



## CITY COUNCIL ACTION REPORT

April 5, 2007

TO: Phillip L. Nelson, City Manager

FROM: John M. Lamerato, Assistant City Manager/Finance & Administration  
 Brian P. Murphy, Assistant City Manager/Economic Development Services  
 Susan A. Leirstein, Purchasing Director *oal*  
 Timothy L. Richnak, Public Works Director *TR*  
 Gert Paraskevin, Information Technology Director *GP*  
 Steve Vandette, City Engineer *SV*

SUBJECT: Bid Waiver – Pavement Condition Assessment and Digital Video

### Background:

- As inter-regional competition for road maintenance dollars becomes greater, the role of a pavement management system is quickly becoming the preferred tool among road agencies to assess road conditions and compete for road dollars.
- Council approved the purchase and implementation of a complete Asset Management system including Pavement Management from Hansen Information Technologies in 2001. In order to use the Pavement Management software within Hansen, pavement condition data is required.
- Council approved a contract with Stantec in 2003 for data collection services of pavement condition, street signage inventory and digital video capture.
- Staff has been utilizing the 2003 Stantec data within the Hansen Pavement Management System software to determine major, local and industrial road maintenance needs for the previous two (2) budget years. Due to the age of the 2003 condition data and continuous deterioration of the roads, the 2003 data is outdated.
- The digital video portion of the work is referenced to the city's ESRI GIS centerline coverage to provide the city with the ability to view video for the associated road segments providing a visual image of the road surface and right-of-way.
- Stantec is under contract with the RCOC for pavement condition data collection on all County Roads.
- Stantec data is uniquely formatted for use with the city's Pavement Management System.
- Data and video will be collected on approximately 228 survey miles of city major and industrial roads in 2007.
- Data and video will be collected on approximately 126 survey miles of city local roads in 2008.
- Stantec's proposal for the video portion of the work is included for your reference.

### Financial Considerations:

- The estimated cost for Stantec to capture digital video of approximately 354 survey miles of city roads is \$41,555.00.

April 5, 2007

To: Philip L. Nelson, City Manager

Re: Bid Waiver – Pavement Condition Assessment and Digital Video

- The estimated cost for Stantec to collect pavement condition data is \$8,850.
- Stantec has agreed to extend the County's contract price of \$25/mile under a separate agreement with RCOC to be executed at a later date.
- Funds are included in the proposed 2007-08 Local Road fund, account number 401499.7989.150 for the video work by Stantec as well as the condition data collection under a future agreement with the RCOC.

Legal Considerations:

- Formal bidding procedures are waived, as no benefit would be derived from soliciting formal bids.

Policy Considerations:

- Minimize the cost and increase the efficiency and effectiveness of City government. (Goal II)
- Maintain relevance of public infrastructure to meet changing public needs. (Goal V)

Options:

- City Management is requesting a waiver of the formal bid process and authorizes Stantec Consulting Michigan, Inc. to provide pavement condition assessment data collection and capture of digital video of approximately 354 survey miles of city roads for an estimated total cost of \$41,555.00, at rates contained in the Stantec proposal dated April 2, 2007, File: 620-85000.



**Stantec**

April 2, 2007  
File: 620-85000

The City of Troy  
500 West Big Beaver Road  
Troy, MI 48084

**Attention: Mr. Alex Bellak**

**Reference: Pavement Condition Assessment and Capture of Digital Video**

#### **Pavement Condition Assessment**

The City of Troy is requesting that approximately 354 survey miles of City roads be surveyed to determine the overall condition and to record video images of these roads. The City of Troy will be taking advantage of the existing contract between Stantec Consulting (Stantec) and the Road Commission of Oakland County (RCOC) for the condition assessment which will be undertaken over 2007 and 2008. A separate agreement will be completed between Troy and RCOC for the Pavement Condition Assessment. This assessment will be completed in two separate years with Majors and Industrial road being surveyed in 2007 and Local roads being completed in 2008.

The condition survey consists of rating the City roads based on two parameters. These parameters are Roughness and Surface Distress.

For large scale data collection including pavement condition surveys Stantec uses its RT 3000 survey vehicle. The vehicle consists of the following sub-systems:

- Roughness measurement devices
- Real-Time Distress keyboard interfaces
- High Resolution Digital Cameras
- Real Time Differential Global Positioning System (GPS)
- Multiple Distance Measurement Units (DMI)
- On board digital storage and backup system
- On board real time monitoring systems

**Reference: Pavement Condition Assessment and Capture of Digital Video**

Roughness data will be collected using a certified Class I profilometer (ASTM E950) on the basis of longitudinal roughness profile measurements similar to the Surface Dynamics Profilometer concepts that are the universally accepted industry standard. These standards were mandated by the LTPP program of the US Federal Highways Strategic Highway Research Program (SHRP).

The profile measurement system on the RT 3000 survey vehicle employs 3 different sensing devices in each of the wheel tracks as follows:

1. A laser height sensor (32 kHz) that measures the distance between the vehicle and the pavement surface while the vehicle is traveling at up to posted speed.
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 transverses the road.

Operating software and post-processing software combine the three measurements, eliminating the effects of vertical vehicle motion and thereby defining the vertical profile of the pavement surface. The longitudinal roughness profile of each wheel track is obtained using an accelerometer and height sensor in each wheel track.

Roughness data is computed from this profile and expressed in terms of the standard International Roughness Index (IRI) expressed as in/mile. IRI measurements obtained by this system match those obtained from other valid Profilometers as well as IRI statistics from rod and level surveys. IRI will be measured in each wheel track separately. The IRI values will be supplied at 100 ft intervals.

Surface Distress conditions will be assessed based on the standard accepted by RCOC for the distress types for Roads. The surface distress data collected will be representative for up to 3 lanes of the road surface, however the IRI data will be for the traversed lane only. Any roads consisting of 4 or more lanes in any given direction will be surveyed in multiple or return passes and will be considered in the overall survey mileage to be collected. The City of Troy has identified separate segments for divided roads with boulevards. This results in no segments within the City inventory with more than 3 lanes.

**Hansen Upload**

The City is using Hansen's Version 7 Pavement Management System. During the previous data collection completed by Stantec for the City, modifications were required between the standard data collected for RCOC and the data to be used in the Hansen software. Based on discussions with the City this is no longer a requirement and the standard data collected for RCOC will be utilized in the Hansen software. This will require modifications to be made to the data upload process and the system configuration within Hansen. The modifications to the Hansen system configuration and the data upload will be the sole responsibility of the City.

**Reference: Pavement Condition Assessment and Capture of Digital Video**

### **Capture of Digital Video**

The survey mileage for the digital video capture will include the same mileage as in the pavement condition survey which is completed on both City and RCOC roads within the City limits. In addition, digital video will be required on all City roads in the City of Troy as well as the opposite direction for those two way roads within the City limits that contain 3 lanes or less. Only one direction will be surveyed on two way 3 lane or less roads in the original pavement condition survey. This will result in a total of 457 survey miles for the Digital Video. Since this will be completed in conjunction with the RCOC 2007 & 2008 data collection only half of the video collection will be completed or approximately 228 miles in 2007 and the remaining 229 miles will be collected in 2008.

The use of high definition digital video cameras (Sony DFW-SX910) mounted on the RT 3000 enables Stantec to provide quality images with a maximum output image size of 1280 x 960 pixels. With a combination of high definition cameras, and real time differential GPS (Global Positioning System) Stantec has the ability to collect quality images with accurate corresponding GPS data.

Creation of AVI files which contain all the images on the segment. An MS Access table will be provided identifying the files and the linkage to each Arc within the GIS database. The AVI files will be named based on the Segment ID and the direction of travel ("P" travel in plus direction from the start of the segment to the end of the segment; "M" travel in the minus direction from the end of the segment to the start of the segment). Stantec will provide the City with the AVI's extracted from the digital video on Hard Drive. The digital images will be split and referenced to the City's ESRI GIS centerline coverage to provide the City with the ability to view the video for the associated road segments.

Reference: Pavement Condition Assessment and Capture of Digital Video

**Proposed Fee for Service:**

**2007 Pavement Condition Assessment and Capture of Digital Video:**

<b>Description</b>	<b>Units</b>	<b>Unit Rates</b>	<b>Fee</b>
Pavement Condition Data Collection*	228 miles	N/A	N/A
Capture of Digital Video			
Project initiation and system configuration	-	Lump Sum	\$1,000
Digital video collected in conjunction with pavement condition survey on City and County Segments	228 est. survey miles	\$20.00/survey mile	\$4,560.00
Digital video collected on return runs for Segments with 3 lanes or less	0 est. survey miles	\$45.00/survey mile	\$0.00
Image (AVI) Files (delivered on Hard Drive) provided on a per Segment per Direction basis			
656 unique segments with video recorded in both directions	1,312 est. traces	\$4.00/trace	\$5,248.00
292 unique segments with video recorded in only one direction	292 est. traces	\$4.00/trace	\$1,168.00
<b>Total:</b>			<b>\$11,976</b>

\* This is a separate agreement between RCOC and the City of Troy

**2008 Pavement Condition Assessment and Capture of Digital Video:**

<b>Description</b>	<b>Units</b>	<b>Unit Rates</b>	<b>Fee</b>
Pavement Condition Data Collection*	126 miles	N/A	N/A
Capture of Digital Video			
Project initiation and system configuration	-	Lump Sum	\$3,000
Digital video collected in conjunction with pavement condition survey on City and County Segments	126 est. survey miles	\$20.00/survey mile	\$2,520
Digital video collected on return runs for Segments with 3 lanes or less	103 est. survey miles	\$45.00/survey mile	\$4,635
Image (AVI) Files (delivered on Hard Drive) provided on a per Segment per Direction basis			
2,394 unique segments with video linked in both directions	4,788 est. traces	\$4.00/trace	\$19,152
68 unique segments with video recorded in only one direction	68 est. traces	\$4.00/trace	\$272
<b>Total:</b>			<b>\$29,579</b>

\* This is a separate agreement between RCOC and the City of Troy

The above fees will remain valid for a period of 90 days from the date on this letter.

**Stantec**

April 2, 2007  
Mr. Alex Bellak  
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**Reference: Pavement Condition Assessment and Capture of Digital Video**

I look forward to working with you again through this Pavement Condition Assessment and Capture of Digital Video assignment. If you have any questions or comments please contact me

Sincerely,

**STANTEC CONSULTING MICHIGAN INC.**



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