

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 08-17

WHEREAS, the Central Texas Regional Mobility Authority ("CTRMA") was created pursuant to the request of Travis and Williamson Counties and in accordance with provisions of the Transportation Code and the petition and approval process established in 43 Tex. Admin. Code § 26.01, *et. seq.* (the "RMA Rules"); and

WHEREAS, the Board of Directors of the CTRMA has been constituted in accordance with the Transportation Code and the RMA Rules; and

WHEREAS, the CTRMA is charged with funding and developing transportation improvements throughout the region to help solve the current mobility crisis and improve the quality of life for residents of Central Texas; and

WHEREAS, the general engineering consultant retained by the CTRMA (the "GEC") previously developed a scope of work and a proposed budget to conduct traffic simulations and other feasibility work related to various CTMRA projects and potential projects; and

WHEREAS, the Board of Directors in Resolution 06-35, dated June 28, 2006, approved Work Authorization No. 6.0 and found that the scope of work included therein was necessary and appropriate to further assess the feasibility of certain projects and potential projects and further determined in Resolution 06-63, dated October 25, 2006 that Supplement No. 1 should be adopted to fulfill the scope of work; and

WHEREAS, the GEC has undertaken the scope of work described in Work Authorization No. 6.0, and has determined that further efforts are necessary to realize the full benefits of such scope of work; and

WHEREAS, the CTRMA staff and the GEC have represented to the Board of Directors that Supplement No. 2 to Work Authorization No. 6.0 in substantially the form attached hereto as Attachment "A" is necessary and appropriate to allow for the further assessment of the feasibility of certain projects and potential projects.

NOW THEREFORE, BE IT RESOLVED, that the Board of Directors of the CTRMA approves Supplement 2 to Work Authorization No. 6.0 in substantially the form attached hereto as Attachment "A"; and

BE IT FURTHER RESOLVED, that all work performed under Supplement 2 to Work Authorization No. 6.0 shall be subject to the Agreement for General Consulting Civil Engineering Services between the CTRMA and the GEC and that no additional work may be undertaken without the specific approval of the Board of Directors.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 26th day of March, 2008.

Submitted and reviewed by:



Tom Nielson
General Counsel for the Central
Texas Regional Mobility Authority

Approved:



Robert E. Tesch
Chairman, Board of Directors
Resolution Number 08-17
Date Passed 3/26/08

Attachement "A"
To
Resolution No. 08-17
Supplement 2 to Work Authorization No. 6.0

ATTACHMENT "A"

WORK AUTHORIZATION

Work Authorization No. 6.0

Supplement No. 2

This Supplement No. 2 to Work Authorization No. 6.0 is made as of this ___ day of April, 2008, under the terms and conditions established in the AGREEMENT FOR GENERAL CONSULTING ENGINEERING SERVICES, dated as of September 1st, 2003 (the Agreement), between the Central Texas Regional Mobility Authority (Authority) and HNTB Corporation (GEC). This Supplement No. 2 to Work Authorization 6.0 is made for the following purpose, consistent with the services defined in the Agreement:

Feasibility Study Work

The following terms and conditions of Work Authorization No. 6.0 are hereby amended, as follows:

Section A. - Scope of Services

A.1. GEC shall perform the following Services:

Refer to Attachment A – Scope of Work

A.2. The following Services are not included in this Work Authorization, but shall be provided as Additional Services if authorized or confirmed in writing by the Authority.

Refer to Attachment A – Scope of Work

A.3. In conjunction with the performance of the foregoing Services, GEC shall provide the following submittals/deliverables (Documents) to the Authority:

Refer to Attachment A – Scope of Work

Section B. - Schedule

GEC shall perform the Services and deliver the related Documents (if any) according to the following schedule:

Services defined herein are expected to be substantially complete within **six (6) months** from the date this Supplement No. 2 to Work Authorization 6.0 becomes effective. This Supplement to Work Authorization 6.0 will not expire until all tasks associated with the Scope of Services are complete.

Section C. - Compensation

C.1. In return for the performance of the foregoing obligations, the Authority shall pay to the GEC the amount not to exceed \$ _____ based on Attachment B-Fee Estimate. This will increase the not to exceed compensation amount for Work Authorization No. 6.0 from \$409,895.00 to \$ _____. Compensation shall be in accordance with the Agreement.

The Authority and the GEC agree that the budget amounts contained in Attachment B-Fee Estimate for the various companies and firms composing the GEC are estimates and that these individual figures may be redistributed and/or adjusted as necessary over the duration of this Work Authorization. The GEC may alter the compensation distribution between tasks or work assignments to be consistent with the Services actually rendered within the total Work Authorization amount. The GEC shall not exceed the maximum amount payable without prior written permission by the Authority.

C.2. Compensation for Additional Services (if any) shall be paid by the Authority to the GEC according to the terms of future Work Authorizations.

Section D. - Authority's Responsibilities

The Authority shall perform and/or provide the following in a timely manner so as not to delay the Services of the GEC. Unless otherwise provided in this Work Authorization, the Authority shall bear all costs incident to compliance with the following:

N/A

Section E. - Other Provisions

The parties agree to the following provisions with respect to this specific Work Authorization:

N/A

Except to the extent expressly modified herein, all terms and conditions of the Agreement shall continue in full force and effect.

Authority: Central Texas Regional Mobility
Authority

GEC: HNTB Corporation

By: _____

By: _____

Signature: _____

Signature: _____

Title: _____

Title: _____

Date: _____

Date: _____

CENTRAL TEXAS RMA**ATTACHMENT A – SCOPE OF WORK****WORK AUTHORIZATION NO. 6.0
SUPPLEMENT NO. 2****SERVICES TO BE PROVIDED BY THE GENERAL ENGINEERING CONSULTANT
(GEC)**

This scope of services includes the provision of professional services and deliverables for various tasks related to the study of tolling projects.

TASK 1 – PROJECT MANAGEMENT & ADMINISTRATION

The GEC will perform project management, administrative and coordination duties, including contract administration, project management, reporting, meeting minutes of required meetings and telephone conversations, and other related administrative tasks (e.g., direct costs) associated with the Project, including:

- 1.1 Coordinate, execute and administer work authorizations as required with the CTRMA and the subconsultants.
- 1.2 Progress Reports and Invoices – Prepare monthly invoices and progress reports for the work tasks, together with evidence of work accomplished during the time period since the previous report. Prepare a detailed schedule (provide in the CTRMA approved format) of anticipated monthly invoice billing linking to the project work authorization tasks. A monthly progress report will be submitted and will include: activities completed, initiated or ongoing, during the reporting period; activities planned for the coming period; problems encountered and actions to remedy them; overall status, including a tabulation of percentage complete by task; updated project schedule; minutes of study meetings and copies of monthly correspondence. The GEC will also provide a weekly e-mail summary to the CTRMA that briefly summarizes services performed and activities that occurred that week, including any required action items or any other pertinent project issues.
- 1.3 Record Keeping and File Management – Maintain all records and files related to the Project throughout the duration of the services. Uploading of project files to a shared *website* will be coordinated with the CTRMA. Maintain and update via an approved software the deliverables tracking log provided by the CTRMA and denote specific submittals in the weekly e-mail summary.
- 1.4 Correspondence – Prepare written materials, letters, survey forms, etc. used to solicit information or collect data for the project and submit them to the CTRMA for review and

approval prior to its use or distribution. Copies of outgoing correspondence and incoming correspondence will be provided to the CTRMA on a continuing basis, but not less than once a month.

- 1.5 Work Authorization Schedule – Prepare a detailed, graphic schedule linking work authorization tasks, subtasks, critical dates, milestones, deliverables and CTRMA/Texas Department of Transportation (TxDOT)/ Federal Highway Administration (FHWA) review requirements. The project schedule will be in a format, which depicts the order and inter-dependence of the various tasks, subtasks, milestones and deliverables for each of the tasks identified therein. Progress will be reviewed periodically for conformance to work schedule Exhibit “C” and should these reviews indicate a substantial change in progress, a schedule recovery strategy will be developed and implemented and the schedule will be revised accordingly.

TASK 2 – 183A EXTENSION TOLL PROJECT SCHEMATIC

The GEC will provide professional services and deliverables in support of CTRMA’s development of the 183A Extension Toll Project from north FM 1431 to the north side of the South San Gabriel River. Included in this scope are efforts associated with:

- Design Services – Schematic Review, Revision, Design Survey, and Design

2.1 Design Services – Schematic Review and Revision

This work will include engineering design services for the 183A Turnpike from north of FM 1431 to the north side of the South San Gabriel River. The tasks shall include: general evaluation of the existing 183A Schematic (from FM 1431 to north of the San Gabriel River) and revisions required due to evaluation; revisions to schematic design to revise all proposed toll collection facilities including adjustment of ramp locations/lengths; identification of proposed ETC tolling locations; revisions to/development of the Schematic for expanded project limits (to the north side of the South San Gabriel River); coordination with adjacent corridor land owners with respect to future development; and coordination with Williamson County 183A frontage road design.

2.1.1. 183A Design Schematic

- 2.1.1.1. Design Criteria - Review and update where appropriate the design criteria for 183A.

- (a) Design Speed.
- Mainlanes: 70 mph.
 - Ramps: 40 mph.
 - Frontage Roads: 60 mph.
 - Cross streets consistent with current available local major thoroughfare plans, including those of Cedar Park and Leander.

- 2.1.1.2. Horizontal and Vertical Alignments - Review and where appropriate revise horizontal and vertical alignments and proposed ROW limits for the proposed 183A facility from north of FM 2243 to north of the San Gabriel River. Roadway geometry will be based on the criteria and requirements set forth in Part IV of the TxDOT Roadway Design Manual.
- (a) The horizontal alignment will show bearings in the tangent sections and complete curve data including delta angles, PI stations, tangent lengths, length of curve, and radii. The plan views will show the center-line, edge of pavement, striping, lane widths, shoulder widths, cross slopes, superelevations with transitions, direction of traffic flow, and layouts for all speed change lanes. The GEC will provide horizontal alignments as follows:
- Mainlane horizontal alignment.
 - Frontage road horizontal alignments.
 - Entrance and exit ramps horizontal alignments for both southbound and northbound directions.
 - Cross street horizontal alignments, best fit of the existing cross street between the frontage roads.
 - Turnaround horizontal alignments.
 - ROW limits, showing proposed Control of Access as necessary.
- (b) The GEC will review existing and proposed grade separation structures and, where appropriate, develop horizontal turnarounds. Acceleration and deceleration lanes will be provided for at all turnarounds.
- (c) The vertical alignment will show existing and proposed elevations at 100-foot intervals, vertical curve VPI stations, curve lengths, superelevation rates and transitions, design speeds, "K" values (evaluation to obtain minimum "K" values), and tangent grades. The GEC will provide vertical alignments as follows:
- Main lane vertical alignment.
 - Frontage road vertical alignment.
 - Entrance and exit ramps vertical alignments.
 - Cross road vertical alignments.
 - Turnaround vertical alignments, straight grade alignments between the frontage roads.
- 2.1.1.3. Typical Sections - The GEC will evaluate and revise typical sections for mainlanes, frontage roads, ramps, and cross streets within the 183A ROW and Williamson County Layout, and develop additional typical sections as needed for the expanded project limits. Typical sections will include preliminary pavement sections approved by CTRMA and will also show the intermediate phases of construction as determined by preliminary construction phasing. Typical sections will be shown on the Schematic.
- 2.1.1.4. Toll Collection System Development
- (a) Identify proposed tolling locations

- (b) Develop basic tolling facilities layouts

2.1.1.5. Schematic Development & Revisions

- (a) The Schematic will be prepared in English units with MicroStation V8 and GEOPAK. The GEC will prepare the Schematic drawing using the same scale, legend and symbology as the existing 183A Schematic.
- (b) The GEC will provide technical staff to participate in a Schematic Workshop with the CTRMA. The GEC will provide a color Schematic of the plans to be used in the Schematic Workshops.
- (c) The GEC will assess the currently proposed retaining walls, update the retaining wall locations as needed due to geometric design revisions, and determine locations of retaining walls for the expanded project limits. Geotechnical evaluation of the preferred retaining wall type will not be completed under this Work Authorization.
- (d) The GEC will determine the bridge limits, bent locations, span type, and length of the bridge over the San Gabriel River.
- (e) The GEC will review the earthwork cross-sections and evaluate methods to improve sections to minimize costs and maintain a safe facility, and produce preliminary earthwork cross sections for the expanded project limits.
- (f) The GEC will develop preliminary construction phasing showing proposed intermediate phasing of construction, to be shown on the typical sections.
- (g) GEC will review the locations of guide signs and pavement markings for compliance with Texas Manual for Uniform Traffic Control Devices (TMUTCD). The GEC will update signs and pavement markings as needed due to geometric design revisions and proposed tolling configuration, and determine the locations of additional signs and pavement markings for the expanded project limits.
- (h) The GEC will provide to CTRMA, as a final product, three (3) color copies of the Schematic. The Final Schematic shall also be provided in a digital format. CADD Files shall be provided for Document and Information Exchange. The updated Final Schematic will include the following:
 - The location of all main lanes, grade separations, frontage roads, ramps, and bridges.
 - Vertical profiles for mainlanes, frontage roads, and ramps.
 - Traffic flow direction on all roadways.
 - Right of Way and Control of Access lines.
 - Geometric typical sections (including pavement cross slopes, lane and shoulder widths, and slope intercept lines for cuts and fills) for proposed mainlanes, ramps, frontage roads, and cross streets.
 - ETC toll gantry footprints and layouts.
 - Current and projected traffic volumes as provided by CTRMA (20-year projections, unless determined otherwise by the CTRMA).

- Guide signs.
 - Toll signs.
 - Geometry of speed change (acceleration, deceleration, climbing, etc.) lanes.
 - Location of proposed structures, including pertinent dimensions, lanes on roadways and bridges, directions of travel and preliminary vertical clearances for grade separations.
- (i) Additional copies of Schematic to be provided include:
- Draft Preliminary Schematic, three copies, for review by CTRMA.
 - Preliminary Schematic, three copies, for TXDOT and FHWA review.
- 2.1.1.6. Hydrologic/Hydraulic Analysis – The GEC will perform a hydrologic study and preliminary hydraulic analysis to determine approximate sizes and locations of major drainage structures and bridges.
- 2.1.1.7. Construction Estimate - The GEC will develop a construction estimate for the construction detailed in the construction phasing.
- 2.1.1.8. Coordination – The GEC will coordinate with Williamson County and adjacent Corridor land owners in regards to future development and access. The GEC will also coordinate design with schematic design of 183A north of RM 2243 with the Williamson County frontage road designs to coordinate at the project transitions.
- 2.1.1.9. QA/QC – The GEC will provide Quality Control/Quality Assurance for all design and schematic production activities.

2.2 Design Survey

Provide the following surveying and aerial mapping services in connection with the US 183A design project for the CTRMA. The general survey control and aerial mapping limits, along with assumptions and quantities used to develop the estimate are as follows:

- From 500 feet south of RM 1431 to 500 feet north of the San Gabriel River, 7.2 miles, 62 aerial panels, 4 flight lines, 51 models.

2.2.1. Aerial Photography Control Surveys

2.2.1.1. Right of Entry (ROE) on Private Property

- (a) Because all of the aerial panels will be set either within the right of way (ROW) of US 183A or within the ROW of cross roads, no ownership research or right of entry effort is proposed nor budgeted as part of this scope and estimate.

2.2.1.2. Horizontal and Vertical Control for Aerial Mapping

- (a) Recover existing US 183A control within the mapping limits, as well as control recently established for the mapping project north of the river, and utilize this control datum as the primary control for the project.

- (b) Set a pair of aerial panels (each 4' X 4' overall) at approximate 1500-foot intervals within the mapping limits based upon a control layout map to be prepared. The panels will be set near the east and west ROW (assumed to average 400' wide) of US 183A, or whenever possible, within the ROW of roadways crossing US 183A.
- (c) Based upon the project control recovered as a part of this scope of services, horizontal and vertical values will be determined for each panel using GPS methods performed to TxDOT "Level 3" standards and digital level loops, respectively.
- (d) A control drawing of the primary and aerial panel control will be delivered in a digital dgn file and hardcopy 11x17 mylar. Field book copies will also be provided.

2.2.2. Aerial Mapping

- 2.2.2.1. All aerial mapping efforts will conform to TxDOT Standards and Specifications and National Map Accuracy Standards (NMAS).
- 2.2.2.2. The aerial mapping project corridor is approximately 4.0 miles for Option 1, 3.2 miles for Option 2 and 7.2 miles for Option 3 along US 183A, as described above. The planimetric and DTM collection boundary will be approximately 400' (200' left and right of the ROW centerline of US 183A. At cross roads, the mapping corridor width will increase to 800' (400' left and right of the centerline of US 183A).
- 2.2.2.3. The photo scale will be 1" = 250'. The aerial photography flight height will be 1,500 feet Above Mean Terrain (AMT). This project will be flown within 3 days of panel placement, assuming weather permitting aerial photography.
- 2.2.2.4. Project Scope for Aerial Mapping
 - (a) There will be 4 flight lines with a total of approximately 56 color exposures. The film processed directly after the photo mission is accomplished. All negatives will be quality control checked by SAM, Inc.
 - (b) Negatives will be scribed to TxDOT standards.
 - (c) All negatives will be scanned at 14 microns on our DSW 700 Photogrammetric Scanner for use on softcopy digital photogrammetric workstations. The scanned imagery will be utilized in support of the digital analytical aerial triangulation, digital map compilation, and Digital orthophotography generation efforts by SAM, Inc.
 - (d) Fully analytical digital aerial triangulation will be performed on approximately 51 stereo models using digital softcopy techniques and ORIMA triangulation software. The triangulation adjustment for each flight strip will meet NMAS requirements for producing 1:3000 scale mapping. A summary report of the triangulation results is included as a deliverable item.

- (e) Mapping will include a Digital Terrain Model (DTM) consisting of breakline and mass point data suitable for producing 1' contours. TxDOT Legend for Symbology will be used. In areas where the ground is not visible due to tree canopy or dense vegetation ground cover, the area will be outlined and defined as obscured.
- (f) All electronic files will be fully compatible with the State's MicroStation/GeoPak System without further modification or conversion.
- (g) Files will include as applicable all features listed on the State's current Photogrammetric Mapping Legend symbology and level structure will be in compliance with the State's current Photogrammetric Mapping Legend.
- (h) Color digital orthophoto images will be provided in TIFF and HMR image formats with an associated geo-referenced world file at a 1/4' pixel resolution.

2.2.3. Aerial Mapping and Survey Control Deliverables

2.2.3.1. The aerial film negative will be delivered to the CTRMA.

2.2.3.2. Two sets of the following deliverables will be transmitted to HNTB Corporation:

- (a) Analytical Aerial Triangulation Summary Report.
- (b) Metadata File (README.txt file)
- (c) Digital photogrammetric data:
 - MicroStation US feet (3D) DTM utilizing TxDOT MicroStation V8 seed file.
 - MicroStation US feet (2D) Planimetric/Contours utilizing TxDOT MicroStation V8 seed file.
 - Color digital orthophoto images will be provided in TIFF and HMR image formats with an associated geo-reference world file at a 1/4' pixel resolution.
- (d) Survey- Control drawing (2D V8 dgn and 11x17 mylar) showing control used and aerial panels. Word text file containing the surveyed control & aerial panel points and Field book copies (hardcopy).

2.3 Environmental Re-evaluation

The work to be performed by the GEC shall consist of providing a re-evaluation, including public involvement, of the Final Environmental Impact Statement (FEIS) of the 183A Turnpike Project from RM 620 to approximately three miles north of the City of Leander.

The re-evaluation will focus on design changes including the construction of mainlanes and the addition of a transition area approximately 1000 feet north of the northern terminus.

Assumptions

- The projected average daily traffic (ADT) of 183A is less than 140,000, therefore a qualitative MSAT analysis will be prepared for the re-evaluation.

- The GEC will base the re-evaluation on the best information available at the time this work authorization is executed. Incorporation of better information will be considered out of scope.
- This scope assumes no design changes and no revisions to traffic data after the execution date. Should changes be made that would result in the need for additional analysis and/or revisions to the document, any related effort would be considered out of scope.

2.3.1. Right-of-Entry

The GEC will coordinate obtaining right-of-entry for properties not previously assessed or where right-of-way has not been acquired.

2.3.2. Data Collection

The GEC will review the FEIS and any previous re-evaluations for 183A for the history of the Project, consistency with purpose and need, and design changes. The GEC will also perform data collection and site reconnaissance visits within the existing and proposed ROW, upon notice to proceed and receipt of right-of-entry, to supplement data needed to complete the re-evaluation. The GEC will obtain or update periodically publicly available information and perform site investigation including:

- Locations of public buildings, schools, churches, parks, etc.
- Historic-age structures
- Aerial/Infrared photography, if available.
- National Wetland Inventory Maps.
- Site Review for presence of non-inventoried wetlands.
- County Soil Survey Maps.
- TCEQ & EPA Hazardous Materials Database Information.
- FEMA 100-year floodplains.
- Vegetation Information.
- Threatened and Endangered Species Information.
- Noise Receiver Locations.

2.3.3. Preparation of Environmental Document

The GEC shall prepare environmental documentation of the level required by proposed improvements, utilizing the appropriate outline in accordance with; TxDOT's Environmental Manual, Title 23, Parts 771 and 772, FHWA's Technical Advisory T6640.8A, and TxDOT's 1996 Noise Guidelines and 1999 Air Quality Guidelines.

The GEC will include in the document a discussion of the history of the project, the purpose and need, and a description of design changes being assessed. The document will also include an existing environment discussion, direct effects discussion, and indirect, and cumulative impacts analysis as described below.

2.3.4. Existing Environment

Through data collection and field investigation, the GEC will update the description of the affected environment to serve as the basis for determining the environmental consequences of the proposed 183A/CR 274 interchange. This description will include land use, socio-economics (including identification of minority, low income, and limited English proficient (LEP) populations), farmlands, soils, noise, air quality, surface water, groundwater, wetlands, vegetation, wildlife habitat, threatened and endangered species, cultural resources, Section 4(f) properties, and hazardous materials sites.

2.3.5. Archeological Survey

For anticipated new right-of-way, the GEC will perform an archeological survey including shovel tests in accordance with the Texas State Minimum Archeological Survey Standards (TSMASS) for archeological surveys. The following items are included in the archeological survey:

Archival Research

- The GEC will conduct archival research at the Texas Historical Commission (THC), the Texas Archeological Research Laboratory (TARL), and General Land Office (GLO), the National Park Service's online National Register Information System (NRIS), and /or other relevant archives for information on previous cultural resource investigations conducted in the vicinity of the project's APE and previously recorded cultural resource sites and historic properties in and near the project's APE.

Intensive Pedestrian Survey

- The GEC will obtain a Texas Antiquities Permit prior to initiating field activities.
- The GEC will perform an intensive pedestrian survey including walkover and surface inspection as well as shovel testing of the project's APE at a level of intensity sufficient to meet or exceed the TSMASS and guidelines established by the Council of Texas Archeologists.
- The GEC will document any cultural resources encountered to a sufficient degree to make preliminary determinations of the significance of the resources in terms of their eligibility for inclusion in the National Register of Historic Places and for designation as State Archeological Landmarks.
- The GEC will inspect the locales of any previously recorded archeological sites within the APE and assess their current condition.
- The GEC will submit State of Texas Archeological Site Data Forms (for new archeological sites) or update forms (for previously recorded sites) to TARL.

Reporting

- The GEC will prepare a report suitable for review by TxDOT and the THC under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas. The report will include descriptions of the APE and regulatory background against which archeological investigations were conducted, the environmental and cultural settings of the project are, the results of archival research and the archeological survey, and any archeological resources recorded during the survey.

- A non-collection policy will be employed to the maximum extent practicable.

2.3.6. Historic Resources Survey

As part of the re-evaluation of the existing environment, the GEC will update the historic sites listings for the re-evaluation. The GEC will conduct surveys, research and documentation of historic buildings, structures, and objects within the Area of Potential Effect (APE) for proposed right of way that was not previously surveyed. The historic structures survey will follow the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation and will include:

- Field inspection
- Documentation of the survey results;
 - For buildings and other structures, objects and districts, the documentation will include the following for the area of survey, within the APE on either side of the right of way of the proposed 183A Turnpike frontage roads, for any property over 45 years old:
 - A map showing the location of the property in relation to the proposed project area
 - Date of construction
 - Clear photographic prints, including at least one front elevation and one oblique view of each property surveyed, and area or streetscape views in potential districts
 - Research on historical associations
 - Identification of cultural resources that may be eligible for listing or are listed in the National Register of Historic Places, including historic and prehistoric archeological sites, buildings and other structures, objects, districts, traditional cultural properties, and cultural or historic landscapes located during the survey
 - Recommendations regarding National Register eligibility of identified cultural resources
 - Recommendations and descriptions on findings of potential effect
 - Project effects on potentially eligible historic resources

2.3.7. Direct Effects

With the information compiled on the affected environment and design and traffic data, the GEC will determine the environmental consequences, or direct effects, of the proposed design changes. The direct effects will be determined on the resource categories analyzed for the Affected Environment. The direct effects will include a qualitative MSAT analysis based upon traffic projections being below the quantitative MSAT criteria threshold of 140,000 ADT. The qualitative analysis will be based upon the FHWA *Interim Guidance on Air Toxic Analysis in NEPA Documents*, February 3, 2006.

2.3.8. Indirect and Cumulative Impacts (ICI) Analysis

The GEC will conduct an ICI analysis consistent with the eight-step approach in TxDOT's *Interim Guidance on Preparing Cumulative Impact Analyses*, dated March 2006. The ICI

analysis will focus on impacts from the design changes. The GEC will review changes attributable to past roadway improvements in the area in order to project indirect effects of the proposed improvements in the re-evaluation. The *National Cooperative Highway Research Program Report 466 (NCHRP 466)* will be used as guidance in this analysis.

2.3.9. Public Involvement

- 2.3.9.1. Open House: The GEC will prepare and present one (1) open house in support of the re-evaluation. The GEC will attend the open house for the purpose of providing informational materials regarding the re-evaluation, and for gathering comments from the community-at-large, and addressing local concerns regarding the project. The GEC will secure the sites for the open house. Site locations will be submitted to the Authority for approval prior to booking the rooms. Additionally, the GEC will make arrangements for a court reporter to be present at the open house.
- 2.3.9.2. Open House Facilitation: The GEC will prepare and mail meeting notices to identified stakeholders in the database, and develop and publish one (1) legal notice in two newspapers in preparation for the open house. The notices will be placed in previously identified local paper(s) 30 days and 10 days before the open house. Additionally, the GEC will prepare an agenda, project overview, location map, comment cards (up to 500), indoor/outdoor signage, sign-in sheets, exhibit boards (up to 2), and up to four (one page, double-sided) handouts for public use. All project boards and materials will be printed in English. An Open House Summary Report will be prepared after the open house to record public comment. Project communication materials will be approved by the CTRMA before use.
- 2.3.9.3. Open House Staffing: The GEC will provide a project manager, two (2) technical staff members and two (2) support staff members to attend the Public Meeting for the purpose of providing informational materials regarding the project, addressing local concerns, staffing the sign-in table and providing meeting management.

Exclusions

The following tasks are specifically excluded from the preparation of environmental documents and not included in this work authorization, and would be scoped and detailed at a later date, as necessary:

- Endangered species coordination and/or surveys;
- Biological Assessments;
- USACE 404 delineations and permit coordination;
- Historic/Archeological coordination involving National Register Testing and/or Data Recovery-level excavation or mitigation or Section 106 Coordination except as specifically noted and included above;
- Preparation and coordination for Section 4(f) or Section 6(f) approval;
- Hazardous materials Phase II Environmental Site Assessment;

- Additional documentation services requested as a result of a change in environmental regulations or TxDOT/FHWA documentation standards from those in practice and acceptable at the time of approval of this Work Authorization;
- Work associated with outfalls outside the project ROW after the notice to proceed is received;
- Coordination with TCEQ.

Deliverables

The GEC will prepare a draft re-evaluation for review by TxDOT-ENV (10 copies will be provided). Upon receipt of comments from TxDOT-ENV, the GEC will prepare a second draft for submittal to FHWA (10 copies will be provided). A third and final draft will be prepared to address comments received as a result of FHWA review (20 copies will be provided to TxDOT-ENV and FHWA). An updated re-evaluation will be prepared following the Open House, if determined necessary based on public comment. Should a post-meeting update be necessary, the GEC will respond to one set of review comments.

Deliverables will consist of the following:

- Twenty (20) draft copies, twenty (20) final copies of the re-evaluation document
- 5 copies of the Archeological Report
- 5 copies of the Historic Resources Report
- One (1) Open House
- One (1) Court Reporter
- One (1) Open House transcript
- One (1) legal notice
- One (1) Open House agenda
- Up to five hundred (500) Comment Cards for the Open House
- Up to two (2) exhibit boards for the Open House
- One (1) Handout for the Open House
- One (1) Open House notice/letter for mail out, multiple copies as required
- One (1) electronic and one (1) hard copy of the Open House Summary Report

TASK 3 – 183A EXTENSION PROJECT DEVELOPMENT

This scope of services includes professional services and deliverables in support of CTRMA's development of the 183A Extension Toll Project from north of FM 1431 to the north side of the South San Gabriel River. Included in this scope are efforts associated with:

- Project Development Support – Assistance with Project Development.
- Design Consultant Services Procurement - Assistance in procuring design consultants.
- Design Program Management – Oversight of project design.
- Design Services - Traffic signing plan and toll systems/facilities preliminary design.

3.1 Project Development Support

The Consultant will provide support to the CTRMA as required during the Project Development process. Specific efforts will include:

- 3.1.1. TIFIA Loan Application:** Assist the CTRMA in the development of the TIFIA loan application for the Project as requested. This will include preparation of various elements of the TIFIA loan form & associated documentation; it will also include participation in the coordination efforts as requested by the CTRMA.
- 3.1.2. GEC Engineering and Technical Support:** Provide various engineering and technical tasks as requested by CTRMA including but not limited to: reports and research, presentations, and meetings.
- 3.1.3. Interagency Coordination:** Provide appropriate staff as part of the coordination efforts between the CTRMA and other Agencies. GEC will provide coordination efforts on the CTRMA's behalf at the direction of the CTRMA.
- 3.1.4. Traffic and Revenue (T&R) Consultant Coordination:** Provide continued coordination and support to the CTRMA T&R Consultant, as directed by the CTRMA.
- 3.1.5. Provide Project Cost Estimate, Schedule,** update financial feasibility calculations & provide Official Statement (OS) support: Perform updates to preliminary cost estimate, schedule, and financial analysis necessitated by the ongoing project scoping / sizing process. Develop and certify the Engineers Report for OS. Review and comment on the OS as requested by CTRMA.
- 3.1.6. Provide DBE Outreach and Public Involvement** support as requested by CTRMA.

3.2 Design Consultant Services - Procurement

The GEC will provide support for the acquisition by the CTRMA of professional services as defined in Section 2254.001 of the Texas Government Code, or any successor statute thereto, relative to the acquisition of architecture, professional engineering, and land surveying. With respect to assistance for securing professional design services, these support activities will consist of the following specific tasks (anticipate one (1) solicitation):

- 3.2.1.** Assist CTRMA in Preparation of Scope of Services and Fee Estimate for design of Project, including initial draft, revisions and finalized versions;
- 3.2.2.** Assist CTRMA with Request for Qualifications(RFQ) for Design Consultant (SDC), including RFQ document preparation, addendums and advertising;
- 3.2.3.** Participate with CTRMA Pre-Proposal Conference, including participation, agenda and sign-in sheets;
- 3.2.4.** Participate with CTRMA RFQ evaluations and selection, including development of evaluation criteria;

- 3.2.5. Participate with CTRMA interviews, including development of questions and evaluation criteria;
- 3.2.6. Assist CTRMA in Scope of Services and Fee Negotiations

3.3 Design Program Management

The work to be performed by the GEC will include coordination with CTRMA and the selected Design Consultant (SDC) in the design of the Project. The GEC will provide the overall project supervision, management, scheduling, administration, review and coordination of the SDC preparing plans, specifications and estimates (PS&E) for the 183A Extension Project.

- 3.3.1. Coordinate with CTRMA, TxDOT, CAMPO, Williamson County and other entities as required during Project Development.
- 3.3.2. Prepare a Master Schedule reflecting the schedule provided by the SDC. Coordinate with SDC to maintain an updated version of the Master Schedule for the Project, including planning activities, design, right-of-way acquisition and construction phases. Maintain and revise the Master Schedule, as necessary, during the course of this Work Authorization.
- 3.3.3. Quality Control/Quality Assurance will be an essential element of this task. Regularly scheduled progress meetings (see Task 3.3.5.1) will be conducted with CTRMA or their representative to ensure all components of the Project are proceeding in compliance with the Scope of Services and according to the project schedule. All communications associated with the Project will be directly channeled through the GEC for distribution to the Project Team as appropriate.
- 3.3.4. Develop and implement a Documents Control Plan for the Project, including file management.
- 3.3.5. Manage and oversee SDC activities during the Work Authorization period, including:
 - 3.3.5.1. Conduct a kick-off meeting and bi-weekly progress meetings. (anticipated 36 progress meetings)
 - 3.3.5.2. Review monthly invoices and progress reports. (anticipated 18 months of progress reports)
 - 3.3.5.3. Manage and oversee the preparation of construction documents during the Work Authorization period, including:
 - (a) Review and provide written response on the adequacy of all SDC submittals of plans and reports including structural plans, roadway plans, and engineering reports. Review the PS&E design at 30, 60, 90, and 100 percent milestones. GEC review time will be two weeks. Based upon these reviews, the GEC will recommend acceptance and approval by CTRMA of the plans, specifications and estimates.
 - (b) Ensure that the designs as provided by the SDC are in accordance with applicable requirements of TxDOT Specifications, Standards and

Manuals. Whenever possible, assure that SDCs are using TxDOT's standard drawings, standard specifications, or previously approved special provisions and/or special specifications.

- (c) Conduct constructability reviews, including utility relocations, SW3P, drainage, typical sections, time constraints, correct bid items, etc.
- (d) Oversee submission of plans to TxDOT for review at 30, 60, 90, and 100 percent milestones.
- (e) Oversee submission of plans and Water Pollution Abatement Plan (WPAP) forms to the Texas Commission on Environmental Quality (TCEQ) at 60 and 100 percent milestones.

3.3.6. Assemble two (2) final PS&E packages from SDC with supporting contract documents and provide them to CTRMA for Final PS&E review and processing for letting. The SDC will assist on an as-needed basis. Repackaging of PS&E submittals into different construction packages is not included in the Scope of Services. Assistance for preparation of construction contracts, these support activities generally will consist of the following specific tasks (up to 2 contracts):

- 3.3.6.1. Assistance with solicitation of bids, including advertising and pre-bid conference.
- 3.3.6.2. Assistance with bid review and preparation of recommendations.
- 3.3.6.3. Assistance with contract preparation and administration.

3.4 Design Services - Traffic Signing Concept Plan

The GEC will develop an overall Traffic Signing Layout Master Plan for the Project. The concept plan will indicate the following:

- 3.4.1. Develop layouts for overall interim and final signing strategies, illustrating proposed large signs including overhead, cantilever, and large ground mounted signs. Include placement of signs outside contract limits.
- 3.4.2. Provide Quality Control/Quality Assurance for signing concept plan.

Deliverables

- Two (2) roll plot copies of the Draft Signing Concept Plan for CTRMA review.
- Five (5) roll plot copies of the Final Signing Concept Plan for distribution to CTRMA, and SDC.

3.5 Design Services – Toll Systems / Facilities Preliminary Design

3.5.1. Toll Facilities Preliminary Design Plans

The GEC will develop preliminary design plans for the tolling system for the 183A Extension Project within the limits of the Work Authorization. It is anticipated the toll system will have 8 (eight) tolled entrances/exits along this portion of the corridor and will

utilize an all electronic cashless collection system (ETC). No toll plazas or major facilities are anticipated in this Project. The GEC will develop the toll facilities design using the revised schematic plans as a base. Sufficient input from CTRMA will be included to ensure proper input is received regarding the design concept(s).

3.5.1.1. Toll Facilities Preliminary Design

- (a) Locate toll systems / facilities on preliminary design plans.
- (b) Include in the preliminary design (in reference to toll systems):
 - Plan view (Structural, Large Signs, Striping)
 - Elevations
 - General Sections
- (c) Analysis of:
 - Toll Operations
 - Mechanical and Electrical Operations
 - Provisions for local utilities
 - Facilities for surveillance, communication and control
- (d) Layouts for overhead sign bridges
- (e) Outline Specifications
- (f) Statement of Probable Construction Cost

TASK 4 – LOOP 1 MANAGED LANES PROJECT DEVELOPMENT

This scope of services includes professional services and deliverables in support of CTRMA's development of the Loop 1 Managed Lanes Project from south of Cesar Chavez to north of FM 734 – Parmer Lane. Included in this scope are efforts associated with:

- Project Development Support – Assistance with Project Development Agreement.
- Design Program Management – Oversight of Project Design.
- Design Services - Toll Systems / Facilities Design.

4.1 Project Development Support

The GEC will provide support to the CTRMA as required during the Project Development process. Specific efforts will include:

- 4.1.1. TIFIA Loan Application:** Assist the CTRMA in the development of the TIFIA loan application for the Project as required. This will include preparation of various elements of the TIFIA loan form & associated documentation; it will also include participation in the coordination efforts as requested by the CTRMA.+
- 4.1.2. Engineering and Technical Support:** Provide various engineering and technical tasks as requested by CTRMA including but not limited to: general engineering assistance, general technology assistance, general environmental coordination, reports, research, presentations, and meetings.

- 4.1.3. **TxDOT Coordination:** Provide appropriate staff as part of continuing coordination efforts between the CTRMA and TxDOT. GEC will provide coordination efforts on the CTRMA's behalf at the direction of the CTRMA.
- 4.1.4. **Union Pacific Railroad (UPRR) Coordination:** Provide appropriate staff as part of continuing coordination efforts between the CTRMA and UPRR. GEC will provide coordination efforts on the CTRMA's behalf at the direction of the CTRMA.
- 4.1.5. **Traffic and Revenue (T&R) Consultant Coordination:** Provide continued coordination and support to the CTRMA T&R Consultant, as directed by the CTRMA.
- 4.1.6. **Project Development Agreement (PDA):** Assist in the development of the PDA, generation of PDA exhibits, review of PDA drafts, and TxDOT coordination support.
- 4.1.7. **Provide Project Cost Estimate, Schedule,** update financial feasibility calculations & provide Official Statement (OS) support: Perform updates to preliminary cost estimate, schedule, and financial analysis necessitated by the ongoing project scoping / sizing process. Develop and certify the Engineers Report for OS. Review and comment on the OS as requested by CTRMA.
- 4.1.8. **Provide DBE Outreach and Public Involvement** support as requested by CTRMA.

4.2 Design Program Management

The GEC will include coordination with CTRMA and the selected design consultant in the design of the Project. The GEC will provide the overall project supervision, management, scheduling, administration, review and coordination of the design consultant preparing plans, specifications and estimates for the project.

- 4.2.1. Coordinate with CTRMA, FHWA, TxDOT, UPRR, CAMPO, County and other entities as required during Project Development.
- 4.2.2. Prepare a Master Program Schedule from schedules provided by the design consultant. Coordinate with the design consultant to maintain an updated version of the Master Schedule for the Project, including planning activities, design, right-of-way acquisition and construction phases. Maintain and revise the Master Program Schedule, as necessary, during the course of this Work Authorization.
- 4.2.3. Quality Control/Quality Assurance will be an essential element of this task. Regularly scheduled progress meetings (see Task 4.2.5.1) will be conducted with CTRMA or their representative to ensure all components of the Project are proceeding in compliance with the Scope of Services and according to the project schedule. All communications associated with the Project will be directly channeled through the GEC for distribution to the Project Team, as appropriate.
- 4.2.4. Develop and implement a Documents Control Plan for the Project, including file management.
- 4.2.5. Manage and oversee the design consultant's activities during the Work Authorization period, including:

- 4.2.5.1. Conduct a kick-off meeting and bi-weekly progress meetings. (anticipated 50 progress meetings)
- 4.2.5.2. Review monthly invoices and progress reports. (anticipated 24 months of progress reports)
- 4.2.5.3. Manage and oversee the preparation of construction documents during the Work Authorization period, including:
 - (a) Review and provide written response on the adequacy of all design consultant submittals of plans and reports including structural plans, roadway plans, and engineering reports. Review the PS&E design at 30, 60, 90, and 100 percent milestones. GEC review time will be two weeks. Based upon these reviews, the GEC will recommend acceptance and approval by CTRMA of the plans, specifications and estimates.
 - (b) Ensure that the designs as provided by the design consultants are in accordance with applicable requirements of TxDOT Specifications, Standards and Manuals. Whenever possible, ensure that the design consultant is using TxDOT's standard drawings, standard specifications, or previously approved special provisions and/or special specifications.
 - (c) Conduct constructability reviews, including utility relocations, SW3P, drainage, typical sections, time constraints, correct bid items, etc.
 - (d) Oversee submission of plans to TxDOT for review at 30, 60, 90, and 100 percent milestones.
 - (e) Oversee submission of plans and Water Pollution Abatement Plan (WPAP) forms to the Texas Commission on Environmental Quality (TCEQ) at 60 and 100 percent milestones.
 - (f) Assemble two (2) final PS&E packages, roadway and noise wall construction, from the design consultant with supporting contract documents and provide them to CTRMA for Final PS&E review and processing for letting. The design consultant will assist on an as-needed basis. Repackaging of PS&E submittals into different construction packages is not included in the Scope of Services.
- 4.2.5.4. Assistance for preparation of construction contracts, these support activities generally will consist of the following specific tasks (up to 2 contracts):
 - (a) Assistance with solicitation of bids, including advertising and pre-bid conferences.
 - (b) Assistance with bid reviews and preparation of recommendations.
 - (c) Assistance with contract preparation and administration.

4.3 Design Services – Toll Systems / Facilities Design

4.3.1. Toll Schematic Design Plans

The GEC will develop schematic design plans for the tolling system for the Loop1 Managed Lanes Project. It is anticipated the toll system will have six (6) entrances/exits

along the Corridor and will utilize an Electronic Toll Collection (ETC) system (cashless). No toll plazas or major facilities are anticipated in this project. The GEC will coordinate with the design consultant and develop the toll design using the design consultant plans as a base. Sufficient input from CTRMA and TxDOT will be included to ensure proper input is received regarding the design concept(s). The toll schematic design plans will be submitted to CTRMA for approval prior to development of PS&E documents.

4.3.1.1. Toll Systems/Facilities Schematic Design

- (a) Locate toll systems / facilities on Schematic Design plans.
- (b) Include in the Schematic Design (in reference to toll systems):
 - Plan view (Structural, Large Signs, Striping)
 - Elevations
 - General Sections
- (c) Analysis of:
 - Toll Operations
 - Mechanical and Electrical Operations
 - Provisions for local utilities
 - Facilities for surveillance, communication and control
- (d) Layouts for overhead sign bridges
- (e) Outline Specifications
- (f) Statement of Probable Construction Cost

4.3.2. Toll System/Facilities PS&E Design

- 4.3.2.1. Based on the approved Schematic Design drawings and documents, the GEC will prepare the PS&E Documents. These documents will set forth in detail the requirements for construction of the toll collection systems portion of the Project. The PS&E Documents shall establish in detail the quality level of materials and systems for the toll collection systems / facilities and will include:
 - (a) Plans
 - (b) Elevations
 - (c) Sections
 - (d) Details
 - (e) General Conditions
 - (f) Technical Specifications
 - (g) Updated Statement of Probable Construction Cost
- 4.3.2.2. Final Review Documents will be submitted to CTRMA or its designated representative. Based on the review, the Final PS&E Documents will be finalized and submitted for bidding purposes.
- 4.3.2.3. Signings and Pavement Markings. Generally, the GEC work consists of corridor operational signing and collection system for the corridor and localized pavement markings around the ramp areas. For this Work Authorization it is

assumed that all major roadway directional guide signs and pavement markings will be included in the section engineer's plans. Signs in this work authorization will include those associated with toll systems operation only. The signing and pavement marking design effort is more specifically defined as follows:

(a) Signing

- For this work authorization it is assumed that the section engineers will provide all large sign layout sheets. Sheets will show location of proposed guide signs as required for the project. If additional large signs are required for toll operation purposes, they will be developed by the section engineer and included in their construction documents.
- For this work authorization it is assumed that the section engineers will provide all Overhead Sign Bridges (OSB's) required for the project. If additional OSB's are required for toll operation purposes, they will be developed by the section engineer and included in their construction documents.
- For this work authorization it is assumed that the section engineers will provide all large sign panel detail sheets as required for the project. If additional panels are required for toll operation purposes, they will be developed by the section engineer and included in their construction documents.
- The GEC will prepare Small Sign Layout Sheets showing proposed small signs required for tolling operation.
- The GEC will prepare miscellaneous sign details as required.
- The GEC will provide all required signing standards.
- The GEC will calculate signing quantities and will coordinate with the section engineer.
- CTRMA or their representative will provide any special architectural standards or details required for the signing plans. Development of these special details is not considered part of this scope of work.

(b) Pavement Markings

- For this work authorization it is assumed that the section engineers will provide pavement marking sheets. The GEC will prepare pavement marking and delineation layouts for the ramp areas and will coordinate with the section engineer. Layout will show the proposed markings, delineators and object markers.
- The GEC will provide required pavement marking standards.
- The GEC will calculate pavement marking quantities and will coordinate with the section engineer.

4.3.2.4. Surveillance, Communication and Control

- (a) Development of Surveillance, Communication and Control plans, details and estimates is not included in this scope of work. However, conduits for SC&C facilities provided by others will be included as directed by CTRMA.

4.3.2.5. Electrical Design

- (a) The GEC will provide electrical design efforts related for the toll collection systems aspects of the Project.
- (b) The GEC will provide required electrical standards.
- (c) The GEC will provide necessary drawings and specifications to adequately describe the Electrical Design for the toll collection systems portion of the Project.

4.3.2.6. Utility Design

- (a) The GEC will provide a preliminary report on utility requirements at the toll gantry locations.
- (b) For this work authorization it is assumed that the section engineer will provide utility information as electronic files. Review toll plaza design features with the section engineer's existing utility and relocation plans to identify potential conflicts with proposed toll plaza improvements. Coordinate mitigation of any identified conflicts with the section engineer and the Utility Companies.
- (c) The GEC will determine availability of utilities locally and regionally at the OSBs.
- (d) The GEC will develop utility plan for regional and onsite service.
- (e) Utility relocation plans are not included in this scope of work. Any utility relocation plans in the project area are assume to be the responsibility of the Section Engineer for that section.

4.3.2.7. Miscellaneous

- (a) The GEC will prepare general notes for the construction documents.
- (b) The GEC will prepare list of governing specifications, special specifications and special provisions.
- (c) The GEC will provide Quality Control/Quality Assurance for toll design and plan production activities.

Deliverables

Deliverables will consist of the following:

- Schematic Design Review Submittal - eight (8) paper copies
- PS&E Review Submittal - eight (8) paper copies
- PS&E Submittal - one (1) mylar original and two (2) CD-ROM copies of the Plans, Specifications and Estimates and all related contract documents.

TASK 5: O'CONNOR BOULEVARD/SH 45 INTERCHANGE SCHEMATIC**5.1 Project Development Support**

The Consultant will provide support to the CTRMA as required during the Project Development process. Specific efforts will include:

- 5.1.1. **TIFIA Loan Application:** Assist the CTRMA in the development of the TIFIA loan application for the Project as requested. This will include preparation of various elements of the TIFIA loan form & associated documentation; it will also include participation in the coordination efforts as requested by the CTRMA.
- 5.1.2. **GEC Engineering and Technical Support:** Provide various engineering and technical tasks as requested by CTRMA including but not limited to: reports and research, presentations, and meetings.
- 5.1.3. **Interagency Coordination:** Provide appropriate staff as part of the coordination efforts between the CTRMA and other Agencies. GEC will provide coordination efforts on the CTRMA's behalf at the direction of the CTRMA.
- 5.1.4. **Traffic and Revenue (T&R) Consultant Coordination:** Provide continued coordination and support to the CTRMA T&R Consultant, as directed by the CTRMA.
- 5.1.5. **Provide Project Cost Estimate, Schedule, update financial feasibility calculations & provide Official Statement (OS) support:** Perform updates to preliminary cost estimate, schedule, and financial analysis necessitated by the ongoing project scoping / sizing process. Develop and certify the Engineers Report for OS. Review and comment on the OS as requested by CTRMA.
- 5.1.6. **Provide DBE Outreach and Public Involvement support** as requested by CTRMA.

5.2 Route And Design Studies

- 5.2.1. **Develop Roadway Design Criteria:** Prepare a Design Summary Report (DSR) that will serve as the living document for the project. Develop the roadway design criteria utilizing TxDOT design principles and practices. Fill in the TxDOT Form 1002 that will serve as the design criteria for the project.
- 5.2.2. **Preliminary Cost Estimate:** Develop a preliminary cost estimate (one estimate during schematic development) utilizing the approved roadway design criteria and the Average Low Bid Unit Prices for Construction located on the TxDOT website.
- 5.2.3. **Design Schematic**
Develop a design schematic utilizing the approved roadway design criteria to be utilized for obtaining the environmental clearance.

The schematic layouts will include the basic information necessary for the proper review and evaluation of the proposed improvement (per TxDOT Design Manual, Section 3):

- General project information including project limits, design speed, and functional classification.
- The location of interchanges, mainlanes, grade separations, frontage roads, turnarounds, and ramps.
- Existing and proposed profiles and horizontal alignments of mainlanes, ramps, and crossroads at proposed interchanges or grade separations. Frontage road alignment data need not be shown on the schematic; however, it should be developed in sufficient detail to determine right of way needs.
- Location and text of the proposed mainlane guide signs should be shown. Lane lines and/or arrows indicating the number of lanes should be shown.
- An explanation of the sequence and methods of stage construction including initial and ultimate proposed treatment of crossovers and ramps.
- Tentative right of way limits.
- Bridges and bridge class culverts.
- The geometrics (pavement cross slope, superelevation, lane and shoulder widths, slope ratio for fills and cuts) of the typical sections of proposed highway mainlanes, ramps, frontage roads, and cross roads.
- Location of retaining walls.
- The existing and proposed traffic volumes and, as applicable, turning movement volumes.
- Existing and proposed control of access lines.
- Direction of traffic flow on all roadways.
- The geometrics of speed change and auxiliary lanes.
- Design speed.
- Existing roadways and structures to be closed or removed.
- Location of toll facilities.

5.2.4. Geotechnical Investigations

5.2.4.1. Soil Core Hole Drilling

Explore the subsurface conditions at the bridges, MSE walls and pavements in general accordance with TxDOT design guidelines. The explorations will be planned using existing data that may be available through TxDOT, published geologic maps and soil surveys and visual observations in the field in order to most efficiently perform the subsurface investigation.

The Engineer anticipates supporting the bridges on drilled shafts founded in rock. Drill and core to a minimum of 10 feet below the anticipated shaft tip elevation to confirm the presence and strength of the rock and to evaluate the rock for anomalies that may affect the foundations. Drill twelve (12) borings at the bridges, with one boring at each bridge bent and abutment location, to depths of approximately 30 feet below ground surface. Drill six (6) embankment/MSE wall borings, each to refusal on bedrock.

Coordinate with TxDOT to obtain site access and permits for the subsurface investigation. Contact One Call for utility clearance prior to performing the geotechnical investigation.

Utilize a truck-mounted drill rig equipped to sample using push-tubes, Texas Cone, Standard Penetration Test (SPT) samplers, and rock coring. The information obtained from the borings will be used to evaluate subsurface conditions within the depth of foundation influence. Observations for groundwater will be made while sampling prior to the introduction of drilling fluids, which are necessary once coring begins. No other groundwater monitoring is included in this scope of work.

5.2.4.2. Laboratory Testing

The testing may include but is not limited to the tests listed below.

- Atterberg Limits (liquid limit, plastic limit, and plasticity index)
- Percent Passing the #200 Mesh Sieve
- Unified Soil Classifications
- Unit Weight and Moisture Content
- Unconfined Compression
- Soil Corrosivity

5.2.4.3. Engineering Analyses and Foundation Report

Conduct geotechnical engineering evaluations and prepare a Geotechnical Design Report for the structures. This report will provide the information necessary for design of the bridge foundations, MSE walls, and embankments.

The investigations and subsequent testing will be performed in accordance with Technical Provision 14 and the TxDOT Geotechnical Design Manual. Designs will be based upon TxDOT methods (Texas Cone Penetrometer, WinCore) and verified using FHWA practice for design of drilled shafts and foundations. MSE walls will be evaluated using the FHWA procedures for evaluating for external conditions (the internal design will be provided by others); evaluations will include sliding, bearing capacity, overturning, differential settlement, and global stability.

The following information will be included in the foundation report:

- Existing facilities and proposed improvements
- Site conditions
- Field investigation and geotechnical testing
- Geotechnical conditions, including site geology, faulting and seismicity, subsurface conditions, and groundwater conditions
- Soil corrosivity
- Geotechnical analysis and design, including recommended subsurface parameters for design for use in the structural analyses of the bridges and MSE walls
- Discussion of the recommended structure foundation type

- Drilled shaft data tables: axial, uplift, and lateral capacity; and lateral calculation output for use in structural design using service load methods
- Global stability evaluations for MSE walls and geotechnical recommendations for the internal wall design (to be used by the wall design firm)
- Necessary foundation improvements, including earthwork recommendations
- Construction considerations
- Appendices will include the soil boring/rock coring logs, laboratory test results, a graphical subsurface profile, and our lateral drilled shaft analyses results (from LPile), and WinCore data

5.2.5. Field Surveying

5.2.5.1. Control

Utilize the existing TxDOT Survey Control Network NAD-83/93 (HARN) NAVD 88 datum, Texas State Plane Coordinate System, Texas Central Zone. A Global Positioning System (GPS) and conventional land surveying methods will be used to establish additional project control if needed. These methods will also be used to perform the various tasks of this project.

5.2.5.2. Record of Right of Way

Obtain the record right-of-way (ROW) strip maps for O'Connor Boulevard, McNeil Road, and SH 45 from TxDOT and/or Williamson County. Field locate minimal ROW monumentation within the project area. Plot the record ROW lines in the project area and use minimal monument field locations to place the record lines in the working drawing relative to the design survey. This is not a ROW survey and is record location only. Establish the record centerline alignment of SH 45 based on the record right-of-way (ROW) strip maps for SH 45 and minimal ROW monumentation.

5.2.5.3. Right of Way Map

A right-of-way (ROW) map, parcel plats and field notes will be prepared and furnished. These documents will be revised as required due to changes in highway design, ownership changes, revised parcel numbering, or other circumstance which might be reasonably expected to occur during the project. The ROW map must depict all improvements affecting ROW. Project base line is to be drawn and stationing on the ROW map. All plats, maps and field notes must be signed, dated and sealed by a Registered Professional Land Surveyor. Conduct an on-the-ground survey of all affected ROW parcels, identifying found monuments and establishing new monuments as required. It is estimated that up to four parcels may be affected by the project. Assist CTRMA to obtain approval of ROW Maps by TxDOT.

5.2.5.4. Engineering Design Survey

Perform cross sections of the SH 45 right-of-way (ROW) extending approximately 6000 feet east and 3000 feet west of the intersection with O'Connor Boulevard. Perform cross sections of the O'Connor Boulevard right-of-way (ROW) from its intersection with the SH 45 frontage road to approximately 2000 feet north of that intersection. Perform cross sections of the McNeil Road right-of-way (ROW) from its intersection with the SH 45 frontage road to approximately 1000 feet north of that intersection. The cross sections will be obtained at 50-foot stations and major grade-breaks. All improvements, signs, pavement striping and visible utilities will be located. All 8-inch and larger trees will be located. (Data will not be collected within the travel lanes of SH 45) Utilizing MicroStation and Geo-Pak digital terrain modeling program, a one-foot contour interval map and digital terrain model will be prepared for the project area.

5.2.5.5. Soil Boring Staking

Upon completion of the soil borings, field tie to establish horizontal and vertical project control, the x and y coordinates as well as the z elevation of the soil boring location. Stake approximately 18 borings and locate after boring are complete.

5.2.5.6. Control Location Maps

Prepare control location map plan sheets depicting all project survey control points. These location maps should tie the control point, by distance, to a minimum of three known topographic features and identify the control point x, y, elevation, name and or number. The plan sheets shall also contain the descriptions and all pertinent information regarding bench marks for the project.

Deliverables

Deliverables will consist of the following:

- Electronic copy of the Design Summary Report (DSR) & Form 1002.
- Five (5) roll plots and an electronic copy of the Design Schematic.
- Five (5) bound copies of the Geotechnical Design Report.
- One original and one copy of the Right-of-way (ROW) map, parcel plats and field notes

5.3 Environmental Re-evaluation

The work to be performed by the GEC shall consist of providing a re-evaluation, including public involvement, of the Final Environmental Impact Statement (FEIS) of the SH45 Toll Road Project from RM 620 to approximately three miles north of the City of Leander.

The re-evaluation will focus on design changes including the construction of a partial interchange, including the addition of ramp connections to the SH45 mainlanes.

Assumptions

- The projected average daily traffic (ADT) of SH45 is less than 140,000, therefore a qualitative MSAT analysis will be prepared for the re-evaluation.
- The GEC will base the re-evaluation on the best information available at the time this work authorization is executed. Incorporation of better information will be considered out of scope.
- This scope assumes no design changes and no revisions to traffic data after the execution date. Should changes be made that would result in the need for additional analysis and/or revisions to the document, any related effort would be considered out of scope.

5.3.1. Right-of-Entry

The GEC will coordinate obtaining right-of-entry for properties not previously assessed or where right-of-way has not been acquired.

5.3.2. Data Collection

The GEC will review the FEIS and any previous re-evaluations for 183A for the history of the Project, consistency with purpose and need, and design changes. The GEC will also perform data collection and site reconnaissance visits within the existing and proposed ROW, upon notice to proceed and receipt of right-of-entry, to supplement data needed to complete the re-evaluation. The GEC will obtain or update periodically publicly available information and perform site investigation including:

- Locations of public buildings, schools, churches, parks, etc.
- Historic-age structures
- Aerial/Infrared photography, if available.
- National Wetland Inventory Maps.
- Site Review for presence of non-inventoried wetlands.
- County Soil Survey Maps.
- TCEQ & EPA Hazardous Materials Database Information.
- FEMA 100-year floodplains.
- Vegetation Information.
- Threatened and Endangered Species Information.
- Noise Receiver Locations.

5.3.3. Preparation of Environmental Document

The GEC shall prepare environmental documentation of the level required by proposed improvements, utilizing the appropriate outline in accordance with; TxDOT's Environmental Manual, Title 23, Parts 771 and 772, FHWA's Technical Advisory T6640.8A, and TxDOT's 1996 Noise Guidelines and 1999 Air Quality Guidelines.

The GEC will include in the document a discussion of the history of the project, the purpose and need, and a description of design changes being assessed. The document will also include an

existing environment discussion, direct effects discussion, and indirect, and cumulative impacts analysis as described below.

5.3.4. Existing Environment

Through data collection and field investigation, the GEC will update the description of the affected environment to serve as the basis for determining the environmental consequences of the proposed 183A/CR 274 interchange. This description will include land use, socio-economics (including identification of minority, low income, and limited English proficient (LEP) populations), farmlands, soils, noise, air quality, surface water, groundwater, wetlands, vegetation, wildlife habitat, threatened and endangered species, cultural resources, Section 4(f) properties, and hazardous materials sites.

5.3.5. Archeological Survey

For anticipated new right-of-way, the GEC will perform an archeological survey including shovel tests in accordance with the Texas State Minimum Archeological Survey Standards (TSMASS) for archeological surveys. The following items are included in the archeological survey:

Archival Research

- The GEC will conduct archival research at the Texas Historical Commission (THC), the Texas Archeological Research Laboratory (TARL), and General Land Office (GLO), the National Park Service's online National Register Information System (NRIS), and /or other relevant archives for information on previous cultural resource investigations conducted in the vicinity of the project's APE and previously recorded cultural resource sites and historic properties in and near the project's APE.

Intensive Pedestrian Survey

- The GEC will obtain a Texas Antiquities Permit prior to initiating field activities.
- The GEC will perform an intensive pedestrian survey including walkover and surface inspection as well as shovel testing of the project's APE at a level of intensity sufficient to meet or exceed the TSMASS and guidelines established by the Council of Texas Archeologists.
- The GEC will document any cultural resources encountered to a sufficient degree to make preliminary determinations of the significance of the resources in terms of their eligibility for inclusion in the National Register of Historic Places and for designation as State Archeological Landmarks.
- The GEC will inspect the locales of any previously recorded archeological sites within the APE and assess their current condition.
- The GEC will submit State of Texas Archeological Site Data Forms (for new archeological sites) or update forms (for previously recorded sites) to TARL.

Reporting

- The GEC will prepare a report suitable for review by TxDOT and the THC under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas. The report will include descriptions of the APE and regulatory background

against which archeological investigations were conducted, the environmental and cultural settings of the project are, the results of archival research and the archeological survey, and any archeological resources recorded during the survey.

- A non-collection policy will be employed to the maximum extent practicable.

5.3.6. Historic Resources Survey

As part of the re-evaluation of the existing environment, the GEC will update the historic sites listings for the re-evaluation. The GEC will conduct surveys, research and documentation of historic buildings, structures, and objects within the Area of Potential Effect (APE) for proposed right of way that was not previously surveyed. The historic structures survey will follow the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation and will include:

- Field inspection
- Documentation of the survey results;
 - For buildings and other structures, objects and districts, the documentation will include the following for the area of survey, within the APE on either side of the right of way of the proposed 183A Turnpike frontage roads, for any property over 45 years old:
 - A map showing the location of the property in relation to the proposed project area
 - Date of construction
 - Clear photographic prints, including at least one front elevation and one oblique view of each property surveyed, and area or streetscape views in potential districts
 - Research on historical associations
 - Identification of cultural resources that may be eligible for listing or are listed in the National Register of Historic Places, including historic and prehistoric archeological sites, buildings and other structures, objects, districts, traditional cultural properties, and cultural or historic landscapes located during the survey
 - Recommendations regarding National Register eligibility of identified cultural resources
 - Recommendations and descriptions on findings of potential effect
 - Project effects on potentially eligible historic resources

5.3.7. Direct Effects

With the information compiled on the affected environment and design and traffic data, the GEC will determine the environmental consequences, or direct effects, of the proposed design changes. The direct effects will be determined on the resource categories analyzed for the Affected Environment. The direct effects will include a qualitative MSAT analysis based upon traffic projections being below the quantitative MSAT criteria threshold of 140,000 ADT. The qualitative analysis will be based upon the FHWA *Interim Guidance on Air Toxic Analysis in NEPA Documents, February 3, 2006*.

5.3.8. Indirect and Cumulative Impacts (ICI) Analysis

The GEC will conduct an ICI analysis consistent with the eight-step approach in TxDOT's *Interim Guidance on Preparing Cumulative Impact Analyses*, dated March 2006. The ICI analysis will focus on impacts from the design changes. The GEC will review changes attributable to past roadway improvements in the area in order to project indirect effects of the proposed improvements in the re-evaluation. The *National Cooperative Highway Research Program Report 466 (NCHRP 466)* will be used as guidance in this analysis.

5.3.9. Public Involvement

- 5.3.9.1. Open House: The GEC will prepare and present one (1) open house in support of the re-evaluation. The GEC will attend the open house for the purpose of providing informational materials regarding the re-evaluation, and for gathering comments from the community-at-large, and addressing local concerns regarding the project. The GEC will secure the sites for the open house. Site locations will be submitted to the Authority for approval prior to booking the rooms. Additionally, the GEC will make arrangements for a court reporter to be present at the open house.
- 5.3.9.2. Open House Facilitation: The GEC will prepare and mail meeting notices to identified stakeholders in the database, and develop and publish one (1) legal notice in two newspapers in preparation for the open house. The notices will be placed in previously identified local paper(s) 30 days and 10 days before the open house. Additionally, the GEC will prepare an agenda, project overview, location map, comment cards (up to 500), indoor/outdoor signage, sign-in sheets, exhibit boards (up to 2), and up to four (one page, double-sided) handouts for public use. All project boards and materials will be printed in English. An Open House Summary Report will be prepared after the open house to record public comment. Project communication materials will be approved by the CTRMA before use.
- 5.3.9.3. Open House Staffing: The GEC will provide a project manager, two (2) technical staff members and two (2) support staff members to attend the Public Meeting for the purpose of providing informational materials regarding the project, addressing local concerns, staffing the sign-in table and providing meeting management.

Exclusions

The following tasks are specifically excluded from the preparation of environmental documents and not included in this work authorization, and would be scoped and detailed at a later date, as necessary:

- Endangered species coordination and/or surveys;
- Biological Assessments;
- USACE 404 delineations and permit coordination;

- Historic/Archeological coordination involving National Register Testing and/or Data Recovery-level excavation or mitigation or Section 106 Coordination except as specifically noted and included above;
- Preparation and coordination for Section 4(f) or Section 6(f) approval;
- Hazardous materials Phase II Environmental Site Assessment;
- Additional documentation services requested as a result of a change in environmental regulations or TxDOT/FHWA documentation standards from those in practice and acceptable at the time of approval of this Work Authorization;
- Work associated with outfalls outside the project ROW after the notice to proceed is received;
- Coordination with TCEQ.

Deliverables

The GEC will prepare a draft re-evaluation for review by TxDOT-ENV (10 copies will be provided). Upon receipt of comments from TxDOT-ENV, the GEC will prepare a second draft for submittal to FHWA (10 copies will be provided). A third and final draft will be prepared to address comments received as a result of FHWA review (20 copies will be provided to TxDOT-ENV and FHWA). An updated re-evaluation will be prepared following the Open House, if determined necessary based on public comment. Should a post-meeting update be necessary, the GEC will respond to one set of review comments.

Deliverables will consist of the following:

- Twenty (20) draft copies, twenty (20) final copies of the re-evaluation document
- 5 copies of the Archeological Report
- 5 copies of the Historic Resources Report
- One (1) Open House
- One (1) Court Reporter
- One (1) Open House transcript
- One (1) legal notice
- One (1) Open House agenda
- Up to five hundred (500) Comment Cards for the Open House
- Up to two (2) exhibit boards for the Open House
- One (1) Handout for the Open House
- One (1) Open House notice/letter for mail out, multiple copies as required
- One (1) electronic and one (1) hard copy of the Open House Summary Report

TASK 6: US290E, US183S, SH71E, US290W, SH71W, SH45SW PROJECT DEVELOPMENT

6.1 290E & US290W Design Consultant Procurement

6.1.1. Procurement Management & Administration

The GEC will provide support for the acquisition by the CTRMA of professional services as defined in Section 2254.001 of the Texas Government Code, or any successor statute

thereto, relative to the acquisition of architecture, professional engineering, and land surveying. With respect to assistance for securing professional design services, these support activities will consist of the following specific tasks:

- 6.1.1.1. Participate in the management and administration of the subject procurements. This will include participation in Evaluation Committee meetings during the procurement process. PBS&J will also be responsible preparations necessary to effectively facilitate the meetings and follow-up activities that result from the meetings.
- 6.1.1.2. Develop a schedule which will define the entire procurement process.
- 6.1.1.3. Prepare correspondence (letters, email, memos, etc.) necessitated by the subject procurement process, as required.

6.1.2. Notice of Issuance (NOI)

The GEC will develop the NOI which will inform potentially interested design consultants of the subject procurement. Included with this task will be participation in NOI reviews & incorporation of modifications.

6.1.3. Request for Qualifications (RFQ)

The GEC will develop the RFQ to solicit responses from design consultants who are interested in competing in the subject procurement. Included with this task will be the following efforts:

- 6.1.3.1. Participation in RFQ reviews & incorporation of modifications.
- 6.1.3.2. Preparation of a Reference Document DVD for distribution with the RFQ.
- 6.1.3.3. Preparation of addenda documents, as required.
- 6.1.3.4. Preparation of responses to questions related to the RFQ and procurement process, as required.

6.1.4. Pre-Proposal Conference

- 6.1.4.1. The GEC will develop documents required to effectively facilitate a Pre-Proposal Conference for the subject procurement. Included with this task will be the following efforts:
 - (a) Development of a PowerPoint presentation.
 - (b) Development of a "talking points" document to be used during the presentation.
 - (c) Development of miscellaneous documents (agenda, sign-in sheets, handouts, etc.) required for the conference.
- 6.1.4.2. Participate in the Pre-Proposal Conference. It is anticipated that this will include staff participation in the actual presentation, conference set-up and clean-up, and sign-in table.
- 6.1.4.3. Complete all follow-up activities resulting from the Pre-Proposal Conference, including the preparation of all meeting material for inclusion on the CTRMA website.

6.1.5. RFQ Response Evaluations

- 6.1.5.1. Develop draft evaluation criteria for the review and consideration of the Evaluation Committee. Specific evaluation criteria will be developed for each Segment. Included with this task will be participation in NOI reviews & incorporation of modifications.
- 6.1.5.2. Upon the acceptance of the evaluation criteria by the Evaluation Committee, PBS&J will develop an Evaluation Document containing guidelines and forms to be used during this portion of the procurement.
- 6.1.5.3. Upon receipt of Responses to the RFQ, PBS&J will assist in the processing of the documents. This will include logging and organizing the Responses for distribution to the Evaluation Committee. cursory reviews of the Responses will also be included to determine consistency with the RFQ requirements.
- 6.1.5.4. Participate in the evaluation of Responses to the RFQ as part of the Evaluation Committee.
- 6.1.5.5. Complete reference checks for each of the proposing entities submitting a Response to the RFQ. This effort will include the development of a standard email questionnaire, distribution of the email questionnaire, and review/documentation of replies.

6.1.6. Interviews

- 6.1.6.1. Develop an Interview Guidelines document which will provide guidance to the Design Consultants selected to partake in this portion of the procurement. Included with this task will be participation in Interview Guidelines reviews & incorporation of modifications.
- 6.1.6.2. Assist in the development of Interview Questions to be asked of the Design Consultants selected to partake in this portion of the procurement.
- 6.1.6.3. Develop draft interview evaluation criteria for the review and consideration of the Evaluation Committee. Included with this task will be participation in interview evaluation criteria, reviews, & Incorporation of modifications.
- 6.1.6.4. Upon the acceptance of the interview evaluation criteria by the Evaluation Committee, PBS&J will develop an Interview Evaluation Document containing guidelines and forms to be used during this portion of the procurement.
- 6.1.6.5. Participate in the Interviews as part of the Evaluation Committee.

6.1.7. Draft Design Consultant Scope & Fee Development

- 6.1.7.1. Prepare draft versions of segment specific Scope of Services documents for distribution to the selected Design Consultants during the initial negotiations meeting. The intent of these documents is to provide the selected Design Consultants with a scope which contains the CTRMA's expectations and understanding of the project work effort. These documents will also serve as the starting point to initiate scope negotiations.
- 6.1.7.2. Prepare draft versions of segment specific Fee Estimates for the CTRMA's use. The intent of these documents is to provide the CTRMA a established

fee range which can be used for comparison during fee negotiations with the selected Design Consultants.

6.1.8. Scope & Fee Negotiation Support

- 6.1.8.1. Assist in the review of scope & fee estimate submittals by the selected Design Consultants.
- 6.1.8.2. Assist in the development of correspondence which will document the results of the scope & fee estimate reviews.
- 6.1.8.3. Support the CTRMA in meetings with the selected Design Consultants as the parties finalize scope & fee negotiations.

6.2 Corridor Management And Program Support

6.2.1. Program Management

- 6.2.1.1. Project Management
 - (a) Provide staff to manage the daily activities of the program.
 - (b) Serve as the primary contact between CTRMA, TxDOT, design consultants, third party consultants, utility companies, public agencies, and the general public.
- 6.2.1.2. CTRMA Program Manual
 - (a) Develop a CTRMA Program Manual that outlines the program organization; roles & responsibilities, communication protocol, program process and procedures throughout the entire program team. The program team includes.
 - (b) Maintain the CTRMA Program Manual as a living document by the addition, modification, or deletion of provisions as necessary and will issue revisions as the program progresses.
- 6.2.1.3. Project Management Plan (PMP)

The GEC will develop corridor specific PMP's in accordance with FHWA published Guidance Documents that outlines the project organization and communication protocol throughout the entire project team. The CTRMA Program Manual will be utilized as the foundation document for this effort, with modifications incorporated to make it a corridor specific PMP.
- 6.2.1.4. Document Controls
 - (a) Develop and implement a document controls plan to be provided to the Program Team.
 - (b) Maintain project files for the length of the project.
 - (c) Transfer program and project files to CTRMA upon completion of the work or as directed by the CTRMA.

6.2.2. Program Reporting

- 6.2.2.1. Prepare and issue monthly status reports on segment designs, environmental clearance, ROW acquisition, and utility relocation progress and document any issues and delays encountered.
- 6.2.2.2. Provide a monthly update to CTRMA on key tasks accomplished during the preceding month, meetings and key activities for the upcoming month, and identify outstanding issues requiring resolution.
- 6.2.2.3. Provide Project Administrative support staff to track, monitor, and report on contracts and budgets for PBS&J, sub consultants, and Segment Designers including sub consultants.
- 6.2.2.4. Provide Project Administrative support staff to track, monitor, and prepare reports on DBE/HUB utilization by Prime and Segment Designers, and DBE/HUB programs for other program contracts including construction contracts.
- 6.2.2.5. Prepare a Quarterly Report with an Executive Summary that provides a comprehensive summary of the monthly reports and the overall program progress.

6.2.3. Program Scheduling

- 6.2.3.1. Prepare and maintain a Master Program Schedule (Primavera format) that will show critical milestones for the performance and coordination of services. The following major tasks will be included:
 - (a) Program Management Tasks
 - (b) Design Tasks
 - (c) Right-of-way Acquisition and Coordination
 - (d) Utility Coordination, Development of Agreements, and Adjustments, as applicable.
 - (e) Environmental Document(s), supplemental agreements, addendums, reevaluations, and permitting.
 - (f) Environmental studies and tasks associated with right-of-way clearance.
 - (g) Public Involvement, Meetings, Hearings, and Communications
 - (h) Master construction time schedules for each project segment including disincentives and incentives.
- 6.2.3.2. Monitor, evaluate, and validate all schedules produced by others (Segment Designers, Utility Companies, etc.) that are a subset of the Master Program Schedule.
- 6.2.3.3. Provide monthly updates of schedules at the appropriate stages of the program and shall provide an assessment of schedules provided by applicable third parties for integration into the Master Program Schedule.

6.2.4. Segment Designers Management

- 6.2.4.1. Coordination and Oversight of Segment Designers

- (a) Assign Corridor Managers to serve as the day-to-day contact and to provide project management coordination for the assigned Segment Designer.
- (b) Evaluate each of the progress reports and invoices for completeness and accuracy as provided by the Segment Designers with the evidence of the work accomplished during the period since the previous report.
- (c) If the progress performed is found to be adequate, provide a written response stating that the physical progress as reported by the design consultants was found to be satisfactory and make the appropriate recommendations to CTRMA.
- (d) Maintain a schedule for billing and monitor budgets established for each Segment Designer.
- (e) Provide resolution and recommendations to any contract issues and provide response to Requests for Information and Requests for Clarification received from Segment Designers as related to contract issues.
- (f) Assess requests for supplemental agreements as submitted by Segment Designers and provide written recommendations to CTRMA concerning validity of requests, proposed man-hours, and whether or not a supplemental agreement is warranted under the terms of the contract(s).
- (g) Prepare independent estimate (pre-negotiation estimate) of proposed fee for supplemental agreements as may be required.
- (h) Review supplemental agreements and contracts for spreadsheet accuracy using approved rates from the contracts prior to Segment Designer submittal to CTRMA.
- (i) Support CTRMA, as directed, in the preparation of final supplemental agreement documents for final processing.

6.2.4.2. "Over The Shoulder" Review Activities

The GEC will provide continual "Over The Shoulder" reviews of the Segment Design Consultants to verify conformance to design specifications and enhance coordination between the Segment Designers.

6.2.5. Project Meetings & Documentation

The GEC will facilitate the following Project Meetings to assess progress, schedule, and quality of services being provided as well as identify issues:

- 6.2.5.1. Production Meetings (Monthly)
- 6.2.5.2. Design Coordination Meetings (Bi-Weekly)
- 6.2.5.3. Environmental Coordination Meetings (Bi-Weekly)
- 6.2.5.4. ROW Coordination Meetings (Bi-Weekly)

- 6.2.5.5. Utility Coordination Meetings (Bi-Weekly)
- 6.2.5.6. Toll Facilities Design Coordination Meetings (Bi-Weekly)
- 6.2.5.7. Issue Resolution Meetings (As Needed)

The GEC will prepare Meeting Minutes and Action Items for each of the Project Meetings and distribute to attendees and appropriate personnel.

6.2.6. Document Review Activities

- 6.2.6.1. Coordinate, log, and track comments on all reviews of Segment Designer submittals including:
 - (a) Engineering Reports
 - (b) 30% Plan Submittals
 - (c) 60% Plan Submittals
 - (d) 90% Plan Submittals
 - (e) 95% Plan Submittals (Plan Review)
 - (f) 100% Plan Submittals (Design Division)
- 6.2.6.2. Review submittals for completeness and coordinate reviews by discipline area specialists and appropriate personnel as applicable.
- 6.2.6.3. Evaluate the PS&E for consistency between corridor segments.

6.2.7. CTRMA Coordination Support

The GEC will support CTRMA in coordination and any interlocal agency agreements including exhibit preparation and supporting document preparation and assembly with the following agencies:

- 6.2.7.1. Texas Department of Transportation (TxDOT)
- 6.2.7.2. Federal Highway Administration (FHWA)
- 6.2.7.3. City of Austin (COA)
- 6.2.7.4. Capital Area Metropolitan Planning Organization (CAMPO)
- 6.2.7.5. Capital Metropolitan Transportation Authority (CAPMETRO)
- 6.2.7.6. Travis County
- 6.2.7.7. Hays County
- 6.2.7.8. Local Municipalities and Municipal Utility Districts
- 6.2.7.9. Other Agencies as identified and as directed by CTRMA

6.3 Strategic Financing Support

6.3.1. Operations, Maintenance, and Renewal & Replacement Estimate Updates

- 6.3.1.1. Develop operations estimates using either a Sketch Level approach (i.e., an assumed per transaction cost based on average operations costs of similar toll systems) or a Level 1 approach (i.e., estimate actual quantities for the

- various elements of the toll operations and applying anticipated unit prices to same to develop an opening year cost which can be escalated over time).
- 6.3.1.2. Develop annual/routine maintenance estimates using either a Sketch Level approach (i.e., an estimated per centerline mile cost based on the facility type which considers the number of lanes, pavement material, and location) or a Level 1 approach (i.e., estimate actual quantities for the various elements of the maintenance efforts and applying anticipated unit prices to same to develop an opening year cost which can be escalated over time).
 - 6.3.1.3. Develop renewal & replacement budget estimates (also known as periodic/non-routine maintenance estimates) using either a Sketch Level approach (i.e., an estimated per mile cost based on renewal & replacement budgets utilized on similar facilities) or a Level 1 approach (i.e., includes the identification of a long-term, periodic maintenance schedule, estimation of quantities for the associated elements, and inflated prices of same to assess the overall cost requirements of the system in the target years).

6.3.2. Project Cost Estimate Updates

As directed by CTRMA, GEC will provide total project cost estimate updates for the corridors. GEC will prepare an estimate of probable construction costs which will include quantity/cost estimates for major components of work such as; roadway paving, roadway earthwork, roadway drainage, bridge structures, retaining walls, other structures, signing and marking, lighting, signalization and toll collection systems. The estimate of probable construction costs will be used to estimate total project costs that will also include preliminary engineering, final engineering, right-of-way (ROW) acquisition, environmental compliance/mitigation, construction, utility relocation and construction engineering and inspection (CEI).

6.3.3. Toll Feasibility Analysis Updates

The GEC will assist CTRMA in updating toll feasibility analyses which includes the incorporation of traffic and revenue forecast updates (by others); operations, maintenance, and renewal & replacement estimates; and total project cost estimates to determine the financial feasibility of the corridors.

6.3.4. Financial Advisor Support/Financial Plan Development

The GEC will provide financial advisor support necessary for the CTRMA to conduct financial programming of their system. This will include the development of cash flow analyses which contemplate implementation costs and schedules. PBS&J will also assist in the identification of priorities to support the determination of alternate program deliver scenarios. The tasks will include:

- 6.3.4.1. Develop project costs based upon alternative project approaches. Assess third party related costs for utility adjustments/relocations.
- 6.3.4.2. Assess funding sources such as state funds, federal formula funds, federal discretionary funds, and tolls.
- 6.3.4.3. Assess financing techniques such as State Infrastructure Banks, the Transportation Infrastructure Finance and Innovation Act (TIFIA),

Advanced Construction, Toll Revenue Bonds, State Cash Flow Bonds, other state bonds.

- 6.3.4.4. Develop and recommend revenue shortfall mitigation strategies to minimize impacts on scheduled project delivery and prepare a summary of significant cost increases or reductions that will affect the cost of the project.
- 6.3.4.5. Develop a Funding Contingency Plan should funding for the project as a whole not be provided and determine the impact of various design approaches on estimated project costs and project design life. PBS&J will:
 - (a) Develop a list of "reasonable" design options for consideration such as lane reductions, interchange and ramp reductions, frontage road elimination and pavement structure modifications
 - (b) Meet with CTRMA to get concurrence regarding design options prior to additional analysis.
 - (c) Analyze and document the financial implications of the various design options considered and include such things as project cost, schedule impact, local economic impact, length of useful life, and impact on financing options.

6.3.5.Strategic Financing Partner Procurement Support

The GEC will support the CTRMA as required during Strategic Financing Partner procurement. It is anticipated that GEC will provide information pertaining to the implementation cost estimates, implementation schedules, operation cost estimates, maintenance cost estimates, and renewal & replacement budget estimates. Additionally, it is anticipated that the GEC will be asked to support the CTRMA by participating in meetings between the CTRMA and shortlisted proposers.

6.4 Environmental Coordination

6.4.1.Document Review

- 6.4.1.1. Review Environmental Documents and provide written comments and recommendations on such documents.
- 6.4.1.2. Confirm that work on the project conforms to the applicable requirements of TxDOT and FHWA. Sources of materials will include data received from TxDOT and other federal, state and local governmental and quasi-governmental agencies and field investigations.

6.4.2.Exhibits

The GEC will prepare updated exhibits, as necessary, including, but not limited to the following: existing and proposed typical sections, plan layout, noise and air receptor location map, wetlands inventory map, if appropriate, and hazardous sites map.

6.4.3. Coordination

- 6.4.3.1. Support CTRMA in coordination with TxDOT Austin District, Consultants, Resource Agencies, TxDOT's Environmental Affairs Division, and the FHWA, as required, for permitting, re-evaluations, preparation of additional environmental documents, and tracking of commitments made in environmental documents.
- 6.4.3.2. Coordinate findings and conclusions with each Segment Design consultant for appropriate inclusion in the environmental documentation of each segment.
- 6.4.3.3. Coordinate environmental commitments for consistency throughout the corridor and develop and provide an environmental commitments document.

6.4.4. Meetings

The GEC will document meetings held, decisions made, the process used to reach the decisions, and the final recommendations.

6.5 Right-of-Way**6.5.1. Right-of-Way Coordination**

As directed by CTRMA, the GEC may provide right-of-way management support to assist the CTRMA with the coordination and monitoring of the various right-of-way activities. Support might include the following services:

- 6.5.1.1. Assisting the right-of-way team in the identification and prioritization of parcel acquisitions critical to the overall project schedule and the required private utility relocation activities.
- 6.5.1.2. Preparing and maintaining a detailed right-of-way acquisition schedule.
- 6.5.1.3. Coordinating with the right-of-way team to maintain a parcel status tracking system.
- 6.5.1.4. Developing right-of-way acquisition cost estimates.
- 6.5.1.5. Coordinating right-of-way production meetings with the right-of-way team including the CTRMA, acquisition service providers, TxDOT, and the utility coordination group.
- 6.5.1.6. Supporting the right-of-way team with Relocation Assistance.
- 6.5.1.7. Conducting reviews of title commitments, appraisal reports, acquisition packages, relocation plans, asbestos reports, and condemnation packages to insure compliance with policy and procedures.
- 6.5.1.8. Preparing bid packages for the demolition of structures.
- 6.5.1.9. Coordinating and monitoring the removal of asbestos, underground petroleum storage tanks, and improvements within the acquired right of way.
- 6.5.1.10. Assisting right-of-way team with ownership research and the preparation of right of entry documents.

- 6.5.1.11. As necessary and when directed by CTRMA, initiate and maintain communications with state and government officials, property owners, tenants, and the general public.
- 6.5.1.12. Preparing a monthly Right-of-Way Status and Critical Parcel Report.
- 6.5.1.13. Maintaining a composite right-of-way map with parcel status and critical parcels identified.
- 6.5.1.14. Reviewing and coordinating activities related to the preparation of parcel maps, legal descriptions, and right of way maps suitable for the acquisition of real property interests and probable issuance of a title policy.
- 6.5.1.15. Reviewing right-of-way maps, plats, property descriptions, area calculation sheets, and other acquisition documents, for accuracy.

6.6 Utility Coordination

The GEC will provide technical expertise in the areas of Utility Accommodation Rules (UAR), utility coordination, utility reimbursement procedures and real property interest issues. The GEC will act as a liaison with CTRMA and Utility Owners on Utility matters.

6.6.1. Utility Adjustment Coordination

- 6.6.1.1. Participate in meetings as necessary to effectively manage the utility coordination process. Activities include:
 - (a) Schedule periodic meetings with utility owner's representatives for coordination purposes.
 - (b) Attend meetings with TxDOT and other interested parties as directed.
 - (c) Meet with the CTRMA's roadway designers as necessary to resolve matters relating to schedules, utility identification, design changes and negotiation with utility owners.
- 6.6.1.2. Assist CTRMA with negotiating the details of utility agreements with the utility companies. Details will include any necessary betterment percentages, indirect costs, plans, estimates and schedules for the utility companies' activities. The GEC will also prepare draft agreements for CTRMA's use including the necessary exhibits and information concerning the Project (such as reports, plans and surveys).
- 6.6.1.3. Prepare and maintain schedules which will identify utility ownership and include milestones and operations and activities pertinent to each assigned project.

6.6.2. Utility Engineering

- 6.6.2.1. Review existing utility information for conflicts with the proposed roadway and provide a utility conflict analysis.
- 6.6.2.2. Provide a conceptual utility relocation plan.

- 6.6.2.3. Review utility plans for compliance with the TxDOT Utility Accommodation Policy, compatibility with roadway features, betterment inclusion and constructability.

6.7 Technical Support Activities

6.7.1. Public Involvement and Communications Program

As approved by CTRMA, the GEC will support CTRMA with the following activities:

- 6.7.1.1. Development and production of public information materials including exhibits, brochures, pamphlets, newsletters, etc.
- 6.7.1.2. Coordination of special events and activities, which focus on design and/or CSD efforts.
- 6.7.1.3. Coordinate and facilitate meetings for the purpose of establishing two-way communication and rapport building with affected stakeholders.
- 6.7.1.4. Provide personnel to support in the NEPA public involvement process for the projects.
- 6.7.1.5. Establish and update a public website to reflect current Program activities and other general Program-related information that enhances the distribution of Program information to the general public.

6.7.2. Traffic Analysis for Environmental Documents

The GEC will develop toll corridor traffic forecasts and traffic operations analyses for use in environmental studies. Traffic forecasts will be developed for two future years, the expected opening date of each project (estimated time of completion, or ETC), and a horizon year 20 years after opening. Consistent with other environmental studies, traffic forecasts and traffic analyses will focus the assessment of the adequacy of the typical section of the project between each interchange, and will allocate forecasted traffic among main lanes, frontage roads, express/managed lanes, signal queue bypass ramps and/or collector distributor roads inside the project right-of-way.

Corridors included in the assessment are:

- US183 from north of Springdale Road to SH71
- SH71 from east of Montopolis Road to east of SH130
- US290 from US183 to east of FM973
- US290/SH71 from Williamson Creek to Scenic Brook Drive (including SH71 from US290 to Fletcher Lane)
- SH45SW from LP1 to FM1626

Corridor scenarios to be assessed include existing geometric conditions and the ultimate project configuration for both the ETC and 20 years after the ETC. The ultimate project scenario shall also include traffic forecasts and a level of service assessment of all lane groups under tolled and non-tolled conditions.

- 6.7.2.1. Develop Traffic Forecasts
- (a) Develop average daily traffic forecasts for segments of each project between interchanges/crossroads, for the ETC and the 20th year after the ETC using traffic forecast trends developed by TxDOT Transportation Planning & Programming (TPP) Division, and any more-recent evidence of corridor traffic growth trends including recent traffic counts, or new travel demand model forecasts from CAMPO.
 - (b) Allocate daily traffic forecast among all lane groups in the project cross section between each interchange including main lanes, frontage roads, collector-distributor roads, etc. under non-tolled conditions for ETC and ETC+20 year forecasts.
 - (c) Develop a separate re-allocation of daily traffic forecasts among lane groups assuming the tolled configuration for the project for ETC and ETC+20 year forecasts.
 - (d) Compute design hour volumes for all geometric scenarios, project segments, lane groups, forecast years, and tolling configurations for traffic capacity analyses using TPP traffic factors.
- 6.7.2.2. Conduct Traffic Capacity Analyses
- (a) Estimate the section capacity of each lane group, and compute the volume to capacity ratio of each project segment and lane group.
 - (b) Determine level of service under peak conditions for all geometric scenarios, project segments, lane groups, forecast year and tolling configuration.
 - (c) Compile traffic forecasts in schematic graphical form for use in conducting project-level air quality and noise analyses, and for documentation of transportation benefits in the environmental document.
- 6.7.2.3. Update CORSIM Models
- (a) Update traffic forecast and turning movement traffic numbers for SH 71 from Montopolis to SH 130
 - (b) Update CORSIM model to proposed corridor scenario and then adjust model, as needed, for minor design revisions
 - (c) Develop Technical Memo\Powerpoint report outlining summary of analysis and recommendation for operational improvements
- 6.7.2.4. Documentation and Meetings
- (a) Develop technical memorandum documenting analysis procedure applied in development of project traffic forecasts and traffic capacity analysis.
 - (b) Develop an executive summary of analysis procedures for inclusion in the environmental document, including a suitable graphical/pictorial depiction of the concept of level of service.

- (c) Attend meetings with TxDOT District staff to obtain relevant data, discuss refinements to analysis process and procedures, exchange comments on documentation and/or present results of the forecasts and analyses.

6.7.3. Miscellaneous Technical Support

The GEC will provide various engineering and technical services as requested by CTRMA.

6.8 US290W Schematic

6.8.1. Social & Environmental Studies and Public Involvement

- 6.8.1.1. Public Meetings
Attend preparation meetings, prepare exhibits, and provide project personnel as needed for the Public Meetings.
- 6.8.1.2. Public Hearings
Attend preparation meetings, prepare exhibits, and provide project personnel as needed for the Public Hearings.
- 6.8.1.3. Public Workshops
Attend preparation meetings, prepare exhibits, and provide project personnel as needed for the Public Workshops.

6.8.2. Route and Design Studies

- 6.8.2.1. Design Schematics
 - (a) Collect and review available data for SH 71 West, US 290 West and adjacent areas and roadways. Perform field investigations to aid in this task.
 - (b) Develop the roadway design criteria for the project to be discussed, revised and approved at a Design Concept Conference. This set of criteria will be based on Chapter 3 of the TxDOT Roadway Design Manual. Prepare a Design Summary Report.
 - (c) Prepare calculated horizontal and vertical geometrics for the US 290 mainlines, the US 290 frontage roads, affected cross streets, and SH 71 DC's. The designs will accommodate the horizontal and vertical geometrics of the SH 71 DC's. Prepare Typical Sections for the affected roadways and generate preliminary cross sections for estimation of cut and fill quantities.
 - (d) Perform traffic operational analyses with TxDOT developed traffic volumes to uncover issues related to the William Cannon Entrance Ramp, the Convict Hill Road overpass, and the termination of the facility at the west end of the project.

- (e) Develop a large sign schematic to show the placement of large guide signs. A preliminary striping layout will be designed to accompany the large sign schematic.
- (f) Develop a Project Schematic and an Engineer's Estimate of Probable Construction Costs based on the design described above.
- (g) Establish the proposed right-of-way and easement requirements and locations required for construction of the project.
- (h) Develop a US 290 Concept Report which summarizes the Public Involvement process and results relating to the US 290 Mediation Meetings.

6.8.2.2. Field Surveying

- (a) Obtain "right-of-entry" by signed letter from the owner of each of the subject properties and when necessary, will contact property owners in advance of field surveys or to address specific property owner concerns about the work to be performed or being performed.
- (b) Establish and/or recover primary and secondary control monuments as needed for supplemental surveys and perform digital and/or three wire level loop operations for secondary control monuments and temporary benchmarks used in supplemental surveys.
- (c) Perform supplemental topographic surveys to supplement the existing DTM information.

6.8.2.3. Right of Way and Utility Adjustments

Update existing Right of Way data for areas not previously included in the original schematic.

6.8.2.4. Project Management

Maintain project schedules, prepare monthly progress reports, develop monthly project invoices, meet with the CTRMA following each submittal, review the work produced by subconsultants, and provide a copy of the QC/QA documents for each submittal

6.8.3. Drainage Design

6.8.3.1. Drainage Design and Analysis

- (a) Perform and document potential changes to the FIS hydrologic model along the reach defined by the limits of the project encroachment. The check will include models of both the existing and proposed conditions.
- (b) Perform Impervious Cover Calculations and Detention Estimates.
- (c) Model the US 290 W Bridge crossing of Williamson Creek and incorporate it into the updated FIS HEC-RAS hydraulic model.
- (d) Develop schematic level hydrology and hydraulics for proposed cross drainage structures and schematic layouts of the cross drainage culverts with hydrologic and hydraulic documentation.

- (e) Develop TSS load calculations and locations for BMPs required under the Edwards rules.
- (f) Review existing drainage easements and identify any additional easements required for the project.
- (g) Develop Drainage report documenting the above mentioned analyses.

6.8.4. Bridge Design

Design schematic-level structure depths and determine abutment locations for the following structures at these approximate locations:

- US 290 at Scenic Brook
- US 290 at RM 1826
- US 290 at Convict Hill
- US 290 from SH 71 to William Cannon
- US 290 at Williamson Creek
- William Cannon Entrance Ramp
- Old Bee Caves Road
- Eastbound Frontage Road at McCarty Lane

[END OF SECTION]