EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

PROJECT DESCRIPTION

The services designated herein as "Services provided by the ENGINEER" shall include the performance of all engineering services for the following described facility:

COUNTY/CITY: Webb County

CONTROL: ______________________

PROJECT/DESCRIPTION: Intersection Control Evaluation (ICE) Analysis

LENGTH: 4.0 Miles

HIGHWAY: Mangana Hein Road

LIMITS: From US 83 to CR 6703A

PROJECT CLASSIFICATION

(Place an "X" in only one Project Classification)

- ___ Surface Treatment
- ___ Overlay
- ___ Rehabilitation Existing Road (Scarify & Reshape)
- ___ Convert Non-Freeway to Freeway
- ___ Widen Freeway
- _X_ Widen Non-Freeway
- ___ New Location Toll Freeway
- ___ New Location Non-Freeway
- ___ Interchange (New or Reconstruct)
- ___ Bridge Widening or Rehabilitation
- ___ Bridge Replacement
- ___ Upgrade to Standards - Freeway
- ___ Upgrade to Standards - Non-Freeway
- ___ Miscellaneous Studies (Use Function Code 110 for All Tasks)

ENGINEER shall mean GDJ Engineering.

COUNTY shall mean Webb County.

LPA shall mean Webb County.

PRELIMINARY PROJECT DEVELOPMENT

(Function Code 102)

ADVANCED PLANNING: INTERSECTION CONTROL EVALUATION (ICE) ANALYSIS:

The ICE study will encompass a comprehensive evaluation of all intersections along the Mangana Hein Road corridor as part of the planned improvements. The following tasks are included in the scope of work:

1. Project Setup and Kickoff
    a. Begin the project with a formal kickoff meeting to verify the scope, schedule, roles, and deliverables. Collaborate with GDJ to initiate a data request, including AADT volumes, crash records, intersection geometry, and GIS basemaps. Implement internal project tracking and QA/QC protocols and prepare preliminary model frameworks for Synchro and GIS to facilitate initial analyses. This approach ensures stakeholder alignment and establishes a strong foundation for project execution.

2. Data Collection and Review
    a. Gather and review all relevant data, including AADT volumes, turning movement counts (if available or estimated from AADT), roadway geometry, and crash data (2015–present) for each intersection. Crash data will be analyzed to identify predominant crash types or safety issues at the existing intersections. If available, existing travel time or delay data will be collected; otherwise, this baseline will be established via model simulation.

3. Traffic Forecasting
    a. Using the base year 2025 traffic volumes, develop 2035 traffic volume forecasts for each intersection. Growth trends from 2015 to 2025, AADTs, and regional development data will inform the projection of turning movement volumes for the opening year. These forecasts ensure the analysis accounts for future demand in the corridor.

4. Stage 1 – ICE Screening Analysis
    a. Perform a preliminary screening of feasible intersection control alternatives for each location. This will include identifying viable control scenarios (e.g., signalized intersection, roundabout, two-way or all-way stop, or innovative designs like RCUT) appropriate for the context. Each alternative will be evaluated at a planning level using Capacity Analysis for Planning of Junctions (CAP-X), an FHWA spreadsheet tool for comparing intersection capacities. The CAP-X tool will compute critical lane volumes and volume-to- capacity (v/c) ratios for various intersection types, helping to flag any options that fail to meet capacity requirements. A high-level safety assessment will also be applied in this stage (utilizing crash modification factors and safety performance data from the Highway Safety Manual) to screen out alternatives with poor safety performance. The Stage 1 analysis will result in one or more promising intersection control alternatives for each intersection, carried forward for detailed evaluation. If any intersection shows a superior alternative (e.g., a roundabout that dramatically outperforms other options in safety and operations), it may be selected as the recommended control at the end of Stage 1; otherwise, multiple top alternatives will advance to Stage 2.

5. Stage 2 – Detailed Operational Analysis
    a. Conduct an in-depth analysis of the shortlisted alternatives from Stage 1 for each intersection. This will involve traffic operational modeling using Synchro (Version 11) for deterministic capacity analysis and SimTraffic for microsimulation. Synchro will provide Highway Capacity Manual (HCM) metrics such as delay, queue lengths, and

Level of Service for signalized and unsignalized control scenarios. SimTraffic (microsimulation software) will model complex interactions along the corridor, beneficial if intersections are closely spaced or if alternative designs (like RCUTs or roundabouts) require simulation of U-turn patterns and platooning effects. Through SimTraffic, we will also obtain travel time estimates and corridor performance measures under each alternative – this addresses the lack of measured travel time data by using simulation outputs as a surrogate. The detailed analysis will evaluate network-wide impacts, ensuring that an improvement at one intersection does not adversely affect others (e.g., queue spillback or signal coordination issues). Since multiple intersections are being improved in tandem, the corridor will be analyzed as a system, not just as isolated locations.

6. Safety Evaluation
    a. In parallel with operational analysis, perform a quantitative safety evaluation for the existing conditions and each alternative control scenario. This involves applying the TxDOT Traffic & Safety Analysis Procedures Manual (2023) guidelines for safety analysis. We will use predictive methods from the AASHTO Highway Safety Manual (HSM) or TxDOT's recommended tools (such as the Interactive Highway Safety Design Model, IHSDM) to estimate the expected crash frequency for each intersection alternative, accounting for traffic volume changes and geometric differences. The crash data (2015–present) will be used to calibrate these predictions and to identify current safety issues (e.g., a high prevalence of angle collisions may indicate benefit from a roundabout or signal). By comparing the predicted crash reduction in 2035 for each alternative, we will quantify the safety benefits. This data-driven safety comparison is a crucial part of the ICE process, ensuring the recommended alternative aligns with TxDOT's goal of reducing severe crashes.

7. Comparison and Recommendations
    a. Summarize the results of the Stage 2 analysis to compare alternatives based on key performance metrics—safety (predicted crashes), operations (delay/LOS, queue lengths, travel time), and other factors such as right-of-way needs or costs, when data is available. A decision matrix or scoring system may be used to rank the alternatives for each intersection. The outcome will be a recommended intersection control type for each site that best achieves the objectives — maximizing safety improvements and operational efficiency. We will ensure the recommendations are context-sensitive (appropriate for the corridor's land use and traffic composition) and consistent across the corridor system (for example, avoiding mixed controls that could confuse drivers, and considering how a control choice at one intersection affects others downstream).

8. Documentation and Reporting
    a. Prepare a comprehensive ICE Report documenting the entire study process and results. This report will include an Executive Summary of findings, the methodology and assumptions, data summaries (traffic and safety data), analysis outcomes for each intersection, and the rationale for the recommended controls. As recommended by TxDOT for corridor ICE studies, a corridor-level summary will be provided to explain how the individual intersection recommendations work together as a system. All analysis outputs (capacity calculations, simulation results, safety analysis computations) will be appended or referenced for transparency. The documentation will ensure the intersection control selections are evidence-based and defensible, in line with TxDOT's ICE requirements.

9. Quality Assurance/Internal Review
   a. Conduct a thorough internal review of all analysis outputs, models, and documentation to ensure accuracy, consistency, and adherence to TxDOT guidelines. Perform QA/QC checks on traffic forecasts, Synchro models, safety evaluations, and report content. Incorporate feedback from prior review cycles and finalize all deliverables. This task ensures that the ICE study is defensible, technically sound, and ready for submission.

GDJ Engineering

"Exhibit D"
Fee Estimate

Supplemental Work Authorization #3 : Mangana Hein - ICE Analysis Fee Proposal

Webb County Precinct #2: Mangana Hein Road US 83 to SH 20

			MANHOURS									
Intersection Control Evaluation (ICE) Analysis Fee Proposal - Webb County: Mangana Hein Road US 83 to CR 6703A			Principal/Senior Project Manager	Project Manager	Agency Coordination/ Utility Manager	Project/Design Engineer	Environ. Specialist	EIT	Engineering Tech	Admin/Clerical	Total Hours	Total Line Item Cost
TASK												
		ICE Analysis										
	1	Intersection Control Evaluastion (ICE) Analysis	SUBCONSULTANT - TRAFFIC COST									$ 58,184.00
	2	Intersection Alternatives Engineering & Exhibits	4	16	30	38		40	44	0	172	$ 19,058.00
		Subtotal (ICE Analysis)	**4**	**16**	**30**	**38**	**0**	**40**	**44**	**0**	**172**	**$ 77,242.00**
Total Labor Hours			**4**	**16**	**30**	**38**	**0**	**40**	**44**	**0**	**172**	
Contract Rate			$ 185.00	$ 160.00	$ 120.00	$ 125.00	$ 99.00	$ 95.00	$ 82.00	$ 55.00		
Total Labor Costs			**$ 740.00**	**$ 2,560.00**	**$ 3,600.00**	**$ 4,750.00**	**$ -**	**$ 3,800.00**	**$ 3,608.00**	**$ -**		**$ 77,242.00**

<u>LINE ITEM EXPENSES</u>

N/A $ -

Total Expenses **$ -**

GDJ Engineering Total Cost **$ 77,242.00**