September 3, 2024

Phillip Grooms
City Manager
City of Mount Pleasant
100 Public Square, PO Box 426
Mt. Pleasant, TN 38474
pgrooms@mtpleasant-tn.gov

Re: **Proposal for Pavement and Sidewalk Condition Assessment and Pavement Management System (PMS) Implementation**

Dear Mr. Grooms:

KCI Technologies, Inc. (KCI) understands that the City of Mount Pleasant (City) is looking for consulting services to conduct a comprehensive survey of the City's pavement system. The survey will cover approximately 42 centerline miles of streets and sidewalks.

KCI is uniquely positioned to support state and local agencies with their changing infrastructure needs. Our team offers localized expertise and data-driven solutions to support decision-making. We are eager to provide the City with a comprehensive pavement condition assessment and budget scenarios analysis report. This report will identify funding requirements and recommend pavement management strategies, enabling the City to prioritize resources and allocate budgets effectively.

With more than 68 years of significant experience providing professional engineering and assessment services for various clients like the City, KCI has the necessary resources, knowledge, and experience to manage and execute this contract for the City. Our commitment to the City's needs is unwavering, and with a local presence, the team remains dedicated to what's happening in their backyard. This commitment ensures that we will always prioritize the City's best interests.

The success of any project, particularly a project of this magnitude and complexity, depends on the qualifications and experience of the consultant team. KCI and our teaming partner, ESP Associates, Inc. (ESP), offer an extensive portfolio of previous pavement data collection and assessments. This wealth of experience equips us to help cities and City's plan for future maintenance and asset management initiatives, instilling confidence in our ability to deliver results.

Our team is exceptionally qualified to perform the work described because:

- **Team members performed similar pavement condition assessments** and are experts in pavement conditions evaluation, maintenance, and rehabilitation techniques.

- Our automated digital survey vehicle with a **32MP 360° camera and laser crack measurement system (LCMS)** provides an efficient, effective, and repeatable collection and detection process.

- We provide an automated **digital f index (PCI) rating representing the condition of 100% of the driven lanes**, not based on a sample; therefore, we can also accurately estimate repair needs and costs.

- We will utilize a downward-facing, progressive line scan camera that provides high-resolution images (1mm pixel, 4,000 pixels wide, and ~12 feet width) of the pavement surface to **clearly detect the type, severity, and extent of the distresses.**

- Our comprehensive sidewalk assessment provides numerical **condition ratings**, which can be utilized for maintenance and repair cost estimation.

- Team members possess **specialized education and experience in pavement engineering** and understand the pavement distress mechanism and repair strategy to **maximize pavement performance at a minimal cost**.

- We offer a full-service Asset Management practice with expertise in PAVER™ pavement management software and GIS/web dashboard capabilities.

- We will present the results of the **pavement condition assessment, repair analysis, and budget scenarios to the City Council members** and help justify the budget needs.

- We have a **proven team dynamic that is professional and pleasant.** We will maintain a collaborative team throughout the project and foster collaboration and open discussion with the City.

On behalf of the KCI team, we appreciate the opportunity to submit our qualifications to the City of Mount Pleasant for this Street Condition Survey contract. If you have any questions, please contact our project manager, Will Hager, or me. Will can be reached at 629.204.5058 or by email at will.hager@kci.com.

Respectfully,

Heidi Hammel, PMP, GISP
Vice President
(410) 527-4415
heidi.hammel@kci.com

Will Hager, AICP, LEED Green Associate
Practice Leader
(629) 204-5058
will.hager@kci.com

FIRM/TEAM INFORMATION

KCI Technologies, Inc.

KCI's history can be traced to a small firm operating out of the basement of the co-founder's home in 1955. By its second year, the company took up residence in a proper facility, only to change locations several times over the next decade in a succession of moves that paralleled its growth. Today, roughly 2,100 employee-owners operate out of nearly 70 offices in 20 states and the District of Columbia. With revenues of approximately $441 million in 2022, the *Engineering News-Record* consistently places KCI among the top consulting engineering firms in the country, currently ranked 56th.

KCI is a 100 percent employee-owned engineering, consulting, and construction firm serving clients nationwide. KCI's corporate vision is to be the professional consulting firm of choice for our employee-owners, clients, and business partners. KCI is constantly driven by energy, passion, and talent. We are a recognized industry leader, employing cutting-edge technologies, management practices, and strategic growth initiatives. The strong team we've built over the last 68 years operates as a single entity of technical specialists providing a collaborative, efficient suite of services across core markets. Our multi-disciplined offerings allow us to offer exceptional turnkey project delivery. Our people, projects, and organizational success have been honored with awards from some of the trade's most prestigious bodies.

AREAS OF PRACTICE

KCI's professional staff of engineers, planners, scientists, surveyors, and construction managers offer a broad range of engineering services, including asset management, civil, structural, transportation, environmental, hazardous waste, mechanical, electrical, wireless/communications infrastructure, and telecommunications. We also provide cultural and environmental resource management services, land planning and landscape architecture, geology, hydrology, ecology, surveying, and construction management and inspection.

ASSET MANAGEMENT

Our dedicated asset management practice is founded on the core principles of enterprise asset management and is backed by a highly qualified ISO-certified team. Our Asset Management professionals have become certified by the Institute of Asset Management (IAM) in the "Principles of Asset Management." Originating in the United Kingdom, IAM is the professional body for asset management practitioners and industry leaders in training for ISO 55000 and PAS55. The KCI team has leveraged this knowledge to promote good asset management concepts and principles and awareness to our clients regarding industry standards and practices. Our goal is to provide guidance to our clients that aligns with core principles and best practices when establishing any

new program or organization. Our multi-disciplinary team of trained asset management professionals has unparalleled breadth and depth of expertise.

PAVEMENT MANAGEMENT EXPERTISE

Honed through previous experience on pavement evaluation and management projects, the KCI

DATA COLLECTION SERVICES

o Automated pavement condition assessment
  ▪ Surface distress, ride quality, and structural
o Asset inventory and assessment on a GIS platform
  ▪ Sidewalks, trails, signs, striping, traffic signals, curb & gutter, lighting, and other right-of-way assets
o 360 degree camera high-resolution video-logging of right-of-way
o LiDAR point cloud data acquisition and asset data extraction

CUSTOMIZED ASSET MANAGEMENT SOFTWARE

o Central management system implementation for all assets
  ▪ PAVER™, Pavement Express®, Cityworks®, Maximo, Cartegraph OMS, and other CMMS
o Mobile applications for field support (asset inventory, condition surveys, and maintenance activities)
  ▪ Sidewalks, trails, signs, markings, light poles, traffic signals, etc.
o GIS integration, GIS/database management, web-portal and cloud data visualization tools
o Pavement and right-of-way asset image viewer dashboard

ENGINEERING AND PLANNING SERVICES

o Multi-year maintenance and capital improvement plan (CIP) development
o Maintenance quality assurance (MQA) review
o Governmental policy compliance (GASB 34, retroreflectivity)
o Non-Destructive Testing of Pavements
  ▪ Ground Penetrating Radar (GPR)
  ▪ Falling Weight Deflectometer (FWD)
o Pavement Design
  ▪ AASHTOWare Pavement ME Design
  ▪ Life-cycle-cost analysis (LCCA)

team brings expertise and lessons learned on comprehensive and successful street condition survey projects. The team offers:

- Expertise in pavement engineering and understanding pavement distress mechanism, pavement condition evaluation (i.e., PCI), and remedies to address pavement issues.
- Knowledge of the appropriate survey technique, collection methods, and equipment necessary to gather, process, and prioritize data related to roadway conditions.
- Expertise in pavement management software implementation and training, such as PAVER™, Cartegraph OMS, Pavement Express™, etc.
- Experience integrating a work order management system such as Cityworks® with a pavement management system such as PAVER™
- Proficiency with analyzing, interpreting, and making recommendations for data gathered.
- GIS experts familiar with GIS tools for mapping and analysis.
- Staff with experience prioritizing maintenance and repair projects

Team

KCI has selected ESP Associates, Inc. as a subconsultant for automated pavement condition data collection because it is local and offers specialized expertise and significant experience relevant to this project. Further, ESP has worked and is currently working with KCI on several projects of similar scope, size, and context. Over time, KCI has become highly familiar with ESP's personnel, capabilities, and technical background. Recent projects for which KCI and ESP have collaborated include the US 17 Widening of Speedway Boulevard in Jasper, SC; road improvements to Mt. Gallant Road in Rock Hill, SC; and **automated pavement data collection and processing to determine PCI for the City of Dunwoody, GA, and the City of Greenville, NC**.

PROJECT APPROACH

The paragraphs below summarize KCI's understanding and approach to this project.

PROJECT UNDERSTANDING

KCI understands that the City requires pavement condition data and right-of-way imagery of approximately 42 centerline miles of roadways and sidewalks and processing the recorded data on a segment-by-segment basis to determine the pavement condition Index (PCI) for each pavement section. The City needs inventory verification of sidewalk attributes and condition assessment. The City also wants to implement a pavement management system utilizing the PAVER™ pavement management system. The pavement conditions data need to be uploaded to PAVER™, generate budget scenarios, and recommend a multi-year pavement maintenance and rehabilitation (M&R) plan based on the available annual funding. A technical report needs to be delivered to the City, encompassing pavement condition analysis, budget scenarios, and a multi-year M&R plan, enabling the City to make informed infrastructure decisions. The City needs a comprehensive sidewalk condition data geodatabase and condition assessment, as well as loading the data on the City's ESRI ArcGIS system after confirming the data validity by performing a proven, documented, and systematic QA/QC process. The City will also need a presentation on the pavement conditions and management plan to the City Council. A diagram of our proposed approach is depicted below:
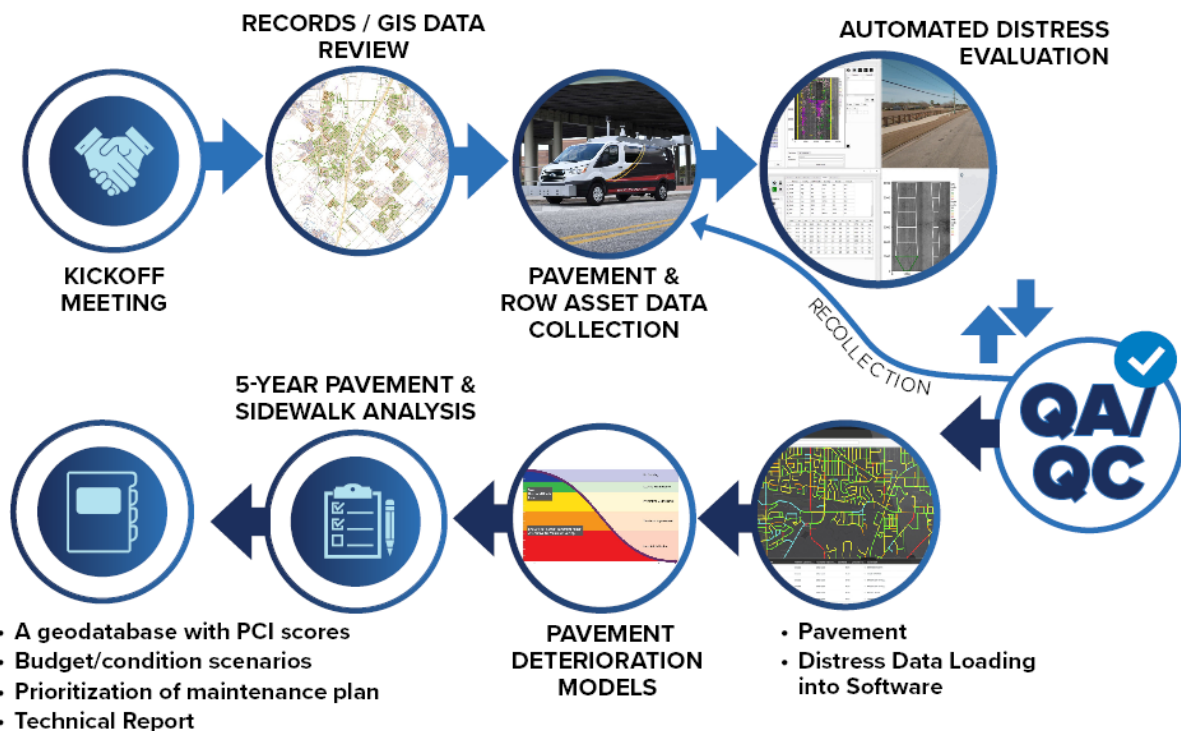
The sections below detail how KCI would meet the City's needs in carrying out the project.

TASK 1.0 – KICKOFF MEETING AND RECORDS REVIEW

KCI understands the importance of planning and preparation at the onset of a project. KCI will coordinate with the City for a project kickoff meeting to confirm the scope, extent, and contents of the project as well as the following items:

- Project management

- Scope, project schedule, and milestones
- Data provided by the City
- Previous maintenance programs and practices
- Pavement construction history
- PAVER™ Software and integration with the City's GIS
- Field pilot for pavement data collection and quality verification
- Deliverables

KCI believes communication is the key to a successful project. Our Project Manager, Dr. Shahidul Islam, will work with the City to schedule weekly/bi-weekly project coordination meetings and define channels for communication between the KCI team and City staff.

After receiving the street centerline geodatabase from the City, we will generate GIS layers and maps for use by the Digital Survey Vehicle (DSV). If necessary, we will also digitize or import any new streets that may have been recently constructed and/or accepted by the City. At this stage, we will:

- Create a pavement database using the existing centerline data.
- Maintain the unique identifier of each of the road segments.
- Maintain a persistent link to the GIS data

We will confirm the roadways and mileage with the City before collection. The finalized road network will be loaded into the ICC Connect software to define what needs to be collected and delivered, eliminating routing problems and location errors.

DELIVERABLES
- Kickoff meeting minutes and finalized scope, schedule, and project milestones
- An updated roadway network geodatabase to be utilized for pavement data collection

TASK 2.0 – AUTOMATED PAVEMENT FIELD DATA COLLECTION AND PROCESSING

For pavement field data collection, KCI will partner with ESP to collect and process the City's pavement conditions with state-of-the-art digital survey vehicles equipped with **fully automated 3D Laser Crack Measurement System (LCMS-2)** technologies and additional features:

- Our Pavement Condition and Asset Inventory survey vehicle combines state-of-the-art pavement collection and survey-grade mobile mapping sensors. **This allows us to gather pavement data, LiDAR asset mapping, and imagery for the City's entire network of roads (70 centerline miles) from one mobilization.**

- The **3D LCMS-2 camera is a downward-facing laser array providing images used to evaluate data with ASTM D6433 protocols**. It uses two 1-millimeter-pixel resolution line scan cameras to provide a customized digital condition rating system to collect user-defined severity/extent-based pavement distresses and rutting.
- The 3D LCMS-2 collects pavement distress type, severity, and extent and uses them to calculate a PCI score between 0 and 100, representing the condition of 100% of the driven lanes.

- Teledyne **Ladybug 5+ 30 MP spherical 360-degree imagery system** provides unequaled, unobstructed imagery of the complete road right-of-way for accurate roadway asset capture, extraction, and assessment.
- A class 1 inertial profiler for simultaneously capturing dual-wheel path (left and right) International Roughness Index (IRI) measurements to the hundredth inch, in accordance with AASHTO R48.
- Linear distance measuring to within +/-0.5%, and Applanix POS/LV with DGPS (**provides GPS accuracy +/- 1 foot or better**).
- All subsystems are integrated using ICC's collection core, with tight synchronization between all data streams on the truck in real time, referenced to both time and distance. This provides the client with the highest-quality pavement data collection available.

The methods for automated data collection and pavement condition rating are repeatable and defensible. Other essential features of the automated pavement data collection are:

- The images will be collected at 20-feet intervals (or chosen by the City) as 360-degree right-of-way panorama, including forward, rearward, and downward pavement viewing images.
- **Two lane non-divided roads will be driven in one direction**
- **Roads with four or more lanes and divided roads will be driven in both directions**

Automated Survey Vehicle	Laser, Sensors, & LiDAR	Distress/Crack Detection

Laser Crack Measurement System (LCMS) and LiDAR System

TASK 2.1 – FIELD PILOT

During the project kickoff meeting, KCI will work with the City's staff to determine a pilot area of approximately 10 miles. The pilot allows KCI's team to collect, process, and review condition data with the City's staff to confirm the accuracy of the data collection and interpretation protocols. The review of the condition data will be facilitated by our project manager, Mr. Will Hager, and the task manager, Dr. Islam, in the field, who will also review site conditions with city staff.
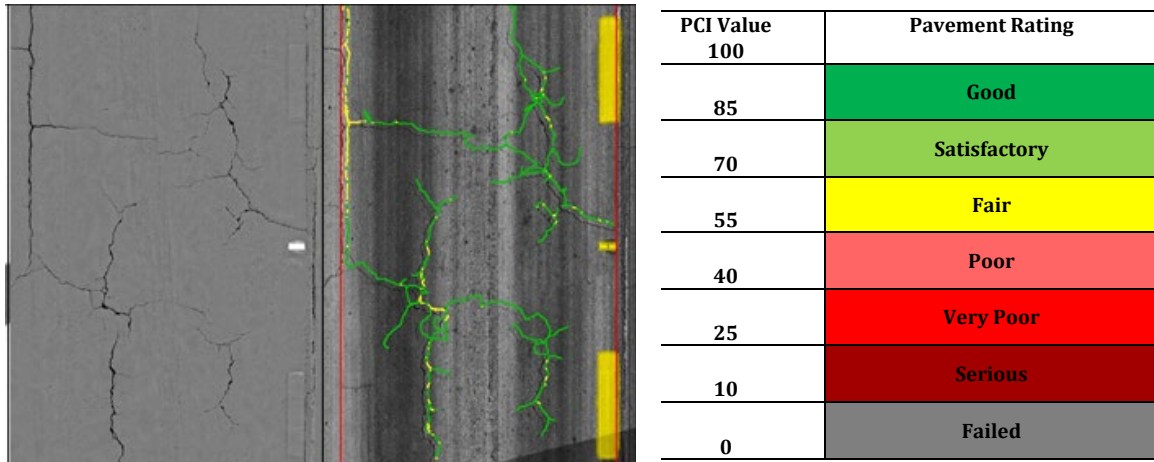
DELIVERABLES

- Detailed pavement distress and PCI data for the field pilot sections for the City to review
- Pavement imagery of the field pilot sections to assist with reviewing the conditions data

TASK 2.2 - PAVEMENT CONDITION DATA PROCESSING

After reviewing the pavement data in the pilot area, we will utilize the ICCConnect software, an AI pavement rating tool, to import all the collected data. During this phase, we will process the data and generate right-of-way and pavement image streams. We will also calculate profile, International Roughness Index (IRI), rutting, detect patching, distortions, raveling, bleeding, and all types of cracking, lane markings, man-made objects, and other distress. The automated crack analysis identifies cracks that we overlay on the pavement images and offsets to verify them. To

determine the type, extent, and severity of distress, we will adhere to ASTM D6433 methodology and use visual quality control checks of image files for resolution. In instances where crack density metrics are necessary, we will use the interval length and road zone width to determine them.

The pavement distress (type, severity, and extent) data will be loaded into the City's PAVER™ pavement management software to calculate PCI values for each pavement section. Each section will be rated based on the PCI scale of 0 to 100, where 0 represents a failed roadway condition, and 100 represents an excellent/new roadway condition.


PCI Value	Pavement Rating
100	
85	Good
70	Satisfactory
55	Fair
40	Poor
25	Very Poor
10	Serious
0	Failed

Automated pavement distress detection and PCI categories.

We have experienced pavement inspectors performing visual field pavement assessments based on ASTM 6433 protocols. The same inspectors will perform QC to confirm the distress and severity of the pavement condition data collected by the automated technology. This manual quality review is performed in accordance with the principles of the ASTM D6433 standard, using the LCMS pavement images gathered during the collection with the distresses superimposed and color-coded, such as what can be seen in the corresponding image.

TASK 2.3 – PAVEMENT CONDITION DATA QA/QC

Our philosophy and implementation of QA/QC enhance the standard Plan-Do-Check-Act (PDCA) cycle. We have a proven QA/QC procedure for all automated pavement data collection projects. **Quality is checked to reduce schedule disruptions and repeated work, so the City receives the precise pavement distress data and PCI values.** KCI understands quality is not added at the end of the project; it is the aggregation of the team's effort and each employee's work product. Our quality philosophy follows the same approach, as embodied in the following statements:
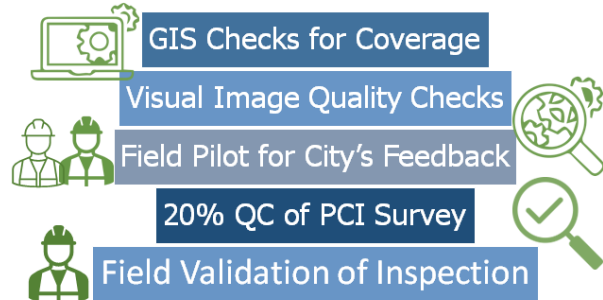

- **Be Responsible:** KCI employees and their subcontractors are responsible for the quality of their work daily and must communicate quality problems to the appropriate manager.
- **Two-Person Rule:** A second person competent in the subject will review essential work products and external communications before the product is transmitted to a customer.
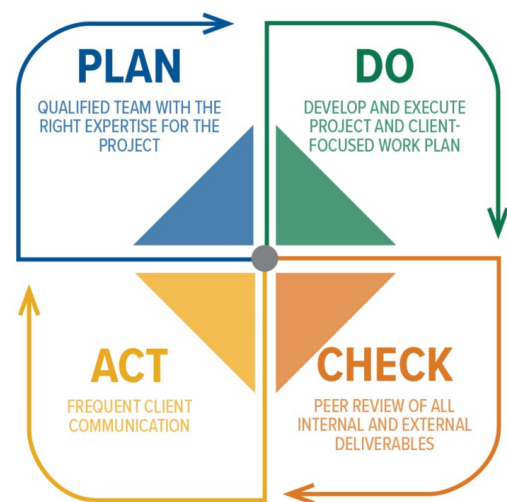
Specific **quality control checks** will include:

- GIS checks of coverage from collected images to confirm no areas were missed.
- Visual image quality checks to check for acceptable focus and clarity.
- Data range checks for acceptable data from vehicle sensors.
- Start data collection at least an hour after sunrise and stop data collection an hour before sunset
- Only survey clear and dry pavements and collect imagery during daylight hours, with no rain, fog, or snow visibility obstructions.

GIS Checks for Coverage
Visual Image Quality Checks
Field Pilot for City's Feedback
20% QC of PCI Survey
Field Validation of Inspection

Specific quality acceptance measures will include:

- Regularly correspond with the City and do a field pilot to review all collected information.
- Submit all deliverables in draft form for review and feedback before final delivery.

We will submit pavement distress and PCI data to the City to perform random field inspections to verify survey data against actual conditions.

DELIVERABLES

- Pavement distress and PCI data of the field pilot area for the City's staff to review the accuracy of pavement conditions assessment.
- Pavement distress and PCI data of the entire network for the City's staff to perform quality control and verify the accuracy of the pavement condition inspection. The pavement attributes will include, but are not limited to, street name, segment length, segment width, inspection date, surface type, functional classification, and others required by the City.
- Georeferenced high-quality right-of-way images (forward, left, right, and LCMS downward) in an external hard drive and an Excel/GIS shapefile with hyperlinks to view the images.
- Presentation on PCI and condition data analysis to the City staff.

TASK 3.0 – PAVEMENT MANAGEMENT SYSTEM IMPLEMENTATION & BUDGET SCENARIOS

After the City's review and acceptance of the pavement condition data, we will customize PAVER™ to reflect the City's current maintenance and rehabilitation practices. We will perform pavement condition analysis, develop/update pavement performance models, develop budget/condition scenarios, and a multi-year pavement rehabilitation plan as described in the following sections:

TASK 3.1 – PAVEMENT PERFORMANCE MODELS

KCI will work with the city's staff to update the history of maintenance and construction works. At this point, the primary step in budget/condition scenarios analysis and determining the maintenance and rehabilitation needs is to develop pavement performance models to predict the pavement's future condition and rehabilitation timelines. The pavement performance modeling process identifies and groups pavements of similar construction and is subjected to similar traffic patterns, weather, and other factors that affect pavement life. We can develop pavement performance models based on traffic, surface type, functional class, and use. We will present the models to the City for review and update based on local knowledge of the treatment's expected

service life. The figure shows a sample pavement performance model developed for low-traffic, collector, and asphalt-surfaced pavement.
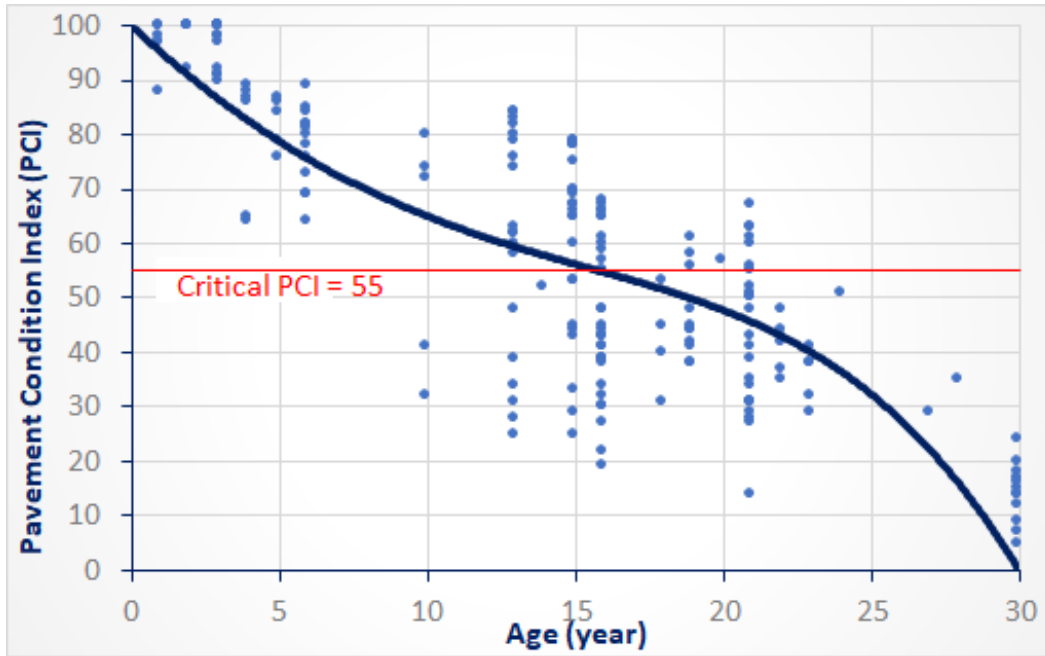
A Sample Pavement Performance Model

TASK 3.2 – PAVEMENT AND SIDEWALK TREATMENT SELECTION MATRIX

We will work with the City's staff to update the unit costs, reflecting the currently used treatments and their costs. We will develop a maintenance and rehabilitation program and provide recommended treatment for each road with estimated costs. The PAVER™ system will be configured with treatment selection criteria to define when a particular treatment is applied and its consequences on pavement conditions. The treatment selection can be based on the PCI, particular distress, traffic, and functional class to incorporate the City's pavement preservation goals. KCI will work with the City to include new pavement preservation and maintenance techniques based on local experiences. The table below shows a sample maintenance and rehabilitation program developed for a City utilizing PCI values for pavement and sidewalk condition index (SCI) for sidewalk.

Sidewalk Condition Index (SCI)	Treatment
81 – 100	Do Nothing
51 – 80	Localized Repair
0 – 50	Full Reconstruction

A sample of Sidewalk Treatment Decision Tree

| PCI Value	PCI Rating	Pavement Treatments
85-100	Good	Crack Seal
70-85	Satisfactory	Crack Seal, Microsurfacing
55-70	Fair	Crack Seal, Distress Repair, Chip Seal
40-55	Poor	2.0" Mill & Inlay
25-40	Very Poor	Patching + 2.0" Mill & Inlay
10-25	Serious	Patching + 2.0" Mill & Inlay
0-10	Failed	Reconstruction

A Sample Pavement Treatment Decision Tree

TASK 3.3 – BUDGET/CONDITION SCENARIOS

KCI's data-driven budget scenario analysis and recommended pavement maintenance and rehabilitation strategies lead to a more effective, efficient, and productive organization and high-performance pavement management systems. The analysis will provide the desired outcome for the City, such as understanding the system's current conditions, performance trends, and the best pavement management strategy based on the PCI value ranges and specific distress type and severity levels. KCI can also generate the following budget/condition scenarios:

- Annual funding required to maintain existing pavement conditions.
- Annual funding required to achieve a target condition set by the City.
- Maintain the current annual funding levels for the next five years.
- Annual funding to eliminate backlogs.
- Balanced option based on a combination of the factors.
- Add moderate funding relative to current funds.

We can also perform the following multi-constraint optimization analysis:

- Force certain roadways to be rehabilitated in a determined year to correspond with a utility project or other priorities in the City. The KCI team will work with the City to determine the work performed and incorporate it into the analysis as 'committed' projects.

- Exclude certain roadways from the analysis that will be resurfaced or reconstructed by other means (such as part of a federally funded project, part of a future development project, etc.).

- Able to analyze a variety of scenarios to determine future funding needs, alternative repair options, and optimized work plans, which provide a maximum benefit for defined constraints.

Predicted PCIs in Different Budget Scenarios

A Sample Budget Scenario Analysis
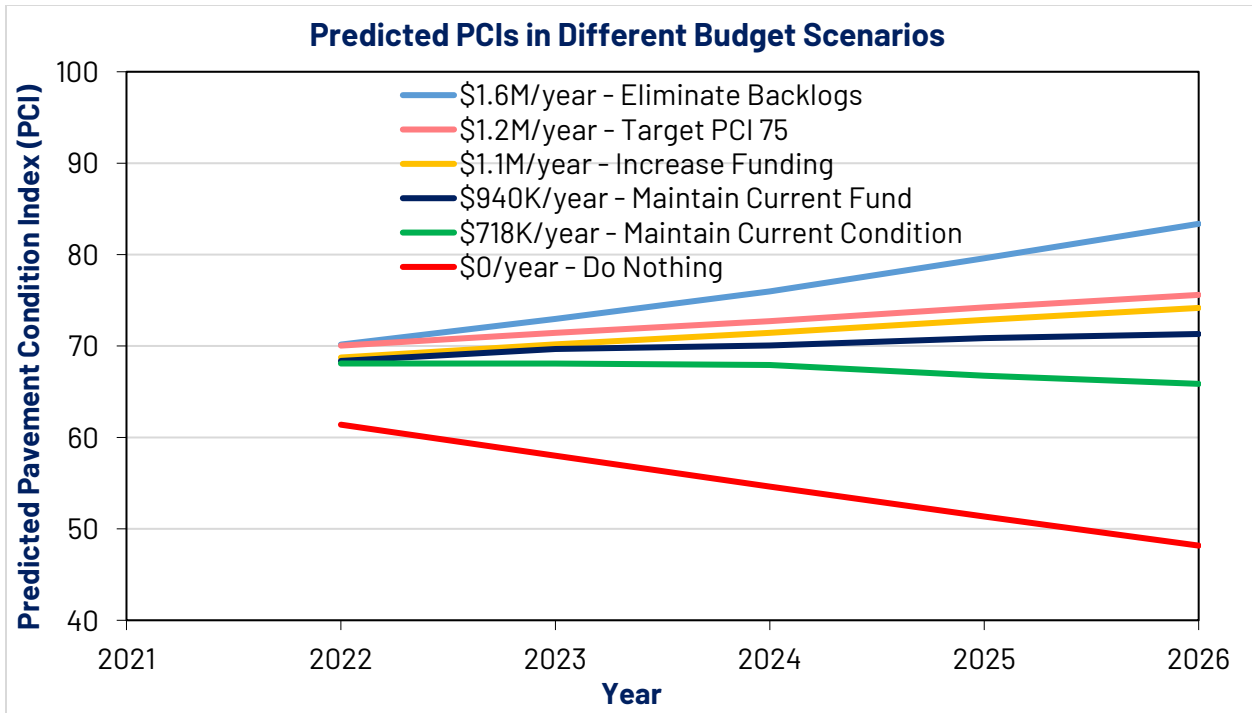
Remaining Backlogs Based on the Budget Scenarios
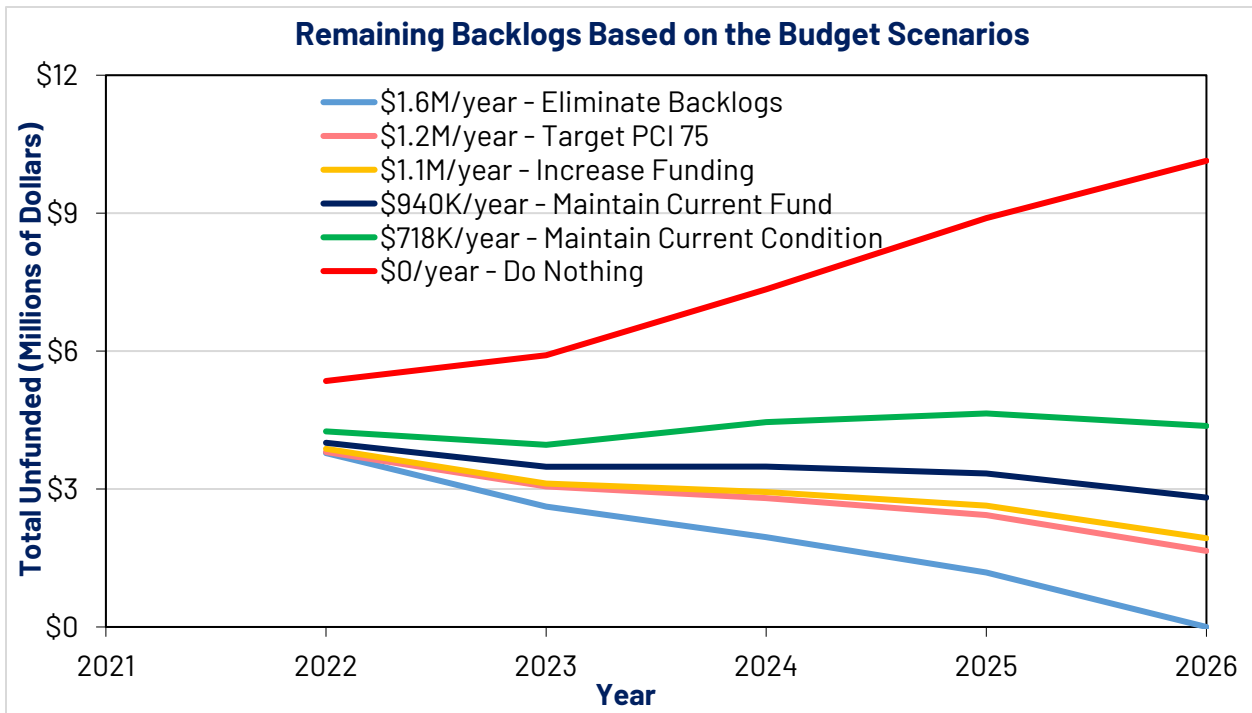
A sample of remaining backlog scenarios at the end of a five-year plan.

The budget scenarios to be included will be finalized in consultation with the City, and the final recommended scenario will be utilized to develop a multi-year maintenance and rehabilitation plan. The program will also include recommended preventative maintenance amounts, costs, and other pavement preservation strategies.

TASK 3.4 – CITY COUNCIL PRESENTATION

We have extensive experience presenting pavement condition analysis and maintenance and repair plans to city councils, county boards, and mayor commissions. Similar to our other projects, we will present the pavement condition assessment results and budget scenarios to the City Council members and help justify the budget needs.

TASK 3.5 – FINAL REPORT AND DELIVERABLES

- A written final report including an executive project summary, discussion of the City's overall pavement conditions, and findings utilizing charts and graphics. The report will also include multiple budget scenario analyses and recommended multi-year maintenance and rehabilitation strategies.
- A PAVER™ database with the pavement conditions data, budget scenarios, and multi-year maintenance and rehabilitation plan
- A geodatabase that contains information on pavement conditions and a multi-year maintenance and rehabilitation plan outlining which streets require specific types of treatment each year.

TASK 4.0 – SIDEWALK INVENTORY AND CONDITION ASSESSMENT

Sidewalks form the backbone of the pedestrian network, and their conditions impact not only individuals with disabilities but all pedestrians. Our Pavement and ROW collection vehicles will collect right-of-way asset inventories while collecting data for the pavement condition survey. The vehicles will capture images at an interval of approximately 20 feet for both forward and side-facing directions and geo-referenced to the pavement inventory by segment. KCI will collect the following for the sidewalk inventory:

Sidewalk Attributes (Linear Feature):

- AssetID
- Street Name
- Position
- Direction
- Length
- Width
- Condition
- Horizontal & Vertical Faults
- Obstructions
- Cracking
- Spalling
- Panels Affected
- Overall Physical Condition Rating
    - Good
    - Fair
    - Poor
- Comments

Deliverables:

- A sidewalk inventory with attributes and condition assessment identified above in a GIS file geodatabase.

KEY PERSONNEL

The success of any project is dependent on the quality and experience of the overall team as well as individual project personnel; therefore, KCI selected key staff to highlight based on their experience with pavement condition assessment, preventive maintenance and rehabilitation strategies, pavement preservation, pavement management, GIS integration, and their ability to transfer knowledge through formal and informal training. In addition, KCI has a team of 50+ highly qualified, diverse experts to leverage as needed.

The team presented herein has completed projects under similar agreements and will draw on their experience to effectively complete the project. Our key personnel will mobilize quickly to meet the project schedule and deliverables. The table below identifies their years of experience in their respective fields.

Key Staff, Role, Years of Experiences	Summary of Experience
Will Hager, AICP, LEED Project Manager Experience: 20+yrs.	As Project Manager for this project, Mr. Hager will direct all coordination activities, provide quality assurance and quality control for deliverables and serve as the primary point of contact for the City. Mr. Hager has over 20 years of experience in community planning and has assisted the City of Mount Pleasant's Building and Planning Department since 2016.
Shahidul Islam, PhD, PE Task Manager Experience: 14 yrs.	Dr. Islam will lead and coordinate the services needed for the pavement condition assessment, pavement maintenance and rehabilitation strategies, multi-year capital improvement plan generation, and presentation at the Board meeting. Dr. Islam has performed these same services for the following municipalities: • City of Shelbyville, TN • Dickson County, TN *(currently underway)* • Athens-Clarke County, GA • City of Kyle, TX
Kofi Acheampong, PhD, PE Pavement Design and Maintenance Expert Experience: 38 yrs.	Dr. Acheampong 's expertise lies in pavement subgrade improvement with backfill material and geotextile, Cement Modified Subgrade (CMS), and recycled asphalt pavement. His technical background is in geo-forensics, subsurface investigations, and slope stability. He has worked on multiple highway infrastructure projects designing pavement and geotechnical structures. Dr. Archeampong's relevant project experience is listed below: • MDTA Moravia Road Pavement Assessment, Baltimore, MD • DCDOT Pavement Engineering & Management, Washington, DC • Anne Arundel County Public Schools, MD

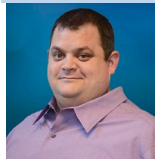| Key Staff, Role, Years of Experiences	Summary of Experience
Sarah Huber, GISP GIS Integration and Asset Management Experience: 18 yrs.	Ms. Huber has experience supporting user-friendly field data collection applications, survey forms, and maps for operators and business intelligence dashboards, AGOL web applications, workflow analysis, asset condition assessment, and asset management plans for strategic decision-makers. Ms. Huber has performed these same services for the following municipalities: • Town of Shelbyville, DE • City of Durham, NC • Envirolink, Inc., Raleigh, NC
Darryl Glascock Sidewalk Assessment Experience: 27 yrs.	Darryl is a transportation data collector with extensive experience in collecting roadway inventory data, pavement and sidewalk condition assessment, pedestrian and bicycle counts, traffic volume and speed data, and turning movement counts. Mr. Glascock has performed these same services for the following municipalities: • City of Shelbyville, TN • Dickson County, TN *(currently underway)*
Brian Moravec Automated Data Collection Experience: 23 yrs.	Mr. Moravec has highly technical capabilities in pavement condition assessments, mobile lidar collection, GPS technology, hydrographic surveys, and other advanced geospatial technologies. He will oversee the field collection procedures, hardware/software management, data management, post-processing, registration, and classification of collected data. Mr. Moravec has performed these same services for the following municipalities: • Town of Indian Trail, NC • City of Dunwoody, GA • North Dakota, South Dakota, & Iowa • City of Seguin, TX

PROJECT SCHEDULE

We propose a four-month preliminary schedule to complete the pavement condition evaluation and deliver the final report. We can meet the City's expectation of collecting, processing, and analyzing the data to provide the deliverables. The schedule below illustrates the time KCI anticipates completing each task outlined in the scope of work.

Description of Activities	2024 – 2025			
	Oct 24	Nov 24	Dec 24	Jan 25
Kickoff Meeting & Record Review				
Pavement Condition Data Collection				
Pavement Condition Index (PCI) Rating				
Sidewalk Condition Assessment				
Presenting PCI Results to the City				
Budget Scenario Analysis, Maintenance & Rehabilitation Analysis				
Development of a Multi-Year Rehabilitation Plan				
Technical Report and Presentation				

COST PROPOSAL

KCI's lump sum price for the project is shown in the following table. All prices include labor, overhead, travel, and other direct costs. KCI will submit monthly invoices based on the percentage completed and will require payment within 30 days of receipt of each invoice.

Task	Task Description	Fee
1.0	Project Kickoff Meeting, Records Review, and GIS Map Updates with Pavement Attributes & Data Collection Route Planning	$ 13,260
2.0	Automated Pavement Data Collection, Processing, & QA/QC	$ 32,420
3.0	Condition Data Analysis, Budget/Condition Scenario Analysis, Multi-Year Maintenance & Rehabilitation Plan	$ 27,420
4.0	Sidewalk Inventory and Condition Assessment	$ 21,880
5.0	Final Report & Presentation	$ 17,650
6.0	Directs (PAVER License, Hard Drives for Street Imagery Delivery, & Travel)	$ 3,470
	Total Cost =	**$ 116,100**