

AGREEMENT WITH G.I.E TECHNOLOGIES, INC. TO PROVIDE
CITY-WIDE PAVEMENT MANAGEMENT PROGRAM UPDATE SERVICE

June 12, 2012

Page 2

The term of this service agreement will be one (1) year with four (4) optional one (1) year terms for a total of five (5) years. The grand total for this 5-year term is \$306,049.33. The breakdown is as follows:

For year one (1) cost will be \$120,028.54, year two (2) \$1,500.00, year three (3) \$88,144.61, year four (4) \$1,500.00, and year five (5) \$94,876.18, for a not to exceed total of \$306,049.33.

The equipment used to collect the roadway survey data is unique to G.I.E. and cannot be purchased from another firm. G.I.E. continues to make MicroPaver software adjustments, ensuring the capability to import survey data into the City of Garden Grove's Geographic Information System. With state funding for roadway maintenance dwindling it is important that we sustain our competitive posture by generating accurate and consistent data, which will aid immeasurably in our pursuit to secure needed Measure M2 funding.

Based on the aforementioned facts and pursuant to the City of Garden Grove Municipal Code Section 2.50.060(4) governing bidding procedures; the Finance Director has determined that due to the uniqueness of their equipment and the City of Garden Grove's specific software and program needs, services can only be obtained from G.I.E.

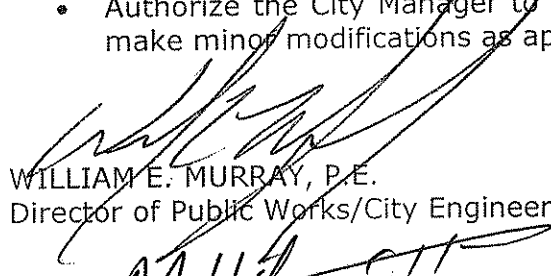
FINANCIAL IMPACT

The Professional Services Agreement cost for a term of five (5) years in the amount of \$306,049.33 is available in the Public Works Department budget.

RECOMMENDATION

It is recommended that the Garden Grove City Council:

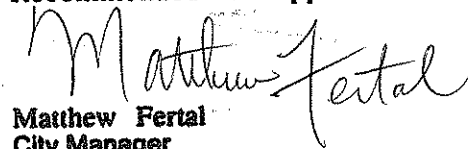
- Approve the attached service agreement with G.I.E. Technologies, for a total service term of five years at a total cost of \$306,049.33;
- Approve allocation of available funds for the agreement with G.I.E. Technologies Inc.; and
- Authorize the City Manager to execute the agreement on behalf of the City and make minor modifications as appropriate.


WILLIAM E. MURRAY, P.E.
Director of Public Works/City Engineer


By: A.J. Holmon III
Streets/Environmental Services Manager

Attachment: Agreement

Recommended for Approval


Matthew Fertal
City Manager

PROFESSIONAL SERVICES AGREEMENT

THIS AGREEMENT is made this _____ day of _____, 2012, by the **CITY OF GARDEN GROVE**, a municipal corporation, ("CITY") and **G.I.E. Technologies, Inc.**, herein after referred to as "CONTRACTOR".

RECITALS

The following recitals are a substantive part of this Agreement:

1. This Agreement is entered into pursuant to Garden Grove COUNCIL AUTHORIZATION, DATED _____.
2. CITY desires to utilize the services of CONTRACTOR to **Furnish all labor, materials, and equipment for the 2012-2016 Pavement Management System Update for the City of Garden Grove.**
3. CONTRACTOR is qualified by virtue of experience, training, education and expertise to accomplish services.

AGREEMENT

THE PARTIES MUTUALLY AGREE AS FOLLOWS:

1. **Term and Termination.** The term of the agreement shall be for period of one (1) year from full execution of the agreement, with an option to extend said agreement additional five (5) years, for a total performance period of six (6) years. Option years shall be exercised one (1) year at a time, at the sole option of the CITY. This agreement may be terminated by the CITY without cause. In such event, the CITY will compensate CONTRACTOR for work performed to date in accordance with proposal which is attached as Attachment A and is hereby incorporated by reference. Contractor is required to present evidence to support performed work.
2. **Services to be Provided.** The services to be performed by CONTRACTOR shall consist of tasks as set forth in the Proposal. The Proposal is attached as Attachment A, and is incorporated herein by reference. The Proposal and this Agreement do not guarantee any specific amount of work.
3. **Compensation.** CONTRACTOR shall be compensated as follows:
 - 3.1 **AMOUNT.** Total Compensation under this agreement shall not exceed (NTE) amount of Three Hundred Thousand Six Hundred Ninety Dollars (\$300,690.00), payable as follows:

- Year One (1) cost will be \$9,500, Year Three (3) \$52,188.4, and Year Five (5) \$6,500 for a not to exceed total of \$68,188.00.
 - Year Two (2) cost will be \$95,411.68, Year Four (4) \$89,565.33, and Year Six (6) \$47,524.74 for a not to exceed total of \$232,502.00 in arrears and in accordance with proposal in Attachment "A".
- 3.2 Payment. For work under this Agreement, payment shall be made per invoice for work completed. For extra work not a part of this Agreement, a written authorization by CITY will be required, and payment shall be based on schedule included in Proposal (Attachment A).
- 3.3 Records of Expenses. CONTRACTOR shall keep complete and accurate records of all costs and expenses incidental to services covered by this Agreement. These records will be made available at reasonable times to CITY.
- 3.4 Termination. CITY and CONTRACTOR shall have the right to terminate this agreement, without cause, by giving thirty (30) days written notice of termination. If the Agreement is terminated by CITY, then the provisions of paragraph 3 would apply to that portion of the work completed.

4. Insurance requirements.

- 4.1 COMMENCEMENT OF WORK. CONTRACTOR/CONSULTANT shall not commence work under this Agreement until all certificates and endorsements have been received and approved by the CITY. All insurance required by this Agreement shall contain a Statement of Obligation on the part of the carrier to notify the CITY of any material change, cancellation, or termination at least thirty (30) days in advance.
- 4.2 WORKERS COMPENSATION INSURANCE. During the duration of this Agreement, CONTRACTOR and all subcontractors shall maintain Workers Compensation Insurance in the amount and type required by law, if applicable.
- 4.3 INSURANCE AMOUNTS. CONTRACTOR shall maintain the following insurance for the duration of this Agreement:
- (a) Commercial general liability in an amount of \$1,000,000.00 per occurrence (**claims made and modified occurrence policies are not acceptable**); Insurance companies must be acceptable to CITY and have a Best's Guide Rating of A-, Class VII or better, as approved by the CITY.

- (b) Automobile liability in an amount of \$1,000,000.00 combined single limit (**claims made and modified occurrence policies are not acceptable**); Insurance companies must be acceptable to CITY and have a Best's Guide Rating of A-, Class VII or better, as approved by the CITY.

An **On-Going and Completed Operations Additional Insured Endorsement** for the policy under section 4.3 (a) shall designate CITY, it's officers, officials, employees, agents, and volunteers as additional insureds for liability arising out of work or operations performed by or on behalf of the CONTRACTOR. CONTRACTOR shall provide to CITY proof of insurance and endorsement forms that conform to CITY's requirements, as approved by the CITY.

An Additional Insured Endorsement for the policy under section 4.3 (b) shall designate CITY, it's officers, officials, employees, agents, and volunteers as additional insureds for automobiles, owned, leased, hired, or borrowed by the CONTRACTOR. CONTRACTOR shall provide to CITY proof of insurance and endorsement forms that conform to CITY's requirements, as approved by the CITY.

For any claims related to this Agreement, CONTRACTOR's insurance coverage shall be primary insurance as respects CITY, it's officers, officials, employees, agents, and volunteers. Any insurance or self-insurance maintained by the CITY, it's officers, officials, employees, agents, and volunteers shall be excess of the CONTRACTOR's insurance and shall not contribute with it.

5. **Non-Liability of Officials and Employees of the CITY.** No official or employee of CITY shall be personally liable to CONTRACTOR in the event of any default or breach by CITY, or for any amount which may become due to CONTRACTOR.
6. **Non-Discrimination.** CONTRACTOR covenants there shall be no discrimination against any person or group due to race, color, creed, religion, sex, marital status, age, handicap, national origin, or ancestry, in any activity pursuant to this Agreement.
7. **Independent Contractor.** It is agreed to that CONTRACTOR shall act and be an independent contractor and not an agent or employee of the CITY, and shall obtain no rights to any benefits which accrue to CITY'S employees.
8. **Compliance with Law.** CONTRACTOR shall comply with all applicable laws, ordinances, codes, and regulations of the federal, state, and local government.

9. **Notices.** All notices shall be personally delivered or mailed to the below listed address, or to such other addresses as may be designated by written notice. These addresses shall be used for delivery of service of process.

- a. (Contractor)
G.I.E. Technologies, Inc.
150 Graveline Street
Montreal (Quebec) Canada H4T 1R7

- b. (Address of CITY) (with a copy to):
City of Garden Grove Garden Grove City Attorney
11222 Acacia Parkway 11222 Acacia Parkway
Garden Grove, CA 92840 Garden Grove, CA 92840

10. **CONTRACTOR'S PROPOSAL.** This Agreement shall include CONTRACTOR'S proposal or bid which shall be incorporated herein by reference. In the event of any inconsistency between the terms of the proposal and this Agreement, this Agreement shall govern.

11. **Licenses, Permits, and Fees.** At its sole expense, CONTRACTOR shall obtain a Garden Grove Business License, all permits, and licenses as may be required by this Agreement.

12. **Familiarity with Work.** By executing this Agreement, CONTRACTOR warrants that: (1) it has investigated the work to be performed; (2) it has investigated the site of the work and is aware of all conditions there; and (3) it understands the facilities, difficulties, and restrictions of the work under this Agreement. Should Contractor discover any latent or unknown conditions materially differing from those inherent in the work or as represented by CITY, it shall immediately inform CITY of this and shall not proceed, except at CONTRACTOR'S risk, until written instructions are received from CITY.

13. **Time of Essence.** Time is of the essence in the performance of this Agreement.

14. **Limitations Upon Subcontracting and Assignment.** The experience, knowledge, capability, and reputation of CONTRACTOR, its principals and employees were a substantial inducement for CITY to enter into this Agreement. CONTRACTOR shall not contract with any other entity to perform the services required without written approval of the CITY. This Agreement may not be assigned voluntarily or by operation of law, without the prior written approval of CITY. If CONTRACTOR is permitted to subcontract any part of this Agreement, CONTRACTOR shall be responsible to CITY for the acts and omissions of its subcontractor as it is for persons directly employed. Nothing contained in this Agreement shall create any contractual relationship between any subcontractor and CITY. All persons engaged in the work will be

considered employees of CONTRACTOR. CITY will deal directly with and will make all payments to CONTRACTOR.

15. **Authority to Execute.** The persons executing this Agreement on behalf of the parties warrant that they are duly authorized to execute this Agreement and that by executing this Agreement, the parties are formally bound.
16. **Indemnification.** CONTRACTOR agrees to protect, defend, and hold harmless CITY and its elective or appointive boards, officers, agents, and employees from any and all claims, liabilities, expenses, or damages of any nature, including attorneys' fees, for injury or death of any person, or damage to property, or interference with use of property, arising out of, or in any way connected with performance of the Agreement by CONTRACTOR, CONTRACTOR'S agents, officers, employees, subcontractors, or independent contractors hired by CONTRACTOR. The only exception to CONTRACTOR'S responsibility to protect, defend, and hold harmless CITY, is due to the sole negligence of CITY, or any of its elective or appointive boards, officers, agents, or employees.

This hold harmless agreement shall apply to all liability regardless of whether any insurance policies are applicable. The policy limits do not act as a limitation upon the amount of indemnification to be provided by CONTRACTOR.

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(Agreement Signature Block On Next Page)

IN WITNESS THEREOF, these parties have executed this Agreement on the day and year shown below.

Date: _____

**"CITY"
CITY OF GARDEN GROVE**

By: _____
City Manager

ATTESTED:

City Clerk

Date: _____

**"CONTRACTOR"
G.I.E. Technologies, Inc**

By: Charles Abikhzer

Name: CHARLES ABIKHZER

Title: PRESIDENT

Date: JANUARY 23RD, 2012

Tax ID No. No A.

Contractor's License: No A.

Expiration Date: No A.

If CONTRACTOR is a corporation, a Corporate Resolution and/or Corporate Seal is required. If a partnership; Statement of Partnership must be submitted to CITY.

APPROVED AS TO FORM:

[Signature]
Garden Grove City Attorney

1/30/12
Date

**2012-2016 ANNUAL PAVEMENT
MANAGEMENT SYSTEM UPDATE**

REQUEST FOR PROPOSAL

CITY OF GARDEN GROVE

DECEMBER 2011

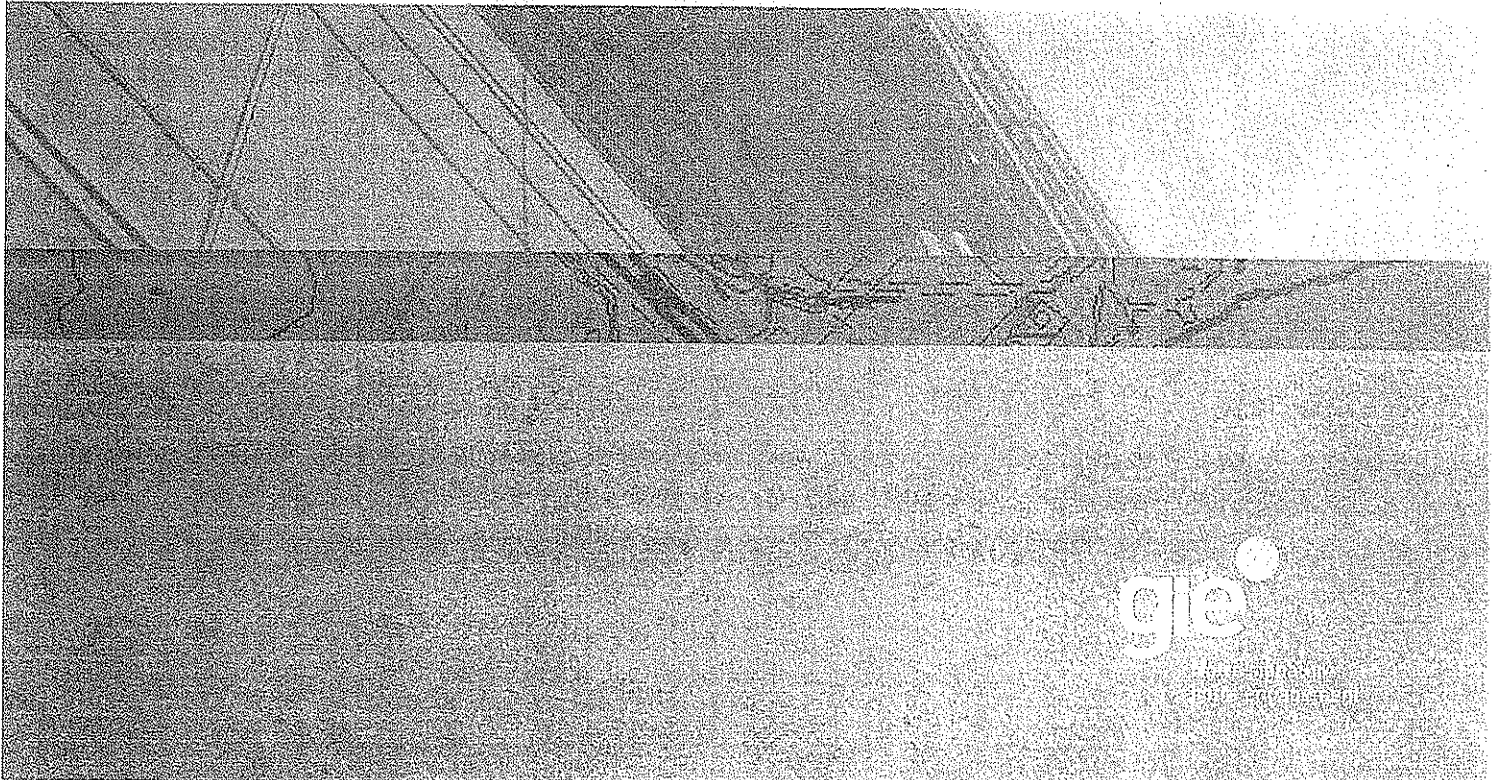


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1 COVER LETTER SIGNED BY AN AGENT AUTHORIZED TO BIND THE COMPANY

December 23, 2011

A. J. Holmon III
Environmental/Streets Manager
City of Garden Grove and
Garden Grove Sanitary District
(714) 741-5956, FAX (714) 741-5419

Re: 2012 -2106 PAVEMENT MANAGEMENT SYSTEM UPDATE FOR THE CITY OF GARDEN GROVE

In response to your need for services, GIE Technologies is pleased to express his interest to perform the engineering services requested for PAVEMENT CONDITION DATA COLLECTION and PAVEMENT MANAGEMENT SERVICES suitable for use by the City of Garden Grove Infrastructure Management Team.

With respect to the requested services, GIE Technologies is offering to the City of Garden Grove the following positive qualifications:

- Active presence with the City of Garden Grove providing successfully similar services since 1999.
- Availability of key personnel who offer specialized expertise in Pavement Data Collection and Pavement Management services which has been gained on numerous city, county, provincial and state wide assignments.
- A dedication to effective project management, quality control, and budgetary constraints.

Enclosed are one (1) original and two (2) copies of our proposal for your review and consideration. If you have any questions please communicate with the undersigned contact person.

Very truly yours,


Charles Abikhzer, P.E. President
G.I.E. Technologies inc.
60, St-Jacques West, 8th floor
Montreal (Quebec)
Canada H2Y 1L5
Tel.:(514) 284-6085, Fax.:(514) 284-5229
Web: www.gieinc.ca

2 EXECUTIVE SUMMARY

In conformance with the criteria stated in the Orange County Local Transportation Authority Ordinance No. 3 refer as the new Measure M program the City of Garden Grove needs to conduct the evaluation of its streets network in order to update it's Pavement Management System of streets and develop a seven-year plan for road maintenance and rehabilitation in concordance with the following measure M program eligibility requirements:

- The current status of road pavement conditions;
- A seven-year plan for road maintenance and rehabilitation (including projects and funding);
- The projected pavement condition resulting from the maintenance and rehabilitation plan; and
- Alternative strategies and costs necessary to improve road pavement conditions.

The renewed Measure M Program specifies that each local jurisdiction must adopt and update a Pavement Management Plan (PMP) every two years. To qualify for allocation of revenues generated from Measure M one of the eligibility requirement specifies that each local jurisdiction evaluates the pavement condition over 100% of the Arterial Street and Local Street Systems every two (2) and six (6) years respectively.

Therefore, pavement evaluation will be performed every two years. Yearly condition survey will consist of 100% of arterial roads and 33% (one third) of all other streets thus meeting the minimum areas coverage requirements. Condition evaluation will be performed using a state of the art data collection vehicle, analyzed and reported in accordance with the City of Garden Grove sectioning identification and referencing system in a format compatible with MicroPaver.

Following the yearly data analysis and pavement management system update, a seven-year plan for road maintenance and rehabilitation (including projects and funding) will be produced and with tables and figures to summarize the condition of the street system and recommended maintenance needs. The report will also include projected pavement condition resulting from the maintenance and rehabilitation plan and alternative strategies and costs necessary to improve road pavement conditions.

As requested by the City, a yearly MicroPaver database maintenance update service is presented in the offer. The service will allow the City to maintain their pavement management database with the most recent maintenance and rehabilitation work including new roads addition along with the Geographical Information System. Also, included in this offer upon request by the City is the cost for the GIE GeoViewer "Geographical Visualization Software" along with three-day MicroPaver and GeoViewer on-site training.

It is understood that the City requires accurate and objective infrastructure data collected, analyzed and reported through a proven Quality Assurance Plan that addresses budgeting, scheduling, accuracy, repeatability, calibration and maintenance alternatives throughout each of the project phases. In that regards, our project manager Mr. Marc Bergeron, P.E. will see that every task is properly prepared and closely monitored in accordance to a rigorous quality control plan to ensure that only the highest quality output will be provided. Doing so, Marc will provide the City with a progress report indicating the status of the data collection and processing effort.

3 FIRM PROFILE AND EXPERIENCE

The wide range of pavement evaluation and management mandates hitherto performed by GIE Technologies Inc. are indicative of its leadership in the Infrastructure Management consultant community. GIE Technologies Inc. has successfully completed hundreds of evaluation and management projects for roadways, highways, interchanges, bridges and airports including full scale design of maintenance and rehabilitation programs across the United States and Canada.

In addition to our professional Pavement Evaluation and Management services, GIE Technologies Inc. has a thorough R&D department, a full range of survey equipment, several data processing workstations and an experienced staff specialized in pavement evaluation and management.

Furthermore, GIE Technologies Inc. is part of the GIE Group, a leading corporate entity of over thirty employees. The main fields of activity of the GIE Group are:

- ⇒ Building Science
- ⇒ Environmental Engineering
- ⇒ Geotechnical and Materials Engineering
- ⇒ Pavement Evaluation and Management

Summary corporate profile of GIE Technologies is provided in Appendix IV. Recent projects that were realized by GIE Technologies similar in scope to this RFP are presented in Appendix I. Letters of reference of recent clients are presented in Appendix V:

4 KEY PERSONNEL

GIE Technologies Inc. has always adhered to the practice of effective and strong project management. Our policy is to make responsiveness, quality, scheduling, and budget management second to none in the engineering community. As such, GIE Technologies inc. will assign the following key staff members to this project.

MARC-ANDRE BERGERON, P.E. – Project Manager/ Database/GIS specialist (GIE)

LIVIU BURSANESCU, Ph.D. – Quality Assurance Manager/Hardware specialist (GIE)

MICHAEL ABIKHZER, P.E. - Data Collection Team Leader (GIE)

- o Smain Boulemkahel, Senior Technician - Data Collection Operator (GIE)

MIHAELA BURSANESCU, M.Sc. – Data Processing Team Leader (GIE)

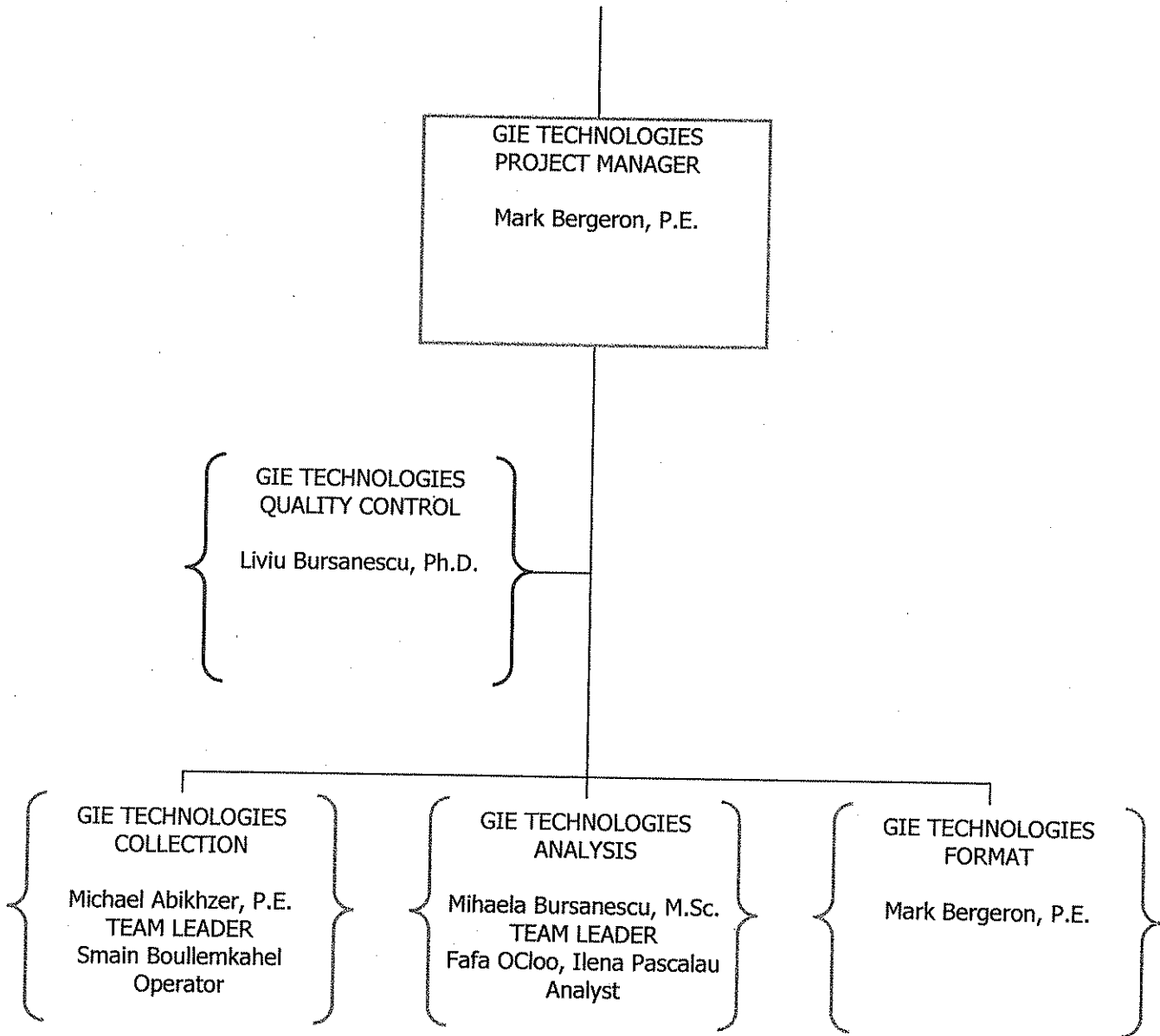
- o Ayawa Fadji Ocloo (GIE)
- o Ileana Pascalau (GIE)

The organization chart of our key personnel selected for this job, their duties and their affiliation is presented on the following page. A brief profile and task descriptions for each assigned personnel is attached in Appendix II.

ORGANIZATIONAL CHART

(City Garden Grove)

Project Manager



5 PROJECT METHODOLOGY

In accordance with the Countywide Pavement Management Program Guidelines GIE Technologies Inc. and the new Measure M Program eligibility requirements, pavement evaluation will be performed using a multifunction vehicle equipped with state-of-the-art pavement evaluation systems. Using this vehicle, the detailed pavement evaluation will be performed over 100% of every pavement section lengths identified by the City, which exceeds by far the minimum requirement of the ASTM-6433. The roads will be surveyed in accordance to the City of Garden Grove's approved survey convention. If not available, all sections, three-lane and less, will be surveyed a single pass in one direction while four-lane roads will be surveyed one pass in each direction. The 2012 to 2016 yearly pavement evaluation schedule is presented in Section 5 of this proposal.

The Pavement Evaluation Program and Pavement Maintenance and Rehabilitation Program will be undertaken in a systemic way, with two (2) main programs of five (5) phases each, namely:

- **PAVEMENT EVALUATION PROGRAM**
- **MAINTENANCE AND REHABILITATION PROGRAM**

Each project phase comprises a set of logical sub-phases. The logical sub-phases related to the Pavement Evaluation are:

- Phase 1.1 – Initialization Meeting
- Phase 1.2 – Network Segmentation, Project Start-up and Calibration
- Phase 1.3 – Data Collection
- Phase 1.4 – Data Analysis
- Phase 1.5 – Condition Index calculation, Format and Post Follow-Up

The logical sub-phases related to the Maintenance and Rehabilitation Program are:

- Phase 2.1 – Initialization Meeting
- Phase 2.2 – Database Development
- Phase 2.3 – Analysis Parameter Development
- Phase 2.4 – Strategy Generation and Optimization
- Phase 2.5 – Report and Deliverables

The following pages describe in details each of the above listed phases.

PAVEMENT EVALUATION PROGRAM

1.1 Initialization Meeting

The proposed project tasks will be reviewed to confirm compliance with the goals of the project. Outstanding questions identified in the proposed project approach will be resolved during this task. It is GIE's intent in this review to confirm the types of data that will be collected as part of the condition data survey and to verify itinerary and project schedule in place.

In this phase GIE will review the reference document especially map c/w GIS file. This exercise will allow GIE to prepare the survey database and establish the most efficient routing for the survey. This work done through always take in consideration the logical sequence of the segment collected and identify exception cases such as one way streets and multi-lane roads that may have to be surveyed in both direction in order to achieve representative inspection coverage.

Review will also include the existing inventory data (definitions attached to each attribute), distresses list, distresses protocol, survey conventions along with work hour bylaws, quality assurance plan (QAP) and the communication structure.

1.2 Project Start-Up & Calibration

Before the beginning of the survey, GIE will proceed with the equipment calibration. The video camera set-up for the pavement and front view perspectives are verified with the Client representative prior to proceed with the survey. Roughness, Rutting and, Cracking measurements are verified against calibrated reference sites in accordance to the Client quality control procedures (QCP) or if not available, in accordance to our own QCP's.

1.3 Data Collection

GIE will proceed with the data collection in accordance with the submitted and Client approved street network sectioning and mileage. GIE is planning to collect the condition data in fifteen (15) days (weather permitting). The unit is operated with one driver/operator. Prior to beginning, the staff receives the statement of the objective to achieve, the project documentation and related tools (history, reports, maps, charts, permits, etc.), the work schedule and the quality assurance procedures pertinent to their task.

Surface Distress, IRI, Rutting, Digital Images are recorded during a single pass using the survey unit. The data gathered during the survey is tagged with linear reference and spatial coordinates (GPS). The equipments used to capture the road roughness, wheel path ruts and the digital images (used to measure the pavement cracks) are

presented in Appendix III.

1.4 Data Analysis

Two (2) weeks after the beginning of the Data Collection Phase, GIE will proceed with the data analysis phase. Prior to begin the processing, the staff receives the statement of the objective to achieve, the project documentation and related tools, the work schedule, the quality assurance procedures and the training pertinent to their task. For this project all the data collected will be analyzed in accordance to the Client prevailing specifications. A minimum of 2 image analysts will be assigned to this task.

During the processing phase, high quality referenced (spatial and linear) high resolution pavement images collected every 32 feet are used to quantify distress data using a digital imaging interface designed to log distress and pavement attributes information identified on sequencing images. The software labeled "I-VIEW" has been designed to allow interpretation in accordance with various Distress Protocols. While Pavement distresses are logged from a Pavement View, Inventory Elements and other road attributes such as the bridges, lane width, road width, number of lanes, sidewalk, curb and gutter etc. are logged using a Right-of-Way View (broad view of the road inspected). The analysis software I-VIEW features are listed in Appendix X - Software Tools.

Please note that roughness and wheel path ruts are readily available in real time and therefore do not require any analysis time other than formatting work and QC verifications.

1.5 Condition Index Calculation

This phase accounts for the final verification performed on the preliminary results generated in phase 4. The entire sets of results are verified in accordance with our quality control plan on a sampling basis. Data verified includes image quality, distress rating, mile section beginning and mile section end etc. At this stage, distress data may still be rejected following a verification therefore calling for the re-analysis of a section or complete road. Once the analysis and verification are completed, the network sections with their attached pavement distresses are imported into GIE pavement management software "MicroPaver". Following the import, MicroPaver is used to calculate for every network section, the Pavement Condition Index (PCI).

MAINTENANCE AND REHABILITATION PROGRAM

In accordance with the Measure M Program Guidelines a seven-year plan for road maintenance and rehabilitation (including projects and funding) will be produced and include tables and figures to summarize the condition of the street system and recommended maintenance needs. The report will also include projected pavement condition resulting from the maintenance and rehabilitation plan; and alternative strategies and costs necessary to improve road pavement conditions.

The overall work plan is illustrated schematically in the diagram below. Each of the tasks comprising the major phases of the project is further described later in this section. The implementation approach that GIE utilizes will encourage participation from Client staff and thus results in a clearer understanding of the final report. This interactive approach will ensure a shared development and smooth implementation of the proposed plan.

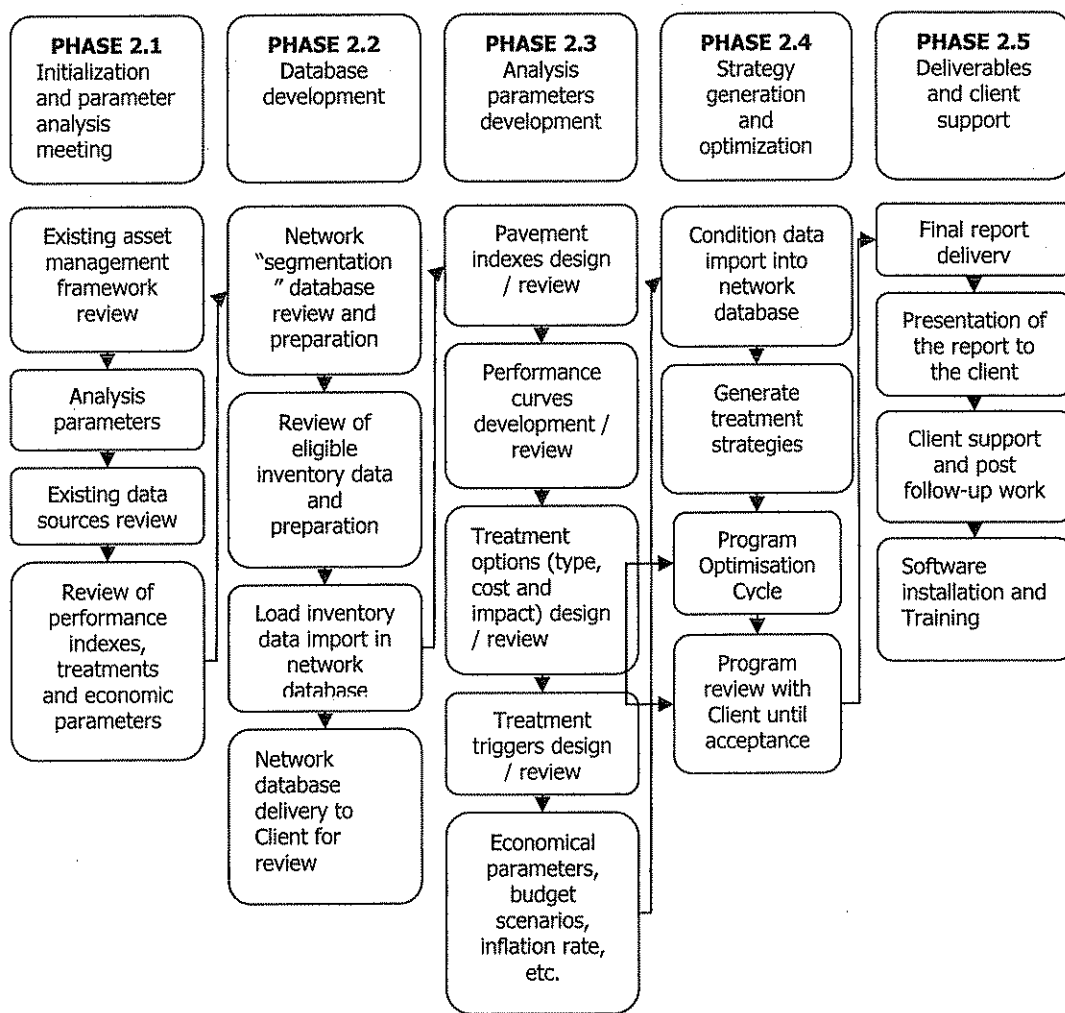


Figure 1: Maintenance and Rehabilitation Program Framework

The logical sub-phases related to the Maintenance and Rehabilitation Programs are:

2.1 Initialization

- Initialization and Data Source Review

This task allows work to begin on the structure of the MicroPaver database in Phase 2.1 and the development of the analysis parameters in Phase 2.3.

GIE would also likely discuss the format in which the final report is to be delivered. Existing data sources and availability will be reviewed in conjunction with Client staff to determine its relevance to the objectives of the project and its currency. GIE will also gather or review information on the client asset management framework in use (policies, rating method etc.). At this stage, the meeting may also involve GIS specialists to help define/reiterate the requirements for the Client GIS interface.

- Review Analysis Parameters

This part of the initialization phase will concentrate on the review of the analysis parameters that will be used in the asset management framework. From these initial underlying parameters, the complete management system can be mapped out and designed from the bottom up. The parameters that will be investigated will include pavement indices, pavement families, treatments alternatives, budgets scenarios and economic parameters.

Client staff will play an important role in the parameter development portion of the initialization meeting because the goal of the meeting is to define a set of parameters that will help GIE to satisfy the pavement management objectives of the Client.

2.2 Database Development

Based on discussions with the Client regarding the condition data and a review of the inventory data, the MicroPaver database will be configured and reviewed to accept all existing inventory data collected from the Client's Office. As an example, road width, shoulder width, type of pavement, construction year, work history, etc. is also populated or updated into the pavement network database. Once imported into MicroPaver, the network definition with all its attributes will be made available to the Client for review. The format of how the information will be delivered is flexible and can be discussed prior to delivery. This task allows GIE and the Client to resolve issues prior to upload (Phase 2.4) and seal the most current inventory information into MicroPaver.

2.3 Analysis Parameter Development

Work sessions will be held with the Client Engineer to determine the Client's treatment current practice of pavement treatment. During the work sessions GIE will identify the type of maintenance, rehabilitation, or replacement treatments required for each street segment and the estimated cost for performing alternative treatments. The sessions will also identify minor maintenance treatments such as recommending and costing the repair of individual pavement distresses, which are identified in the distress survey.

- Pavement Family and Performance Curve Development

In MicroPaver inventory items are organized into groups with anticipated similar behavior. Groupings, or families, can be based on any attribute including, but not limited to, pavement type, traffic loading, drainage condition or geographic location. These families accommodate the development of performance curves that are applicable to distinct sets of inventory items. Performance curves are mathematical models of the way in which the pavement condition indexes change with respect to some independent variable such as time.

Local opinion from the Client will be used to develop both pavement families and performance curves. The equations for performance curves are not hard coded into the PMS and can be reviewed and revised at any time.

- Establish Treatment Alternatives

The Client will be surveyed to determine the list of treatment alternatives that have historically been used and performed favorably. After discussion the list will be finalized and defined in MicroPaver with respect to applicability, cost and the impact the treatment has on the road inventory. This list of treatments is used by MicroPaver to generate multi year treatment strategies for each road elements. The treatments list is also a parameter in MicroPaver that can be changed by the user at any time.

- Economic Parameters

GIE will provide a set of priority and benefit/cost analyses listing for determining project order and timing. Method used for the analyses will be based on discussion held with the Client staff regarding needs, desires and policies for setting maintenance priorities. GIE will provide engineering discussion as it regards the priority listings if required. These discussions will analyze each of the options and make recommendations as to the best prioritization methodology to be used by the Client.

Also in this task GIE will likely hold work sessions with the Client staff to define the budget sources. GIE will gather the Client pavement treatments unit costs and enter them into MicroPaver. Economic parameters include the definition of Budget Scenarios, Budget Categories and Inflation Rate. Once defined, these parameters allow MicroPaver to apply economic judgment to the engineering based generated treatment alternatives.

2.4 Strategy Generation and Optimization

In this task the transformations that convert the condition data into condition indexes are run to give a snapshot of the condition of the roadway network. At this point, the PMS is sufficiently structured to be able to provide a snapshot of the current condition of the Client road network. GIE will use the MicroPaver GIS integrated Interface to perform a wide range of thematic displays (IRI, Rutting, Cracking etc.) in order to validate the consistency of the produced indexes.

- Generate Treatment Strategies

Following the analysis parameter defined in task 2.3 MicroPaver will take the calculated condition indexes, apply performance parameters to project the future condition of each road element and generate a list of feasible treatment strategies for each inventory section in the Client road network. This may include several treatment strategies for each inventory section in each year of the analysis period. Such strategies will identify maintenance and rehabilitation needs in simulating various PMS prioritization scenarios such as the most pessimistic funding scenario, expected funding scenarios, most optimistic funding scenario, unconstrained funding scenario and constant PCI scenarios.

When GIE completes this task, the results are reviewed in conjunction with the Client to determine the reliability of the analysis parameters used and the various budget scenarios produced and ultimately selecting the recommended program.

- Review Recommended Program

The recommended construction program will be reviewed with the Client staff against realistic conditions in the field. Findings may result in having to revisit some of the analysis parameters that were defined in the PMS to "debug" them. The strategy generation and optimization will be run again following any changes and the results reviewed again.. When GIE and the Client are satisfied that the parameters are generating realistic maintenance and rehabilitation recommendations, the verification of the analysis and parameters is complete and the system can be delivered to the Client.

2.5 Report, Training, Support and Deliverables

This task includes the final report, training, maintenance, technical support and software setup if selected. More specifically the task will supply and deliver the following deliverables:

Measure M Seven-Year Plan

The final report consists of a seven-year plan in concordance with the Measure M Program reporting guidelines (eligibility requirements presented below). In general the report verifies if funding allocations for the Client's road resurfacing programs are adequate to meet projected goals identified in our pavement management program and

makes recommendations for the Client's funding needs through its capital improvement program (CIP) budget

Renewed Measure M Program Eligibility Requirements Overview

On November 6, 1990, the voters in Orange County approved a ½-cent sales tax for transportation improvements known as Measure M. This sales tax includes funding for streets and roads that is available to local agencies through both a formula distribution and a competitive process. On November 6, 2006, voters approved a renewal of Measure M to continue the ½-cent sales tax for thirty years, beginning in 2011.

One of the eligibility requirements included in the Renewed Measure M specifies that each local jurisdiction must adopt and update a Pavement Management Plan (PMP) every two years. All agencies must use a common format as part of the countywide pavement management effort. The PMP must include:

- The current status of road pavement conditions;
- A seven-year plan for road maintenance and rehabilitation (including projects and funding);
- The projected pavement condition resulting from the maintenance and rehabilitation plan; and
- Alternative strategies and costs necessary to improve road pavement conditions.

In addition to the above requirements, a local match reduction of 10% of the eligible cost is available if the local jurisdiction either:

- Shows measurable improvement of paved road conditions during the previous reporting period defined as an overall weighted (by area) average system improvement of one Pavement Condition Index (PCI) point with no reduction in the overall weighted (by area) average PCI in the Master Plan of Arterial Highways (MPAH) or local street categories;
 - or -
- Have road pavement conditions during the previous reporting period within the highest 20% of the scale for road pavement conditions in conformance with OCTA Ordinance No. 3, defined as a PCI of 75 or higher.

Geographical Visualization Interface "Geo Viewer" and Geographical Information System Update

A finalized shape file will also be provided to the Client containing all collected pavement Data, Pavement Condition Rating, recommended maintenance activities, and cost information. The report will be submitted with a digital copy of the finalized GIS attributes database in a DBF format that reflects centerline breakpoints using the appropriate from

Beginning and End descriptions.

Included with the deliverable is a Geographical Visualization Interface. This software labeled "GIE GeoViewer" is tagging the sampled images to a GIS file (.shp) The Software is easily custom fit to the particular needs of each client. The Software is used to link the Road Data such as Roughness Condition Index (RCI), Pavement Condition Index (PCI) etc. to sampled images and network GIS cartography including a powerful query module allowing users to generate an infinite number of color theme and report.

MicroPaver and GeoViewer Training

GIE recommends three (3) days of specialized MicroPaver and GeoViewer on-site training. GIE will train Client staff to update, set-up parameters, and run reports on MicroPaver and the GeoViewer. Operation of the software and generation of the pavement management reports and recommendations will be a self sufficient activity within the Client after completion of this task.

This training also includes discussions of the engineering parameters selected on the project, including standards and criteria used for defining roads sections, traffic volumes, and how the parameters may be modified or enhanced in the future to meet changing conditions. Training also involves discussion regarding the results developed and presented by GIE in the final report. Client personnel will trained so that they understand the basis upon which the recommendation were made and how MicroPaver functionalities were used to produce recommendations for road maintenance and rehabilitation priorities.

The Training syllabus is available upon request.

Technical Support and Yearly PMS Maintenance and Rehabilitation Update Service

As requested by the City, a yearly MicroPaver maintenance update fee is also provided in this offer. This service will allow the City to maintain its pavement management database with the most recent maintenance and rehabilitation works including new road addition along with the Geographical Information System update and the MicroPaver road areas adjustment consisting of harmonizing the new MicroPaver GIS compatible pavement database and the old MicroPaver pavement database.

6 PROJECT SCHEDULE

The yearly evaluation project (2012, 2014, and 2016) will be completed within a maximum of twelve (12) weeks. Yearly pavement condition evaluation includes the yearly 100% of the Arterial Street and one third (33%) of the Local Street Systems thus meeting one of the renewed Measure M Program eligibility requirements, that is, to inspect 100% of the Arterial and local Street System every two (2) and six (6) years respectively.

Phase / Week	1	2	3	4	5	6	7	8	10	11	12
Phase 1.1 – Project Initialization	X										
Phase 1.2 – Start-up and Calibration		X									
Phase 1.3 – Data Collection		X	X	X	X						
Phase 1.4 – Data Analysis			X	X	X	X	X				
Phase 1.5 – Format and post follow-up							X	X			
Phase 2.1 – Initialization	X	X									
Phase 2.2 – Database Development			X	X							
Phase 2.3 – Analysis Parameter					X	X	X				
Phase 2.4 – Strategy Generation and Optimization								X	X		
Phase 2.5 – Report,, Training, Support,, Maintenance and Deliverables										X	X

Yearly Pavement Evaluation Program

Phase 1.1 – Initialization; **Phase 1.2** – Project Start-up and Calibration; **Phase 1.3** – Data Collection; **Phase 1.4** – Data Processing/Data Reduction; **Phase 1.5** – Data format and post follow-up

Yearly Pavement Maintenance and Rehabilitation Plan

Phase 2.1 – Initialization (Review of Data Sources, Review Analysis Parameters); **Phase 2.2** – Database Development (Review of Inventory Data, Structure of PMS Database, Load Inventory Data, Deliver Network Database for Review); **Phase 2.3** – Analysis Parameter Development (Establish PMS Indexes, Pavement Family and Performance Curve Development, Treatment Triggers, Budget and Economic Parameters); **Phase 2.4** – Strategy Generation and Optimization (Load Network Condition Data, Generate Treatment Strategies, Optimization, Review Recommended Program); **Phase 2.5** – Report, Training, Maintenance, Support and Deliverables.

7 EQUIPMENT RESOURCES

The data collection survey unit uses on board computers, multi purpose laser cameras system, high resolution digital imaging, system and GPS/Inertial Platform to capture and analyze key road infrastructure information. The combination of lasers, digital imaging and geo spatial technologies constitutes the core of the Multifunction Unit and provides multiple feature extraction of road information at highway speed. Road surface data are recorded and synchronized with the GPS generated by the distance measurement Instrument c/w precision 0.05% and the Differential Global Positioning System c/w a precision +/- 1 meter. Up to three cameras provide a wide variety of geo-referenced road view configuration.

All systems are controlled via a data collection interface allowing the operator to perform the survey directly from a client network database. For each section surveyed, the interface via the operator input stored the reference localization information such as the beginning Linear Reference Point (LRP), ending LRP, the beginning GPS, ending GPS and other descriptive client information's. Automated raw data collected are processed using proprietary analysis software. All the features extracted are reported with their spatial location: linear positioning and/or GPS positioning.

More specifically, the unit is equipped with the following data collection systems. Not all of the data collection systems presented below will be used for the scope of this project:

- Longitudinal Profile Measurement System (Roughness, Faulting)
- Transversal Profile Measurement System (Rutting)
- Digital Imaging System (Surfaces distresses)
- Macro-texture Measurement System
- Geometrics Measurement System (Grade, Crossfall)
- Global Positioning System (GPS) Distance Measurement System (DMI)

And the following analysis and viewing software:

- Image Interpretation Software (IVIEW)
- Geographical Visualization Software (GEO VIEWER)

Detailed specifications of equipments and software are presented in Appendix III.

8 PRICE

Cost items presented below are in concordance with the present proposal listed services and deliverables and include the price to evaluate the existing condition of the City of Garden Grove streets network, the yearly pavement management inventory update, to generate a seven-year plan for road maintenance and rehabilitation (including projects and funding) in concordance with the Measure M eligibility requirements, the software requirement and the training. Overall five (5) year term project cost and breakdown per task and per year are presented below:

2012-2016 ANNUAL PAVEMENT MANAGEMENT SYSTEM UPDATE\$ 291,189.49 \$

COST BREAKDOWN

Year	ITEM 1: Survey & Analysis & MicroPaver Update Arterial 100% and Residential 33% every 2 year		ITEM 2: Yearly PMS Maintenance Fee	ITEM 3: Biennial Measure M Reports	ITEM 4: GeoViewer Software	ITEM 5: Training MicroPaver and Geo Viewer (add \$1,000 on site)	Total
	Cost	Unit price					
2012	\$77,911.68	\$381.92	\$11,000.00	\$2,500.00	\$9,500.00	\$3,000.00	\$104,293.60
2013	\$0.00	\$0.00	\$1,500.00	\$0.00	\$0.00		\$1,500.00
2014	\$84,144.61	\$420.72	\$1,500.00	\$2,500.00	\$0.00		\$88,565.33
2015	\$0.00	\$0.00	\$1,500.00	\$0.00	\$0.00		\$1,500.00
2016	\$90,876.18	\$454.38	\$1,500.00	\$2,500.00	\$0.00		\$95,330.56
Total	\$252,932.47	\$1,257.02	\$17,000.00	\$7,500.00	\$9,500.00	\$3,000.00	\$291,189.49

- ITEM 1 (2012, 2014, 2016): Survey & Analysis & MicroPaver Update over Arterial Streets (100%) and Local Streets (33%). Refer to Phase 1.1 through 2.4 for the detailed methodology.
- ITEM 2 (2012 through 2016): Yearly PMS Maintenance Fee with Additional \$9,500.00 in the first year for the MicroPaver Road Areas Adjustment work. Refer to Phase 2.5 for the details.
- ITEM 3 (2012, 2014, 2016): Biennial Measure M Reports. Refer to Phase 2.5 for the detailed methodology.
- ITEM 4 (2012): GeoViewer Software (Unlimited License). Refer to Phase 2.5 for the specific details.
- ITEM 5 (2012): Training MicroPaver and Geo Viewer (add \$1,000 for on site training). Refer to Phase 2.5 for the detailed methodology.

Price based on yearly survey mileage not to exceed 140 centerline-miles. Should the yearly mileage be significantly higher than 140, additional surveyed lane-mile will be charged at the yearly indicated unit price.

9 QUALITY ASSURANCE

GIE Technologies Inc. is committed to provide high quality services.



**ISO 9001:2000
FS 64475**

The company, which is certified ISO 9001-2000 has developed a comprehensive Quality Assurance Plan to control all aspects of the data collection, data processing and reporting stages of comparable projects. The detailed quality assurance plan could be provided upon request.

APPENDIX I

PROJECT REALIZATIONS

The following are six (6) recent projects that were accomplished by GIE Technologies similar in scope to this RFP. Additional realizations are available upon request.

1. Client Name: City of Garden Grove, California

Client Address: City of Garden Grove and Garden Grove Sanitary District

Contact: A. J. Holmon III, (714) 741-5956

Period of performance: 1999-2011

Brief Description: Averaging 400 centerline-miles. Pavement and Inventory Data Collection, Data Processing and Data Import into City Pavement Management Software (MicroPaver)

Data items:

- Roughness (IRI), Rutting, Cracking in accordance to City Standard Practice for Roads Pavement Condition Index Surveys
- Paser Index, PCI (ASTM 6433) Index Calculation
- 2 years MicroPaver GASB34 Compliant Maintenance and Rehabilitation Plan
- Years Condition Index Analysis
- Pavement View and Right of Way Imaging
- Network and project level report
- GIS link through GIE GEOVIEWER and MicroPaver

2. Client Name: City of Montreal, Quebec, Canada

Client Address: 999 Louvain Est. Montreal, Quebec. H2M 1B3

Contact: France Bernard, P.Eng.- (514) 872-3990

Period of performance: 2009 - 2011

Brief Description: 7000 lane-kilometers. Pavement Data Collection, Data Processing and Data Import into the City Pavement Management Software.

Data items:

- Roughness (IRI), Rutting, Cracking in accordance to City Standard Practice for Roads Pavement Condition Index Surveys
- Paser Index, MicroPAVER PCI (ASTM 6433) Index Calculation
- Pavement View and Right of Way Imaging
- Network and project level report
- GIS link through GIE Viewing Software

3. Client Name: City of Sudbury, Ontario, Canada

Client Address: 200 Brady Street, 1st Floor, Tom Davies Square, Sudbury ON, P3E 5K3

Contact: William Soderman - (705) 674-4455, 4252

Period of performance: 2007-2010

Brief Description: 1600 lane-kilometers. Pavement and Inventory Data Collection, Data Processing and Data Import into City Pavement Management Software (Hansen)

Data items:

- Roughness (IRI), Rutting, Cracking in accordance to City Standard Practice for Roads Pavement Condition Index Surveys
- Paser Index, MicroPAVER PCI (ASTM 6433) Index Calculation
- Pavement View and Right of Way Imaging
- Network and project level report
- GIS link through GIE Viewing Software

4. Client Name: City of Gatineau, Quebec, Canada

Client Address: 100 rue d'Edmonton, Quebec, Canada

Contact: François Larose – (819) 243-2345, 7392

Period of performance: 2007-2011

Brief Description: 1600 lane kilometers. Pavement and Inventory Data Collection, Data Processing and Data Import into City Asset Management Software

Bi-annual PMS Service Maintenance

Brief Description: MicroPaver Implementation/ GIS Dynamic Segmentation Creation

Data items:

- Roughness (IRI), Rutting, Cracking in accordance to City Standard Practice for Roads Pavement Condition Index Surveys
- Curb and Gutter Condition Assessment
- Inventory Assessment: Road width, Lane width, lane number, bridge, railroad, pavement type etc.
- Paser Index, PCI (ASTM 6433) Index Calculation
- Pavement View and Right of Way Imaging
- GIS link through GIE Viewing Software and through MicroPaver GIS
- Pavement Rehabilitation Program
- Complete Inventory Data Update
- Past Work Update including harmonization of City work codes
- Pavement Maintenance and Rehabilitation Plan Update
- MicroPaver Implementation and Training

Contract Include a multi-years MicroPaver Service Contract. GIE has been contracted to maintained the City Pavement Management Software

5. Client Name: City of Ottawa, Ontario, Canada

Client Address: 100 Constellation Cres., Ottawa, ON K2G 6J8

Contact: Steve Goodman – (613) 580-2424, 28583

Period of performance: 2004-2007

Brief Description: 1000 lane-kilometers/Year. Pavement and Inventory Data Collection, Data Processing and Data Import into City Pavement Management Software

Data items:

- Roughness (IRI), Rutting, Cracking in accordance to City Standard Practice for Roads Pavement Condition Index Surveys
- Paser Index, MicroPAVER PCI (ASTM 6433) Index Calculation
- Pavement View and Right of Way Imaging
- Network and project level report
- GIE GIS Viewing Software
- Pavement Rehabilitation Program
- Stantec PMA Import Format Creation

6. Client Name: City of Mississauga, Ontario, Canada

Client Address: 3484 Semenyk Court, Mississauga, ON L5A 4C5

Contact: Jasbir Madpuri – (905) 615-3200 ext. 3016

Period of performance: 2004-2006

Brief Description: 2600 lane kilometers. Pavement and Inventory Data Collection, Data Processing and Data Import into City Pavement Management Software (Hansen)

Data items:

- Roughness (IRI), Rutting, Cracking in accordance to City Standard Practice for Roads Pavement Condition Index Surveys
- FWD Deflection Testing
- Paser Index, MicroPAVER PCI (ASTM 6433) Index Calculation
- Pavement View and Right of Way Imaging
- Network and project level report
- GIS link through GIE Viewing Software
- Pavement Rehabilitation Program
- Hansen Format Creation

APPENDIX II

BRIEF DESCRIPTION OF KEY PERSONNEL

MARC-ANDRE BERGERON, P.Eng. – Senior Project Manager/ Micro Paver and Database/GIS Specialist in Road Infrastructures Project Management, Data Collection/Analysis and Pavement Management.

Having more than 15 years experience in Roads Engineering, Mr. Bergeron joined the GIE staff in 1997. Since then Mr. Bergeron was in charge of over 50 projects. He has extensive experience with field data collection; pavement standards distress manuals (ASSHTO, ASTM, FHWA, etc), data interpretation, GIS System Integration and pavement management system implementation. His exposure to a wide variety of pavement management systems and software, his administrative, budgeting and project planning skills, makes Mr. Bergeron the excellent leader this project needs for its successful completion.

In addition to his project management tasks Mr. Bergeron will be responsible: to import the inspection data into the City's paved road inventory database; all the work leading to the production of the format deliverables; viewing software requirements and training.

Communication Plan

Mr. Bergeron will also submit on a weekly basis progress report. The report will indicate: the survey progress status, analysis progress status and be used as needed to identify any non-conformity identified during the realization of each phases of the project. Mr. Bergeron will be available at any time during the realization of the mandate. Telephone, fax and email will be used to communicate. Every question by the client will be addressed promptly.

LVIU BURSANESCU, Ph.D. – Quality Assurance Manager / Hardware and Software Specialist

Mr. Bursanescu cumulates more than 24 years experience in research and Development of Optoelectronic Systems and particularly 10 years in systems development of automated pavement and data collection systems for the measuring of roughness, rutting, cracking and faulting. He is also a specialist in pavement and right of way imaging technologies and an expert in data localization using state of the art GPS technologies,

Mr. Bursanescu has also more than 10 years experience in the developing/enforcing of quality control procedures on Pavement Data Collection and Data Processing projects. He is familiar with all the control stages that data passes through such as collection, processing, interpretation, classification, index calculation etc. He has been responsible to enforce quality control procedures on over 30 service contracts since 1996. His expertise represents a valuable asset in providing road information data that satisfy or even surpass client expectations.

MICHAEL ABIKHZER, P.E., - Data Collection Team Leader

With a bachelor degree in civil engineering Mr. Abikhzer is with GIE since 1999. He is an experienced data collection resource. Mr. Abikhzer is familiar with all stages that data passes through as collection, processing, equipments calibrating etc. and cumulates more than 50,000 lane-kilometers of survey/analysis experience over several pavement condition evaluation projects across Canada and the United States. M. Abikhzer undergoes regular training session in pavement distress rating and cumulates well over 5 years experience in field survey.

Mr. Abikhzer will be responsible for the field collection phase. Mr. Abikhzer will also be responsible: of enforcing the quality control procedures associated to the collection phase; of the weekly delivery of right of way, raw data for rutting, IRI, faulting and GPS data including all data collection calibration test results (DMI, Rutting, Roughness, Faulting, Video foot print etc.)

SMAIN BOULEMKAHEL, - Senior Survey Operator

Mr. Boulemkahel is with GIE Technologies since 2089. Mr. Boulemkahel Morse is a field technician. He is responsible for FWD/HWD testing as well as Road Surface Profiling projects nationwide. Since with GIE Technologies Mr. Boulemkahel has realized more than 10,000 lane-miles of pavement inspection.

Mr. Boulemkahel will be reporting to Mr. Abikhzer during the data collection phase of the project using weekly progress report. The report will indicate: the survey progress status, analysis progress status and be used as needed to identify any non-conformity identified during the realization of each phases of the project. Mr. Morse will be available at any time during the realization of the mandate. Telephone, cell, fax and email will be used to communicate. The field crew will be equipped with a cell phone and email capability to forward the progress status report on a weekly basis.

MIHAELA BURSANESCU, M.Sc. – Data Processing Team Leader

M. Bursanescu cumulates more than 10 years of experience in on Pavement Data Collection and Data Processing projects. She is familiar with several data analysis protocols and is an experienced digital imaging interpreter and RSP Data Analyst. She has been responsible to enforce quality control procedures on over 50 service contracts since 1996. She is also an experienced data processing resource having participated to over 30 projects where she had to realize Roughness, Rutting and Cracking analysis using several techniques including digital imaging analysis and according to a variety of pavement protocols.

Miss. Bursanescu will be primarily responsible to supervise the procedures and techniques used to analyze each data elements. She will also be responsible of providing the training to the image analysts at the specified level of detail as set forth in the City Protocols.

Two Image Analysts will be used for this mandate. Each of them cumulates a minimum of three years experience in surface distress evaluation and a minimum of 12,000 lane-miles of image interpretation. Miss. Bursanescu will be enforcing the quality control procedures associated to the work performed by her team and report on a weekly basis to the project manager the progress realized as well as non-conformity identified.

NB: All key staff will be assigned full time to this project.

APPENDIX III

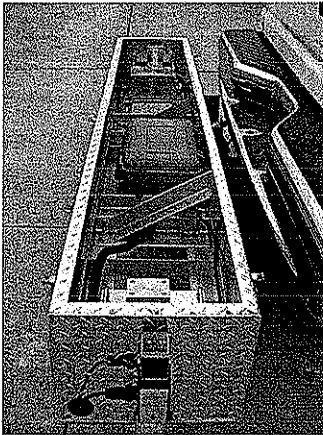
EQUIPMENTS AND SOFTWARES

HSP - HIGH SPEED PROFILER KIT

The AMES Engineering HSP Model 8200 is designed as a portable system that can be used on multiple vehicles. The system can be front or rear mounted and can easily install onto any vehicle using the vehicle's standard 2" receiver hitch. A rugged Panasonic Toughbook CF-30 laptop mounts inside the cab to control all of the profiler system functions. The Ames High Speed Profiler meets or exceeds the following requirements: ASTM E950 Class 1 profiler specifications, AASHTO PP 51-02 and Texas test method TEX 1001-S.

BENEFITS

- Calculates Profile Index (PI), International Roughness Index (IRI), Half-car Roughness Index (HRI), Ride Quality Index (RQI), and Ride Number (RN)
- Display profile in real time while data is being collected



KEY FEATURES

- High Speed system can be on front or rear mount using the vehicles standard 2" hitch receiver
- Ruggedized laptop mounted in cab of vehicle with test personnel
- Single or dual wheel track systems
- Frame is adjustable to accommodate different vehicles

SYSTEM SPECIFICATIONS

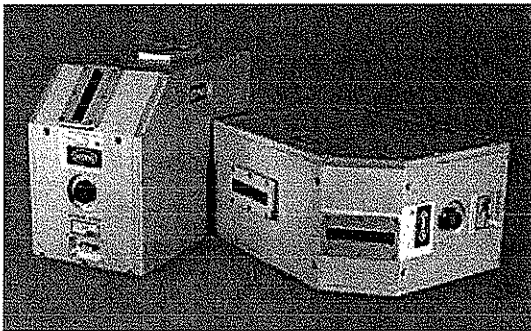
- Capable of collecting measurements at speeds between 25 and 60 mph
- Laser height sensor with a range of eight inches and a resolution of 0.002 inch
- Horizontal distance measured with an optical encoder that has a resolution of 0.15 inches
- Pavement elevation sampling: 16,000 samples per second
- Pavement elevation sample storage: software selectable 1-16 samples/foot
- Profile wavelength range: 0.5 to 760 feet
- Accelerometer resolution: 0.0001g



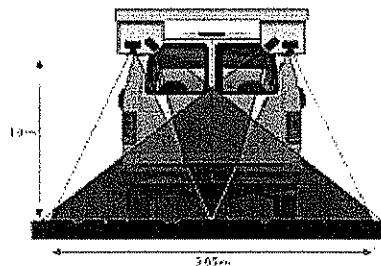
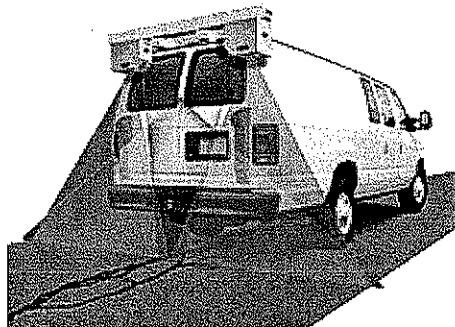
LRIS - LASER ROAD IMAGING SYSTEM

INO's laser road imaging system is composed of two high resolution linescan cameras and lasers that are configured to image 4m transverse road sections with 1 mm resolution at speeds that can reach 100 km/h. This patented imaging system was designed to increase the contrast and visibility of both small longitudinal and lateral road cracks. Using high power laser line projectors and special collection optics, the LRIS system can operate in full daylight because it is immune to variations in outside lighting conditions and shadows cast by roadside objects, viaducts and the inspection vehicle itself. The system configuration offers several advantages as compared to more traditional imaging techniques. The most important feature of the system is that increases the visibility of even the smallest cracks by using the incident illumination angle of the laser to cause the cracks to project shadows.

KEY FEATURES



- 1 mm imaging resolution at 100 km/h
- Day or night operation
- Immune to shadows
- Crack image contrast enhancement
- Low power consumption
- Compact system



SYSTEM SPECIFICATIONS

- Image size: 4096 pixels/line
- 28000 lines/s
- Image width: 4 m (3950 mm nominal)
- Laser class: 3B
- Power: 250W
- Sensor size (approx.): 300 mm(H) x 375 mm(L) x 200 mm(D)
- Sensor weight (approx.): 20 kg

LRMS - LASER RUT MEASUREMENT SYSTEM

INO's laser rut measurement system is a transverse profiling device that detects and characterizes pavement rutting. The LRMS acquires full 4-meter width profiles of a highway lane at normal traffic speeds, with optional maximum sampling rate of 30 or 150 Hz. The system uses two laser profilers that digitize transverse sections of the pavement. Custom optics and high-power pulsed laser line projectors allow the system to operate in full daylight or in nighttime conditions. In order to keep a constant longitudinal sampling, the vehicle's odometer is continually monitored. Road transverse profile data is collected and processed in real time on board the vehicle. Rut extraction algorithms have been developed to automatically measure rut depth and width.

BENEFITS

- Immediate and precise detection and characterization of rutting conditions
- Optimization of road maintenance funds
- Improvement of safety due to better road pavement maintenance

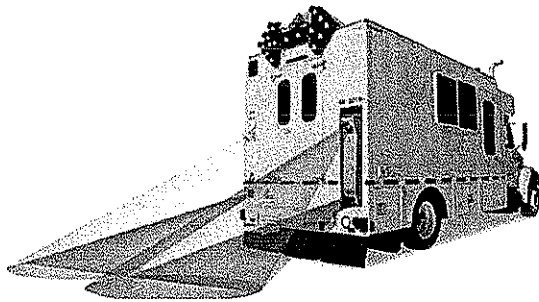
KEY FEATURES



- Real-time data acquisition and processing on board the inspection vehicle
- Operation in normal daylight or nighttime conditions
- Short integration times for minimal image blur at maximum inspection speeds
- Inspection speeds up to 100 km/h

SYSTEM SPECIFICATIONS

- Number of laser profiles: 2
- Sampling rate: 30 or 150 profiles/s
- Vehicle speed: 0 to 100 km/h
- Profile spacing: adjustable
- Transversal (width) resolution: 1280 points/profile (max)
- Transversal field-of-view: 4 m
- Depth range of operation: 500 mm (30 Hz) or 450 mm (150 Hz)
- Depth accuracy: ± 1 mm
- Transversal (width) accuracy: ± 3 mm
- Laser profiler weight (approx.): 12 kg
- Power consumption (max): 150 W at 120/240 VAC
- Laser profiler dimensions (approx.): 108 mm (W) x 692 mm (H) x 220 mm (D)

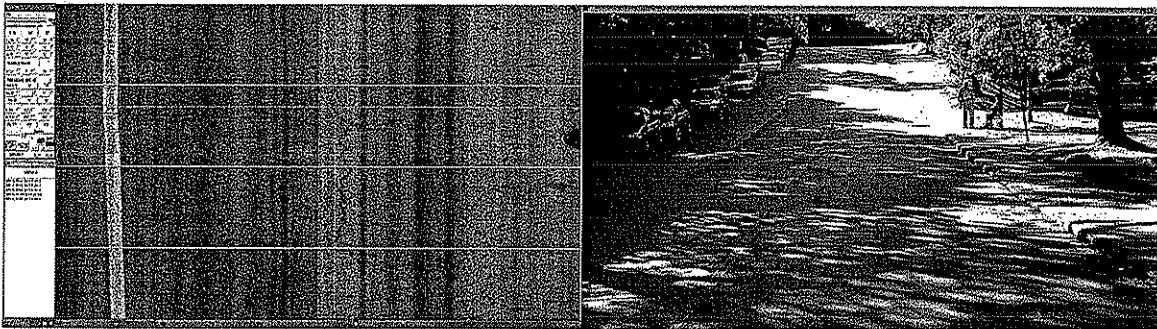


IVIEW – IMAGE INTERPRETATION SOFTWARE

GIE's IVIEW software is an analysis tool for pavement cracking and inventory elements that uses high resolution digital images. It provides precise three-dimensional reference as well as parallel use of multiple image views including « line scan » images. The geo-referenced data positioning on a digital map allows assigning in a single step data to each client address and generate the cracking pattern from the analyzed images. The geographic data positioning to client address allows avoiding errors generally associated with linear positioning. This development allows assigning the images associates with a predefined segment during the analysis stage no matter in witch order the data was collected. Creation of geo-referenced cracking patterns from sequentially images of 2.5m each ease quality control efforts and allows precise validation of the identified element (classification, extent, position) as well as its geographic positioning.

BENEFITS

- The precision of details allows producing maintenance and rehabilitation programs at project level i.e. de precise identification of required interventions, required quantities and associated budgets for road repair.



KEY FEATURES

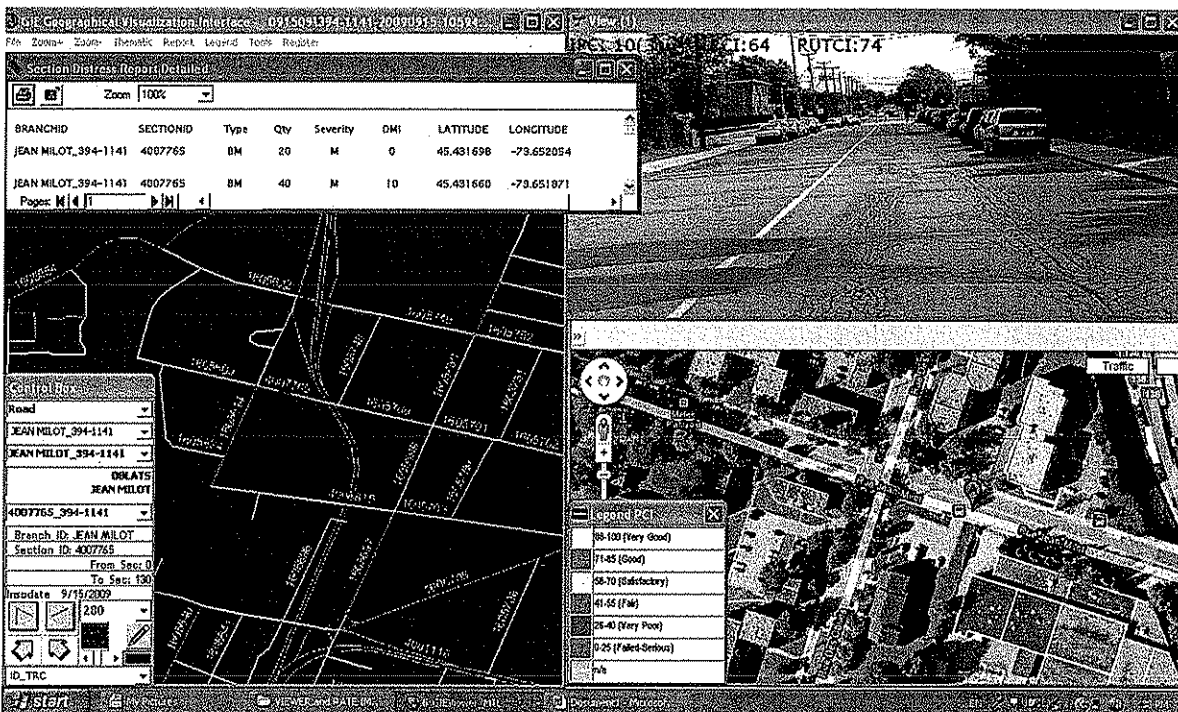
- Modules :
 1. Pavement Surface Evaluation (Asphalt Surface and Concrete Pavement - Type, Extent, Severity);
 2. Sidewalk Surface Evaluation (Type, Extent, Severity);
 3. Inventory Elements.
- Object Oriented Programming adapted to different image capture technologies for pavement and road inventory allowing classification and quantities measurement from the cracking pattern drawn on the analyzed image.
- Object Oriented Programming adapted to different digital map formats such as ArcView de ESRI (fichier .shp) and Google Map.

GeoVIEWER - GEOGRAPHICAL VISUALIZATION SOFTWARE

GIE's GeoVIEWER software is tagging the sampled images to a GIS file (.shp) The Software is easily custom fit to the particular needs of each client. The Software is used to link the Road Data such as Roughness Condition Index (RCI), Pavement Condition Index (PCI), M&R Plan etc. to sampled images and network GIS cartography. Include a powerful query module allowing users to generate an infinite number of color theme and report. Offer the possibility to tag to any GIS segment and milepost unlimited number of documents (doc, pdf, txt, html, eml, etc.), pictures (jpeg, tiff, bmp, gif etc.) drawing (dwg, dxf, dgn, etc.), Video (avi, mpeg etc.).

BENEFITS

- Instant data access
- Precise data positioning



KEY FEATURES

- Allows performing various data queries for thematic graphical display;
- Multi layers and multi windows interface;
- Includes standard MS Windows and GIS functionality's such as: (Open File, Save, Save As, Zoom In and Zoom Out, Select, Copy, Cut, Search, Print Report, etc.);
- Allows visualizing images in Still Mode or Playback Mode;
- Sizable window design; Direct link of GIS referencing ID to Client Database Images; Direct link to Google Street Map Application.



gie[®]



Pavement Evaluation
and Management

THE RESULT : THE RIGHT INTERVENTION, AT THE RIGHT PLACE, AT THE RIGHT TIME!

The continuous maintenance and rehabilitation processes of infrastructure transport systems consume a significant share of public administration budgetary funds. For this reason, any delays in interventions or repairs solely based on immediate need rather than long-term planning, will lead to an inefficient use of available funds since that approach does not allow the administrators to evaluate the cost effectiveness of alternative repair strategies.

Consequently, GIE not only evaluates the current pavement condition, but also predicts future behaviour. In predicting the rate of deterioration, life-cycle cost analysis is performed in order to determine the most effective maintenance and rehabilitation alternative aiming at maintaining or increasing the assets service life.

Our approach is based on a proactive partnership with agencies designed to determine their objectives through a sound engineering decision process establishing policies, priorities, schedules and budgets thus defining the development and implementation of an effective and sustainable pavement management solution.

Once completed, the process provides our clients with a custom tailored GIS (Geographical Information System) solution allowing the production of a wide variety of thematic representation and of detailed reports such as:

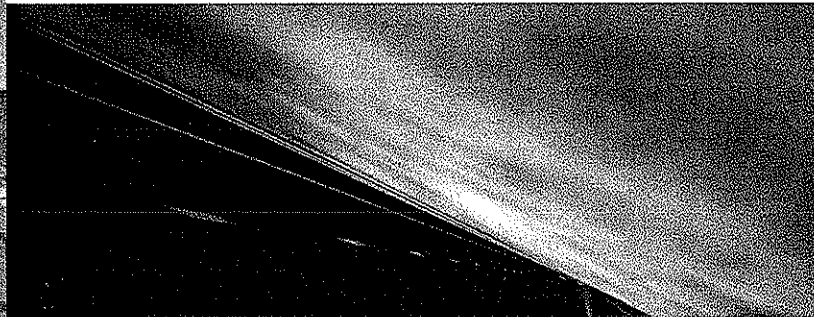
- › Network Condition Report
- › Maintenance and Rehabilitation Plan
- › Multi-Year Budget Plan

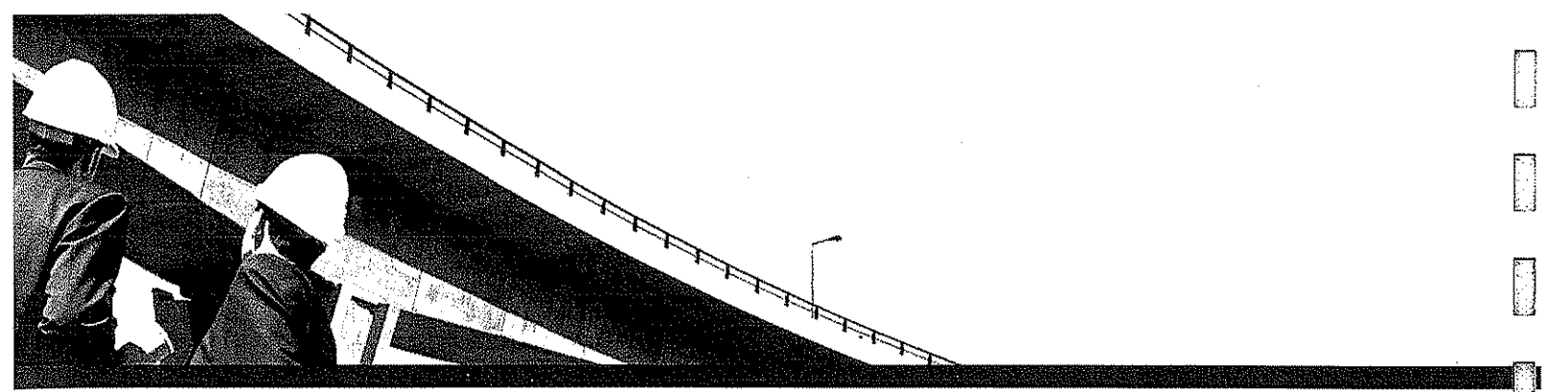
GIE Group is certified ISO 9001-2008.

GIE Group is comprised of four core operating divisions:



Building Science
Environmental Engineering
Geotechnical and Materials Engineering
Pavement Evaluation and Management





The Pavement Evaluation and Management Division strives to make you benefit from its know-how.

OUR MISSION : TO PROVIDE TURNKEY SOLUTIONS IN ROAD INFRASTRUCTURE CONDITION EVALUATION AND PAVEMENT MANAGEMENT

Our approach provides reliable condition assessment in order to prioritize your needs and establish technically justified and cost effective maintenance and rehabilitation programs. Our services are offered to the managers of the following infrastructures:

- › Roads and Streets
- › Airports
- › Large Parking Lots

GIE has successfully completed several small, medium and large-scale projects throughout the United States and Canada. Since 1996, GIE has provided agencies such as DOT's, Counties, Cities and Towns, with timely and cost effective solutions adapted to their needs and budgets.

THE KEY : THE USE OF NON DESTRUCTIVE CUTTING EDGE PAVEMENT EVALUATION TECHNOLOGIES

The following pavement condition indicators can be provided in sync with high precision linear and spatial references and in accordance with North America's most recognized standards:

- › International Roughness Index (IRI)
- › Rutting
- › Surface Distress
- › Geometrics (gradient, crossfall and curvature)
- › Inventory Elements (road signs, pavement markings, curbs & gutters, sidewalks, road width, etc.)
- › Macrotexture
- › Deflection
- › Skid Resistance
- › Thickness of Surface and Subsurface Layers
- › Bridge Deck Condition Assessment



APPENDIX IV

SUMMARY CORPORATE PROFILE

APPENDIX V

REFERENCE LETTER

Direction des travaux publics
7171, rue Bombardier
Anjou (Québec) H1J 2E9

February 2, 2010

Dear Madam or Sir

RE : GIE Technologies, Inc. – Pavement Evaluation and Management Services

The engineering firm of GIE technologies, Inc. was commissioned twice, that is, in 2003 and 2007, in order to carry out the assessment of Anjou Borough's street network in order to collect data on the pavement's distresses and to analyse and to interpret the data, leading to the evaluation per se of the pavement condition and to the design of a Pavement Management Program.

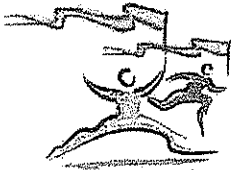
We were much impressed by the expertise and professionalism which were shown by the members of GIE'S Project Team. In the course of the project, no effort was spared in using state of the art technologies for inspecting, measuring and assessing the pavement condition.

The mandate was carried out in a very satisfactory manner: professional quality work, schedule and predetermined budgets were in total compliance with the expected results.

Your sincerely



Robert Généreux, ing., M.A.
Adjoint au directeur d'arrondissement
et directeur
514 493-5100



Gatineau
2010 45^e FINALE
JEUK DU QUÉBEC

GIE Technologies Inc.
C/O Mr Pierre Lebeault, P.E.
Vice-President – Business Development
150 Graveline Street
Montreal (Québec) H4T 1R7

Subject : GIE Technologies Inc. – Pavement Evaluation and Management

Sir,

The Town of Gatineau has elected to select GIE Technologies, Inc.'s engineering services in order to proceed, in the course of years 2004 and 2005, with a thorough pavement evaluation of its whole network length : 1 300 kilometers.


Under the co-ordination and supervision of GIE, the Town of Gatineau has acquired the MicroPaver Software to be used for the calculation of the PCI (Pavement Condition Index), in order to determine the pavement condition of our urban network which, in turn, led to locate distresses and target top priorities for timely and cost-effective repair interventions.

In the course of these commissions, the Town of Gatineau was able to appreciate the expertise, efficiency and effectiveness of GIE'S specialists. In short, the engineers of the Infrastructures Department of the Town of Gatineau feel that the terms of reference were delivered and carried out to their total satisfaction while complying perfectly with the predetermined schedules and the budgets. Consequently, we will not hesitate to call again upon GIE for further network evaluation services.

Sincerely

Adresse postale

C. P. 1970, succ. Hull
Gatineau (Québec)
J8X 3Y9



François Larose, B.A.Sc., M.Sc
Coordinator – Master Plans
Telephone : 1-819-243-2345, Ext. : 7392

Tél. : 819 243-2345, poste 7300

Télé. : 819 595-7321

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Ministry of Transportation

**Pavements and Foundations
Section**

**Materials Engineering and
Research Office**

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Room 232, Building C
Downsview, Ontario M3M 1J8
Tel Number: (416) 235-3732
Fax Number: (416) 235-3919

Ministère des Transports

**Section des revêtements et des
fondations**

**Bureau de la recherche et du génie
en matière de matériaux**

1201, rue Wilson, 2^e étage
Bureau 232, édifice C
Downsview (Ontario) M3M 1J8
Tél. : (416) 235-3732
Télec. : (416) 235-3919



March 21, 2011

To whom it may concern:

The engineering firm of GIE Technologies Inc was commissioned by the Ministry of Transportation, Ontario to collect network-level pavement roughness data in terms of IRI (International Roughness Index) values for the year-2010 and year-2011 for a major portion (approximately 15, 000 km) of the Ontario's provincial highways system. IRI data is a key component of the Ministry's Pavement Management System.

The acquisition of the 2010 data was accomplished by GIE on time and within the budget. We are pleased with the expertise and professionalism demonstrated by the GIE's team through out the project and we look forward to working with GIE.

Yours sincerely,

Becca Lane
Head, Pavements & Foundations Section



METROPOLITAN
KNOXVILLE
AIRPORT
AUTHORITY

December 17, 2008

RE: GIE Technologies' Pavement Condition Assessment and Analysis

To whom it may concern,

McGhee Tyson Airport recently selected GIE to perform a Pavement Condition Assessment and provide an updated distress database for our MicroPaver software. GIE's unique approach has provided our organization with a very cost-effective solution in the assessment of the actual condition of our Airport Network, leading to easily located distresses and allowing us to establish priorities for repair of our network which should allow our organization to realize significant maintenance savings by stopping further deterioration and postponing complete reconstruction of some parts of our network.

We solicited proposals from three companies and GIE was easily the lowest priced respondent as well as the most detailed. GIE was able to produce an Automated Pavement Condition Assessment based upon collected distress intervals of 32 feet and calculate a project level PCI index (ASTM-6433) for nearly 100% pavement surface coverage (10 % recommended by the ASTM). The increased coverage should improve substantially the reliability of our generated pavement maintenance and rehabilitation plan as well as our budgetary estimates.

GIE is also identified, for every section length, the linear and spatial references of every sample unit and distress required by MicroPaver, which will allow us to update the distress database using GPS on an on-going basis. GIE also demonstrated the ability to link, through user-friendly visualization software, our GIS to the Images and Results.

We were very pleased with the services provided by GIE and look forward to working with them again for these and other services.

If you would like to discuss this further, please feel free to contact me at 865.342.3022.

Sincerely,

Eric Williamson, Airport Engineer