballasted tracks*
 - 16.6.3.3.2. *Embedded and non-ballasted tracks*
 - 16.6.3.3.3. *Direct fixation tracks*
 - 16.6.3.3.4. *Other special fixation types*
 - 16.6.3.4 Coordinate with systems designers for the electrical isolation and grounding requirements
 - 16.6.3.5 Prepare track report for the storage facility and maintenance base
 - 16.6.3.6 Prepare standard and directive drawings for track types and fasteners
- 16.6.4 Crossovers, Turnouts, and Other Special Trackwork

- 16.6.4.1 Assist civil designers in locating and identifying the type of special trackwork in various types of track as identified for mainline tracks and at the maintenance base
 - 16.6.4.1.1. *Single crossovers*
 - 16.6.4.1.2. *Double (scissors) crossover*
 - 16.6.4.1.3. *Half grand /grand unions*
 - 16.6.4.1.4. *Turnout numbers*
 - 16.6.4.1.5. *Non-standard types*
- 16.6.4.2 Develop preliminary design layout of special trackwork units
- 16.6.4.3 Prepare special trackwork report
- 16.6.4.4 Prepare standard and directive drawings for crossovers, turnouts, and special trackwork
- 16.6.5 Preliminary Specifications
 - 16.6.5.1 Running rail
 - 16.6.5.1.1. *Standard carbon rail*
 - 16.6.5.1.2. *Special rails*
 - 16.6.5.2 Track construction
 - 16.6.5.2.1. *Ballasted tracks*
 - 16.6.5.2.2. *Embedded and non-ballasted tracks*
 - 16.6.5.2.3. *Direct fixation tracks*
 - 16.6.5.2.4. *Other special fixation types*
 - 16.6.5.3 Track fixation
 - 16.6.5.3.1. *Tie and ballast with spring clip*
 - 16.6.5.3.2. *Embedment and non-ballast*
 - 16.6.5.3.3. *Direct fixation fasteners*
 - 16.6.5.3.4. *Other Special fixation types*
 - 16.6.5.4 Special trackwork
 - 16.6.5.4.1. *Single crossovers*
 - 16.6.5.4.2. *Double (scissors) crossover*
 - 16.6.5.4.3. *Half grand /grand unions*
 - 16.6.5.4.4. *Turnout numbers*
 - 16.6.5.4.5. *Non-standard types*

ASSUMPTIONS:

- This task was developed based on a rail technology.

SCHEDULE:

- Start: Immediately upon NTP.
- Finish: January, 2010.

DELIVERABLES:

1. Trackwork Design Criteria
2. Yard trackwork layout
3. Prepare trackwork design report
4. Prepare trackwork design report for yard and shop facility
5. Prepare standard and directive drawings for track types and fasteners
6. Prepare special trackwork report
7. Prepare standard and directive drawings for special trackwork
8. Prepare preliminary specifications

16.7 Constructability Assurance of PE Design

APPROACH:

Constructability reviews will occur during all aspects of the architectural and engineering design work. Key to these reviews will be the optimization of contract units and construction sequencing, examining utility relocations, searching for right-of-way issues, defining required construction easements, and the cost and schedule implications of all aspects of the Project's design.

SCOPE:

16.7.1 Method and Approach

16.7.1.1 Prepare Guideline for Constructability Review through PE design, the development of DB documents, and utility relocation final design that details the method and approach for the review

16.7.1.2 Prepare Draft Guidelines for Constructability Review through Final Design, providing proposed schedule for the reviews and the general method and approach for the review

16.7.2 Laydown Areas

16.7.2.1 Working with the Segment Designers, develop required construction laydown and staging area requirements for the constructors

16.7.2.2 Identify potential sites for construction laydown areas

16.7.2.3 Prepare Summary Report for Construction Laydown Requirements and Identify Proposed Sites

16.7.3 Preliminary Works

16.7.3.1 Review the proposed transit corridor with the Segment Designers to identify work that should be advanced to reduce cost and schedule impacts to the Project

16.7.3.2 Prepare Summary Report for Preliminary Work Recommended

16.7.4 Temporary Works

16.7.4.1 Identify temporary construction or work sequencing necessary to mitigate environmental or right-of-way impacts that have significant impact to the construction schedule and budget

16.7.4.2 Prepare Summary Report for the temporary works identified

16.7.5 Permanent Works

- 16.7.5.1 Working with the Designers, develop preliminary construction approach, materials, and method options for construction
- 16.7.5.2 Develop preliminary construction sequencing strategy for construction
- 16.7.5.3 Identify non-typical site conditions that would impact construction
- 16.7.5.4 Prepare Preliminary Construction Strategy Report
- 16.7.5.5 Perform detailed constructability review of the DB and utility relocation technical and contractual documents in accordance with guidelines established in Subtask 1.1
- 16.7.5.6 Prepare Constructability Review Report summarizing the recommended changes to the technical and contract documents from Subtask 5.5
- 16.7.6 Staffing
 - 16.7.6.1 From Task 5.0, develop construction contractor manpower requirement for each segment
 - 16.7.6.2 Prepare Construction Staffing Report
- 16.7.7 Labor/Skill Sets
 - 16.7.7.1 From Task 6.0, identify the manpower requirements by labor trade. Identify supervisory manpower requirements
 - 16.7.7.2 Analyze local labor pool capacity to support Project construction
 - 16.7.7.3 Prepare Labor/Skill Report
- 16.7.8 Special Equipment
 - 16.7.8.1 Identify special equipment needed and lead times to acquire
 - 16.7.8.2 Prepare Labor/Skill Report
- 16.7.9 Sequencing
 - 16.7.9.1 From the findings of the Tasks above, review the preliminary Final Design and Construction Schedule for optimization of contract units and construction sequencing
 - 16.7.9.2 Prepare Draft Report for Project Sequencing of Final Design and Construction

ASSUMPTIONS:

- Work products denoted as "Draft" will require updating during final design.
- Constructability review of design-build and utility relocation contract packages is included in this work effort (Subtasks 5.5 and 5.6).

SCHEDULE:

- Start: November, 2007.
- Finish: January, 2010.

DELIVERABLES:

1. Prepare Guideline for Constructability Review through PE design, the development of Design-Build documents, and utility relocation final design, detailing the method and approach for the review
2. Prepare Draft Guidelines for Constructability Review through Final Design, providing proposed schedule for the reviews and the general method and approach for the review
3. Prepare Summary Report for Construction Laydown Requirements and Identify Proposed Sites
4. Prepare Summary Report for the Temporary Works identified
5. Prepare Preliminary Construction Strategy Report
6. Prepare Constructability Review Report summarizing the recommended changes to the technical and contract documents from Subtask 5.5
7. Prepare Construction Staffing Report

8. Prepare Labor/Skill Report
9. Prepare Draft Report for Project Sequencing of Final Design and Construction

16.8 Labor Availability Study

Scope items pursuant to Subtask 16.8 are included in Subtask 16.7 above.

16.9 Elevators and Escalators

APPROACH:

Based upon the criteria developed in Subtask 16.1 Architecture, elevators and escalators will be included in the designs for stations and facilities of the proposed systems. The CONSULTANT will define the design approach for this equipment and develop preliminary specifications.

SCOPE:

- 16.9.1 Review regulatory requirements for elevators and escalators, including the ADA, state, and municipal codes
- 16.9.2 Working with the architectural team, prepare a listing by facility describing the type and rise for the elevators and escalators proposed for the system
- 16.9.3 Prepare design and operational requirements, including, but not limited to, the following:
 - 16.9.3.1 Ambient environmental conditions impacting the operation and maintainability of the equipment
 - 16.9.3.2 Capacity requirements based upon projected patronage
 - 16.9.3.3 Equipment security, including the evaluation of remote monitoring capabilities
 - 16.9.3.4 Operations and maintenance philosophy for input into the operations plan staffing studies
 - 16.9.3.5 Reliability requirements for the equipment
 - 16.9.3.6 Minimum requirements for equipment finish work and controls
- 16.9.4 Prepare specification for the elevator and escalator equipment
- 16.9.5 Prepare standard plans and directive drawing for equipment hoistways, escalator truss, and associated machine rooms

ASSUMPTIONS:

- Elevators will be required at each station, but escalators will be used selectively based upon architectural criteria.

SCHEDULE:

- Start: January, 2008.
- Finish: December, 2008.

DELIVERABLES:

1. Regulatory compliance report
2. Elevator and escalator type/size and location matrix
3. Design and operations requirements report
4. Specifications for elevators and escalators (to be included in the RTD standard specifications)
5. Standard plans and directive drawings

17.0 Transit Systems and Sub-Systems Design Criteria and Designs

APPROACH:

The purpose of this task is to develop definition information and apply this information to the design approach for fixed guideway transit subsystems. The CONSULTANT will develop sets of Preliminary Engineering (PE) level performance/procurement specifications and drawings that define each subsystem and resolve the interface requirements between the civil, facilities, and systems designs. During the design process, the CONSULTANT will assess alternative options and configurations and provide interim reports addressing trade-offs among the alternatives considered. Documents will be developed to establish the functional requirements for the system components, including rail transit vehicles, fare collection, traction power, train control, communications (Voice and Data Radio System, Fiber Optic Cable System, Central Control and SCADA System, and Passenger Information and Monitoring System) and other system-wide elements to meet the operational goals of the project.

SCOPE:

17.1 Revenue Vehicle

17.1.1 Develop overview of project approach:

- Determine system performance and capacity requirements
- Consider life cycle costs

17.1.2 Develop system interface requirements:

- Identify vehicle system/equipment interfaces with other system elements, such as train control, track or guideway, traction power etc.
- Identify input/output requirements at interfaces
- Consider EMC interference
- Determine interface requirements that meet the system performance requirements and provide a safe system

17.1.3 Define vehicle clearance dynamic outline:

- Vehicle dynamic outline will be determined taking into consideration the track or guideway geometry and vehicle loading and vehicle suspension failure conditions

17.1.4 Determine fleet size:

- Task to be accomplished in parallel with Task 13.0 "Operability Input to Design"

17.1.5 Develop design criteria:

- Identify vehicle performance requirements
- Consider track or guideway geometry, slope, elevation, curvature
- Consider system operation requirements
- Determine braking and acceleration requirements
- Identify fire/life safety requirements using NFPA 130 and fire/life safety criteria
- Develop vehicle design criteria to provide basis for developing the design requirements for the procurement documentation

17.1.6 Prepare aesthetic design report:

- Identify options for vehicle exterior and interior designs that will provide unique color schemes and brands (logos) for the new vehicle
- Prepare presentation materials for review
- Prepare final interior and exterior themes for the vehicle

17.1.7 Prepare performance specifications:

- Specifications to be based on elements of speed, capacity, throughput, and other items as identified in the design criteria

17.1.8 Define Americans with Disabilities Act (ADA) requirements:

- Review FTA's Accessibility Handbook for transit facilities
- Review 28 CFR Part 36, ADA Standard for Accessible Design
- Review 49 CFR Part 37, Transportation Services for Individuals with Disabilities
- Implement the transportation and related provisions of Titles II and III of the ADA as applicable for the vehicle and in conjunction with station designs for a full integrated system

17.1.9 Determine fire/life/safety criteria for vehicle:

- Review all applicable NFPA codes and standards, including NFPA 130 requirements applicable to vehicle
- Review Fire Code of the CITY
- Develop vehicle fire/life/safety criteria, including all applicable fire codes and standards
- Coordinate with the F/LS committee

17.1.10 Develop reliability, availability, and maintainability criteria:

- Assign top-level reliability/availability quantitative goals for vehicle
- Breakdown quantitative reliability/availability goals to lower level where they can be part of design goals
- Determine reliability and maintainability analyses to be performed
- Determine qualitative and quantitative maintainability requirements
- Develop and include reliability, availability and maintainability requirements in the criteria

17.1.11 Perform preliminary engineering:

- Establish the basis for final preparation of contract documents and criteria

17.1.12 Prepare procurement specifications:

- In concert with the performance specifications, provide the technical specifications for contract documents

17.1.13 Prepare implementation schedule:

- Perform in concert with other project elements and overall project timetable to ensure planned project completion

17.1.14 Develop preliminary and final cost estimates:

- Consider cost to support project variables, including escalation due to isolation from the mainland as well as contingency

17.1.15 Provide input to facility space programs and function:

- Perform in conjunction with design criteria and performance specifications

17.1.16 Prepare final engineering report and calculations:

- During all phases of project, format engineering report and calculations into a final report

17.2 Train Control

17.2.1 Develop overview of project approach:

- Determine system performance and capacity requirements
- Consider life cycle costs
- Train control system will support the selected vehicle operation, provide a safe system, and meet system performance requirements

17.2.2 Determine system interfaces:

- Identify train control system/equipment interfaces with other system elements, such as vehicle, track, traction Power etc.
- Identify input/output requirements at interfaces
- Consider EMC interference
- Determine train control interface requirements that affect train control and other systems interfaced by the train control system to provide a safe system providing the desired system performance

17.2.3 Incorporate vehicle clearance dynamic outline:

- Train control system design will consider vehicle dynamic outline determined by considering track geometry and vehicle suspension failure conditions

17.2.4 Determine system size:

- To be determined by performance and operating requirements

17.2.5 Prepare design criteria:

- Identify train control system performance requirements
- Consider track or guideway geometry, slope, elevation, and curvature
- Consider system operation requirements
- Identify fire/life safety requirements using NFPA 130 and fire/life safety criteria

17.2.6 Develop train control system design criteria to provide basis for developing the design requirements for the procurement documentation. Develop performance specifications:

- To be based on elements of speed, capacity, throughput, and other items as identified in the design criteria

17.2.7 Determine fire/life/safety criteria:

- Review all applicable NFPA codes and standards applicable to train control system
- Review Fire Code of the CITY
- Develop train control system fire/life/safety criteria, including all applicable fire codes and standards

17.2.8 Develop reliability, availability, and maintainability criteria:

- Assign top level reliability/availability quantitative goals for train control system
- Break down quantitative reliability/availability goals to lower level where they can be part of design goals
- Determine reliability and maintainability analyses to be performed
- Determine qualitative and quantitative maintainability requirements
- Develop and include reliability, availability and maintainability requirements in the criteria

17.2.9 Perform preliminary engineering:

- Establish the basis for final preparation of contract documents and criteria

17.2.10 Prepare procurement specifications:

- In concert with the performance specifications, provide technical specifications for contract documents

17.2.11 Prepare implementation schedule:

- Perform in concert with other project elements and overall project timetable to ensure planned project completion

17.2.12 Develop preliminary and final cost estimates:

- Consider cost to support project variables, including escalation due to isolation from the mainland as well as contingency

17.2.13 Provide input to facility space programs and function:

- Provide space requirements for train control equipment at station and wayside (trackside)
- Provide power requirements to the station design
- Provide conduit and cable requirements to facilities design team

17.2.14 Prepare final engineering report and calculations:

- During all phases of project, format notes and calculations into a final report

17.3 Traction Power

17.3.1 Develop overview of project approach:

- Determine system performance and capacity requirements
- Consider life cycle costs
- Identify property requirements
- Identify utility supply circuits
- Provide a traction power supply system to meet the operating requirements of the selected vehicle and provide for a safe system

17.3.2 Determine system interfaces:

- Identify traction power system /equipment interfaces with other system elements such as vehicle, train control, SCADA, etc.
- Identify input/output requirements at interfaces
- Consider EMC interference
- Determine interface requirements that meet system performance requirements and provide a safe system

17.3.3 Incorporate vehicle clearance dynamic outline:

- Traction power system design will consider vehicle dynamic outline determined by considering track geometry and vehicle suspension failure conditions

17.3.4 Determine system size:

- To be determined by performance and operating requirements

17.3.5 Prepare design criteria:

- Identify traction power system performance requirements
- Consider track geometry, slope, elevation, and curvature
- Consider system operation requirements
- Determine braking and acceleration requirements
- Identify fire/life safety requirements using NFPA 130 and fire/life safety criteria
- Develop traction power system design criteria to provide basis for developing the design requirements for the procurement documentation

17.3.6 Develop performance specifications:

- To be based on elements of speed, capacity, throughput, and other items as identified in the design criteria

17.3.7 Determine fire/life/safety criteria:

- Review all applicable NFPA codes and standards, including NFPA 130 requirements applicable to traction power system
- Review Fire Code of the CITY
- Develop traction power system fire/life/safety criteria, including all applicable fire codes and standards

17.3.8 Develop reliability, availability, and maintainability criteria:

- Assign top level reliability/availability quantitative goals for traction power system
- Break down quantitative reliability/availability goals to lower level where they can be part of design goals
- Determine reliability and maintainability analyses to be performed
- Determine qualitative and quantitative maintainability requirements
- Develop and include reliability, availability, and maintainability requirements in the criteria

17.3.9 Perform preliminary engineering:

- Establish the basis for final preparation of contract documents and criteria

17.3.10 Prepare procurement specifications:

- In concert with performance specifications, provide the technical specifications for the contract documents

17.3.11 Prepare implementation schedule:

- Perform in concert with other project elements and overall project timetable to ensure planned project completion

17.3.12 Develop preliminary and final cost estimates:

- Consider cost to support project variables, including escalation due to isolation from the mainland as well as contingency

17.3.13 Provide input to facility space programs and function:

- Perform in conjunction with the design criteria and performance specifications

17.3.14 Prepare final engineering report and calculations:

- During all phases of project, format notes and calculations into a final report

17.4 Traction Power Distribution (third rail assumed)

17.4.1 Develop overview of project approach:

- Determine system performance and capacity requirements
- Consider life cycle costs
- Provide a distribution system to supply the selected vehicle, support the project goals in terms of aesthetics and other elements, and be compatible with affected civil structures

17.4.2 Determine system interfaces:

- Identify traction power distribution system/equipment interfaces with other system elements such as vehicle, track, traction power supply, etc.
- Identify input/output requirements at interfaces

- Determine interface requirements that meet the system performance requirements and provide a safe system
- 17.4.3 Incorporate vehicle clearance dynamic outline:
- Traction power distribution system design will consider vehicle dynamic outline determined by considering track geometry and vehicle suspension failure conditions
- 17.4.4 Determine system size:
- To be determined by performance and operating requirements
- 17.4.5 Prepare design criteria:
- Identify traction power distribution system performance requirements from the system operating plan
 - Consider track geometry, slope, elevation, and curvature
 - Identify fire/life safety requirements using NFPA 130 and fire/life safety criteria
 - Develop traction power distribution system design criteria to provide basis for developing the design requirements for the procurement documentation
- 17.4.6 Develop performance specifications:
- To be based on elements of speed, capacity, throughput, and other items as identified in the design criteria
- 17.4.7 Determine fire/life/safety criteria:
- Review all applicable NFPA codes and standards applicable to a traction power distribution system
 - Review Fire Code of the CITY
 - Develop traction power distribution system fire/life/safety criteria, including all applicable fire codes and standards
- 17.4.8 Develop reliability, availability, and maintainability criteria:
- Assign top level reliability/availability quantitative goals for traction power distribution system
 - Break down quantitative reliability/availability goals to lower level where they can be part of design goals
 - Determine reliability and maintainability analyses to be performed
 - Determine qualitative and quantitative maintainability requirements
 - Develop and include reliability, availability, and maintainability requirements in the criteria
- 17.4.9 Perform preliminary engineering:
- Establish the basis for final preparation of contract documents and criteria
- 17.4.10 Prepare procurement specifications:
- In concert with the performance specifications, provide the technical specifications for contract documents
- 17.4.11 Prepare implementation schedule:
- Perform in concert with other project elements and overall project timetable to ensure planned project completion
- 17.4.12 Develop preliminary and final cost estimates:
- Consider cost to support project variables, including escalation due to isolation from the mainland as well as contingency

17.4.13 Provide input to facility space programs and function:

- Perform in conjunction with the design criteria and performance specifications

17.4.14 Provide rate negotiation support:

- Based upon power utilization calculations and simulations, determine average and peak load requirements
- Provide technical support for the rate negotiation for the operating system

17.4.15 Prepare final engineering report and calculations”

- During all phases of project, format notes and calculations into a final report

17.5 Communications System

17.5.1 Develop overview of project approach:

- Determine system performance and capacity requirements
- Consider life cycle costs

17.5.2 Determine system interfaces:

- Identify communications system/equipment interfaces with other system elements such as train control, SCADA, traction power etc.
- Identify input/output requirements at the interfaces
- Consider EMC interference
- Determine interface requirements that meet the system performance requirements and provide a safe system

17.5.3 Determine system size:

- To be determined by operational and safety requirements

17.5.4 Prepare design criteria:

- Identify communications system performance requirements from the system operating plan
- Consider system operation requirements
- Identify fire/life safety requirements using NFPA 130 and fire/life safety criteria
- Develop communications system design criteria to provide basis for developing the design requirements for the procurement documentation

17.5.5 Develop performance specifications:

- To be based on elements of the operations plan, user devices, and other items as identified in the design criteria

17.5.6 Define Americans with Disabilities Act (ADA) requirements:

- Review FTA's Accessibility Handbook for transit facilities
- Review 28 CFR Part 36, ADA Standard for Accessible Design
- Review 49 CFR Part 37, Transportation Services for Individuals with Disabilities
- Implement the transportation and related provisions of Titles II and III of ADA as applicable for the communications system and in conjunction with station designs for a full integrated system

17.5.7 Determine fire/life/safety criteria:

- Review all applicable NFPA codes and standards, including NFPA 130 requirements applicable to communications system
- Review Fire Code of the CITY
- Develop communications system fire/life/safety criteria, including all applicable fire codes and standards

17.5.8 Develop reliability, availability, and maintainability criteria:

- Assign top level reliability/availability quantitative goals for communications system
- Break down quantitative reliability/availability goals to lower level where they can be part of design goals
- Determine reliability and maintainability analyses to be performed
- Determine qualitative and quantitative maintainability requirements
- Develop and include reliability, availability, and maintainability requirements in the criteria

17.5.9 Perform preliminary engineering:

- Establish the basis for final preparation of contract documents and criteria

17.5.10 Prepare procurement specifications:

- In concert with the performance specifications, provide technical specifications for contract documents

17.5.11 Prepare implementation schedule:

- Perform in concert with other project elements and overall project timetable to ensure planned project completion

17.5.12 Develop preliminary and final cost estimates:

- Consider cost to support project variables, including escalation due to isolation from the mainland as well as contingency

17.5.13 Provide input to facility space programs and function:

- Perform in conjunction with the design criteria and performance specifications

17.5.14 Prepare final engineering report and calculations:

- During all phases of project, format notes and calculations into a final report

17.6 Central Control

17.6.1 Develop overview of project approach:

- Determine system performance and capacity requirements
- Consider life cycle costs

17.6.2 Determine system interfaces:

- Identify central control system/equipment interfaces with other system elements such as vehicle, train control, traction power, SCADA, communication system, etc.
- Identify input/output requirements at interfaces
- Consider EMC interference
- Determine central control interface requirements that affect the central control and other systems interfaced by the central control system to provide a safe system providing the desired system performance

17.6.3 Determine system size:

- To be determined by operations planning, performance and infrastructure requirements, and the degree of support for other system elements being monitored and controlled by central control

17.6.4 Prepare design criteria:

- Identify central control system performance requirements

- Consider system operation requirements
 - Identify fire/life safety requirements using NFPA 130 and fire/life safety criteria
 - Develop central control design criteria to provide basis for developing the design requirements for procurement documentation
- 17.6.5 Develop performance specifications:
- To be based on elements of communications system, operations plan, and other items as identified in the design criteria
- 17.6.6 Define Americans with Disabilities Act (ADA) requirements:
- Review FTA's Accessibility Handbook for transit facilities
 - Review 28 CFR Part 36, ADA Standard for Accessible Design
 - Review 49 CFR Part 37, Transportation Services for Individuals with Disabilities
 - Implement the transportation and related provisions of Titles II and III of the ADA as applicable to central control
- 17.6.7 Determine fire/life/safety criteria:
- Review all applicable NFPA codes and standards, including NFPA 130 requirements applicable to central control
 - Review Fire Code of the CITY
 - Develop central control fire/life/safety criteria, including all applicable fire codes and standards
- 17.6.8 Develop reliability, availability, and maintainability criteria:
- Assign top level reliability/availability quantitative goals for central control systems/equipment
 - Break down quantitative reliability/availability goals to lower level where they can be part of design goals
 - Determine reliability and maintainability analyses to be performed
 - Determine qualitative and quantitative maintainability requirements
 - Develop and include reliability, availability, and maintainability requirements in the criteria
- 17.6.9 Perform preliminary engineering:
- Establish the basis for final preparation of contract documents and criteria
- 17.6.10 Prepare procurement specifications:
- In concert with the performance specifications, provide the technical specifications for contract documents
- 17.6.11 Prepare implementation schedule:
- Perform in concert with other project elements and overall project timetable to ensure planned project completion
- 17.6.12 Develop preliminary and final cost estimates:
- Consider cost to support project variables, including escalation due to isolation from the mainland as well as contingency
- 17.6.13 Provide input to facility space programs and function:
- Perform in conjunction with the design criteria and performance specifications
- 17.6.14 Prepare final engineering report and calculations:
- During all phases of project, format notes and calculations into a final report

17.7 Supervisory Control and Data Acquisition

17.7.1 Develop overview of project approach:

- This communications median between the control center and all field devices will be developed in concert with the control center and the design of user nodes
- Determine system performance and capacity requirements
- Consider life cycle costs

17.7.2 Determine system interfaces:

- Identify SCADA system/equipment interfaces with other system elements such as train control, communications system, traction power, etc.
- Identify input/output requirements at interfaces
- Consider EMC interference
- Determine interface requirements that meet the system performance requirements and provide a safe system

17.7.3 Determine system size:

- To be determined by performance and the requirements of the design of all user elements

17.7.4 Prepare design criteria:

- Identify SCADA system performance requirements
- Consider system operation requirements
- Consider system monitoring requirements
- Identify fire/life safety requirements using NFPA 130 and fire/life safety criteria
- Develop SCADA system design criteria to provide basis for developing the design requirements for the procurement documentation

17.7.5 Develop performance specifications:

- To be based on elements of the communications system and other items as identified in the design criteria

17.7.6 Determine fire/life/safety criteria:

- Review all applicable NFPA codes and standards, including NFPA 130 requirements applicable to SCADA system
- Review Fire Code of the CITY
- Develop SCADA system fire/life/safety criteria, including all applicable fire codes and standards

17.7.7 Develop reliability, availability, and maintainability criteria:

- Assign top level reliability/availability quantitative goals for SCADA system
- Break down quantitative reliability/availability goals to lower level where they can be part of design goals
- Determine reliability and maintainability analyses to be performed
- Determine qualitative and quantitative maintainability requirements
- Develop and include reliability, availability, and maintainability requirements in the criteria

17.7.8 Perform preliminary engineering:

- Establish the basis for final preparation of contract documents and criteria

17.7.9 Prepare procurement specifications:

- In concert with the performance specifications, provide the technical specifications for contract documents

17.7.10 Prepare implementation schedule:

- Perform in concert with other project elements and overall project timetable to ensure planned project completion

17.7.11 Develop preliminary and final cost estimates:

- Consider cost to support project variables, including escalation due to isolation from the mainland as well as contingency

17.7.12 Provide input to facility space programs and function:

- Perform in conjunction with the design criteria and performance specifications

17.7.13 Prepare final engineering report and calculations:

- During all phases of project, format notes and calculations into a final report.

17.8 Trackwork

17.8.1 Develop overview of project approach:

- Develop a track system to provide the best median for the selected vehicle, integrate into the civil structure, and provide sufficient conductivity for traction power and train control systems
- Determine system performance and capacity requirements
- Consider life cycle costs

17.8.2 Determine system interfaces:

- Identify track system/equipment interfaces with other system elements, such as train control, vehicle, traction power etc.
- Identify input/output requirements at interfaces
- Determine interface requirements that meet system performance requirements and provide a safe system

17.8.3 Define vehicle clearance dynamic outline:

- Track system design will consider vehicle dynamic outline determined by considering the track geometry and vehicle suspension failure conditions

17.8.4 Determine system size:

- To be determined by performance and infrastructure requirements

17.8.5 Prepare design criteria:

- Identify track system performance requirements
- Consider track geometry, slope, elevation, and curvature
- Consider system operation requirements
- Identify fire/life safety requirements using NFPA 130 and fire/life safety criteria
- Develop trackwork design criteria to provide basis for developing the design requirements for the procurement documentation

17.8.6 Develop performance specifications:

- To be based on elements of speed, capacity, throughput, and other items as identified in the design criteria

17.8.7 Develop reliability, availability, and maintainability criteria:

- Assign top level reliability/availability goals for trackwork system
- Break down reliability/availability goals to lower level where they can be part of design goals
- Determine reliability and maintainability analyses to be performed

- Determine qualitative and quantitative maintainability requirements
- Develop and include reliability, availability, and maintainability requirements in the criteria

17.8.8 Perform preliminary engineering:

- Establish the basis for final preparation of contract documents and criteria

17.8.9 Prepare procurement specifications:

- In concert with the performance specifications, provide technical specifications for contract documents

17.8.10 Prepare implementation schedule:

- Perform in concert with other project elements and overall project timetable to ensure planned project completion

17.8.11 Develop preliminary and final cost estimates:

- Consider cost to support project variables, including escalation due to isolation from the mainland as well as contingency

17.8.12 Provide input to facility space programs and function:

- Perform in conjunction with the design criteria and performance specifications

17.8.13 Prepare final engineering report and calculations:

- During all phases of project, format notes and calculations into a final report

17.9 Fare Vending

17.9.1 Develop overview of project approach:

- Design system to meet project's fare collection philosophy, accept defined monetary medians, and meet requirements for collection of monetary funds and system data
- Determine system performance and capacity requirements
- Consider life cycle costs

17.9.2 Determine system interfaces:

- Identify fare vending system/equipment interfaces with other system elements such as stations, SCADA, communications system, etc.
- Identify input/output requirements at interfaces
- Determine fare vending system/equipment interface requirements that affect the fare vending system/equipment and other systems interfaced by the fare vending system/equipment to provide a safe and reliable system providing the desired system performance

17.9.3 Determine system size:

- Determine by the number of stations and other required dispensing areas and anticipated customer loads

17.9.4 Prepare design criteria:

- Identify fare vending system/equipment performance requirements
- Consider system operation requirements
- Identify fire/life safety requirements using NFPA 130 and fire/life safety criteria
- Develop fare vending system/equipment design criteria to provide basis for developing the design requirements for the procurement documentation

17.9.5 Develop performance specifications:

- Use elements of operations and other plans and design criteria as a basis
- 17.9.6 Define Americans with Disabilities Act (ADA) requirements:
- Review FTA's Accessibility Handbook for transit facilities
 - Review 28 CFR Part 36, ADA Standard for Accessible Design
 - Review 49 CFR Part 37, Transportation Services for Individuals with Disabilities
 - Implement the transportation and related provisions of Titles II and III of the ADA as applicable for the fare vending system/equipment and in conjunction with station designs for a full integrated system
- 17.9.7 Determine fire/life/safety criteria:
- Review all applicable NFPA codes and standards applicable to fare vending system/equipment
 - Review Fire Code of the CITY
 - Develop fare vending system/equipment fire/life/safety criteria, including all applicable fire/life safety codes and standards
- 17.9.8 Develop reliability, availability, and maintainability criteria:
- Assign top level reliability/availability quantitative goals for fare vending system/equipment
 - Break down quantitative reliability/availability goals to lower level where they can be part of design goals
 - Determine reliability and maintainability analyses to be performed
 - Determine qualitative and quantitative maintainability requirements
 - Develop and include reliability, availability, and maintainability requirements in the criteria
- 17.9.9 Perform preliminary engineering:
- Establish the basis for final preparation of contract documents and criteria
- 17.9.10 Prepare procurement specifications:
- In concert with the performance specifications, provide the technical specifications for contract documents
- 17.9.11 Prepare implementation schedule:
- Perform in concert with other project elements and overall project timetable to ensure planned project completion
- 17.9.12 Develop preliminary and final cost estimates:
- Consider cost to support project variables, including escalation due to isolation from the mainland as well as contingency
- 17.9.13 Provide input to facility space programs and function:
- Perform in conjunction with the design criteria and performance specifications
- 17.9.14 Prepare final engineering report and calculations:
- During all phases of project, format notes and calculations into a final report.
- 17.10 Passenger Information System
- 17.10.1 Develop overview of project approach:
- Meet operational requirements in concert with the communications design and comply with ADA
 - Determine system performance and capacity requirements

- Consider life cycle costs
- 17.10.2 Determine system interfaces:
- Identify passenger information system/equipment interfaces with other system elements such as stations, SCADA, communications system, etc.
 - Identify input/output requirements at interfaces
 - Determine passenger information system/equipment interface requirements that affect the passenger information system/equipment and other systems interfaced by the passenger information system/equipment to provide a safe system providing the desired system performance
- 17.10.3 Determine system size:
- Determine by the number of stations and other passenger areas, as well as what type of systems are required
- 17.10.4 Prepare design criteria:
- Identify passenger information system/equipment performance requirements
 - Consider system operation requirements
 - Identify fire/life safety requirements using NFPA 130 and fire/life safety criteria
 - Develop passenger information system/equipment design criteria to provide basis for developing the design requirements for the procurement documentation
- 17.10.5 Develop performance specifications:
- Use elements of passenger information system and design criteria as a basis
- 17.10.6 Define Americans with Disabilities Act (ADA) requirements:
- Review FTA's Accessibility Handbook for transit facilities
 - Review 28 CFR Part 36, ADA Standard for Accessible Design
 - Review 49 CFR Part 37, Transportation Services for Individuals with Disabilities
 - Implement the transportation and related provisions of Titles II and III of the ADA as applicable for the passenger information system/equipment and in conjunction with station designs for a full integrated system
- 17.10.7 Determine fire/life/safety criteria:
- Review all applicable NFPA codes and standards, including NFPA 130 requirements applicable to passenger information system
 - Review Fire Code of the CITY
 - Develop passenger information system fire/life/safety criteria, including all applicable fire/life safety codes and standards
- 17.10.8 Develop reliability, availability, and maintainability criteria:
- Assign top level reliability/availability quantitative goals for passenger information system
 - Break down quantitative reliability/availability goals to lower level where they can be part of design goals
 - Determine reliability and maintainability analyses to be performed
 - Determine qualitative and quantitative maintainability requirements
 - Develop and include reliability, availability, and maintainability requirements in the criteria
- 17.10.9 Perform preliminary engineering:
- Establish the basis for final preparation of contract documents and criteria
- 17.10.10 Prepare procurement specifications:

- In concert with the performance specifications, provide technical specifications for contract documents
- 17.10.11 Prepare implementation schedule:
- Perform in concert with other project elements and overall project timetable to ensure planned project completion
- 17.10.12 Develop preliminary and final cost estimates:
- Consider cost to support project variables, including escalation due to isolation from the mainland as well as contingency
- 17.10.13 Provide input to facility space programs and function:
- Perform in conjunction with the design criteria and performance specifications
- 17.10.14 Prepare final engineering report and calculations:
- During all phases of project, format notes and calculations into a final report
- 17.11 Passenger and Security Monitoring System
- 17.11.1 Develop overview of project approach:
- Develop to support the operations and safety and security plan
 - Determine system performance and capacity requirements
 - Consider life cycle costs
- 17.11.2 Determine system interfaces:
- Identify passenger monitoring system/equipment interfaces with other system elements such as stations, SCADA, communications system, etc.
 - Identify input/output requirements at interfaces
 - Determine interface requirements that meet the system performance requirements and provide a safe system
- 17.12 Yard and Shop Equipment (Refer to Task 20.0)
- 17.13 Non-Revenue Rail Vehicles
- 17.14 Fire Life Safety Equipment
- 17.14.1 Develop overview of project approach:
- Work with fire/life/safety committee and applicable codes and regulations to prepare a report describing the types of fire life safety equipment to be used throughout the system
- 17.14.2 Determine system interfaces:
- Prepare interface report that describes interfaces between the proposed control and monitoring systems
- 17.14.3 Vehicle Dynamic Envelope: N/A
- 17.14.4 Determine system size:
- Determine the type and number of equipment needed
- 17.14.5 Prepare design criteria:
- Develop criteria for the functionality and minimum operational requirements for each type of equipment
 - Prepare staging acquisition plan for the equipment and recommended spare parts
- 17.14.6 Develop performance specifications:

- For each type of equipment, prepare performance specifications
- 17.14.7 Define Americans with Disabilities Act (ADA) Requirements:
- Research federal, state, and local codes for ADA requirements for maintenance equipment and conform criteria to meet these requirements, if applicable.
- 17.14.8 Determine fire/life/safety criteria:
- Working with the fire/life/safety committee, review the type and performance of the proposed equipment
- 17.14.9 Develop reliability, availability, and maintainability criteria:
- Develop reliability, availability, and maintainability criteria for the fire/life/safety equipment
- 17.14.10 Perform preliminary engineering:
- Establish the basis for final preparation of contract documents and criteria
 - Technical specifications for the contract documents.
- 17.14.11 Prepare procurement specifications:
- In concert with the performance specifications, provide technical specifications for contract documents
- 17.14.12 Prepare implementation schedule:
- Perform in concert with other project elements and overall project timetable to ensure planned project completion
- 17.14.13 Develop preliminary and final cost estimates:
- Consider cost to support project variables, including escalation due to isolation from the mainland as well as contingency
- 17.14.14 Provide input to facility space programs and function:
- Perform in conjunction with the design criteria and performance specifications
- 17.14.15 Prepare final engineering report and calculations:
- During all phases of project, format notes and calculations into a final report

DELIVERABLES:

1. Technical memorandum of project approach
2. System interface memorandum
3. Design criteria
4. Preliminary engineering design
5. Preliminary cost estimate
6. Performance specifications
7. Procurement documentation
8. Implementation schedule
9. Final cost estimate
10. Systems report and calculations documentation

18.0 Transit Sub-Systems

This Task is deliberately blank -- scope items pursuant to Transit Sub-Systems are contained in Task 17.0 above.

19.0 Vehicle Technology and DB Contractor Selection Process

APPROACH:

The RTD intends to use a competitive procurement to select the vehicle technology and, in parallel with the technology selection, initiate a design-build (DB) procurement process for Phase 1 construction. However, the CONSULTANT will support the RTD in an alternative selection process, if requested.

SCOPE:

19.1 Solicit interest from prospective proposers for DB contracts for Line Section and Maintenance Facility in accordance with HRS Chapter 103D (the Procurement Code).

19.1.1 Prepare requests for Letters of Interest (LOI) from the DB industry, providing general description of the proposed project, the anticipated selection process, the commitment required by the interested parties, and tentative schedule

19.1.2 Support the RTD in the solicitation of DB industry

19.1.3 Respond to inquiries of potential DB teams

19.2 Solicit interest from prospective proposers for technology in accordance with the Procurement Code.

19.2.1 Prepare requests for LOI from technology suppliers, providing general description of the project, the anticipated selection process, the commitment required by the interested parties, and tentative schedule

19.2.2 Support the RTD in the solicitation of interested suppliers

19.2.3 Respond to inquiries of potential suppliers

19.3 Receive LOIs

19.3.1 Confirm LOI of DB and technology suppliers and establish roster of firms to participate in the procurement process

19.4 Prepare Draft Step 1 First Step Procurement Documents for DB and technology, including, but not limited to, the following:

19.4.1 Vehicle Engineering: Conform detailed performance specification for the technology developed in Subtask 18.1 into Procurement Document, including questionnaires to determine the following for each proposed technology:

19.4.1.1 Systems Engineering – System interface requirements

19.4.1.2 Structural Engineering – Structural loading, including structural configuration requirements unique to a specific technology

19.4.1.3 Operational – minimum operational performance and capacity requirements

19.4.1.4 Environmental requirements, including noise and vibration

19.4.1.5 Experience, technical, and financial capabilities

19.4.2 Develop general scope of the DB segments, including the AA/DEIS level plan and profile of the alignment, yard and shop configurations, and operational requirements

19.4.2.1 Prepare questionnaire to establish DB team experience, technical expertise, and financial capabilities to perform the contract

19.4.3 Work with the CITY purchasing office to develop the draft contractual documents, both general and special conditions

19.4.4 Prepare Draft Step 1 Procurement Documents for DB contracts

19.4.5 Prepare Draft Step 1 Procurement Documents Technology Selection

19.4.6 Issue Draft Procurement Documents to interested proposers for comment

19.5 Support the RTD in DB/Technology Workshop, including the following:

- 19.5.1 Prepare the agenda
- 19.5.2 Prepare presentations describing the work scope, process, and schedule
- 19.5.3 Keep minutes of the meeting, including questions and responses
- 19.5.4 Provide responses to written request for clarification
- 19.5.5 Document all clarification requests, written or oral, and provide to interested proposers
- 19.5.6 Incorporate any changes to the Procurement Documents based upon the industry review, into final for Step 1
- 19.6 Step 1 proposals
 - 19.6.1 Assist the RTD in the development of evaluation criteria for the DB to determine which DB teams will advance to the next step
 - 19.6.1.1 Establish criteria for technical and financial capabilities of the teams to perform
 - 19.6.1.2 Establish scoring methodology
 - 19.6.2 Assist the RTD in the development of evaluation criteria for the technology supplier to determine which suppliers will advance to the next step
 - 19.6.2.1 Prepare criteria-scoring matrix for conformance to the performance requirements of the Procurement Documents
 - 19.6.2.2 Prepare scoring methodology to evaluate new or emerging technologies in relationship to proven (operating) technologies
 - 19.6.2.3 Assist the RTD in establishing the threshold for advancing to the next step
 - 19.6.3 Issue final Procurement Documents for Step 1 DB and technology for formal proposals by interested proposers
- 19.7 Announce roster of qualified DB teams and technology suppliers for advancement to Step 2
 - 19.7.1 Support the RTD in the proposal evaluations
 - 19.7.2 Document the scoring process
 - 19.7.3 Assist in post-selection interviews
 - 19.7.4 Assist the RTD in formal presentations of the finding of the evaluation process
- 19.8 Step 2 Procurement Documents for Technology Selection
 - 19.8.1 Update Performance Specification based upon the Step 2 roster of suppliers and include technical requirements necessary to obtain competitive price proposals (developed in Subtask 18.1).
 - 19.8.2 Develop pricing schedule for both capital and operation costs to be included in the RFP for determination of life-cycle costs.
 - 19.8.3 Update contractual documents for price proposal Procurement Documents, including: detail capital cost for the vehicle and any special infrastructure or systems required by a technology; and operating costs for the life of the technology, including normal subsystem(s) replacement and routine maintenance and projected energy costs.
 - 19.8.4 Issue Step 2 Procurement Documents for firm price proposals to Step 2 roster of suppliers
- 19.9 Finalize Station Facility Program – Space and Functional Requirements – Work effort included in Task 16.0
- 19.10 Finalize Design Guidelines – Work effort included in Task 16.0
- 19.11 Finalize Utility Design – Work effort included in Task 16.0
- 19.12 Step 2 Proposals
 - 19.12.1 Assist the RTD in responding to requests for information or proposed terms and conditions amendments from the proposers

- 19.12.2 Assist the RTD in the evaluation of the proposals, including the methodology to determine the life-cycle cost for each proposal
- 19.12.3 Perform Risk Assessment for the proposed technologies to compare relative risk and determine risk contingency for each proposal
- 19.13 Selection of Technology Supplier
 - 19.13.1 Assist the RTD in determining responsiveness of the proposals to the Procurement Documents
 - 19.13.2 Assist the RTD in applying the evaluation criteria and calculating the life-cycle costs for each proposal, including the following:
 - 19.13.2.1 Capital investment specific to each technology
 - 19.13.2.2 Lifecycle operating and maintenance cost
 - 19.13.3 Prepare procurement documentation for final selection
 - 19.13.4 Assist the RTD with post-award interviews
- 19.14 Convene Workshop for Selected Technology Supplier and DB teams
 - 19.14.1 Prepare agenda
 - 19.14.2 Prepare and present technical presentations as to the infrastructure and systems design requirements relative to the selected technology
 - 19.14.3 Keep the minutes of the meeting, including questions and responses
 - 19.14.4 Provide responses to written requests for clarification
 - 19.14.5 Document all clarification requests, written or oral, and provide to interested proposers
- 19.15 Step 3 Procurement Documents for DB Contract Units
 - 19.15.1 Prepare technical documents for Procurement Documents – criteria, drawings, and specifications – Work effort included in Task 16.0
 - 19.15.2 Assist the RTD in preparing contractual documents for the Procurement Documents
 - 19.15.3 Update cost estimates for DB segments for evaluation of proposals
 - 19.15.4 Issue Procurement Documents to DB teams
- 19.16 Step 3 Proposals Due
 - 19.16.1 Assist the RTD in responding to requests for information or proposed terms and conditions amendments from the proposers
- 19.17 Selection of DB(s) Best Value
 - 19.17.1 Assist the RTD in determining responsiveness of the proposals to the Procurement Documents
 - 19.17.2 Assist the RTD in evaluating cost proposals
 - 19.17.3 Prepare procurement documentation for final selection
 - 19.17.4 Assist the RTD with post-award interviews
- 19.18 Issue Limited NTP for DB and Technology Design under Letter of No Prejudice LONP
 - 19.18.1 Assist the RTD in the negotiations of contracts
 - 19.18.2 Review contract submittals – Work effort included in Task 18.0
- 19.19 Anticipate Signing of Full Funding Grant Agreement FFGA
 - 19.19.1 Support the RTD in acquiring FFGA – Work effort included in Subtask 7.2

ASSUMPTIONS:

- Within Subtask 7.1, a detailed procurement strategy document for both the technology and DB procurements will be developed, including guidelines for the following:

- Solicitation process
 - Evaluation process
 - Document confidentiality
 - Role of the DB firms in the technology selection process
- Design-Build contracts will be developed for Segment B/C (Ewa/Waipuhu/Waiawa) and the Yards and Shops. Will use 2 Step contract process for award of DB contracts.
 - Design-bid-Build (DbB) contracting approach may be used for the Utility Relocation Construction contracts. The work effort for the drawings and specifications for relocation of the utilities is included in Task 16.0. This work may include preparation of contract bid documents for work not self performed by the affected utilities.
 - The CONSULTANT will support the RTD in developing the Procurement Documents for the DB and technology procurements.
 - A modified Two-Step Procurement process will be used for the Technology/Vehicle Selection. Step 1 will be based upon Technical Proposals in response to a Performance Specification developed by the CONSULTANT. Step 2 will solicit cost proposals from the qualified supplier of Step 1. The CONSULTANT will develop life-cycle cost for each proposal based upon a predetermined methodology.
 - The assumption is that the procurement process for both the DB and Technology Selection will not be challenged by any proposers, and the CITY procurement policy supports the intended procurement method. If such challenges are received, the CONSULTANT will support the RTD.

SCHEDULE:

- Start: Immediately upon NTP.
- Finish: January, 2010.

DELIVERABLES:

1. Letters to prospective proposers for DB contracts
2. Letters to prospective proposers for technology
3. Draft Procurement Documents for DB and technology
4. Evaluation criteria for DB and technology selection process
5. Life-cycle cost methodology for technology selection
6. Life-cycle cost analysis for technology of each supplier
7. Summary report for technology selection
8. Contract documents for Procurement Documents for DB contracts
9. Summary report for DB selection

20.0 Maintenance and Storage Facilities

APPROACH:

The Maintenance and Storage Facility will be designed to accommodate routine and heavy maintenance in accordance with the American Public Transportation Association APTA Standards for Revenue Vehicle Maintenance, industry best practice, and supplier recommendations. A Maintenance and Operation Plan for the Yard and Shop will define the requirements for the facilities. This plan will include an evaluation of local and off-island capability to competitively outsource repairs to determine the minimum in-house repair capabilities.

For Phase 1 the CONSULTANT will initially consider all potential technologies for conceptual design. Conceptual-level yard layouts and Operations and Maintenance (O&M) plans will be developed for planning purposes, as well as the technology selection process. It is anticipated that up to five different technologies will be studied in the conceptual design phase. In addition, the CONSULTANT shall perform

a study of the two possible Yard and Shop locations, as identified in the AA, to determine the most cost-effective location based upon capital investments and on-going operating costs.

SCOPE:

20.1 O&M Plan for the Yard and Shop Facilities:

For Phase 1 of the project, the CONSULTANT will develop conceptual O&M Plans for the various technologies under consideration. The conceptual-level O&M Plans shall be at a level to distinguish differences among the technologies to provide relative capital and operating investment for input into the selection process. Upon completion of Phase 1, a final O&M Plan will be developed for the selected technology. The O&M Plan will consist of the following:

20.1.1 Shop Functions – The CONSULTANT will develop specific needs for the following functions:

- Running Repairs – Designed so that all necessary routine running repairs are accommodated.
- Service & Inspections – Sized and designed to handle all necessary inspections and repairs.
- Component Change Outs – To include a system of car hoists, body supports, and turntables for major components on the car for repair.
- Heavy Maintenance – To include a means of jacking cars using portable jacks and body supports for extended repairs.
- Support Shops – To include support facilities for Air Brake, Truck, Car Body/Welding, Electronics (limited), HVAC, and Electrical.
- Wheel Truing – Wheel truing capabilities will be located within the facility.
- Contract Maintenance – A study of on-island capabilities for contract maintenance will be undertaken to determine the acceptability of contract maintenance for revenue vehicle components. The study will also address the viability of off-island repairs, the resultant inventory requirements, and a first-level cost analysis to determine the cost benefit of in-house maintenance alternatives.
- Parts Storeroom – Will be sized.
- MOW Shops – Support shops, building maintenance, material storage, and larger exterior material laydown will be identified, and functional requirements will be defined.
- Transportation Areas – The Operations Control Center, administrative areas, and layover facilities areas will be identified.

20.1.2 Yard Functions – The CONSULTANT will develop specific needs for the following functions:

- Daily inspections will be developed per APTA Standards for Revenue Vehicle Maintenance.
- Vehicle washing – Located for optimum operational efficiency.
- Turnaround cleaning – Mid-run cleaning stations will be located.
- Daily Cleaning – Will be located.
- Detail Cleaning – Will be located.

20.2 Project Design Criteria: The CONSULTANT will provide Project Design Criteria that will be used by the selected final design.

20.3 Conceptual Design: Drawings will depict the entire yard facility, including track work, buildings, roadways, parking, etc. These documents will be reviewed by the RTD and will be the basis of Preliminary Design. For Phase 1, the CONSULTANT will provide conceptual yard and shop layouts for all technologies under consideration. The conceptual designs shall be at a level of effort to distinguish differences among the technologies to provide relative capital and operating investment for input into the selection process.

20.4 Cost Benefit Analysis for Yard and Shop Location: In parallel with Subtasks 20.01 and 20.03, and assuming Light Rail Transit (LRT) technology, a cost benefit analysis of the two proposed yard and shop sites will be performed to support the RTD in its selection of the ultimate site for design.

20.5 Preliminary Design: Final Preliminary Design will follow Phase1 Conceptual Design and will be specific to the selected technology. Refer to Task 16.0 (Architectural, Civil, Structural) and Task 17.0/18.0 (Systems) for deliverables specific to the Yard and Shop Facility.

20.6 Shop Facilities Specifications (Refer to Tasks 16.0 and 17.0)

20.7 Yard Facility Specifications (Refer to Task 16.0)

20.8 Schedule Development

A CPM schedule will be prepared with all milestones required from early start date to construction completion date.

20.9 Cost Development

Cost estimate will be provided in detail so that bids can be reviewed and compared to the engineer's estimate.

20.10 Bid Documents

A package of drawings, specifications, narratives, and design criteria will be developed as part of the design/build package that will be put out for bid.

ASSUMPTIONS:

- For preliminary design, steel wheel on steel rail technology selection is assumed.

SCHEDULE:

- Start: September, 2007.
- Finish: January, 2010.

DELIVERABLES:

1. Conceptual O&M Plan for both shop and yard functions for each technology under consideration
2. Final O&M Plan for the selected technology
3. Design criteria for shop and yard
4. Conceptual drawings for shops and yard for the technologies under consideration
5. Cost benefit analysis comparing the two potential Y&S facilities identified in the AA
6. Preliminary drawings for shops and yard
7. Specifications for shop, yard, and special equipment
8. Schedule
9. Cost estimate
10. Bid documents for design/build contract

All deliverables will be provided to the RTD in draft for comment. Comments and revisions will be incorporated into final form for acceptance by the RTD.

21.0 Public Involvement

APPROACH:

A Public Involvement Plan will be developed to create and maintain an on-going process for Project communication between the RTD, the CONSULTANT, key stakeholders, agency representatives, and the general public. The CONSULTANT will implement the Public Involvement Plan to inform the citizens of Oahu about the PE/EIS phase by providing meaningful information throughout the process, and to solicit and record the public's view on key issues. The overall Public Involvement Plan will be constructed by

the CONSULTANT to ensure compliance with federal NEPA and SAFETEA-LU regulations throughout the PE/EIS process.

SCOPE:

21.1 Implementation

The Public Involvement process for the PE/EIS phase is intended to build upon previous and existing public involvement activities. The CONSULTANT will develop a Public Involvement Plan to provide constructive guidance for the Public Involvement effort. This plan will be designed to complement the technical flow of work, while making every effort to inform key stakeholders, property owners, policy makers, and the general public, especially those along the proposed alignment.

Weekly coordination meetings will be held between the CONSULTANT and the RTD to foster continued communication throughout the study process.

The Public Involvement Plan will identify existing and new public groups interested in and affected by the project using a variety of methods and techniques. The overall implementation of the public involvement plan will focus on activities identified in the RFQ as noted below.

21.1.1 Implementation of Public Involvement Plan

21.1.2 Continued Focus on Environmental Issues

21.1.3 Preliminary Station Design

21.1.4 Art in Transit

21.1.5 Urban Design Guidelines

21.1.6 Landscape

21.2 Public Involvement Program Activities

The Public Involvement program activities developed by the RTD and the CONSULTANT for this phase of the Project are expected to continue, enhance, and add to the public involvement activities conducted during the Alternatives Analysis phase of the Project. The comprehensive Public Involvement program will provide the opportunity for public input through an on-going Advisory Committee, public information meetings, neighborhood/interest group briefings, and a formal public hearing. The Public Involvement Plan will include the following components at a minimum:

21.2.1 Participation in Community Events

The CONSULTANT will actively seek out community events in which to showcase the Project and solicit comment. It is expected that the CONSULTANT will participate in two (2) community events per week for the duration of the PE/EIS phase. The CONSULTANT will facilitate, prepare, coordinate, and participate in all aspects of these meetings. Staffing will be on an "as needed" basis. Comment cards will be available for attendees to voice concerns, issues, and comments regarding the Project. Where applicable and appropriate, public meeting materials (e.g., displays, fact sheets, and comment forms) will be presented for review and comment.

Community events could include organizational meetings, trade shows, professional conferences, or university seminars. The events selected for project participation will be those likely to have attendees capable and interested in commenting on the environmental issues, preliminary station design, art in transit, urban design guidelines, and landscape of the Project. Participation in these events will be focused on providing a mechanism for community input to these elements of the Project.

21.2.2 Facilitation of Project Public Involvement Meetings

The CONSULTANT will handle, if necessary, all aspects of event coordination, including selecting and securing a location compatible with community needs; conducting site-checks of proposed facilities and paying all rental fees if required; drafting and producing information materials, such as agendas, fact sheets, and programs; design, production, and dissemination of information and publicity materials prior

to each meeting, including postcards, newsletters, flyers, and media releases; conducting "reminder" telephone calls to encourage attendance; drafting and producing comment cards, sign-in sheets, and staff name tags; providing refreshments; set-up and clean-up of equipment and facilities; meeting follow-up, including preparing summary reports with specified action items and issues and appropriate responses, database maintenance, and correspondence; as well as all other event logistics.

The RTD will be provided with original printed and electronic copies of all informational materials/handouts, comment forms, attendance records, summary reports of all meetings complete with agendas, comments and statements by responsive members, specified action items and issues, and any required follow-up.

In addition to "regular" public involvement meetings, four (4) or five (5) design charrettes will be completed for a representative sampling of the 20 proposed station areas as part of station area land use planning (Task 11.0). An additional series of up to 40 working sessions (up to two for each station) will be held to refine architectural designs and reflect local input (Subtask 16.1). In cases where two stations reflect similar design concepts, they may be covered in common working sessions.

21.2.3 Coordinating and Managing the Public Meeting(s) Serving as the EIS Public Hearing

The public outreach and involvement plan will proactively engage the public in the planning process in compliance with all NEPA and HRS Chapter 343 requirements. Documentation of all public involvement efforts and the community's response will be prepared at every step in the process. The public involvement team will assist in ensuring that all those who participate in the process have the opportunity to review and comment on the Draft EIS.

The CONSULTANT will host three (3) open-house style public hearings in the project area. The public hearing will be advertised at least 15 days prior to the hearing and after the Draft EIS has been placed in public locations for review. The CONSULTANT will prepare a handout describing the Project and the purpose of the hearing. Several copies of the proposed action will be displayed. Environmental, planning, and engineering staff will be available to answer questions. The CONSULTANT shall conduct one informational open house and Draft EIS Public Hearing in a format coordinated with the RTD. Up to 3 public involvement, 2 project management, and 5 technical staff members from the CONSULTANT team shall attend the hearing. A court reporter will be available to take formal testimony and prepare a hearing transcript. Comment sheets will be provided for written comments that also will become part of the hearing record. A voice recorder will also be provided for those attendees who wish to orally record their comments away from the larger audience. These comments will be documented by a written summary and become part of the hearing record.

The CONSULTANT will develop, produce, and provide sign-in sheets, 200-500 copies of black and white fact sheets depending on meeting type and size summarizing the project and the EIS process, and 200-500 depending on meeting type and size comment sheets. Meeting attendees will be able to have their contact information added to the project mailing list.

This task also includes the important process of responding to comments on the Draft EIS. The number of comments submitted is expected to be large, and the CONSULTANT is recommending that a Web-based data tracking program called PB CommentSense be utilized for this task. This database would catalog comments by letter number, comment number, commenter, and subject, and would facilitate the arrangement of comments by common theme and assigning responsibility among the CONSULTANT team for responding. The CONSULTANT has implemented this type of database and found it to be extremely effective and efficient for this purpose. The development of this database will occur during the 45-day public review period on the Draft EIS, and populating the database with all of the comment letters is expected to take about one week following completion of the review period.

21.2.4 Producing Graphics in Support of the Public Involvement Program

Graphics will be developed and provided for public involvement activities separate from necessary planning and engineering drawings. Graphics will include, but are not limited to, those necessary for

newsletters, sign-in sheets, website, media and/or community involvement presentations, and the public hearing.

Boards that display relevant and important information will be produced, which include, but are not limited to, the following:

- Community event boards (2 per event)
- Boards for charrettes (20 boards for each charrette/workshop)
- Public hearing displays (40 total)
- Community involvement/meeting boards (2 per month)

For cost considerations, the CONSULTANT will prepare 30 project visualizations presenting existing vs. proposed views of the project area.

21.2.5 Developing and Producing Presentations and Managing Presentation/Meeting Schedule (i.e., "Speakers Bureau")

The CONSULTANT will continue to participate in Speakers Bureau meetings, as well as participate in additional meetings throughout the project area during the progression of the Project. This will include preparation and execution of presentation materials. The CONSULTANT will participate in a maximum of four (4) meetings per week.

In addition, the CONSULTANT will participate in briefings to the Council and local governing bodies regarding the community involvement component of the Project. It is anticipated that there will be a maximum of eight (8) briefings of this type during the PE/EIS phase of the Project. Where applicable and appropriate, public meeting materials (e.g., displays, fact sheets, and comment forms) will be presented for review and comment.

21.2.6 Maintaining Existing and Developing New Contacts with Local Groups and Organizations, including City Council and Neighborhood Boards, and Participating in Their Meetings as Appropriate

As stated previously, the CONSULTANT will continuously maintain and develop new contacts with local groups and organizations throughout the life of the Project. Contact with existing organizations, and participation in their meetings shall be continued. A maximum of four (4) such meetings will be attended per week. Where applicable and appropriate, public meeting materials (e.g., displays, fact sheets, and comment forms) will be presented for review and comment.

Particular attention will be paid to reaching groups that are traditionally underserved and underrepresented in the public involvement process, such as low-income and minority populations that are often referred to as "environmental justice" populations. Materials will be prepared in the languages most often used on Oahu and translators will be available upon request at the meetings. Information will be distributed through cultural organizations, ethnic associations, housing associations, and community development groups such as Empower Oahu, the Kalihi-Palama-Chinatown Community Initiating Group, and similar groups in other areas of the island.

In addition, contact with the Advisory Committee will be maintained. The Advisory Committee will serve as a sounding board for the Project and will advise where necessary in an effort to resolve potential project issues on behalf of the community before they become controversial.

21.2.7 Maintaining the Project Mailing List, Website, and Hotline with Appropriate Updates

The CONSULTANT will continue to work with RTD staff to develop an inclusive and diverse database incorporating all interested parties from the Alternatives Analysis phase, as well as new contacts. The existing website initiated for this Project, www.honolulutransit.org, will continue to be operated and updated by the CONSULTANT with relevant information. Information related to the Project, implementation schedule, briefing/fact sheets, agendas, newsletters, meeting announcements, Project milestones, press releases/articles, etc. will be posted on the website. In addition, the informational telephone hotline previously used for the Project will continue to provide 24-hour access for public inquiry

and comment. The recorded phone message shall be updated weekly, or as-needed, to include updates, upcoming public meetings, and event information. The informational hotline shall be checked for messages twice daily, with comments or questions routed to appropriate personnel for timely response. Meeting attendees will be able to have their contact information added to the project mailing list on all sign-in sheets provided at public involvement meetings.

21.2.8 Developing, Producing, and Distributing Public Information Documents (e.g., Newsletters, Fact Sheets)

The CONSULTANT will design and produce newsletters, fact sheets, agendas, and other needed public information documents with detailed information on current project issues. The CONSULTANT will prepare, publish, and distribute bi-monthly (with a maximum of 12) newsletters during the Project period. Newsletters will be produced in an "easy to read" format that will provide concise, yet necessary, information in an inviting format. In addition, newsletters will be translated, as appropriate, into languages represented in the corridor to enable a wide circulation of knowledge concerning the project. Approximately 15,000 copies of each newsletter edition will be printed and distributed through a combination of direct mail and distribution at meetings, hearings, and briefings.

Fact sheets will also be prepared, printed, and distributed by the CONSULTANT to provide information to property owners, businesses, community leaders, and the general public as to the ongoing status of the design and construction of the Project. Fact sheets will be 8 ½" x 11" flyers. Fact sheets will be produced as needed and will be available for all public meetings and hearings.

Information will be displayed in heavily trafficked areas throughout the project corridor. All public information documents will be available throughout the life of the Project and will also be posted on the project website.

21.2.9 Developing, Producing, and Distributing Public Information Electronic Media (e.g., DVD, CD) Designed to Describe and Illustrate Technical Documents and Project Progress

The CONSULTANT will develop, produce, and distribute a maximum of 50,000 DVD and/or CDs to illustrate technical documents and project progress. DVDs and CDs will be formatted to be opened on compatible machines.

21.2.10 Responding to Public Inquiries about the Project

The CONSULTANT will respond in a timely manner to all public inquiries through all established outlets including, but not limited to, the website, hotline, and/or written or verbal comments and inquiries.

To keep the Project on schedule, the CONSULTANT will provide ample opportunity for input throughout the process and thoroughly document all public comments, beginning with the scoping process. The CONSULTANT will ensure that all comments and concerns are addressed to the satisfaction of policymakers and the general public. To make this process more efficient, the CONSULTANT will use PB CommentSense to allow multiple users to record comments into a single database. This will make it easier to document the comments and show the public that their input received due consideration.

The CONSULTANT shall maintain a database of all public and agency comments received concerning the Draft EIS whether through the environmental process or through the normal course of public involvement throughout the public involvement process. In general, the CONSULTANT shall respond to comments received via telephone, e-mail, or in writing within five business days once received by the CONSULTANT. Comments will be categorized by topic area (e.g., alignment issues, ridership, environmental) for ease of retrieval and analysis and given to the correct technical person for response. Comments received outside of the Draft EIS statutory process will be formally documented as well.

21.2.11 Assisting the RTD on Media and/or Agency Coordination as Needed

The CONSULTANT will work with the RTD to prepare quarterly press releases (up to eight) and develop up to eight project-related articles to be distributed by the RTD's public information office to local publications, such as *The Honolulu Advertiser*, *The Honolulu Star-Bulletin*, *Honolulu Weekly*, *Pacific Business News*, and/or other print media. This includes information on project milestones, as well as

opportunities for public participation and input. While the bulk of the media effort is assumed to be in earned media, paid advertising will be used in a strategic manner.

21.2.12 Documentation

During the course of the public involvement program, the CONSULTANT will prepare monthly public involvement activity reports. The reports will describe public involvement activities for the subject time period and will summarize results (i.e., summaries of the public input received). In addition, the Public Involvement Plan will identify how the above discussed public involvement activities will be implemented throughout the PE/DEIS process.

ASSUMPTIONS:

It is assumed that all estimates for the exact number of print copies, boards, visual simulations, displays, and other public involvement needs are fluid and may be increased or decreased based upon need. It is also assumed that the RTD will review all public involvement materials in a timely manner.

SCHEDULE:

Public involvement will be continuous through the life of the Project. However, specific milestones must be kept in order to complete the environmental process according to statute and also within the timeline set forth by the RTD. The public involvement schedule will reflect not only the statutory requirements for the environmental process but will ensure the RTD and general public have the opportunity for meaningful participation, involvement, and knowledge concerning the Project.

The following is an overview schedule for major milestones for the Project. A more specific schedule for public involvement activities will be developed in the Public Involvement Plan:

- Public Involvement Plan (6 weeks after NTP)
- All statutory public involvement regarding the environmental process prior to the Draft EIS as required by NEPA and HRS Chapter 343 requirements – June 2008
- Completion of the Final EIS - August 2008
- Beginning of construction/final design – 2009
- First segment opening - 2012

DELIVERABLES:

At the completion of the public involvement program, the CONSULTANT will prepare a Public Involvement Summary Report describing formation and implementation of the Public Involvement Plan and results thereof. Products will include the following:

- Public Involvement Plan
- Monthly Public Involvement Activity Reports
- Public Involvement Summary Report
- Final summary of Public Involvement Activities
- PB CommentSense documentation and logs
- Boards, displays, and visual simulations
- Fact sheets, newsletters, and other media
- DVDs and CDs of technical documents

22.0 Public Art

APPROACH:

The Mayor's Office of Culture and the Arts (MOCA) will be responsible for implementing, administering, and monitoring the art program for the Project. Artwork to be incorporated into the Project's facilities

and/or facility sites shall either be procured by MOCA through purchase or as a result of a donation(s), or MOCA may commission local artists who will be responsible for the design, fabrication, and installation of artwork.

The CONSULTANT shall have the following responsibilities during PE in regard to the Project's artwork program:

SCOPE:

- 22.1 The CONSULTANT shall provide input to the solicitation prospectus developed by MOCA to explain the nature of each Project facility or facility site and the parameters, both opportunities and constraints, under which the artwork is to be designed.
- 22.2 The CONSULTANT shall coordinate with MOCA, the RTD, and the artists in the resolution of concerns or problems associated with incorporation of artwork within each facility or facility site.
- 22.3 The CONSULTANT shall coordinate with MOCA, the RTD, and the artists regarding the incorporation of artwork proposals into the design of facilities or facility sites and their respective PE design drawings.
- 22.4 The CONSULTANT shall assist the artists with estimates of interface construction costs, such as mounting requirements, artwork bases, etc., the costs of which will be included in the budgets for each work of art.

ASSUMPTIONS:

N/A

SCHEDULE:

N/A

DELIVERABLES:

N/A

23.0 Record of Decision (ROD)

APPROACH:

Based on the work completed in Task 6.0, the CONSULTANT will work with the RTD to obtain a Record of Decision (ROD) for the Project satisfying the requirements of the National Environmental Policy Act of 1969.

SCOPE:

The CONSULTANT will prepare the required materials to request and finalize a ROD. The ROD will describe the Project, project background, alternatives considered and the process leading to the Preferred Alternative, the basis for the decision with all the benefits achieved through the implementation of the Project, measures to be implemented to minimize impacts or unavoidable adverse impacts, any appropriate determinations and findings in critical areas such as Environmental Justice, air quality, Section 4(f), cultural resources, etc., and a listing of specific mitigation measures identifying impacts to be addressed by the measure, as well as timing and responsibility for implementation, including any monitoring requirements that may be necessary to ensure compliance with applicable regulations.

ASSUMPTIONS:

N/A

SCHEDULE:

The CONSULTANT will provide the RTD with a draft ROD two weeks after issue of the Final EIS or completion of issues that must be addressed in the ROD, whichever is later. After receiving comments on the draft ROD, the CONSULTANT will provide a final ROD to the RTD within two weeks.

DELIVERABLES:

ROD (draft and final)

24.0 Project Insurance Options

The CONSULTANT will assess the various options for providing insurance for the Project, including the benefits and consequences of instituting a wrap up program of insurance for the Project. This assessment shall include:

- 24.1 An overview of insurance needs for the Project
- 24.2 Evaluating insurance brokers to procure the insurance on behalf of client,
- 24.3 Advising which types and amounts of insurance, should be included in a wrap up program,
- 24.4 Recommendations on cost savings and benefits in the insurance program, and
- 24.5 Identifying appropriate organization structures to manage the various insurances procured for the Project.

25.0 Travel Forecasting

APPROACH:

Projections of travel demand in the project influence area are essential in evaluating the benefit of the Project, assessing transportation impacts for the No Build and Build alternatives as part of the Draft and Final EIS, and complying with federal requirements for New Starts funding. An updated version of the travel forecasting model used for the AA will also be used for the EIS. This task includes the provision of travel forecasts for the traffic impact analysis, air and noise analyses, to be conducted under Task 6.0 as part of the DEIS and FEIS. Forecasts for three build alternatives will be developed in the EIS: Salt Lake Only, Airport Only, and Salt Lake + Airport. (Two additional alternatives may be added to include a spur on Salt Lake or to the Airport.) In addition to projections for the opening segment (from Kapolei to Leeward Community College), the forecasts will cover both the initial 20-mile First Project as well as the final full-system build out.

SCOPE:

The following tasks will comprise the travel forecasting effort.

25.1 2005 Model Calibration/Validation

Several model refinements have been recommended by FTA to enhance the OahuMPO model's ability to accurately forecast transit demand based on observed 2005 data. This subtask involves additional analysis of estimated versus observed base-year ridership in the proposed high-capacity transit corridor in order to improve the model's ability to forecast ridership in the corridor in 2030. The income distributions used in the 2030 land use data and the auto ownership model impacts on ridership will also be investigated. These tasks must be completed quickly in order to finalize forecasts to complete work on the Draft EIS.

25.2 2030 Draft EIS Model Application

The finalization of 2030 forecasts for completion of the Draft EIS will include an analysis of formal versus informal park-and-ride trips, the income distributions used in the 2030 land use data, and auto ownership

model impacts on ridership. The outputs of the final Draft EIS forecasting will include future-year patronage, station boardings and alightings, highway traffic volumes to be used for traffic, air, noise, and energy impact analysis and project user benefits. There are currently seven alternatives identified to be modeled as part of this task:

- 2030 No Build
- 2030 Baseline
- 2030 Salt Lake full length (Kapolei to UH Mānoa and Waikiki)
- 2030 Airport full length (Kapolei to UH Mānoa and Waikiki)
- 2030 Salt Lake + Airport full length (Kapolei to UH Mānoa and Waikiki)
- 2030 New Start project (East Kapolei to Ala Moana Center via Salt Lake)
- 2030 Phase 1 of the New Start project (East Kapolei to Leeward Community College)

This subtask is to be completed within three months of NTP and after completion of Subtask 25.1.

25.3 Alternatives Refinement

This subtask covers travel forecasting and analysis to test the impact of changes in route alignment, run times, operational characteristics, and station locations over the duration of the Project. This involves coding networks, running the OahuMPO Regional Travel Demand model, analyzing model outputs including ridership and user benefits, communicating results to the project team, and summarizing results of the analysis for the Final EIS.

25.4 FTA Coordination/New Starts Submittals

This subtask covers coordination with FTA on travel forecasting activities. Regular meetings will be held with FTA representatives to discuss travel demand forecasting results, model enhancements and calibration results, and user benefit information, both in-person and via telephone and web-conferencing.

Preparation of user benefit information for the annual New Starts submission will also be undertaken as part of this task, as well as responding to any additional analysis requested by FTA as part of the New Starts application process.

25.5 Uncertainty Analysis

The contractor performance report provisions in the May 16, 2006, *FTA Guidance on New Starts Policies and Procedures* states that, "FTA will begin tracking the performance of contractors for all projects that are approved for enter into New Starts Preliminary Engineering. Information on the contractor's area of responsibility for the forecasts will be required along with explanations or analysis of uncertainties." The analysis of risk and uncertainties associated with travel demand forecasts is common in the context of investment-grade forecasting but is less common in the public arena. Techniques that could be employed to investigate risk include the following:

- The use of alternative models, such as aggregate forecasting tools, to provide a range of forecasts
- The use of alternative future-year population and employment projections to understand how ridership is dependent on regional growth
- The use of alternative model parameters to determine how various model sensitivities influence ridership

All of these methods require running the models, often multiple times, and documenting results to understand the range of potential ridership. The methods to be employed for this Project, and the analysis required, will be cooperatively determined in consultation with FTA.

25.6 Operations Analysis and Equilibration

A number of model outputs are required for input to the operational planning tasks, such as sizing park-and-ride lots and station platforms, and planning transit headways. These include boardings and alightings at each station, park-and-ride versus kiss-and-ride station demand, and bus transfer versus walk access demand at each station, by time period. Feeder bus demand and peak load point data are

required to understand whether operational plans meet demand. The process of equilibration is used to iterate between demand estimation and operational plan refinement to ensure that the operational plan meets the anticipated demand levels at the lowest possible cost. Multiple travel demand model runs are required as part of this task.

25.7 Additional Model Refinements

As part of the Draft EIS, a number of model additional refinements have been recommended by FTA to enhance the OahuMPO model's ability to accurately forecast transit demand and capture all benefits that accrue to travelers due to construction of the Project. These enhancements include the calibration of input travel speeds that more adequately represent actual congested travel times (through the use of matrix estimation techniques) and implementation of transit capacity-restraint to represent the benefits of increased transit capacity in the transit corridor. A model enhancement plan will be developed as part of this task and reviewed with the project team and FTA before implementing these enhancements. Their implementation will likely require model re-calibration and sensitivity testing. All enhancements will be documented.

ASSUMPTIONS:

The schedule and be maintained if the modeling output is accepted for use in further analysis within the prescribed review periods.

SCHEDULE:

Begin: immediately upon NTP.

First set of model results will be available for use by other disciplines within 3 months of NTP to allow for inclusion in the Draft EIS.

Other modeling activity will conform to required schedules for FTA submittals.

DELIVERABLES:

N/A