


Local Agency Lake County Division of Transportation	 Illinois Department of Transportation DRAFT Engineering Services Agreement For Non-MFT Funds	C O N S U L T A N T	Consultant Delcan Corporation
County Lake			Address 650 E. Algonquin Road, Suite 400
Section 12-00268-11-TL			City Schaumburg
Project No. -----			State IL
Job No. -----			Zip Code 60173
Contact Name/Phone/E-mail Address Jon Nelson 847-377-7473 JPNelson@lakecountyiil.gov	Contact Name/Phone/E-mail Address Joseph Brahm 847-925-0120 j.brahm@delcan.com		

THIS AGREEMENT is made and entered into this _____ day of _____, 2012 between the above Local Agency (LA) and Consultant (ENGINEER) and covers certain professional engineering services in connection with the PROJECT. Federal-aid funds allotted to the LA by the state of Illinois under the general supervision of the Illinois Department of Transportation (STATE) will be used entirely or in part to finance engineering services as described under AGREEMENT PROVISIONS.

Project Description

Name	Lake County Passage Phase 4	Route	Various	Length	Structure No.
Termini	_____				

Description: Provide design and integration services for the Phase 4 Lake County Passage system development in accordance with the Schedule A Scope of Work.

Agreement Provisions

I. THE ENGINEER AGREES,

1. To perform or be responsible for the performance, in accordance with STATE approved design standards and policies, of engineering services for the LA for the proposed improvement herein described.
2. To attend any and all meetings and visit the site of the proposed improvement at any reasonable time when requested by representatives of the LA or STATE.
3. To complete the services herein described within 1095 calendar days from the date of the Notice to Proceed from the LA, excluding from consideration periods of delay caused by circumstances beyond the control of the ENGINEER.
4. The classifications of the employees used in the work should be consistent with the employee classifications and estimated man-hours shown in EXHIBIT A. If higher-salaried personnel of the firm, including the Principal Engineer, perform services that are indicated in Exhibit A to be performed by lesser-salaried personnel, the wage rate billed for such services shall be commensurate with the payroll rate for the work performed.
5. That the ENGINEER is qualified technically and is entirely conversant with the design standards and policies applicable for the PROJECT; and that the ENGINEER has sufficient properly trained, organized and experienced personnel to perform the services enumerated herein.
6. That the ENGINEER shall be responsible for the accuracy of the work and shall promptly make necessary revisions or corrections resulting from the ENGINEER's errors, omissions or negligent acts without additional compensation. Acceptance of work by the STATE will not relieve the ENGINEER of the responsibility to make subsequent correction of any such errors or omissions or for clarification of any ambiguities.
7. That all plans and other documents furnished by the ENGINEER pursuant to this AGREEMENT will be endorsed by the ENGINEER and will affix the ENGINEER's professional seal when such seal is required by law. Plans for structures to be built as a part of the improvement will be prepared under the supervision of a registered structural engineer and will affix structural engineer seal when such seal is required by law. It will be the ENGINEER's responsibility to affix the proper seal as required by the Bureau of Local Roads and Streets manual published by the STATE.
8. That the ENGINEER will comply with applicable federal statutes, state of Illinois statutes, and local laws or ordinances of the LA.

9. The undersigned certifies neither the ENGINEER nor I have:
- employed or retained for commission, percentage, brokerage, contingent fee or other considerations, any firm or person (other than a bona fide employee working solely for me or the above ENGINEER) to solicit or secure this AGREEMENT,
 - agreed, as an express or implied condition for obtaining this AGREEMENT, to employ or retain the services of any firm or person in connection with carrying out the AGREEMENT or
 - paid, or agreed to pay any firm, organization or person (other than a bona fide employee working solely for me or the above ENGINEER) any fee, contribution, donation or consideration of any kind for, or in connection with, procuring or carrying out the AGREEMENT.
 - are not presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from covered transactions by any Federal department or agency,
 - have not within a three-year period preceding the AGREEMENT been convicted of or had a civil judgment rendered against them for commission of fraud or criminal offense in connection with obtaining, attempting to obtain or performing a public (Federal, State or local) transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements or receiving stolen property,
 - are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (e) and
 - have not within a three-year period preceding this AGREEMENT had one or more public transactions (Federal, State or local) terminated for cause or default.

10. Scope of Services to be provided by the ENGINEER are included as Schedule A.

II. THE LA AGREES,

- To furnish the ENGINEER all presently available survey data and information
- To pay the ENGINEER as compensation for all services rendered in accordance with this AGREEMENT, on the basis of the following compensation formula. The Total compensation for this shall not exceed **\$1,998,789.54**.

Cost Plus Fixed Fee CPFF = 14.5%[DL + R(DL) + OH(DL) + IHDC]

Where: DL = Direct Labor
 IHDC = In House Direct Costs
 R = Complexity Factor
 OH = Consultant Firm's Actual Overhead Factor

- To pay the ENGINEER using one of the following methods as required by 49 CFR part 26 and 605 ILCS 5/5-409:

With Retainage

- Upon receipt of monthly invoices from the ENGINEER and the approval thereof by the LA, monthly payments for the work performed shall be due and payable to the ENGINEER, such payments to be equal to 90% of the value of the partially completed work minus all previous partial payments made to the ENGINEER.
- Final Payment** – Upon approval of the work by the LA but not later than 60 days after the work is completed and reports have been made and accepted by the LA and the STATE, a sum of money equal to the basic fee as determined in this AGREEMENT less the total of the amounts of partial payments previously paid to the ENGINEER shall be due and payable to the ENGINEER. For the purposes of this Agreement, LA and the State shall provide any comments or exceptions to the Engineer's reports within 20 business days following submission of the report in question. Failure to comment within this time frame shall conclusively indicate acceptance of said report by LA and the State. This same time frame shall apply upon any resubmission of a report by the Engineer following the provision of comments by LA and the State.

Without Retainage

- For progressive payments** – Upon receipt of monthly invoices from the ENGINEER and the approval thereof by the LA, monthly payments for the work performed shall be due and payable to the ENGINEER, such payments to be equal to the value of the partially completed work minus all previous partial payments made to the ENGINEER.
- Final Payment** – Upon approval of the work by the LA but not later than 60 days after the work is completed and reports have been made and accepted by the LA and STATE, a sum o money equal to the basic fee as determined in this AGREEMENT less the total of the amounts of partial payments previously paid to the ENGINEER shall be due and payable to the ENGINEER.

4. The recipient shall not discriminate on the basis on the basis of race, color, national origin or sex in the award and performance of any DOT-assisted contract or in the administration of its DBE program or the requirements of 49 CFR part 26. The recipient shall take all necessary and reasonable steps under 49 CFR part 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts. The recipient's DBE program, as required by 49 CFR part 26 and as approved by DOT, is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as violation of this agreement. Upon notification to the recipient of its failure to carry out its approved program, the Department may impose sanctions as provided for under part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31U.S.C. 3801 et seq.).

III. IT IS MUTALLY AGREED,

1. That no work shall be commenced by the ENGINEER prior to issuance by the LA of a written Notice to Proceed.
2. That tracings, plans, specifications, estimates, maps and other documents prepared by the ENGINEER in accordance with this AGREEMENT shall be delivered to and become the property of the LA and that basic survey notes, sketches, charts and other data prepared or obtained in accordance with this AGREEMENT shall be made available, upon request, to the LA or to the STATE, without restriction or limitation as to their use. Notwithstanding the above, the ENGINEER shall be entitled to reuse any work product produced pursuant to this Agreement, provided that the LA and the STATE shall be responsible for any liabilities that arise in connection with such reuse.
3. The LA acknowledges that the ENGINEER will utilize and/or provide as part of its work product software (the "Software") which is currently owned either by Delcan or a third party. The Engineer agrees to grant the LA a royalty-free, nonexclusive, nontransferable, personal, irrevocable, perpetual, license including access to all source codes and readable documentation to reproduce; use; modify; recompile; review; evaluate; maintain; upgrade or reinstall the Software, but only to the extent necessary to manage, maintain, operate, develop, and improve the transportation systems within the geographical boundaries of Lake County. This includes the use of the Software by IDOT and other Lake County municipalities to maintain and/or operate the transportation system in Lake County. The LA agrees to require third parties who wish to obtain technical information, including but not limited to, all technical documents, software documentation and source code regarding the Software to execute a Confidentiality Agreement, marked and attached as Schedule B, prior to the LA disclosure of any information. The LA shall not be restricted in any way from releasing information, including proprietary information, in response to a subpoena, court order, or other legal process but shall promptly notify ENGINEER in writing of the demand for information before the LA responds to such demand. Notwithstanding the forgoing, any Commercial Off the Shelf Software (COTS) provided to the LA through this agreement shall be subject to the terms and conditions set forth in the COTS license agreements.
4. That all reports, plans, estimates and special provisions furnished by the ENGINEER shall be in accordance with the current Standard Specifications for Road and Bridge Construction, Bureau of Local Roads and Streets Administrative Policies, Federal-Aid Procedures for Local Highway Improvements or any other applicable requirements of the STATE, it being understood that all such furnished documents shall be approved by the LA and the STATE before final acceptance. During the performance of the engineering services herein provided for, the ENGINEER shall be responsible for any loss or damage to the documents herein enumerated while they are in the ENGINEER's possession and any such loss or damage shall be restored at the ENGINEER's expense.
5. That none of the services to be furnished by the ENGINEER shall be sublet, assigned or transferred to any other party or parties without written consent of the LA. The consent to sublet, assign or otherwise transfer any portion of the services to be furnished by the ENGINEER shall not be construed to relieve the ENGINEER of any responsibility for the fulfillment of this agreement.
6. To maintain, for a minimum of 3 years after the completion of the contract, adequate books, records and supporting documents to verify the amounts, recipients and uses of all disbursements of funds passing in conjunction with the contract; the contract and all books, records and supporting documents related to the contract shall be available for review and audit by the Auditor General and the STATE; and to provide full access to all relevant materials. Failure to maintain the books, records and supporting documents required by this section shall establish a presumption in favor of the STATE for the recovery of any funds paid by the STATE under the contract for which adequate books, records and supporting documentation are not available to support their purported disbursement.
7. The payment by the LA in accordance with numbered paragraph 3 of Section II will be considered payment in full for all services rendered in accordance with this AGREEMENT whether or not they be actually enumerated in this AGREEMENT, with the exception of payment for additional work which is requested by LA and in relation to which it is agreed between the parties that additional compensation will be paid.
8. That the ENGINEER shall be responsible for any and all damages to property or persons arising out of an error, omission and/or negligent act in the prosecution of the ENGINEER's work and shall indemnify and save harmless the LA, the STATE, and their officers, agents and employees from all suits, claims, actions or damages of any nature whatsoever resulting therefrom. These indemnities shall not be limited by the listing of any insurance policy.

9. This AGREEMENT may be terminated by the LA upon giving notice in writing to the ENGINEER at the ENGINEER's last known post office address. Upon such termination, the ENGINEER shall cause to be delivered to the LA all drawings, plats, surveys, reports, permits, agreements, soils and foundation analysis, provisions, specifications, partial and completed estimates and data, if any, from soil survey and subsurface investigation with the understanding that all such material becomes the property of the LA. The LA will be responsible for reimbursement of all eligible expenses to date of the written notice of termination. Furthermore, this Agreement may be terminated by the Engineer in the event that LA is in material breach of its obligations hereunder, provided that the Engineer first provides 30 days written notice of its intentions and also provided that said breach has not been remedied within the 30 day notice period. LA acknowledges and agrees that the Engineer cannot warrant the fitness of any work that is incomplete due to early termination or suspension of the work, or that is altered, revised, amended or modified without the Engineer's knowledge and consent or used for any purpose other than that for which it was originally intended.
10. This certification is required by the Drug Free Workplace Act (30ILCS 580). The Drug Free Workplace Act requires that no grantee or contractor shall receive a grant or be considered for the purpose of being awarded a contract for the procurement of any property or service from the State unless that grantee or contractor will provide a drug free workplace. False certification or violation of the certification may result in sanctions including, but not limited to, suspension of contract or grant payments, termination of a contract or grant and debarment of the contracting or grant opportunities with the State for at least one (1) year but no more than five (5) years.

For the purpose of this certification, "grantee" or "contractor" means a corporation, partnership or other entity with twenty-five (25) or more employees at the time of issuing the grant, or a department, division or other unit thereof, directly responsible for the specific performance under a contract or grant of \$5,000 or more from the State, as defined in the Act.

The contractor/grantee certifies and agrees that it will provide a drug free workplace by:

- a. Publishing a statement:
 - (1) Notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance, including cannabis, is prohibited in the grantee's or contractor's workplace.
 - (2) Specifying the actions that will be taken against employees for violations of such prohibition.
 - (3) Notifying the employee that, as a condition of employment on such contract or grant, the employee will:
 - (a) abide by the terms of the statement; and
 - (b) notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after such conviction.
- b. Establishing a drug free awareness program to inform employees about:
 - (1) The dangers of drug abuse in the workplace;
 - (2) The grantee's or contractor's policy of maintaining a drug free workplace;
 - (3) Any available drug counseling, rehabilitation and employee assistance program; and
 - (4) The penalties that may be imposed upon an employee for drug violations.
- c. Providing a copy of the statement required by subparagraph (a) to each employee engaged in the performance of the contract or grant and to post the statement in a prominent place in the workplace.
- d. Notifying the contracting or granting agency within ten (10) days after receiving notice under part (B) of paragraph (3) of subsection (a) above from an employee or otherwise receiving actual notice of such conviction.
- e. Imposing a sanction on, or requiring the satisfactory participation in a drug abuse assistance or rehabilitation program by,
- f. Assisting employees in selecting a course of action in the event drug counseling, treatment and rehabilitation is required and indicating that a trained referral team is in place.
- g. Making a good faith effort to continue to maintain a drug free workplace through implementation of the Drug Free Workplace Act.

11. The ENGINEER or subconsultant shall not discriminate on the basis of race, color, national origin or sex in the performance of this AGREEMENT. The ENGINEER shall carry out applicable requirements of 49 CFR part 26 in the administration of DOT assisted contracts. Failure by the ENGINEER to carry out these requirements is a material breach of this AGREEMENT, which may result in the termination of this AGREEMENT or such other remedy as the LA deems appropriate.

12. In the event the ENGINEER fails to meet any of its contractual obligations, as set forth in this AGREEMENT, then the LA, at its option, may consider the AGREEMENT as canceled effective with the delivery of written Notice of Termination for Cause to the ENGINEER, and the ENGINEER shall have no further claims or rights against the LA except as set forth herein. The LA may, as additional remedies, and without prejudice to or waiver of any other right or remedy which it possesses hereunder or as a matter of law, and after delivering a Notice of Termination for Cause to the ENGINEER, secure services from any other available source and any reasonable cost resulting as damages incurred by the LA due to the negligence of the ENGINEER shall be charged back to the ENGINEER, or the LA may deduct any such cost from any payments due or to become due ENGINEER, if any. In addition to any difference in cost for services, incurred by the LA, the ENGINEER shall pay the LA for any costs, fees, or expenses, including administrative, engineering and legal expenses incurred by the LA due to the failure of the ENGINEER to meet such obligations. The foregoing costs, fees and expenses, may, at the direction of the LA, be deducted from any sums remaining due for services properly performed prior to the effective date of the cancellation and termination. The ENGINEER's total liability to the LA under this paragraph shall not exceed \$250,000.

A Notice of Termination for Cause may be delivered to the ENGINEER upon the occurrence of any of the following:

- a. If the ENGINEER becomes insolvent, commits any act of bankruptcy, makes a general assignment for the benefit of creditors, or becomes the subject of any proceeding commenced under any statute or law for the relief of debtors;
- b. If a receiver, trustee or liquidator of any of the property or income of the ENGINEER shall be appointed;
- c. If the ENGINEER shall fail to perform the scope of services, or any part thereof, with the diligence necessary to maintain its progress and complete the scope of services as prescribed by the time schedule and shall fail to take such steps as reasonably directed by the LA to remedy such failure within thirty (30) days after written notice thereof from LA;
- d. If the ENGINEER shall violate any of the terms, provisions, conditions or covenants contained in this Agreement and shall fail to take such steps as reasonably directed by the LA to remedy such default within Thirty (30) days after written notice thereof from LA.

13. For greater certainty, the ENGINEER shall have no obligation to provide services where funds to pay compensation for such services are not available and/or approved, except as required pursuant to Section I.6.

14. Hardware purchased under this agreement will be invoiced to the LA with no mark up by ENGINEER.

Executed by the LA:

Lake County

(Municipality/Township/County)

ATTEST:

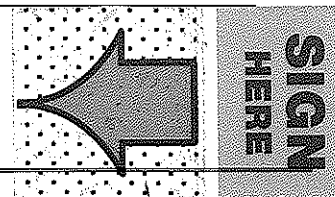
By: _____

By: _____

Clerk

Title: _____

(SEAL)



Executed by the ENGINEER: Delcan Corporation

ATTEST:

By: [Signature]

By: [Signature]

Title: R. V. P.

Title: Lester T. Yoshida, President

INTRODUCTION

This agreement provides for engineering services to design and integrate upgrades to the Lake County Passage Program

The work will be accomplished as detailed in the following 6 tasks.

TASK 1: PROGRAM AND PROJECT MANAGEMENT

TASK 2: ATMS PHASE 4 SYSTEM ENHANCEMENTS

TASK 3: COMMUNICATIONS & FIELD ELEMENT DESIGN & INTEGRATION SUPPORT

TASK 4: SYSTEM MAINTENANCE FIELD

TASK 5: SYSTEM MAINTENANCE CENTRAL

TASK 6: TRAFFIC SIGNAL TIMING

Detailed task descriptions are provided in the following sub-sections

Notes:

- All project reports, documents, manuals, and training materials will be delivered in both electronic and hardcopy formats if requested. Lake County will be provided with up to 5 draft copies and 5 final copies of all key document deliverables unless otherwise noted or agreed by both parties.
- All work provided within this project will be performed on a cost plus basis as project budget is available. All tasks will be coordinated closely with LCDOT.

TASK 1: PROGRAM AND PROJECT MANAGEMENT

PURPOSE:

The purpose of this task is to help LCDOT coordinate the work and implementation of the Lake County Passage program upgrades. These activities will help the project to maintain its schedule, stay within budget and ensure that all tasks are completed properly. The following outlines the anticipated work items included in this task.

INPUTS:

- Document set from the Lake County TMC Feasibility Study and Implementation Plan.
- Documents from Phase 1, 2 and 3 design and deployments.
- Delcan Project Management Information System.
- Regular updates from all members of the project team concerning work completed and any outstanding issues.
- This Scope of work.
- Biweekly status meetings.
- Outputs from previous phase work.

ACTIVITIES:

- Maintain project schedule, budget and scope.

- Coordinate and manage day-to-day project activities with the Delcan Team and the client project team.
- Provide project invoices and status reports.
- Continuously monitor and track project schedules, budgets and critical path items. To the extent possible, anticipate potential problems so they can be addressed prior to causing unrecoverable damage to the project schedule, budget or scope.
- Work closely with the LCDOT project management team to resolve any identified issues.
- Work with LCDOT and IDOT to identify, prioritize and track potential system enhancements to be included in Task 2 or future phases of system development.
- Work with LCDOT and IDOT to promote the regional program and procure future system funding allocations.
- Work with LCDOT in coordinating project details with the local agencies including meeting preparation and attendance.
- Work with LCDOT to facilitate the development of interagency agreements as needed for the project.
- Support ongoing funding request efforts.

DELIVERABLES TO LAKE COUNTY:

- Monthly status reports on progress of the project with potential problems highlighted.
- Monthly invoices detailing work accomplished against anticipated progress.
- Minutes of meetings between the LCDOT and Delcan, summaries of meetings with other interests.
- Build schedules and applicable schedule updates as well as cost reports with any problems explained and solutions proposed.
- Correspondence relevant to project.

ASSUMPTIONS

- The budget provided under this task is based on the anticipated schedule and a three year project life. Delays in this schedule outside of Delcan's control may add to project management costs.
- The project management budget assumes the program proceeds in accordance with this Scope of Work. Significant deviations from this program plan may affect project management costs.
- Biweekly status meetings similar to what we have been doing with phase 3.

TASK 2: ATMS PHASE 4 SYSTEM ENHANCEMENTS*PURPOSE:*

The purpose of this task is to design, develop and integrate Phase 4 upgrades into the Lake County Passage ATMS. LCDOT has expressed interest in adding several new functional components to the ATMS. In addition, LCDOT anticipates that they will identify other desired modifications as they continue to use the ATMS. Under this Task, LCDOT will issue task orders for Delcan to review, design and deploy ATMS upgrades. Typically, system upgrades will be developed under two Task Orders. First LCDOT will issue a Task Order to review and provide a

preliminary budget and design for a potential upgrade or upgrades. Under this Design Task Order Delcan will provide LCDOT with a write-up, and possibly a presentation for larger tasks, describing what would be required to make the requested changes, what it would cost and provide a potential schedule for deployment. Based on the results of the Design Task Order, LCDOT may choose to issue an Upgrade Task Order to develop and deploy the upgrade as outlined in the Design Task Order.

INPUTS:

- This Scope of Services
- Lake County ATMS Manuals
- Inputs from LCDOT and other stakeholders
- Results of Design Task Orders

ACTIVITIES TO BE COMPLETED BY DELCAN:

The list below identifies several items that Lake County would like to consider for upgrades to the ATMS. It is understood that LCDOT may not be able to deploy all these enhancements within the project budget. Tasks will be managed and assigned as described in this document. In order to optimize LCDOT's return on their investment, many of these enhancements will be based on the reuse of software from other Delcan systems. As a result, scheduling, and prioritizing of these enhancements will consider how to make the best use of upgrades developed under other contracts.

Potential system enhancements:

- Computer Aided Dispatch (CAD) Integration ATMS
 - Additional CAD Integration CAD Vendor
 - Other ATMS upgrades
 - Video wall integration
 - Fixed Dynamic Message Sign (DMS) support
 - Centracs Vehicle Detection Station (VDS) data to Travel Time
 - Corridor Management, Ramp flushing etc.
 - Full system data recovery
 - Migrate to virtual environment
- Provided as potential list only***

Each Task Order will include a clear definition of the work to be performed, clear and defined deliverables, expected completion date, estimated work hours, and a task budget. Task Orders that include the deployment of system upgrades may include a description of acceptance criteria for the upgrade. All Task Orders will be approved by the County Traffic Engineer or a LCDOT designee assigned in writing by the County Engineer or County Traffic Engineer.

Delcan will be compensated for work completed under this task on a time and materials basis in accordance with the terms of this contract. Delcan will not be authorized to exceed the budget or time limits defined in a Task Order without prior written approval from the County Traffic Engineer or his designee.

Upon the Request of LCDOT, Delcan will be authorized up to 8 hours to put together a Task Order. Delcan will not expend more than 8 hours developing a Task Order without prior approval from the County Traffic Engineer or his designee.

DELIVERABLES TO LAKE COUNTY:

- Draft and final Task Orders in Word format.
- Deliverables as defined in individual Task Orders.
- Tested and deployed system upgrades as defined in Upgrade Task Orders.
- Acceptance criteria for system Upgrade Task Orders.
- System documentation upgrades as defined with each Upgrade Task Order.
- Training for system upgrades as defined in individual Task Orders.

ASSUMPTIONS:

- Upgrades will typically be designed and deployed in groups to improve build efficiency.
- Builds will be coordinated with LCDOT through the biweekly meeting process
- Software change control will be managed as it has been in Phase 3.

***TASK 3: COMMUNICATIONS AND FIELD ELEMENT DESIGN &
INTEGRATION SUPPORT***

PURPOSE:

Over the next three years LCDOT will continue to expand their ITS communications and field element infrastructure. The purpose of this task is to support this effort on an as needed basis. Under this task LCDOT will direct Delcan to provide these support tasks through calls, meetings or via email notifications. Tasks that are expected to require more than 8 hours should be requested in writing (typically via email). When Delcan receives a written request for services, we will acknowledge receipt of the request and provide a preliminary plan and time line for the task as appropriate for the assigned task. If, during the performance of the task, it appears that the task will not be completed within the initial preliminary estimated time, Delcan will notify LCDOT and reach an agreement on an approach and revised estimate to complete the task, or terminate the task.

INPUTS:

- Phase 3 PS&E package
- Existing LCDOT network diagram
- Existing LCDOT network configurations
- Existing schematics
- Existing ITS field communications network
- Previously developed field element and communications plans.

ACTIVITIES TO BE COMPLETED BY DELCAN:

This task includes support for Phase 4 field communications design, management, oversight and deployment as requested. Work will include support for communications upgrade planning, schematics and fiber diagram management and updates. This task also includes miscellaneous communications and wireless planning, design and deployment support as requested by LCDOT.

New communications and field equipment may be procured, setup and deployed under this task as requested by LCDOT. Field equipment purchases will be coordinated with, and approved by LCDOT, prior to submitting the purchase order.

DELIVERABLES TO LAKE COUNTY:

- Revised or updated schematics
- Fiber splicing diagram updates
- Programming and deployment of field communications equipment as requested
- Communications planning documents as needed
- Other deliverables as requested by LCDOT to support the expansion of the ITS communications and field infrastructure.

ASSUMPTIONS

- The setup, programming and debugging of switches and encoders to support other construction contracts will typically be completed outside of this project.

***TASK 4: SYSTEM MAINTENANCE FIELD &
TASK 5: SYSTEM MAINTENANCE CENTRAL****PURPOSE:*

The Passage System components will require maintenance and repairs for continued proper operation. This task allows for a structured approach to providing routine maintenance and on call troubleshooting and repair. Maintenance will be divided into two parts, field and central system maintenance. Delcan will provide monthly routine maintenance for the central ATMS and ITS communications system in accordance with the outline below. When system problems or failures occur, LCDOT will notify Delcan via email. With each notification, Delcan will be authorized to spend up to eight hours to review the problem. Upon receipt of a notification, Delcan will investigate the problem and either resolve the issue (if it can be fixed within the authorized 8 hours), submit a Problem Correction Plan, or advise LCDOT to assign the problem to the field Electrical Maintenance Contractor (if it is determined that the problem is related to a field device covered under their contract). While investigating a Problem Ticket, Delcan will not exceed the authorized 8 hours without prior approval by LCDOT.

The Problem Correction Plans will describe the issue and what Delcan believes it will take to correct the problem, as well as provide an estimate on the number of hours expected. LCDOT will review Problem Correction Plans and may authorize Delcan to proceed with execution of the Correction Plan. Approval of the Correction Plans by LCDOT will authorize Delcan to spend up to the estimated hours to resolve the problem. If additional issues are identified while attempting

to correct the problem, Delcan will not exceed the estimated hours without prior written approval by LCDOT.

Issues relating to ATMS functionality may be referred to the project management team for resolution and distribution with a future build.

INPUTS:

- Installed and integrated system.
- Input from system monitoring and evaluation tools.
- Email notifications
- Problem Correction Plans.

ACTIVITIES TO BE COMPLETED BY DELCAN:

- Monthly system maintenance and status checks
 - Review operating system and ATMS logs looking for record errors
 - Check process status to verify all ATMS processes are running properly
 - Check disk storage reserves for process and databases
 - Monitor ATMS security and user rights
 - Review switch maintenance logs
 - Purge all counters
 - Investigate system anomalies identified during monthly reviews
 - Resolve anomalies identified during monthly review or create a Problem Ticket
- Quarterly system maintenance
 - Shutdown servers, run diagnostic and restart application
 - Consider applying OS patches and applications as needed and coordinated with LCDOT
- Investigate Problem issues
- Resolve problems related to the ATMS and Passage communications or field elements.
- Write up Problem Correction Plans for issues that cannot be resolved within the initial 8 hour investigation of a Problem Ticket
- Advise LCDOT when Problem Tickets should be assigned to the Electrical Maintenance Contractor for problems that appear to be related to field devices that are covered under the electrical maintenance contract
- Procure and install replacement equipment as needed and authorized by LCDOT
- May also procure additional spare components as requested and authorized by LCDOT
- Manage Equipment inventory

DELIVERABLES TO LAKE COUNTY:

- Field reviews and assessments
- Problem Resolution Reports
- Problem Correction Plans
- System problem resolutions
- Replacement parts procured under this task
- Annual Report of field maintenance expenditures
- Monthly inventory updates

ASSUMPTIONS:

- Delcan will not be required to expend any time above and beyond those specifically authorized by LCDOT to resolve system problems.
- Delcan is only required to provide maintenance as budget is available. Nothing in this agreement is interpreted to be a guarantee that the budget allocated will be sufficient to cover all annual maintenance. However, the budget was based on our best expectation.
- As long as budget is available, Delcan will respond to field maintenance problems within 48 hours of written notification from authorized LCDOT staff. If Delcan does not respond within 48 hours, the LCOT project manager may notify the Delcan project manager.
- Response will typically mean a trip to the problem location in the field. However, some problems may be resolved or assessed from the Delcan Office. If Delcan can assess the problem from the office and provide LCDOT with an action plan to resolve the problem, this will be considered appropriate response. However most field element problems will require a trip to the field to respond appropriately.
- For clarity, response will not necessarily mean the problem is solved. However, if Delcan cannot solve the problem at the first response, they will provide LCDOT with an assessment of the issue and an action plan, or suggestion, to resolve it.

TASK 6: TRAFFIC SIGNAL TIMING

There are four types of traffic signal timing work that are included under this task. They are divided into four sub tasks; 6A, 6B, 6C and 6D

Sub Task 6A - Lake County Traffic Responsive programming for IDOT Systems in Centraacs

The purpose of this sub task is to help LCDOT & IDOT develop Traffic Responsive System plans (TRP) for the signal system sections running under the traffic signal software - Centraacs. The scope will provide for the development and fine-tuning of the plans to ensure satisfactory operation.

Inputs:

- Existing system detector locations and numbers
- Current time-of-day plan for starting point of traffic responsive operation

Activities to be completed by Delcan:

The following describes activities related to this task:

Verify System detectors, graph daily plots and select Level thresholds

The purpose of this is to ensure that there are adequate system detectors available for traffic responsive operation, to verify proper volume data and to graph the data and select the various Cycle and Offset levels to select the proper timing plans.

Key activities include:

- Accessing the detector locations in the traffic signal software
- Reviewing the detector volumes to determine proper vehicle counting
- Plot each satisfactory detector to be used in the Pattern Matrix
- Selecting appropriate values from the plots for the AM, MD, PM and Free profiles

Enter all Level profile values

Delcan will input all of the parameters to build each TRP plan. Using the values derived above, all of the level thresholds will be developed. To maintain consistency Level 1 will choose Plan 1 or the Midday plan, Level 2 will choose Plan 2 or the AM plan, Level 3 will choose Plan 3 or the PM plan. For signal systems assigned to Delcan for Traffic Responsive System Plans (TRP) that involve Eagle controllers, Delcan will work with the IDOT Standards for timing plan numbering of Eagle signal systems..

Key activities include:

- Q/A assurance checking of all parameters entered by the engineer and making sure only the test controller will be affected by the enabling of the TRP plan until the plan is ready to be live implemented.

Enable the TRP plan into Centrac and monitor operations

Each TRP plan developed will be enabled in Centrac before actually running the plan in the field.

Key activities include:

- Enable the developed TRP plan and enable in Centrac but not in the field.
- Adjust parameters as needed and collect new traffic graphs to make adjustments to Level thresholds and other parameters.
- Evaluate the Pattern selection as compared to the expected time-of-day pattern changes.
- Check weekend pattern changes

Enable TRP plan to Live Control Section and Monitor

At the completion of the previous task, the developed TRP plan should be operating satisfactorily. However, since it has not been used on live controllers, a subsequent monitoring period will be conducted to ensure proper operations once the plan has been enabled.

Key activities include:

- Enable the TRP plan and monitor for a minimum two week period.
- Make adjustments as necessary to ensure proper operations.

It is recommended that a procedure to periodically check all enabled TRP programs be developed. This will ensure proper signal operations and prevent incorrect timing plans from being sent to the field. Most common problems centered around failed system detectors which give misleading vehicular travel parameters to the TRP algorithms.

Deliverables to Lake County:

Traffic responsive plan for each section or group of signals as defined by Lake County, IDOT and Delcan.

Assumptions

The following assumptions were made for the scope of work to be carried out:

- The cost is developed on a per section basis or per TRP plan developed.
- Each TRP plan will include roughly 20 or less system detectors.
- No complex TRP plans are included in this scope. The TRP plan will include a simple 4 plan (AM, MIDDAY, PM and FREE) operation.
- All system detectors are set up and functioning correctly. Delcan will provide verification of the detectors and report to Lake County any problems for resolution.

Task 6B - Lake County Traffic Signal - Move Intersection

The purpose of this sub task is to produce traffic signal incident plans for the Event Management portion of the Lake County Passage ATMS. The scope will provide for developing timing plans for signals that will be moved from one section to another and possibly across jurisdictional groupings between IDOT, Lake County and participating municipalities.

Inputs:

- List of potential intersections to be recommended for moving to a different group
- Timing plans from new group that intersection is to be moved to (cycle lengths, splits and offsets of nearest intersections for matching)

Activities to be completed by Delcan:

The following describes activities related to this task:

Copy AM, Midday, and PM peak plans for moved intersections to match new group response plan locations.

DELSCAN will move or edit timing plans as needed to match the new group. This task may require developing new split times and estimating new offsets. It is assumed that no traffic counts will be collected or other analysis be done. Intersections being moved will be “matched” into the new group/section as needed and with engineering judgment.

Key activities include:

- Determining the appropriate plans (AM, Midday, and PM peak) by intersection and agency jurisdiction
- Copying plans into the appropriate plan numbers
- Make modifications to the intersections Cycle, splits and offset as required

- Perform QA checks of copied plans

Modify timing plans based on field review

Under this task, DELCAN will field review the newly matched timing plans for each location. This will be done for every peak time period AM, Midday, and PM peak. Delcan will have personnel present in the field reviewing operations and personnel in the office available to download timing changes as needed. Once satisfactory field operations are achieved, the timing plan will be considered complete.

Key activities include:

- Making appropriate timing plan modifications to ensure satisfactory operations at the initial timing plan implementation
- Proper field review by qualified engineering staff. On-street experience is necessary to ensure proper traffic signal operations.
- Having experienced staff in the office to make timing change requests from the field engineer.
- Documentation of signal operations for agency staff in the event that operations are less than standard after the task is complete.

Deliverables to Lake County:

Updated and fine-tuned timing plans for intersections to be moved. The number of new intersection plans will be determined by the number of plans that the intersections will match up to in the new group. I.E., may match plans in AM but not the PM.

Assumptions

Centracs will allow intersections to be in multiple groups depending on either time-of-day or type of operation or intersections can move between groups by other means in the software.

6C - Lake County Traffic Signal Incident Plan Development

The purpose of this task is to produce traffic signal incident plans for the Event Management portion of the Lake County Passage ATMS. The scope will provide for developing timing plans for signals as recommended by the LCDOT and IDOT. The following describes each portion of the scope of work.

Inputs:

- Determination of Response intersections versus non-response intersections
- Current timing plans and phase rotations and assignments for all intersections
- Determination of AM and PM plan locations based on agency jurisdiction

Activities to be completed by Delcan:

Copy AM and PM peak plans for all intersections into response plan locations

Under this task, DELCAN will populate all of the timing plans into the plan numbers as defined in the design document. The AM peak plan will be copied into timing plan numbers 21 through 29 and the PM peak plan will be copied into timing plan numbers 31 through 39. Currently, Centraacs does not have a copy feature. Delcan will make use of the Synchro module and the Uniform Traffic Data Format (UTDF) to copy plans. This will reduce risk of data entry error of keying timings in by hand.

Key activities include:

- Determining the appropriate plans (AM and PM peak) by intersection and agency jurisdiction
- Copying plans into the appropriate Signal Response plan numbers
- Perform QA checks of copied plans

For Non-response intersections this will require moving the current AM plan to Plan 29 and the PM Plan to Plan 39. The same QA checks will be performed.

Modify timing plans for Incident Response Intersections

DELCAN will develop the actual Signal Incident Response timings for the signalized intersection included in the scope. In this task, it will be important to know the signal phasing designations used by Lake County, IDOT, and any potential local agency. For each response intersection, it will be important to have a phasing diagram that shows the numbering of signal phases by direction (east, west, etc.). The event response algorithm is based on the direction of the response intersection from the event and the appropriate plan that correlates to this direction will need to be called. Delcan has developed an excel spreadsheet to aid in the development of the actual response plans.

Key activities include:

- Determining any unusual configurations, geometry, or road directions that do not conform to the design document. These will be adjusted in the next step to ensure proper timing plans are being called.
- Making timing plan revisions to increase left turn times for response plans based on the design document which defines the plan numbering by direction and whether the intersection in question is contiguous or non-contiguous or a non-diversion intersection that will be included in the coordination group (plan 29 or 39). Modify timing plan numbering as necessary to accommodate unusual conditions.
- Performing limited testing of the incident response plans. This will either be done off-line or during non-rush hour times. Simulate an incident within the ATMS system and then verify the timing plans being called. After confirming that the proper plans have been designated by the ATMS, then send plans to the controllers. View the status of the controllers in ICONS to determine that they are running the proper incident response plans and coordinating. *For the Non-response intersections this will require testing Plans 29 and 39 for any errors on operation only. At this point the non-response intersection will be complete.*

Revise timings for unusual conditions

Under this task, Delcan will make adjustments to the timing plans to account for any potential split timing (coordination) issues or for any intersections that do not conform to a standard east-west or north-south configuration. This will be accommodated in either the intersection timings or the ATMS software tables as needed. Final testing will then be done.

Key activities include:

- Make split adjustments for any intersections that experience coordination errors.
- Make timing plan modifications for any plans not being correctly called due to unusual geometry or route directions
- Any unusual intersections will be documented for the ATMS operators. This will aid in making logical control decisions of the incident response plans. Some intersections may be required to have plan numbering that doesn't conform to the design document because of these unusual geometries or route directions. Recent changes to the ATMS algorithm for recommending response intersections has reduced this task effort, but Delcan will still work and test the unusual geometry conditions.
- Re-test all changes made until satisfactory operation is achieved.

Deliverables to Lake County:

- For response intersections - 18 timing plans numbered 21-29 and 31-39 for AM and PM incidents response to help motorists around major incidents.
- For non-response intersections – timing plans 29 and 39 to match cycle lengths and remain in coordination with response intersections.

Assumptions:

- Current phasing and phasing rotations follow IDOT standards and are known for each intersection
- For signal systems assigned to Delcan for either optimization or Traffic Responsive System (TRP) that involve Eagle controllers, Delcan will work with the IDOT Standards for timing plan numbering of Eagle signal systems and within the limits of the Centrac system to develop a consistent numbering scheme.

6D - Lake County Traffic Signal System Optimization

The purpose of this task is to develop optimized traffic signal timings for various signal system sections in the signal system.

Inputs:

- Identification of traffic signal system sections requiring optimization
- Existing Synchro runs if available
- Current traffic counts if available
- Lake County Staff input for expected operations, cycle lengths, time periods, pedestrian clearances and standard timing intervals for min, max, yellow and all-red parameters.

Activities to be completed by Delcan:

Data Collection Program

The following text briefly describes the data collection effort:

- If current Lake County data is not available we will collect 24 Hour (7 Day Counts) - This data will be collected using system detectors whenever possible. Otherwise, Automated Traffic Recorders (ATRs) will be placed. This data will identify peak periods and day of week traffic fluctuations.
- If current Lake Count data is not available we will collect Turning Movement Counts - This data will be obtained during peak periods of 6:30 a.m. to 9:30 a.m.; 11:00 a.m. to 1:00 p.m.; and 3:30 p.m. to 6:30 p.m. This data will not be collected on Monday mornings or Friday afternoons unless otherwise indicated by the 24 hour ATR counts or known peak traffic flows during these time periods. Occasionally, weekend, or where possible holiday traffic periods will also be obtained as requested or necessitated by local conditions. Data obtained in the field can be directly downloaded into spreadsheets for summarizing, error checking and reporting.
- Miscellaneous Data Collection - All data described below will be obtained to properly code the modeling software. If Lake County data is not available and Delcan needs to due full data collection, the following data will be collected during the Turning movement counts.
- Special Vehicle Counts - These counts will be obtained to identify the number of heavy vehicles, buses etc. that impact the arterial under study. This information is also relevant to the Highway Capacity Software for determination of saturation flow rates. Pedestrian traffic will also be obtained where required.
- Collect Field Geometrics - This information will be obtained to properly reflect field conditions for the modeling software and to properly fine tune the model output. At a minimum, the following information will be collected if not available from Lake County or contained in existing Synchro analyses:
 - Number of Approach Lanes
 - Number of Throat Lanes
 - Lane Widths
 - Lane Type
 - Approach Grades
 - Signal and Pedestrian Indications
 - Pedestrian Push-buttons
 - Crosswalks and Pedestrian Clearances
 - Left Turn Bay Storage Length
 - Link Lengths
- Determine Speed Limits
- Collect Parking Restriction Information

- Special Lane Usage - Special lanes include identification of bus lanes, reversible lanes, on-street parking in painted through lanes, etc.
- Existing Signal Phasing Sequence - Often, the modeling software will suggest new phase sequences for better coordination. Typically, these suggestions will include the implementation of lagging left turns or split phases. Ordinarily, any change of this nature to the signal sequence is not appropriate or politically feasible. However, if it is deemed to be in the best interest of traffic flow, Delcan will document any benefits for such a change.
- Existing Signal Timings - Existing signal timing parameters will be obtained. This data will include: Walk; Pedestrian Clearance; Minimum Green; Maximum Greens; Yellow; All Red; Extension; Time to Reduce; Time Before Reduction; etc. This data will provide information relative to the timing plan development effort and the fine-tuning process.
- Photograph Intersections – If Lake County records are not available, a photographic record of all intersection approaches will be taken.
- Perform "Before Study" - The following data will be collected in the field for the "Before" Study:
- Floating Car Field Study - This study will be conducted on the study arterial. A minimum of three runs in each direction per study period will be performed. The before study will be conducted on the existing timings contained in the controllers. The SPEEDY speed/delay utility will be used.
- Before MOE's will be generated using the Floating Car field studies and computer models to evaluate delay, stops, fuel consumption, and vehicle emissions.

Data Analysis

This Task represents the work required to assemble all data collected above and to model actual traffic flows, driver behavior, and field conditions with the appropriate piece of software. For this project the software will be Synchro. The following sub-tasks describe the data analysis effort in some detail that Delcan will perform.

- Enter Data into analysis package.
- Determine Saturation flow rates and perform capacity analysis.
- Run Optimization program - Optimization software will be used to develop cycle lengths, splits and offsets.
- Optimize computer model and Fine-tune - The computer output, as with any modeling results, must be evaluated with a keen knowledge of traffic and signal operations. It will be necessary to adjust and to re-adjust the splits until a satisfactory result is obtained that is practical and safe for field implementation.

- Reverse Engineer Final Analysis - Once the final output is settled, it will be necessary to "reverse engineer" the output into a standard input file for the appropriate traffic signal software.
- Submit Pre-Implementation Report - Prior to implementation of the timings, Delcan will submit to Lake County the proposed timings.
- Revise Timings as Required - Comments received from Lake County relative to the timing plans developed will be reflected in a revised set of timing plans.

Implementation

The implementation Task is critical in that this is the first time the public will be exposed to the timing plan design effort. It is necessary to be cognizant of this fact, but first and foremost it is absolutely necessary to be safety conscious. To this end, Delcan will never implement anything in the field without being present. The maintenance contractor will also be notified before implementation occurs. Signal operation will be quickly and thoroughly checked for safe operation. Next, split timings and side street queues will be evaluated. After the system is checked and deemed to be operating safely with the new timing plans, Delcan will fine tune the system operation by checking splits and offsets. .

- Set Up Intersections - Intersection databases will be set up and downloaded to the controllers.
- Evaluate Timing Plans - The timing plans will be first evaluated to ensure safe operation.
- Fine Tune Plans for Coordination - After safety is guaranteed, the timing plans will be fine-tuned to ensure adequate side street splits and provide for better coordination.

Evaluation

An objective evaluation of the performance of the timing plans as compared with the "before" conditions will be made. A comparison of all MOEs obtained as a result of field studies and simulation runs of the modeling software will be made. Delcan will perform this Task.

- Perform "After" Study - The following data will be collected in the field for the "After" Study:
- Floating Car Field Study - This study will be conducted on the study arterial. A minimum of three runs in each direction per study period will be performed. Again, SPEEDY will be used.

Data obtained in the above study will be compared with the data obtained from the "Before" study.

- After MOE's will be developed from the Floating Car field studies and computer models and compared to the before studies to develop a Benefit/Cost Ratio for the system implementation.
- Prepare Final Report

Deliverables:

The following tasks will result in deliverable products that will be provided.

- A pre-implementation report will be submitted to Lake County and any local agency affected by the signal timing implementation prior to installing any signal timings in the field. This report will summarize all timing parameter modifications, coordinated timing parameters and the Time-of-Day, Day-of-Week schedule.
- A Final Report will be submitted to Lake County. This report will summarize the project background, project scope, methodology employed, MOE comparison results and any special recommendations and/or observations.
- A CD will be provided for each system. This CD is intended to provide a historical data reference to all activities undertaken by the project. This will be a "living" document and will be formatted to easily maintain a current record of all data or timing changes to the system. The CD will include the following items:
 - The Final Report will be included.
 - A summary of all data collected and inventory information - This data will be presented in a clear and concise manner.
 - A summary of all studies conducted - This material will include all studies conducted for each system as well as results of the "Before" and "After" studies. All information will be presented in a clear and concise manner.
 - All optimization analyses performed will be provided.
 - All data, studies, and modeling input and output data files developed with computer hardware will be delivered to Lake County on a CD.

