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Scope of Services

Project Background

The goal of this project is to improve the traffic operations of 13 signalized intersections along SR 96 between Eddy Lane and Arno Road in Franklin, TN.

Design elements of this project may include enhanced vehicle detection, Flashing Yellow Arrows (FYAs), upgrade of existing signal controllers to Advanced Traffic Controllers (ATCs), Connected Vehicle (CV) infrastructure to support Signal Phase and Timing (SPaT) message broadcasting, and ADA and PROWAG pedestrian improvements.

The Gresham Smith team (Consultant) will provide the following professional design services associated with this project:

Project Tasks

Task 1 – Project Management

This task includes the following:

- Prepare project schedule – The project schedule developed using Microsoft Project will include a work breakdown structure to document the relationship between tasks, critical milestones, and the planned duration of each activity. Updates to the schedule will be provided with each progress report.

- Kickoff meeting – Within 5 days of Notice to Proceed (NTP), the Consultant will hold a kick-off meeting with the City of Franklin to review the project scope, schedule, deliverables, communication protocol, and team organization. Meeting minutes will be provided within five (5) days of the meeting.

- Project status meetings – Project status meetings will be conducted at the City of Franklin's Traffic Operations Center (TOC) located at 109 3rd Ave. South, Ste. 133 Franklin, TN 37064, or alternatively by teleconference, to provide detailed updates on the project status.

    - Status meetings will occur at no more frequently than once per month. Consultant assumes that 36 project status meetings will be held over the project duration.
    - The Consultant will organize, schedule, and conduct all project meetings in coordination with the City Project Manager. The Consultant will prepare the agendas, furnish meeting materials, and prepare and distribute meeting minutes assuming one comment review cycle by the City.
    - In addition to these project status meetings, it is anticipated that periodic coordination meetings may be required between the Consultant and the City to discuss project activities and receive direction on project decisions. The Consultant assumes no more than six (6) "coordination meetings" over the course of a 36-month project duration.

- Stakeholder Coordination – Consultant will coordinate with stakeholder organizations anticipated to include the City, TDOT Local Programs, and organizations associated with the project.

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- An initial meeting will be set up with the City and TDOT to determine the ADA needs for this project within 30 days of NTP.

- Prepare project progress reports and monthly invoices – Monthly invoices will be accompanied by monthly status reports that include a written description of the work completed over the reporting period, a description of anticipated work that will be performed in the upcoming reporting period, documentation of changes to the project schedule or scope, and note technical, management, or coordination issues.

Task 1 Deliverables:

- *Project schedule*
- *Meeting agendas, meeting materials and minutes for all scheduled meetings*
- *Monthly project progress reports and invoices*

SEAR and NEPA Phase

Task 2 – System Engineering Analysis Report (SEAR)

In conformance with Federal Rule 940 and TDOT Requirements, a SEAR document will be developed to address technology, operations, and maintenance of the proposed system and will include the following:

- Concept of Operations
- System Requirements
- Alternatives Analysis
- Technology Procurement Options and Recommendations
- Agreements and Integration
- System Verification Plan
- Operations and Maintenance Plan

The sub-consultant will provide as needed technical assistance for the SEAR creation.

Task 2A – Concept of Operations

A Concept of Operations (ConOps) will provide the framework for the SR 96 system. This document will include a high-level overview of the system, identify the stakeholders, the elements and capabilities of proposed technologies for the corridor, what the proposed technologies for the corridor will be used for, and how the proposed technologies will be operated and maintained.

The Consultant will conduct one (1) ConOps Workshop that will provide a forum for discussion with the City and project stakeholders and gather input. A sample agenda for this workshop will include:

- Overview
- Defining the goals and objectives
- Defining the operations needs
- Proposed system overview
- Operational/support environment
- Operational scenarios

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Following the ConOps Workshop, a draft ConOps document will be submitted to the City for review and comment. The draft final ConOps document will be based on one comment review cycle of the draft document. The final ConOps document will be developed based on one comment review cycle of the draft final document and included as part of the final SEAR deliverable.

Task 2A Deliverables:

- *Workshop Stakeholder list, agenda, and workshop materials*
- *Draft ConOps, and Draft Final ConOps. The Final ConOps will be incorporated and delivered as part of the consolidated SEAR deliverable.*

Task 2B – System Requirements

The System Requirements documentation builds on the ConOps and identifies the functional requirements, applicable ITS standards from the ITS architectures, applicable statutes, regulations, and policies, and notes project constraints. The System Requirements document for this project will include a system verification plan, traceability matrix, and system acceptance plan.

A draft document will be submitted to the City for review and comment. The draft final System Requirements document will be based on one comment review cycle of the draft document. The final System Requirements document will be developed based on one comment review cycle of the draft final document and included as part of the final SEAR deliverable.

Task 2B Deliverables:

- *Draft System Requirements, Draft Final System Requirements. The Final System Requirements will be incorporated and delivered as part of the consolidated SEAR deliverable.*

Task 2C – Alternatives Analysis

The Alternatives Analysis will include an examination into alternative system configurations and technology options that meet the requirements for the system. A maximum of three (3) system options will be developed. The Alternatives Analysis will be a component of the overall SEAR and not a standalone deliverable.

Task 2D – Funding /Procurement Options and Recommendations

The Funding/Procurement Options and Recommendations will include an exploration into the available procurement options and provide the City with recommendations. This will be a component of the overall SEAR and not a standalone deliverable. This component will be incorporated and delivered as part of the consolidated SEAR deliverable.

Task 2E – Agreements and Integration

For this section of the SEAR, the Consultant will work with the City to identify needed agreements and integration activities for the system. This will be a component of the overall SEAR and not a standalone deliverable. This component will be incorporated and delivered as part of the consolidated SEAR deliverable.

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Task 2F – System Verification Plan

The System Verification Plan will be a component of the System Requirements document and will identify the applicable ITS standards and testing procedures for the system. This will be a component of the overall SEAR and not a standalone deliverable. This component will be incorporated and delivered as part of the consolidated SEAR deliverable.

Task 2G – Operations and Maintenance Plan

The Consultant will create an Operations and Maintenance Plan that identifies the procedures and resources necessary for operations, management, and maintenance of the system on SR 96. This will be a component of the SEAR and not a separately provided document. This component will be incorporated and delivered as part of the consolidated SEAR deliverable.

Task 2H – SEAR Deliverable

A consolidated draft SEAR will include items 2A through 2G as described above. The final SEAR will be developed based on one comment review cycle of the draft final document.

Task 2 Deliverables:

- *Draft Final, and Final SEAR document submitted to the City, TDOT Local Programs, and FHWA (via Local Programs)*

Task 3 – Prepare National Environmental Policy Act (NEPA) Documents

The Consultant will prepare the NEPA documentation for the proposed project which is anticipated to be classified as a NEPA C-list Categorical Exclusion (CE). The C-list CE will require the preparation of a Purpose and Need Document, coordination with the TDOT Technical Sections, a review of historic structures, and preparation of the C-List CE template documenting that the project meets the criteria outlined in 23CFR771.117(c) and that the project will have no significant effects to the environment.

To support the data collection for the NEPA documentation and SEAR, a preliminary field review will be conducted to identify visible utilities, verify right-of-way, identify potential CV infrastructure locations, identify potential pedestrian improvements for ADA and PROWAG, identify candidate FYA locations, and identify detection needs. A preliminary layout plan for the proposed design will be developed and included within the NEPA documentation.

Task 3 Deliverables:

- *Preliminary layout plan*
- *Technical Studies; final NEPA document*

Task 3A – Preliminary Plans for Environmental Only

As a component of the NEPA documentation, the team will create the preliminary design of the system, which provide an opportunity for the City to provide feedback regarding the preliminary design via one comment review cycle.

Preliminary Plans will include:

- Cover sheet
- Layout sheets

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Task 3A Deliverables:

- *Preliminary plans. One submittal.*

Task 4 - Technology Demonstrations

Using the SEAR ConOps and System Requirements as guidelines, the Consultant will coordinate connected vehicle and Automated Traffic Signal Performance Measures (ATSPM) technology demonstrations for the City. These 60 to 90 minute demonstrations will provide the City a time to learn about new technologies that are available and provide a forum to ask questions. The Consultant will work with the City to evaluate what technologies are most appropriate for the needs documented in the SEAR and will use this information as a basis for design and specifications for the project. It is assumed that product vendors will provide all materials to demonstrate their products/technology solutions.

Task 4 Deliverables:

- *Up to four (4) Technology Demonstration Meetings*
- *Technology Demonstration Meeting Notes. One draft submittal for all demonstrations, and a final submittal assuming one comment review cycle.*

Design and ROW Phases

Task 5 – Design Plans

The Consultant will prepare the Preliminary, ROW, and Construction plans using existing pdf and MicroStation drawings supplied by the City from past ITS, signal or intersection improvement projects as well as City GIS data. The intersection plan layout sheets will include existing features and detection and proposed technology. Detail sheets will include requirements for the new detection and signal control devices, including notes, manufacturer installation requirements and drawings. For this task, the sub-consultant will provide as needed technical assistance.

Task 5A – Submittal of Preliminary Plans

Once the Notice to Proceed (NTP) to Design has been issued, the team will submit the preliminary plans for review, which provide an opportunity for the City and TDOT to provide feedback regarding the initial design via one comment review cycle. After responding to review comments via a comment response form, the Consultant will request the NTP for the ROW phase. Comments on the preliminary plans will be incorporated in the ROW plans.

Plans will include:

- Cover sheet
- Layout sheets

Task 5A Deliverables:

- *Preliminary plans. One submittal.*
- *Local Programs Form 5-3 Preliminary Checklist*

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Task 5B – ROW Plans

After receiving the NTP for ROW phase, the Consultant will conduct a ROW phase field review that will be used in conjunction with Preliminary Plan phase comments to develop the ROW plans. The initial ROW Plans will be submitted to TDOT and the City for one comment review cycle. The Consultant will respond to initial ROW plan comments in a comment response form and incorporate changes into the Final ROW plans. The Final ROW plans will then be submitted to TDOT and the City with a request for the ROW Certification since no additional ROW is expected for this project.

ROW Plans will include:

- Cover sheet
- Quantity Sheets
- Index of Sheets, Standard Drawings and Abbreviations
- Scope of Work, General and Special Notes sheet(s)
- Layout sheets
- Plan sheets

Task 5B Deliverables:

- *Initial ROW Plans*
- *Preliminary plans comment response form*
- *Local Programs Form 5-3 Initial ROW Checklist*
- *Final ROW Plans*
- *Initial ROW Plans comment response form*
- *Local Programs Form 5-3 Final ROW Checklist*

Task 5C – Construction Plans

After receiving the ROW Certificate, the Consultant will develop the Construction plans. The initial Construction Plans will be submitted to TDOT and the City for one comment review cycle. The Consultant will respond to initial Construction plan comments in a comment response form and incorporate changes into the Final Construction plans. Final Construction plans will then be submitted to TDOT along with the Final Construction Estimate, Bid Documents which include the Specifications (described further in Task 6), DBE Goals, and Bid Advertisement. Additionally, utility coordination documentation will be submitted.

The following components will be added to the ROW plans components as part of the construction plans:

- Detail sheets
  - Cabinet Equipment Table
  - Signal Controller Block Diagrams
  - Ramp and Pedestrian Signals Details, if needed
  - Detection Details
  - FYA Wiring Details
  - DSRC Details
- Traffic Control Plans Details – Advanced Work Zone Sign Layout

Task 5C Deliverables:

- *Initial Construction Plans*
- *Local Programs Form 5-3 Initial Construction Checklist*
- *Initial Construction Plans comment response form*

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- *Final Construction Plans*
- *Local Programs Form 5-3 Final Construction Checklist*
- *Final Construction Estimate*
- *Bid Documents which include the Specifications*
- *Form 7-1 DBE Goals*
- *Bid Advertisement*

Task 6 – Develop Engineering Estimate of Probably Cost

The Consultant will prepare an engineering cost estimate for the design of the project. A draft version of the cost estimate will be submitted to the City for comment with the Preliminary, ROW, and Construction plans. The Final Construction Estimate will be prepared and submitted to the City and TDOT as noted in the previous task.

Task 6 Deliverables:

- *Preliminary Cost Estimate, Final ROW Cost Estimate, and Final Construction Plan Engineering Estimate of Probable Cost*

Task 7 –Specifications and Bid Documents

The Consultant will develop specifications for the signal controller, detection, dedicated short-range communications (DSRC) and ATSPM devices that will detail hardware and software requirements, define the Contractor's integration requirements, conditional and final acceptance testing requirements, and Contractor warranty and support requirements. Finally, the specifications will define Contractor required training and documentation. For this task, the sub-consultant will provide as needed technical assistance and develop the DSRC specification.

The draft Specifications will be submitted to TDOT and the City for one comment review cycle. Further, the Consultant will conduct an off-team peer review of the specifications. The Consultant will respond to draft specifications comments in the Final Specifications. The Consultant will also create the Bid Documents, which will include the specifications and Construction Advertisement.

Task 7 Deliverables:

- *Specification Documents (Draft and Final)*
- *Bid Documents (Form 8-1)*
- *Construction Advertisement (Form 8-2)*

Task 8 – Utility Clearance

The ROW plans will be distributed to the utilities as noted by the TDOT Utility office to determine if there are any anticipated conflicts. The goal of the process is to identify utility permits or make-ready work required. The Consultant will track correspondence and collect notification letters (i.e. no facilities, no conflict). Due to the nature of this project, it anticipated that limited or no utility relocations will be needed. The following are activities are anticipated with this task:

- Initial outreach to utilities within the County to determine if they are within the area
- Initial review of ROW plans to determine companies involved and extent of relocation to clear conflicts

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- Official notification of utilities and distribution of plans via pdf via Newforma (hard copy upon request only; assume 2 hardcopies will be needed)
- Prepare correspondence
- Coordinate with TDOT Utilities on Certification

Task 8 Deliverables:

- *Utility "No Facilities" and "No Conflict" letters*
- *Utility Correspondence*

Construction Phase

Task 9 – Before and After Study

A Before and After Study will be conducted as part of this task. The Consultant will collect and compile data from the ATSPM system prior to the construction beginning along the corridor and will serve as a baseline. This data will be collected during the weekday AM, Noon, and PM peak periods while public schools are in session. Upon the competition of the construction, data will be collected via the same methodology utilizing the technology deployed. Data collected will include:

- Total travel time
- Running time
- Stopped time
- Average speed
- Number of stops

Collected data will be analyzed to determine emissions and translated to cost savings benefits using FHWA methodology. The report will describe the data collected and summarize this data in an executive summary describing the overall project, and any potential savings in both time and money, including benefit to cost ratios.

The draft Benefit-Cost report will be submitted to the City for one comment review cycle. Further, the Consultant will conduct and off team peer review of the Benefit-Cost report. The Consultant will respond to draft Benefit-Cost report comments in the Final Benefit-Cost report.

Task 9 Deliverables:

- *Draft Before and After Report*
- *Final Before and After Report*

Task 10 – Post Design Services

This task includes anticipated Post Design Services for the project. The Consultant will assist the City appointed CEI with construction phase services, including the following:

- Attend Preconstruction meeting. Assume one meeting.
- Shop drawing equipment review. Assume 2 reviews.
- Request for Information (RFI) responses. Assume 2 RFI responses.
- Review of conditional and final acceptance testing results.

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Task 10 Deliverables:

- Reviewed Shop Drawings
- Responses to RFI's
- Review of testing results

Compensation

The following fee is:

	Fee
Labor Plan Design and Specifications	$ 266,865.00
Expenses	$ 2,353.60
Total Fee	**$ 269,218.60**

Additional Services:

The following are additional services beyond this scope of services that the City may request the Consultant to scope and negotiate at a later time.

- Integration – the Consultant may be requested to support the Contractor with integration of project devices into the existing City of Franklin signal system.
- Software development (dashboard) and integration – the Consultant may be requested to develop and integrate a software platform to integrate the high resolution controller data from the project controllers and create an ATSPM dashboard to report the results.
- Signal timing support – the Consultant may be requested to assist the City in the development and implementation of new signal timings along the SR 96 corridor.

Excluded Items:

- Survey and geotechnical data gathering
- ITS Architecture Update
- Signal Timing Studies
- Updated Coordinated Signal Timing Plans
- Biological Assessments
- Archeological Assessments
- Collection of new traffic counts or turning movement studies
- Traffic Control Plans (TDOT Standards will be referenced on the final plans)
- Utility Relocation Design Services and Plans
- Right-of-Way or easement acquisition, exhibits, descriptions or other related services