AGREEMENT FOR PROFESSIONAL SERVICES
BY AND BETWEEN

GOODPOINTE TECHNOLOGY, INC.
AND
CITY OF DULUTH

THIS AGREEMENT, effective as of the date of attestation by the City Clerk (the "Effective Date"), by and between the City of Duluth, hereinafter referred to as City, and GoodPointe Technology, Inc. located at 287 E. 6th Street, Suite 200, St. Paul, MN 55101, hereinafter referred to as Consultant for the purpose of rendering services to the City.

WHEREAS, the City has requested consulting services for provide pavement condition data collection services, (the "Project"); and

WHEREAS, Consultant has represented itself as qualified and willing to perform the services required by the City; and

WHEREAS, Consultant submitted a proposal to provide services for the Project (the "Proposal"), a copy of which is attached hereto as Exhibit A; and

WHEREAS, the City desires to utilize Consultant's professional services for the Project;

NOW, THEREFORE, in consideration of the mutual covenants and conditions hereinafter contained, the parties hereto agree as follows:

I. Services

Consultant will provide services related to the Project as described in Consultant's Proposal (the "Services"). Consultant agrees that it will provide its services at the direction of the City Engineer ("Engineer"). In the event of a conflict between the Proposal and this Agreement, the terms and conditions of this Agreement shall be deemed controlling.

II. Fees

It is agreed between the parties that Consultant's maximum fee for the Project and Services shall not exceed the sum of eighty-nine thousand, five hundred ten and 00/100 dollars ($89,510.00) inclusive of all travel and other expenses associated with the Project, payable from Fund 290-500-5441; Resolution No. 18-0024R passed on January 8, 2018. All invoices for services rendered shall be submitted monthly to the attention of the Engineer. Payment of expenses is subject to the City's receipt of reasonable substantiation/back-up supporting such expenses.

III. General Terms and Conditions

1. Amendments

Any alterations, variations, modifications or waivers of terms of this Agreement shall be binding upon the City and Consultant only upon being reduced to writing and signed by a duly authorized representative of each party.

2. Assignment

Consultant represents that it will utilize only its own personnel in the performance of the services set forth herein; and further agrees that it will neither assign, transfer or subcontract any rights or obligations under this Agreement without prior written consent of the City. The Primary Consultant(s) assigned to this project will be Anthony Kadlec (the "Primary Consultant"). The Primary Consultant shall be responsible for the delivery of professional services required by this Agreement and, except as expressly agreed in writing by the City in its sole discretion, the City is not obligated to accept the services of any other employee or agent of Consultant in substitution of the Primary Consultant. The foregoing sentence shall not preclude other employees of Consultant from providing support to the Primary Consultant in connection with Consultant's obligations hereunder.

3. Data and Confidentiality, Records and Inspection

a. The City agrees that it will make available all pertinent information, data and records under its control for Consultant to use in the performance of this Agreement, or assist Consultant wherever possible to obtain such records, data and information.

b. All reports, data, information, documentation and material given to or prepared by Consultant pursuant to this Agreement will be confidential and will not be released by Consultant without prior authorization from the City.

c. Consultant agrees that all work created by Consultant for the City is a "work made for hire" and that the City shall own all right, title, and interest in and to the work, including the entire copyright in the work ("City Property"). Consultant further agrees that to the extent the work is not a "work made for hire" Consultant will assign to City ownership of all right, title and interest in and to the work, including ownership of the entire copyright in the work. Consultant agrees to execute, at no cost to City, all documents necessary for City to perfect its ownership of the entire copyright in the work. Consultant represents and warrants that the work created or prepared by Consultant will be original and will not infringe upon the rights of any third party, and Consultant further represents that the work will not have been previously assigned, licensed or otherwise encumbered.

d. Records shall be maintained by Consultant in accordance with requirements prescribed by the City and with respect to all matters covered by this Agreement. Such records shall be maintained for a period of six (6) years after receipt of final payment under this Agreement.

e. Consultant will ensure that all costs shall be supported by properly executed payrolls, time records, invoices, contracts, vouchers, or other official documentation evidencing in proper detail the nature and propriety of the charges. All checks, payrolls, invoices, contracts, vouchers, orders, or other accounting documents pertaining in whole or in part to this Agreement shall be clearly identified and readily accessible.

f. Consultant shall be responsible for furnishing to the City records, data and information as the City may require pertaining to matters covered by this Agreement.

g. Consultant shall ensure that at any time during normal business hours and as often as the City may deem necessary, there shall be made available to the City for examination, all of its records with respect to all matters covered by this Agreement Consultant will also permit the City to audit, examine, and make excerpts or transcripts from such records, and to make audits of all contracts, invoices, materials, payrolls, records of personnel, conditions of employment, and other data relating to all matters covered by this Agreement.

4. Consultant Representation and Warranties

Consultant represents and warrants that:

a. Consultant and all personnel to be provided by it hereunder has sufficient training and experience to perform the duties set forth herein and are in good standing with all applicable licensing requirements.

b. Consultant and all personnel provided by it hereunder shall perform their respective duties in a professional and diligent manner in the best interests of the City and in accordance with the then current generally accepted standards of the profession for the provisions of services of this type.

c. Consultant has complied or will comply with all legal requirements applicable to it with respect to this Agreement. Consultant will observe all applicable laws, regulations, ordinances and orders of the United States, State of Minnesota and agencies and political subdivisions thereof.

d. The execution and delivery of this Agreement and the consummation of the transactions herein contemplated do not and will not conflict with, or constitute a breach of or a default under, any agreement to which the Consultant is a party or by which it is bound, or result in the creation or imposition of any lien, charge or encumbrance of any nature upon any of the property or assets of the Consultant contrary to the terms of any instrument or agreement.

e. There is no litigation pending or to the best of the Consultant's knowledge threatened against the Consultant affecting its ability to carry out the terms of this Agreement or to carry out the terms and conditions of any other matter materially affecting the ability of the Consultant to perform its obligations hereunder.

f. The Consultant will not, without the prior written consent of the City, enter into any agreement or other commitment the performance of which would constitute a breach of any of the terms, conditions, provisions, representations, warranties and/or covenants contained in this Agreement.

5. Agreement Period

The term of this Agreement shall commence on the Effective Date and performance shall be completed by December 31, 2019, unless terminated earlier as provided for herein.

Either party may, by giving written notice, specifying the effective date thereof, terminate this Agreement in whole or in part without cause. In the event of termination, all property and finished or unfinished documents and other writings prepared by Consultant under this Agreement shall become the property of the City and Consultant shall promptly deliver the same to the City. Consultant shall be entitled to compensation for services properly performed by it to the date of termination of this Agreement. In the event of termination due to breach by Consultant, the City shall retain all other remedies available to it, and the City shall be relieved from payment of any fees in respect of the services of Consultant which gave rise to such breach.

6. Independent Contractor

a. It is agreed that nothing herein contained is intended or should be construed in any manner as creating or establishing the relationship of copartners between the parties hereto or as constituting Consultant as an agent, representative or employee of the City for any purpose or in any manner whatsoever. The parties do not intend to create any third party beneficiary of this Agreement. Consultant and its employees shall not be considered employees of the City, and any and all claims that may or might arise under the Worker's Compensation Act of the State of Minnesota on behalf of Consultant's employees while so engaged, and any and all claims whatsoever on behalf of Consultant's employees arising out of employment shall in no way be the responsibility of City. Except for compensation provided in Section II of this Agreement, Consultant's employees shall not be entitled to any compensation

or rights or benefits of any kind whatsoever from City, including without limitation, tenure rights, medical and hospital care, sick and vacation leave, Worker's Compensation, Unemployment Insurance, disability or severance pay and P.E.R.A. Further, City shall in no way be responsible to defend, indemnify or save harmless Consultant from liability or judgments arising out of intentional or negligent acts or omissions of Consultant or its employees while performing the work specified by this Agreement.

b. The parties do not intend by this Agreement to create a joint venture or joint enterprise, and expressly waive any right to claim such status in any dispute arising out of this Agreement.

c. Consultant expressly waives any right to claim any immunity provided for in Minnesota Statutes Chapter 466 or pursuant to the official immunity doctrine.

7. Indemnity

To the extent allowed by law, Consultant shall defend, indemnify and hold City and its employees, officers, and agents harmless from and against any and all cost or expenses, claims or liabilities, including but not limited to, reasonable attorneys' fees and expenses in connection with any claims resulting from the Consultant's a) breach of this agreement or b) its negligence or misconduct or that of its agents or contractors in performing the Services hereunder or c) any claims arising in connection with Consultant's employees or contractors, or d) the use of any materials supplied by the Consultant to the City unless such material was modified by City and such modification is the cause of such claim. This Section shall survive the termination of this Agreement for any reason.

8. Insurance

Consultant shall obtain and maintain for the Term of this Agreement the following minimum amounts of insurance from insurance companies authorized to do business in the State of Minnesota.

a. Public Liability and Automobile Liability Insurance with limits not less than **$1,500,000** Single Limit, shall be in a company approved by the city of Duluth; and shall provide for the following: Liability for Premises, Operations, Completed Operations, and Contractual Liability. **City of Duluth shall be named as Additional Insured by endorsement** under the Public Liability and Automobile Liability, or as an alternate, Consultant may provide Owners-Contractors Protective policy, naming himself and City of Duluth. **Upon execution of this Agreement**, Consultant shall provide Certificate of Insurance

evidencing such coverage with 30-days' notice of cancellation, non-renewal or material change provisions included.

b. Professional Liability Insurance in an amount not less than $1,500,000 Single Limit; provided further that in the event the professional malpractice insurance is in the form of "claims made," insurance, 60 days' notice prior to any cancellation or modification shall be required; and in such event, Consultant agrees to provide the City with either evidence of new insurance coverage conforming to the provisions of this paragraph which will provide unbroken protection to the City, or, in the alternative, to purchase at its cost, extended coverage under the old policy for the period the state of repose runs; the protection to be provided by said "claims made" insurance shall remain in place until the running of the statute of repose for claims related to this Agreement.

c. Consultant shall also provide evidence of Statutory Minnesota Workers' Compensation Insurance.

d. A certificate showing continued maintenance of such insurance shall be on file with the City during the term of this Agreement.

e. The City of Duluth does not represent or guarantee that these types or limits of coverage are adequate to protect the Consultant's interests and liabilities.

9. Notices

Unless otherwise expressly provided herein, any notice or other communication required or given shall be in writing and shall be effective for any purpose if served, with delivery or postage costs prepaid, by nationally recognized commercial overnight delivery service or by registered or certified mail, return receipt requested, to the following addresses:

City:
City of Duluth
411 W First Street
City Hall Room 211
Duluth MN 55802
Attn: City Engineer

Consultant:
GoodPointe Technology, Inc.
287 E. 6th Street, Suite 200
St. Paul, MN 55101
Attn: Anthony Kadlec

10. Civil Rights Assurances

Consultant, as part of the consideration under this Agreement, does hereby covenant and agree that:

a. No person on the grounds of race, color, creed, religion, national origin, ancestry, age, sex, marital status, status with respect to public assistance, sexual orientation, and/or disability shall be excluded from any participation in, denied any benefits of, or otherwise subjected to discrimination with regard to the work to be done pursuant to this Agreement.

b. That all activities to be conducted pursuant to this Agreement shall be conducted in accordance with the Minnesota Human Rights Act of 1974, as amended (Chapter 363), Title 7 of the U.S. Code, and any regulations and executive orders which may be affected with regard thereto.

11. Laws, Rules and Regulations

Consultant agrees to observe and comply with all laws, ordinances, rules and regulations of the United States of America, the State of Minnesota and the City with respect to their respective agencies which are applicable to its activities under this Agreement.

12. Applicable Law

This Agreement, together with all of its paragraphs, terms and provisions is made in the State of Minnesota and shall be construed and interpreted in accordance with the laws of the State of Minnesota.

13. Force Majeure

Neither party shall be liable for any failure of or delay in performance of its obligations under his Agreement to the extent such failure or delay is due to circumstances beyond its reasonable control, including, without limitation, acts of God, acts of a public enemy, fires, floods, wars, civil disturbances, sabotage, accidents, insurrections, blockades, embargoes, storms, explosions, labor disputes, acts of any governmental body (whether civil or military, foreign or domestic), failure or delay of third parties or governmental bodies from whom a party is obtaining or must obtain approvals, franchises or permits, or inability to obtain labor, materials, equipment, or transportation. Any such delays shall not be a breach of or failure to perform this Agreement or any part thereof and the date on which the party's obligations hereunder are due to be fulfilled shall be extended for a period equal to the time lost as a result of such delays.

14. Severability

In the event any provision herein shall be deemed invalid or unenforceable, the remaining provision shall continue in full force and effect and shall be binding upon the parties to this Agreement.

15. Entire Agreement

It is understood and agreed that the entire agreement of the parties including all exhibits is contained herein and that this Agreement supersedes all oral agreements and negotiations between the parties relating to the subject matter hereof. Any amendment to this Agreement shall be in writing and shall be executed by the same parties who executed the original agreement or their successors in office.

16. Counterparts

This Agreement may be executed in two or more counterparts, each of which shall be deemed to be an original as against any party whose signature appears thereon, but all of which together shall constitute but one and the same instrument. Signatures to this Agreement transmitted by facsimile, by electronic mail in "portable document format" (".pdf"), or by any other electronic means which preserves the original graphic and pictorial appearance of the Agreement, shall have the same effect as physical delivery of the paper document bearing the original signature.

IN WITNESS WHEREOF, the parties have hereunto set their hands as of the date of attestation shown below.

CITY OF DULUTH

By:

Mayor

Attest:

City Clerk

Date Attested: _____

Countersigned:

City Auditor Date

Approved as to form:

City Attorney Date

GOODPOINTE TECHNOLOGIES, INC.

By:

Company Representative

Its:

Title of Representative

Date: _____

EXHIBIT A

Consultant's Proposal

December 6, 2017

Ms. Cari Pedersen, P.E.
Chief Transportation Engineer
City of Duluth, 211 City Hall
411 W. 1st Street
Duluth MN 55802

RE: City of Duluth 2018/2019 PCI Data Collection Proposal A.1

Dear Cari:

We are pleased to present the following cost proposal to provide data collection services for the City of Duluth, Minnesota.

We understand that this project is very important to the City; the quality of your decisions to allocate resources and maintain the short- and long-term health of your pavement network depends on the integrity of the technical models and the quality of the process used to develop and deliver the results of this project.

To ensure that this critically important project is executed successfully, we have assembled a team of internationally recognized infrastructure management experts, engineering professionals, and field technicians to accomplish the required scope of work. Over the past thirty years we have successfully implemented data collection plans worldwide for clients just like the City of Duluth.

We appreciate the opportunity to continue our work with you on this project, and we look forward to providing high-quality pavement data collection and professional engineering consulting services to the City.

I am authorized to make representations and commitments on behalf of GoodPointe Technology.

Sincerely,
GoodPointe Technology

Anthony J. Kadlec
President

Attachment: Cost Proposal

A. PROJECT OUTLINE

WHY SELECT THE GOODPOINTE TECHNOLOGY TEAM FOR THIS PROJECT?

Simply put, the implementation of pavement and related infrastructure asset management systems is what we do for a living, day in and day out. We take pride in building and maintaining long-term client relationships and supporting our clients with their use of our pavement management software and through the delivery of high-quality pavement condition data.

Beyond collecting ***objective and repeatable data,*** our mission is to transform it into ***actionable/decision-making information*** for your staff through the use of the InfrastructureCONsultant (ICON) pavement management system. The network level pavement condition survey proposed in this project will establish a data platform/basis for the City to develop multi-year budget analysis scenarios and for setting the course for improving the condition and value of the City pavement network.

Our experience has taught us to maintain a flexible approach in the process of working with clients in developing, implementing, and updating infrastructure maintenance management systems, since each project presents unique challenges that may depend on a combination of factors including: socio-economic conditions, infrastructure network condition, available staff resources of the project sponsor, and organizational receptivity to the management system.

Our plan for this project is to:

- Collect high quality pavement condition data using our proven digital imaging and GIS consulting processes; and to
- Update the condition data for the City's Pavement Management system and to highlight the technical issues facing the City of Duluth infrastructure network.

The increased benefits of our GPSVision right of way digital imaging data collection process relative to manual walking surveys include the following:

- **Safety:** our staff is able to evaluate the City's network without needing to have staff physically present on the roadways, which is safer for us and provides less interference for the traveling public/citizens of Duluth;
- **Reduction of Liability:** having the set of digital images will provide documentation of in-place traffic control devices (e.g. signs) at the time of survey;
- **Quality Assurance:** with our high-resolution imagery, we are able to facilitate repeatable, high quality inventory and condition surveys;
- **Increased Technical Capability:** utilizing the collected images we can make precise measurements and establish accurate GPS locations of extracted assets, all of which are exportable to City GIS; and,
- **Cost Effective/Economics:** the ability to continually use and reuse the right of way imagery data for multiple, additional purposes allows for an increased return on investment (ROI) for the City.

INTRODUCING GOODPOINTE TECHNOLOGY

GoodPointe Technology (**GoodPointe**) is one of the leading infrastructure management systems- engineering and software-consulting firms in North America. The core mission of GoodPointe is to develop and provide high-quality roadway maintenance management software and system consulting services to clients in the government and private sector.

We help the authorities of public and private infrastructure/facilities to more effectively meet their management and maintenance needs by providing powerful, flexible, and easy to use management system software and implementation services.

Our management system implementation services include:

- Strategic capital improvement project planning and needs analysis for your local conditions;
- Data transfer and design of infrastructure condition data collection services;
- Digital Right of Way imaging data collection and integration services;
- Infrastructure system performance analysis;
- Software Development and Implementation Services;
- GIS Consulting, Crystal Reports Development, and System Training Services;
- Generating budget investment and deferred maintenance analysis scenarios; and,
- The development of short-term and long-term infrastructure maintenance, repair, and rehabilitation plans.

To summarize: we design, develop, market, implement, and maintain maintenance management software systems used by businesses, government agencies and other organizations. The use of these systems enables responsible officials to more cost-effectively manage assets. These assets include highways, county roads, city streets, sidewalks, curb and gutter, signs and signals, lighting systems, bridges, parking lots, wastewater and storm drainage systems, water pipelines, park features and other miscellaneous right of way assets.

OUR PEOPLE

Our personnel have been developing successful pavement management consultation relationships with local, national, and international government agencies since the 1980's. Our team for this project includes staff whose work has advanced the technology of infrastructure management science in North America and the rest of the world. We believe our experience in the field of pavement management science, management system implementations, and our experience in knowing how to work well with governmental agencies across the world, demonstrates our strong commitment to serving clients like you.

OUR COMPANY

GoodPointe Technology, Inc. (**GoodPointe**) appreciates this opportunity to serve the City of Duluth and to (re)introduce our company.

Our company provides the City with a wealth of experience that has already served the needs of a variety of public organizations and private sector clients throughout North America and Asia, with a regional emphasis in the Upper Midwest.

GoodPointe specializes in providing high-quality data collection, data reduction, and implementation services for infrastructure management software systems. Over the past thirty-plus years GoodPointe staff have also been involved in the development, redevelopment, implementation and/or integration of infrastructure management systems such as those developed by the San Francisco Bay Area MTC (BAMTCPMS™), Army Corps of Engineers (MicroPAVER™), Carter System, Infrastructure Management Services, Inc (IMS), Midwest Pavement Management, Inc, (PMP), China PMS, Highway Sign Inventory System, Infracon (PMS/IMS™), and Stantec™, as well as ICON and a number of other public agencies' inhouse infrastructure and pavement management systems.

Our staff includes a talented group of GIS, GPS and digital mapping professionals who design and build data collection vehicles, develop related software, and provide data collection, GIS mapping, and asset inventory services to a wide variety of clients in both the public and private sectors.

Our clients include cities, counties, state DOTs, telecommunication companies, utility companies, municipal engineering consulting firms, and transportation agencies. We have contracted for more than 250,000 miles of GPSVision data collection, mapping, road geometry and asset inventory on roads and rails in the U.S. and Canada since 1994.

GoodPointe Technology is headquartered in St. Paul, Minnesota, and employs technical staff located regionally across North America, Europe, and Asia.

Role in this Project: GoodPointe will serve as the prime consultant for this project and will be facilitating the required data collection plan, collection-, quality control-, and data processing services.

B. FIRM AND CONTACT INFORMATION

GoodPointe Technology is a privately held, Minnesota-based corporation

Address:
GoodPointe Technology, Inc.
287 E. 6th Street, Suite 200
St. Paul, MN 55101

Point of Contact:
Mr. Anthony Kadlec, President
Office Phone: (651) 726-2555
Office Fax: (651) 726-2545
Mobile: (651) 271-0422
Email: tkadlec@goodpointe.com

C. PROJECT TEAM

We offer the City of Duluth a team with deep experience and significant expertise to address the need areas outlined by the City.

Tony Kadlec, Project Manager, GoodPointe Technology
Mr. Anthony (Tony) Kadlec has 25 years of experience in the civil engineering profession, the last 22 of which have been focused on the implementation of infrastructure management systems. He has been involved with the management and the successful completion of more than 350 system implementations and infrastructure improvement plans, in projects throughout all regions of the United States; his international experience includes World Bank system implementation projects located in Mainland China and roadway data collection projects for infrastructure networks in India. His work involves working with clients to determine system requirements, designing the data collection process, analyzing system data, writing reports and presenting the results to the elected officials.

Mr. Kadlec has presented numerous papers at various national and international conferences and is also a guest lecturer in the Infrastructure Systems Engineering (ISE) graduate program at the University of Minnesota, Institute of Technology (IT).

For this Project: Tony will serve as project manager and be the primary contact for the City in this project.

Darwin A. Dahlgren, Principal in Charge, GoodPointe Technology
Mr. Dahlgren has nearly 30 years of experience as a civil engineer in both the civil engineering and the software and system development side of pavement and related infrastructure data collection, evaluation and management systems and services.

Mr. Dahlgren is well known for his expertise in pavement and infrastructure management systems and has participated in the successful implementation of right of way design, maintenance, rehabilitation and management system-related projects for cities, provinces, airports and government installations worldwide. These implementations have included the use of state of the art systems and engineering services designed for accurate, efficient and cost-effective pavement and right of way data collection, evaluation, management, and reporting.

For this Project: Darwin will serve as a technical resource for the City and the project team.

Guangping He, PhD., GoodPointe Technology
Dr. He received his Ph.D. in Photogrammetry from the Technical University of Vienna, Austria, in 1989. Dr. He is responsible for leading-edge research and development of the GPSVision mobile data collection system technology and data capture and extraction solutions. Dr. He is a GPS and image-processing expert. He is recognized nationally in the field of remote sensing and photogrammetry with several papers and presentations to his credit. Specialties include GPS, inertial navigation systems, camera calibration, image database development, image manipulation, facility feature extraction, and data capture for GIS.

For this Project: Guangping will be in charge of data Quality Control and Quality Assurance procedures for the digital imaging data collected in this project.

Jason Dickerson, Senior Software Analyst/DBA
Mr. Dickerson has 15 years of experience in the Information Technology (IT) field, specializing in data integration for the implementation of relational database management systems. He is responsible for the ICON software support operations for our North American client base and for this project will be transferring the data that is extracted from the images, into the respective relational database tables of the City's ICON asset management system.

For this Project: Jason will coordinate the Quality Control services for the infrastructure condition data extracted in this project.

D. PROJECT APPROACH AND WORK PLAN

PROJECT INITIATION

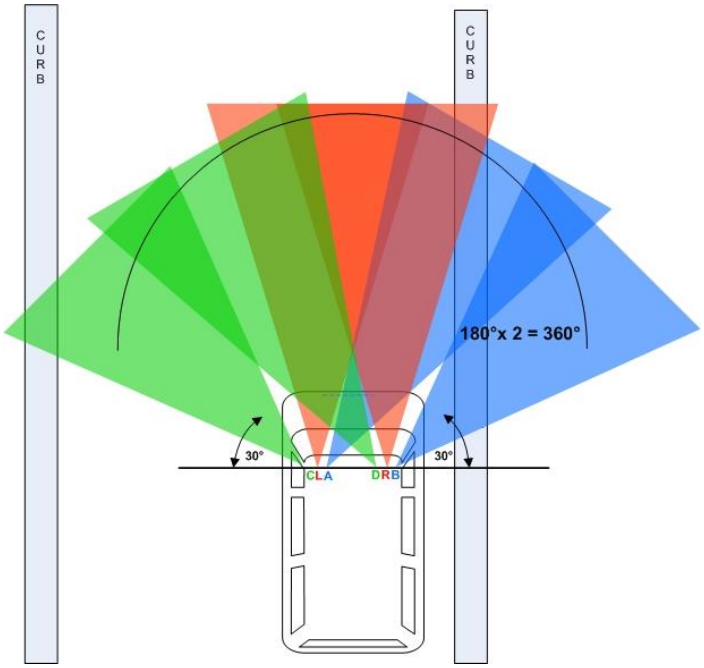
Once the notice of selection has been received, the first step in this project will be to have a project kickoff meeting with the City to establish and document the specific scope of work to be performed based on the project specifications and any options selected. In this meeting, current pavement management operations will be reviewed to identify the data-related requirements for this project.

TASK 1. CITYWIDE PAVEMENT CONDTION ASSESSMENT & DIGITAL IMAGE COLLECTION

Our team will meet this project's critical inventory and condition survey requirements by providing ***sub-meter coordinate accuracy coupled with an asset feature extraction process that does not require follow-up field inspections***.

Our data collection van will utilize the following 6-camera configuration as pictured:

Stereo Pair	Purpose
A/B:	Forward/Right to capture pavement shoulder condition, curb/gutter, sidewalk and most traffic signs.
C/D:	Forward/Left to capture median signs and pavements to left field of view.
L/R:	Forward view, primarily for pavement surveys



DIGITAL IMAGE ACQUISITION

All designated roadway routes specified in this project would be driven by one or more specially equipped data collection vehicles such as the following pictured:

The actual data collection process makes use of the latest digital imaging and Global Positioning System (GPS)/Inertial Navigational System (INS) technology to capture accurate feature location coordinates and a digital record of each visible feature simultaneously.

All imagery is captured with multiple full-frame progressive scan digital color cameras that take high-resolution (1600 pixels x 1200 lines) jpeg images at pre-set intervals along the designated route, as shown at the left.

While not a moving video of the route, images are sequenced to simulate a full video log along each street.

Maximizing the Usefulness of the Geo-Referenced Images Collected in This Project
For this project we are providing an option to deliver the set of geo-referenced JPG images that we will be collecting and utilizing to produce the PCI survey results. The City would then be able to utilize these right of way images for any of its in-house GIS applications, to maximize the return on investment (ROI) realized by the City in this project.

QUALITY ASSURANCE PLAN

"You cannot inspect quality into a product (or service)--it is already there."

W. Edwards Demming, The Father of the American Quality Management.

As it relates to the City pavement condition data collection project, if we collect 100 miles of pavement condition data for Duluth and then were to do, say a 3% quality control (QC) inspection (3 miles) and show you the results after the fact, this QC effort will effectively do nothing to improve the quality of the remaining 97% (or 97 miles) of survey data that we had already collected for the City. In other words, we cannot inspect quality into a product (or service) once it has already been created or delivered.

Therefore, it is the intent of our GoodPointe Quality Assurance (QA) procedures to ensure that each of our technicians is competently trained before starting the project and that we provide ongoing refresher training to our staff to ensure that we are consistent in our rating procedures (i.e. the assignment of distress types, severity levels, and quantities) for the local conditions for any custom survey procedures, etc. and that we keep our raters freshly rotated between their work in the field and in the office doing data entry.

This consistency training involves bringing multiple raters out into the field and doing a walk- through calibration survey, to ensure that our raters are consistently rating distresses-, severity levels, and quantities, within an accepted level of variation. We also encourage the "when in doubt, write it out" policy, which encourages our raters to take detailed notes and flag individual surveys for a closer re-inspection if they observe pavement distress formations that appear out of the normal.

Based on known dates of construction, we can establish an expectation of PCI results to target PCI survey results which are outside the normally expected variation of pavement performance for the indicated pavement's life-cycle.

For example, if we know a residential roadway pavement (asphalt surface type) was newly reconstructed two (2) years ago, we might expect the PCI to be in the 95 to 100 range. However, if the resulting survey PCI=70, then the section would be flagged for QC review to confirm the quality of the condition survey and/or to document any extenuating circumstances (e.g. accidental pavement damage due to heavy construction vehicles, etc.).

QUALITY CONTROL PROCEDURES

The resources that are required to provide our quality control services are already included in the quoted per mile rate of the pavement condition survey; For GoodPointe Technology projects that involve surface condition surveys, the Data Collection Lead (for this project, Jason Dickerson) is assigned the responsibility of coordinating the field quality control services with assigned staff.

A Project Kickoff Meeting will be held prior to the start of data collection operations for the City to meet with lead GoodPointe staff to review the data collection and

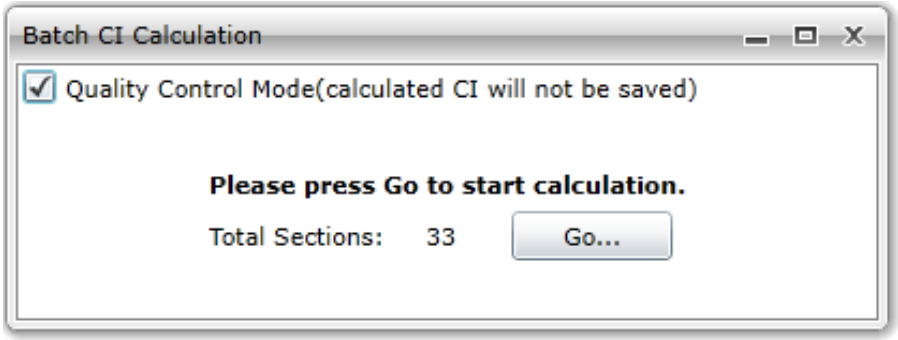
quality control procedures proposed for this project. During this field meeting, pavement distress types and severity levels will be reviewed with the City and the technical staff assigned to the project.

GoodPointe will randomly assign repeat surveys in the initial phase of the data extraction operations at the distress/severity level.

After the completion of the quality control review period, the GoodPointe project team will internally discuss the results of the repeat surveys. Based on the results of this quality control review, our project engineer will apply corrective action, which will include, but not be limited to, adjustment of the survey/sampling procedures, follow-up training for the distress type/severity levels involved, and, possible rotation/replacement of raters.

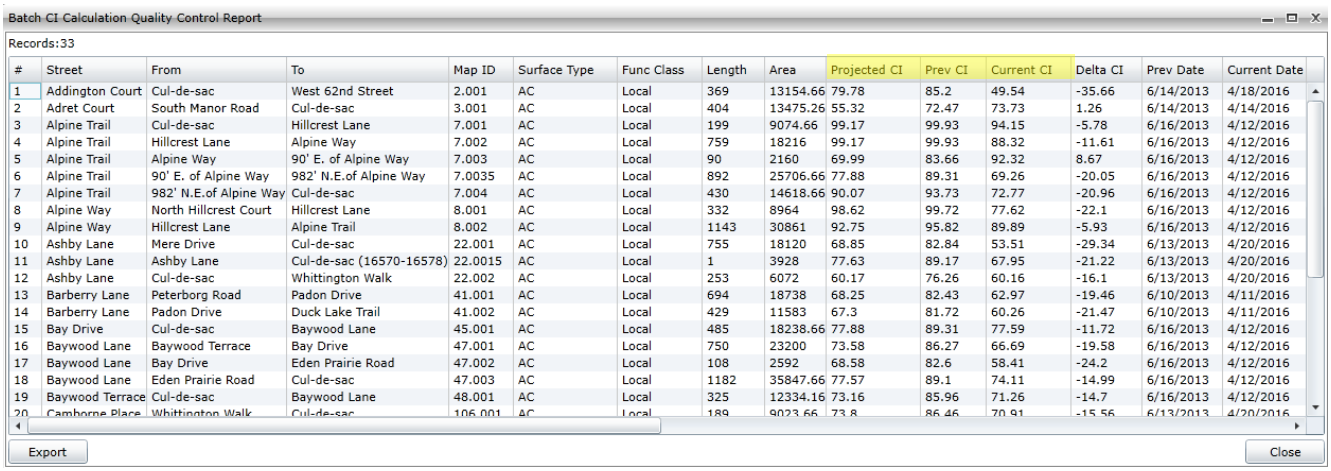
ICON QUALITY CONTROL REPORT

Over the past twenty-five years, we have developed and have continually refined our Infrastructure CONsultant (ICON) Pavement Management System (PMS) software in coordination with our active ICON user group. A prime example of this is our Quality Control *Batch CI Calculation* report, which enables us to automatically capture and present meaningful QA/QC information to help ensure that the collected system data provides a true representation of the actual pavement conditions in the field.



Once the condition data has been imported into the ICON program, clicking the 'Go' button generates a quality control report spreadsheet which compiles the essential inventory, condition, and latest paving project history information for each roadway section in the batch.

The condition data included in this report includes the: Current PCI (i.e. the PCI from the current survey); Previous PCI (i.e. the PCI from the most recent, previous survey), and Projected PCI (i.e. the expected PCI based on the pavement performance curve established within the ICON program.



Batch CI Calculation Quality Control Report

Records:33

#	Street	From	To	Map ID	Surface Type	Func Class	Length	Area	Projected CI	Prev CI	Current CI	Delta CI	Prev Date	Current Date
1	Addington Court	Cul-de-sac	West 62nd Street	2.001	AC	Local	369	13154.66	79.78	85.2	49.54	-35.66	6/14/2013	4/18/2016
2	Adret Court	South Manor Road	Cul-de-sac	3.001	AC	Local	404	13475.26	55.32	72.47	73.73	1.26	6/14/2013	4/14/2016
3	Alpine Trail	Cul-de-sac	Hillcrest Lane	7.001	AC	Local	199	9074.66	99.17	99.93	94.15	-5.78	6/16/2013	4/12/2016
4	Alpine Trail	Hillcrest Lane	Alpine Way	7.002	AC	Local	759	18216	99.17	99.93	88.32	-11.61	6/16/2013	4/12/2016
5	Alpine Trail	Alpine Way	90' E. of Alpine Way	7.003	AC	Local	90	2160	69.99	83.66	92.32	8.67	6/16/2013	4/12/2016
6	Alpine Trail	90' E. of Alpine Way	982' N.E.of Alpine Way	7.0035	AC	Local	892	25706.66	77.88	89.31	69.26	-20.05	6/16/2013	4/12/2016
7	Alpine Trail	982' N.E.of Alpine Way	Cul-de-sac	7.004	AC	Local	430	14618.66	90.07	93.73	72.77	-20.96	6/16/2013	4/12/2016
8	Alpine Way	North Hillcrest Court	Hillcrest Lane	8.001	AC	Local	332	8964	98.62	99.72	77.62	-22.1	6/16/2013	4/12/2016
9	Alpine Way	Hillcrest Lane	Alpine Trail	8.002	AC	Local	1143	30861	92.75	95.82	89.89	-5.93	6/16/2013	4/12/2016
10	Ashby Lane	Mere Drive	Cul-de-sac	22.001	AC	Local	755	18120	68.85	82.84	53.51	-29.34	6/13/2013	4/20/2016
11	Ashby Lane	Ashby Lane	Cul-de-sac (16570-16578)	22.0015	AC	Local	1	3928	77.63	89.17	67.95	-21.22	6/13/2013	4/20/2016
12	Ashby Lane	Cul-de-sac	Whittington Walk	22.002	AC	Local	253	6072	60.17	76.26	60.16	-16.1	6/13/2013	4/20/2016
13	Barberry Lane	Peterborg Road	Padon Drive	41.001	AC	Local	694	18738	68.25	82.43	62.97	-19.46	6/10/2013	4/11/2016
14	Barberry Lane	Padon Drive	Duck Lake Trail	41.002	AC	Local	429	11583	67.3	81.72	60.26	-21.47	6/10/2013	4/11/2016
15	Bay Drive	Cul-de-sac	Baywood Lane	45.001	AC	Local	485	18238.66	77.88	89.31	77.59	-11.72	6/16/2013	4/12/2016
16	Baywood Lane	Baywood Terrace	Bay Drive	47.001	AC	Local	750	23200	73.58	86.27	66.69	-19.58	6/16/2013	4/12/2016
17	Baywood Lane	Bay Drive	Eden Prairie Road	47.002	AC	Local	108	2592	68.58	82.6	58.41	-24.2	6/16/2013	4/12/2016
18	Baywood Lane	Eden Prairie Road	Cul-de-sac	47.003	AC	Local	1182	35847.66	77.57	89.1	74.11	-14.99	6/16/2013	4/12/2016
19	Baywood Terrace	Cul-de-sac	Baywood Lane	48.001	AC	Local	325	12334.16	73.16	85.96	71.26	-14.7	6/16/2013	4/12/2016
20	Camborne Place	Whittington Walk	Cul-de-sac	106.001	AC	Local	189	9023.66	73.8	86.46	70.91	-15.56	6/13/2013	4/20/2016

Export Close

In the event that there is significant amount of variation between the 'Today's Projected PCI' and the latest PCI, we can perform a follow-up check on the PCI survey and/or consider a recalibration of the pavement performance curve for the indicated combination (of surface type, functional class and structural strategy).

In the event that there is significant amount of variation between the 'Previous PCI' and the 'Current PCI' for the amount of time elapsed between the two surveys, then these results can be flagged for review with the City and/or further follow-up action.

PAVEMENT CONDITION SURVEY METHODLOGY

The digital image data will be used to facilitate a quantitative pavement condition survey, in which the various pavement distresses will be digitally measured from the data collected in the survey.

The required surface condition assessment for this project will be based upon the standard survey distress definition as specified in the methodology of ASTM 6433-11, by the American Society for Testing and Materials (ASTM). The assessment will provide a calculated Pavement Condition Index (PCI) for each pavement management sample and inventory section (e.g. per street block) evaluated in the survey.

For the bituminous pavements within the selected area of evaluation, the following pavement surface condition distresses and their related quantities will be recorded:

- **Alligator Cracking**
- **Bleeding**
- **Block Cracking**
- **Bumps and Sags**
- **Depression**
- **Edge Cracking**
- **Joint Reflection Cracking**
- **Lane/Shoulder Drop Off**
- **Patching**
- **Polished Aggregate**
- **Potholes**
- **Railroad Crossing**
- **Shoving**
- **Slippage Cracking**
- **Swell**
- **Weathering/ Raveling**

- **Corrugation**
- **Long. & Trans. Cracking**
- **Rutting**

Any Portland Cement Concrete (PCC) pavements located within the selected project area will have the following pavement surface condition distresses and their related quantities recorded:

- **Blow up/ Buckling**
- **Corner Break**
- **Divided Slab**
- **Durability Crack**
- **Faulting**
- **Joint Seal**
- **Lane/Shoulder Drop Off**
- **Linear Cracking**
- **Patching (Large)**
- **Patching (Small)**
- **Polished Aggregate**
- **Popouts**
- **Pumping**
- **Punchout**
- **Railroad Crossing**
- **Scaling**
- **Shrinkage**
- **Spalling Corner**
- **Spalling Joint**

Using our proprietary feature extraction software, the measured distress data is then registered in an underlying relational database along with its corresponding GPS (xyz) coordinates. Utilizing the existing link between the City pavement management system and GIS, the resulting pavement condition data may then be linked and imported into the City's pavement management database for PCI calculation.

Roughness (IRI) Data

Roughness or ride quality data is most commonly measured and expressed in terms of the International Roughness Index (IRI), however, it can be reported in qualitative terms (good, fair, poor, etc.) based on the data collection plan and models developed for this project. The IRI scale is linearly proportional to roughness. If all of the elevation values in a measured profile are increased by some percentage, then the IRI increases by exactly the same percentage. An IRI of 0.0 means the profile is perfectly flat. There is no theoretical upper limit to roughness, although pavements with IRI values above 8 m/km are nearly impassable except at reduced speeds.

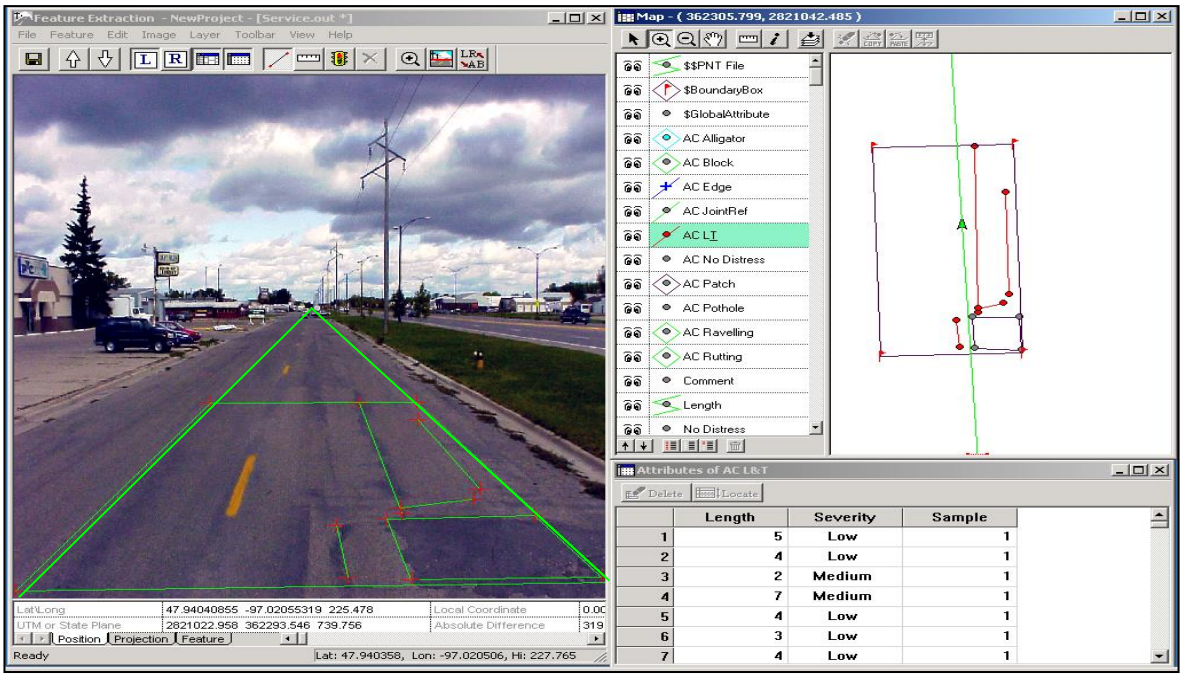
Based on the data collection plan established for this project, roughness data will be collected using the LTI LaserScan™ system.

Traffic and Safety

Field data collection will be performed conforming to all traffic laws and will adhere to all traffic control and safety related procedures deemed necessary by the Client for the protection of the public personnel and our crew members. The GPSVision™ system is equipped with flashing amber lights that are readily visible from the front, sides and rear of the vehicle. The GPSVision™ van is able operate at traffic speeds and there is no unnecessary stopping or blocking of traffic during operation.

With the assistance of client-supplied data and GIS maps, we will develop an efficient general drive plan and schedule. Based on the general drive plan and the previous data collection status, the field data collection team will update the daily drive plan.

The data collection crew will operate the GPSVision™ van according to the daily drive and operational plan. The survey continues following the electronic map that shows



Screen Capture of the Feature Extraction (FE) Application Displaying Pavement Distress

the previous day survey progress against the Client-supplied electronic maps. Blocked road sections, construction-zones, detours and other diversions from the correct travel lane are examples of events that can be marked and can be excluded from the calculations in the final deliverable tables.

GoodPointe will import the pavement condition data that is collected in this project into a dedicated ICON Pavement Management System for the City which is hosted at our data center on our Amazon Web Services (AWS) Cloud Server. The City's ICON program will be used to batch calculate the PCI for the distress data collected in this project.

Within the ICON system we can set up an SQL query/online data service to push ICON system data (e.g. the Today's Calculated PCI, latest structural- and/or non-structural paving project information, etc.) to other third-party systems (e.g. ArcGIS Server) to consume the pavement management data.

Additionally, the City will be able to use the robust budget analysis scenario functionality of ICON to run multi-year scenarios and to track the recommended CIP/maintenance, repair, and rehabilitation plans.

OTHER DATA TO BE EXTRACTED IN THIS PROJECT

In addition to collecting PCI data in this project, the images can be used to extract and collect other right of way data such as: curb/gutter inventory, shoulder attributes, traffic signs, pavement striping, etc.

If the City can provide a list of the features and attributes of the asset types/categories of interest, GoodPointe will provide a not-to-exceed estimate to inventory these features.

Our high-resolution images enable zooming to a feature for a closer look, to extract information

E. PROJECT SCHEDULE

- **Field Data Collection (Early Spring/weather permitting 2018)**
- **PCI Data Extraction/Delivery (Summer/Fall 2018)**

The above is offered as a preliminary schedule suggestion for the City's consideration and can be adjusted to better meet the City's schedule requirements.

F. FEE SCHEDULE

TASK 1. CITYWIDE PAVEMENT CONDTION ASSESSMENT & DIGITAL IMAGE COLLECTION

Year 2018:

222 miles @$201.60/mile = $44,755.00

Year 2019:

222 miles @$201.60/mile = $44,755.00