

ADAMS COUNTY, COLORADO
FIRST ADDENDUM TO
SERVICE AGREEMENT

THIS FIRST ADDENDUM TO SERVICE AGREEMENT ("First Addendum") is entered into this 12th day of June, 2015, by and between the Board of County Commissioners of Adams County, Colorado, located at 4430 South Adams County Parkway, Brighton, CO 80601, and Cartegraph Systems Inc., located at 3600 Digital Drive, Dubuque, IA 52003, hereinafter referred to as the "Contractor."

RECITALS

WHEREAS, on August 26, 2014, the County entered into a Service Agreement with Cartegraph Systems, Inc. to provide transportation asset data collection services; and,

WHEREAS, the County and the Contractor mutually desire to renew the service agreement for the 2015 asset data collection services described in Attachment "A"; and,

WHEREAS, the term of the agreement expires on August 26, 2015; and,

WHEREAS, the County and the Contractor mutually desire to extend the Service Agreement through August 25, 2016.

NOW, THEREFORE, for the consideration set forth herein, the sufficiency of which is mutually acknowledged by the parties, the County and the Contractor agree as follows:

1. The County shall reimburse the Contractor for the work provided under this First Addendum in accordance with Section IV of the Service Agreement. Adams County will pay the Contractor for transportation asset data collection services in the amount of \$52,359.75.
2. The term of the Service Agreement is extended through August 25, 2016. The data collection services for 2015 will be completed by December 10, 2015.
3. The Service Agreement and this First Addendum contain the entire understanding of the parties hereto and neither it, nor the rights and obligations hereunder, may be changed, modified, or waived except by an instrument in writing that is signed by both parties. Any terms, conditions, or provisions of the Service Agreement that are not amended or modified by this First Addendum shall remain in full force and effect. In the event of any conflicts between the terms, conditions, or provisions of the Service Agreement and this First Addendum, the terms, conditions, and provisions of this First Addendum shall control.
4. The Recitals contained in this First Addendum are incorporated into the body hereof and accurately reflect the intent and agreement of the parties.
5. This First Addendum may be executed in multiple counterparts, each of which shall be deemed to be an original and all of which taken together shall constitute one and the same agreement.
6. Nothing expressed or implied in this First Addendum is intended or shall be construed to confer upon or to give to, any person other than the parties, any right,

remedy, or claim under or by reason of this First Addendum or any terms, conditions, or provisions hereof. All terms, conditions, and provisions in this First Addendum by and on behalf of the County and the Contractor shall be for the sole and exclusive benefit of the County and the Contractor.

7. If any provision of this First Addendum is determined to be unenforceable or invalid for any reason, the remainder of the First Addendum shall remain in effect, unless otherwise terminated in accordance with the terms contained in the Service Agreement.
8. Each party represents and warrants that it has the power and ability to enter into this First Addendum, to grant the rights granted herein, and to perform the duties and obligations herein described.

IN WITNESS WHEREOF, the County and the Contractor have caused their names to be affixed.

County Manager

Todd Leopold
Todd Leopold

6/12/15
Date

ATTEST:
STAN MARTIN
CLERK AND RECORDER

Approved as to form:

Deputy Clerk

W. East
Adams County Attorney's Office

Cartegraph Systems, Inc.

Randy L Skemp
Signature

6/11/2015
Date

Signed and sworn to before me on this 11th day of June, 2015 by

Randy L Skemp

Mary Jo Smock
Notary Public

My commission expires on: 8/5/17



Commission #
717753

CONTRACTOR'S CERTIFICATION OF COMPLIANCE

Pursuant to Colorado Revised Statute, § 8-17.5-101, et.seq., as amended 5/13/08, as a prerequisite to entering into a contract for services with Adams County, Colorado, the undersigned Contractor hereby certifies that at the time of this certification, Contractor does not knowingly employ or contract with an illegal alien who will perform work under the attached contract for services and that the Contractor will participate in the E-Verify Program or Department program, as those terms are defined in C.R.S. § 8-17.5-101, et. seq. in order to confirm the employment eligibility of all employees who are newly hired for employment to perform work under the attached contract for services.

CONTRACTOR:

Cartegraph Systems, Inc.
Company Name

6/11/2015
Date

Randy L. Skemp
Name (Print or Type)

Randy L. Skemp
Signature

VP of Sales
Title

Note: Registration for the E-Verify Program can be completed at: <https://www.vis-dhs.com/employerregistration>. It is recommended that employers review the sample "memorandum of understanding" available at the website prior to registering



3600 Digital Drive | Dubuque, Iowa 52003 | (800) 688-2656 | (563) 556-8120 | fax (563) 556-8149
Federal ID: 42-1419553

Software and Services Contract

Customer Bill To: Adams County 4430 S. Adams County Parkway Brighton, CO 80601 303-659-2120	Customer Ship To: Same
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Investment Summary

Cartegraph's proposed fees for this project are included in the summary below.

Date: May 15, 2015

Contract Expiration Date: June 30, 2015

Contract No: #C1505082

	Purchase Type	Qty.	Unit Price	Total Price
DATA SERVICES				
Data Collection Services Pavement Management Program	Fixed Fee Service	1	\$38,261.25	\$38,261.25
Data Collection Services -- Street-Level Mapping	Fixed Fee Service	1	\$9,100.00	\$9,100.00
Data Collection Services -- GIS Asset Inventory/Inspection	Fixed Fee Service	1	\$4,998.50	\$4,998.50
TOTAL COST				\$52,359.75

Not-to-Exceed Contract

Cartegraph will not exceed the total included in this Contract without written approval from Customer. In the event it becomes apparent to Cartegraph that additional service efforts will be needed due to any changes in the scope of this Contract, Cartegraph will notify Customer prior to exceeding the approved efforts and obtain written approval if additional software or services are required.

Data Services (Fee for Service)

Background / Project Approach / Work Plan Proposal Section 1

Current Situation

Adams County, Colorado is seeking a data collection event to continue support of the County Transportation Asset Management System (TAMS). This project includes a pavement condition assessment of approximately 325 lane miles of County maintained roads and the upload of all required data into the County's OMS database.

Project Challenges

- ✓ Provide annual pavement condition data collection for each specified road segment within Adams County's jurisdiction in order to provide objective up-to-date pavement management program results.
- ✓ Provide repeatable/ defensible surface condition assessment in accordance with ASTM standards, TAMS requirements, and Cartegraph program guidelines.
- ✓ Provide a solid quality assurance plan to ensure quality data and build client confidence.
- ✓ Upload all collected pavement condition data into the County's existing pavement management system, Cartegraph OMS, and run OCI calculations for future management and planning purposes.
- ✓ Provide street level Imagery in conjunction with the pavement survey.
- ✓ Provide Curb, Gutter, and Sidewalk data for each specified road segment within Adams County's jurisdiction

In conjunction with the RFP response for phase 1 of the project, Cartegraph will provide the following:

	Tasks	Miles	Price per Mile	Cost
1	IRI Data	325	\$7.14	\$2,320.50
2	Rut Data	325	\$7.53	\$2,447.25
3	Fauling Data	325	\$3.05	\$991.25
4	Cracking Data	325	\$56.14	\$18,245.50
5	Digital images on removable hard drives and CDOT-wide non-proprietary software. Includes Forward, Right, Left, and Rear facing right-of-way jpgs with GPS coordinate/hyperlink	325	\$28.00	\$9,100.00
6	GPS data	325	\$8.10	\$2,632.50
7	Horizontal Curvature	325	\$7.50	\$2,437.50
8	Grade Data	325	\$7.50	\$2,437.50
9	Shoulder Data	325	\$7.69	\$2,499.25
10	Curb, Gutter, Sidewalk data	325	\$15.38	\$4,998.50
11	PMP Program Optimizing (MR&R) Work Planning and Program Reports - (Pavement Preservation Plan (5- years)	Lump Sum		\$4,250.00
			Total	\$52,359.75

Project Assumptions

- ✓ Data collection scope is estimated at 325 miles, plus 8 CDOT Correlation Sites for quality control. If additional miles are required they will be billed at the rates above.
- ✓ One time mobilization is included in the scope
- ✓ Collection occurs at intervals of 10m or ~ 33 feet
- ✓ The scope incorporates at least 8 Project Progress meetings
- ✓ Project will be completed by December 10th, 2015
- ✓ All project services will be delivered remotely via web, audio, and/or video conferences.

Project Initiation

Upon project award/ issue of notice-to-proceed, the Cartegraph project manager will schedule a project initiation (kick-off) meeting in conjunction with Adams County project team. During this meeting, the entire team will review the proposed project work plan, including scope of work, QA/QC Plan, budget, schedule, and deliverables. The kick-off meeting will include:

- ✓ Introduction of the project team and their respective responsibilities.
- ✓ Review the work plan & schedule ~ milestone dates for data review, delivery & acceptance.
- ✓ Review the proposed Quality Management Plan (QMP) and expectations.
- ✓ Information Exchange – (gathering history, background, levels of service measures, decision-making framework, and all available data).
- ✓ Identification Adams County's best practices on pavement/ infrastructure asset management.

Progress Reports

These reports will summarize the project progress to-date and provide an update of the project progress and are typically generated bi-weekly. They include:

- ✓ Survey Schedule and % complete milestones of the project including map highlighting streets tested
- ✓ Details of validation surveys completed during recent weeks including upcoming field schedules
- ✓ Major issues faced during field operation, and any incidents that may have occurred, health and safety issues and traffic management and remedial measures taken to resolve these issues
- ✓ Quality Control and Assurance results
- ✓ Data acceptance processes and task sign-offs

Phase 2: Pavement Management Program (PMP) Development & Implementation

PMP Review ~ Network Definition & Requirements

In order for Adams County to take full advantage of the functionality of their Cartegraph Pavement Management Program (PMP), and in order for Adams County staff to have confidence in the system-generated results and recommendations, it is imperative that the system contains the most complete, accurate, and up-to-date data available.

Data Completeness/Gap Analysis - recent pavement treatment projects, updated traffic data, and any legacy system data will be loaded into the program (i.e. any other information provided from Adams County's existing systems and databases).

After all the street segments and historical data is reviewed and loaded into the database, the next task will be to complete a full and thorough assessment of the County's Cartegraph PMP database. This will include a review of

Adams County's agency data requirements (i.e., what information is needed/desired) and subsequent data gap analysis (i.e., what is missing).

Cartegraph will therefore collect all digital and hard copy data and include the following in our review:

- ✓ Basic inventory information by functional class (i.e. lengths, areas, surface type, etc.)
- ✓ Current condition information, if any
- ✓ Status of survey history, if any
- ✓ Construction and maintenance history
- ✓ Review of maintenance and rehabilitation treatments and unit costs

Pavement Data Collection

The data will be collected in only one direction of all two-lane roads. The direction of data collection shall change from year-to-year on these two-lane roads. On all multiple lane highways that have two or more lanes through one direction, lane #2 will be rated in both directions. Lane #2 is the second lane counting out from the median.

Surface Distress

The "fuel" for your pavement management engine is the surface condition data. Pavement distress provides that important set of data in determining the costs to maintain your road network.

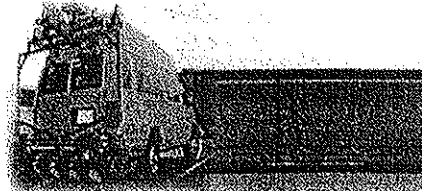
Cartegraph is well positioned to collect/gather data in a sophisticated and proven automated (with linescan cameras), hybrid (semi-automated) as well as the conventional walking (manual) methods to provide the County with an accurate and repeatable condition assessment.



walking (manual) method



hybrid (semi-automated)



automated (with linescan cameras)

In every instance, our pavement inspection technicians will identify and load the required pavement distresses data into the pavement management program utilizing Cartegraph's pavement inspection guidelines, the Federal Highway Administration (FHWA) distress rating manual, as well as, ASTM Standard D 6433 -11.

The evaluation of the pavement surface distress is on the basis of two components:

- **Severity** is defined as '*How bad is the defect?*' in terms of the measurement or degree of wear associated with the condition.
- **Extent** refers to quantity or '*How much?*' of the pavement is affected by a particular distress.

The identification of distresses to calculate the pavement condition include:

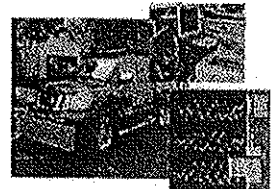
Asphalt Rating System			Portland Rating System		
Distress Description	Extent Criterion	Severity Criterion	Distress Description	Extent Criterion	Severity Criterion
Patching (AC)	Area %	Condition	Patching (PCC)	Area %	Condition
Rippling & Shoving	Area %	Roughness	Scaling	Area %	Surface Peeling
Raveling & Streaking	Area %	Appearance	Raveling (PCC)	Area %	Aggregate Loss
Flushing & Bleeding	Area %	Appearance	Polishing	Area %	Appearance
Deformation & Distortions	Area %	Profile Deviation *	Distortion, Frost Heave	Area %	Profile Deviation *
Excessive Crown	Area %	Elevation *	Corner 'C' & 'D' Cracking	Area %	Crack Width *
Progressive Edge Cracking	Area %	Width '	Coarse Aggregate Loss	Area %	Pocked Areas
Alligator Cracking	Area %	Crack Width "	Potholes (PCC)	Count/Area	Width ' /Depth "
Potholes (AC)	Count/Area	Width " /Depth "	Joint Sealant Loss	Joints / Sample	Exposed Sealant %
Map (Block) Cracking	Area %	Crack Width "	Linear Cracking (PCC)	Crack Length '	Crack Width "
Longitudinal Cracking	Crack Length '	Crack Width "	Transverse Cracking (PCC)	Crack Length '	Crack Width "
Transverse Cracks (AC)	Crack length '	Crack Width "	Joint Spalling	Joints / Sample	Crack Progress "
Wheel Track Rutting	Area %	Rut Depth "	Joint Faulting/Slipping	Joints / Sample	Displacement "

100% of the roadway surface of County maintained roads will be inventoried using the suggested hybrid approach in order to accurately update the County's pavement network database.

Roughness Profile Survey IRI (International Roughness Index)

Cartograph roughness measuring device meets the Class 1 ASTM E 950-98 designation for measuring the longitudinal profile of traveled surfaces, with an accelerometer established inertial reference.

IRI is widely accepted and endorsed by world leading institutions such as FHWA, ASTM, and the World Bank, as the technical standard for determining roadway roughness.



Rutting and Transverse Profiles

Our system will be capable of rut depth measurements for both traveled wheel track ruts simultaneously at client specified intervals while operating at posted speeds. The accuracy of our system provides +/- 1 mm as compared with manual measurements using ASTM procedures with a straight edge device.

Average rut depths will be reported for left wheel path, right wheel path, and a combined average over the length of the pavement segment. A minimum of a 3-laser sensor rut bar will be used for this assignment. The results are triggered by the longitudinal distance traveled, independent of longitudinal speed and measured. A sample screen shot of the RutView application is shown below.



Concrete Faulting

Concrete faulting data will be collected using equipment also provided by ICC. This sub-system is housed in the front bumper of our collection vehicle and contains mounted lasers used for measuring heights to the road surface for the purpose of calculating road profile measurements. The lasers are positioned over wheel paths and provide high quality infrared height sensors. This laser module sends an infrared beam to the pavement and samples the

height value at a rate of 16,000 times per second and these samples will be averaged and referenced to time, GPS, and distance (at a recording rate every 1 inch) so that it may be aligned with the accelerometer data to provide longitudinal profile and roughness indices which meet Highway Pavement Management System (HPMS) submittal specifications.

Field Verification – Pavement Segments

Additional information that is collected and verified during the pavement condition survey include street name, number of travel lanes, segment quantities (indicate the length of the section and pavement surface type, number of travel lanes). A short report highlighting the collected data elements from the field survey will be provided to Adams County for their review. Upon authorization by Adams County, corrected and/or updated values will be inserted into the final PMP database.

GPS Data

The global positional system collects vehicle location, velocity, attitude, track, speed, and dynamics from a moving vehicle. The POS also provides motion compensation information to all other sensor systems onboard the data collection vehicle. The system incorporates a POS unit, an Inertial Measurement Unit (IMU) with real-time differential, and a wheel encoder Distance Measurement Instrument (DMI) that provides a measure of the vehicle's linear distance traveled, and is used to constrain errors in vehicle velocity and displacement.

Shoulder Data

Shoulder data will be collected for all specified county roads and report shoulder related data including:

- ✓ Shoulder type reported as none observed, flexible, rigid, gravel, or curb & gutter.
- ✓ Shoulder width in feet.
- ✓ The presence of rumble strips.

Curb, Gutter, and Sidewalk Data

Data will be collected for all curbs and gutters and sidewalks along collecting roadways. Data shall contain the width, and length (no grade) for each segment and beginning and ending points of width changes.

Collected Events

Events are the main focal point that the pavement data is tied to. The events listed below are collected during the pavement data collection.

- ✓ Every field mile reference post alongside the road identified along with its number.
- ✓ Every block to block segment and intersecting block identification.
- ✓ Every bridge and its beginning point and ending point.
- ✓ Every railroad crossing and its beginning point and ending point.
- ✓ The beginning point and ending point of any road section that is under construction or marked for construction along the roadway system.
- ✓ Anytime the road transitions from a multilane facility (at least two lanes in each direction) to a single lane facility, or vice versa identifying the beginning and ending points of such change.

All information will be compiled and submitted in Microsoft Access 2002 format.

Phase 3: Program Optimization & Deployment

This approach defines a roadmap to ensure Adams County has an optimized, defensible and maintainable Cartegraph pavement management software application.

Cartegraph Pavement Management Program (PMP) – (5-year Plan)

PMP Overall Condition Index (OCI) Analysis

- The condition of a road is based on the data collected by our automated collection vehicle and pavement inspection team. The Overall Condition Index (OCI) is derived from a combination of the Pavement Condition Index (per ASTM D6433) and Ride Index (International Roughness Index per ASTM E950) collected field data. All required data will be loaded into the County's Cartegraph Pavement view by the Cartegraph and our team will calculate the Overall Condition Index (OCI) for each roadway section in the pavement database.

PMP Program Optimizing ~ Maintenance & Rehabilitation (M&R) Work Planning – 5 Year Plan

Our team will assist Adams County in providing a M&R work plan within the Cartegraph PMP system by utilizing the basic inventory data combined with inspection information, maintenance policies, and future maintenance predictions regarding the condition of the pavement. All factors used in determining the M&R or construction activities will be configured to reflect the County's pavement management practices and their costs.

Work plan options include:

- ✓ Determining Budget Consequences,
- ✓ Eliminate M&R Backlog in (x) years,
- ✓ Maintain Current OCI and
- ✓ Reach Preferred Area OCI in (x) years.

PMP Work Planning & System Reports

Our project team will provide a series of detailed technical reports to include:

- ✓ **Network Summary Statistics** ~ breakdown of sections and miles tested by functional class
- ✓ **Inspection History Report** ~ electronic list of all sections in the pavement network
- ✓ **OCI Report** ~ listing of every section, latest performance (OCI), & inspection date.
- ✓ **Quality Management Plan (QMP)**
- ✓ **Performance Prediction & Needs Reports** ~ Future performance of each pavement section tested will be analyzed to determine annual pavement performance and potential needs over the next X-year period. In simplistic terms, the needs analysis answers the questions: "If I have unlimited funding for street maintenance and repair";
 1. Which streets should I fix?
 2. When should I fix them?
 3. What treatments should I apply?
 4. How much will it cost?
- ✓ **Performance Budget Scenarios Reports** ~ Our evaluation uses a weighted effectiveness rating to prioritize sections for repair under constrained, realistic, budgetary assumptions. The effectiveness rating is defined as the area under a pavement performance curve. The effectiveness rating is weighted to place a higher priority on certain streets, such as arterials and collectors.

Multiple funding scenarios may be performed to answer "what-if" questions. Our team will perform up to four budget scenario runs based on input from Adams County. Typical funding scenarios include:

- ✓ Existing funding levels
- ✓ Existing funding levels increased (or decreased) by 10%, 20% etc.
- ✓ Budgets that accommodate spikes in funding from STP, for example
- ✓ Funding levels required to maintain (or increase) the OCI over time
- ✓ Funding levels to maintain (or decrease) backlog over time
- ✓ **Executive Summary Report** ~ Our team will prepare a final report that summarizes the results of the surveys and analyses. This report will provide a brief overview of the project activities, outputs and achievements for distributing to wider audience such as senior management or the general public. The final report will contain:
 - ✓ Executive Summary
 - ✓ Study Objectives
 - ✓ Description of methodology
 - ✓ Results of Study
 - Inventory reports for the entire PMS database
 - Condition (OCI) reports
 - Maintenance and rehabilitation history and decision tree reports
 - Budget needs and budget scenario reports
 - ✓ Conclusions & Recommendations

The Executive Summary will be a 10-15 page report (excluding appendices) that will summarize the overall condition of the pavement network, maintenance and rehabilitation strategies used, results of budgetary analyses and scenarios and various treatment recommendations.

Payment Terms and Conditions

In consideration for the Services and Products provided by Cartegraph to Customer, Customer agrees to pay Cartegraph Software Costs and Professional Service Fees in U.S. Dollars as described below:

1. **Delivery:** Software Products shall be licensed upon acceptance of this Contract. If applicable, Services will be scheduled and delivered upon your acceptance of this Contract, which will be considered as your notification to proceed.
2. **Services Scheduling:** Customer agrees to work with Cartegraph to schedule Services in a timely manner. All undelivered Services shall expire 365 days from the signing of this Contract.
3. **Data Services Invoicing:** Invoicing for the Field Services fee shall occur upon the acceptance of this Contract and shall be invoiced as follows:
 - a. **Installment 1 due upon commencement of pavement and/or street level mapping services--** 100% of General Data Collection Services and 50% of pavement and/or street level mapping services, \$23,682.13.
 - b. **Installment 2 due upon field completion of pavement and/or street level mapping services --** 40% of pavement / street level mapping services, \$16,945.70.
 - c. **Installment 3 due upon completion of all GIS Asset Inventory / Inspection Services --** 100% of GIS Asset Inventory / Inspection Services, \$4,998.50.
 - d. **Installment 4 due upon final delivery of data --** 10% pavement and/or street level mapping services, \$4,736.43.
4. **Payment Terms:** All payments are due Net 30 days from date of invoice.

~~This Contract constitutes the complete and exclusive agreement between Cartegraph Systems, Inc., and the above company, superseding all other Contracts, oral or written and all other communication with respect to the terms of the agreement. Contract must be executed and returned to Cartegraph prior to the expiration date shown above or all terms contained herein are invalid and the entire Contract is void.~~

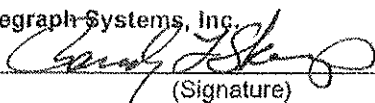
Customer acknowledges that all materials and documents associated with this project are proprietary in nature. Customer further agrees not to copy or otherwise make available such materials outside of Customer's organization and its divisions and departments without the prior written consent of Cartegraph, except as required by law.

Acceptance

The parties, each acting under due and proper authority, have executed this Contract as of the date written below:

Cartegraph Systems, Inc.

By


(Signature)

Randy L. Skemp

(Type or print name)

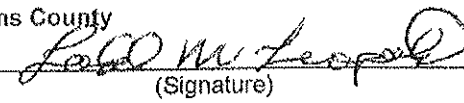
Title Executive Vice President/CRO

Date

6/11/2015

Adams County

By


(Signature)

Todd Leopold

(Type or print name)

Title

County Manager

Date

May 20, 2015