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

RESOLUTION NO. 08-46

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 No. 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 has further determined from time to time by appropriate Resolution that various Supplements to Work Authorization No. 6.0 be adopted to fulfill the scope of work; and

WHEREAS, the Texas Department of Transportation and the CTRMA executed a Multi-Project Preliminary Development Agreement ("MPDA")dated effective as of June 2, 2008 that addressed various regional transportation projects and continuing efforts to analyze, plan and develop such projects in the future; and

WHEREAS, one of the projects included in the MPDA is the proposed Loop 1 managed lanes project (the "Project") which previously was being analyzed by TxDOT through one of its consultants, DMJM Harris; and

WHEREAS, it has been determined that certain modeling efforts are necessary to continue the feasibility analysis of the Project and that such modeling should be continued by DMJM Harris as a subcontractor to the GEC under Work Authorization No. 6; and

WHEREAS, the CTRMA staff and the GEC have represented to the Board of Directors that Supplement No. 5 to Work Authorization No. 6.0 in substantially the form attached hereto as Attachment "A" is necessary and appropriate to provide for modeling of the Project by the GEC through its subcontractor to ensure efforts to further analyze, plan and develop the Project continue in accordance with the MPDA.

NOW THEREFORE, BE IT RESOLVED, that the Board of Directors of the CTRMA approves Supplement 5 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 5 to Work Authorization No. 6.0 shall be subject to the Agreement for General Consulting Civil Engineering Services between the CTRMA and the GEC.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 30th day of July, 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 08-46
Date Passed 7/30/08

Attachement "A"
To
Resolution No. 08-46
Supplement 5 to Work Authorization No. 6.0

EXHIBIT B

SERVICES TO BE PROVIDED BY THE ENGINEER

Work Authorization No. 10: Additional Modeling for the Interim Project of the Loop 1 (SL 1) Corridor Project

CSJ 3136-01-107

Introduction

This Work Authorization (WA) includes additional tasks and activities to support the environmental document (to be prepared under WA 2—Environmental Analysis and Documents). Additional work items include:

- preparation of additional travel forecasts for 2010 and 2030, including alternatives for general purpose lanes, high occupancy vehicle (HOV) lanes, and dynamically controlled managed lanes with varying ingress/egress scenarios,
- preparation of additional traffic operations analyses to evaluate the performance of the additional alternatives, and
- coordinate travel demand and traffic operations analyses with the traffic and revenue forecasting effort.

Function Code 110: Route and Design Studies
Task 1 – Travel Demand Forecasts

1.1 Perform Additional Travel Demand Forecasts

The ENGINEER will develop additional travel demand forecast models to supplement the forecasts undertaken in WA 5. These forecasts will include travel demand forecasts for the years 2010 and 2030 for:

- adding one general purpose lane in each direction,
- adding one HOV lane in each direction, and
- adding one managed lane in each direction.

These forecasts will also include additional models associated with varying the locations of the ingress/egress zones associated with the HOV and managed lane models. Since 2030 forecasts for the manage lane alternative with ingress/egress for 35th Street and US 183 was performed under WA 5, a model of that alternative is not included. Consistency will be maintained with the WA 5 modeling and forecast post processing procedures. The following table summarizes the scenarios for which the additional travel forecasts will be developed:

Model Run No.	Lane Type	Forecast Year	Ingress/Egress Variant
1	General Purpose	2010 & 2030	Not applicable
2	HOV	2010 & 2030	Configuration as in WA 5
3	HOV	2010 & 2030	Remove 35th St, include speed change lanes at US 183
4	HOV	2010 & 2030	Combine 35th St. and US 183 access zones into single access zone near Far West, include speed change lanes
5	Managed Lane	2010 & 2030	Remove 35th St, include speed change lanes at US 183
6	Managed Lane	2010 & 2030	Combine 35th St and US 183 access zones into single access zone near Far West, include speed change lanes

For each of the model alternatives developed, the ENGINEER will use the calibrated model developed in WA 5 as the starting point for coding the alternative scenarios.

Specifically, the ENGINEER will:

- split the trip tables produced from the mode choice output from the model to get AM and PM peak hour assignments for input to the Corridor Microscopic Simulation model (CORSIM) operations analysis included in Task 2 of this work authorization for each alternative
- provide technical assistance to support the CORSIM micro-simulation and traffic operations analysis included in Task 2 of this WA,
- provide AM and PM peak traffic volumes (all link and turning movement counts) used for in the existing, proposed 2010 (proposed) and year 2030 CORSIM models for all eight model alternatives (do nothing, add general purpose (GP), add HOV using WA 5 geometry, add HOV removing 35th Street, add HOV combining 35th and US 183 access zones, add managed lane (ML) as in WA 5, add ML removing 35th Street, add ML combining 35th Street and US 183 access zones) for each year. These volumes should be presented in both a graphical and tabular format for ease of use and review and should be provided in a printed and electronic form to the STATE, and
- develop AM and PM peak CORSIM model for each of the alternatives and populate CORSIM models with the adjusted travel demand forecasts.

1.2 Analysis of Modeling Results

The ENGINEER will analyze the results of the travel demand forecasts by summarizing and comparing the model results for each scenario. Specifically, the ENGINEER will:

- summarize and compare forecast traffic volumes for each alternative modeled, including the alternatives developed in WA 5, highlighting the differences in the results for the model runs on the mainlanes and on key entry/exit ramps in the study area,
- analyze and compare the traffic impacts of each alternative modeled, including the alternatives developed in WA 5, including the level of service (LOS) on the SL 1 mainlanes, and on key entry/exit ramps in the SL 1
- analyze and compare the travel speeds on the SL 1 mainlanes, including the alternatives developed in WA 5,
- analyze and compare travel time in the corridor for each alternative modeled, including the alternatives developed in WA 5
- prepare a summary report documenting the results of the analysis, with text, tables and graphics that show the differences between the each alternative modeled, including the alternatives developed in WA 5. This will include documentation of the model inputs and parameters, forecast traffic volumes, and graphic exhibits and tables, as appropriate,
- evaluate performance measures for all model alternatives for 2010 and 2030 scenarios for AM/PM peaks and provide network measures of effectiveness (MOEs) of (including, but not limited to):
  - total vehicle miles traveled,
  - total delay and average speed,
  - facility specific MOEs, and
  - evaluate network MOEs
  - evaluate facility specific MOEs of (including, but not limited to):
  - average speed and average delay for proposed Loop 1 northbound and southbound managed lanes, HOV lanes and general purpose lanes, including a volume-weighted average for each direction for all lanes in that direction (i.e., an average of the GP lanes and any ML in that alternative)
  - tabular and graphical presentations of speed on all network links and control delay for all modeled intersections in each of the eight alternatives modeled for each AM and PM peak for both 2010 and 2030, as well as existing conditions, and
  - system throughput (both vehicle and person throughput).

1.3 Travel Demand Modeling Documentation and Coordination

The ENGINEER will:

- revise the travel demand forecast summary report prepared under WA 5 to include the additional forecast modeling performed under this WA,
- meet with the STATE and Texas Transportation Institute (TTI) to receive, address, and resolve comments by them, and
- revise the technical report as appropriate following STATE review.

Task 2 – Traffic Operations Analysis

2.1 Adjust Capital Area Metropolitan Planning Organization (CAMPO) Forecasts

The ENGINEER will perform post-model processing to adjust the travel demand forecasts to better reflect local constraints on the network prior to input into the CORSIM analysis. This task will involve the following for each of the alternatives identified in Task 1.1:

- demands across cordons will be examined as well as growth across natural barriers such as Town Lake. If possible, forecasts across the northern cordon of the project (at FM 734[Parmer Lane]) will also be held. These will be considered "givens" in the analysis,
- total growth in east-west traffic will be documented. Relative splits between arterial traffic crossing Loop 1 versus that accessing Loop 1 also will be looked at with respect to existing versus future travel demands. Arterial roadway constraints will also be considered in the forecasts to assure that they do not choke traffic off from the Loop 1 corridor,
- redistribute the traffic approaching and leaving the corridor to better account for existing travel demands and arterial constraints. For example, there is a large increase of travel demand on Northwood Road but the street cannot handle this demand. Under this process, this demand in excess of the street capacity would be shifted to adjacent facilities, and
- if needed, travel demand across the corridor (east-west "through traffic") may need to be adjusted in order to fully load the Loop 1 ramps and mainlines.

2.2 Run CORSIM with Adjusted Forecasts

With the adjusted forecasts, the ENGINEER will run the CORSIM model and report results and MOEs for the eight alternatives identified in Task 1.1.

2.3 Develop 2010 (Opening-Year) Traffic Forecasts

Opening-year (2010) traffic forecasts will be developed for the Loop 1 corridor using historic growth rates, TxDOT Transportation Planning and Programming Division (TPP) forecasts, and observed growth rates between existing traffic and 2030 CAMPO travel demands. These forecasts will be developed only for the WA 10 alternatives and will be compared with the 2010 forecasts developed for WA 5. These forecasts will be developed for the AM and PM peak hour of 2010 for all alternatives. The analysis will be based on these historic growth rates and will not specifically take into account any localized change in land use in or around the corridor.

2.4 Development of Freeway Facilities Mode

The ENGINEER will:

2.4.1 develop a CORSIM model of the Loop 1 highway facilities without inclusion of the frontage roads and arterial network. This model will include ramps, general purpose lanes and managed or HOV lanes. This smaller model will be used to assess the impact of forecast volumes on the freeway facilities, including weaving at managed lane entrances and exits, without local arterial constraints entering into play. As a result, forecast traffic demands coming from this model will differ from those in the full model and should be generally higher. This will be done for all alternatives.

2.4.2 For the managed lane alternatives only, splits between the general purpose lanes and managed lanes will be adjusted to determine the maximum amount of traffic that can be accommodated in the lane to meet the operational objectives for the lane (i.e. level of service). This will involve iterative model runs to determine what split causes the level of service in the managed lane to fall below this threshold, and

2.4.3 report CORSIM model findings and results along with the results of Task 2.4.2.

2.5 Development of Smaller Micro-simulation Models

For all alternatives in the 2010 and 2030 forecast years ENGINEER will:

- develop and analyze CORSIM models to analyze the area between each managed lane/HOV ingress/egress location and its associated GP ramp location (i.e., between a managed lane/HOV egress location and the associated GP exit ramp), and
- include the results of these analyses with each model alternative.

The purpose of these models is to verify any proposed improvements will work with projected traffic volumes. These smaller models are supplemental to the freeway models described in Task 2.4.1, and would remove freeway bottleneck constraints on the volumes passing through managed lane/HOV ramp influence areas.

2.6 Iterative Analysis of Managed Lanes Alternatives

The Engineer will perform iterations of the managed lane alternatives to evaluate proposed added capacity as dynamically managed lanes.

2.7 Documentation and Coordination

The ENGINEER will:

- prepare a Revised Traffic Operations Analysis Report documenting (including tables and figures as detailed in other tasks, as well as complete documentation of every assumption) the methodology and results, and including results from the analysis conducted in WA 5,
- meet with the STATE to receive, address, and resolve comments by the STATE,
- revise the technical report as appropriate following review by the STATE, and
- coordinate effort with planning on the potential US 183 managed lane project.

Task 3 –Level 1 Sketch Feasibility Traffic and Revenue (T&R) Analyses Support and Coordination

3.1 Level 1 Sketch Feasibility Traffic and Revenue (T&R) Analyses Support and Coordination

The ENGINEER will coordinate with the STATE's T&R consultant to maintain consistency between the AM and PM peak hour forecasts used in the CORSIM analysis and the findings of the T&R study. Support to the T&R consultant includes (but is not limited to):

- sharing with the T&R consultant the post processing adjustments made,
- identifying for the T&R consultant specific choke points within the corridor,
- running the CORSIM model for various times of the day to gain a more accurate travel time savings for using the managed lanes, and
- attend up to five (5) coordination meetings with the STATE, the STATE's T&R consultant, and TTI.

Function Code 145: Project Management and Administration
Task 4: Project Management and Administration

4.1 Progress Meetings

The ENGINEER will:

- meet with the STATE on a monthly basis to update STATE personnel on the status of work included in Work Authorization 10 (WA 10), including the schedule, data requirements, upcoming tasks, issues needing resolution, document review, and other project-related topics,
- prepare meeting agendas and materials,
- attend up to eight (8) progress meetings lasting up to two (2) hours each, and involving appropriate personnel from the ENGINEER's staff (depending on the topics to be discussed), and
- prepare meeting summaries within five (5) business days of the progress meeting for review by the STATE, highlighting outstanding issues from the meetings, with respective assignments for follow-up or action.

4.2 Invoicing, Contract Document Coordination

The ENGINEER will:

- prepare monthly progress reports, and
- prepare monthly invoices for submission to the STATE for all requests for payment.

4.3 Sub Consultant Management

The ENGINEER will:

- prepare and execute sub contracts for all sub consultants on WA 10,
- monitor and supervise sub consultant activities (staff and schedule),
- review all work products prepared by sub consultants,
- review and approve sub consultant progress reports and invoices, and

- complete monthly HUB reports for submittal to the STATE.

4.4 Project Scheduling

The ENGINEER will:

- prepare an initial schedule for WA 10 for approval by the STATE indicating tasks, milestones, and major meetings and deliverables for WA 10,
- prepare an initial overall project schedule for approval by the STATE indicating tasks, milestones, and major meetings,
- use Primavera SURETRAK or P3 scheduling software, and
- provide monthly progress schedules with the progress reports and invoices for WA 10.

4.5 Project Administration and Filing

The ENGINEER will:

- prepare, distribute and file written and electronic correspondence for WA 10,
- conduct and document phone calls and conference calls as needed during the project to coordinate the work of various team members (ENGINEER and STATE), and
- maintaining project files for WA 10, and
- contribute to, and maintain, the SL 1 Corridor Project document log and library.

4.6 Work Authorization Closeout

The ENGINEER will:

- provide the STATE with all documentation (including all electronic modeling files) for WA 10 when work is complete.