Miami • Miami Beach Transportation Corridor Study

Bay Link

September 2004

Preliminary Engineering Scope of Services

Miami-Dade Metropolitan Planning Organization

and

U.S. Department of Transportation Federal Transit Administration

MIAMI - DADE TRANSIT

MIAMI-MIAMI BEACH TRANSPORTATION CORRIDOR (BAY LINK)

Scope of Services

For

Bay Link
Preliminary Engineering and Final Environmental Impact Statement

August 2004

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PART A - SCOPE OF SERVICES

A.1 GENERAL

At the Metropolitan Planning Organization Board of Directors meeting on September 25, 2003, the Board formally selected the Locally Preferred Alternative (LPA) for the Miami-Miami Beach Transportation Corridor (Bay Link) Study. Figure 1 reflects the general alignment, stations and facility locations for the Bay Link Project. The PE/FEIS phase of development will address the complete Bay Link project alignment as well as any phasing options necessary to refine and identify the Minimum Operable Segment (MOS) as required by the Federal Transit Administration (FTA) or as may be dictated by local funding constraints.

The additional planning, preliminary engineering and design and environmental analysis described in this detailed scope of services will be pursued to produce an FEIS in compliance with state and federal requirements. The FEIS will be produced in close coordination with the MDT staff, the public, effected agencies and the FTA staff.

The FEIS will respond to comments received on the DEIS, completed on October 2002, and specifically identify methods to be used for mitigating impacts. The FEIS will be prepared consistent with the environmental requirements of the FTA, as dictated by the National Environmental Policy Act (NEPA). Preparation of the FEIS is critical to receiving the environmental clearance for the project in the form of the Record of Decision (ROD), receipt of which is a requirement to enter into Final Design and, eventually, a Full Funding Grant Agreement (FFGA) with FTA for the project. Therefore, the FEIS must be completed in a timely manner to maintain the overall project schedule. The technical scope of work outlined in the following sections will satisfy these requirements.

PE is a phase of project development that includes many activities that are not strictly “engineering” in nature. Indeed, the engineering aspects of PE may be of less importance than the planning, financial, environmental, public involvement and other “soft side” aspects of PE. The overall goals of PE are:

- To reach detailed decisions on all aspects of project scope and definition that will have an appreciable effect on costs, benefits, and impacts;
- To produce a highly credible cost estimate;
- To finalize and begin the implementation of the project financing plan;
- To satisfy the documentation requirements of the state of Florida and the NEPA (federal); and
- To develop a project management plan for Final Design and Construction.

To successfully accomplish these goals and support the decision continuum necessary to advance the project scope, PE must be carefully defined and strategically planned and executed. This is often accomplished through the preparation of the PE work program, which may be presented as part of the Project Management Plan (PMP). The scope of services for PE includes any and all activities needed to achieve the above goals.

Preliminary engineering takes the project from a conceptual engineering level to a level of design that allows a more refined estimate of project costs and impacts. For a number of years the “rule of thumb” in the industry has been that PE must advance the definition of the project to a level of design and engineering that represents approximately 30 percent of the overall design. However, there has been no

standard definition of what constitutes 30 percent of design. Moreover, as described above, it is perhaps more helpful to think in terms of the level of design required to accomplish the goals of PE, including support for the decision process and the NEPA process. The level of effort to meet the PE goals can vary substantially from segment to segment of a project, and from project component to project component. It takes the project to an approximate 30 percent level of completion and defines the scope of work for final design and construction. It establishes the design of the basic civil, architectural, structural, mechanical, electrical, communication systems, trackwork, signals, and train controls, traction power, overhead catenary system, fare collection, vehicles, and other systemwide interfaces.

The PE scope of work incorporates the DEIS and FEIS mitigation measures and defines the impact of construction and environmental concerns on affected parties, including governmental agencies, utilities, and private agencies or owners. In addition, impacts on the right-of-way requirements will be identified to a degree that full takes can be later certified for acquisition and partial take requirements can be reasonably established.

PROJECT DECISION-MAKING

Decisions Normally Made During PE

The PE phase of project development will normally lead to decisions that more precisely define the project, its funding, and the implementation strategy. The Bay Link LPA will be refined as decisions are reached on such physical features as the precise alignment, station locations and configurations, yard and shop location and layout, and system operations. Implementation strategies will also be considered.

Decisions Normally Made in Final Design

The Final Design phase follows PE and further refines the project through the preparation of detailed engineering drawings and specifications for procurement and construction. Contract packages are assembled with an eye to getting the best price in a competitive marketplace, as well as to MDT's philosophy on project management. Right-of-way acquisition, utility relocation and vehicle procurement can begin during Final Design. Any remaining funding commitments, including a FFGA with FTA, are generally secured during Final Design phase.

Refinements Within the Locally Preferred Alternative

Decision-making on project refinements within the selected project concept is one of the primary purposes of PE. Thus, PE will often include the consideration of alternative alignments, termini, yard and shop locations and layouts, and station locations and footprints within the LPA. PE may include refinement of the design standards and assumed specifications for vehicle design. Environmental/community impact avoidance, minimization and mitigation options are considered as well. These may emerge from the environmental process and public involvement. While the planning phase may well have anticipated these environmental features, and budgeted an allowance for them, commitments to such features do not normally occur until the latter stages of PE.

Revisiting Design Concept and Scope Alternatives from the Planning Process

It is not unusual to find the need to revisit one or more alternatives that were considered and rejected in the planning process. Early in PE, perhaps as part of the NEPA scoping process, agencies and the public may ask that the LPA decision be reopened, and this is sometimes done. Similarly, "new ideas" that were not considered in planning may be identified and warrant consideration. The consideration of design concept and scope alternatives should be dealt with early in PE, as a screening exercise. The various activities that occur during PE are intended to produce the information that decision-makers need in order

to make informed choices among the alternatives that are available at any point in the process. This will include information on project cost benefits, and environmental/community impacts of the alternatives, as well as the reaction of other agencies and the public. Decision-makers also benefit from information on the level of risk and uncertainty inherent in estimating cost and forecasting benefits/impacts.

A critical issue often is the appropriate level of detail for each of these analyses. The answer to the question "How much is enough?" is often, "It depends." In general, the level of information generated in PE should be sufficient to support the kinds of decisions that are made in PE. The analysis and evaluation needs to be sufficient to differentiate among the alternatives, with a reasonable degree of confidence. The appropriate level of detail will vary from project to project, and may vary among the alternatives being considered for a particular project or from segment to segment on a given alignment. The appropriate level of detail will also hinge on what it takes to satisfy outside parties (local governments, environmental resource agencies, the public, etc.) that their interests and concerns have been given due consideration. This may push the transit agency to a higher level of detail than would otherwise be considered necessary.

Project sponsor also ought to resolve, during PE, all issues that may have an appreciable impact on costs, even if this requires more detailed analysis. One of the goals of PE is a cost estimate that has a high confidence level. Where design or other uncertainties remain at the end of PE, an adequate contingency reserve should be built into the Baseline cost estimate.

IMPLEMENTATION PLAN

The Implementation Plan for the Bay Link Streetcar Project PE/EIS is designed to serve the following purposes:

- Provide an environmental analysis for the LPA consistent with US Department of Transportation (USDOT), FTA, Council on Environmental Quality (CEQ), NEPA, and other applicable federal and state statutes, regulations and guidelines.

- Produce and respond to public and review agency comments received on the DEIS;

- Resolve any outstanding DEIS issues necessary to complete selection of a final rail alignment, stations and support facility locations.

- Provide environmental information for use in the public information program.

- Prepare a FEIS document, and as appropriate 30 percent level of completion defining the scope of work for final design and construction. It establishes the design of the basic civil, architectural, structural, mechanical, electrical, communication systems, trackwork, signals and train controls, traction power, overhead catenary system, fare collection, vehicles and other systemwide interfaces.

- Establish the baselines for scope, schedule and cost to serve as the basis for Final Design.

The Implementation Plan is organized in the following manner:

- Task 1.0 Project Management and Administration

- Task 2.0 Project Control

- Task 3.0 Quality Control

- Task 4.0 Planning and Project Refinement
- Task 5.0 Draft Environmental Impact Statement
- Task 6.0 Final Environmental Impact Statement
- Task 7.0 Preliminary Engineering
- Task 8.0 Public and Agency Involvement and Coordination
    - Major utilities that are affected by the system, including utilities that must be protected, or relocated, as well as those new utilities required for the system operations.
    - Traffic control devices and maintenance of traffic during construction.
    - Stations, parking lots, and lighting.
    - Landscaping, urban design and art in transit.
  - Review and modification of applicable design policies.
  - Participation in value engineering program.
  - Support and participation in peer reviews.
  - Geotechnical investigations.
  - Right-of-way design/configuration.
  - Preparation of outline technical specifications.
  - Surveying and photogrammetric mapping.
  - Cost and Schedule reporting and control.
  - Capital cost estimates.
  - Operating and maintenance cost estimates.
  - Preparation of graphics and renderings.
  - Constructability reviews.
  - Technical coordination support with outside agencies.
  - Support in obtaining permits.
  - Public involvement.

The starting point for the PE design effort will be the concept plan contained in the revised Draft Environmental Impact Statement (DEIS). The PE/FEIS concept plan is assumed to be the final alignment although minor modifications will be made to meet engineering design criteria and requirements to serve as the basis for Final Design.

The scope of the Consultant's services is further defined below.

Figure 1. Bay Link Project

A.2 WORK ELEMENTS

1.0 PROJECT MANAGEMENT AND ADMINISTRATION

1.1 MOBILIZATION

The Consultant shall provide the management and administrative staff necessary to manage, coordinate and administer the responsibilities of the Consultant. The responsibilities of the Consultant are herein after set forth subject to the authorization of the tasks defined by Contract Work Order (CWOs). The organization and staffing of the Consultant shall be adjusted as necessary to meet the changing needs of the project and the Consultant's responsibilities.

Given the Consultant's proposed organizational structure (Figure 2) and the nomination of key personnel to fill organizational positions, and given the work forming this Scope of Services, mobilize the Consultant's key staff members and support personnel on a schedule commensurate with the needs of the project as approved by Miami-Dade Transit (MDT). Where permanent project personnel are not residents of the Greater Miami area, effect their relocation. The Consultant will review the cost of relocation with MDT to reach agreement on a lump sum payment, or another method of compensation to address the cost of mobilization.

During the course of the work, mobilize additional key personnel and support personnel, as required by the scope and schedule. As discrete Tasks and Subtasks are completed and the character of the work changes, reassign or demobilize affected staff members in a timely way.

1.2 WORK SUPERVISION AND COORDINATION

Provide the managerial services of Consultant's Project Manager, Deputy Project Manager, and the managers of Facilities, Systems, Technical Services, Planning, Environmental and Traffic, Project Integration, Project Control, and Administrative Support and effect overall supervision of Consultant's work, as set forth herein. Maintain close liaison with MDT, its designated Program Management Consultant (PMC) representatives and work as an integrated team with MDT staff and with MDT's other consultants. Where MDT is indicted in the balance of this scope of services, it refers to the MDT staff or the designated PMC representatives. Overview work being performed to help ensure it will be progressed and completed on schedule and in a satisfactory manner.

Participate in MDT-called project management, control, and coordination staff meetings to provide status of the design and to remain fully informed of overall progress of project work and take direction from MDT representatives consistent with the scope and the Contract. React to indications of MDT's Management Information System reports, as necessary, to correct or adjust work in progress where such work is diverting from any established scope, quality, or schedule baselines.

1.3 PROJECT MANAGEMENT PLAN

Federal Transit Administration (FTA) regulations require the project sponsor to prepare a project Management Plan (PMP) that describes how MDT (owner) intends to manage PE and subsequent phases of the project development process. FTA will engage a project Management Oversight (PMO) Consultant to monitor project development activities as an extension of FTA's technical staff.

The Consultant will assist MDT with the preparation of the FTA's PMP. The PMP not only identifies the tools that will be used to guide the project through the myriad of expected issues and challenges, but also gives MDT the opportunity to do some strategic thinking about what decisions are needed and the steps in, and sequence of, the decision process.

Figure 2. Bay Link Project Organizational Chart

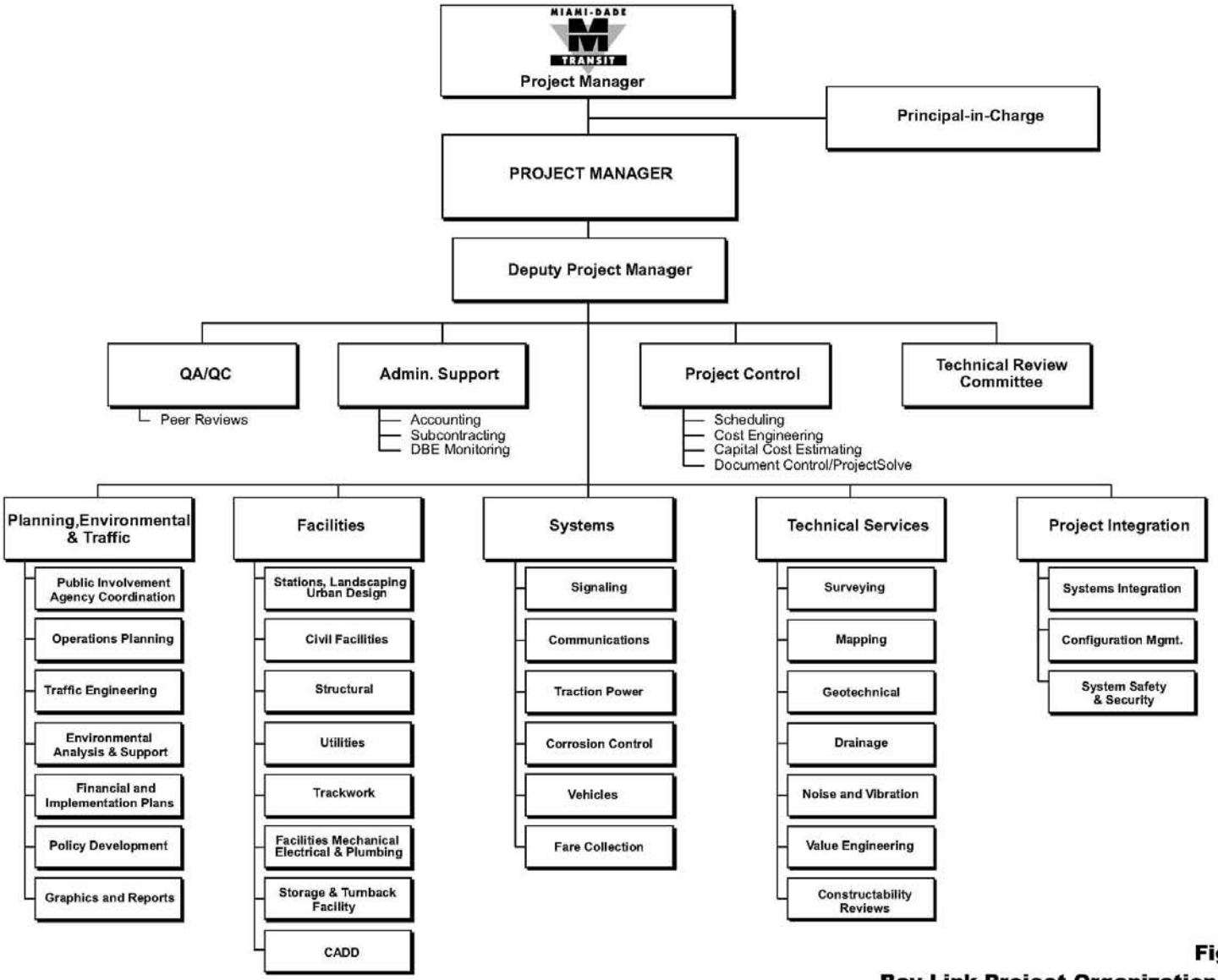

Figure 2
Bay Link Project Organization Chart

1.4 SUPPORT SERVICES TO MDT

As may be requested by MDT from time to time, support MDT staff in the following tasks:

1.4.1 Value Engineering and Peer Review

The Consultant will review and examine candidate changes in the bases of design or other constraints which should be considered as design phase value engineering proposals, cost reduction measures, cost effectiveness enhancements or cost eliminations or deferrals. Where MDT has activated a value-engineering consultant, cooperate and participate with such consultant and participate as requested in specific value engineering meetings.

Cooperate with MDT when it has organized and sponsored a Peer Group Review on some aspect of the project, which directly or indirectly affects the work and deliverables of the Consultant. As may be requested, brief the reviewers and make presentations on matters of concern to MDT and the Peer Group. Provide copies of work materials in progress, as necessary, and respond to questions posed by the reviewers.

1.4.2 Project Management Oversight Consultant Requirements

With the FTA conducting project Management Oversight (PMO) by having assigned such responsibility to an FTA consultant, at MDT's direction cooperate with that consultant in its requests for information, in responding to questions posed, and in allowing the work in progress to be viewed. As requested by MDT, respond and react to the comments received from the PMO on the PE design.

1.5 PROJECT COORDINATION MEETINGS

Anticipate that MDT will establish a series of regular project Coordination Meetings to facilitate focus on critical matters, to effect better coordination among all participants, and to respond to project issues in a timeframe supportive of the Consultant's scheduled activities. The Consultant will attend such meetings with appropriate representation and participate in agenda items, which pertain to the Consultant's responsibilities. Participate also in such procedures MDT may establish for preparation for project Coordination Meetings and for follow-up action. When MDT calls special meetings on a particular issue and includes the Consultant, participate and help resolve the issue expeditiously.

1.6 CONTRACT ADMINISTRATION

As will be necessary from time to time, provide services in administration of the Contract, including the incorporation of additional CWOs, the amendment of the Contract or active CWOs, the related changes to Contract Exhibits, the provision of required certifications, and other changes and administrative activities.

1.7 SUBCONTRACTS

1.7.1 Subcontract Development

Given MDT's agreement that certain specific work may be subcontracted (and that the Consultant's proposed subconsultants, outside associates and consultants identified in Consultant's proposal and the work proposed for such assignment constitutes MDT's agreement), draft the required subcontracts with full recognition of the prime Contract and the pertinent provisions of the relevant Exhibits. In the event the Consultant desires to subcontract work not identified in its proposal or to engage subconsultants not identified in its proposal, submit to MDT the proposed subcontracting, the rationale therefore and such other information as MDT may require, for MDT approval.

Draft standard subcontract form(s) for use under the Contract. Negotiate the scope, schedule, and budget for each subcontract and seek/obtain any required MDT approval for the Consultant to enter into the subcontract. Complete the subcontracting and furnish a signed copy to MDT. Proceed with certifications and issuance of Consultant's written Notice-to-Proceed.

In no event shall the Consultant include in a subcontract work not currently active under a valid CWO, nor shall the Consultant promise or imply by subcontract terms the commitment of additional work to a subconsultant.

1.7.2 Subcontract Administration

During the period of each subcontract, provide services in administration of such subcontract, including direction of methods, format and cycles of invoicing, review of required certifications, monitoring of work performed and status, making of progress payments, review of QC procedures and assurance of their application, subcontract changes and amendments, reviews of deliverables for acceptance, and subcontract close-out.

1.7.3 DBE Participation Monitoring

Given MDT's current 25 percent goal for DBE participation in the project and this Contract in particular, monitor subcontracting and purchasing activities to the end that at any time the level of DBE participation may be reported to MDT. As required by MDT, make periodic reports on the status of DBE participation under the Contract.

When the allocation of current or projected work under the Contract results in a shortfall of the pertinent goal of MDT for this Contract, take corrective action as soon as reasonably possible to increase the level of DBE participation with the objective of achieving the goal and maintaining it. In the event, a proposed subconsultant, outside associate, consultant, or vendor has unclear status as a DBE, refer the question to MDT for verification of DBE certification under its rules of acceptance.

1.8 ACCOUNTING

Working with MDT staff, devise a code for cost accounts which will segregate work tasks, labor costs and direct expenses in accord with MDT's project control system and Work Breakdown Structure and an equated task reporting structure internal to the Consultant's established procedures. Issue and maintain directions to all of Consultant's participating staff as to how to reflect labor and expense charges under the Contract.

Establish with MDT its requirements for periodic invoicing of costs incurred and fee earned. On the cycle and series of closing dates to be set by MDT, prepare Consultant's invoices for the period to be covered and such supporting materials and records as MDT may desire. Submit the invoice on or before the due date set by MDT. Process payments received, including the payment of subconsultants. As required by MDT, accommodate audits of Consultant's charges under the Contract and pre-audits and audits of subconsultants.

2.0 PLANNING AND PROJECT REFINEMENT

The purpose of this task is to provide the planning support necessary to identify, analyze and evaluate alternatives to support the PE decision process. The effort includes refinement within the adopted LPA in close coordination with the ongoing FEIS efforts. The tasks may also include the analyses necessary to address phasing and staging options, as well as alternative sources of financing, institutional arrangements, and procurement strategies.

2.1 REFINEMENTS WITHIN THE LOCALLY PREFERRED ALTERNATIVE

As currently defined, the LPA includes several options to be analyzed further during this phase of project developed. The options include:

1) In Downtown Miami, analysis an option to the basic alignment that would continue service West on NE 9th Street from Miami Avenue to NW 1st Avenue and then turn South running along the curb lanes to NE 3rd Street. There would be a station must West of Miami Avenue on NE 9th

Street and on NW 1st Avenue just north of NE 6th Street and NE 3rd Street. This alternative would replace the alignment and stations on Miami Avenue, NE 1st Avenue and NE 3rd Street. This optional alignment would need to be carefully coordinated with the Miami Streetcar Project.

2) The addition of an additional station on Biscayne Boulevard between NE 9th and NE 12th Streets.

3) On Miami Beach, an option to a portion of the alignment for the Circulator (green line) has been proposed for analysis. Instead of turning west from Alton Road onto 16th Street (Lincoln Road), the proposed option would continue along Alton Road, cross Dade Boulevard and continue to 19th Street. At 19th Street, the alignment would turn east onto 19th Street and continue until it merges with Dade Boulevard. There would be a station just east of Dade Boulevard. The new bridge extending West Avenue to Dade Boulevard may still need to be constructed as a traffic mitigation measure.

4) Currently a number of alternative Yard and Shop sites remain. In careful coordination with the Miami Streetcar Project which may share the facility, it will be necessary analyze the sites and select the site for the shared facility.

The options are reflected in figure A.1-1.

While there are no significant design options associated with the project to be resolved during PE, the Consultant will support MDT in addressing such issues as final station locations and footprints, the configuration and location of the storage and turn back facilities, and the refinement of the alignment to minimize right-of-way impacts. The mitigation measures resulting from the FEIS process must also be conceptualized and incorporated into the design process.

2.2 LAND USE AND OTHER POLICY ALTERNATIVES

The Consultant will assist MDT in advancing the land use plans in the vicinity of the stations and assess the impacts on, and consistency with, local comprehensive plans and zoning. Other policy options that may require further examination include fares and parking supply and pricing. Other demand management strategies may also require analysis.

2.3 TRAVEL DEMAND FORECASTING

As the project definition evolves it may be necessary to modify some of the assumptions used in the modeling process to reflect the changes. The Consultant will support MDT in the development of the modeling data to reflect the refined LPA and respond to the development of the revised New Starts Report.

2.4 COORDINATION WITH OTHER PROJECTS

As the development of PE for the Bay Link Project progresses, it may be necessary to develop the data necessary to define the impacts on other projects or the operation issues introduced. Though this task the Consultant will support MDT in getting the project into the MPO's 2030 Long Range Plan and keep relevant project data current. It will also be necessary to carefully coordinate Bay Link's operating plan with the entire MDT system; particularly Metrorail, Metromover and the MDT buses affected by the introduction of Bay Link.

2.5 REFINEMENT OF FEEDER NETWORKS

As the station area planning progresses, it will be necessary to review, and adjust if necessary, the feeder network definition at each of the stations. The Consultant will provide the resources to support this effort.

2.6 ORIGIN AND DESTINATION STUDY

The City of Miami Beach requested that an origin and destination study be prepared for the study area. The purpose of this task is to identify the travel patterns of people entering the South Beach neighborhood of Miami Beach from the north and the south – specifically, whether they are stopping in the South Beach area or passing through.

The CONSULTANT proposes to conduct a post-card survey for a typical weekday and weekend day. The CONSULTANT will have people distributing postcards to automobiles stopped at traffic signals at specific locations in the study area. Electronic message boards and orange information signs will be used to alert traffic of the program. No cars will be stopped involuntarily. All work will be subjected to approval by the City of Miami Beach Public Works and local and state jurisdictions. The postcards will be postage paid and respondents will be directed to fill out the brief survey (2 to 3 questions) and mail it back or to log onto the internet and fill out an internet survey.

The CONSULTANT successfully used this methodology in early 2003 in a survey at interchanges along I-595 and out of 70,000 postcards distributed got back approximately 7,500 in the mail and 1,500 via internet. All survey work will be conducted with safety as the utmost concern and off-duty police officers with automobiles with flashing lights would be posted at each survey location. The proposed survey locations are:

- Alton Road/Dade Boulevard – southbound
- Meridian Avenue/Dade Boulevard – southbound
- Prairie Avenue/Dade Boulevard – southbound
- Collins Avenue/intersection to be determined – southbound
- Macarthur Causeway/Alton Road – eastbound

In preparation for the survey, a pilot test would be performed. The survey form instrument and proposed questions and times of distributions would be discussed and defined in consultation with the MDT and the City of Miami Beach representatives. As a preliminary proposal, surveyors would work three-hour shifts (7:00 AM to 10:00 AM) (11:00 AM to 2:00 PM) (4:00 PM to 7:00 PM).

The CONSULTANT would analyze all data and prepare a Survey Results Report that would document the findings within one-month of the completion of the survey field work.

2.7 SEAGRASS AND ESSENTIAL FISH HABITAT SURVEY

The CONSULTANT will conduct an Essential Fish Habitat (EFH) survey along the southern and northern edges of MacArthur Causeway from the edge of the proposed Streetcar structure to the edge of the “cut” on the south side, and for a similar width on the north side. The survey will include mapping of seagrasses by species and corals by occurrence, as well as other EFH that may be encountered. The CONSULTANT will coordinate and submit the results of the EFH, seagrass and coral survey with the appropriate agencies.

3.0 PROJECT CONTROL

3.1 SCHEDULE DEVELOPMENT/MAINTENANCE

3.1.1 Work Plan

Recognizing that MDT will release and authorize work under the Contract by CWO, prepare a detailed schedule of the tasks and subtasks for the authorized project Phase. Reflect in such schedule the need for inputs and responses from MDT and its other consultants, any targeted intermediate and end milestones,

the start and finish times of each subtask, event times, available float, outputs, the logical sequence of subtasks, and time allowances for reviews and approvals.

Prepare a Preliminary Work Plan for the project in bar chart format, covering all significant work tasks that commence in the first ninety (90) calendar day period of the project. Identify therein work items, tasks and milestones that affect MDT and third parties and events which are affected by the actions or omissions of such entities. Include with the Work Plan a brief narrative describing the Consultant's work during the schedule span. Therein, elaborate on the basis for event duration's and logic and identify major assumptions used to develop the Preliminary Schedule. Prepare the Work Plan in the form of a computer-generated CPM schedule network covering the entire project and identifying the critical paths and major and minor milestone dates.

At such times as it seems warranted, propose revisions to the Work Plan using the most current revised network diagram and submitting a narrative description of the changes proposed, together with the justification for the proposed change and an update of the schedule basis and assumptions.

3.1.2 Project Master Schedule Support

The Consultant will develop and maintain a project Master Schedule reflecting the design, right-of-way acquisition, third-party facility adjustments, contract bidding, construction, procurements, finishing, testing, and start-up activities as may be requested by MDT for the work elements. In this regard, reflect the conclusions of the adopted Procurement Plan as it pertains to design, construction, and related procurements. Separate activities related to the identification and tracking of procurement items that have "long lead time characteristics," and follow them on a regular basis. As work progresses and the Consultant becomes aware of circumstances at odds with the current project Master Schedule, notify MDT of the perceived departure from the baseline schedule.

3.1.3 Special Schedule Studies

As necessary or as requested by MDT, perform special schedule studies of particular Work Tasks or elements of the project Master Schedule. The objectives of such studies could include finding a:

- shorter overall schedule;
- different critical path;
- means of stepping around a blockage; or a
- more cost-effective solution.

3.2 COST ENGINEERING

During the period of each CWO under this Contract, maintain a cost engineering capability. Prepare such budgets, engineering cost forecasts, cost reports, cash flows, and other contract cost estimates as may be required to manage the work, forecast problems, and report progress. Provide contract cost inputs to the Consultant's periodic progress/status reports. Prior to the commencement of work under a Work Order, establish a related code of accounts which reflects MDT's work breakdown structure (WBS) and equates to Consultant's internal labor and expense cost accounting system. Maintain such account equations over the period of the Contract and take means to assure that charges made to MDT are under proper accounts.

3.3 CAPITAL COST ESTIMATES

Produce estimates of the capital cost of the elements of the project in accordance with FTA policies and procedures. Recognizing that Streetcars represent a new technology for MDT; develop a sufficient file of local, recent construction cost experience and cost trends to use in the pricing of workmanship, materials, equipment and methods. Anticipate that the demands of the project will vary in terms of level of facility

definition available from conceptual designs during preliminary engineering, to preliminary designs, to partially complete final designs, to completed designs, to Engineers' Estimates and to change order pricing. Of particular interest in this PE phase of design is the "baseline" capital cost estimate for the project. Be prepared to perform cost trade-off and life-cycle cost studies in support of the design work and to assist in the assessment of change control cost impacts. Respond to requests of MDT for capital cost status reports, projections, and trend analyses.

MDT, with the necessary Consultant assistance, will establish guidelines and standards for preparing these estimates that will include provisions for chart of accounts, estimate format, accepted data sources, methodology for handling direct and indirect costs, contingency assignment and risk assessment, and escalation considerations. A formal estimate review process will require that estimators submit their work for review and address comments by the respective designers and other staff.

3.4 O&M COSTING

The operating and maintenance (O&M) cost model used during the Environmental Impact Statement (EIS) process will be reviewed and updated by the Consultant, at MDT's discretion, as necessary to reflect the anticipated staffing plan and current labor (wages and fringes) and consumables (electricity, fuels, etc.) rates for MDT. Any additional cost categories needed to increase the precision of the forecasts will be developed by the Consultant for use in the resource build-up methodology.

Utilizing the updated system operation plan, service variables will be computed by the Consultant for the design year and the operating year. The service variables will be input into the O&M cost model by the Consultant to generate estimates for the two key years. Utilizing the Master Schedule, the Consultant will allocate cost to the appropriate years and escalate the estimates to year of expenditure (YOE) dollars for use in the financial analysis.

3.5 PROJECT MANAGEMENT INFORMATION SYSTEMS INPUTS

Anticipate MDT will adopt and operate certain project-wide management information systems (MIS), including computerized data manipulation. The Consultant will cooperate with and participate in these MIS efforts. MDT will define to the Consultant what is expected of it on periodic cycles of project status monitoring. The work of the Consultant is to assist in the control of the project, as may be directed by MDT, and to read, recognize, and heed MIS reports which are flagging trends toward departure of the project from the intended and baseline plan.

3.6 SCOPE CONTROL

3.6.1 System Specification Inputs

With recognition that MDT must document the project with a System Specification or System Description, beginning with the LPA definition, provide assistance to MDT in this work, as may be requested, with particular reference to the physical description of the System's fixed facilities and their placement in the corridor. Review draft material prepared by MDT and its other consultants for purposes of coordination and format and make suggestions where perceived correction or other improvement is needed.

3.6.2 Configuration Management/Interface Control Support

Anticipating the development and adoption of a Configuration Management Plan and Interface Control Procedures by MDT, receive such plans and procedures and delegate within the Consultant's staff responsibilities for operating and imposing these project control mechanisms over the period of the Contract. In accord with such procedures, alert MDT when any event or revelation shows or implies a force or circumstance is operating to divert the project from its baseline scope, description, internal or external interfaces or other established bases of design, construction and procurements.

3.6.3 Change Control Support

Given MDT's Change Control Plan and Procedures, support their purposes as an element of project control and follow the project-wide procedures which attend control of changes after the project Scope and Master Schedule have been baselined. Control of changes, including their rejections, is designed to prevent "scope creep" and other unintended, unauthorized or unrecognized changes in the project, particularly changes that could cause cost overruns or delays. Recognize that changes to project elements under design or construction, whether forced or elective, may have impacts in the work of other consultants and that all impacts must be evaluated in consort. A change which is beneficial in some way to the project works under development may be detrimental to the project as a whole and should be rejected. Participate in the operation of Change Control Procedures where work under the Contract is impacted regardless of where the Change Proposal originated.

3.6.4 Project Contract Unit Description Book Inputs

Once MDT approaches the start of final design work, participate in the preparation and maintenance of a booklet defining the identification, scope and interfaces of each Contract Unit (CU). Although MDT's Procurement Plan will also define the various types, purposes and limits of contracts MDT is scheduled to let, the CU Book facilitates contractual interface control and becomes a common reference to all project participants. In a format to be defined by MDT, draft descriptive material as input to this CU Book.

3.7 PROGRESS/STATUS REPORTS

Once MDT has defined what it expects with respect to making periodic reports of progress made, current status, critical issues, costs expended, costs projected, schedule problems and the like, submit monthly written progress/status reports in the prescribed format. Follow the format and other guidance to be provided by MDT. Anticipate need for narrative descriptions of work status by Work Order and task, computer statistical printouts, graphs, tables, and other forms of display. Be prepared to make presentations of progress and status at the request of MDT.

3.8 DOCUMENT CONTROL

Some of the following subtasks may become applied to an MDT-defined Document Control Plan for common use by all participants and some pertain to the Consultant's internal Document Control Plan, as appropriate. The Consultant will establish a web-based ProjectSolve system, or interface with the MDT site, for managing and sharing the proprietary data associated with the project. ProjectSolve is a secure, internet-based software program that provides information management, collaboration and communication tools to the project team. The ProjectSolve system will allow the project team to consolidate and coordinate information and activities from anywhere in the world using simple yet robust tools and an internet connection. The program allows the project and MDT staff to instantly access a central, common and secure database over the internet without the restrictions related to modem limitations.

3.8.1 Document Control Plan

Assuming adoption of an MDT-devised Document Control Plan for the use and benefit of all consultants, or the decision to use the Consultant's system, participate in its operation to the extent it involves MDT documents (all types) as contrasted to Consultant-specific documents which will also exist and require control. For the Consultant's internal use, develop or adopt an available document control system with a scope which recognizes the types of internal documents which are likely required in the Consultant's Office. (Refer to the following Subtasks which apply to either MDT-level system or the Consultant's system, or to both).

3.8.2 Correspondence

With respect to correspondence (i.e., official letters, internal memoranda, meeting records, administrative directives, invoices, draft Work Orders, status reports and the like), establish a project master filing

system, document routing and handling procedures, and standard distribution lists. In addition, develop a separate correspondence control system and related procedures (or extend MDT's system) to cover project-related topics and operations particular to the Consultant's Office. Where correspondence records can be stored or indexed electronically, consider such write-only data banks to facilitate access by participants on a need-to-know basis.

3.8.3 Reference Documents

Technical personnel working in the Consultant's office will be receiving and accumulating incoming reference documents. MDT's Document Control Plan will address how such references shall be logged in, described, and stored for reference and use by MDT staff and all consultants. Respect this system once established and cooperate with the placement on file of any type of reference material received by or generated by the Consultant. Comply with MDT's procedures and rules for checking out, borrowing, or copying stored reference documents.

3.8.4 Contract Documents

This reference is to complete or incomplete design drawings, reference drawings, definitive design drawings, standard detail drawings and specifications which are intended to become a part of a CU package. Some of these types of documents may be developed within preliminary design but the majority will be developed during final design. However, to the extent early contract documents are prepared hereof, comply with MDT's procedures and rules for controlling and identifying in-progress copies and storing when appropriate the current version of each such item.

3.8.5 CDRL Submittals

Once MDT awards a construction, procurement or installation contract, such contract will carry a summary of required contractor submittals – the Contract Document Requirements List or "CDRL." Because no such contract award is likely under the scope of preliminary design, this Subtask will not become active until final design. If, however, MDT and a third-party agree to advance adjustment of on-site facilities on behalf of MDT, such as utility lines, such agreements could precipitate early need to review materials submitted to MDT for approval or concurrence. If that becomes the case and it involves facilities under the purview of the Consultant, this task could be added by supplemental agreement.

4.0 QUALITY CONTROL

4.1 QUALITY CONTROL PLAN DEVELOPMENT

Draft a Quality Control (QC) Plan using such guidelines as MDT may provide in its quality assurance role applicable to the Consultant's work. Prepare the QC Plan in accordance with the applicable requirements of FTA's *Quality Assurance and Quality Control Guidelines.* Submit a draft of the QC Plan for MDT review and comment. Once feedback has been received, adjust the Plan, as may be necessary, and implement it, per Subtask 4.4.

4.2 DESIGN QUALITY MANUAL

To facilitate quality control and implementation of the adopted QC Plan, the Consultant will prepare a project-oriented Design Quality Manual for use by the Consultant and its subconsultants during preliminary design work under this Contract. First prepare and submit a detailed outline of the proposed coverage and content, for MDT approval, then draft the Manual for MDT review, comment and approval. Once completed and approved, publish and distribute the Manual to all entities participating in QC and QA, and carry out the QC Plan requirements.

4.3 DESIGN REVIEW PROCEDURES/SCHEDULES

The Consultant will coordinate with MDT's quality assurance representative to establish the relative levels at which formal reviews of design work will take place and the procedures which will pertain to such reviews. The Consultant's intends to use the ProjectSolve management information system.

4.4 QUALITY CONTROL PLAN IMPLEMENTATION

Once MDT has approved the Consultant's QC Plan, implement such Plan to the extent it applies to the work of the Consultant. Designate a staff individual as QC Manager with principal duties of monitoring QC Plan conformance and notifying the Consultant's Project Manager if and when failures to conform to the QC Plan are discovered.

5.0 CADD SERVICES

Establish, maintain, and upgrade an integrated computer aided engineering, design, and drafting (CADD) pool based on Bentley MicroStation® (latest version) computer systems. Utilize 3D CADD capabilities where appropriate for design elements and civil facilities to more easily facilitate the development of conceptual layouts, renderings, engineering designs, drawings, constructability reviews, construction planning and sequencing studies. Service the needs of the project during the preliminary design work. Project the demands of the project in terms of CADD capacity in the sense of work stations and peripheral equipment such as plotters, digitizers, and scanners. Provide the support of a CADD Production Coordinator to perform day-to-day oversight and coordination of the CADD production services.

The Consultant will produce a CADD Standards Manual, or adopt the standards manual provided by MDT, to help ensure that the preliminary engineering drawings are presented on consistent bases and in standard formats. Include coverage of sheet sizes and standard titling; uniform conventions, symbols, notations and textual material; cover and index sheets for contract sets; signing and sealing; use of graphic scales and other controls on the various producers of MDT drawings. Include also complete formatting information for working with MDT's standard MicroStation CADD system.

6.0 CIVIL DESIGN BASES

6.1 SITE INVESTIGATIONS AND DATA GATHERING

6.1.1 Assembly of Reference Data

Building upon the work completed during the AA/D EIS phase of the project, assemble reference data on existing conditions within the corridor or impact zone of the project. Update the Consultant's file material on existing and projected conditions potentially affected by or causing influence on the design or construction of project facilities. Maintain current the Consultant's knowledge of existing and projected conditions. Recognize in this regard that other subtasks of Task 6.0 provide for certain specific types of data gathering and that all other types of data are covered here. Add to and maintain reference files for the project as a living document.

6.1.1.1 Utility Facilities

Identify the utilities that exist within and adjacent to the system right-of-way for the project. Meet with the utility agencies affected by the project within and adjacent to the transit system and obtain information regarding the location and size of the existing and planned facilities. Conduct meetings to identify a formal contact person at each agency and develop a procedure to communicate the system requirements between the utility agency, the Consultant, and MDT. Utility research will include making written requests for as-built plans (hard copy and/or CADD discs where available) from the appropriate utility companies/agencies.

6.1.1.2 Traffic Data

Using the traffic data developed during the EIS phase as a basis, develop existing traffic data along the alignment and for intersections within station areas with park-and-ride facilities. Collect the following traffic data:

- Existing daily traffic volumes and a.m. and p.m. peak period turning movement volumes at impacted intersections.
- Intersection/crossing geometrics and future plans for widening or other roadway and traffic operational improvements.
- Existing pedestrian counts and data (where needed).
- Traffic data for signal warrant analysis.
- Existing signal phasings.
- Inventory existing traffic control, signal timing and equipment, hardware, and potential conflicts (i.e., wires, poles, signal equipment, street furniture) on streets impacted by the rail system.

6.1.2 Surveying and Mapping

6.1.2.1 Photogrammetric Base Mapping

Obtain new photogrammetric base mapping for PE and final design. Use the existing Second Order Class 2 baseline survey which was completed during the EIS phase of the project as the basis for mapping. Establish with MDT procedures for the control and distribution of base map files. Incorporate supplemental field survey data into the existing base map files. Maintain these base map files over the life of the project as needed and distribute updated files as needed to the entire project team.

6.1.2.2 Topographic Site Surveying

To the extent the project photogrammetric base mapping contains obscured areas or is not satisfactory in terms of detail or other requirements of the design, conduct topographic site surveys of the areas of interest that supplements the photogrammetric mapping with field surveyed topographic features utilizing existing survey control monumentation. This work includes determination of details such as critical structure and other building elevations and offsets; top of rail locations; curb elevations; back of sidewalk elevations; overhead power line elevations; cross sections of existing street and railroad rights-of-way, and survey support for geotechnical explorations. Recognize that the field surveys particular to utility lines and structures are covered under the work of Subtask 6.1.4, Utility Composite Maps.

6.1.3 Geotechnical Investigations

Explore the subsurface soil conditions along the alignment's guideway, ancillary roadway and parking lot improvements, stations, viaducts, parking garage structures, park-and-ride facilities, retaining walls, storage and turnback facilities, traction power substations, stormwater retention pond sites, and temporary sheeting/bracing systems. Give particular attention to early identification of the foundation requirements for the rail extension's aerial viaduct structures. Develop design parameters and make foundation design recommendations for the viaduct structures and for various ancillary structures along the alignment. This proposal contains an allowance for geotechnical investigations based on the tasks described below. This program may be adjusted during the course of the project by mutual agreement between the Consultant and MDT.

6.1.3.1 Compile and Review Existing Geotechnical Data

Assemble and catalog geological and geotechnical information gathered during the previous phases of the project. Research and collect additional geotechnical information available from Consultant team members and various public agencies.

6.1.3.2 Develop and Implement Geotechnical Field Exploration Standards

Develop geotechnical field exploration standards and geotechnical quality control procedures to be used on the project. Standards would include soil/rock classification, geologic unit terminology, drilling and sampling procedures, and boring log presentation.

6.1.3.3 Subsurface Exploration Program

Geotechnical subsurface exploration field methods will consist primarily of standard penetration test (SPT) test borings in accordance with ASTM D1586. SPT test borings will be taken along the proposed bridge and viaduct structures to estimate depths and vertical and lateral load capacities of deep foundation alternatives for these structures.

In addition, other SPT test borings will be drilled at the locations of proposed facilities not located directly aerial alignment, including ancillary parking improvements, traction power substations, and stormwater retention pond sites. SPT test borings will be accomplished with rotary and/or hollow-stem auger drilling techniques. Use of drills mounted on a combination of vehicles, including on-road trucks, rubber-tired all-terrain vehicles, and low ground-pressure crawler vehicles. Most sites are expected to be accessible with on-road truck drills. Both standard split spoon samples and undisturbed soil samples will be obtained from the SPT test borings, as appropriate to the conditions encountered.

The general locations and depths of the borings will be determined as early as possible during the preliminary design phase. However, the locations and depths may be revised as needed during preliminary design of the exploration program as new information is obtained and the geology is better understood. The borings will be located by hand-tape measuring from known site features. The as-drilled land boring positions will be clearly marked with stakes or paint, enabling them to be located by surveyors.

Up to an estimated 120 SPT borings (a total of 12,000 feet of drilling) will be performed. Borehole percolation testing (at an assumed depth of 15 feet) will be conducted along the proposed route at an average spacing of approximately 500 feet.

An engineer or geologist will be present at each SPT test boring drill rig to monitor all field work, log the borings, conduct field tests, and obtain specimens of samples for future examination and selected laboratory testing.

Soils samples from the subsurface explorations will be screened with a Photoionization Detector (PID) meter. If contaminated soils or soils containing methane gas are detected, MDT will be notified. Resistivity tests at selected boring locations will be taken and analyzed. Arrange all necessary utility checks prior to starting the drilling program. All permits and right of access/entry will be obtained by others.

6.1.3.4 Field and Laboratory Testing

Field testing will consist of groundwater level monitoring and preliminary in-situ permeability testing. Preliminary evaluations of in-situ permeability testing will be obtained using crude slug tests in selected monitoring wells. Groundwater monitoring will include initial readings until stabilized, monthly readings for a three-month period, and quarterly readings thereafter.

Laboratory testing will be conducted on selected soil and rock samples to determine index and engineering properties to assist in identifying soil units and enable correlation with existing soil data. Index tests will include water content determination on approximately 30 samples selected for testing. Grain size distribution, Atterberg limits, and unit weight determination will be performed as appropriate on approximately 60 selected SPT and undisturbed samples.

6.1.3.5 Evaluation of Geotechnical And Groundwater Conditions

Update the interpretation of general geotechnical and groundwater conditions along the selected alignments based on the results of the preliminary engineering subsurface exploration program, field tests, and laboratory tests. Prepare subsurface profiles, to a degree of accuracy commensurate to the average boring spacing that can be used in the geotechnical engineering analyses and foundation design.

6.1.3.6 Preparation of Preliminary Geotechnical Data Report

Based on the evaluation of geotechnical and groundwater conditions made during the preceding tasks, prepare a Preliminary Geotechnical Data Report that includes the results of the subsurface explorations (boring logs, groundwater level observation well logs, subsurface profiles, and results of both field and laboratory tests, groundwater levels as a function of time, and laboratory test results). The general subsurface conditions along the selected alignments will be included, along with a description of each geologic unit encountered along the alignment, and the unit's geotechnical engineering characteristics.

6.1.3.7 Data Analysis and Engineering Evaluation

Data collected during the preliminary exploration phase will be analyzed by geotechnical and foundation engineers as necessary to perform preliminary engineering evaluations for design of the project facilities. Facilities for which preliminary engineering evaluations will be preformed include the ancillary roadway and parking lot improvements, stations, viaducts, parking garage structures, retaining walls, traction power substation foundations, stormwater retention pond sites, and temporary sheeting/bracing systems, as well as for post-construction settlement control and ground improvement measures where necessary.

6.1.3.8 Preparation of Preliminary Geotechnical Design Report

Data analysis and engineering evaluations performed under the preceding subtask activity will be used to develop geotechnical recommendations for specific structures and site areas. These recommendations will be initially provided in the form of technical memoranda as the work progresses during the course of both preliminary and final design. Near the conclusion of the preliminary design phase, a preliminary Geotechnical Design Report will be issued to summarize all data analyses, engineering evaluations, and geotechnical recommendations issued in technical memoranda up to that time.

6.1.3.9 Geotechnical Work Plan for Final Design Phase

Additional geotechnical engineering exploration and analyses will be required in the final design phase once additional preliminary explorations, field tests, and laboratory tests are completed. The objective of the geotechnical program during final design program will be to determine with more confidence the stratigraphy and soil, rock, and groundwater behavior conditions along the route at key sites and to establish the geotechnical parameters to be used in final design. Based on the findings of the preliminary geotechnical investigations, a final design work plan will be prepared which describes additional geotechnical data that will need to be obtained for final design, including additional field explorations, field testing, laboratory testing, and engineering analyses. The geotechnical work plan for final design will be provided as a separate chapter of the preliminary Geotechnical Design Report.

Wetland delineation, which could affect access to proposed boring locations, will be identified. Geotechnical borehole locations will be coordinated with locations selected to evaluate the presence of contaminants to assist in the environmental/hazardous waste assessment efforts.

MDT will make contacts and perform coordination with property owners and tenants as necessary to obtain right of entry for drilling of test borings, installation and reading of ground water level observation wells, and other geotechnical field investigations.

6.1.4 Utility Composite Maps

Using the utility owner's maps and records obtained under Subtask 6.1.1.1 as a basis and guide, the Consultant will conduct field surveys to locate surface features of each utility. Electronic detection techniques and/or test pits will be used to locate critical underground interfaces between existing or relocated utilities and proposed facilities. Existing utilities that might impact the design of the project include storm drainage and sanitary sewers; gas lines and valve boxes; petroleum product pipelines; water mains; power lines, poles, ductbanks and vaults; and communications systems both underground and overhead (telephone, cable transmission systems, alarm systems, etc.). Test pitting for location verification may be accomplished, as needed, by the utility owner or by the Consultant.

Prepare a set of utility composite maps showing the array of existing utility lines and facilities. Identify each utility by owner, type, and location using a separate matrix array keyed to the map set. Once such utility composite maps are completed and checked, submit prints to the respective utility entities for their review and concurrence with the Consultant's interpretation of their individual plans and records. Make revisions or adjustments in the utility composite maps as may be necessary.

6.2 DESIGN POLICIES OF MDT

Anticipate that MDT will assemble a listing of all subjects relating to the project for which a policy pertaining to inclusion, recognition, scope, function, conditions, and limitations is required. Review this list and annotate the listing of policy topics for additions of omitted coverage, for deletions of unnecessary coverage, and for updating or other revisions. Review the annotated list with MDT to reach agreement on design policy coverage and the work program to correct, update, and expand past coverage. Draft new and revised design policy statements relating to the project to fit the agreed coverage. As discrete policy statements are completed submit these to MDT for review, comment, and approval. Assist MDT in maintaining the design policies and assuring changes to published statements are controlled throughout the project.

6.3 DESIGN CRITERIA AND STANDARDS

Utilize the design criteria provided by MDT, or create the design criteria, to establish the basic design concepts that will be held uniform throughout the project. If requested by MDT, the Consultant will expand and update relevant chapters of MDT's criteria and standards into a set of Detailed Design Criteria as an additional service.

6.4 OUTLINE TECHNICAL SPECIFICATIONS

Draft a set of outline technical specifications in CSI format for construction and for furnishing and installing facilities and systems items related to the project. Include coverage of civil, structural, architectural, mechanical, and electrical work and work related to the various work elements of the project. Index these outline specifications to the master list of section numbers in the format of CSI Divisions 1 through 16.

7.0 PRELIMINARY ENGINEERING

7.1 GENERAL

- Respond to public and review agency comments received on the DEIS.
- Resolve any outstanding DEIS issues or design options necessary to complete the definition of a final LPA or baseline for Final Design.
- Provide environmental information for use in the public information program.
- Identify the environmental permits that will be required prior to construction of the system.

- Prepare a FEIS document, and, as appropriate, a Section 4(f) Evaluation and Section 106 Determination of Effect and Memorandum of Agreement, which meet applicable federal and state requirements, if required.

- Prepare a ROD for formal environmental clearance for the project to advance into the next phase of project development – final design and construction.

The specific scope of Consultant services under the Contract is further defined in the following sections.

7.1.1 Environmental Support

7.1.1.1 Environmental Coordination

This subtask is to provide for ongoing support, liaison, and coordination of effort between the Consultant and MDT's preparation of the FEIS. Included under this subtask is coordination on the selection and documentation of mitigation measures identified in the FEIS and that the Consultant designs are consistent with and responsive to the statements and commitments made in that document. Table 7-1 provides a summary of potential environmental impacts.

Table 7-1. Summary of Potential Environmental Impacts

Issue	LPA
Relocations	2 Business, 6 Public Sector
Wild and Habitat	Perform updated sea grass and fish habitat survey; address structure shading issues.
Environmental Justice	Pro-active public involvement program. No disproportionately high or adverse effects on single communities; effects to fall evenly on corridor residents.
Utilities	Potential conflict sites, none affecting service.
Visual/Aesthetics	Moderate
Air Quality	No standards exceeded
Noise	South Pointe Elementary School
Water Quality	Minor effects. BMPs to be used during construction; storm water facilities designed to fulfill water quality requirements.
Archaeological Sites	present;
Historic Sites	Minor
Section 4(f) Resources	No identified effect
Contamination	35 total sites; risk level to be determined

The data in Table 7-1 is based on the original alignment and will be updated during the ongoing FEIS work to address the impacts of the refined LPA.

7.1.1.2 Hazardous Materials

During the EIS phase of the project, a Level I analysis was conducted to determine the actual or likely presence of hazardous materials on or within the soil or ground water at sites where structures or facilities are proposed was assessed. The Consultant will update the Level I analysis and conduct a Level II Analysis of the sites rated as having a medium to high possibility of contamination. The Level II Analysis shall update and complete, as necessary, those field investigations, sampling, and analyses required to identify the extent and type of hazardous material present. Include in this assessment those proposed as storm water management facilities. It is assumed that investigations into asbestos and lead paint contaminants would be conducted by the right-of-way acquisition support work done by others. The Consultant will prepare a final Contamination Assessment Level II Report identifying the sites requiring remediation and a recommended action plan for cleaning up the sites.

7.1.1.3 Noise and Vibration

During the EIS phase of the project, noise and vibration studies were performed at selected sites to determine the general areas and potential levels of impact. For the project, it is now necessary to quantify more precisely the impacted locations, the extent of the impacts, and the proposed mitigation measures defined in the FEIS. The specific mitigation measures identified must be incorporated in the Consultants preliminary designs. The Consultant will develop a specific plan to conduct the additional noise and

vibration studies, and incorporate specific mitigation measures into the Consultant's preliminary (and final) designs.

7.1.2 Alternative Designs and Cost Trade-Off Studies

As may be specifically directed by MDT, conduct technical studies and comparative evaluations of alternative preliminary design solutions to any facility or system element of the project. Include, as appropriate, trade-off studies, life-cycle cost analyses, cost-effectiveness comparisons, aesthetic evaluations, environmental impact assessments and other sets of decision factors. For each such study, develop a technical report describing the issues, the alternatives, the comparisons made, the decision matrix, the conclusions and any recommendations. While this scope item is included, no budget has been provided for this task. As these items are identified, a scope, schedule and budget request will be developed for each study and submitted for MDT's approval.

7.1.3 Special Work Assignments

As may be specifically directed by MDT, carry out any special work assignment pertinent to the project within the preliminary engineering design phase. Provide technical analyses and reports for unprogrammed work which may be required related to the execution of each project. While this scope item is included, no budget has been provided for this task. As these items are identified, a scope, schedule and budget request will be developed for each study and submitted for MDT's approval.

7.2 PRELIMINARY ENGINEERING DESIGN

Under this task, the Consultant will advance the level of facilities design development from that completed for the AA/D EIS process and subsequent refinement of the LPA to completed preliminary designs of various facilities wherein design is approximately thirty percent (30%) completed. It is the objective and policy of the FTA and MDT to identify and resolve all substantial design issues and third-party impacts prior to commencing final design and to develop capital cost estimates by Contract Unit as a part of preliminary design completion. Such cost estimates, once accepted, become the new baseline cost target for final design guidance.

7.2.1 Preliminary Alignment Design

Recognize that at the completion of the preliminary engineering design phase, the horizontal and vertical alignment of the project must be more than "preliminary." It must be near-final and fully mathematized, subject to only adjustments engendered by the final design of structures and systems, third-party conflict resolution and systemwide elements as bid. Given the project location as concluded through the AA/D EIS process and LPA refinement and given the evolving results of the other preliminary design tasks, the Consultant will refine the project control lines which have been selected to define the alignment by applying the geometric design criteria and recognizing the constraints and controls at locations presented by the site. Plot the limits of transit structures and any added clearances for construction, safety, and other separation requirements and use this project "footprint" to make adjustments in the horizontal alignment. Similarly, reckon with constraints on final vertical alignment including special trackwork locations, minimum clearances at crossings of highways and railroads, structural bridge deck allowances over waterways, criteria limitations on maximum an minimum profile grades, and vertical curve standards. As portions of the graphical project alignment becomes essentially final, compute the alignment and tie its control points into the State coordinate system and the project control baselines and benchmarks.

Summarize the preliminary alignment design work of this subtask in a set of plan and profile drawings. Base the plan and profile drawings on the final design base mapping at the selected final design scale, screened to accent proposed features. Include in this work, existing railroad trackage and structures and proposed relocation or other adjustments. Show each passenger station platform and its major features. Show also traction power substations, proposed modifications to existing conditions in the corridor, such

as street relocations and other revisions, retaining walls, grade separation structures, and crossings, and drainage systems. At the site selected for the proposed storage yard and shop, developed the site layout plans and show the required special trackwork locations. The plan and profile drawings shall show a strip of the linear plan view above a vertical profile grid such that the stationing of each corresponds as much as possible. Show on the profile portion the proposed transit facilities (top of rail or guideway, line structures, station platforms, and crossings above and beneath the transit guideway), the existing grade line, and major overhead and underground utilities. Show the mathematized horizontal and vertical geometry, control point stations and elevations, bearings, horizontal curve and spiral data, grades and vertical curve data in tabular form on the drawings. Prepare these drawings in MDT standard MicroStation CADD format.

7.2.2 Preliminary Trackwork Design

Identify trackwork related elements required for the system and determine their general configuration, method of procurement, and method of installation. Begin this work with a review of the conceptual drawings from the AA/D EIS and LPA refinement process, design criteria and standards, preliminary operating plans, and relevant vehicle parameters. Develop operating conditions on each section of trackwork to include such factors as revenue vs. non-revenue trackage, storage tracks, maintenance restrictions, and track quality indices. Coordinate with the noise and vibration mitigation work to identify specific measures to be applied in the design of the trackwork along each section of the project.

Develop running rail standards for track at the early stages of the design. Develop running rail standards for with consideration to procurement lead time, procurement costs, installation costs, vehicle wheel and truck characteristics, and other operating and maintenance requirements.

Identify the physical and functional interfaces of the track system with the signal and traction power systems. Incorporate rail bonding to cover track circuit requirements and stray current mitigation into the design. Coordinate with the designs for third-rail power system, signal supports, and with track and related equipment locations.

The Consultant will prepare schematic track layouts showing locations of crossovers, turnouts, at-grade crossings, structures, and special trackwork following the operating concepts developed for the project. Prepare preliminary detail drawings of special trackwork for the line, storage yard, and for any freight track relocations and connections required. Develop preliminary written specifications for each element of the track system. Identify quantities of trackwork and track subcomponents required for the project. Determine the methods to be used for procurement and installation of trackwork elements.

7.2.3 Preliminary Civil Design

The Consultant will develop the civil works designs from the conceptual level to approximately the 30 percent (30%) level of completion. In conjunction with the preliminary alignment design discussed in subtask 7.2.1, prepare preliminary plans for the general categories of civil works designs to begin definition of construction work necessary to accommodate the fixed-guideway. Include in the preliminary engineering designs and documents:

- Preliminary designs of the reconstruction of improvements showing the proposed surface modifications required due to the imposition of the at grade guideway, stations, systemwide features and aerial structure foundations and columns on the surface and subsurface uses. The designs will take into account drainage patterns, including runoff from Metrorail structures, underground utilities, graded slopes, buildings, fences, sidewalks, curbs and gutters and roadways.
- Preliminary station civil site plans showing the station area improvements and modifications to existing surface and subsurface infrastructure features. The plans will reflect the impact of the

station and station site development (parking lots, intermodal transfer facilities, access roads, and drives), drainage patterns, underground utilities and existing surface features such as structures, fences, sidewalks, curbs, gutters and roadways,

- Preliminary drainage plans indicating existing and proposed major drainage facilities associated with the station sites, guideway, yard storage and facility, traction power substation sites, and stormwater treatment facilities. The plans will include surface drainage, pipe layout with catch basins and manholes, pipe and structure sizes, and a drainage profile.
- Preliminary cross-sections indicating existing ground lines and photogrammetric features, major existing utilities and drainage structures, and proposed improvements.
- Preliminary site plans indicating traction power substation and catenary pale locations and associated access requirements.

The Consultant will produce and submit preliminary engineering civil works design plans and outline technical specifications. Provide preliminary quantity take-offs of civil works designs for cost estimating purposes.

7.2.4 Preliminary Utility Relocation Design

Given the recorded and checked locations of utility lines and facilities in or near the project area as compiled under the work of Subtask 6.1.4, the Consultant will determine under this subtask the methods by which conflicts between such existing utility lines and structures and MDT's proposed construction and structures may be resolved. Given such alternatives as permanent and temporary relocation, strengthening for support and protection in place, and abandonment and salvage, evaluate the viable options and conclude with the owner a course of action. Develop preliminary designs of the agreed relocations or other work and coordinate this effort with the owner. Where MDT and a utility owner have agreed the utility owner will design the relocation, review such third-party design work to verify its conformance with the project's needs and to identify any betterment's which may be included.

7.2.5 Preliminary Traffic Design

7.2.5.1 Conduct Station Area Traffic Analysis

The Consultant will conduct traffic impact studies as necessary to support the design and environmental analysis The impact of the increase in traffic on arterial intersections and neighborhood streets will be analyzed based on the number of peak hour auto arrivals and the volume and LOS of background traffic at intersections and on neighborhood streets where surface parking is removed, the Consultant will designate the necessary off-line parking facilities to replace last parking. Based on a review of the patronage forecasts, the Consultant will identify the area of primary impact for each station. Within the station impact area, the Consultant will identify the impacted arterial intersections requiring upgrades. These critical intersections will be defined as intersections that are either now operating, or projected to operate, at an unacceptable LOS during one or both peak periods, or are determined to be critical for access to the station parking facilities. Review the intersections identified for analysis with local jurisdictions, and revise accordingly.

Conduct capacity analysis of the critical intersections to determine LOS under existing conditions and forecast year conditions both with and without station traffic. Identify improvements required to mitigate the impact of the station traffic and determine LOS with improvements.

In addition to the impacts on arterial streets, localized increases in traffic volumes may also occur on neighborhood streets near stations. The impacts occur from traffic diverted from congested arterials as auto access transit patrons travel through neighborhoods to reach stations. However, some of the traffic would be on the neighborhood streets anyway as many of the transit patrons live in neighborhoods near transit stations. Within the station impact area, the Consultant will identify neighborhood streets where

traffic volumes may increase using the assignments of station traffic. Where impacts are identified, review station site plans to determine if access routes and driveways may be relocated to minimize impacts on neighborhood streets. Results of the on-site investigation will be incorporated in revisions to parking facilities shown on the station site plans. If on-site mitigation cannot be provided, identify off-site mitigation measures. Low-cost measures to be evaluated may include turning restrictions, modification of or installation of signalization, traffic calming treatments, removal of on-street parking in neighborhoods, and neighborhood parking controls. In cases where low-cost measures are inadequate, evaluate geometric improvements to arterials to reduce the diversion of traffic, such as the addition of turn lanes or roadway widening.

7.2.5.2 Prepare Preliminary Traffic Plans

Prepare preliminary design plans for each intersection identified for improvement within station areas. The plans will consist of pavement marking, signing, and signalization plans. Also prepare preliminary design plans showing marking, signing, and signalization for maintenance of traffic during construction of the project. Coordinate preliminary design of intersections with local agencies to comply with local agency standards and policies.

Provide in these preliminary plans the basic information for the preliminary civil works design in Subtask 7.2.3. Provide cost estimate support for traffic facilities. Summarize the traffic methodology, analysis, and results in a technical memorandum.

7.2.6 Preliminary Architectural Design

The purpose of this task, building upon the extensive station area planning effort coordinated to date, will be to establish the design of the basic architectural and landscape features, functional requirements, urban design guidelines, and interface with the systemwide elements.

7.2.6.1 Preliminary Station Design

Under this subtask, the Consultant will develop for each passenger station the basic functional requirements and scope of each station.

Existing Conditions and Evaluation

The first step of completing any plan is “getting ready.” The PB team will set the table for developing a successful Bay Link station area plan with the development of a station area briefing book. We will also gather background information to provide a common database for the charrettes and subsequent work. That will include: land use, land and improvements value; land ownership patterns, zoning, proposed developments, traffic counts of all surrounding arterials/local roads, topography, aerials, population and employment forecasts, and the most recent information on design alternative for Bay Link. The PB team will also prepare an inventory of the barriers and opportunities for TOD in the Bay Link Corridor. As part of the inventory, the team will complete an assessment of current land use plans and codes in the corridor to gauge the extent to which they are “transit-friendly.”

The initial step will be a project kick-off meeting with key stakeholders to review and discuss the objectives for the corridor, and to understand their needs, dreams and fears for station area planning and development in the Bay Link Corridor based on the results of the station area planning conducted to date. At the kick-off meeting the PB team will present a first draft of criteria to evaluate and select stations for inclusions in station area planning. Based on comments the team will finalize the criteria and prepare recommendations for selection of stations for station area planning.

Development Transit Oriented Design

Successful TOD starts with the earliest decisions on the shape and design of transit systems. It is amazing how many new transit lines have been designed in a manner hostile to TOD-surrounding the stations with parking. Locating stations in areas with little or no development potential, and providing for poor pedestrian connection s form the station to the community. The result is messed opportunities – a jackhammer, as every engineer knows, is a very expensive eraser.

PB will organize and conduct a multi-day workshop to evaluate and recommend modifications to base project alignment, station locations, the design of park and rides, and the layout of bus transfer facilities to optimize the design of the Bay Link Corridor for both transit functions and transit-supportive real estate development.

For the workshop PB will convene a "Development Swat Team" made up of architects, developers, planners and transit design engineers. Staff from Miami-Dade and other appropriate agencies will join the Swat Team.

In reviewing the base design of the project the Swat Team will start by applying a series of design principles to with an eye toward enhancing the opportunity for TOD. The team will start by applying the principles of "development-oriented transit":

- Is the station in an area with development potential?
- Are transit facilities designed in a compact, pedestrian manner?
- Does the design of station facilities allow for direct pedestrian connections from the transit facility to adjacent communities?
- Has the park-and-ride been designed in a manner that it does not separate the station from the community it is intended to serve?
- Has TOD been appropriately incorporated into the transit facility design?

TOD Design Charrettes

A key to development of TOD Sketch plans for the Bay Link Corridor are the design charrettes. We are proposing to undertake a three-phased planning process organized around two design charettes. The charrettes are an opportunity for key stakeholders to roll up their sleeves' and jump into the project with senior members of the PB team.

The first charrette aims to tease out the vision, opportunities, Markey realities, and circulation in the project study area. Using small groups the PB team will walk key stakeholders through the process of developing a series of scenarios for each station area. Like crash-test dummies, these scenarios are not designed to survive the process – they assure a full range of practical options can be developed, evaluated and illustrated.

The charrette results then go back to the PB Team to take the 'best bits' for refinement in advance of the second charrette to develop the refined TOD Sketch Plan. The Plan must both inspire and be based on a consensus of what is desirable, a real estate assessment of what is possible, a phasing strategy for what is expected, and an identification of the strategies and actions necessary to make it happen.

TOD Sketch Plans

The result of this task will be the development and refinement of a TOD sketch plan for each of the selected station areas. The scope of work is organized to enable the PB team to prepare the sketch plans by drawing on the results of each of the tasks within the scope. Building on the results of the two charrettes, a detailed Sketch Plan will be prepared. The detailed TOD Sketch Plan will include the areas with an easy walk of selected stations. The Sketch Plans would include the preparation of a station area plan including a vision for the area, a land use plan map of future land uses, renderings and sketches

illustrating future land uses, a description of zoning to accompany the land use map, an urban design plan and a schedule and strategy for economic development and implementation.

Transit-Supportive Land Use Policies

PB proposes to develop transit-supportive land use policies necessary to guide development in a manner consistent with the sketch plans. The land use policies will be tailored to the Bay Link Corridor based on input obtained from local officials, the charrettes and best-practice from across the United States.

Building on both the land use assessment paper and the results of the TOD Sketch Plans the PB team will provide a working paper with a station-by-station assessment of transit-supportive land use changes that would have the greatest positive benefit in securing the highest possible FTA land use rating.

One particularly appealing strategy would be for Metro-Dade to 'contingently' adopt a small package of targeted land use changes necessary to accomplish the type of development envisioned in the TOD sketch plans. For example, the City of Portland adopted density increases in proposed LRT station areas that were self-executing upon receipt of a federal funding commitment for the project. In rating the Portland project, FTA gave them full credit for having adopted policies even though they were lying dormant until a full funding grant agreement was signed.

TOD Guidebook and TOD Toolkit

In support of the Bay Link Corridor Sketch Plans PB will produce a richly illustrated TOD Guidebook suitable for use by local elected officials, planning staff, and developers. The result would be an illustrated guidebook of approximately 70 pages addressing the best practices for TOD planning, implementation and design. The guidebook would include a TOD definition, benefits of TOD, approaches for TOD zoning, as section on TOD Implementation, case studies of built TODs, approaches for designing transit with TOD in mind, and a checklist for evaluating TOD.

Rather than reinvent the wheel we propose to draw on from US best-practice, over 80 Guidebooks in place across the United States. PB would tailor the guidebook to meet the unique needs of Miami-Dade using an interactive process with key stakeholders to develop a guidebook outline which can be most effective in meeting the needs of Miami-Dade. We successfully used this approach in developing TOD Guidebooks for the State of California, Maryland DOT, Orange County Transit in California, and for the Northwest Transit Corridor (NWTC) in suburban Chicago. We propose to use those Guidebooks as a starting point in order to complete this task as cost-effectively as possible.

Final Report

The PB team will prepare a final report summarizing the work completed for the study.

TOD Workshops- with key stakeholders, education/national case studies of TODs with applicability to the corridor/documentation of benefits of TOD/development of PowerPoint for use by project.

The Consultant will develop preliminary layouts of each station site and preliminary plans and designs for all standard architectural features. Special attention will be given to impacts on surrounding neighborhoods. The Consultant will indicate the projected passenger loadings to be accommodated in terms of "offs" and "on's" by peak and base period, the maximum train consist, the quantified requirements for parking and kiss ride stalls and for bus bays, the directional and modal aspects of feeder bus connections, and the number of fare vending units.

The Consultant will develop preliminary architectural elements, which will be utilized at various stations to provide a continuity of system image. The architectural elements, which vary at each site, will be generally defined, but their specific features will be comprehensively detailed in the final design phase.

Specific architectural elements should be directed toward the overall visual and aesthetic quality of the system, and should be continually monitored for cost of design materials and constructability.

Station designs will include development of guidelines for design of canopies, platform furniture, surface treatments, parking lot layouts, landscaping opportunities, handicap accessibility, and area lighting requirements.

Develop preliminary site plans showing the station proper and adjacent rail guideway sections, parking lots, intermodal transfer facilities, bus stops, traction power substations, drainage systems and retention basins, access and circulation roadways, traffic control devices, signage, lighting, landscaped areas, and public art.

7.2.6.2 Yard and Shop Facility

The yard and shop facility (Y&S) must include the service and inspection shops, repair shops, maintenance of way facilities, storage yard and the operational and dispatch facilities for the Bay Link Streetcar system. The specific location and needs of the facility must be closely coordinated with the Miami Streetcar project which may share the facility. The PE effort will build on the work supporting the adoption of the LPA by finalizing the location and completing an industrial engineering assessment for the facilities, the design criteria and standards, and evaluating the existing conditions and constraints at the selected site.

Based o the industrial assessment of needs and spatial requirements, the work generally consist of;

- The definition of such features as shop lighting, catenary/stinger arrangements, door types and openings, layout of the administrative and service employee areas, AVAC and other requirements are to be described in sufficient detail to eliminate costly changes in the final design.

- Develop preliminary engineering and architectural designs for maintenance facility service and inspection shops, repair shops, car wash, paint shop, operations controls center, maintenance-of-way (MOW) facility, electrical substation, and storage yard.

- Develop alternative layouts, as required, of the site and the required facilities and evaluate them on the bases of functional efficiency, safety, service reliability, environmental impacts, interfaces with neighboring land uses, provisions for staged development and growth, capital and operations and maintenance cost and other determinants.

- Advance the preliminary design of the yard including its main line access tracks, transition zones at yard entrances, storage tracks, wash and cleaning track/facility, blow-down and inspection pits, shop tracks, and dead-car storage tracks, to the point where a preliminary mathematization of alignment is feasible.

- Layout service roads, fire lanes, grade crossings, parking lots, materials storage areas, catenary overhead installation support poles, perimeter walls and fencing with gates, area lighting standards, emergency generator, and yard drainage detention system.

- Develop a preliminary architectural design for each shop building and other related buildings. Provide preliminary plan and elevation drawings for each building including work flow process, functional layout, floor plans, tracks, pits, major equipment layout, utility connections, lighting, building power and mechanical systems, fire protection systems, traction power provisions, operational dispatch center, yard control tower, administrative and employee relief areas, structural and architectural materials and finishes and other details.

A good deal of emphasis will be placed on the development of any mitigation measures identified or negotiated with stakeholders in the surrounding area to mitigate any adverse impacts of the facility or its operation.

7.2.6.3 Urban Design

The task of Urban Design will encompass the careful fitting of the rail system into the context of the corridor through which it runs. This process of integration affects every planned and constructed element of the system, from detailed trackway alignments to the architecture of stations. Successful urban design links the demands of engineering and operations with the greater aspirations and needs of the community. Issues that will be addressed by urban design include engineering and architectural aesthetics, historic compatibility, community planning and development, and accessibility.

The Streetcar alignment will be studied to assess opportunities and constraints for the integration of stations and other transit elements with streetscapes, adjacent land uses, and favorable development patterns. Urban design principles and specific proposals will be developed to make the system compatible with the varying aesthetic conditions of the corridor.

In developing preliminary engineering for the guideway and facilities, the Consultant will attempt to provide the design that embraces opportunities to enhance and compliment its urban environment. In addition to providing transportation services in a safe environment, the physical components of the system, including aerial line structures, stations and art work, parking lots, turnback and storage facility, traction power substations, and other wayside structures, should afford good appearance, durability, sensitive design and provide a regional identity in compliance with local requirements and in relation to the varying neighborhoods and land uses of the city of Miami.

The Consultant will prepare an Urban Design Report, covering the process, technical analysis, and recommended policies, programs, planning and design guidelines. The elements of the Urban Design Report will be incorporated into preliminary engineering drawings as appropriate.

7.2.6.4 Preliminary Landscaping Design

The Consultant will prepare preliminary landscaping designs that will include the following: site plans indicating planting and site improvements at stations, parking lots, bus stops, turnback and storage facility, traction power substations, landscape and site details as necessary for clarification of design; hardscape and/or landscape design within station sites and other identified areas.

The following objectives will be adhered to when developing the preliminary landscaping design:

- Provide a landscape design responsive to and compatible with intended system operations, station architecture, graphics, lighting design, and amenities.
- Provide a safe, secure, comfortable and attractive environment throughout the system.
- Achieve landscape design that is compatible with local climatic conditions and conserving of water resources.
- Achieve landscape design that is compatible with the regional aesthetic character and with the character of existing neighborhoods adjacent to the system right-of-way.
- Create a permanent landscape that requires minimal maintenance.
- Establish visual screening where necessary to soften the impact of unattractive adjacent land uses and provide privacy to adjacent residential property, as appropriate.

- Protect and enhance attractive plant materials that may exist along the right of way and to replace such materials that must be removed during construction.
- Ensure that landscaping, architecture, site engineering, and public arts elements are visually and functionally compatible.
- Ensure that landscape id designed so as not to encourage vagrant encampments, varmint nesting, and meets with local criteria.

7.2.6.5 Art in Transit

The Consultant, working with MDT, will prepare an Art in Transit Plan for the project. This plan will identify art opportunities, a list of eligible artists, procedures for developing art RFP's, and establish a budget and scope for art throughout the corridor. Selection of specific artists and preparation of designs will not be initiated until the final design phase.

The plan will compile an inventory of art opportunities throughout the corridor. These opportunities will include, but not be limited to:

- Opportunities for collaborative work (functional elements, shelters, landscaping)
- Opportunities for commissioned artworks
- Opportunities for community involvement

The plan will identify a procedure for soliciting the selection of artists to be awarded contracts. It is anticipated that an RFP will be sent to prospective artists at the beginning of the final design phase.

The plan will identify how the Art in Transit program will progress into final design and construction. A schedule will be prepared that can be inserted into the overall implementation plan for the project.

Preliminary Art in Transit Report

The Consultant will prepare a report that records the status of the Art in Transit program at the completion of the Preliminary Engineering phase of the project, including identification of next steps. The report will include an implementation plan for final design and construction, a summary of art opportunities in the corridor, a summary of Committee meetings, and a record of any other conclusions drawn through the process.

7.2.7 Preliminary Structural Design

The subtasks defined here are intended to produce the most advantageous configuration of project or system structure component in terms of cost, aesthetics, alignment, environmental impact and constructability, including the evaluation of alternative structural concepts and materials and the selection of a preferred choice for the given project site conditions. This scope statement encompasses any type of transit line structure or, peripheral structure – at-grade, aerial, embankment, open or walled cut, retaining walls, maintenance facility structures, bridges, and drainage structures.

7.2.7.1 Alternative Structural Concepts

Given a conclusion about the general structural solution and related adjustments to line and grade, evaluate alternative structural design concepts considering different structural materials and finishes, varying visual and acoustic impacts, aesthetic properties, life-cycle cost, and other characteristics. As may be necessary, draft evaluation criteria to assist in the selection of a final concept and apply these to all alternatives.

7.2.7.2 Preliminary Structure Design

Given the conclusions of other subtasks of this task, the Consultant will develop preliminary structural design of all major project structures, including transit guideway structures, retaining walls, storage and turnback facility, station structures and other facilities.

7.2.8 Preliminary Storage and Turnback Facility Design

The Consultant will produce preliminary design drawings of the storage and turnback facility to form the bases for preliminary capital cost estimates and final design.

7.2.9 Preliminary Mechanical Design

Under this task, the Consultant will perform preliminary mechanical design for station mechanical systems such as elevators, escalators and service water connections. The Consultant will prepare the design in accordance with all applicable criteria and standards and provide, when necessary, for incorporation of components, equipment, and systems designed by others. The Consultant will coordinate the location of mechanical and systemwide elements with other disciplines and resolve or initiate the resolution of any conflicts.

7.2.10 Preliminary Electrical Design

Under this task, the Consultant will perform preliminary electrical design in accordance with all applicable criteria and standards and will provide, when necessary, for incorporation of components, equipment, and systems designed by others. The Consultant will coordinate the location of electrical and systemwide elements with other disciplines and resolve or initiate the resolution of any conflicts. Preliminary electrical design will include the following:

- Drawings indicating power and lighting requirements and the location and approximate sizes of major electrical equipment and panels.
- Drawings indicating the locations, number, approximate sizes, and uses of electrical conduits and raceways.
- Lighting and power calculations.

7.2.11 Preliminary Systems Engineering

The purpose of this task will be to prepare preliminary engineering designs for the project's systemwide components including fare collection, traction power, signals and train control, communications, corrosion control, and other systemwide elements. The Consultant will manage and coordinate project integration and interface requirements with the facilities engineering group.

7.2.11.1 Fare Collection

Develop and identify characteristics required as input for facilities engineering and systems preliminary engineering efforts including functional description and operating philosophy; hardware and support equipment functional layout; electrical inputs; hardware and support equipment dimensions and space requirements; data collection, security issues, maintenance, collection and interface requirements to the CCTV/Security systems and reporting requirements.

7.2.11.2 Traction Power

Develop and identify characteristics required as input for civil engineering and systems preliminary engineering efforts including functional description and operation philosophy; incoming electric power service and its characteristics from service providers along the corridor; computer based system simulation analysis to determine substation ratings and spacing; protective relaying requirements; substations plans and elevations; and one line diagrams.

Prepare a Preliminary Load Study Report, laying down the details and design criteria necessary for subsequent preliminary engineering for the traction power supply, third-rail and corrosion control systems, including: hourly, daily and monthly power demand patterns; energy consumption; fault current; rating criteria for transformers, rectifiers and feeder cables; and substation grounding criteria. Identify the physical size and possible right-of-way locations of traction power substations for the line, and prepare preliminary site development plans for these locations

7.2.11.3 Signals and Train Controls

Develop and identify characteristics required as input for civil engineering and systems preliminary engineering efforts including functional description and operation philosophy; wayside requirements such as signals; rating and placement of impedance bonds; input power requirements; equipment space and access requirements; and rail vehicle on board equipment.

7.2.11.4 Communications

Develop and identify characteristics required as input for civil engineering and systems preliminary engineering efforts including: functional description and operating philosophy; interface philosophy with existing communication systems, and future extensions; station and wayside requirements such as radio base stations, conduits, cabling, and antennas; modification of existing central control facilities including equipment and space requirements; block diagram of overall system; requirements for Closed Circuit Television (CCTV), radio, telephone public address; rail transit vehicle on board equipment.

7.2.11.5 Corrosion Control

Develop and identify characteristics, installations and construction techniques required as input for civil engineering and systems preliminary engineering efforts including, but not be limited to: equipment facility power and signal grounding; lightning protection, both plan and details; cathodic protection; requirements for stray current protection and corrosion control for structures and pipelines owned by other agencies and utility companies; provide a draft stray currents protection report addressing design criteria, design needs, and mitigating measures to be incorporated in the project.

7.2.11.6 System Safety and Security Program

Develop a preliminary system safety program and prepare a plan to identify and describe in detail all significant safety related tasks of system safety management and system safety engineering including the system safety organization, task responsibilities, system safety milestones, and program interfaces with configuration management, QA, reliability, maintainability, and interface management. Include the safety related activities of safety criteria development, hazard analyses, design reviews, contractor integration, contractor program audits, hazard tracking and risk resolution, historical data analysis, safety data bank maintenance, inspections, certification and report preparation. Prepare a Preliminary System Safety Program report documenting the results of the above analysis.

Assemble information on security issues based on experiences of other properties. Outline an approach to solving the security problems in such a way that crime occurrence against personnel, patrons, and property will be minimized. Investigate various security measures, such as policing policies, different security equipment, and technologies such as CCTV, two-way radios, silent alarms, and a computerized management information system (MIS). Consider a number of ordinary security measures such as improved fencing where appropriate, lighting and locks. Outline the requirements for assuring the security of passengers and the overall system. Prepare a Draft Security Program Outline documenting the results of the above analysis.

7.2.11.7 Vehicle

For the Bay Link Streetcars develop and identify characteristics required as input for civil engineering and systems preliminary engineering efforts including functional description and operating philosophy;

vehicle and train dimensions including static and dynamic clearance envelope; pantograph dimensions and its operations range, if applicable, vehicle weight and its axle loads; minimum horizontal and vertical radii of curvature; propulsion system characteristics including power consumption and regeneration; vehicle operating speeds including acceleration, deceleration, and braking rates; elderly and handicapped provisions, Americans with Disabilities Act (AD) requirements; design considerations of Electro-Magnetic Interference (EMI), communications, noise and vibration characteristics, and climate control performance. The fleet management is addressed elsewhere in the scope of sentences.

Technical Content:

LRT Specifications

1. Table of Contents on Proposed Sections
2. Preliminary Specifications Selections, covering;
   a. Functional Description (propulsion and other system characteristics and operating philosophy, etc.)
   b. Vehicle and Train Characteristics (vehicle and pantograph dimensions, envelopes, loading, brake rates, etc.)
   c. Interface Requirements (basic traction power/overhead catenary, communications and train control requirements)

Input and Coordination:

1. Static and Dynamic Clearance Envelope Plan
2. Coordination with train control and definition of space requirements for TWC system
3. Coordination with communications and definition of space requirements for PA and VMS systems
4. Coordination with traction power and definition of operating requirements for propulsion and ocs characteristics

As requested by MDT, the Consultant will examine and document the vehicle requirements for this project. Included in this review will be any new MDT performance requirements or features introduced to accommodate line conditions or design policies and criteria not previously present, such as Americans with Disabilities Act (ADA) 1990 statutory requirements and subsequent rules and regulations.

7.2.12 Constructability Reviews

The Consultant will support the preliminary engineering design process with studies of likely methods of construction and conclusions on constructability for the preliminary designs to determine the feasibility of construction methods that may have to be undertaken by the construction contractor. The review will be conducted with input from general contractors and/or construction management staff to identify needs for contractors' work and material storage space and assist in the estimating of preliminary capital costs with advice on schedule impacts on construction due to site access, traffic maintenance options, interface relationships, and material and equipment procurement lead times.

Recognize that "Constructability" as it pertains to a transit system's facilities and systems elements has many facets, including such site and institutional matters as:

- Emergency access for fire, police, and emergency medical services.
- Operational access for building tenants, customers, delivery service and trash removal.
- Mobility through or across the corridor.

- Disruption due to noise, vibration, dust and silting.
- Conformance with noise ordinances.
- Truck haulage and railroad operations disruption.
- Access to construction work areas and storage areas.
- Reduced street parking.
- Disruption of marquees, sub-sidewalk spaces and signs.
- Visibility of store front show windows.
- Bus stop and route disruption.
- Access to parking garages and auto service centers.
- Work hours per day, work days per week, impact on commuter hours, and special holiday considerations for traditional parade routes and the holiday shopping season.
- Traffic disruptions at intersections for trackway installations or grade-crossing construction.
- Practicality of traffic maintenance.
- Impacts on traffic on other streets from construction detours and activities.
- Utilities disruption.
- Safety of the general public.
- Coordination with other projects.

In addition to matters of constructability which are due to site and institutional constraints, review the facilities design work in progress to determine that there is at least one practical way of constructing the facility under design. Monitor joining of structures, the drainage of structures, the mounting and attachment of architectural features, the anchorages of trackwork and equipment, the maintainability of the resulting structures, the sequence of construction and assembly, the provisions for waterproofing and leak interception and containment, the difficulty of forming and making field connections and other challenges to reasonably, economic, and universal construction capability.

The Consultant will develop a report documenting the results of the constructability review including construction period issues as foreseen at the preliminary design level and defining construction area control requirements which must be address in the drawings and specifications.

7.3 OPERATIONS PLANNING

While this Scope of Services specifically addresses the addition of the Bay Link Streetcar project, this section focuses on the Metrorail system as a whole.

The Consultant will assist MDT in reviewing the basic operating and maintenance policies assumed during the Alternatives Analysis (AA)/EIS process and identify and necessary changes. These generally include such items as the transit service area, hours of operation, policy headways, loading standards (seating/standing ratios, etc.). Maintenance standards are established based on vehicle types and mandated inspections.

The fixed guideway operating plan driven by operating speeds, headways, and train consists for the LPA are initially established during the AA/EIS phase. In PE, the Consultant will assist MDT in revisiting the assumptions and identifying any changes in operating policies or other conditions, such as population and ridership projections. Alternative scenarios may be generated to assess the impacts of modifying

operating policies or to develop information to support decisions on alignment, station locations, and design details (e.g., fare collection, vehicle performance characteristics, etc.). The Consultant will assist MDT in equilibrating to reflect updated travel demand forecast and financial constraints.

The Consultant will assist MDT in reassessing the type of rolling stock, seating arrangements, operating and performance requirements, and fleet sizing during the PE process. This input will serve as input to the vehicle specifications and design and have a positive impact on cost, capacity and performance.

The feeder system assumptions made in support of the AA/EIS effort will be reviewed by the Consultant and modified to reflect any changes in the fixed guideway alignment, station locations, ridership projections or policy. The vehicle characteristics and quantities will also be refined for use in the updated baseline capital cost estimate.

The fare structure and fare collection methods are established during PE as a basis for establishing the dwell times, ridership, system capacity requirements, and staffing requirements. The Consultant will assist MDT in reviewing and updating these parameters as necessary.

The consultant will assist MDT in preparing a Fleet Management Plan in accordance with the FTA's policy and guidance. The plan generally will address how the vehicle new vehicles will be integrated into MDT's existing fleet and address such issues as the redevelopment or replacement of existing vehicles. The Consultant will assist MDT in determining what new equipment will be required to maintain the ways and structures and supervise operation of the extension.

The Consultant will assist MDT in developing a comprehensive Staffing Plan. The staffing plan will include the additional operations, maintenance, security, management and administrative personnel necessary to satisfactorily operate the new service.

The Consultant will assist MDT in evaluating the existing Metrorail yard and shop to assess its ability to accommodate the additional fleet requirements. If deficiencies are found, the Consultant will work with MDT to identify the scope, budget and schedule necessary to address the issues.

7.4 RIGHT-OF-WAY

This task provides for the support of MDT in connection with acquiring for MDT rights in real property needed to construct and permanently occupy space–the rights-of-way for the project.

7.4.1 Right-of-Way Design/Configuration

Given the evolving definition of proposed project facilities, the Consultant will define the project's footprint and the extent proposed construction and permanent structures will encroach on and occupy any private property and public lands. Conduct right-of-way design studies to refine the "take" requirements, including the avoidance of part takes by design revisions and the resolution of reasonable access to and usability of remainders. Avoid property acquisitions that leave the owners with uneconomic remnants. Review the land uses, apparent value, and ownerships of affected parcels to assist in the refinement of MDT's right-of-way. Focus efforts on the early identification of property requirements for the station sites, traction power substation sites, and those portions of the alignment that must be available early.

The Consultant will progressively advance the definition of right-of-way needs for the project such that a final determination of full take and major partial take or easement parcels is made by the completion of the preliminary engineering design phase (30 percent level of design completion). Develop a database of property acquisitions and preliminary right-of-way needs drawings. This data will serve as input in the right-of-way acquisition efforts (title research, parcel map preparation, certifications, etc.) to be performed by others.

7.5 GRAPHICS AND RENDERINGS

As requested by MDT, produce various types of representations of the work being designed for the benefit of MDT and for the support of its community involvement program.

Include production of the following representations:

- Plans, sketches, diagrams, tables, charts, text, and the like, appropriately rendered, enlarged as required, and mounted on foam-core boards for easel presentation.
- Slide transparencies or MS PowerPoint presentations.
- Computer photo-imaging techniques applied to system features, particularly useful in comparing designs and in "before" and "after" comparisons by superimposing new elements on photographs of existing conditions.
- Slide presentations - formatting materials, preparing word graphics, and having photo transparencies made.

8.0 FINAL ENVIRONMENTAL IMPACT STATEMENT

The FEIS that will be prepared in this task documents the public and agency comments received on the DEIS, refines the PE/EIS analyses based on the comments, and identifies mitigation measures for avoiding impacts and minimizing harm. Preparation of the FEIS completes the federal environmental process necessary to obtain the ROD and clear the way for FTA to approve the project for Final Design and initiate a Full Funding Grant Agreement (FFGA) for the transit element of the project.

During the preparation of the FEIS, the mitigation measures from the DEIS also will be refined by the Consultant and incorporated into the FEIS. Mitigation measure will be developed for all adverse impacts resulting from the project. A Section 4(f) Evaluation will be prepared by the Consultant, if parks and historic properties are adversely impacted as determined by criteria established in applicable Federal regulations. Based on Section 106 determinations of National Register eligibility and effects, a Memorandum of Agreement (MOA) with the State Historic Preservation Office (SHPO) will be developed by the Consultant for any adverse effects on historic resources. Close coordination will be maintained with the FTA in preparing the Section 4 (f) Evaluation and Section 106 materials. The mitigation measures identified in the FEIS will represent commitments to the project made by the MDT.

The FEIS will summarize the results of the public involvement program. The Consultant will prepare a draft FEIS for review and comment by the MDT before submission for FTA for administrative review. After satisfactory revisions are made by the Consultant in response to this review, a final FEIS will be submitted to the FTA for signature.

Once the FEIS is completed, a ROD will be prepared by the Consultant for signature by FTA. The ROD can be signed no sooner than 30 days after publication of the final EIS notice in the Federal Register. The ROD will summarize the project, impacts, and mitigations. This will complete the environmental process. Support will be provided to MDT, as necessary, by the Consultant to prepare the ROD for signature by FTA.

9.0 PUBLIC AND AGENCY INVOLVEMENT AND COORDINATION

9.1 PUBLIC INVOLVEMENT

While the FEIS will be nearing completion prior to the start of this PE effort, public involvement is a continuing activity throughout the PE phase. The Consultant will modify the Public Involvement Plan to address the requirements keyed to the variety of “publics” who may be interested in, or affected by the

project. The Consultant will pay particular attention to effort needed to support the major decisions and support the station area development process.

As MDT may request, provide support for up to 40 public meetings to include meetings with interest groups, citizens, elected officials, etc. Provide writing and graphic support services in various media as a part of public involvement program implementation. Provide knowledgeable technical personnel to participate in public presentations and community participation meetings.

9.2 UTILITY ENTITIES

9.2.1 Maintenance of Liaison Support

Recognizing that during the AA/D EIS phase, liaison was established and maintained between each potentially impacted agency, the Consultant will support MDT staff in its renewal of such contact and the maintenance of liaison with each entity impacted by the LPA system and any unresolved route location/configuration alternatives. Maintain the updated Master List of Agency Contacts initiated in Tasks 6.1.1.1.

9.2.2 Master Agreement Development Support

Relocating, revising and removal of the existing facilities of impacted third parties will, in most cases, have to be covered by written agreements between MDT and the utility owner. MDT will be responsible for leading the master agreement development effort. Such agreements are usually two-part documents where the general conditions are covered by a "master agreement" and the site-specific terms are attached as a series of specific agreements. Where MDT does not already have suitable agreements with impacted utility owners, the Consultant will assist MDT staff and counsel in the drafting of master agreements covering the typical or general terms and rights of the parties as requested.

9.2.3 Relocation Plan Coordination

As preliminary engineering progresses and the "footprint" of transit facilities becomes better defined, the Consultant will develop alternative schemes or methods for resolving each conflict between the existing utilities and the proposed transit facilities. Evaluate, as appropriate, alternative schemes, including meeting with utility owner-engineers to reach a mutually agreeable physical solution. Review the proposed plan with MDT including its estimated cost to MDT, for approval. Coordinate each utility relocation case with all others required in the same location such that all changes are compatible and are not in conflict among themselves. Input agreed relocation solutions into the PE documents and reflect them as preliminary special agreements to the master agreements.

9.3 RAILROADS

The same general approach described under Subtask 9.2 applies to this subtask, except for the difference in numbers of entities involved and the right-of-way aspect of the project's impact on the Florida East Coast (FEC) railroad.

9.3.1 Maintenance of Technical Liaison

The Consultant will support MDT staff in its establishment of contacts with the affected railroads and the maintenance of liaison with all involved railroads where the proposed rail system impacts the railroad in some manner.

9.3.2 Support of Agreement Development

Recognizing that portions of the proposed System are planned to cross over existing rights-of-way of the FEC, accept the need for an agreement which will set forth the respective rights and obligations of the parties. Support MDT staff and counsel in developing the terms of such agreement (or agreements), as may be requested. Prepare, as necessary, agreement exhibits, which clarify the agreement terms. Define

any physical changes of railroad facilities which may be required, and input their preliminary design definitions and specifications to the PE process and related cost estimating.

9.4 COORDINATION WITH PERMITTING AGENCIES

To the extent required during the preliminary engineering design process, the Consultant will initiate and maintain contacts with the various permitting agencies. Where not previously identified, identify in the initial meeting with the permitting agencies a formal contact person at each agency and develop procedures to communicate between the permit agency, the Consultant and MDT. Identify the surface water management requirements of the agency(s) required for the project.

Prepare a Preliminary Hydrology/Hydraulics Report. The report will include collection, conveyance and treatment at a preliminary level for the locally preferred alternative. This will form the basis for the final hydraulics report and design. Calculate size of facilities needed for storm water management at a preliminary level to identify impacts and right-of-way requirements.

10.0 FINANCIAL PLANNING

A detailed financial plan for the project was developed as part of the PE/FEIS application process and subsequently submitted to the FTA with the request to move into the PE phase of project development. During the PE effort, some of the parameters underlying the financial plan may change as the project is defined in more detail, the baselines (scope, schedule and budget) are refined and a specific implementation plan is adopted. The Consultant will support MDT in updating the financial plan for the project as necessary. The areas typically needing update include:

- Capital cost estimates (current and year of expenditure (YOE) dollars)
- O& M cost estimates (current and YOE dollars)
- Documentation of current funding conditions
- Cash flow analysis
- The FTA financial criteria documentation for New Starts

11.0 POLICY DEVELOPMENT AND COMMITMENT

Under this task the Consultant will undertake the following policy development and commitment tasks:

11.1 LAND USE AND TRANSIT ORIENTATED DEVELOPMENT

The Consultant will assist MDT to coordinate with and support local land use planning, particularly around planned stations. This may include promotional activities to encourage local governments and developers to encourage transit-orientated development, potentially leading to amendments to local land use policies, comprehensive plans, and zoning and other ordinances. Project modifications and enhancements, such as pedestrian and bicycle access facilities, may be added to the project to promote transit-orientated development.

11.2 JOINT DEVELOPMENT

The Consultant will assist MDT to develop a joint development policy and seek out opportunities to encourage joint development during alignment, station location/design, and right-of-way studies. The project design may also include features that will facilitate joint development in areas that are physically or functionally related to the project. For example, the right-of-way plans may involve whole takes to create opportunities for joint development. Similarly, the civil design may include foundations that would enable development adjacent to or in air rights above the transit facility.

11.3 PARKING SUPPLY AND PRICING

Recognizing the commitment to replace any parking lost on Miami Beach due to the project, the Consultant will assist MDT to seek local government support for transit-supportive policies, particularly in downtown areas or other destination areas. This may include reduced requirements for parking supply near transit stations and/or parking pricing policies that promote transit ridership.

12.0 IMPLEMENTATION PLANNING

12.1 IMPLEMENTATION PLAN AND STRATEGY

As the Consultant approaches the end of the preliminary engineering process, it will assist MDT with the development of an Implementation Plan and Strategy for the project. The Implementation Plan will address:

- the contract limits and procurement strategy to be pursued in advancing each component of the project (civil works, stations, vehicles, systems components, right-of-way, testing and start-up);
- the approach and responsibility for advancing each component through final design, right-of-way acquisition, procurement, construction, and test and start-up preparation, and revenue service;
- phasing and staging and provides the "baseline" (scope, schedule, and budget) for each element of the project by phase;
- provides and integrated master schedule in sufficient detail to identify all major milestones interface and coordination points; and
- Project Management Plan update to address the requirements for final design, right-of-way acquisition, and Test and Start-up.

12.2 UPDATE NEW STARTS REPORT

At the end of PE (as part of the request to initiate final design), and annually during the PE and final design phases until such time as a Full Funding Grant Agreement (FFGA) is signed, the Consultant will assist MDT in updating and submitting a revised New Starts Report. The Consultant will ensure that the necessary data is produced as part of the PE process and the Schedule for producing the reports is supportive of the FTA's scheduled needs.

APPENDIX A

LIST OF DELIVERABLES

PE SCOPE OF SERVICES

Within this PE scope of services, the Consultant will prepare and deliver to MDT the following outputs:

Deliv. No.	Deliverable Description	Task Reference
1.	Updated Project Management Plan	1.3
2.	Copies of Executed Subconsultant Agreements	1.7.1
3.	Invoices and supporting documentation of costs incurred	1.8
4.	Origin and Destination Study	2.6
5.	Seagrass and Essential Fish Habitat Survey	2.7
6.	Update schedule on a monthly basis	3.1.1
7.	Preliminary Work Plan	3.1.1
8.	Baselined Work Plan	3.1.1
9.	Update schedule on a monthly basis	3.1.2
10.	Project Master Schedule	3.1.2
11.	Capital Cost Estimates	3.3
12.	O&M Cost Estimates	3.4
13.	Project MIS Inputs	3.5
14.	Contract Unit Description Book Inputs	3.6.43.6.4
15.	Project Progress/Status Reports	3.7
16.	Quality Control Plan	4.1
17.	Design Quality Manual	4.2
18.	CADD Standards Manual	5.0
19.	Technical Memorandum Summarizing the Traffic Data	6.1.1.2
20.	Photogrammetric Base Mapping	6.1.2.1
21.	Preliminary Geotechnical Data Report	6.1.3.6
22.	Preliminary Geotechnical Design Report	6.1.3.8
23.	Preliminary Geotechnical Test Boring Location and Test Boring Log Drawings	6.1.3.9
24.	Composite Utility Drawings	6.1.4
25.	Outline Technical Specifications	6.1.4
26.	Contamination Assessment Level II Report	7.1.1.2
27.	Plan and Profile Drawings	7.2.1
28.	Preliminary Trackwork Drawings	7.2.2
29.	Preliminary Civil Design Drawings	7.2.3
30.	Preliminary Utility Relocation Drawings	7.2.4
31.	Traffic Engineering Input to Preliminary Civil Designs	7.2.5.2
32.	Technical Memorandum Summarizing Traffic Methodology,	7.2.5

Deliv. No.	Deliverable Description	Task Reference
	Analysis and Results	
33.	Preliminary Signal Plans	7.2.5
34.	Preliminary Signing Plans	7.2.5
35.	Preliminary Maintenance of Traffic Plans	7.2.5
36.	Preliminary Street Lighting Plans	7.2.5
37.	Preliminary Station Plans	7.2.6.1
38.	Transit Oriented Development Report	7.2.6.1
39.	Preliminary Industrial Assessment	7.2.6.2
40.	Preliminary Engineering and Architectural Drawings	7.2.6.2
41.	Preliminary Design Report	7.2.6.2
42.	Preliminary List of Equipment Requirements	7.2.6.2
43.	Urban Design Report	7.2.6.2
44.	Preliminary Landscaping Plans	7.2.6.4
45.	Preliminary Art in Transit Report	7.2.6.5
46.	Alternative Aerial Structural Concepts Report	7.2.7.1
47.	Preliminary Structure Drawings	7.2.7.4
48.	Preliminary Storage and Turnback Facility Design Drawings	7.2.8
49.	Preliminary Mechanical Plans	7.2.9
50.	Preliminary Electrical Plans	7.2.10
51.	Preliminary Systems Engineering Drawings	7.2.11
52.	Preliminary Fare Collection Report	7.2.11.1
53.	Preliminary Traction Power Report	7.2.11.2
54.	Preliminary Load Study Report	
55.	Preliminary Signal Report	7.2.11.3
56.	Preliminary Communication Report	7.2.11.4
57.	Preliminary Corrosion Control Report	7.2.11.5
58.	Preliminary System Safety Program Report	7.2.11.6
59.	Draft Security Program Outline	7.2.11.6
60.	Preliminary Vehicle Performance Spec	7.2.11.7
61.	Constructability Review Report	7.2.12
62.	Preliminary Right-of-Way Needs Plans	7.4.1
63.	Draft and Final FEIS Document	8.0
64.	Section 4(f) Evaluation (If Required)	8.0
65.	Draft Record of Decision	8.0
66.	Updated Public Involvement Plan	8.1
67.	Updated Master List of Agency Contracts	9.2.1
68.	Master Utility Agreements	9.2.2
69.	Railroad Agreements	9.3
70.	Preliminary Hydrology/Hydraulics Report	9.4
71.	Refined Financial Plan	10.0

Deliv. No.	Deliverable Description	Task Reference
72.	Implementation Plan	11.1
73.	New Starts Report Updates	11.2