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May 23, 2014

Mr. Randy Whitaker
Project Manager
City of Flagstaff
211 W. Aspen Avenue
Flagstaff, AZ 86001

**RE: *Proposed Scope and Fee for Professional Services
Traffic Signal Control System - Project No. 925001***

Dear Mr. Whitaker:

Pursuant to our May 13 meeting with you and City staff, Lee Engineering respectfully submits this proposed scope of work and fee proposal for your review for subject project.

Kindly review and provide and comments or suggested changes at your convenience, in anticipation of Council action, on June 17.

If you have any questions, seek clarification or otherwise need to contact me, I may be reached at dbrugg@earthlink.net or at (602) 618-0406.

We look forward to working with the City of Flagstaff, and associated staff!

Sincerely,
Lee Engineering, LLC

Dave Bruggeman, PE, PTOE
Principal

TRAFFIC SIGNAL CONTROL SYSTEM

Scope of Work:

The Planning Process:

Inventory:

Inventory of field components, such as controllers (brand/model/firmware), cabinets (type/size), signal and pedestrian displays and detection, existing phasing and timing settings.

Field verification of route and existence of empty interconnect conduit.

Obtain peak period traffic turning movement counts at six signalized intersections as well as 24-hour volume counts, by 15-minute increments, at two locations along the corridor.

Review as-built plans provided by City, and identify any missing components still needed for street, intersection and conduit system plans at and between, and inclusive of the six signals from Beaver Street to Ponderosa/Butler.

Research and collect current information on current state of the art traffic signal systems, for use in presentation in the workshops.

Workshop 1:

Workshop 1 will be conducted with city-identified stakeholders to present the current situation (operational/technology) and present matrices of the various types and configurations of signal systems, following the 2005 FHWA Traffic Control Systems Handbook as a general guide, but offering updated, acknowledging that new system hybrids have been introduced since 2005. Workshop will assume attendees are learning this subject for the first time and will assume no prior understanding. Workshop material will be supplemented by other more recent materials, such as FHWA documents and presentations, vendor information and newer technical reports since the 2005 handbook.

Workshop 2:

Workshop 2 will be conducted to present specific candidate functional elements/features for consideration, in the context of the Flagstaff environment, and to start to separate "must haves" from "would like", and give the opportunity for discussions with staff regarding "could a system give us 'this' capability...?" The goal of the second workshop is to gain consensus on a list of "mandatory needs", "absolutely don't needs", and "ok withs". The goal of Workshop 2 is to determine final system configuration and features, leading to design.

Concept of Operations:

The results of the workshops set the stage for our development of a draft Concept of Operations, conduct a Systems Engineering Analysis (SEA) to confirm conformance to the Statewide ITS Architecture, develop a draft evolution plan for future expansion geographically/agency to agency/and technology, and to evaluate and confirm multi-modal compatibility, operations and maintenance implications, and potential costs. Upon review and revision, based on city reaction to Draft concepts, we will refine these documents and create an Implementation Plan, which will address the steps for making the concept a reality, including identifying initial set-up steps, testing and staff training requirements.

The Design Process:

Plans, Specifications and Estimates:

Based on the agreed to components identified in the Concept of Operations, conduct the design of any conduit, antennas, detection devices, cabling/wire, cabinet replacements/modifications, UPS, control equipment, communications equipment or other system components.

Conduct due diligence by obtaining and confirming existing right-of-way locations and existing utilities from city-furnished plans, and maps from utilities to insure any new field features are confined to within existing city right-of-way and avoid impacts to existing utilities.

Coordinate with CMAR contractor for review of documents as they become available, and the mutual give-and-take process of value engineering built into CMAR would come into play until a refined product, approved by the city, evolves. Insure the necessary components and pieces are accounted for in the design, to meet the functional goals determined in the Planning Process, be involved in product selections, and protect the city interests with the goal of a fully-functioning turn-key system at the end. Mutually determine the level of detail necessary to provide the CMAR contractor adequate documentation to achieve the project installation and start-up, between city, CMAR and designer.

Develop specifications, or minimum criteria for the various parts and pieces of the agreed to system resulting from the Concept of Operations. This may include control and communications components in the field, and/or computer equipment in an "office" environment, such as at City Hall and/or the signal maintenance shop. In the event some items are determined to be obtained as a procurement, outside of the CMAR process, develop specifications as appropriate, for successful procurement.

Pedestrian and Bicycle Coordination:

Make a presentation to the Bicycle Advisory Committee at one of their first Thursday afternoon meetings, accompanied by a city staffer involved in the project, to brief them on the project's intent, how it benefits the bicycle community, any anticipated impacts, and establish a line of communications between project representatives (city and/or consultant) and the Committee to continue dialog and communication.

Impacts can range from a technical concept of detecting and dealing with bicycles within the framework of signal operations to diversion strategies in the event any physical construction events are planned as a result of system configuration and implementation needs.

Meet with the Flagstaff Pedestrian Advisory Committee to present project intent, impacts to the pedestrian community and project schedule at one of the second Thursday committee meetings. We will establish a line of communications between project representatives (city and/or consultant) and the Committee to continue dialog and communication.

In the event either committee desires a follow-up meeting, one additional meeting per group will be conducted, at no additional cost to the city. Part of the challenge is to convey a technical project without overly scientific language, so that a person outside our technical world can grasp the issues that may be of interest to them.

Implementation Process:

Material Reviews:

Conduct review and first right of approval/rejection of any material submittals related to items not typical of city projects, such as software, computers, communications components, control equipment not typically used by city staff, etc. As part of that process, we will meet with city staff and discuss reasons why items are rejected or requested for modification so staff can apply that education to future expansion of the system.

Implementation Oversight:

Designer shall be involved in field implementation, system set-up, component (detection, communications, computers, software) and system testing (all components linked together in final operational configuration), and initial system settings (based on the traffic data acquired during the Planning Process) to provide a layer of oversight and inspection, to the level city staff is comfortable with.

Testing & Training:

Participate in system training, by attending training to monitor the effectiveness, completeness and to determine if any key elements that occur to us, as experienced system operators, that city staff may not think of. Issues such as creating intersection displays, user rights for modifications, data upload/download, and how to add additional locations to the system tend to be issues an operating agency certainly needs to grasp.

Assist city staff in monitoring and enforcing the final systems test, as well as develop and as-built documentation/plans and any applicable photo log of completed components as supporting documentation.

Project Schedule:

We propose the following project milestone schedule, subject to flexibility as the project progresses, or to meet city schedule points associated with funding:

Planning Process:

Project Start	Week 1
Workshop #1	Week 4
Workshop #2	Week 7
Draft Concept Documents	Week 11
Final Concept Documents	Week 15

Design Process:

Preliminary Design Start	Week 16
Preliminary Design Submittal	Week 28
Final Design Submittal	Week 36

The Implementation Process start will be defined as a new Week 1, to allow adjustment to when the implementation process of a CMAR, contractor, procurement or other varied approach determined during the Concept of Operations begins.

Implementation Process:

Start Eqpt Submittals	New Week 1
Start Field Activities	New Week 2
Complete Field Activities	New Week 10
Complete Inside Systems	New Week 11
Testing Complete	New Week 15

Upon project initiation, Lee Engineering can provide a graphical schedule tied to specific dates, if requested.