

ENGINEERING SERVICES AGREEMENT

THIS AGREEMENT is made and entered into by and between the Fort Bend Grand Parkway Toll Road Authority, a transportation corporation organized and operating under the laws of the State of Texas, hereinafter called the "FBGPTRA" and Applied Research Associates, Inc., an Illinois corporation, hereinafter called "Engineer."

WITNESSETH

WHEREAS, the FBGPTRA desires to enter into an agreement for the performance by Engineer of services related to the Project, and which are within the "Scope of Services" as defined in paragraph 2 below; and

WHEREAS, the FBGPTRA proposes to construct Toll Road grade separation structures and maintain existing pavement from US 59 to north of the Fort Bend Westpark Tollway (FM 1093) on State Highway 99 in Ft Bend County, Texas (the "Project");

NOW, THEREFORE, in consideration of the mutual covenants and conditions set forth below, the parties agree as follows:

AGREEMENT

1. General

The Engineer shall render professional services to FBGPTRA related to the Project as defined in the Scope of Services in Attachment A and Attachment A-1.

The standard of care for all professional engineering and related services performed or furnished by Engineer under this Agreement will be the care and skill ordinarily used by members of Engineer's profession practicing under similar conditions at the same time and in the same locality.

2. Compensation and Payment

- a. The Maximum Compensation under this contract is \$88,300.00. The amount paid under this Agreement may not exceed the Maximum Compensation without an approved change order.

Compensation for the performance of services within the Scope of Services described in Attachment A will be paid as a lump sum amount not to exceed \$88,300.00, as shown in Attachment B. Progress payments for work detailed in Attachment A will be made when the Engineer has attained a level of completion equal to or greater than agreed upon milestones of completion in the reasonable opinion of FBGPTRA.

Compensation for services described in Attachment A-1 will be paid per the rates described in Attachment B-1 only for work authorized in writing prior to being performed and only for such work as was actually performed. The Engineer shall

furnish satisfactory documentation of such work (e.g. timesheets, billing rates, classifications, invoices, etc.) as may be required by FBGPTRA.

- b. All performance of the Scope of Services and any Additional Services including changes in the contractual scope of work and revision of work satisfactorily performed, will be performed only when approved in advance and authorized by the FBGPTRA, and Additional Services will be reimbursed based on the billing rates in effect at that time, to the extent that such labor costs, and subcontracts are reasonable and necessary for the performance of such services. Out-of-pocket expense costs may be reimbursed only when approved in advance and authorized by the FBGPTRA. Payment will be made on the basis of project completion certificate and, for Additional Services, time and expense records and in accordance with those payment procedures set forth in subparagraph d. below. Billing rates will be inclusive of all direct labor, fringe benefits, general overhead, and profit.
- c. Where subcontractors are employed by the Engineer to perform additional services not within the original Scope of Services, the Engineer will be reimbursed for subcontractors' actual salaries and hourly rates, including overtime rates. Reimbursement to the Subcontractor for non-salary costs incurred by subcontractor will be on the same basis as if the cost was incurred by the Engineer. For subcontractors employed for the convenience of the FBGPTRA, the Engineer will be paid a subcontract administrative fee equal to ten percent (10%) of all subcontractor invoiced amounts.
- d. It is understood and agreed that monthly payments will be made to the Engineer by the FBGPTRA based on the following procedures: On or about the fifteenth day of each month during the performance of services hereunder and on or about the fifteenth day of the month following completion of all services hereunder, the Engineer shall submit to the FBGPTRA two (2) copies of invoices showing the amounts due for services performed during the previous month, set forth separately for work under this Agreement and for additional services (accompanied by supporting certified time and expense records of such charges in a form acceptable to the FBGPTRA.) It is specifically understood that any requests for travel reimbursements shall comply with those procedures for travel reimbursement to Fort Bend County employees established by the Fort Bend County Auditor. The FBGPTRA shall review such invoices and approve them within 30 calendar days with such modifications as are consistent with this Agreement and forward same to the Auditor. The County shall pay each such invoice as approved by the FBGPTRA within thirty (30) calendar days after the FBGPTRA's approval of same.

3. Time of Performance

It is understood and agreed that the time for performance of the Engineer's services under this Agreement shall begin with receipt of the Notice to Proceed and end 100 calendar days from that date.

4. The FBGPTRA's Option to Terminate

- a. The FBGPTRA has the right to terminate this Agreement at its sole option at any time, with or without cause, by providing 30 days written notice of such intentions to terminate and by stating in said notice the "Termination Date" which shall be less than 30 days later than the actual receipt of such written notice by the Engineer. Upon such termination, the FBGPTRA shall compensate the Engineer in accordance with paragraph 3, above, for those services which were provided under this Agreement prior to its termination and which have not been previously invoiced to the FBGPTRA. The Engineer's final invoice for said services will be presented to and paid by the FBGPTRA in the same manner set forth in paragraph 3(b), above.
- b. Termination of this Agreement and payment as described in subparagraph (a) of this Paragraph shall extinguish all rights, duties, obligations, and liabilities of the FBGPTRA and the Engineer under this Agreement and this Agreement shall be of no further force and effect, provided, however, such termination shall not act to release the Engineer from liability for any previous default either under this Agreement or under any standard of conduct set by common law or statute. The obligations in Paragraph 6 shall survive the termination of this Agreement.
- c. If the FBGPTRA terminates this Agreement as provided in this paragraph, no fees of any type, other than fees due and payable at the Termination Date, shall thereafter be paid to the Engineer.
- d. The FBGPTRA's rights and options to terminate this Agreement, as provided in any provision of this Agreement shall be in addition to, and not in lieu of, any and all rights, actions and privileges otherwise available under law or equity to the FBGPTRA by virtue of this Agreement or otherwise. Failure of the FBGPTRA to exercise any of its said rights, actions, options or privileges to terminate this Agreement as provided in any provision of this Agreement shall not be deemed a waiver of any rights, actions or privileges otherwise available under the law or equity with respect to any continuing or subsequent breaches of this Agreement or of any other standard of conduct set by common law or statute.
- e. Copies of all completed and partially completed documents prepared under this Agreement shall be delivered to the FBGPTRA within 30 days or upon Engineer's receipt of termination payment, whichever is sooner, when and if this Agreement is terminated.

5. Inspection of the Engineer's Books and Records

The Engineer will permit the FBGPTRA, or any duly authorized agent of the FBGPTRA, to inspect and examine the books and records of the Engineer for the purpose of verifying the amount of work performed on the Project. FBGPTRA's right to inspect survives the termination of this Agreement for a period of four years.

6. Ownership and Reuse of Documents

All documents, including original drawings, estimates, specifications, field notes, and data created, produced, developed or prepared by Engineer or its approved outside advisory or support consultants (collectively, the "Documents") shall be the property of the FBGPTRA subject to all of the following terms and conditions; provided, however, FBGPTRA shall not own and shall have no right to receive any documents not deemed "final" by the Engineer until termination of this Agreement. Engineer will deliver the Documents to FBGPTRA within 30 days of the termination of this agreement and may retain a set of reproducible record copies of the Documents, provided that the Engineer has received full compensation due pursuant to the terms of this Agreement. It is mutually agreed that FBGPTRA will use the Documents solely in connection with the Project and for no other purposes, except with the express written consent of the Engineer, which consent will not be unreasonably withheld. Any use of the Documents without the express written consent of the Engineer will be at District's sole risk and without liability or legal exposure to Engineer.

FBGPTRA shall also be the owner of all intellectual property rights of the services rendered hereunder, including all rights of copyright therein. It is the intention of Engineer and FBGPTRA that the services provided are a "work for hire" as the term is used in the federal Copyright Act. Moreover, Engineer hereby agrees to assign, and by these presents, does assign to FBGPTRA all of Engineer worldwide right, title and interest in and to such work product and all rights of copyright therein.

Engineer agrees that all trademarks, trade names, service marks, logos, or copyrighted materials of FBGPTRA that Engineer is permitted to use in connection with the services will not be used without FBGPTRA's consent and shall remain in the sole and exclusive properties of FBGPTRA and this Agreement does not confer upon Engineer any right or interest therein or in the use thereof.

7. Personnel, Equipment, and Material

- a. The Engineer represents that it presently has, or is able to obtain, adequate qualified personnel in its employment for the timely performance of the Scope of Services required under this Agreement and that the Engineer shall furnish and maintain, at its own expense, adequate and sufficient personnel and equipment, in the opinion of the FBGPTRA, to perform the Scope of Services when and as required and without delays. It is understood that the FBGPTRA will approve assignment and release of all key Engineer personnel and that the Engineer shall submit written notification of all key Engineer personnel changes for the FBGPTRA's approval prior to the implementation of such changes. For the purpose of this agreement, key Engineer personnel are defined as: Project Manager. Services described in this Agreement shall be performed under the direction of an engineer licensed to practice professional engineering in the State of Texas.
- b. All employees of the Engineer shall have such knowledge and experience as will enable them to perform the duties assigned to them. Any employee of the Engineer who, in the opinion of the FBGPTRA, is incompetent or by his conduct

becomes detrimental to the Project shall, upon request of the FBGPTRA, immediately be removed from association with the Project.

- c. Except as otherwise specified, the Engineer shall furnish all equipment, transportation, supplies, and materials required for its operation under this Agreement.

8. Items to be furnished to Engineer by the FBGPTRA

The following items will be supplied to the Engineer:

- a. Copies of preliminary studies by others.
- b. Assistance in coordination with all utility companies.
- c. Assistance in coordination with all public and governmental entities.

9. Subletting

The Engineer shall not sublet, assign, or transfer any part of its rights or obligations in this Agreement without the prior written approval of the FBGPTRA. Responsibility to the FBGPTRA for sublet work shall remain with the Engineer.

10. Conference

At the request of the FBGPTRA, the Engineer shall provide appropriate personnel for conferences at its offices, or attend conferences at the various offices of the FBGPTRA, or at the site of the Project, and shall permit inspections of its offices by the FBGPTRA, or others when requested by the FBGPTRA.

11. Appearance as Witness

If requested by the FBGPTRA, or on its behalf, the Engineer shall prepare such engineering exhibits and plans as may be requested for all hearings and trials related to the Project and, further, it shall prepare for and appear at conferences at the office of the FBGPTRA's Executive Director and shall furnish competent expert engineering witnesses to provide such oral testimony and to introduce such demonstrative evidence as may be needed throughout all trials and hearings with reference to any litigation relating to the Project. Trial preparation and appearance by the Engineer in courts regarding litigation matters are Additional Services and compensation will be made in accordance with the schedule contained in Exhibit B-1.

12. Compliance with Laws

The Engineer shall comply with all federal, state, and local laws, statutes, ordinances, rules and regulations, and the orders and decrees of any courts or administrative bodies or tribunals in any matter affecting the performance of this Agreement, including, without limitation, Worker's Compensation laws, minimum and maximum salary and wage

statutes and regulations, licensing laws and regulations. When required, the Engineer shall furnish the FBGPTRA with certification of compliance with said laws, statutes, ordinances, rules, regulations, orders, and decrees above specified.

13. Insurance

The Engineer shall obtain and maintain, throughout the term of the Agreement, insurance of the types and in the minimum amounts set forth in Attachment C.

14. Indemnification

With respect to claims brought by third parties against either Engineer of the FBGPTRA relating to the property or facilities with respect to which this Agreement pertains, Engineer and the FBGPTRA agree as follows:

- a. **ENGINEER WILL INDEMNIFY AND HOLD HARMLESS THE FBGPTRA, ITS DIRECTORS, OFFICERS, AND EMPLOYEES AGAINST ANY CLAIMS, DEMANDS OR CAUSES OF ACTION; AND COSTS, LOSSES, LIABILITIES, EXPENSES AND JUDGMENTS INCURRED IN CONNECTION THEREWITH, INCLUDING REASONABLE ATTORNEY'S FEES AND COURT COSTS, BROUGHT BY ANY OF ENGINEER'S EMPLOYEES OR REPRESENTATIVES, OR BY ANY OTHER THIRD PARTY, BASED UPON, IN CONNECTION WITH, RESULTING FROM OR ARISING OUT OF THE NEGLIGENT ACTS, ERRORS OR OMISSIONS OF ENGINEER; HOWEVER, ENGINEER'S CONTRACTUAL OBLIGATION OF INDEMNIFICATION SHALL NOT EXTEND TO THE NEGLIGENCE OR OTHER FAULT OF THE FBGPTRA OR STRICT LIABILITY IMPOSED UPON THE FBGPTRA AS A MATTER OF LAW (INCLUDING STRICT LIABILITY IMPOSED UPON THE FBGPTRA AS A RESULT OF THE CONDITION OF THE PROPERTY OR FACILITIES WITH RESPECT TO WHICH THIS AGREEMENT PERTAINS).**
- b. In the event that both the FBGPTRA and Engineer are adjudicated negligent or otherwise at fault or strictly liable without fault with respect to damage or injuries sustained by the claimant, each shall be responsible for its own costs of litigation and pro rata share of damages as determined by the proceedings.

It is a condition precedent to the indemnitor's contractual obligation of indemnification under this Agreement that the party seeking indemnity shall provide written notice of a third party claim, demand or cause of action within 30 days after such third party claim, demand or cause of action is received by the party seeking indemnity. It is a further condition precedent to the indemnitor's contractual obligation of indemnification under this Agreement that the indemnitor shall thereafter have the right to participate in the investigation, defense and resolution of such third party claim.

15. Dispute Resolution

Except as expressly provided in Section 4. Termination, if a dispute arises out of, or relates to, the breach thereof, and if the dispute cannot be settled through negotiation, then the FBGPTRA and the Engineer agree to submit the dispute to mediation. In the event the FBGPTRA or the Engineer desires to mediate any dispute, that party shall notify the other party in writing of the dispute desired to be mediated. If the parties are unable to resolve their differences within 10 days of the receipt of such notice, such dispute shall be submitted for mediation in accordance with the procedures and rules of the American Arbitration Association (or any successor organization) then in effect. The deadline for submitting the dispute to mediation can be changed if the parties mutually agree in writing to extend the time between receipt of notice and submission to mediation. The expenses of the mediator shall be shared 50 percent by the FBGPTRA and 50 percent by the Engineer. This requirement to seek mediation shall be a condition required before filing an action at law or in equity.

16. Delivery of Notices, Etc.

- a. All written notices, demands, and other papers or documents to be delivered to the FBGPTRA under this Agreement shall be delivered to the Fort Bend Grand Parkway Toll Road Authority, P.O. Box 2789, Sugar Land, Texas 77487-9740, Attention: Bill Jameson, or at such other place or places as it may from time to time designate by written notice delivered to the Engineer. For purposes of notice under this Agreement, a copy of any notice or communication hereunder shall also be forwarded to the following address: Fort Bend County Clerk, 301 Jackson Street, Richmond, Texas 77469, Attention: County Judge.
- b. All written notices, demands, and other papers or documents to be delivered to the Engineer under this Agreement shall be delivered to Applied Research Associates, Inc., 100 Trade Centre Drive, Suite 200, Champaign, Illinois, 61820-7322, Attention: Mike Harrell, or such other place or places as the Engineer may designate by written notice delivered to the FBGPTRA.

17. Reports of Accidents, Etc.

Within 24 hours after the occurrence of any accident or other event which results in, or might result in, injury to the person or property of any third person (other than an employee of the Engineer), whether or not it results from or involves any action or failure to act by the Engineer or any employee or agent of the Engineer and which arises in any manner from the performance of this Agreement, the Engineer shall send a written report of such accident or other event to the FBGPTRA, setting forth a full and concise statement of the facts pertaining thereto. The Engineer shall also immediately send the FBGPTRA a copy of any summons, subpoena, notice, other documents served upon the Engineer, its agents, employees, or representatives, or received by it or them, in connection with any matter before any court arising in any manner from the Engineer's performance of work under this Agreement.

18. The FBGPTRA's Acts

Anything to be done under this Agreement by the FBGPTRA may be done by such persons, corporations, or firms as the FBGPTRA may designate.

19. Limitations

Notwithstanding anything herein to the contrary, all covenants and obligations of the FBGPTRA under this Agreement shall be deemed to be valid covenants and obligations only to extent authorized by the Act creating the FBGPTRA and permitted by the laws and the Constitution of the State of Texas. This Agreement shall be governed by the laws of the State of Texas, and no officer, director, or employee of the FBGPTRA shall have any personal obligation hereunder.

20. Captions Not a Part Hereof

The captions of subtitle of the several sections and divisions of this Agreement constitute no part of the content hereof, but are only labels to assist in locating and reading the provisions hereof.

21. Controlling Law, Venue

This Agreement shall be governed and construed in accordance with the laws of the State of Texas. The parties hereto acknowledge that venue is proper in Fort Bend County, Texas, for all disputes arising hereunder and waive the right to sue or be sued elsewhere.

22. Successors and Assigns

The FBGPTRA and the Engineer bind themselves and their successors, executors, administrators and assigns to the other party of this Agreement and to the successors, executors, administrators and assigns of the other party, in respect to all covenants of this Agreement.

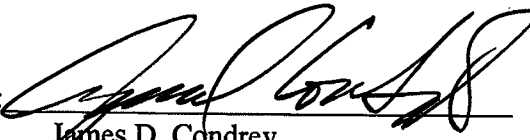
23. Appendices

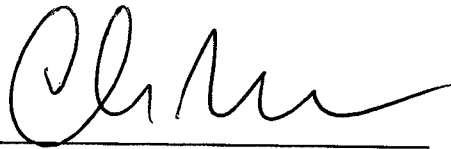
The Appendices attached to this Agreement, which consists of:

Attachment A	Scope of Services
Attachment A-1	Additional Services
Attachment B	Compensation for Scope of Services
Attachment B-1	Compensation for Additional Services
Attachment C	Insurance Requirements

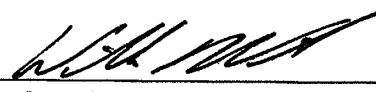
IN WITNESS WHEREOF, the parties hereto have signed or have caused their respective names to be signed to multiple counterparts to be effective on the 4th day of August, 2011.

FORT BEND GRAND PARKWAY TOLL ROAD
AUTHORITY, a local government Texas
corporation

By: 
James D. Condrey
Chairman, Board of Directors

ATTEST: 
By _____
Secretary, Board of Directors

Applied Research Associates, Inc.
ENGINEER

By: 
Name: **William R. Vavrik, Ph.D., P.E.**
Title: **Vice President
Midwest Division Manager**

ATTACHMENT A



PROJECT UNDERSTANDING

The Fort Bend Grand Parkway Toll Road Authority (FBGPTRA) operates one route in Fort Bend County, Texas

- Grand Parkway (from US 59 to FM 1093, approx. 52 lane-miles)

Professional Project Management Services (PPMS) requested a proposal from ARA to perform the following services for the FBGPTRA:

- Pavement data collection services
- Pavement condition evaluations
- Pavement Remaining Service Life (RSL) assessments
- Implementation of Pavement Management System (PMS)
- Asset management inventory for the following assets:
 - Signs
 - Lightpoles
 - Guardrails
 - Median barrier walls
 - Crash cushions
 - Traffic signals
 - Toll collection cameras

ARA understands that portions of the Grand Parkway will begin major interchange improvement projects on August 15, 2011, requiring that data collection on the Grand Parkway be performed before that date.

SCOPE OF SERVICES

This section details services ARA will provide to implement our RoadCare Pavement and Roadside Asset Management System and facilitate the determination of a reliable, site-specific Remaining Service Life (RSL) for the pavements of the FBGPTRA system.

A task-by-task summary of ARA's proposed scope of work is provided in the following sections.

PAVEMENT CONDITION AND MANAGEMENT SERVICES

Task 1. Kickoff Meeting

ARA will meet with FBGPTRA staff in Fort Bend County to discuss the project elements and plan for execution. At this time, ARA will have their Digital Survey Vehicle (DSV) present for introduction and demonstration to stakeholders.

Task 2. Digital Data Collection on FBGPTRA Routes

It is understood that ARA will traverse the following FBGPTRA toll roads with the DSV:

- Grand Parkway (from US 59 to FM 1093, approx. 52 lane-miles)

Digital Survey Vehicles (DSV)

ARA maintains and operates three DSVs that are equipped with varying configurations of cameras, laser sensors, differential GPS and inertial navigation systems that can provide a wide variety of pavement surface and geometric characteristics. Automated data collection provides a number of benefits in pavement management, including:

- Minimal impact on traveling public with collection at highway speeds
- Increased safety due to surface condition rating being performed in the office
- Incorporation of images and other data in ARA's ImageViewer "virtual drive" software
- Archived digital records and images of historical pavement and Right-of-Way (ROW) condition
- Ability to expand utilization of images at a later time (ROW and asset inventory surveys)

ARA's DSV is equipped with the following integrated survey systems:

1. ICC Road Profiler (ASTM E-950) with up to 5-laser sensors. It is currently configured with two 32 kHz lasers in the wheel paths and one 16 kHz laser in the center front bumper position. The system can also be configured with either of the following options, but not both:
 - a. Option #1 – 5-sensor rutting using either angled lasers or wings.
 - b. Option #2 – add Grade & Cross-slope
2. Applanix POS/LV 420 Inertial Navigation System
3. OmniStar Differential GPS Receiver
4. Geo3D Kronos Asset Management Camera System with four 2448 x 2048 color digital area scan video cameras. These are typically configured three to the front in panoramic mode and one to the rear.
5. Distance Measuring Instrument accurate to 1 ft/mi
6. DSV Positioning Computer showing the real time vehicle location during data collection on a client provided GIS map.

The DSV typically captures all four right-of-way images at 16-ft intervals at speeds up to 65 MPH with sub-meter positional accuracy.

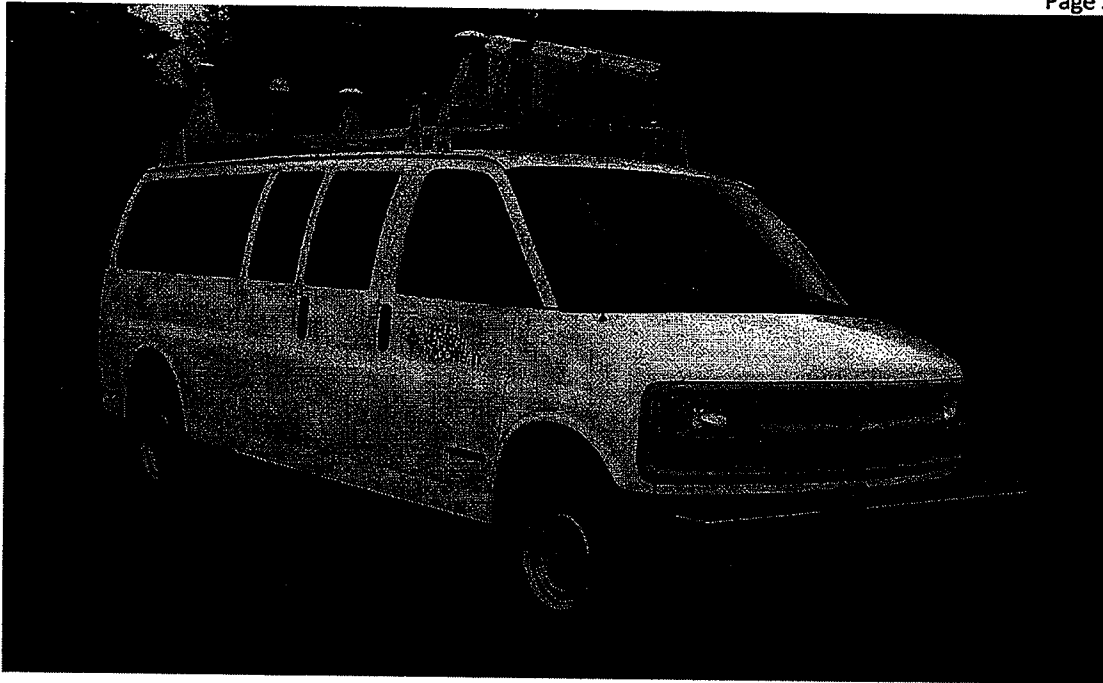


Figure 1. Digital Survey Vehicle (DSV).

Task 3. Pavement Condition Surveys

Regarding pavement surface condition, ARA generally employs one of several rating methodologies; Illinois Department of Transportation's (IDOT's) Condition Rating Survey (CRS), the Pavement Condition Index (PCI) methodology per ASTM D 6433, or a modified version of PCI. We have implemented each method for a number of clients similar to FBGPTRA. Each methodology has a different cost/effort for collection and a different depth of data provided.

Based on the historical data available, planned future goals, and the applicability of recent work experience and practices in neighboring communities, ARA recommends the IDOT CRS methodology for FBGPTRA's system: the methodology is well-suited for long stretches of continuous roadway. ARA performed CRS surveys for FBGPTRA using digital imagery and data in 2011. The CRS methodology incorporates the pavement surface condition as well as digital sensor measurements of roughness (IRI) and faulting. The IDOT CRS methodology rolls up observed distresses (frequencies and severities) and sensor measurements into a 0-9 scale. All survey results will be incorporated as a data set in RoadCare.

Task 4. Assign Remaining Service Life

ARA understands FBGPTRA would like to quantify the pavement network's Remaining Service Life (RSL), that is, the remaining number of years FBGPTRA can expect their current pavement structures to perform against current and growing traffic. RSL is defined as the number of years a pavement will provide serviceability above a certain threshold before requiring improvements (diamond grinding, overlays, reconstruction, etc.).

ARA will utilize the results of the construction history information from PPMS, traffic counts and forecasts, and pavement performance models to assign an RSL for each segment of roadway on the system. ARA will work with PPMS to develop pavement performance models customized to FBGPTRA's system. The RSL will be incorporated as a data set in RoadCare.

Task 5. Implement Pavement Management System (includes RoadCare software license fee of \$25,000)

Kickoff Meeting, Records Review & Data Transfer – At the onset of this project, ARA will meet with FBGPTRA staff in their office to review the project requirements and explore current systems and practices. This may include discussions and review of FBGPTRA's pavement management inventory, condition, and GIS data, an introduction to the IT environment and implementation requirements, and general discussions of maintenance and rehabilitation (M&R) practices and policies. The primary purpose of this task is to understand what data sources are available and pertinent to the pavement management process and how they should be managed throughout subsequent project steps, including data conversion, field testing plan development, and the programming of M&R logic.

RoadCare Network Definition & Data Conversion – ARA will use the information obtained to build inventory, condition, and other available data into the RoadCare database. The bulk of this effort will focus around using FBGPTRA's data and other sources to match or define a linear reference system for the system and convert section data and quantities to the new referencing scheme. This conversion will enable FBGPTRA to utilize the dynamic segmentation and flexible data management capabilities of RoadCare. ARA will work closely with FBGPTRA staff to ensure proper conversion of all data from a section-referenced to linear-referenced basis and will provide a sample database of the converted inventory and attribute data for review prior to developing specific M&R analysis scenarios.

RoadCare M&R Customization & Analysis – The M&R Simulation module of RoadCare allows the owner to define the rules in how pavement performance and needs are predicted, what types of activities can be performed, and what consequences are to be expected as a result. The required inputs generally include:

- Development and refinement of pavement performance models
- Feasibility, cost, and consequences of available M&R treatments
- Funding sources and investment parameters (earmarked funds, required areas for spending)
- Project selection methodology (including optimization and prioritization)
- Incorporation of policies (performance goals and serviceability thresholds)

Upon successful conversion and migration of FBGPTRA's data into RoadCare, ARA will combine a review of FBGPTRA's current M&R practices and historical condition data with our extensive pavement management experience for similar agencies to develop a "first cut" of the M&R system logic.

Finally, ARA will work with FBGPTRA to incorporate changes and recommendations to the M&R logic and begin performing multiple analyses to develop and consider short-term, mid-term, and long-term M&R strategies. From this iterative analysis, ARA will prepare a report and present the results to FBGPTRA. Aside from installation of the system software and database, these presentations will serve as the primary deliverable of this effort.

System Delivery and Training – ARA will work with FBGPTRA to develop a system implementation plan that meets the project's needs, dependent on the chosen method of system delivery. The full implementation involves a configured delivery of single or multiple desktop applications in a network environment, allowing the user full control and accessibility to all data management, viewing, reporting, and analysis functionality; alternatively, a Web-based delivery is available to provide most viewing and reporting capabilities along with basic management and analysis of simulation results.

A final project meeting will be required to deliver the RoadCare system and database and provide on-site support through installation and configuration. ARA will also provide on-site training for FBGPTRA staff during this meeting. FBGPTRA shall provide meeting space and computers required for those in attendance of the training meeting.

Task 6. On-going Maintenance & Support – First Year (\$0), Annual Fee (\$5,000)

ARA offers a variety of maintenance and support (M&S) services for the RoadCare system. We provide services on an annual-basis that can include phone, e-mail, and online support requests as well as bug fixes and version upgrades. The first year of M&S services is included with the base implementation effort of RoadCare, beginning on the date of RoadCare system deployment and on-site training. Additional FBGPTRA approval will be required for M&S Services beyond the first year.

ASSET MANAGEMENT INVENTORY SERVICES

One of the significant benefits of utilizing ARA's RoadCare software is the software is designed to manage more than just pavements. It is actually Asset Management software! ARA will utilize RoadCare to store FBGPTRA's asset management inventory information.

Another benefit of using ARA's digital data collection services is the same digital images collected and reviewed for pavement condition can be utilized to locate and inventory other asset inventory data. Because each digital image collected by the DSV is geo-referenced, latitude and longitude coordinates can be obtained for any item that appears in two successive images. While sitting at a workstation, the operator simply identifies the asset and "tags" it in two successive images. Geo-3D software then triangulates the coordinates of the point in the two images using the latitude and longitude of the images, the angle of the camera and the position of the "tag" in each image. Figure 2 shows how this process would work for locating a sign by identifying the base of the sign in two successive images.

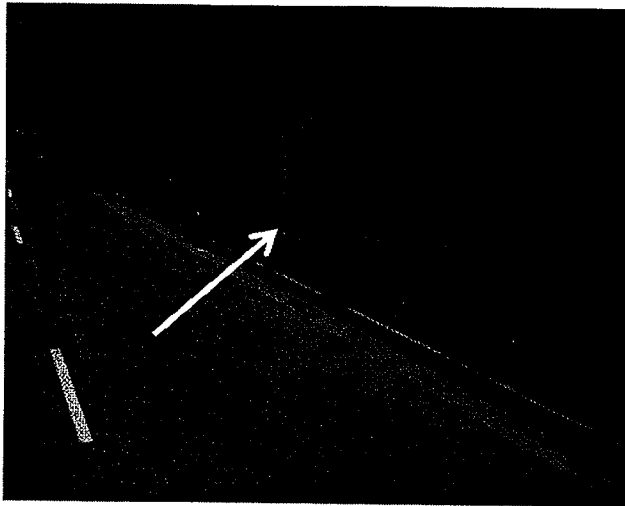


Image 3R000060

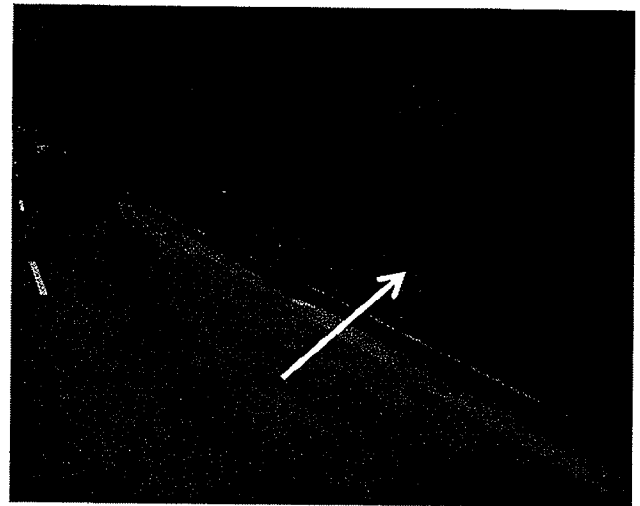


Image 3R000061

Figure 2. Example of locating sign via DSV images.

In this case, the base of the pole on which the sign is mounted has been chosen as the point to tag in the images, though any other point of the sign, such as the top corner, could also have been used. ARA's experience has shown that using the lowest point on a roadside asset provides the most consistent and accurate GPS locations over the entire network.

As each asset is located in successive images, the type or category of the asset is added to the lat/long data to provide the basic elements of the roadside asset inventory data. Asset categories can follow industry standard nomenclature, such as the MUTCD designations for signs, or can be derived using terminology specific to the network. If FBGPTRA has a set of descriptions already in place for guard rail or lightpoles, then existing terminology can be used.

Task 1. Asset Inventory Services

ARA is prepared to collect and inventory attributes on the following asset classes:

- Signs
 - Latitude
 - Longitude
 - Route
 - Direction of travel
 - Milepost or other linear reference
 - Location with respect to direction of travel (overhead, right side, median)
 - Digital image
 - MUTCD code (if appropriate)
 - Support type (wood, telespar, truss, lightpole, etc.)
 - Support ID (if multiple signs exist on same support)
- Guardrail/Median Barrier Wall
 - Beginning point
 - Latitude
 - Longitude
 - Milepost/linear reference
 - End point
 - Latitude
 - Longitude
 - Milepost/linear reference
 - Approximate representation of linear shape
 - Digital image of beginning and end
 - Route
 - Direction of travel
- Lightpoles
 - Latitude
 - Longitude
 - Digital image closest to lightpole
 - Milepost/linear reference
 - Route
 - Direction of travel
 - Location with respect to direction of travel (right side, median)
 - Support ID (if it supports signs or signals)
- Cameras (toll collection cameras)
 - Latitude
 - Longitude
 - Digital image closest to camera
 - Milepost/linear reference
 - Route
 - Direction of travel
 - Lane over which camera is oriented (FBGPTRA numbering, otherwise Lane 1 is inside)

- Traffic Signals
 - Latitude
 - Longitude
 - Digital image closest to traffic signal
 - Milepost/linear reference
 - Route
 - Direction of travel
 - Intersection name
 - Quadrant of intersection (ie: northwest)
 - Support ID
 - Lane over which signal is oriented (FBGPTRA numbering, otherwise Lane 1 is inside)

In most cases, additional information that would be considered “inventory data” will be available for FBGPTRA’s roadside assets. Data such as cost and date of procurement, construction, or installation are likely available, and can be accessed with the expenditure of some effort. FBGPTRA will be able to decide how much effort will go into collecting and including this type of information initially, or how much information they will simply “put in as they go” as assets are repaired, reconstructed, or replaced.

Task 2. Database Configuration

Upon completion of the asset inventory task, ARA will populate a database within RoadCare that will house the asset inventory data. The database will have exportable functionality to GIS and spreadsheets. ARA can work with FBGPTRA to develop customized asset inventory database filters, queries, and reports if desired.

Task 3. Asset Inventory Report

ARA will summarize all asset inventory efforts into an engineering report to document the steps and processes that were undertaken. ARA will submit a draft report, receive comments and feedback from FBGPTRA, and publish a final report for archival purposes.

PROJECT SCHEDULE

ARA has estimated the following schedule to facilitate the successful completion of this important project. We can begin data collection services within 3 weeks of receipt of written notice to proceed (NTP). We anticipate one week for field data collection, followed by the CRS survey and determination of RSL. The implementation of the RoadCare PMS will happen amongst the CRS and RSL activities. We estimate delivery of RoadCare and computation of RSL to be complete within 12 weeks from beginning of data collection, provided we can interface early and often with the FBGPTRA to make choices and/or answer questions. We anticipate completion of asset management inventory efforts within 14 weeks from beginning of data collection. The implementation of an asset management system needs to be a cooperative effort with the FBGPTRA, as the value of this tool will be maximized with the highest level of interest and interaction between ARA and the FBGPTRA. . Notwithstanding the above, ARA understands that portions of the Grand Parkway will begin major interchange improvement projects on August 15, 2011, requiring that data collection on the Grand Parkway be performed before that date.

Task	Weeks													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Receive written notice to proceed (NTP)														
Complete DSV data collection														
Perform CRS survey														
Kickoff meeting														
Data Transfer (from FBCTRA/PPMS)														
Records Review														
RoadCare network definition and data conversion														
RoadCare Maintenance and Rehabilitation (M&R) customization														
Revision of M&R strategies														
Development of Remaining Service Life (RSL)														
System delivery and training														
Draft report of all activities														
Final report of all activities														
Signs														
Lightpoles														
Cameras														
Guardrails/Median Barrier/Crash Cushions														
Traffic Signals														
Database Configuration														
Draft report of all activities														
Final report of all activities														

ATTACHMENT B

PROJECT COSTS

ARA's firm-fixed price costs for digital data collection, pavement management system implementation and deployment, and roadside asset inventory services on the Fort Bend Grand Parkway are **\$88,300**.

Attachment C

The Engineer shall furnish certificates of insurance to the FBGPTRA evidencing compliance with the insurance requirements hereof. Certificates shall indicate name of the Engineer, name of insurance company, policy number, term of coverage and limits of coverage. The Engineer shall cause its insurance companies to provide the FBGPTRA with at least 30 days prior written notice of any reduction in the limit of liability by endorsement of the policy, cancellation or non-renewal of the insurance coverage required under this Agreement. The Engineer shall obtain such insurance from such companies having a Bests rating of B+/VII or better, licensed or approved to transact business in the State of Texas, and shall obtain such insurance of the following types and minimum limits:

- a. Workers' Compensation insurance in accordance with the laws of the State of Texas, or state of hire/location of Services, and Employers' Liability coverage with a limit of not less than \$500,000 each employee for Occupational Disease, \$500,000 policy limit for Occupational Disease; and Employer's Liability of \$500,000 each accident.
- b. Commercial General Liability insurance including coverage for Products/Completed Operations, Blanket Contractual, Contractors' Protective Liability Broad Form Property Damage, Personal Injury/Advertising Liability, and Bodily Injury and Property Damage with limits of not less than:

\$2,000,000	general aggregate limit
\$1,000,000	each occurrence, combined single limit
\$2,000,000	aggregate Products, combined single limit
\$1,000,000	aggregate Personal Injury/Advertising Liability
\$50,000	Fire Legal Liability
\$5,000	Premises Medical
- c. Business Automobile Liability coverage applying to owned, non-owned and hired automobiles with limits not less than \$1,000,000 each occurrence combined single limit for Bodily Injury and Property Damage combined.
- d. Umbrella Excess Liability insurance written as excess of Employer's Liability, with limits not less than \$3,000,000 each occurrence combined single limit.
- e. Professional Liability insurance with limits not less than \$2,000,000 each claim/annual aggregate.

The FBGPTRA and the FBGPTRA's Directors shall be named as additional insureds to all coverages required above, except for those requirements in paragraphs "a" and "e." All policies written on behalf of the Engineer shall contain a waiver of subrogation in favor of the FBGPTRA and the FBGPTRA's Directors, with the exception of insurance required under paragraph "e."