

CITY of NOVI CITY COUNCIL

Agenda Item D
September 22, 2008

SUBJECT: Approval to award a contract for engineering services for the Pavement Condition Assessment and Traffic Control Sign Inventory project to Soils and Materials Engineers, Inc., for a not-to-exceed design fee of \$73,500.

SUBMITTING DEPARTMENT: ^{RA} Engineering and Public Works

CITY MANAGER APPROVAL: 

EXPENDITURE REQUIRED	\$ 47,550 (Pavement Assessment) \$ 25,950 (Sign Inventory)
AMOUNT BUDGETED	\$ 50,000 (Pavement Assessment) \$ 46,326 (Sign Inventory)
LINE ITEM NUMBER	204-204.00-816.150 (Pavement Assessment) 101-442.00-816.000 (Sign Inventory)

BACKGROUND INFORMATION:

This project is a combination of two service improvement requests included in the FY08/09 budget: the pavement condition assessment (called PASER in the past) initiated by Engineering, and the sign inventory project initiated by Public Works. The pavement condition assessment project is similar to the PASER projects completed in 2001, 2004, and 2006 in that all city public streets will be evaluated to establish a numerical rating of pavement condition on a scale from 1 (poor condition) to 10 (excellent condition). The ratings will be used to assist in the prioritization of future road improvements and reconstruction projects. The purpose of the sign inventory project is to create a database of the location of all of the traffic control signs within the city along with their type, size, and compliance status with the Michigan Manual for Uniform Traffic Control Devices (MMUTCD).

Collectively, the pavement condition assessment and sign inventory will provide the first step in establishing a formal city-wide asset management program, as required by Public Act 199 of 2007. In order to preserve Federal funding eligibility, PA 199 requires local road agencies to: develop a pavement management system for each mile of Federal Aid-eligible roads; develop a multi-year program of projects using a formalized asset management process; and, submit a report listing a multi-year program of projects. PASER studies in previous years provided a basis for addressing roads using a "worst first" strategy; but a formal asset management program will allow city staff to proactively develop a strategy that uses any number of maintenance and repair techniques that will extend the pavement's useful life so that the complete reconstruction of the roadway is deferred as long as possible.

In the course of developing the Request for Proposals (RFP) for the pavement condition assessment, it was determined that both projects had some common elements and there was the potential for cost savings in combining the two projects into one. A cross-departmental team of individuals from Public Works, Engineering and Information Technology (GIS) was assembled to complete the combined scope of the project RFP, which was then sent out for competitive proposals.

The project was structured with several alternates so that, if necessary, some components of the project could be awarded without awarding the entire scope. The project components are as follows:

- Base Project: Pavement Condition Assessment - the scope includes a traditional assessment of the pavement condition for each city street to assign an overall rating of 1 through 10.
- Alternate Scope 1: Capture of Digital Video - a new component that would deliver to the city sequential images of the roadside in video format (see Chris Blough memo dated September 15, 2008 for additional discussion).
- Alternate Scope 2: Sign Inventory - the scope includes using the video from Alternate Scope 1 to assign coordinates to the traffic control signs and to identify the type and size of each sign.
- Alternate Scope 3: Assistance with the Development of an Asset Management System using Roadsoft® - the scope includes limited training with city staff to implement Roadsoft® (a free statewide standard software distributed by the Federal Highway Administration's Local Technical Assistance Program) as a standard asset management database.

The project scope, including all of the alternates, will allow staff to better use the data that is being provided to make maintenance decisions. In past years, the data that has been provided for the pavement condition assessment has been static in map form. This project will present that data in a database that can be modeled and analyzed. It also allows the city to provide asset management reports to the State, a capability that is not currently readily available.

The attached Request for Proposals for engineering services was advertised publicly. Five proposals were received and each was evaluated using the Qualifications Based Selection process, with an emphasis on the each firm's experience, approach to the project and understanding of the project scope. The results of the staff review of qualifications are as shown below. The detailed analysis of the fees is

Firm	Base Scope	Alternate 1	Alternate 2	Alternate 3	Base+ All Alternates	Staff Score	Rank
SME	\$25,800.00	\$19,500.00	\$16,200.00	\$12,000.00	\$ 73,500.00	1520	1
Wade Trim	\$74,860.00	\$ 9,690.00	\$14,250.00	\$ 8,600.00	\$107,400.00	1437.5	2
IMS	\$25,650.00	\$14,250.00	\$33,000.00	\$ 4,500.00	\$ 77,400.00	1080	3
GIE	\$63,368.80	\$ -	\$71,570.00	\$15,600.00	\$150,538.80	760	4
Gould	\$29,450.00	\$54,862.50	\$45,700.00	\$ 6,500.00	\$136,512.50	555	5

Of the five firms that submitted proposals, Soils and Materials Engineers, Inc. (SME), had the highest staff review score, lowest fee and met all requirements listed in the RFP (see attached SME's proposal dated September 11, 2008 and Engineering staff's proposal scoring summary for reference). SME has worked on various city projects, typically as a subconsultant. Most recently, SME assisted on the Haggerty Regional Detention Basin project.

The field work component of the project will be completed by November 10, 2008 (before inclement weather) to enable delivery of the pavement assessment report by December 31, 2008 and delivery of the sign inventory by March 31, 2009.

RECOMMENDED ACTION: Approval to award a contract for engineering services for the Pavement Condition Assessment and Traffic Control Sign Inventory project to Soils and Materials Engineers, Inc., for a not-to-exceed design fee of \$73,500.

	1	2	Y	N
Mayor Landry				
Mayor Pro Tem Capello				
Council Member Crawford				
Council Member Gatt				

	1	2	Y	N
Council Member Margolis				
Council Member Mutch				
Council Member Staudt				

SCORING SUMMARY

Project Description: Pavement Analysis/Sign Inventory

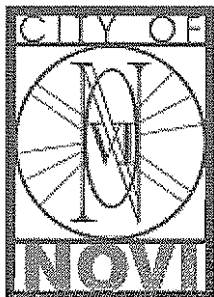
RANK 1= LOW, x= BEST (x = number of firms repounding)

TOTAL SCORES	<i>Item weight:</i> 20	15	30	20	15	Totals	<i>Rank</i>
GIE Technologies	1	2	3	4	5	760	4
Gould Engineering	4	10	11	10	0	555	5
IMS	8	5	6	7	0	1080	3
Soils & Materials Engineers	17	16	10	10	0	1520	1
Wade Trim	19	16	18	18	0	1437.5	2
TOTALS	60	65.5	63	64	0		

SCORING CRITERIA

1. Engineering Fee
2. Evaluation of Schedule
3. Evaluation of Approach, Statement of Understanding of Project, and proposed staff
4. Analysis of subjective statements applicable to the project as required on the RFP (Value added items)
5. Evaluation of past performance on City projects

MEMORANDUM



cityofnovi.org

TO: BRIAN COBURN, CIVIL ENGINEER
FROM: CHRISTOPHER BLOUGH, GIS MANAGER *CAB*
SUBJECT: PASER ASSESSMENT & TRAFFIC CONTROL SIGN INVENTORY – ENTERPRISE-WIDE DATA SERVER
DATE: SEPTEMBER 15, 2008

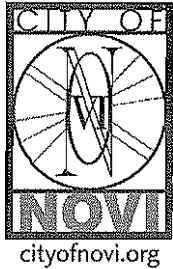
Dear Brian:

I would like to thank you for allowing me the opportunity to serve as a member of the QBS evaluation team responsible for scoring vendor responses to the City's RFP for the Engineering Services for Pavement Condition Assessment and Traffic Control Sign Inventory. This project will involve the acquisition of over 200 GB of digital images reflecting pavement condition, traffic signage condition/placement, and right-of-way features. These project deliverables will become a vital part of a city-wide asset management program which will allow staff from all City service areas to access this information on a daily basis. This project will enable staff in other departments to utilize asset information to perform the following activities:

- Prioritize rehabilitation/replacement of aging street infrastructure (Engineering/DPW)
- Facilitate responsive right-of-way permit applications reviews (Engineering)
- Comply with Federally mandated traffic control sign maintenance requirements (DPW)
- Promote best practices for storm water management in the right-of-way (DPW)
- Enhance communications with City Council and public stakeholders when improvements to City street systems are made (DPW/Manager's Office)
- Identify opportunities for non-motorized pathway/sidewalk expansion prioritization (Community Development)
- Assist with accident investigation/incident reporting (Fire/Police)
- Promote ordinance enforcement reviews (Community Development)
- Supplement exhibits to City Council when involving site specific discussions in local neighborhoods (all departments)

A new data server will be necessary to centralize all City infrastructure data and provide city-wide access to staff in order to properly maintain the City's asset management program. This investment will allow us to overcome our current data storage limitations present using existing server infrastructure. The new server will be dedicated to support the needs of the asset management program in the future. Our current State of Michigan pricing discount will allow us to secure a server meeting the needs of this project at a cost of \$4,900. Please let me know if I can provide additional background regarding this data management resource.

c: Rob Petty, Chief Information Officer



REQUEST FOR PROPOSALS CITY OF NOVI, MICHIGAN

ENGINEERING SERVICES FOR PAVEMENT CONDITION ASSESSMENT AND TRAFFIC CONTROL SIGN INVENTORY

August 29, 2008

The City of Novi is seeking Proposals and Statements of Qualifications for engineering services to conduct a pavement condition assessment and traffic control sign inventory.

Project Description

There are four major tasks identified for this project that are summarized below and detail further in the next section.

Base Project: Pavement Condition Assessment--The City of Novi is requesting that approximately 190 centerline miles of City roads be surveyed to determine the overall condition of each road. The condition survey consists of rating the City roads based on roughness and surface distress.

Additional Alternate Scope 1: Capture of Digital Video—The City of Novi is requesting that the consultant provide the City with digital video for all of the roads included in the base project.

Additional Alternate Scope 2: Sign Inventory—The City is requesting that the consultant provide a complete sign inventory along all roads included in the base project.

Additional Alternate Scope 3: Assistance with the Development of an Asset Management System using Roadsoft—The City is requesting that the consultant provide limited assistance setting up an asset management system and implementing the pavement management program in Roadsoft.

We anticipate that the contract would be awarded on September 22, with completion of the field work by November 10, 2008, and a final deliverable by January 31, 2009. The estimated budget for the project is \$75,000.

SCOPE OF SERVICES

The selected consultant shall conduct the following activities upon authorization by the City Council and the City Engineer:

Base Project:

1. The consultant shall meet with the City staff to review the project tasks and to understand the goals of the project. At this kick-off meeting, the City will provide the centerline GIS data for use in completing the project and will also provide all other requested information as available. The City will also provide the pavement condition survey data from the studies completed in 2001 (PASER), 2004 (PASER), and 2006 (PQI).
2. The consultant shall conduct an analysis of all public streets within the City's jurisdiction to establish a PASER rating. The PASER rating must be determined using the standards established by the Transportation Asset Management Council (TAMC) and Michigan's Local Technical Assistance Program (LTAP). The consultant shall also evaluate and report the surface distress type, extent, severity and assessment method used similar to the example below (consultant can provide its own version in the proposal for review purposes):

Example of Pavement Conditions Table.

Type	Extent	Severity	Method of Data Collection
Longitudinal Cracking	l.ft.	3 levels	Fully Automatic, Extent and Severity
Edge Cracking	l.ft.	3 levels	Fully Automatic, Extent and Severity
Transverse Cracking	l.ft.	3 levels	Fully Automatic, Extent and Severity
Alligator Cracking	Area/l.ft.	3 levels	Fully Automatic, Extent and Severity
Block Cracking	Area/l.ft.	3 levels	Fully Automatic, Extent and Severity
Raveling	Area/l.ft.	3 levels	Semi Automatic, Extent and Severity
Bleeding	Area/l.ft.	3 levels	Semi Automatic, Extent and Severity
Potholes	Count	3 levels	Semi Automatic, Extent and Severity
Patching	Area/l.ft.	3 levels	Semi Automatic, Extent and Severity
Distortion	l.ft.	3 levels using ride	Programmable Keyboard
Direction	l.ft.	N.A.	Fully Automatic
Ride Condition Rating	IRI (inch/mile)	3 levels	Fully Automatic, Extent and Severity
Rutting	Inch	3 levels	Fully Automatic, Extent and Severity
Evaluation Date	Date	N.A.	Fully Automatic,
Automated PASER Index	1 to 10	N.A.	Fully Automatic

3. The work product delivered shall be compatible with Roadsoft version 6.8.5 (available from the Michigan Local Technical Assistance Program).
4. A final report shall be provided detailing an overview of the project, methodology of the data collection and analysis, and a discussion of the overall condition of the road system.

Deliverables:

- PASER rating and Pavement Condition data as required above shall be provided in ESRI Personal Geodatabase format (version 9.2 or later) and shall be delivered separately on DVD media at the time of final report delivery. The consultant shall use the road centerline layer segment geometry in the State of Michigan Framework version 7a to report the data.
- Final Report: Five printed copies of the final report shall be provided along with a .pdf version of any intermediate drafts and the final draft (for reproduction, as needed).

Alternate Scope 1: Capture of Video Data

5. If awarded, the consultant shall provide digital video which consists of a series of still shots in addition to single still images for all of the routes included in the pavement condition survey. The photos must include the road and areas within the right-of-way along the road. The consultant shall provide geographically referenced images that will allow for a city wide asset inventory. The consultant shall have the ability to collect quality images (output size of 1280 x 960 pixels, or better) and provide accurate corresponding GPS data for each acquisition point (+/- 1 meter). The video collected should have the ability to be used by the city in the future (with appropriate commercially available software) to calculate the GPS location of city owned assets viewable from the street right-of-way, such as street signs, trees, traffic signals and other related infrastructure. The city is interested in acquiring video from both directions of travel for every public street under the City's jurisdiction.

Deliverables:

- Each video data file will incorporate still shots between intersections and will be associated with the road centerline segment geometry in the State of Michigan Framework version 7a.
- Data will be delivered on a portable hard drive suitable to contain all the information acquired.

Alternate Scope 2: Sign Inventory

6. If awarded, the consultant shall extract traffic sign type, location, and attributes from the still video data capture provided in Alternate Scope 1 into a database to generate a complete and accurate asset inventory for traffic signs. The database shall include the following attributes:
- GPS Location (NAD 83 Latitude/Longitude coordinates (Decimal Degrees) OR Michigan GeoRef Coordinate System (meters))
 - MMUTCD Sign Type (e.g. R1-1, D3-1, etc.)
 - Physical dimensions of the sign
 - Generated image of each sign that does not match MMUTCD sign type, or sign that has non-standard wording such as the "D" series signs.

Deliverables:

- The sign inventory shall be in ESRI Personal Geodatabase format (version 9.2 or later) and shall be delivered separately on DVD media OR on a portable hard drive with other acquired data at the time of final report delivery. A point feature class representing one point for each sign location will be generated and delivered in Michigan GeoRef coordinates containing the database attributes described above. A standardized domain of attribute values will be agreed upon prior to the collection of the sign locations.

Alternate Scope 3: Assistance with the Development of an Asset Management System

7. If awarded, the consultant shall provide technical assistance to city staff in the implementation of an asset management program. The assistance shall include the following tasks:
- Preparation of an additional report section (to be included in the report required under base scope) to address:
 - The need for an asset management program
 - Steps required to implement an asset management program (specific to Novi), including funding requirements
 - How to use the asset management program as a maintenance and capital improvement planning tool
 - Outline best practices to maintain the asset inventory
 - Provide training (8 hours total) with Engineering and Public Works staff to provide an overview of the Roadsoft software (specific to Novi). Goals of the training would include:
 - Understanding how to retrieve the asset information that was collected
 - Know how to utilize the data to properly
 - Guidance on how to sustain an asset management program

Deliverables:

- The Alternate Scope 3 report will be delivered as part of the base scope report.

DOCUMENT AND FILE FORMAT

All documents shall be submitted to the City of Novi in an electronic format as specified by the Engineering Division.

Documents: MS Word

Digital copies of files, maps, or drawings:
files: ESRI Personal Geodatabase (9.2 format
or later)

Project – Michigan GeoRef Coordinate
System as documented by the State of
Michigan's Center for Geographic Information
Datum – NAD83,
Ellipsoid – GRS1980
Linear Units – Meters

All digital data should correspond to:

CONSULTANT SELECTION

Any firms desiring to be considered for the project and having the capabilities for this work shall submit **five (5) bound copies and one (1) unbound copy** of their proposals. The submittal should include, at a minimum, the following:

- Background of firm; including history, areas of expertise, locations, size and resource capabilities to perform the required services.
- Summary of related experience in other communities (especially in Michigan) with projects of similar scope. Include cost, description and location of the project.
- References for related projects or other communities with similar types projects.
- Resumes of individuals in the firm who would likely be involved in the project.
- Statement of understanding of the scope of services and project approach
- A description of the methodology to be used in the collection and analysis of the data
- Project schedule
- Hourly rate fee schedule
- Fee Proposal (Exhibit A)

Qualified firms wishing to submit proposals should submit their qualification statements to the City of Novi, Office of the City Clerk, 45175 W. Ten Mile Rd., Novi, MI 48375 prior to **11:00 AM on Friday, September 12, 2008**.

The proposal must be clearly labeled "ENGINEERING SERVICES FOR PAVEMENT CONDITION ASSESSMENT AND TRAFFIC CONTROL SIGN INVENTORY."

Your proposal will be evaluated using the QBS (Qualifications Based Selection) process based on the criteria listed below:

<u>Criteria</u>	<u>Weight</u>
Fee	20%
Evaluation of firm and proposed staff	20%
Evaluation of approach and understanding of project	40%
Ability to meet project requirements	20%

In the hiring of employees for the performance of work under this contract, neither the contractor, subcontractor, nor any person acting in their behalf shall by reason of race, creed, color, age, height, weight, sex, sexual preference or handicap discriminate against any person qualified to perform the work required in the execution of the contract.

All proposals must remain valid for one hundred twenty (120) days from due date and cannot be withdrawn during this period.

USE OF CITY LOGO IN YOUR PROPOSAL IS PROHIBITED.

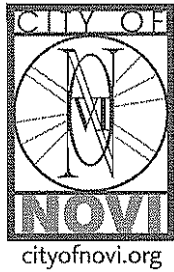
Questions regarding this Request for Proposals may be directed to:

Brian Coburn, Civil Engineer at 248-735-5632 or via email bcoburn@cityofnovi.org
Chris Blough, GIS Manager at 248-347-3279 or via email cblough@cityofnovi.org

The City of Novi reserves the right to accept any or all alternative proposals and to award the project to other than the firm with the lowest fee proposal, waive any irregularities or informalities, or both, to reject any or all proposals, and in general, to make award in any manner deemed by the City, in its sole discretion, to be in the best interests of the City of Novi.

Exhibits

A - Fee Proposal



**EXHIBIT A
FEE PROPOSAL
CITY OF NOVI**

**ENGINEERING SERVICES FOR
PAVEMENT CONDITION ASSESSMENT AND
TRAFFIC CONTROL SIGN INVENTORY**

We the undersigned propose to furnish to the City of Novi services consistent with the Request for Proposals dated August 29, 2008. Fees will be paid on an hourly basis for actual work performed to a maximum as proposed. A separate fee schedule is being provided should the City request additional work on an hourly basis.

Project Task	Fee Basis	Proposed Fee
Base Scope: Pavement Condition Assessment	___ miles x \$ _____ per mile	\$
Alternate Scope 1: Capture of Digital Video	__ miles (both sides of street) x \$ _____ per mile	\$
Alternate Scope 2: Sign Inventory	15,000 signs x \$ _____ per sign + supply images of signs that don't match MMUTCD (2,000 signs x \$ _____ per image)	\$
Alternate Scope 3: Assistance with the Development of an Asset Management System	8 hours x \$ _____ per hour training time + \$ _____ additional fee for reporting and training preparation	\$

PLEASE TYPE:

Company Name: _____

Address: _____

Agent's Name: _____

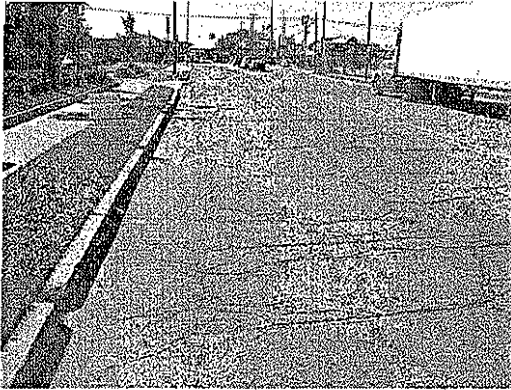
Agent's Title: _____

Agent's Signature: _____

Telephone Number: _____ Fax Number: _____

E-mail Address: _____ Date: _____

ENGINEERING SERVICES FOR PAVEMENT CONDITION ASSESSMENT AND TRAFFIC CONTROL SIGN INVENTORY

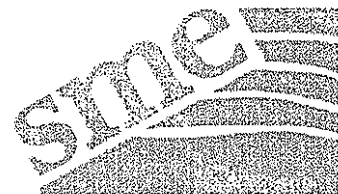


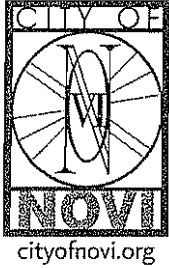
Submitted to:

City of Novi

Submitted by:

**Soil and Materials Engineers, Inc.
43980 Plymouth Oaks Blvd.
Plymouth, MI 48170
(734) 454-9900**





**EXHIBIT A
FEE PROPOSAL (REVISED)
CITY OF NOVI**

**ENGINEERING SERVICES FOR
PAVEMENT CONDITION ASSESSMENT AND
TRAFFIC CONTROL SIGN INVENTORY**

We the undersigned propose to furnish to the City of Novi services consistent with the Request for Proposals dated August 29, 2008. Fees will be paid on an hourly basis for actual work performed to a maximum as proposed. A separate fee schedule is being provided should the City request additional work on an hourly basis.

Project Task	Fee Basis	Proposed Fee
Base Scope: Pavement Condition Assessment	190 center line miles x \$ 135.79 per mile	\$ 25,800
Alternate Scope 1: Capture of Digital Video	190 center line miles (both sides of street) x \$ 102.63 per mile	\$ 19,500
Alternate Scope 2: Sign Inventory	15,000 signs x \$ 1.00 per sign + supply images of signs that don't match MMUTCD (2,000 signs x \$ 0.60 per image)	\$ 16,200
Alternate Scope 3: Assistance with the Development of an Asset Management System	8 hours x \$ 316 per hour training time + \$ 9472 additional fee for reporting and training preparation	\$ 12,000

Please acknowledge receipt of addenda by initialing below:

Addendum #1 CAH


PLEASE TYPE:

Company Name: Soil and Materials Engineers, Inc.

Address: 43980 Plymouth Oaks Blvd, Plymouth, MI 48170

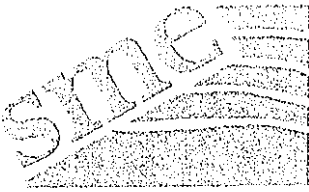
Agent's Name: Chuck Gemayel

Agent's Title: Vice President

Agent's Signature: 

Telephone Number: (734) 454-9900 Fax Number: (734) 454-0629

E-mail Address: gemayel@sme-usa.com Date: 9/11/08



September 11, 2008

Soil and Materials Engineers, Inc.
The Kramer Building
43980 Plymouth Oaks Blvd.
Plymouth, MI 48170-2584

tel (734) 454-9900
fax (734) 454-0629
www.sme-usa.com

Kenneth W. Kramer, PE
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Frank A. Henderson, PG
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Chuck A. Gemayel, PE
Larry P. Jedele, PE
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Edward S. Lindow, PE
Gerard P. Madej, PE
Timothy J. Mitchell, PE
Robert C. Rabeler, PE
Daniel O. Roeser, PG

J. William Coberly, CET
Andrew J. Emmert, CPA
Sheryl K. Fountain, SPHR
Michael E. Gase, CWI, ASNT III
James M. Harless, PhD, CHMM, RBP
Davie J. Hurlburt, PE
Cheryl Kehres-Dietrich, CGWP
Jeffery M. Krusinga, PE, GE
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Mark L. Michener, CDT
Larry W. Shook, PE
Thomas H. Skotzke
Michael J. Thelen, PE
John C. Zarzecki, CWI, CDT

Ms. Sue Morianti
Purchasing Manager
City of Novi
Office of the City Clerk
45175 W. Ten Mile Rd
Novi, MI 48375

RE: Engineering Services for Pavement Condition Assessment and
Traffic Control Sign Inventory

Dear Ms. Morianti:

Soil and Materials Engineers is please to submit a proposal for the
referenced project.

If we are awarded this project, we agree to perform the work as outlined in
our proposal.

We look forward to working with you on this project.

Very truly yours,

SOIL AND MATERIALS ENGINEERS, INC.

Starr D. Kohn, PhD, PE
Senior Vice President

Plymouth
Bay City
Grand Rapids
Kalamazoo
Lansing
St. Joseph Township
Toledo
Traverse City

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1.0 INTRODUCTION

Pavements age with time and gradually deteriorate due to weather and daily wear and tear from traffic. With improved computer technology, engineers can now monitor and manage pavement systems by tracking pavement distress, predicting future deterioration, and selecting maintenance and repair strategies. In other words, precious resources for maintaining and repairing roads can be efficiently managed so that the dollars are spent in the right place at the right time.

The City of Novi has recognized the benefits of performing regular pavement condition surveys to determine existing pavement conditions to allocate maintenance and construction funds. According to the RFP the city has performed the following surveys: Paser (2001), Paser (2004), and PQI (2006). The City of Novi is interested in updating the pavement condition of its road network by performing a new pavement conditions survey and to obtain an inventory of signs in the city.

Soil and Materials Engineers, Inc. (SME) has teamed up with Grand Valley Metropolitan Council (GVMC) to assemble a team that is capable of performing the work required for this project. SME is pleased to provide a qualifications statement and our fee proposal to perform the work indicated in the RFP. We are ready to serve the City of Novi on this project and have the experienced staff available to complete the project on time and within budget.

SME and GVMC have worked together for 10 years to develop a pavement management system for GVMC that included 1050 centerline miles of roadway in various cities/townships in Kent and Ottawa counties. SME set-up the pavement management system in 1996 using the Paver software, and performed a condition survey on the entire network. SME subsequently performed surveys on a third of the network at approximately one year intervals. In 2006, GVMC purchased a multi-function data collection vehicle (see Section 6 for a description of the equipment) to allow for comprehensive coverage of the

system and expand its asset management program to include signs and other assets in the right-of-way. GVMC has been utilizing this vehicle for its asset management program since 2006. This vehicle will be used to collect the data required for this project. ***It should be noted that GVMC not only collects the data in the exact same manner as indicated in the RFP, but they are also users of such data.***

The SME and GVMC team are both Michigan based and fully understand the inner workings of all of the players in the asset management arena in Michigan.

We have had our insurance agent go through Attachment A (Insurance Requirements) and Exhibit D (Consulting Engineering Agreement) in the RFP. Appendix C contains these two documents with the changes suggested by the insurance agent. SME is willing to discuss these changes with the City of Novi. The next page has a commitment letter from GVMC indicating that they will participate with SME on this project.



GRAND VALLEY METRO COUNCIL

ALEXANDRIA TOWNSHIP • ALLENDALE TOWNSHIP • ALPINE TOWNSHIP • BYRON TOWNSHIP • CALEDONIA TOWNSHIP • CANTON TOWNSHIP • CASCADE TOWNSHIP • CEDAR SPRINGS • COOPERSVILLE • COURTLAND TOWNSHIP
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KENT COUNTY • KENTWOOD • MIDDLEVILLE • OTTAWA COUNTY • PLAINFIELD TOWNSHIP • ROCKFORD • SPARTA • SPARTA TOWNSHIP • TALLMAIDGE TOWNSHIP • WALKER • WAYLAND • WYOMING

September 11, 2008

Dr. Start D. Kohn
Soil and Materials Engineers
43980 Plymouth Oaks Blvd
Plymouth, MI 48170

RE: City of Novi Solicitation Engineering Services for Pavement Condition Assessment and
Traffic Control Sign Inventory

Dear Dr. Kohn:

Grand Valley Metropolitan Council is pleased to join your team in the proposal being developed for the above referenced solicitation.

Grand Valley Metropolitan will collect the field data using our multi-function data collection vehicle and process the collected data as outlined in the scope of work submitted to you. We will be able to meet the timelines indicated in the RFP for delivering the data.

We look forward to working with you on this project.

Very truly yours,

Abed Itani
Director of Transportation Planning
Grand Valley Metropolitan Council



2.0 BACKGROUND OF FIRM

SOIL AND MATERIALS ENGINEERS, INC,

Soil and Materials Engineers, Inc. (SME) is a professional engineering firm providing consulting services in geosciences, pavements, materials, and the environment. SME was incorporated in the State of Michigan in 1964 and is currently in its 44th year of service to the engineering and construction professions. Since it's founding in 1964, SME has provided services on over 58,000 projects. The Engineering News Record (ENR) ranks SME among the top 500 design firms within the United States. SME services its clients from the corporate office located in Plymouth and the following regional offices:

Corporate Office 43980 Plymouth Oaks Blvd.
Plymouth, Michigan 48170-9837
Phone: (734) 454-9900
Fax: (734) 454-0629

Regional Offices **Bay City**
1501 West Thomas Street
Bay City, MI 48706-3299
Phone: (989) 684-6050
Fax: (989) 684-0210

Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611
Phone: (269) 323-3555
Fax: (269) 323-3553

Shelby Twp.
13019 Pauline Drive
Shelby Twp., MI 48315-3122
Phone: (586) 731-3100
Fax: (586) 731-3582

Traverse City
733 E. Eighth Street, Ste. 102
Traverse City, MI 49686-2665
Phone: (231) 941-5200
Fax: (231) 941-5259

Grand Rapids
88 54th Street, SW, Ste. 102
Grand Rapids, MI 49548-5683
Phone: (616) 406-1756
Fax: (616) 406-1749

Lansing
2663 Eaton Rapids Rd.
Lansing, MI 48911-6310
Phone: (517) 887-9181
Fax: (517) 887-2666

Toledo
415 Tomahawk Drive
Maumee, OH 43537-1633
Phone: (419) 897-0409
Fax: (419) 897-0429



The requested services will be primarily performed out of the Plymouth office. SME has been providing pavement engineering services since its incorporation in 1964. The SME pavement group offers consulting services in the areas of implementation of pavement management systems, distress surveys, new pavement design, evaluation of existing pavements, nondestructive pavement testing using Falling Weight Deflectometer, ride quality evaluation using a profiler, pavement research studies, and laboratory testing.

SME's main office and laboratory facilities cover 52,000 square feet. SME's laboratory facilities are equipped for performing soil and materials tests required by construction industry. The materials laboratory is equipped with a broad range of testing facilities to evaluate pavement components, along with materials testing for aggregates, concrete and soils. SME owns a Dynatest 8081 Falling Weight Deflectometer (FWD). SME has been operating the FWD since 1986. SME also owns a Dynatest road profiler.

The SME's geotechnical group evaluates soil and groundwater conditions to determine their impact on proposed or existing facilities. Geotechnical engineering typically includes site evaluation, laboratory testing, engineering analyses, and construction verification. The environmental group in SME performs environmental site assessments, baseline environmental assessments, hydrogeological studies, contamination investigations, risk assessments, underground storage tank management, remediation, compliance audits, asbestos and lead-based paint management, waste minimization studies, and wetland evaluations. The materials group in SME provides monitoring services during construction, analysis of roofs, structural steel, corrosion, and welding. Construction monitoring services are provided for inspection during construction of pavements, foundations, concreting and other construction activities. Roofing services include design, condition evaluation of existing structures, development and implementation of rehabilitation and maintenance programs, nondestructive testing, laboratory testing, and quality control during construction.

SME also provide facilities asset management services including facility condition assessments, maintenance and capital programming, and project management services.

GRAND VALLEY METROPOLITAN COUNCIL (GVMC)

Founded in 1991, The Grand Valley Metropolitan Council (GVMC) is a non-profit alliance of governmental units in the Grand Rapids, Michigan metropolitan area that are appointed to plan for the growth and development, improve the quality of the communities' life, and coordinate governmental services. The Metropolitan Planning Organization (MPO) dates back to the mid-1960's. Similar in nature to the South East Michigan Council of Governments (SEMCOG), GVMC is responsible for the coordinated planning of nearly 1,600 miles of federal aid eligible roadways.

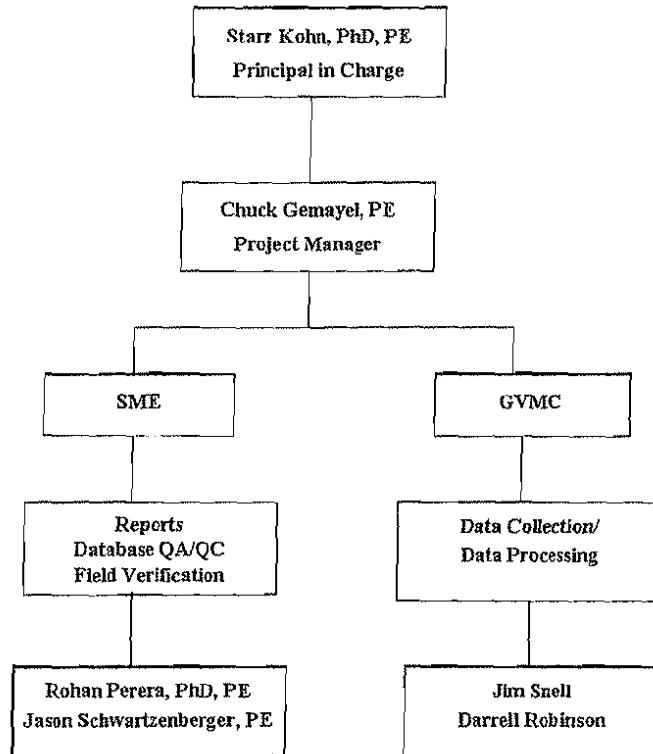
GVMC annually surveys nearly 3,000 miles of roadways in West Michigan including trunklines and local streets. Members who benefit from GVMC's comprehensive pavement survey program include: The cities of Grand Rapids, Wyoming, Kentwood, Grandville, Walker, East Grand Rapids, and Rockford as well as the Kent and Ottawa County Road Commissions. The decision makers within the MPO are given annual data to base their important funding decisions. This data is consistent throughout the region and consistent in the manner it is collected.

In 2007, GVMC offered this service outside the GVMC boundary to agencies who wanted a complete survey of their assets. Meridian Township in the Lansing area as well as the City of Wayland were completed in 2007. In 2008, the City of Portage requested a survey of their major street system.



3.0 MANAGEMENT SUMMARY

The following figure shows the management plan for this project.



Dr. Starr Kohn, P.E. will be the Principal in Charge. He will provide technical assistance on an as-needed basis and will provide the project team with management support.

Mr. Chuck Gemayel, P.E. will be the project manager assigned to this project. He will be responsible for the overall management of the project and he will be the key point of contact with the City and will be available to meet and discuss the project progress and budget.

Field data collection and data collection and data processing will be performed by GVMC, with the personnel in charge of these tasks being Mr. Jim Snell and Mr. Darel Robinson.

Additional field services and field verifications will be coordinated by Mr. Jason Schwartzenberger, P.E. from SME Plymouth office. Dr. Perera will perform quality control checks on the collected data and will serve as the database manager.

Resumes of the personnel who will be involved in this project are included in Appendix A.

4.0 STATEMENT OF THE PROBLEM

The RFP identifies the following four major tasks:

Base Project: This project consists of performing a condition survey on approximately 190 centerline miles in the City of Novi. The condition survey consists of rating the roads based on roughness and surface distress (based on PASER method). In addition, a pavement condition table that describes the distresses present on each segment is also required. A Roadsoft database that includes the PASER ratings needs to be submitted. In addition, the PASER rating and pavement condition data must be provided in ESRI Personal Geodatabase format (version 9.2 or later) and must be submitted in DVD media. A final report documenting the data collection effort must also be provided.

Additional Alternate 1: This alternate consists of providing digital video, which consists of a series of still shots in addition to single still images for all of the routes included in the pavement condition survey. The photos should include the road and the areas within the right-of-the way of the road. Digital video for both directions of the road is required.

Additional Alternate 2: This alternate consists of providing a sign inventory along all roads included in the base project. The traffic sign type, location, and attributes should be extracted from the from the still video data capture provided in Alternate 1 into a database to generate a complete and accurate asset inventory for traffic signs.

Additional Alternate 3: This alternate consists of assistance with the development of an Asset Management System. The work required for this alternate consists of two tasks. The first task is to prepare an additional report section (to be included in the report required under base scope) to address: (1) the need for an asset management program, (2) steps required to implement an asset management program (specific to Novi), including funding requirements,

(3) how to use the asset management program as a maintenance and capital improvement planning tool, (4) outline best practices to maintain the asset inventory. The second task is to provide training (8 hours total) with Engineering and Public Works staff to provide an overview of the Roadsoft software (specific to Novi). Goals of the training will include: (1) understanding how to retrieve the asset information that was collected, (2) know how to utilize the data to properly, (3) guidance on how to sustain an asset management program

5.0 WORK PLAN

BASE PROJECT

The work required for the base project has been divided into four tasks. The proposed work for each task is described separately.

***Task 1 (RFP Statement):** The consultant shall meet with the City staff to review the project tasks and to understand the goals of the project. At this kick-off meeting, the City will provide the centerline GIS data for use in completing the project and will also provide all other requested information as available. The City will also provide the pavement condition survey data from the studies completed in 2001 (PASER), 2004 (PASER), and 2006 (PQI).*

***Proposed Work:** SME and GVMC staff will attend the kick-off meeting to review the tasks of the project with City of Novi staff and reaffirm our thorough understanding of the project and its many facets. We understand that the City of Novi does not currently have a Roadsoft database which has the PASER ratings. Prior to the meeting we will obtain the basemap in Roadsoft that contains the city of Novi streets from Michigan LTAP and evaluate the section breaks for each street. This map is based on Framework version 7a. Prior to the meeting the project team will make an initial analysis of the most efficient manner to collect the required data. GVMC staff uses State of Michigan Framework version 7a as its in-house centerline segment geometry which will allow for smooth project initiation.*

***Task 2 (RFP Statement):** Conduct an analysis of all public streets within the City's jurisdiction to establish a PASER rating. Determine the PASER rating using the standards established by the Transportation Asset Management Council (TAMC) and Michigan's Local Technical Assistance Program (LTAP). Also report the surface distress type, extent, severity of the rated segments.*

Proposed Work: The GVMC multi-function data collection vehicle (described in Section 6) will traverse the entire road system to be rated in one direction. As the van traverses over the segments, personnel in the vehicle will use the Roadsoft Laptop Data Collector to assign a PASER rating for each road segment. The standards established by the Transportation Asset Management Council (TAMC) and Michigan's Local Technical Assistance Program (LTAP) will be used in assigning the PASER rating. GVMC staff is trained and certified to collect PASER data throughout the State of Michigan. The cameras in the vehicle that takes images of the pavement surface will be turned-on to get a continuous video of the pavement surface.

These images will be reviewed in the office using a workstation to assign a level of coverage and a severity level for the distresses shown in the table shown in the next page.

Each distress type will be assigned three levels of coverage (low, medium, high) depending on the extent of the distress present on the section, with each distress also being assigned a severity (low, medium, high) depending on the severity of the distress. If a distress type is not observed, it will be assigned a coverage of zero.

The above table shows the distresses for an asphalt surfaced pavement. For a concrete surface a similar approach will be utilized, with the main distress types identified in concrete pavements being slab cracking and spalling.

The GVMC Data Collection Vehicle is capable of measuring roughness and rutting in the in the predominant wheel path of a section at highway speeds. The data collected by the laser sensors will be used to compute a rut depth and the International Roughness Index (IRI), which is a measure of ride quality. *When initiating IRI data, the vehicle must travel about 150 to 250 ft before it can collect accurate data. Hence, reliable IRI values may not be possible on short residential streets.* Survey date and travel direction are automatically calculated and incorporated into the data set.

Distress Type	Distress Coverage	Severity	Method of Data Collection
Longitudinal Cracking	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Edge Cracking	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Transverse Cracking	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Alligator Cracking	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Block Cracking	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Raveling	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Bleeding	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Potholes	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Patching	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Distortion	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Corrugation	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Joint Reflection	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Polishing	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Slippage	3 levels - % Coverage	Low- Medium - High	Semi-Automated, Reviewed
Roughness	n/a	IRI Rating	Automated
Rutting	n/a	Laser Measurement	Automated
Ride Rating	n/a	0-5 Rating	Automated
Survey Date	n/a	n/a	Automated
Travel Direction	n/a	n/a	Automated
Curb and Gutter Condition	n/a	n/a	Gathered in the field with manual review and verification
PASER Rating	n/a	n/a	Gathered in the field with manual review and verification

GVMC staff will include a general rating of curb and gutter for each segment of the system. We have found that determining a basic rating for the curb and gutter enhances the overall understanding of the condition of the roadway. This activity is relatively quick and adds no cost to the project. GVMC personnel will check the PASER ratings assigned in the field using the pavement surface images obtained from the data collection vehicle.

SME will perform quality control checks on the Roadsoft database and will make random field checks as required.

Task 3 (RFP Statement): *The work product delivered shall be compatible with Roadsoft version 6.8.5.*

Proposed Work: As mentioned earlier in Task 2, the PASER ratings will be entered in the field into the Roadsoft Laptop Data Collector, and the entered data will be transferred into the office computer.

It should be noted Roadsoft has several data fields in addition to PASER ratings. The following information can be added to each pavement segment: Surface Type, Number of Lanes, Pavement Width, Shoulder Width, and Shoulder Type. If the City desires we can complete these fields in the Roadsoft database. The road and shoulder widths can be obtained from the video recorded by the data collection van. GVMC will assign PASER ratings using Roadsoft and will convert any files from Roadsoft to a format compatible with ESRI Personal Geodatabase format (version 9.2 or later) and will be delivered separately on DVD media at the time of final report delivery. All data will be delivered to City Staff in both Roadsoft and ESRI compatible files. This will provide ease of data acceptance and minimize the need for conversion if Roadsoft is chosen to be the platform for the City of Novi Asset Management System. If the City desires, the pavement surface images that were recorded can be provided.

Task 4 (RFP Statement): *A final report shall be provided detailing an overview of the project, methodology of the data collection and analysis, and a discussion of the overall condition of the road system.*

Proposed Work: A comprehensive final report that includes the details of the data collection, processing and analysis will be prepared. The report will also contain a snapshot of the condition of the roadway system at the time of data collection. The report will be prepared by personnel from SME and GVMC.

PASER rating and Pavement Condition data as described in Task 2 will be provided in ESRI Personal Geo-database format (version 9.2 or later). The data will be delivered separately on DVD media at the time of final report delivery. All data will be geo-coded to the road centerline layer segment geometry in the State of Michigan Framework version 7a to report the data.

ALTERNATE 1: CAPTURE OF VIDEO DATA

RFP Statement: *If awarded, the consultant shall provide digital video which consists of a series of still shots in addition to single still images for all of the routes included in the pavement condition survey. The photos must include the road and areas within the right-of-way along the road. The consultant shall provide geographically referenced images that will allow for a city wide asset inventory. The consultant shall have the ability to collect quality images (output size of 1280 x 960 pixels, or better) and provide accurate corresponding GPS data for each acquisition point (+/- 1 meter). The video collected should have the ability to be used by the city in the future (with appropriate commercially available software) to calculate the GPS location of city owned assets viewable from the street right-of-way, such as street signs, trees, traffic signals and other related infrastructure. The city is interested in acquiring video from both directions of travel for every public street under the City's jurisdiction.*

Proposed Work: The GVMC data collection van (see Section 6 for a description) will collect digital photos with an output size of 1600 x 1200 with corresponding GPS data for each to the acquisition point to sub-meter accuracy. The digital photos will be collected over the entire street system covered under base project, on both directions of the road. The GVMC van captures still photos every 18-20 feet continuously over each segment surveyed. The van uses dual cameras to shoot photos forward in the travel lane and one angled toward the right-of-way for detailed photos of the entire system. The photos can be incorporated into the Trident-3D Analyst software available through Geo 3-D. Using this system, City staff

could calculate the GPS location of any city owned asset in camera view to sub meter accuracy.

We will also provide photos straight down on the pavement through the use to the onboard linescan camera mounted on the rear of the van. The linescan camera shots (resolution of 1392 x 1024) give very clear and detailed views of the entire lane traveled for detailed analysis of distresses present. The linescan photos give the opportunity to complete more detailed analysis than the normal forward shots.

The forward and linescan (straight down) photos taken every 18-20 feet will be geo-coded to the State of Michigan Framework version 7a. *If used in conjunction with Microsoft Windows Picture Viewer, users can take a virtual tour of any road segment in the city.* It should be noted that photos from both cameras provide a continuous coverage with no gaps.

All data and associated photos will be delivered on a portable hard drive(s) suitable to contain all the information acquired (approx 200 Gb).

ALTERNATE 2: SIGN INVENTORY

RFP Statement: *If awarded, the consultant shall extract traffic sign type, location, and attributes from the still video data capture provided in Alternate Scope 1 into a database to generate a complete and accurate asset inventory for traffic signs. The database shall include the following attributes: (1) GPS Location (NAD 83 Latitude/Longitude coordinates (Decimal Degrees) OR Michigan GeoRef Coordinate System (meters), (2) MMUTCD Sign Type (e.g. R1-1, D3-1, etc.), (3) Physical dimensions of the sign, and (4) Generated image of each sign that does not match MMUTCD sign type, or sign that has non-standard wording such as the "D" series signs.*

Proposed Work: Using Trident Geo 3-D software, we will provide a complete inventory of up to 15,000 street signs under the jurisdiction of the City of Novi. Using the data collected



during the Base and Alternate 1 phase GPS location, MMUTCD Sign Type, the physical dimensions of each sign will be provided. In addition, an image and location will be provided of each sign that does not match MMUTCD sign type or a sign that non-standard wording will be identified and located. In addition, the sign inventory data can be converted into Roadsoft for use should the City decide to use Roadsoft as its platform for Asset Management.

A comprehensive sign inventory in ESRI Personal Geodatabase format (version 9.2 or later), delivered separately on DVD media OR on a portable hard drive with other acquired data at the time of final report delivery. A point feature class representing one point for each sign location will be generated and delivered in Michigan GeoRef coordinates containing the database attributes described above.

ALTERNATE 3: ASSISTANCE WITH THE DEVELOPMENT OF AN ASSET MANAGEMENT SYSTEM

RFP Statement: *If awarded, the consultant shall provide technical assistance to city staff in the implementation of an asset management program. The assistance shall include the following tasks: (1) Preparation of an additional report section (to be included in the report required under base scope) to address: (a) the need for an asset management program, (b) steps required to implement an asset management program (specific to Novi), including funding requirements, (3) how to use the asset management program as a maintenance and capital improvement planning tool, and (4) outline best practices to maintain the asset inventory. and (2) Provide training (8 hours total) with Engineering and Public Works staff to provide an overview of the Roadsoft software (specific to Novi). Goals of the training would include: (a) Understanding how to retrieve the asset information that was collected, (b) Know how to utilize the data to properly, (c) guidance on how to sustain an asset management program. The Alternate Scope 3 report will be delivered as part of the base scope report.*

Personnel from SME will prepare an additional report section (to be included in the report required under base scope) to address: (a) the need for an asset management program, (b) steps required to implement an asset management program (specific to Novi), including funding requirements, (3) how to use the asset management program as a maintenance and capital improvement planning tool, and (4) outline best practices to maintain the asset inventory. SME is experienced in providing these services and has performed similar services in the past to various organizations such as Grand Valley Metropolitan Council, Genesee County MPO, City of Bay City, and City of Dearborn

SME and Staff from GVMC will provide training (8 hours total) with Engineering and Public Works staff to provide an overview of the Roadsoft software (specific to Novi). Goals of the training would include: (a) Understanding how to retrieve the asset information that was collected, (b) Know how to utilize the data to properly, (c) guidance on how to sustain an asset management program. It is important to note that GVMC not only collects data but also uses the data they collect in their asset management program. Hence, the participation of GVMC staff in the training will provide a valuable Michigan perspective from the data users' point-of-view. In addition, they will be able to provide their input on their experiences in maintaining and using an asset management program.

6.0 MULTI-FUNCTIONAL DATA COLLECTION VEHICLE

The Grand Valley Metro Council (GVMC) will use an International Cybernetics Corporation (ICC) multi-function data collection vehicle to collect the data required for this project. This vehicle is equipped with various data collection subsystems. These subsystems can collect digital images of the pavement surface, digital images of the right-of-way, rut depths using a five-laser system, and longitudinal profile along the wheelpaths (for calculating roughness). The vehicle is equipped with a DMI and GPS to track the vehicle position. The GPS and DMI data are integrated with images and data collected by other subsystems. Figure 1 shows a photograph of the data collection vehicle.



Figure 1. Data collection vehicle.

Figure 2 shows the front view of the vehicle showing the five laser sensors that are mounted on the front of the vehicle. Accelerometers are present on top of the laser sensors along the wheel paths, and these two sensors collect longitudinal profile data that are used to compute the roughness. Data from all five sensors are used to compute the rut depth. Figure 3 shows a back view of the van that show the lighting system and the cameras that are used to obtain images of the pavement surface.

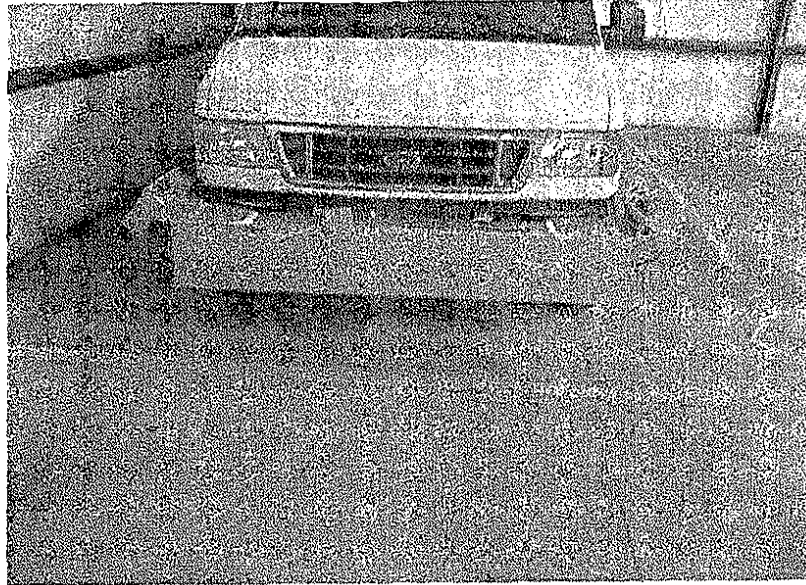


Figure 2. Front view of the van showing the lasers.



Figure 3. Back view of the van showing the lighting system and cameras for obtaining pavement surface images.

Figure 4 shows the cameras mounted on the front of the van to obtain right-of-way images. Figure 5 shows the workstations that are used to review the images captured from the linescan cameras that re used to obtain images of the pavement surface and the perspective view cameras that are mounted on the front of the van.

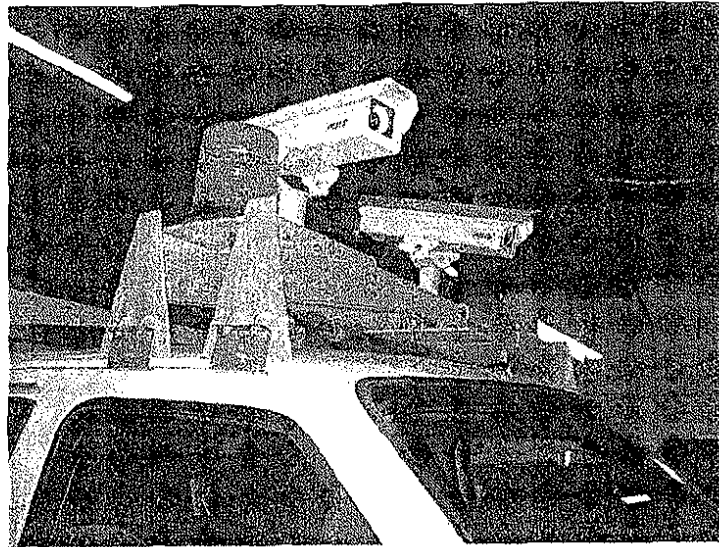


Figure 4. Cameras mounted on the front of the van.

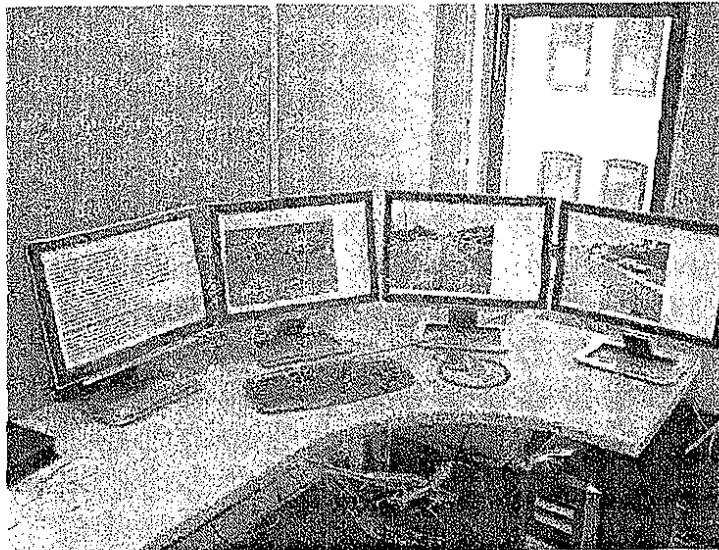


Figure 5. Workstations for reviewing images.

Figures 6 and 7 show photographs of images captured from the perspective view cameras, while Figure 8 shows a view of the image captured from the camera taking images of the pavement surface.

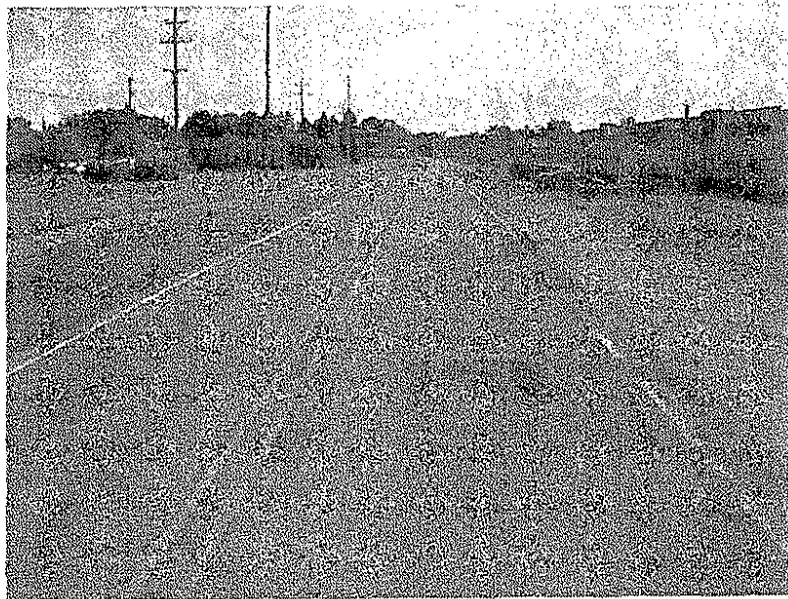


Figure 6. Image from the front camera.

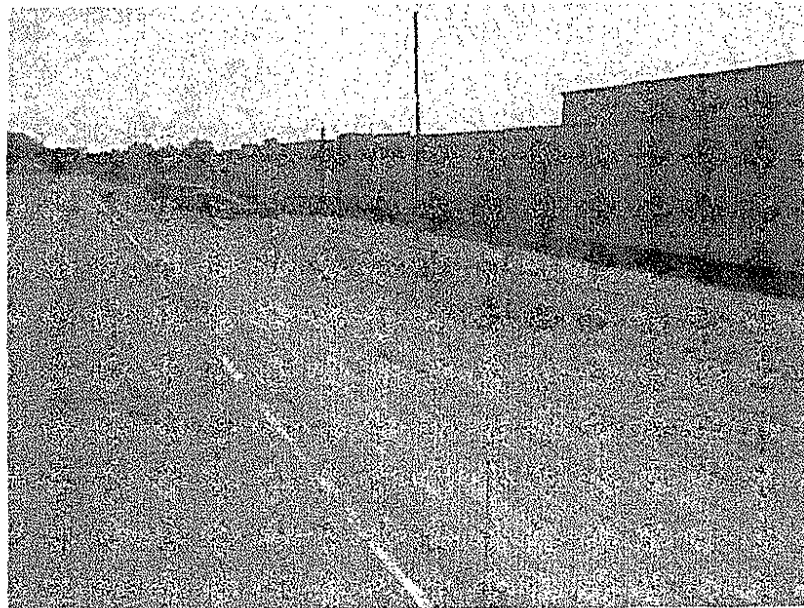


Figure 7. Image from the front camera.



Figure 8. Image from the rear camera.

7.0 PRIOR EXPERIENCE

SOIL AND MATERIALS ENGINEERS

SME has been involved in the pavement design, evaluation, and rehabilitation areas for the past 44 years. Our first involvement in the area of pavement management was in the late 1970's when the Construction Engineering Research Laboratory (CERL) of the Army Corps of Engineers was developing the Paver system. SME was contracted to complete the Pavement Condition Index (PCI) manual for the roads and streets portions of the management system. Dr. Starr Kohn of the SME staff performed these services. Dr. Kohn also developed the PCI procedure for porous friction surfaces for the United States Air Force.

SME has been performing pavement management services at various levels over the past 20 years. *Most recently in 2007 SME updated the Roadsoft database for the city of Kalamazoo (180 centerline miles).* In 2006 SME completed the pavement condition update on 266 miles of local and major streets for the City of Dearborn. The survey was performed in accordance with the PAVER method. SME also performed the initial implementation and yearly updates on the Grand Valley Metro Council PMS system between in 1998 and 2005. The initial implementation in 1996 involved 1,050 miles and each update involved 350 miles. In addition, SME implemented the PAVER system for the City of Bay City, which includes approximately 180 centerline miles.

In the past, SME implemented the Micro-Paver program for Genesee County, Michigan on over 850 miles of primary roads. We also implemented the system at Maxwell AFB on airside and landside pavements, and at Gunter AFB on landside pavements. Both air bases are located in Alabama. *We also implemented a PASER system for the City of Vassar, Michigan.* Other projects included pavement evaluations of 17.5 miles of streets in

Oak Park, MI., eighteen streets in Grosse Pointe Woods, Michigan, and citywide evaluation of streets in the City of Pleasant Ridge, Michigan.

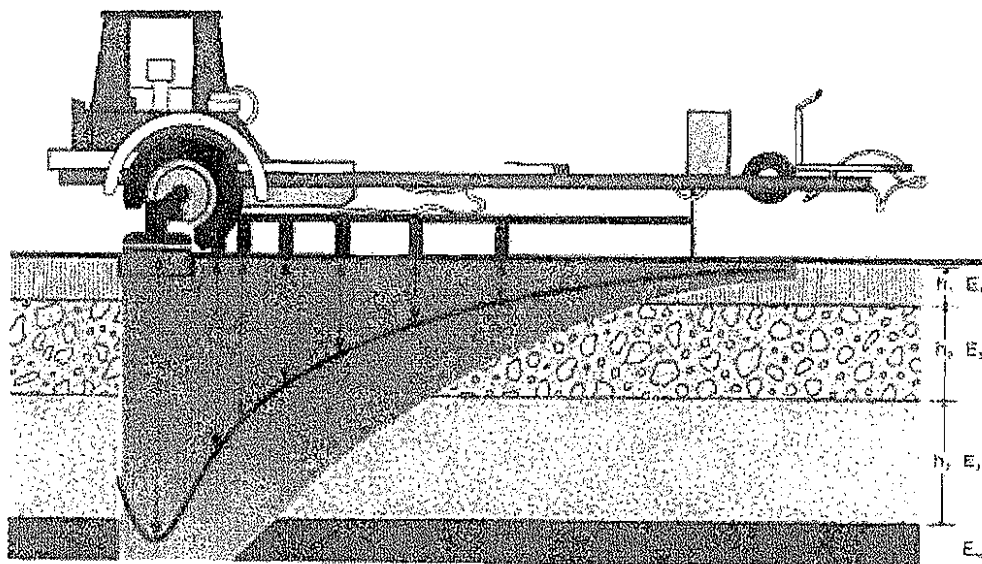
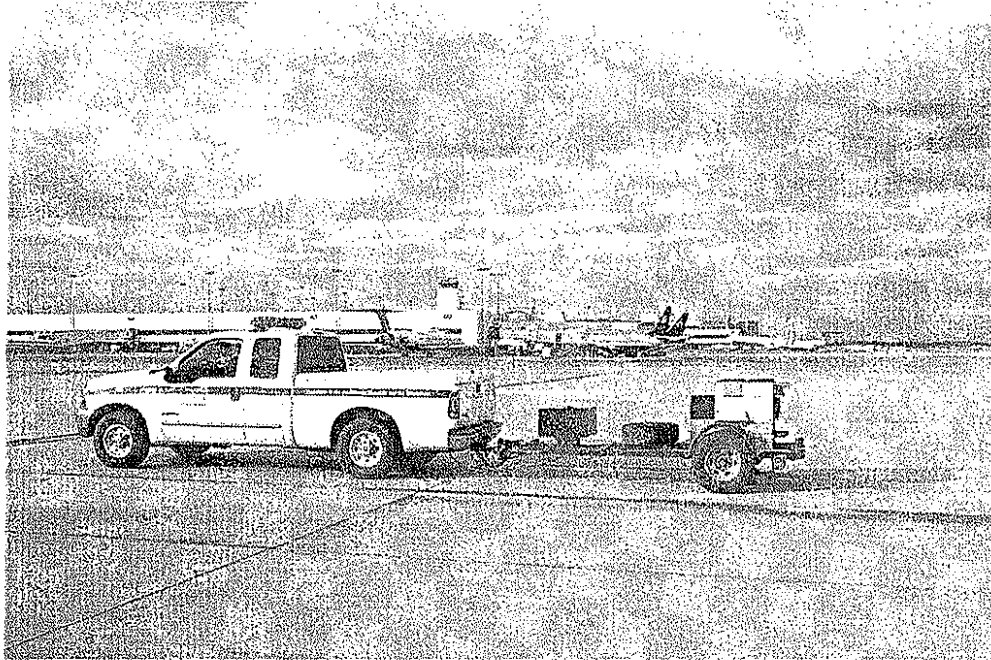
SME was also involved in the Strategic Highway Research Program (SHRP) as a member of a team responsible for coordinating data collection activities in the North Central Region, which includes 13 Midwestern states and two Canadian provinces. Our staff is trained to perform condition surveys in accordance with the requirement of the SHRP program, which requires research quality data. The Federal Highway Administration currently administers the program. Our staff traveled throughout the Midwestern region from Kansas to Michigan and from Kentucky to Manitoba, Canada.

SME was retained by the Michigan Department of Transportation to update the pavement condition on over 80 airports located throughout the state between 1992 and 2002. The pavement management system used by the Airport Planning Unit was switched from a proprietary system to Micro-Paver in 1996. SME developed software to upload data from the proprietary system into Micro-Paver. SME also performed a pavement evaluation on over 3 million square feet of concrete apron at Detroit Metropolitan Airport. In addition, SME implemented a pavement management system for Ford Motor Company on their parts distribution facilities located nationwide. These projects are located from coast to coast.

In addition to our pavement management capabilities, SME owns and operates a Dynatest Model 8081 Heavy Falling Weight Deflectometer (HWD), and can perform nondestructive pavement evaluations. SME is the only Michigan firm and one of the few firms in the Midwest that owns such equipment. The HWD simulates moving vehicle loads on the pavement. The test data can be used for any type of pavement over any subgrade material. The data is used to determine:

- Load carrying capacity
- Uniformity of pavement support and structure
- Remaining life of the pavement
- Load transfer at joints
- Identification of weak support areas

- Properties of pavement layers, (elastic moduli values)
- Overlay thickness requirements.



All of the above information can enhance the capabilities of a pavement management system by providing more accurate estimates of the structural condition and life expectancy of the pavements.

GRAND VALLEY METROPOLITAN COUNCIL

- Pavement Condition Inventory w/ PASER review, Kent County Road Commission - 860 miles – (2006–2008).
- Pavement Condition Inventory w/ PASER review, City of Kentwood, Michigan - 146 miles – (2006-2008).
- Pavement Condition Inventory w/ PASER review, City of Grandville, Michigan - 71 miles (2006 & 2008).
- Pavement Condition Inventory w/ PASER review, City of Wyoming, Michigan - 240 miles – (2006 & 2008).
- Pavement Condition Inventory w/ PASER review, Meridian Township, Michigan – 147 miles – (2007).

8.0 REPRESENTATIVE PROJECTS AND REFERENCES

SOIL AND MATERIALS ENGINEERS

The following provides a description of selected projects and developments related to pavement services in which SME has been involved.

Project 1: City of Kalamazoo Pavement Management System

Sponsor: Department of Public Services
Engineering Division
City of Kalamazoo
415 E. Stockbridge Avenue
Kalamazoo, MI 49001

Contact: Mr. Shahid Abbas

Phone: (269) 337-8612

SME updated the Roadsoft database maintained by the city. A total of 180 centerline miles were surveyed in this project to assign PASER ratings and Ride Quality ratings to pavement segments. The road system consisted of approximately 2000 pavement segments.

Project 2: City of Dearborn Pavement Management System

Sponsor: City of Dearborn
4500 Maple
Dearborn, MI

Contact: Mr. Godfrey Udoji

Phone: (313) 943-2145

SME implemented the Micro-Paver system on all streets in the City of Dearborn. The network includes about 266 centerline miles of roadway. Alleyways and parking lots were also included in the study. Training of field and office personnel was included in our scope of services. The project was completed in 1999. Since then, SME has completed a pavement condition update on the major and local streets. The condition update was completed in September of 2006.

Project 3: Grand Valley Metro Council

Sponsor: GVMC
Grand Rapids, MI
(616) 776-3876

Contact: Abed Itani / Jim Snell

SME implemented the Micro-Paver system on 1,050 centerline miles of county and city streets, which are functionally classified. The distress data was collected manually using the PCI condition rating system. All data is stored in the Micro-PAVER database. Pavement condition updates have been performed yearly on 350 miles of streets since 1998. Also a pavement ride quality evaluation was performed on the entire network. SME completed the last condition update in 2005.

Project 4: Airport Condition Survey, Capital City Airport Lansing

Sponsor: R. W. Armstrong & Associates
4100 Capital City Blvd
Lansing, MI 48906
hone: (517) 327-1980.

Contacts: Mike Borta/Gordon Bogner

SME performed a condition survey of all pavements within the Capital City Airport. The data were entered into Micro Paver program. SME developed effect of various budgeting scenarios on future pavement conditions.

Project 5: Airport Condition Report

Sponsor: Michigan Department of Transportation
Bureau of Aeronautics
(517) 335-9484

Contacts: Neil Barncard

SME was retained by the Michigan Department of Transportation to update the pavement conditions on over 80 airports located throughout the state between 1992 and 2002. The pavement management system used by the Airport Planning Unit was switched from a proprietary system to Micro-Paver in 1996. SME developed software to upload data from the proprietary system into Micro-Paver.

Project 6: City of Bay City

Sponsor: City of Bay City
Bay City, MI
(989) 894-8181

Contact: John Gaydos

SME implemented the Micro-Paver system on all streets in the City of Bay City. The streets include 54 miles of major streets and 126 miles of local streets.

Project 7: Genesee County Metropolitan Planning Commission

Sponsor: GCMPC
Flint, MI
810-257-3010

Contact: Stanley Brantley

Field data for about 450 miles of roadways were collected in 1989 for implementing a pavement management system. The distress data was collected using the PCI condition rating system. All data was stored in the Micro PAVER database. The information in the pavement management system was updated in 1994 and the network was expanded from 450 to 800 miles.

GRAND VALLEY METROPOLITAN COUNCIL

- Pavement Condition Inventory w/ PASER review, Kent County Road Commission - 860 miles – (2006–2008), Contact: Roger Belknap – 616-242-6948
- Pavement Condition Inventory w/ PASER review, City of Kentwood, Michigan - 146 miles – (2006-2008), Contact: Pat Hughes – 616-554-0739
- Pavement Condition Inventory w/ PASER review, City of Grandville, Michigan - 71 miles (2006 & 2008), Contact: Ron Carr – 616-538-1990
- Pavement Condition Inventory w/ PASER review, City of Wyoming, Michigan - 240 miles – (2006 & 2008), Contact: Scott Zastrow – 616-530-7254



- Pavement Condition Inventory w/ PASER review, Meridian Township, Michigan – 147 miles – (2007), Contact: Jerry Richards – 517-853-4254



9.0 STAFFING

Key project staff members include the following:

Soil and Materials Engineers

- Dr. Starr D. Kohn, P.E. - Principal Engineer
- Mr. Chuck A. Gemayel, P.E. - Project Manager
- Dr. Rohan Perera, P.E. - Project Engineer
- Mr. Jason Schwartzenbeger - Project Engineer

Grand Valley Metropolitan Council

- Jim Snell
- Darrel Robinson

Resumes of these personnel are included in Appendix A.

STAFF EXPERIENCE (SME)

SME's key staff members are highly experienced in the field of pavement management systems. Dr. Starr Kohn was involved in the early development of the Paver system and the Pavement Condition Index (PCI) method. Dr. Kohn worked at CERL during the development of the PCI system and the original mainframe Paver program. In 1984, Dr. Kohn modified the PCI procedure for the Air Force Europe to accommodate porous friction surfaces. He was also an instructor of the first PCI training course presented to the Navy at Port Hueneme in 1978.

Mr. Chuck Gemayel is also highly experienced in the field of pavement management. He was the project engineer in charge of the Roadsoft Paser update for the city of Kalamazoo, Grand Valley Metro Council and Genesee County Paver implementations, the Michigan Department of Transportation Airport Condition Report project and the implementations of the pavement management systems and pavement evaluations which were listed earlier. He previously served on the Transportation Research Board - Pavement Rehabilitation (AFD70),

Strength and Deformation (AFD80), Pavement Management Systems (AFD10) and Pavement Maintenance (AHD20).

As shown in the resumes, our proposed project staff is well qualified. The lead engineers have a combined experience level of 43 years in the following areas:

Starr D. Kohn, Ph.D., P.E. - 28 years

Pavement Design and Evaluation (Condition Survey), and Management.

Chuck A. Gemayel, P.E., MSCE - 21 years

Pavement Condition Survey and Management, NDT Analysis, Materials Characterization.

Mr. Jason Schwartzberger has acted as the Project Engineer on the field data collection portion of the projects performed for the City of Kalamazoo, Grand Valley Metro Council, City of Dearborn, and MDOT Aeronautics. He will assist with field verification of pavement condition data on an as needed basis. Dr. Perera is highly experienced in pavement management systems, and will perform QA/QC checks on the Roadsoft database. Dr. Perera recently prepared a Pavement Management Catalog for the Federal Highway Administration that contained information regarding Pavement Management Systems and various equipment that are used to collect pavement condition data (i.e., Falling Weight Deflectometers, Road Profilers, Skid Trailers, and Multi-Function Data Collection Vehicles). Dr. Perera currently provides technical assistance to Michigan Department of Transportation (MDOT) on pavement smoothness equipment certification under a FHWA contract. He has also provided technical assistance to Department of Transportations in Ohio, West Virginia, and Oregon on issues related pavement smoothness measurements using road profilers. Dr. Perera also provided technical assistance for over 10 years to the Long-Term Pavement Performance Program (LTPP that is administrated by FHWA on issues related to collecting roughness data

on highways. Dr. Perera will also be involved in preparation of various reports needed for this project.

STAFF EXPERIENCE (GVMC)

Mr. Jim Snell and Mr. Darel Robinson will be the key personnel from GVMC who will be involved in this project. They will undertake field data collection and data processing.

Mr. Snell is a Senior Transportation Planner with 21 years experience in transportation planning and asset management and has 14 years experience managing the GVMC Asset Management Program. He is trained and certified by the Michigan Asset Management Council in collecting and processing PASER data using Roadsoft. He annually completes automated survey and data processing for numerous public entities totaling in excess of 2,500 miles annually. He is proficient in the use of numerous GIS software programs.

Mr. Robinson is a transportation planner with 15 years experience in transportation planning and asset management. He has 5 years experience collecting and processing PASER data on all types of roadways in Michigan. He has coordinated regional PASER data collection since program began in 2004. He is trained and certified by the Michigan Asset Management Council in collecting and processing PASER data using Roadsoft. He assists during automated survey and data processing for numerous public entities totaling in excess of 2,500 miles annually. He is proficient in the use of Roadsoft and the Laptop Data Collector.

10.0 TIMELINE

The estimated timeline for this project is shown in the following diagram.

Task	Sep		Oct		Nov		Dec		Jan		Feb		Mar	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Project Award														
Kick-Off Meeting														
Field Data Collection														
Base Data Processing														
Base Final Deliverable														
Alternate 1 and 2 Processing														
Alternate 1 Deliverable														
Alternate 2: Deliverable														
Alternate 3: Report														
Training														
Final Completion (Alternates)														

If we are awarded alternate I and II, data collection for these tasks will take place when data for Base Project are being collected

As stated in the RFP, the project will be awarded on September 22, 2008. We will meet the following deadlines:

Field Data Collection Completed: ~~September 22, 2008~~

Base Project Final deliverable: November 10, 2008

Final Completion (Including all alternated scopes): March 31, 2009.

All existing road survey commitments will be completed by GVMC by September 22nd. Hence, GVMC will have ample staff and time to work on this project until the 2009 data collection season will begin in mid-April, which is after the final deadline for the project. Given the right weather conditions, field work for the 190 miles in Novi will take no longer than 5-6 days to complete. As the days get shorter there will be more urgency to complete the snapshot in a timely manner so the quality of photos will be superior. SME and

GVMC maintain ample staffing capacity to complete this portion of the task well within the time frame allocated in the RFP.



11.0 HOURLY RATE FEE SCHEDULE

The hourly rate fee schedule for personnel from SME who are involved in the project are shown in the following table.

<i>STAFF TYPE</i>	<i>NAME</i>	<i>Rate (\$/hr)</i>
PRINCIPAL	STARR KOHN	185.00
PROJECT MANAGER	CHUCK GEMAYEL	155.00
SENIOR PROJECT ENGINEER	ROHAN PERERA	135.00
SENIOR PROJECT ENGINEER	JASON SCHWARTZENBERGER	135.00
STAFF ENGINEER		80.00
TECH II		48.00
CLERICAL		48.00

Any additional work will be performed according to the fee schedule FS:0 (01/08) included in Appendix B.

APPENDIX A – RESUMES



Chuck Gemayel, PE
Vice President, SME

Project Manager and lead analyst on pavement related projects, especially those involving pavement management and nondestructive testing. Responsibilities include developing scope of services, scheduling, coordinating, and supervising staff for all pavement related projects.

❖ **Career History:** SME since 1987

❖ **Education:** B.S., Civil Engineering, University of Louisiana at Lafayette
M.S., Civil Engineering, Arizona State University

❖ **Registration:** Professional Engineer - Michigan

❖ **Affiliations:** American Society of Civil Engineers:
Airfield Pavement Committee - Air Transport Division
Transportation Research Board:
American Society for Testing and Materials:
Member of D-4 Committee on "Road and Paving Materials"
Falling Weight Deflectometer (FWD) Users Group

❖ **Professional Qualifications:**

- Expert in pavement design, management and evaluation.
- Knowledgeable in state-of-the-art analysis and evaluation of highway and airfield pavements.
- Proficient in materials testing procedures including conventional as well as state-of-the-art methods.

❖ **Project Experience:**

- Project manager for the implementation of a pavement management systems (Micro-Paver) for the Grand Valley Metro Council (1,050 miles), Genesee County (825 miles), Bay City (200 miles), City of Dearborn (265 miles) and City of Marlette (14 miles). Projects involved pavement network definition and performing pavement condition surveys using the Pavement Condition Index Method.
- Project manager for performing pavement condition surveys at various airports in Michigan from 1992 to 2002 under four separate contracts. The contract year and the number of airports inspected are: 1992/93 – 28, 1996 – 31, 1999 – 29, and 2002 – 19.
- Project manager for sampling and testing according to Strategic Highway Research Program (SHRP) at two experimental sites in Michigan (US-23 and US-27, St. Johns bypass) each site includes 13 test sections containing variable layer thickness and types. Project was performed for MDOT.

- Project engineer from 1988 to 1995 for FHWA's Long Term Pavement Performance program (LTPP) formerly known as the Strategic Highway Research Program (SHRP), a \$150 million, nationwide study of pavement performance.
- Project engineer for 3 million square feet of pavement evaluation at Detroit Metropolitan Airport that included pavement condition survey, nondestructive testing, soils investigations, and sewer video inspection. All field activities were performed while airport remained in operation.
- Project manager for nondestructive testing and evaluation projects at O'Hare International Airport (Chicago, IL), Nashville International Airport (Nashville, TN), Kent County Airport (Grand Rapids, MI), Capital City Airport (Lansing, MI), Jackson Airport (Jackson, MI), and Port Huron Airport (Port Huron, MI).
- Implemented pavement management systems at Maxwell and Gunter Air Force Bases in Montgomery, Alabama. Included airside and landside pavements.
- Project engineer for a research project for the Army Corps of Engineers. Developed a thickness design procedure for stabilized base courses in airfield pavements.
- Project manager for a Corps of Engineers Waterways Experiment station demonstration project on "Nondestructive Pavement Evaluation and Rehabilitation Design Process." Project included testing and analysis of eight projects in Warren County, Mississippi and 22 projects in Cincinnati, Ohio.
- Instructor of the Federal Highway Administration "Pavement Deflection Analysis" Short Course.
- Project engineer for the review and revision of the Army/Airforce "Airfield Pavement Evaluation Manual" under contract with the Army Corps of Engineers, Omaha District.
- Project manager for development and implementation of pavement rehabilitation projects at eight Ford Motor Company plants across the United States.
- Project manager for pavement evaluations and development of plans and specifications for United Parcel Service centers located in Detroit, Flint, Lansing (2 facilities), St. Joseph and Canton, Ohio.
- Project Manager for pavement evaluations and construction materials services at Oakland Community College campuses located in Farmington Hills, Auburn Hills and Waterford.
- Project Manager for pavement evaluations and developments of plans and specifications at Oakland University located in Rochester, MI.
- Project Manager for pavement, geotechnical and environmental services related to the Newburgh Road Grade separation project in Livonia.



- Project manager of a pavement evaluation for the City of Oak Park with a city-wide pavement construction program. Project included approximately 17.5 miles of pavement.
- Project manager of a pavement evaluation for the City of Grosse Pointe Woods. Project included visual condition survey, nondestructive testing, coring and subgrade sampling. Project included 18 streets.

Starr D. Kohn, PhD, PE
Senior Vice President/Principal (SME)

❖ Education

- > B.S. in Civil Engineering, University of Illinois, 1976
- > M.S. in Civil Engineering, University of Illinois, 1978
- > Ph.D., University of Michigan, 1989\

❖ Professional Registration

- > Professional Engineer - Michigan, 1980

❖ Professional Societies

- > American Society Civil Engineers
- > Transportation Research Board
- > Association of Asphalt Paving Technologist
- > International Society of Asphalt Pavements
- > Chi Epsilon
- > Technical Committees:
 - TRB Committee on Strength and Deformation
 - Committee on Sealant & Filler for Cracks & Joints
 - Committee on Rigid Pavement Design
 - ACI Committee 325-Concrete Pavements

❖ Summary Experience:

Dr. Kohn is the Manager of Pavement Services at Soil and Materials Engineers, Inc. He has been with SME for two service periods from 1977-1980 and from 1986 to the present. He is responsible for coordinating all activities within the SME Pavements group. He is the principal investigator for two FHWA project, Smoothness Criteria for Concrete Pavements and FHWA's Pavement Surface Characteristics Project. He was the principal investigator for the following projects, all of which have been completed: Best Practices for Airfield Pavement Construction (IPRF Project), Achieving High Levels of Smoothness without Sacrificing Long Term Performance (FHWA), NCHRP Project 20-50(08/13), LTPP Data Analysis: Factors Affecting Pavement Smoothness; NCHRP Project 20-50(01), LTPP Product Development: Workshop on Pavement Smoothness, FHWA project Investigation of Development of Pavement Roughness. He was the co-principal investigator for NCHRP Project 10-47, Guidelines for Longitudinal Profile Measurements. He was involved in the development of course material for the NHI Course, Pavement Smoothness – Use of Inertial Profilers for Construction Acceptance. He has worked on projects ranging from small commercial pavement evaluations to international projects involving nondestructive testing and materials testing. This work has taken place in Michigan and the surrounding states and has included work in most regions of the United States.

Dr. Kohn has been involved in nondestructive testing, forensic studies, and construction trouble-shooting at numerous airports throughout the United States. Dr. Kohn has been involved with pavement management systems since its early development. During his work with the Corps of Engineers (CERL), he was involved in the development of the Pavement Condition Index (PCI) and the Paver system. This pavement management system is currently widely accepted by cities, counties, and Army/Navy/Air Force installations.

While at SME Dr. Kohn has maintained a close relationship with the University of Michigan and serves as an adjunct professor during winter terms. He teaches a class on quality control and specification development.

❖ Key Work Experience:

- Principal Investigator of the Federal Highway Administration Project "Smoothness Criteria for Concrete Pavements." The work performed for this project will identify profile characteristics on new or newer concrete pavements that are objectionable to highway users.
- Principal Investigator of the Federal Highway Administration Project "Achieving High Levels of Smoothness without Sacrificing Long Term Performance", which was completed recently. The objectives of this project were to, assess whether activities necessary to attain some high level of smoothness can cause detrimental effects on concrete performance, and to provide guidance on adjustments to materials and procedures in order to avoid such detrimental effects.
- Innovative Pavement Research Foundation Project "Best Practices for Airport Pavement Construction." A document describing the Best Practices for Airport Pavement Construction was prepared for this project.
- National Highway Institute Course, Pavement Smoothness: Use of Inertial Profilers for Construction Acceptance. Dr. Kohn participated in the development of the course material for this course. He currently serves as an instructor of this course.
- NCHRP Project 20-50 (08/13): LTPP Data Analysis: Factors Affecting Pavement Smoothness. Dr. Kohn served as the principal investigator for this project. In this research project, the data available in the LTPP Information Management System (IMS) was used to determine the effect of factors such as design and rehabilitation parameters, climatic conditions, traffic levels, material properties, and extent and severity of distress that cause changes in pavement smoothness, and to quantify the contribution of these factors to pavement smoothness.
- NCHRP Project 20-51 (01): Workshop on Pavement Smoothness. Dr. Kohn served as the principal investigator for this project. The objective of this project was to organize and convene a national workshop that would advance the state of practice and knowledge of pavement smoothness. A document that describes the current state of knowledge on Pavement Smoothness Measurement and Analysis was prepared as a part of the project. After the completion of the workshop, a report describing the proceedings of the workshop was prepared.

- Investigation of Development of Pavement Roughness: Dr. Kohn served as the principal investigator for this project. The data collected for the Long Term Pavement Performance study were analyzed to determine trends in roughness development in pavements. Data collected on rehabilitated asphalt concrete and portland cement concrete pavements were analyzed to determine roughness development in rehabilitated pavements. Models for predicting the development of roughness were developed as a part of this study.
- Guidelines for Longitudinal Profile Measurements (NCHRP Project 10-47): Dr. Kohn served as the co-principal investigator for this project. The factors that affect longitudinal profile data collection such as profiling equipment, pavement shape, environmental conditions, profiler operation and profiler operator were studied to identify their effect on profile data collection. Based on the research from this study an Operational Guidelines for Profile Measurements was prepared.
- Analysis of Road Profiler User Group Data, 1993-1994: Analyzed data collected by thirty-five road profilers at four regional calibration sites in 1993 to compare the results obtained by the profilers. The results of the analysis were presented at the Fifth Road Profiler User Group Meeting in Harrisburg, Pennsylvania in October 1993.
- Development of the pavement condition index for airfield pavements and roads and streets for the Army Corps of Engineers. This project involved evaluation of hundreds of pavement sections across the country. In the late 1980's, the method was modified to include porous friction surfaces which required evaluation of European pavements.
- Project manager for an evaluation of pavement management systems for eight communities in the Grand Rapids area for the Grand Valley Metropolitan Council (GVMC). The Grand Rapids and Environs Transportation Study (GRETS) needs analysis involved a state-of-the-art review of existing pavement management systems, development and execution of a questionnaire surveying the needs of each community, a prioritized summary of concerns and needs, and final recommendations to implement the Micro-PAVER System.
- Evaluation of the FAA design procedures for High Volume Traffic Pavements. Dr. Kohn was the principal investigator on the 2 million dollar research project. The project required evaluation of several pavement section at the major airports located throughout the country. Evaluation at each location covered destructive testing, nondestructive testing, collection of construction information, and present condition information on each pavement section.
- Senior Engineer for the North Central Region of the Strategic Highway Research Program as part of the LTPP program. This project requires interaction with SHA engineers to locate general pavement section and special pavement section for evaluating specialized rehabilitation and maintenance techniques. This project has provided an insight into the SHA operating procedures and allowed the project team to observe pavement performance throughout the Midwest. Dr. Kohn is responsible for the coordination of the engineers in the eastern portion of the region. He has evaluated the variability of the SHRP profilometers and has been involved in the evaluation of the SHRP methodologies for collection of nondestructive testing deflection data.



- He has been the project manager for pavement evaluation in the Dominican Republic which involved materials testing and NDT of 300 lane kilometers of major highway, and for evaluation of 3.5 million s.f. of apron pavement at Detroit Metropolitan Airport.
- Commercial and Industrial projects which have employed pavement management, NDT, and actual construction management services number in the hundreds.

❖ **Papers - Primary Author:**

- Development of a Design Procedure for Rigid Pavements with Stabilized Bases, Fourth International Conference on Concrete Pavement Design, Lafayette, IN, April 1989.
- Performance of Rigid Airfield Pavement Subjected to High Traffic Volumes, Third International Conference on Concrete Pavement Design, Lafayette, Indiana, April 1985.
- Economic Analysis of Field Implementing the PAVER Pavement Management System, Transportation Research Record 846, 1982 (with M. Y. Shahin).
- Structural Design of Composite Concrete Pavement, Second International Conference of Concrete Pavement Design, Indianapolis, Indiana, April 1981 (with M.I. Darter).

❖ **Co-Author**

- R.W. Perera and S.D. Kohn. Ride Quality Performance of Asphalt Concrete Pavements Subjected to Different Rehabilitation Strategies, 2006 Transportation & Development Institute Airfield and Highway Pavement Specialty Conference, Atlanta, Georgia, 2006.
- R.W. Perera and S.D. Kohn. Roughness Trends of Jointed Concrete Pavements – Analysis of Data from the LTPP GPS-3 Experiment, 5th Symposium on Pavement Surface Characteristics, Toronto, 2004.
- R.W. Perera, and S.D. Kohn. Effects of Variation in Quarter Car Simulation Speed on International Roughness Index Algorithm, Transportation Research Record 1889, Transportation Research Board, 2004.
- R.W. Perera and S.D. Kohn, Roughness Trends of Jointed Concrete Pavements – Analysis of Data from the LTPP GPS-3 Experiment, Proceedings 5th Symposium on Pavement Surface Characteristics, Toronto, 2004.
- Cumulative Traffic Prediction Method for Long-Term Pavement Performance Models, The Transportation Research Record, 2003, (with C. Byrum).
- R.W. Perera and S.D. Kohn. Profiling Errors and How to Avoid Them, Proceedings Pavement Evaluation 2002, Roanoke, Virginia, October 2002.
- R.W. Perera, and S.D. Kohn. International Roughness Index of Asphalt Concrete Overlays: Analysis of Data from Long Term Pavement Performance Program SPS-5 Projects, Transportation Research Record 1655, Transportation Research Board, 1999.
- R.W. Perera, C. Byrum and S.D. Kohn, Roughness Characteristics of GPS Flexible Pavements in the LTPP Program, Eighth International Conference on Asphalt Pavements, Seattle, Washington, August 1997.
- R.W. Perera, S.D. Kohn, and S. Bemanian, Comparison of Road Profilers, Transportation Research Record, 1536, Transportation Research Board, 1996.
- R.W. Perera, S.D. Kohn and J.E. Naughton, Correlations Between Flexural Strength and Other Strength Parameters of Concrete, American Society of Civil Engineers, Transportation Congress, San Diego, California, 1995.

- R.W. Perera, C.A. Gemayel, and S.D. Kohn, Use of Nondestructive Testing in Evaluating Composite Pavements, 4th International Conference on Bearing Capacity of Roads and Airfields, Minneapolis, Minnesota, 1994.
- R.W. Perera, S.D. Kohn and C.A. Richter, Comparative Testing of Profilometers, Transportation Research Record No. 1435, Transportation Research Board, 1994.
- Nondestructive Testing Techniques and Evaluation Procedures for Airfield Pavements, ASTM First International Symposium on Nondestructive Testing of Pavements and Backcalculation of Moduli, Baltimore, Maryland, June 1988 (with Alexander and Grogan).
- Evaluation of FAA Design Procedures for High Traffic Volume Pavements, DOT/FAA.PM-84, U. S. Department of Transportation, FAA, Washington, DC, October 1985.
- Rigid Airfield Pavement Distress Prediction, Miscellaneous Paper GI-85-28, Geotechnical Laboratory, Dept. of the Army, Waterways Experiment Station, Corps of Engineers, Vicksburg, MS, Final Report November 1985.
- Evaluation of the Pavement Condition Index for Use on Porous Friction Surfaces, U. S. Army Corps of Engineering, CERL, RE-17351, July, 1984.
- Development of a Data Structure for Storing Nondestructive Test Data, TRB, 1984 (with M. Y. Shahin, D. D. Davis).
- Prediction of Pavement Performance Using Nondestructive Test Results, TRB, 1983 (with D.E. O'Brien, III, M.Y. Shahin).
- Airfield Pavement Performance Prediction and Determination of Rehabilitation Needs, Fifth International Conference on the Structural Design of Asphalt Pavements, Volume I, pp 637-652, Delft, The Netherlands, 1982 (with M. Y. Shahin).
- Overview of the PAVER Pavement Management System, Transportation Research Record 846, 1982 (with M.Y. Shahin).
- Optimization of a Joint-Slab-Sealant System, Work Congress on Joint Seals and Bearings, ACE publication SP-70, Volume I, September 1981 (with E. Tons).
- Conditions Evaluation of Jointed Concrete Pavements, A.S.C.E. Transportation Journal, TEI, July 1980 (with M.Y. Shahin, M.I. Darter).
- Evaluation of Airfields Pavement Condition and Determination of Rehabilitation Needs, TRB 700, 1979 (with M. Y. Shahin, M. I. Darter).
- Condition Evaluation of Asphalt Surfaced Airfield Pavements, Association of Asphalt Paving Technologists, Volume 47, 1978 (with M. Y. Shahin, M. I. Darter).
- Development of a Pavement Maintenance Management System, Volume I, Airfield Pavement Condition Rating, AFCEC-TR-76-27, 1976 (with M. Y. Shahin, M. I. Darter).
- Development of a Pavement Maintenance Management System, Volume II, Airfield Pavement Distress Identification Manual, AFCEC-TR-76-21, 1976 (with M. Y. Shahin, M. I. Darter).
- Development of a Pavement Maintenance Management System, Volume III, Maintenance and Repair Guidelines for Airfield Pavements, CEEDO-TR-77-44, 1977 (with M. Y. Shahin, M. I. Darter).

Jason Schwartzberger, PE
Project Engineer (SME)

- ❖ **Career History:** SME since 1997
- ❖ **Education:** B.S., Civil Engineering, University of Michigan
- ❖ **Registration:** Professional Engineer (PE) – Michigan
- ❖ **Certifications:** Certified Nuclear Density Meter Operator - Troxler
- ❖ **Affiliations:** ASCE, Michigan Section, Ann Arbor Branch

Project engineer on pavement related projects, including pavement management, destructive and nondestructive testing. Responsibilities include coordinating and performing field sampling, and laboratory testing of materials and evaluation of data collected. Experienced in a wide variety of construction projects and geotechnical investigations.

❖ **Professional Qualifications:**

- Experienced in pavement design, management, and evaluation.
- Experienced in state-of-the-art nondestructive pavement testing and field analyses.
- Knowledgeable in geotechnical and materials sampling and laboratory testing.
- Experienced in design, construction, and inspection of shallow and deep foundations and earthwork operations, and earth retention systems.

❖ **Representative Project Experience:**

- Project Engineer for a multi-year multi-service contract with the Wayne County Airport Authority. Under this contract SME has worked on the new sixth runway project, the midfield terminal, the new de-icing pad building, and various construction projects at the airport.
- Leader of pavement inspection team for performing pavement condition surveys at various airports in Michigan in 1999 and 2002. Twenty nine airports inspected in 1999 and 19 airports inspected in 2002.
- Leader of pavement inspection team for performing pavement condition surveys on 350 miles of roadway annually for Grand Valley Metropolitan Council.
- Project Engineer for the Pavement Management System (PMS) at the Capital City Airport in Lansing, Michigan. Project involved surveying the airfield pavements to update the PMS database. Duties include project management, training of field staff, supervision of data collection, and performing quality control checks on the collected data.
- Project Engineer for the pavement evaluation of the rehabilitation of the 7,000-foot-long main runway at Chippewa County International Airport in Kinross, Michigan. Project also includes rehabilitation of the main apron. Duties included coordinating

and supervising distress survey, sampling of the existing pavement and preparation of engineering report with recommendations for pavement rehabilitation.

- Project Engineer for the pavement/geotechnical evaluation of the rehabilitation of the 9,000-foot-long main runway at Selfridge Air National Guard Base in Mount Clemens, Michigan. Project also includes constructing overruns and construction of two turn-around taxiways at the end of the runway. Duties included coordinating field sampling and laboratory testing, and preparation of engineering report with recommendations for pavement rehabilitation.
- Project Engineer for pavement rehabilitation projects at Auto Alliance plant in Flat Rock, Laurel Park Place Mall in Livonia, Oakland University in Rochester, University of Michigan-Dearborn in Dearborn, and Selfridge ANG Base in Mt. Clemens, Michigan; Wright-Patterson ANG Base in Dayton, Ohio; and over 40 sites for Ford Land in Dearborn and Livonia, Michigan and numerous parking lots and roads in the Metro area. These projects typically include distress surveys, sampling of the existing pavement and subgrade, non-destructive testing using a Falling Weight Deflectometer (FWD), providing pavement rehabilitation recommendations, and in some cases developing of plans and specifications and monitoring of construction activities.

Rohan Perera, PhD

Project Engineer (SME)

Responsibilities include analysis of data from inertial profilers, designing new pavement systems, evaluating and analyzing pavements using falling weight deflectometer (FWD) data, development of pavement management systems, and statistical analysis of data.

❖ **Career History:** SME since 1991 - Other Firms from 1981

❖ **Education:** B.S., Civil Engineering, University of Moratuwa, Sri Lanka
M.S., Civil Engineering, Asian Institute of Technology, Thailand
Ph.D., Civil Engineering, Arizona State University, Tempe, Arizona

❖ **Registration:** Professional Engineer - Ohio

❖ **Affiliations:** American Society of Civil Engineers

❖ **Professional Qualifications:**

- Experienced in analysis of data from road profilers.
- Experienced in pavement design and pavement evaluation of highway and airfield pavements.
- Proficient in nondestructive evaluation of pavements.
- Experienced in development of pavement management systems.
- Expert in statistical analysis of data and development of computer programs for data analysis.

❖ **Project Experience:**

- Project Engineer for the development of a Pavement Management system for the City of Dearborn. Over 300 miles of city streets, and parking lots covering an area of 3 million sq. ft, were surveyed during the condition survey. The distress data were entered into the Paver pavement management system, and reports summarizing current and future pavement conditions were generated.
- Project Engineer for the development of a Pavement Management system for the Grand Valley Metro Council. A paver database was developed for this project. The length of roads in the pavement management system (PMS) was 1050 centerline miles. SME established the PMS 1996-1997. After that, SME has been performing pavement condition surveys on a third of the network each year.
- Project Engineer for conversion of City of Ann Arbor Pavement Management system to Paver 4.2. The existing pavement management system for the city of Ann Arbor was based on a system that was developed by the city. The data contained in the database was converted to Paver 4.2 system.

- Project engineer for performing pavement condition surveys at various airports in Michigan from 1992 to 2002 under four separate contracts. The contract year and the number of airports inspected are: 1992/93 – 28, 1996 – 31, 1999 – 29, and 2002 – 19.
- Project Engineer for the development of pavement management systems for the Maxwell Air Force Base, and the Alabama and Detroit Metropolitan Airports.
- Analyzed data from FWD tests to evaluate pavement conditions at numerous airports. Projects include Detroit Metropolitan Airport, Capital City Airport, Lansing; Midway Airport and O'Hare Airport, Chicago; Nashville International Airport, Kalamazoo airport and Port Huron Airport.
- Co-Principal Investigator for National Cooperative Highway Research Program (NCHRP) Project, Workshop on Pavement Smoothness. A report summarizing information on pavement smoothness related issues was prepared and submitted to the NCHRP. The report described the state of knowledge and practice pertaining to measuring equipment, data analysis, applications and specifications.
- Development of National Highway Institute course on "Pavement Smoothness: Factors Affecting Inertial Profiler Measurements Used for Construction Quality Control". Currently serves as an instructor for this course.
- Co-Principal Investigator for NCHRP Project, Factors Affecting Pavement Smoothness. This data collected for the Long Term Pavement Performance Program (LTPP) was analyzed in this project to identify factors causing short term and long-term changes in pavement smoothness.
- Project Engineer for NCHRP Project 10-47, Guidelines for Longitudinal Pavement Profile Measurements. The research work performed for this project was published in NCHRP Report 434 and in NCHRP Research Result Digest 244. These reports provide guidelines for factors to be considered when collecting longitudinal profile data on pavements using inertial profilers. The reports provide details on factors that affect roughness measurements, and the quantification of the effect of these factors on repeatability and accuracy.
- Evaluation of 90 miles of haul routes in Washtenaw County using data from the falling weight deflectometer (FWD) to determine the structural capacity of the pavements. The results from the FWD data analysis were used to determine overlay thicknesses.
- Evaluation of pavement condition at Ford Test Track in Romeo, Michigan and Bosch Test Track in Indiana using data from FWD testing and profile testing.
- Co-principal investigator for the Investigation of Development of Pavement Roughness project that analyzed roughness data collected for the LTPP Program. The patterns of roughness development were investigated for specific pavement types, and factors affecting roughness development were identified. The results of this research study were published in FHWA Publication FHWA-RD-97-147.
- Evaluation of fifteen miles of roadway in City of Marlette using pavement condition data, FWD data, and ground penetrating radar data. A prioritized scheme for pavement rehabilitation was developed.



❖ Papers:

Primary Author

- R.W. Perera, S.D. Kohn and C.A. Richter, Comparative Testing of Profilometers, Transportation Research Record No. 1435, Transportation Research Board, 1994.
- R.W. Perera, C.A. Gemayel, and S.D. Kohn, Use of Nondestructive Testing in Evaluating Composite Pavements, 4th International Conference on Bearing Capacity of Roads and Airfields, Minneapolis, Minnesota, 1994.
- R.W. Perera, S.D. Kohn and J.E. Naughton, Correlations Between Flexural Strength and Other Strength Parameters of Concrete, American Society of Civil Engineers, Transportation Congress, San Diego, California, 1995.
- R. W. Perera, S.D. Kohn, and S. Bemanian, Comparison of Road Profilers, Transportation Research Record, 1536, Transportation Research Board, 1996.
- R.W. Perera, C. Byrum and S.D. Kohn, Roughness Characteristics of GPS Flexible Pavements in the LTPP Program, Eighth International Conference on Asphalt Pavements, Seattle, Washington, August 1997.
- R.W. Perera, C. Byrum and S.D. Kohn. International Roughness Index of Asphalt Concrete Overlays: Analysis of Data from Long Term Pavement Performance Program SPS-5 Projects, Transportation Research Record 1655, Transportation Research Board, 1999.
- R.W. Perera and S.D. Kohn. Profiling Errors and How to Avoid Them, Proceedings Pavement Evaluation 2002, Roanoke, Virginia, October 2002.
- R.W. Perera, and S.D. Kohn. Effects of Variation in Quarter Car Simulation Speed on International Roughness Index Algorithm, Transportation Research Record 1889, Transportation Research Board, 2004.
- R.W. Perera and S.D. Kohn, Roughness Trends of Jointed Concrete Pavements – Analysis of Data from the LTPP GPS-3 Experiment, Proceedings 5th Symposium on Pavement Surface Characteristics, Toronto, 2004.

Co-Author

- J.P. Zaniewski, R.W. Perera and M.S. Mamlouk, Feedback of Pavement Management Performance Data for Pavement Design, Transportation Research Record No. 1272, Transportation Research Board, Washington, D.C., 1990.

- S. Houston and R. Perera, Impact of Natural Site Variability on Nondestructive Test Deflection Basins, *Journal of Transportation Engineering*, Vol 117, No. 5, September/October 1991.
- W.N. Houston, M.S. Mamlouk and R.W. Perera, Laboratory Versus Non-destructive Testing for Pavement Design, *Journal of Transportation Engineering*, Vol. 118, No. 2, March/April 1992.
- T.D. Gillespie, S.M. Karamihas, S.D. Kohn and R.W. Perera. Diurnal Changes in Profile of Eleven Jointed PCC Pavements, 7th International Conference on Concrete Pavements, Proceedings Volume 1, September 2001.

REPORTS

- R.W Perera, C. Byrum and S.D. Kohn, Investigation of Development of Pavement Roughness, FHWA-RD-97-147, Federal Highway Administration, McLean, Virginia, 1998.
- S.M. Karamihas, T.D. Gillespie, R.W. Perera and S.D. Kohn, Guidelines for Longitudinal Pavement Profile Measurement, NCHRP Report 434, Transportation Research Board, National Research Council, 1999.
- S.M. Karamihas, T.D. Gillespie, R.W. Perera and S.D. Kohn, Operational Guidelines for Longitudinal Pavement Profile Measurement, Research Result Digest, National Cooperative Highway Research Program, Number 244, November 1999.
- R.W. Perera and S.D. Kohn, Comparison of SHRP Profilometers, Report No. SHRP-P-639, Strategic Highway Research Program, National Research Council, 1993.
- R.W. Perera and S.D. Kohn, LTPP Data Analysis: Factors Affecting Pavement Smoothness, Final Report, National Cooperative Highway Research Program, Web Document 40, Washington DC, 2001.
- R.W. Perera and S.D. Kohn, Pavement Smoothness Measurement and Analysis: State of the Knowledge, National cooperative Highway Research Program, Web Document 42, Washington DC, 2001.



Jim Snell – Senior Transportation Planner
Grand Valley Metropolitan Council

Relevant Experience

- 21 years experience in transportation planning and asset management
- 14 years experience managing the GVMC Asset Management Program
- Lead staff person for Pavement Management for GVMC since its inception in 1995.
- Trained and certified by the Michigan Asset Management Council in collecting and processing PASER data using Roadsoft.
- Annually completes automated survey and data processing for numerous public entities totaling in excess of 2,500 miles annually.
- Proficient in the use of numerous GIS software programs.

Darrell Robinson – Transportation Planner

Grand Valley Metropolitan Council

- 15 years experience in transportation planning and asset management
- 5 years experience collecting and processing PASER data on all types of roadways in Michigan.
- Has coordinated regional PASER data collection since program began in 2004.
- Trained and certified by the Michigan Asset Management Council in collecting and processing PASER data using Roadsoft.
- Assists during automated survey and data processing for numerous public entities totaling in excess of 2,500 miles annually.
- Proficient in the use of Roadsoft and the Laptop Data Collector.

APPENDIX B – FEE SCHEDULE



FEE SCHEDULE PERSONNEL AND EXPENSES

PERSONNEL

Technician I.....	Per Hour	40.00
Technician II	Per Hour	48.00
Technician III	Per Hour	55.00
Technician IV, NDT Technician	Per Hour	65.00

Minimum 4 Hours Per Day for Technicians

Field Engineer/Geologist.....	Per Hour	70.00
Staff Engineer/Geologist, Materials Specialist, Environmental Specialist.....	Per Hour	80.00
Senior Engineer/Geologist, Senior Materials Specialist, Senior Environmental Specialist	Per Hour	95.00
Project Engineer/Consultant, Materials Consultant.....	Per Hour	110.00
Senior Project Engineer/Consultant, Project Manager	Per Hour	135.00
Senior Consultant, Senior Project Manager, Certified Industrial Hygienist.....	Per Hour	155.00
Principal Consultant	Per Hour	185.00
Laboratory Technician	Per Hour	65.00
CAD	Per Hour	75.00
Drafter	Per Hour	60.00
Log Processor.....	Per Hour	55.00
Word Processing, Administrative Assistant	Per Hour	48.00
Communication Fee (Postage, Shipping, Faxes, Cell Phones, etc)	3% of Personnel Fees	

Expert Testimony and Depositions (including preparation time)..... Premium of 50% added to hourly rate

Overtime rate (Applies to all work in excess of 8 hours per day, before 8:00 am or after 5:00 pm Monday through Friday or anytime Saturday, Sunday, or Holiday)..... Standard Rate x 1.5

TRANSPORTATION AND EXPENSES

Transportation Charge, SME or Private Vehicle.....	Per Mile	0.65
Lodging, Subsistence, Out-of-town Travel	At Cost + 20%	
Subcontract Expenses, Equipment Rental	At Cost + 20%	
Direct Expenses (Film, Photos, Prints, Permits, Maps, etc)	At Cost + 20%	
Extra Copies of Report (normal distribution is 3 copies)	Per Copy	50.00
Blueprints	Per Sheet.....	2.00
Blueprint Sepia	Per Sheet.....	20.00
Other Services including Drilling, Special Equipment use, and Special Laboratory Testing	See Appropriate Fee Schedule	

Other services not listed will be provided upon request

GENERAL NOTES

1. Hourly rates will be charged for time spent in the interest of the project, in preparation of reports, as well as travel time to and from the job site. Fees for laboratory tests include reporting of routine results without comments, recommendations or conclusions. Discussion, interpretation, and consultation are charged at appropriate hourly rates.
2. SME representatives may provide observation and field-testing. The scope of services does not include job or site safety, supervision, or direction of the actual work of the contractor. The presence of SME on the job site should not be construed to relieve the contractor in any way of his obligations and responsibilities under the construction contract.
3. SME General Conditions govern all the work performed.

