PURCHASING ITEM
FOR
COUNCIL AGENDA
MEMO NO. ST09-015

1. Agenda Item Number: 41

2. Council Meeting Date: February 12, 2009

TO: **MAYOR & COUNCIL**

THROUGH: **CITY MANAGER**

3. Date Prepared: January 7, 2009

4. Requesting Department: Public Works

5. SUBJECT: Approve Sole Source purchase for data collection and process services for RoadMatrix Software with Stantec Consulting in an amount not to exceed $107,500.00.

6. RECOMMENDATION: Recommend approving Sole Source purchase for data collection and process services for RoadMatrix Software with Stantec Consulting in an amount not to exceed $107,500.00.

7. BACKGROUND/DISCUSSION: RoadMatrix is a software program that is used to store, analyze, monitor and report data on the City street infrastructure. Stantec is the originator of the RoadMatrix program and this contract would authorize Stantec Consulting Inc. to collect, update, process and download the new data onto our system. Over fifteen distresses of road pavement and expert technical data are electronically collected and processed into the RoadMatrix. This updated information along with additional training will be used to help evaluate, project and schedule street maintenance projects.

8. EVALUATION PROCESS: The City of Chandler Street Divison is requesting to use Stantec Consulting Inc. for sole source data collection of condition and distress on City streets to update the pavement management system, RoadMatrix. RoadMatrix, a Stantec product is protected under a copyright patent only Stantec can work within the software. If problems occur in the collection and download of the data, Stantec can assume all responsibility for problems incurred in the data collection and make the necessary corrections.

This data collected will be used to budget and project future work on Chandler streets. Overall pavement quality index is compiled from the 15 distresses that are collected in tandem with the ride quality.

9. FINANCIAL IMPLICATIONS:

Cost: $107,500
Savings: N/A
Long Term Savings: N/A
Fund Source:

Acct No.:	Fund Name:	Program Name:	CIP:	Amount:
01.3300.0000.6513	General Fund	Street Maintenance	N/A	$107,500

10. PROPOSED MOTION: Move to approve Sole Source purchase for data collection and process services for RoadMatrix Software with Stantec Consulting in an amount not to exceed $107,500.00.

APPROVALS

11. Requesting Department
Daniel W. Cook, Deputy Public Works Director

12. Department Head
R.J. Zeder, Public Works Director

13. Procurement Officer
Sharon Brause, CPPB, CPCP

14. City Manager
W. Mark Pentz

Chandler · Arizona
Where Values Make The Difference

Request for Sole Source

TO: PURCHASING OFFICE DATE: **12-17-2008**

FM: **Rex Hartmann** PHONE NO. : **3493**
Name of Requester

Street Division
Name of Division/Department

SUB: Sole Source Request for the Purchase Of: **Data Collection & Process Services for RoadMatrix Software**

REQUESTED SUPPLIER: **Stantec Consulting**
SUPPLIER'S ADDRESS: **8211 S. 48th Street Phoenix, Az. 85044**
CONTACT: **Fred Stephenson** PHONE: **602-707-4602** COST ESTIMATE $ **107,500**

STATEMENT OF NEED:

This recommendation for sole source is based upon an objective review of the product/service being required and appears to be in the best interest of the City. I know of no conflict of interest on my part or involved in any way with this request. No gratuities, favors or compromising action have taken place. Neither has my personal familiarity with particular brands, types of equipment, materials or firms been a deciding influence on my request to sole source this purchase when there are other known suppliers to exist.

Refer to the attached sole source justification as prepared by our (user) department, to the attached review of available products/services and to my (user department's) completed Purchase Requisition.

SIGNATURE OF REQUESTER:

C. Rex Hartmann DATE: 12/18/08

SIGNATURE OF REQUESTING DIVISION HEAD:

R A Brennan DATE: 12-18-08

APPROVAL OF DEPARTMENT DIRECTOR OR ASSISTANT DIRECTOR:

David W Ode DATE: 12-19-08

JUSTIFICATION FOR SOLE SOURCE: (Describe the unique nature of the product or service, what efforts were made to locate other sources, any market testing and research results, any other information that may help evaluate the request for sole source. Attach documents as appropriate to this request.)

The City of Chandler Street Divison is requesting to use Stantec for data collection on City streets to update the pavement management system that we use - RoadMatrix a Stantec product.

Accuracy of data entry and corrolation with the RoadMatrix system is vital to this data collection process. Information will be collected on the condition of approximately 900 centerline miles of roadway including collection of distresses and severity and extent of distress. Collection of this information is only a portion of the project which includes the data being processed, downloaded into the program and quality assurance. Some new training of staff in using the RoadMatrix system is also part of this request. Re-setting of maintenance districts, re-evaluation of traffic counts, adjustment of inflation rates and classification weighting are necessary in conjunction with ongoing Stantec technical support.

Because the RoadMatrix system is protected under a copyright patent only Stantec can work within the software If problems occur in the collection and download of the data, Stantec can assume all responsibility for problems incurred in the data collection and make the necessary corrections.

PURCHASING COMMENTS:

PURCHASING APPROVALS:

BUYER: [signature] DATE: _____

PURCHASING & MATERIAL MGR: Robert Comby DATE: 12-23-08

TO BE COMPLETED BY REQUESTING DEPARTMENT AND SUBMITTED TO PURCHASING
(PLEASE TYPE)

Stantec Consulting Inc.
8211 South 48th Street
Phoenix AZ 85044
Tel: (602) 438-2200
Fax: (602) 431-9562

Stantec

December 18, 2008
File: 1832-99000

City of Chandler
Department of Public Works – Street Division

Attention: **Rex Hartmann, Street Division Coordinator**

Reference: **2009 Pavement Management System Update**

Stantec Consulting Inc. is pleased to provide the following quotation for the update of the City's RoadMatrix pavement management system. This project would primarily include the collection of pavement condition (surface distress and roughness) data on the entire city road network. The pavement condition data was last updated in 2006.

The project would also include RoadMatrix database services to review and update information such as new road segments added to the network since the last survey, any re-alignment of maintenance districts, traffic counts, maintenance and rehabilitation strategies and associated unit rates, and work history.

In addition Stantec would provide the City with RoadMatrix training for select City staff, as well as an engineering review of the models (deterioration and priority models, and decision trees) and analysis results within the application.

EQUIPMENT AND METHODOLOGY

Stantec owns and operates a fleet of RT3000 units that simultaneously collect pavement condition, GPS, and digital image data streams. Stantec's RT3000 data collection vehicle will be used to complete both the surface condition and roughness data components of this project.

As an option to the City, the RT3000 may be used to collect a digital imagery inventory of the City's road network.

Surface Distress

Stantec utilizes a semi-automatic process where visual distress evaluations are recorded real-time on an event keyboard while the RT3000 traverses the road network. The technique is a well-established visual pattern recognition process that has been shown to provide accurate and repeatable condition assessments. Stantec's proprietary distress keyboard rating system allows our field technicians to enter individual distress conditions into the on-board system. This approach allows the field technicians to traverse the City roads at posted speeds (up to 50miles/hr) without impeding traffic flow.

Each surface distress is evaluated on the basis of two components: severity and extent. Severity is defined as 'How bad is the defect?' in terms of the width or degree of wear associated with the condition. An example of a severity measurement includes the width of a crack. The second component evaluates the extent or 'How

much is there?' in terms of the quantity of the surface the distress covers. Examples of measures used for extent would include the number or length of transverse cracks, length of longitudinal cracking or the pavement area affected by alligator cracking. For this project, the integrated keyboards will be used to log the various distresses in accordance with AASHTO guidelines. For flexible pavements this includes:

FLEXIBLE PAVEMENTS	RIGID PAVEMENTS
• Patching	• Patching
• Rippling & Shoving	• Scaling
• Ravelling/Streaking	• Ravelling & Weathering
• Flushing & Bleeding	• Polishing
• Distortion	• Distortion/Frost Heave
• Excessive Crown	• C&D Cracking
• Progressive Edge Cracking	• Coarse Aggregate Loss
• Alligator Cracking	• Potholes
• Potholes	• Joint Sealant Loss
• Block/Map Cracking	• Linear Cracking
• Longitudinal Cracking	• Transverse Cracking
• Transverse Cracking	• Joint Spalling
• Wheel Track Rutting	• Joint Faulting/Stepping

The location of each defect along the roadway or individual pavement section is logged automatically with a Distance Measuring Device (DMI), which is accurate to +/- **3ft per mile.** The post-processing of the real time data calculates the quantities of the defects based on the location of the keyboard entries and leaves the technicians to focus only on the identification of the distresses and severity levels. This is a significant improvement over the traditional 'windshield surveys' of the past, thereby providing high production rates and ensuring data integrity and repeatability.

Longitudinal Profile (Roughness)

Roughness data will be collected using a fully automated and certified Class I profilometer as per ASTM E950. The specialized profile measurement system, mounted on the front bumper of the RT 3000 survey vehicle, employs 3 different sensing devices;

1. A laser height sensor that measures the distance between the vehicle and the pavement surface while the vehicle is traveling at posted speeds.

2. An accelerometer that measures the vertical acceleration of the vehicle as it bounces in response to the pavement surface profile.

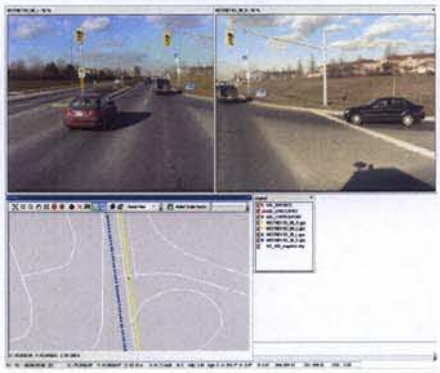
3. The DMI to provide a reference measurement of the vehicle as it traverses the road.

These three measurements are combined during post-processing to eliminate the effects of vertical vehicle motion of the vehicle and thereby defining the longitudinal profile of the pavement surface.

Roughness data is computed from this profile and expressed in terms of the standard International Roughness Index (IRI) in units of in/mile.

Digital Image Data Capture – (Optional)

Stantec owns and operates the latest Inertial GPS (IGPS) systems, digital video equipment, pavement condition analysis systems, and software available in the industry. These systems are ideal for both roadway geometric determinations and geo-referenced data extraction from digital video. By integrating high definition cameras and an Applanix POS/LV inertial navigation system on-board the RT 3000, Stantec can collect continuous GPS data coupled with quality images and accurate corresponding coordinate data.



Digital Video Systems

Stantec is extremely proactive in the use of digital image technology in the work that we carry out for State and Local agencies. We have found numerous uses and benefits for the images collected in real time in conjunction with our pavement evaluation services. We have enhanced the technology to incorporate the latest in cameras, filters, lens, and mounting hardware, to create one of the most comprehensive mobile data acquisition systems in North America.

Stantec collects digital imagery using 2 forward facing camera configurations and a Kronos video acquisition system. The camera configuration is comprised of high-resolution cameras (up to 1300 x 1030 dpi) that collect continuous digital images at a predefined interval (time or distance based), and stores the images in real time, to a portable hard drive system.

We have the ability to store the digital video in an AVI format (i.e. movie file) during field data collection, and extracting to an image format (i.e. JPG, TIF, etc.) during data processing. There are many uses for digital imagery across a Public Works organization or other City departments. Some of these include:

- Virtual field trip of all City streets
- Asset extraction to geo-locate many assets within the street ROW
- Legal/Liability claims
- Pre/post disaster conditions for FEMA
- Pre-engineering reviews

Deflection Testing – (Optional)

Another component to pavement condition evaluations is the determination of structural adequacy, the ability of the pavement structure, specifically the subgrade material, to handle the anticipated traffic loads. This is accomplished by means of a Dynaflect or Falling Weight Deflectometer (FWD) device. The Dynaflect and FWD are fully automatic, objective, and

non-destructive devices where pavement deflections are generated by oscillating static loads or variable falling weights.

Deflection measurements are derived using a series of sensors and transmitted directly to the truck's recording unit (sensor readings are temperature corrected prior to submission of the data). The results of these tests are used in conjunction with the subsurface data and traffic data to determine if the pavement is structurally adequate to support the anticipated loads over a given time period.

Deflection testing on low-traffic roads handling little or no commercial vehicle traffic may not be cost-effective, since such roads typically do not fail structurally. Deflection testing is typically limited to roadways where structural adequacy is more critical (i.e., high traffic roads and/or roads with a high percentage of commercial traffic). However, based on the results of the surface distress survey, those roads that exhibit moderate distress characteristics should also be considered as candidates for deflection analysis.

WORK PLAN

The following work plan details the various tasks involved in executing the project to achieve the desired results and satisfy the City's objectives.

The following is a list of the Tasks involved in this project:

Task 1: Project Management

This task provides for Project Initiation, Project Set-up and Mobilization in preparation for the fieldwork and project management throughout the duration of the project. Specifically these items include the following:

1. Project Initiation covers the administration of the contract and the provision of the insurance certificates;

2. Project Setup covers the preparation of the information the field survey crew requires prior to starting the field survey. This includes both electronic files, hard copy database listing and reference maps;

3. Project Management applies to the coordination and supervision of the entire project.

Within two weeks of receipt of the notice to proceed, a project initiation meeting will be held with the City's project team. The project initiation meeting will serve the following purpose;

- Introduce key staff and their roles for the project.
- Establish primary lines of communication.
- Agree upon scheduling requirements and possible constraints.
- Review pavement inventory and condition rating criteria and formats.
- QA/QC requirements and procedures.
- Review City supplied sources (GIS, Traffic, Unit Rates, Work History)
- Define project deliverables.

Task 2: Network Sectioning and Database Update

Since the last Pavement Management update in 2006, the road network maintained by the City has likely grown as a result of development or jurisdiction revisions. As a result, the RoadMatrix database should be updated to include these new road segments in the analysis. Stantec and the City would identify the most appropriate source of information, such as the GIS, to add the required street segments into the RoadMatrix database.

In addition to identifying the road segments to be added, it is necessary to ensure that the appropriate attributes of each road segment are populated. This includes such attributes as location, widths, traffic, pavement structure, curb, and drainage. Where this information is not readily available, Stantec would consult with the City at identifying appropriate default values to allow these roads to be analyzed fully within the system.

Other database updates would include network wide traffic counts, maintenance district alignments, unit rates and work history.

Task 3: SDI and RCI Data Collection

This task involves the field survey conducted by the RT3000 survey vehicle and crew. This survey includes the collection of 13 different surface distress and roughness condition data. From this data, the RoadMatrix system generates 3 indexes, Surface Distress Index (SDI), Ride Condition Index (RCI) and an overall Pavement Quality Index (PQI).

900 test miles of city streets has been estimated to accommodate new streets and any divided or multilane street sections that require return runs.

Task 4: Data QA/QC, Edit & Upload

This task provides for the effort required to: (1) review the collected data, (2) apply any edits, as noted in the survey crew's RT field log book, and (3) and upload the condition data into the Road Matrix software.

Task 5: System Training and Engineering Review

This task provides for 1 day of onsite RoadMatrix training for select City-staff that have not been trained on the application previously, or are in need of additional training. This training will focus on assisting staff to navigate around the software and be able to run analysis and generate reports.

In addition, Stantec will provide 2 days of onsite consulting services to review the engineering models and decision trees in the application. Stantec will assist the City in making any adjustments to the models while on site.

Reference: 2009 Pavement Management System Update

COMMERCIAL ARRANGEMENTS:

The following table represents the proposed commercial arrangements for the assignment. All pricing is exclusive of any City, State or Federal taxes, levies or duties.

Pavement Management System Update			
Task Decription		Unit Price	Task Cost
Task 1	Project Management	Lump Sum	$3,000
Task 2	Network Sectioning and Database Update	Lump Sum	$2,500
Task 3	Surface Distress and Roughness Condition Data Collection (Approx 900 survey miles)	$105/test mile	$94,500
Task 4	Data QA/QC, Editing and Upload to RoadMatrix	$5/test mile	$4,500
Task 5	RoadMatrix Training and Engineering Review	Lump Sum	$3,000
		Total:	$107,500

Optional Items:

Digital Video Collection.....$ 13,500
- Video collected in direction of pavement condition survey
- Provide digital images (jpg) at 15ft spacings and geo-referenced to City's GIS

Deflection Testing.....$15/ test
- Minimum 1000 tests
- Traffic control NOT included

If you have any questions, please do not hesitate to contact me at 602-438-2200, or via e-mail at fred.stephenson@stantec.com

Sincerely,

STANTEC CONSULTING INC.

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