GRAND MOUND
PAVEMENT MANAGEMENT PLAN

Grand Mound, IA

September 2017

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ISG

ARCHITECTURE + ENGINEERING + ENVIRONMENTAL + PLANNING

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ISG

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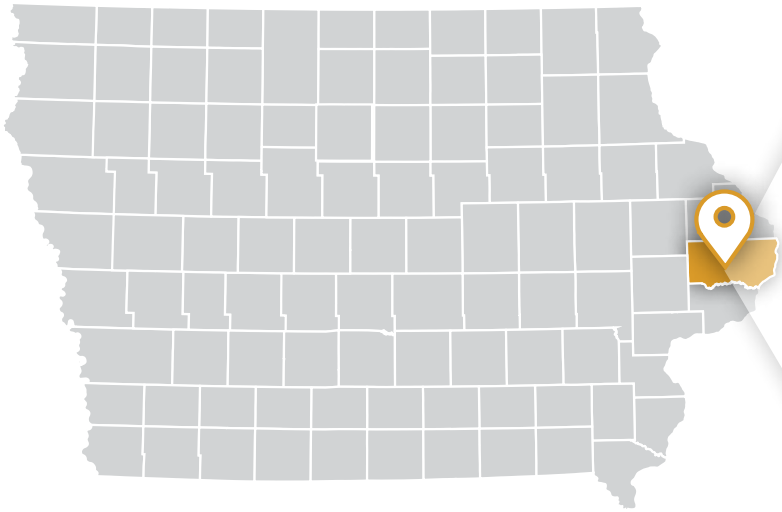
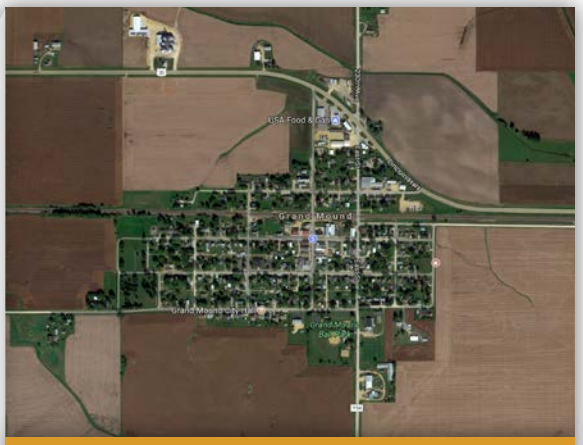
Site Location

HISTORY OF GRAND MOUND

A railroad was built through Grand Mound in 1858, and it was later platted in 1866. Grand Mound is a city located in Clinton County in south central Iowa. A small city with a population of 642 at the 2010 census, Grand Mound is proud of its agricultural origins.

Grand Mound is part of the Central Community School District and the Clinton County Library Association. Annual events include the Grand Mound Combination Sale, 4th of July Celebration and Fireworks, an annual community-wide garage sale, and other various events and activities. The City maintains a park-playground, and a ballpark that includes shelters, ball diamonds, basketball court, volleyball courts. A Community Center provides meeting and event space.





CITY OF GRAND MOUND, IA

POPULATION
611

INDUSTRIES
Agriculture + Manufacturing

AREA
1.82 Square Miles

SCHOOL DISTRICT
Serves 1,463 Students

Certifications

2017 Pavement Management Plan

Grand Mound, IA

August 2017

Project No. 17-20057

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

William A. Kratt, PE
Project Engineer
License number: 21903

Date

My license renewal date is December 31, 2018

Page/Documnets covered by this seal:
Grand Mound Pavement Management Plan

I+S Group, Inc.

201 Main Street, Suite 1020

La Crosse, WI 54601

End of Certifications Page

Executive Summary

BACKGROUND

The City of Grand Mound has expressed interest in developing a plan to help in prioritizing maintenance funds for its roadway network. ISG was retained to prepare this Pavement Management Plan (PMP) as a tool to help assist the City of Grand Mound in pavement management decision making. This report summarizes the findings of detailed field inspections and provides a budget analysis and proposed 5-year Capital Plan.

The City of Grand Mound currently owns and maintains 4.7 miles of paved HMA roadways, 0.4 miles of paved concrete roadways, and 1.8 miles of gravel roadways. This does not include intersections within length calculations due to double measuring in varying directions. It is in the best interest of the City to maintain streets for safety, long life, and to minimize life cycle costs.

4.7 MILES
of Paved HMA Roadways

0.4 MILES
of Paved Concrete Roadways

1.8 MILES
of Gravel Roadways

In April of 2017, ISG performed a complete inspection of all HMA and concrete streets currently owned and maintained by the City. The City's alleyways were not measured or included in this inspection. The data collected during the field inspections was used to assign each street segment a rating, on a scale of 0 to 100, known as a Pavement Condition Index (PCI). The PCI ratings provide a snapshot of the City's overall street conditions (see Table 1).

THE PCI SCALE

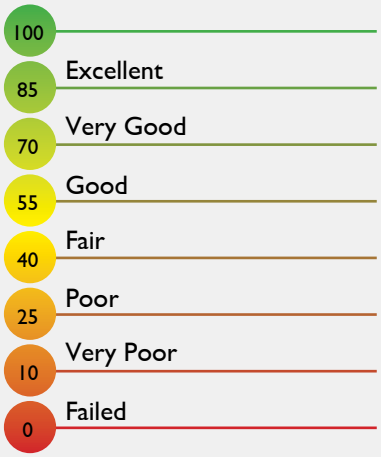


TABLE 1: PERCENTAGE OF STREETS IN EACH PCI CATEGORY

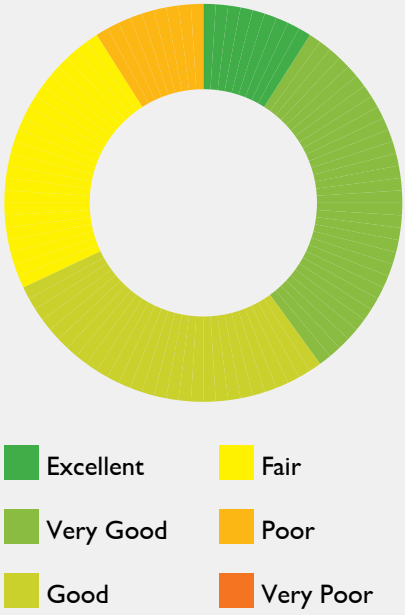
PCI CATEGORY	PCI CATEGORY RATING	% OF TOTAL PAVED AREA
85-100	Excellent	9.46%
70-85	Very Good	30.58%
55-70	Good	27.62%
40-55	Fair	23.31%
25-40	Poor	9.05%
10-25	Very Poor	0.0%
0-10	Failed	0.0%

As shown in Table 1 above, 90.95% of the total area is rated as Fair or better, and the other 9.05% is rated as Poor or worse. A pie chart of the same data can be seen in Figure 1.

During inspection, curb presence and sidewalk entrance compliance were noted. 15.08% of street segments have curb, and 12.50% of sidewalk entrances are compliant.

Executive Summary

FIGURE 1: GRAND MOUND PAVEMENT CONDITIONS



A pie chart, seen in Figure 1, provides a better visual of this.

The data will allow the City to take action and prioritize the budgeting and maintenance of its streets with this PMP based on current and future budgets. ISG recommends that the City of Grand Mound strive to maintain and improve the PCI ratings of their streets. To assist with this, a biannual inspection program of its paved streets is advised.

APPENDIX REFERENCE: G

Based on review of the field inspections, project location considerations, and specific needs the City has expressed, a detailed five-year Capital Plan was developed. Each annual project type listed in the Capital Plan should be inspected the year prior to construction to provide a final determination on work type and cost. The five-year Capital Plan is located in Appendix G, but is briefly summarized in Table 2.

TABLE 2: 5-YEAR CAPITAL PLAN SUMMARY

YEAR	WORK TYPE	APPROXIMATE COST
FY18 Ongoing	Mill + Overlay	$47,550
FY19	Sealcoat	$53,507
FY20	Sealcoat	$50,039
FY21	Sealcoat	$43,186
FY22	Sealcoat	$48,433
FY23	Sealcoat	$35,100

All cost estimates discussed in this report were prepared for general planning purposes and are expressed in 2017 dollars. These costs were prepared based on typical lineal footage costs experienced. Actual costs will be determined through the public bidding process and will vary depending on specific project conditions.

In conclusion, ISG recommends the City:

- ☑ Implement the street maintenance and replacement schedule provided to prevent further PCI reduction of the City's street inventory and associated increased maintenance and replacement costs in the future. Based on industry research and experience with pavement rehabilitation projects, maintaining an average PCI value in the Good range or better is recommended, the result being an overall reduction in roadway lifecycle maintenance costs and replacement costs for the City.
- ☑ Consider this PMP a living document that should be re-evaluated on a regular basis. City-wide pavement condition assessments should be performed on a biannual basis in conjunction with the preparation of subsequent Capital Plans to ensure that the PMP is meeting the goals of the City.

City-wide pavement condition assessments should be performed on a biannual basis in conjunction with the preparation of subsequent Capital Plans to ensure that the PMP is meeting the goals of the City.

Executive Summary

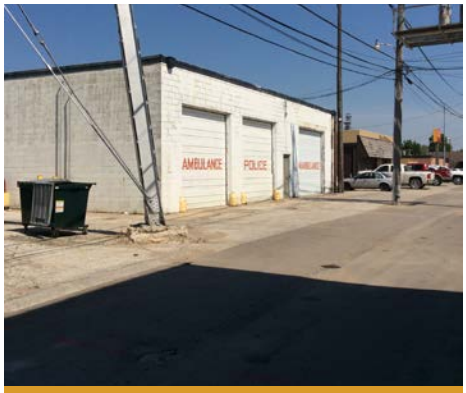
INTRODUCTION + PURPOSE

The City of Grand Mound understands the value and importance of properly maintaining its roadway network. The City Council authorized this report's preparation to assist the City in pavement management decision making. ISG was retained to perform a comprehensive study of Grand Mound's streets. The resulting Pavement Management Plan (PMP) summarizes the findings of detailed field inspections and provides recommendations for annual street improvements and maintenance funding for 2018 through 2022.

The main PMP goals are to answer the following questions:

- How many miles of streets does the City maintain?
- What is the current condition of each City's paved street segments?
- What prevention, maintenance, and rehabilitation strategies can be utilized and where?
- How can pavement life be extended and overall life-cycle costs be reduced?
- Where should truck routes be established within the City to reduce impact to local streets?
- How and when should sidewalks be improved to ADA (Americans with Disabilities Act) standards in conjunction with street projects?
- How and when should City utility improvements be included in conjunction with street projects?
- How and where can streets be eliminated and street widths be reduced to lessen future funding obligations?
- How much funding is necessary to meet the City's goals?
- What funding options are available for the City?

As stated previously, the City of Grand Mound currently owns and maintains 4.7 miles of paved HMA streets, 0.4 miles of paved concrete streets, and 1.8 miles of gravel streets. Due to the significant costs associated with maintaining and reconstructing these streets, it is vital for the City to develop and implement a plan to manage these assets. This PMP aims to protect the investment already made in the street network by establishing maintenance standards and prioritizing maintenance treatments.



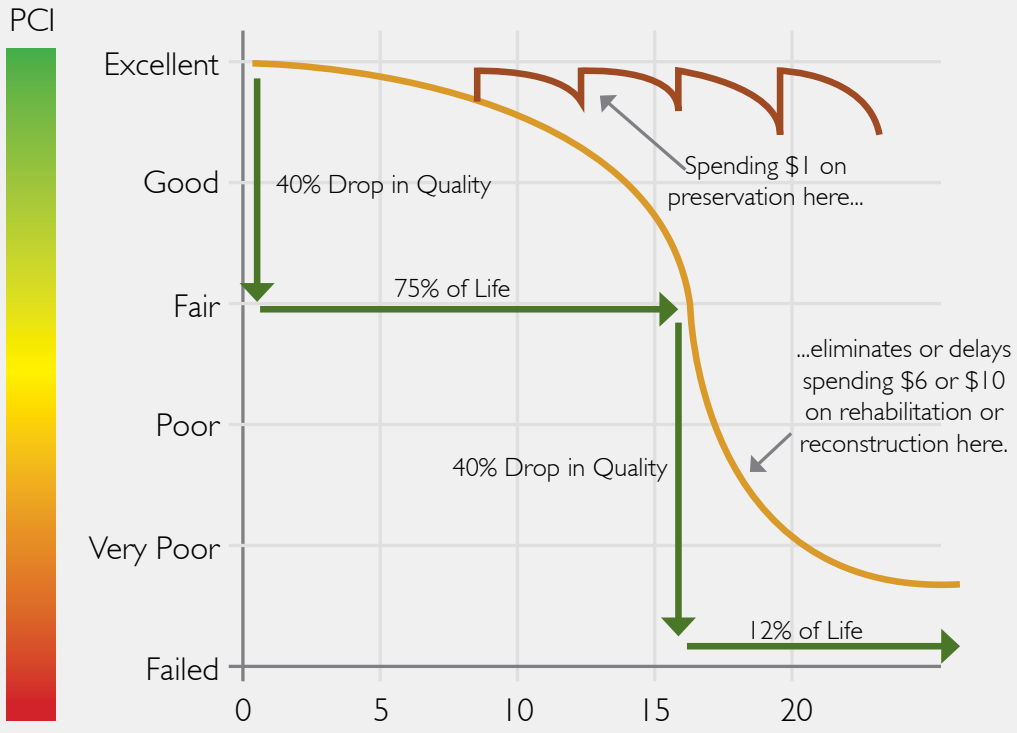
WHY MANAGE PAVEMENTS

Highway engineers have studied pavement life cycles over the years and found that pavements deteriorate over time at a predictable rate. Figure 2 presents a typical Pavement Deterioration Curve and illustrates how the pavement condition (PCI) changes over time. In the first 75% of a pavement's life, the deterioration rate is relatively slow. However, the next 12% of its life, the deterioration accelerates rapidly.

MAINTAINED ROADS
Can Last More Than
60 Years

On the other hand, performing preventative maintenance measures throughout the pavement's life will keep it in that condition longer and delay the point in time when rapid deterioration will occur, extending the pavement's life. Preventative maintenance includes crack sealing, joint sealing, seal coating, and other surface treatments, which are relatively inexpensive. As pavements deteriorate further and reach the Fair to Poor categories, more extensive (and expensive) repair measures become necessary, such as mill and overlay, joint repair, base patching, and pavement replacement. When a pavement reaches the Very Poor category, it is usually structurally deficient and will likely require complete reconstruction. Reconstruction costs are much greater than the cost of minor repair measures, and significantly greater than preventative maintenance costs. Without any preventative maintenance, streets could need reconstruction approximately every 25-years. Meanwhile, streets that are properly maintained can last more than 60 years under ideal conditions.

FIGURE 2: PAVEMENT DETERIORATION CURVE



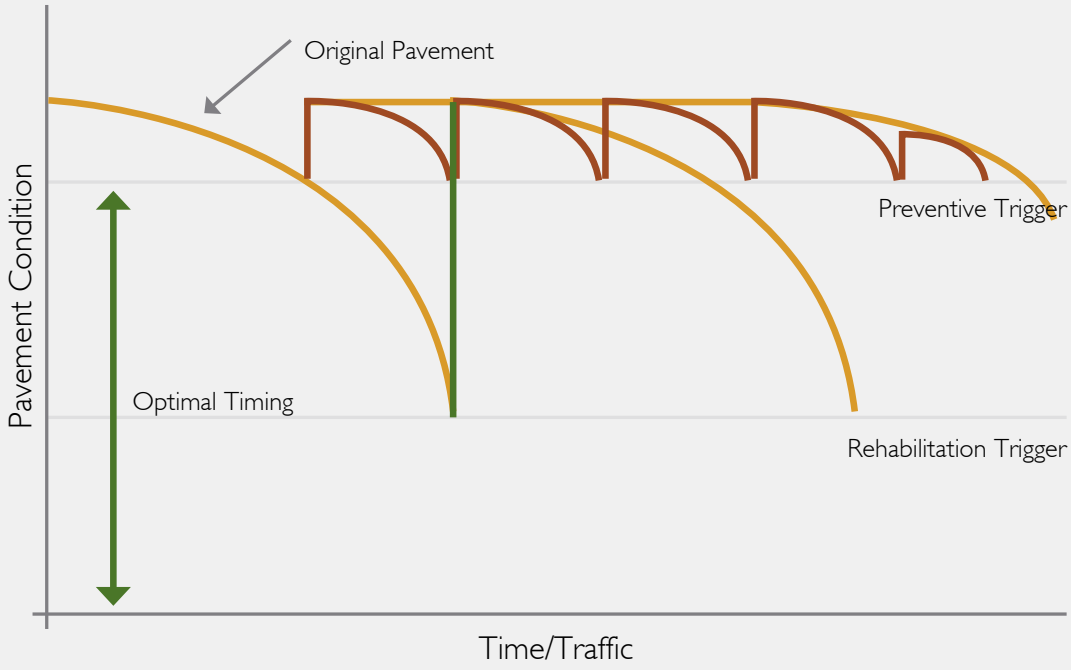
When a pavement reaches the Very Poor category, it is usually structurally deficient and will likely require complete reconstruction.

Figure 3 illustrates how repeated preventative maintenance will extend pavement life.

These illustrations demonstrate the underlying principal of a PMP – that it is less expensive to keep roads in good condition than it is to fix damaged roads. The "keeping good roads good" philosophy is similar to what we practice in our own lives. We change our car's oil regularly rather than wait for the engine to fail and replace it. We periodically paint the siding or repair damaged roof shingles on our homes rather than waiting to replace the entire siding or roof structure.

UNMAINTAINED ROADS
Need Reconstruction
Every 25 Years

FIGURE 3: PAVEMENT PRESERVATION ACTIONS



The underlying principal of a PMP is that it is less expensive to keep roads in good shape than it is to fix damaged roads.

THE PCI SCALE

- 100
- 85 Excellent
- 70 Very Good
- 55 Good
- 40 Fair
- 25 Poor
- 10 Very Poor
- 0 Failed

PAVEMENT CONDITION INDEX (PCI)

The Pavement Condition Index (PCI) is a numerical rating system used to determine the structural condition of a flexible pavement. The system was originally created by the United States Army Construction Engineering Research Laboratory and has become a standard flexible pavement evaluation and rating method. The evaluation method is non-destructive, meaning that core samples are not taken, and the subgrade soils are not directly evaluated.

Since the City of Grand Mound maintains some concrete streets as well, a separate rating system developed by the Metropolitan Transportation Commission was used for comparison to the existing HMA streets. This system, utilized by the U.S. Department of Transportation and the Federal Highway Administration, uses the same PCI values but ranks concrete streets for comparisons to HMA streets.

A third method of PCI rating was also used for the gravel streets. The Paser Manual for Gravel Roads – Pavement Surface Evaluation and Rating is a gravel roadway condition rating manual produced for the Transportation Information Center at the University of Wisconsin – Madison. This method was used to calculate PCI values of the existing gravel roads for comparison to the other roads in the network.

PAVEMENT DISTRESSES + RECOMMENDATION REPAIR OPTIONS

APPENDIX REFERENCE: H

he process begins with a street pavement physical examination. Twelve distinct distresses for HMA streets – and seven for concrete streets – are considered. The total length or area of each distress is then tabulated. These quantities are then used to compute the PCI, a value between 0 and 100. A rating above 85 is a road in excellent condition, while a rating below 10 is a failed road condition. A summary of the intermediate values is shown in Figure 4. We have also provided photos of various streets within Grand Mound that fall within these PCI categories listed for a visual reference in Appendix H.

HMA Street Considerations

- Alligator or Fatigue Cracking
- Bleeding
- Block Cracks
- Corrugation
- Depressions
- Longitudinal Cracks
- Transverse Cracks
- Patch
- Aggregate Polishing
- Raveling + Weathering
- Rut
- Slippage Cracks
- Swell

Concrete Street Considerations

- Corner Breaks
- Divided (Shattered) Slabs
- Faulting
- Linear Cracking
- Patching + Utility Cuts
- Scaling/Map Cracking/Crazing
- Spalling

Gravel Street Considerations

- Crown
- Drainage
- Gravel Layer
- Surface Deformation
- Surface Defects

The PCI of a pavement section is indicative of its overall condition, while the individual types of distresses allow specific types of repairs to be recommended. For reference, a detailed description of each pavement distress and the associated repair options is included in Appendix B, Appendix C, and Appendix D.

APPENDIX REFERENCE: B, C, D

STREET PCI INVENTORY + RECOMMENDED REPAIRS

APPENDIX REFERENCE: A, E, F

For this PCI Study, information regarding paved HMA and concrete streets currently owned and maintained by the City was provided by the Institute for Transportation (InTrans) from their 2015 inspection, and the information was field confirmed or corrected by ISG team members in April 2017.

Initial data was collected by InTrans. InTrans is Iowa State University's "focal point for transportation-related research, education, and outreach." InTrans provides services as a part of Iowa's Pavement Management Program (IPMP). The IPMP provides pavement management information, tools, and training for project-level and network-level pavement management activities. The IPMP provides agencies with raw pavement distress data collected using automated distress collection equipment. This data is provided in a format where users can examine and analyze pavement condition information for individual pavement sections. The Iowa DOT pays for the collection and processing of automated pavement distress data for all paved roads in Iowa.

ISG first used data and PCI values collected through InTrans and then followed with field inspections to validate, adjust, or assign each street segment a final PCI rating. Manual field calculations, in which the severity and amount of failure modes were recorded, were used to validate PCI values in various condition ranges.

These final PCI values provide the City of Grand Mound with information as to each street segment's overall condition. For an overview of the condition of the City's streets, the City of Grand Mound aerial maps are shown in Appendix A with color-coded street segments. Furthermore, a detailed summary of each street segment is tabulated with its corresponding PCI value, pavement type, pavement area, and estimated reconstruction cost in Appendix E. Based on the individual street PCI values, pavement distresses noted, and other inspection information gathered, ISG prepared a more detailed synopsis of each street segment. The synopsis includes estimated costs for various maintenance repair options and repair recommendations for each street segment. This information can be found in Appendix F.

DESIGNATED TRUCK ROUTES

In the City of Grand Mound, East Street naturally receives the majority of the City's truck traffic. East Street may not have been designed to handle these heavy loads and is showing considerable pavement distress. Truck traffic will cause significantly more distress to pavements as opposed to regular, light vehicular traffic, and pavements should be designed accordingly. Once funding is available to reconstruct East Street, the roadway can be designed to a standard that accommodates heavy loads.

AMERICANS WITH DISABILITIES ACT (ADA) SIDEWALK IMPROVEMENTS

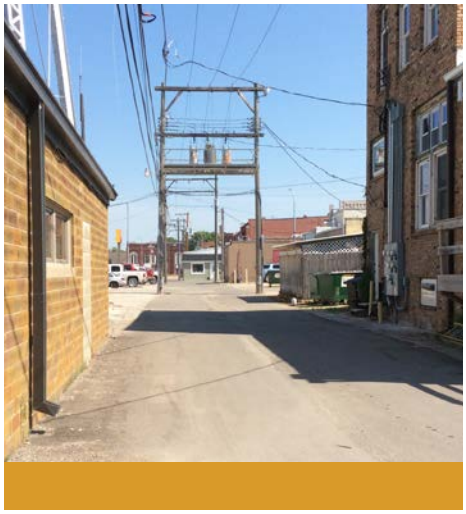
APPENDIX REFERENCE: F

When performing street maintenance projects, sidewalk improvements may be required. The "rule of thumb" follows that if sidewalks currently exist along the street corridor, they will need to meet current ADA requirements (if they do not already) specifically at all access points, including those within street intersections. Sidewalks and sidewalk

access points should be evaluated in conjunction with street maintenance projects; they should be replaced or improved as required. As a part of ISG's field survey, the current sidewalk locations within the City of Grand Mound were noted, and locations where ADA sidewalk improvements should be considered were identified. Cost estimates for sidewalk improvements were prepared and are tabulated in Appendix F. Estimates include the cost to replace any nonconforming curb ramps. The replacement of additional sidewalk sections are not included.

It is typically more costly for municipalities to make smaller, staged ADA sidewalk improvements in conjunction with an annual street maintenance project. Completing a larger ADA sidewalk improvement project prior to scheduled street maintenance projects creates economies of scale, saving money. Sidewalk improvements are not included in the 5-year plan but can be included in Years 6-20.

UTILITY IMPROVEMENTS



Similar to sidewalk improvements, City owned utilities (water main, sanitary sewer, storm sewer, etc.) should be closely evaluated prior to performing more aggressive street rehabilitation projects. This is especially the case when planning a complete street reconstruction. During street reconstruction, a significant portion of work will be performed that would also need to be performed on a stand-alone utility project. Overlapping these costs creates considerable savings for the City and reduces the likelihood of needing to patch a recently reconstructed street due to a utility failure (i.e. water leak, pipe collapse, structure failure, etc.). Delaying needed utility improvements when performing a street reconstruction creates a situation where the City could, in essence, pay twice for the same job. Evaluation of the City's utilities is not a part of this PMP's scope, nor is it included in this report's cost estimates. Street improvements should be considered and re-evaluated at these locations prior to final design. The Capital Improvement Plan (CIP) section, located later in this report, provides guidance on estimating and funding utility replacement costs.

ALTERNATIVE COST SAVING IDEAS

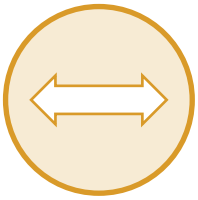
Street Closures

For some street segments, an alternative approach to continued maintenance is to close the road entirely. The objective is to lower maintenance costs such as street overlays, seal coats, and/or reconstructions. In essence, the street would no longer receive maintenance and would be closed to traffic when it becomes impassable. Ultimately, the pavement structure would be removed completely, and the area that was once a road would then become green space. The City would continue to own the right-of-way and any subsurface utilities would remain in place. Alleys would be extended through the right-of-way as necessary to connect with adjacent alleys. Additionally, sidewalks or trails could be constructed to maintain the same level of pedestrian accessibility.

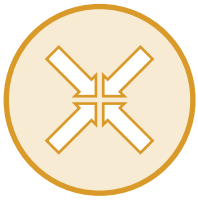
Upon closure, savings would also be realized during street sweeping and snow plowing operations. Additional mowing costs could result, unless the City requires adjacent property owners to maintain the green space.

The City's predominant grid pattern could accommodate this; the result would essentially be longer blocks between cross streets. Street segments that would be the best candidates for closure have little or no direct access to private property and are not a major part of the traffic network. Since the right-of-way would not be vacated, the City could still reconstruct the street in the future. A more detailed analysis of the City's traffic patterns and driveway connections should be conducted prior to closing any streets.

Funding Sources + 5-Year Capital Improvement Program



24.5 FEET
The Average Street Width in the City of Grand Mound, IA



21 FEET
The Width Streets Could Be Reduced to Accommodate Parking

$2.0 MILLION
The Amount Grand Mound Could Save in Reconstruction Costs

Reduce Street Width

Similarly, narrowing street widths, where possible, would also reduce maintenance and reconstruction costs. The average street width within the City is 24.3 feet. Depending on the need for parking, residential street widths could be reduced to as low as 21 feet. If the city reduced residential street widths, the city could save approximately $2.0 million in reconstruction costs (using HMA reconstruction costs). Width reduction should be examined on a case-by-case basis.

Any major changes to roadway geometries should be discussed in an open forum with input from the public. For the remainder of this report, however, it is assumed that all streets will remain with their current dimensions.

5-YEAR MAINTENANCE SCHEDULE

APPENDIX REFERENCE: G

A 5-year Capital Plan with estimated annual costs is shown in Appendix G. This was developed from ISG's review of detailed field inspections with special consideration of specific City input/needs. The plan provides one 5-year cycle to address specific focus items including seal coating, reconstruction, concrete patching and crack sealing.

CAPITAL PLAN FOCUS ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6+
Seal Coating	•	•	•	•	•	
Reconstruction						•
Concrete Patching and Crack Sealing						•

Years 6-20 include all other improvements required. The City can address these projects as funding becomes available. By funding a larger project for a specific work type each year, it is anticipated the City will receive better pricing due to the efficiency created by grouping similar small projects into a larger scale maintenance operation. The PCI values for streets expected to receive maintenance prior to the implementation of this plan, will increase and likely affect the work outlined in the 5-year Capital Plan for these streets. As stated earlier in this report, each annual project type listed in the Capital Plan should be inspected the year prior to construction to confirm work type and cost.

POTENTIAL FUNDING SOURCES FOR RECOMMENDED IMPROVEMENTS

Identifying funding sources is an important component of the planning process. Identifying funding sources will help the City of Grand Mound to determine the best way to fund recommended improvements provided in this PMP. The main sources the City can utilize to pay for annual transportation maintenance and improvements are:

- ☑ General Fund Current Revenues
- ☑ General Fund Reserves
- ☑ Road Use Tax Fund (RUTF)
- ☑ Local Option Sales Tax (LOST)
- ☑ General Obligation Bonds (GO) and GO Capacity

Funding Sources + 5-Year Capital Improvement Program

General Fund Current Revenues

This represents funding from current year revenue collections in the General Fund that support operations and capital outlay expenditures. Revenue sources include property tax levies, state aid payments, and various permit and license fees. This source of funding for transportation improvements is accounted for in the budget for the current fiscal year.

General Fund Reserves

Reserves of the General Fund are the funds remaining after subtracting cash flow and emergency amounts from the City's cash balance, sometimes referred to as fund balance. The use of General Fund Reserves is not recommended for Capital Improvements without significant staff and Council review.

Road Use Tax Fund (RUTF)

This fund is a result of revenues received from the State of Iowa from gas taxes, license fees, and weight tax. The State distributes some of the revenue it collects back to cities on a per capita basis. The funding the City receives can be used on transportation related activities such as maintenance and improvements.

As of July 2017, the City of Grand Mound receives $76,719 annually of RUTF funding from the State of Iowa. RUTF funding of $30,000 per year is applied to street maintenance/improvements, and the remaining amount is applied to salary and wages of Street Department personnel and other Department annual expenditures. At the time of this report, there is a Certificate of Deposit of RUTF worth $106,883 that could be cashed out and applied to a large street improvement project. Additionally, the RUTF fund has a balance of $73,520. In order to fund the projects identified in this PMP it is recommended that the annual RUTF allocation set aside specifically for street maintenance/improvements be increased to $45,000 annually beginning in FY 2019. For FY 2018, it is recommended that $30,000 of the RUTF funding is set aside in the RUTF fund to add to the current fund balance in anticipation of projects outlined in this PMP. This would allow the City to continue to pay for the salaries and other expenditures while still supplying adequate funding for the City's maintenance and improvement program.

Local Option Sales Tax (LOST)

LOST funding is established for a specific purpose and approved by a majority of the voters on ballot measure during an election. As of July 2017, the City receives $60,000 annually in LOST funding. Fifty percent ($30,000) of this funding is allocated for capital improvements and the remaining $30,000 is added to the general fund. Currently there is no specific allocation of LOST funding for street maintenance or improvements, but a portion of the LOST funding directed to the general fund could be used to fund the projects identified in this PMP. We recommend the City allocate $15,000 annually of LOST funding toward street improvements and maintenance beginning in FY 2019. In FY 2018, it is recommended that $10,000 of LOST funding is set aside to begin a fund for street improvements and maintenance.

General Obligation Bonds (GO)

General Obligation Bonds are backed by the full faith and credit of the subject municipality. Iowa communities are subject to a maximum debt capacity of 5% of the community's total assessed valuation. As of January 1, 2016 Grand Mound's total assessed property valuation was approximately $32.5 million.

GO Capacity

Based on the 5% rule, the City of Grand Mound has a debt capacity of approximately $1.6 million. As of July 1, 2015 (the start of FY 2016), the City of Grand Mound has $1.6 million available in debt capacity. The City currently has no outstanding GO Debt.

5-YEAR CAPITAL IMPROVEMENT PLAN (CIP)

APPENDIX REFERENCE: G

Recommended Improvements

Appendix G defines a 5-year maintenance schedule for necessary maintenance and street reconstructions at current-day estimates. It is important to note this PMP only addresses Opinion of Probable Costs as it relates to increasing the life cycle of the pavement. Utilities such as water main, sanitary sewer mains, and storm sewer are not accounted for in the estimated cost in the 5-year schedule.

When reconstruction is recommended in the 5-year schedule the City should consider replacing the utilities as part of the project, and budget accordingly for the costs associated with utility replacement. As a general rule of thumb, an additional 40% should be budgeted for each block scheduled for reconstruction to replace utilities. For example, if the opinion of probable cost is $250,000 to reconstruct one block of pavement, an additional $100,000 should be budgeted to replace all utilities bringing the total estimated cost to $350,000. The funding for the utility replacement can come from the sources identified in the section above. Also, funding from the City's water and sewer funds can be applied to the utility portion of the project along with 40% of the pavement cost.

First Five Years of Recommended Improvements (CIP)

Since the current day estimates are expected to increase significant over a 5-year period, ISG is providing a 5-Year Capital Improvement Plan. Table 3 provides recommendations on how to fund the improvements based on identified funding sources. It also shows the anticipated effect on the Road Use Tax Fund (RUTF) balances and Local Option Sales Tax (LOST) balances.

TABLE 3: 5-YEAR CAPITAL PLAN FUNDING

YEAR	ESTIMATED COST	SOURCES OF FUNDING	REMAINING RUTF FUND BALANCE	REMAINING LOST FUND BALANCE
Current	N/A	N/A	$73,520	$0
FY 2018 (Ongoing)	$47,550	RUTF- $37,550 LOST- $10,000	$65,970	$0
FY 2019 (Year 1)	$53,507	RUTF- $45,000 LOST- $8,507	$65,970	$6,493
FY 2020 (Year 2)	$50,039	RUTF- $45,000 LOST- $5,039	$65,970	$16,454
FY 2021 (Year 3)	$43,186	RUTF- $43,189 LOST- $0	$67,784	$31,654
FY 2022 (Year 4)	$48,433	RUTF- $45,000 LOST- $3,433	$67,784	$43,221
FY 2023 (Year 5)	$35,100	RUTF- $35,100 LOST- $0	$77,684	$58,221
FY 2024+ (Year 6+)	$1,141,682	RUTF - $302,684 LOST - $133,221 RUTF CD - $106,883 GO Debt/Reserves - $598,894	$0	$0

Notes:

- Table 3 assumes the City of Grand Mound will continue to apply $45,000 of allotted RUTF towards pavement management each year over the next 5 years beginning in FY 2019, with $30,000 allotted in 2018.
- Table 3 assumes the City of Grand Mound will continue to apply $15,000 of LOST revenues towards pavement management each year over the next 5 years beginning in FY 2019, with $10,000 of LOST reserves to be allocated in 2018.
- FY 2024+ includes street reconstruction. To avoid GO Debt issuance, $598,894 of funding would need to come from GF reserves or by earmarking $598,894 to Capital Improvements in the FY 2024 City Budget.
- FY 2024+ street projects: ISG recommends that utilities are looked at and possibly replaced as part of the improvements. Using the 40% rule of thumb figure for utility replacement, an additional $320,000 may need to be budgeted into the project for utility replacement. Water, sewer, and general funds would need to be applied into the overall project budget for utility replacement to avoid GO Debt issuance.
- FY 2024+ (Remaining Projects) includes the other projects identified in the Year 6+ portion of the Recommended 5-Year Reconstruction and Maintenance Schedule. Table 3 assumes that the $45,000 RUTF funding and $15,000 LOST funding will continue to be applied to the identified projects with the remaining balances used to build up the RUTF and LOST fund balances.

Conclusion

This PMP provides the City of Grand Mound with condition ratings of each street segment within the City as well as a summary of the percentages of streets that fall within each PCI rating category. This gives the City a better understanding of its street network and helps determine maintenance strategies to employ. Based on discussions with the City, preventative maintenance (i.e. seal coating, crack sealing, etc.) has not been consistently prioritized in the past.

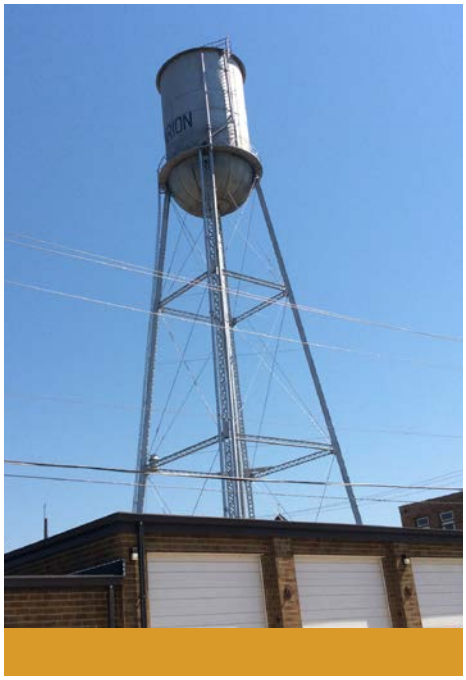
One goal of this PMP is to promote a robust preventative maintenance program that advocates the "keeping good roads good" philosophy.

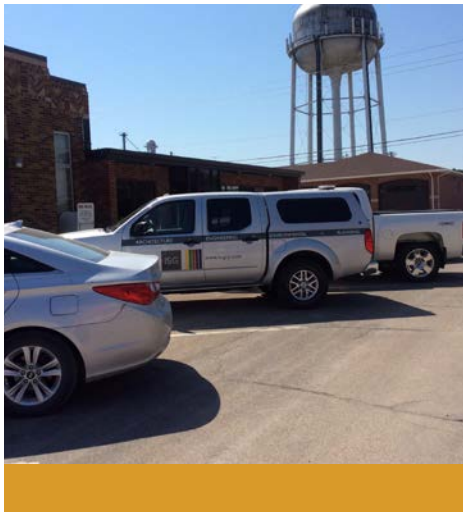
Preventative maintenance on "good" roads is a cost effective way to increase pavement life, and in turn, reduce the frequency of major repairs and associated costs.

The PMP includes helpful information on pavement distresses types commonly observed in the City of Grand Mound along with recommended maintenance and repair strategies. The PMP is meant to serve as a guideline for the City's street maintenance policy. Furthermore, the PMP is a living document that should be evaluated on a regular basis to ensure it is meeting the goals of the City.

Based on this study's findings, ISG offers the following recommendations:

- Adopt the PMP as a framework for future maintenance of the City's streets
- Implement the 5-year Capital Plan and review annually to revise as needed
- Prioritize preventative (inexpensive) maintenance strategies in helping with the "keeping good roads good" approach – in other words, resolve to not neglect preventative maintenance and only perform rehabilitation and reconstruction projects once preventative maintenance is no longer effective
- Look for opportunities to reduce cost and maintenance obligations long-term (e.g. street closures, street width reduction, etc.)
- Establish designated truck routes, thereby restricting truck traffic on local streets to prevent premature failure and increased maintenance costs
- Plan for ADA sidewalk improvements as required in conjunction with street maintenance projects
- Plan for utility improvements to occur during street maintenance projects, when possible, to overlap costs
- Inspect each annual project type listed in the Capital Plan the year prior to confirm work type and cost
- Account for construction price inflation when budgeting for future street maintenance
- Perform City-wide pavement condition re-inspections every two years in conjunction with preparing subsequent Capital Plans to ensure that the PMP is meeting City goals





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Appendix A

City Maps: Pavement Conditions

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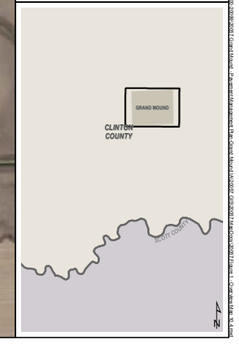
ISG

Figure 1
Overview Map
City of Grand Mound
Grand Mound
Clinton County, Iowa
Friday, June 16, 2017

PN: 17-20057

Source:
Orthophoto (USDA NAIP, 2016)
Municipalities (IA DOT, 2017)
Waterbody (IA DNR, May, 2007)
Roads (IA DOT, 2014)

0 175 350 700 Feet
1 inch = 350 feet



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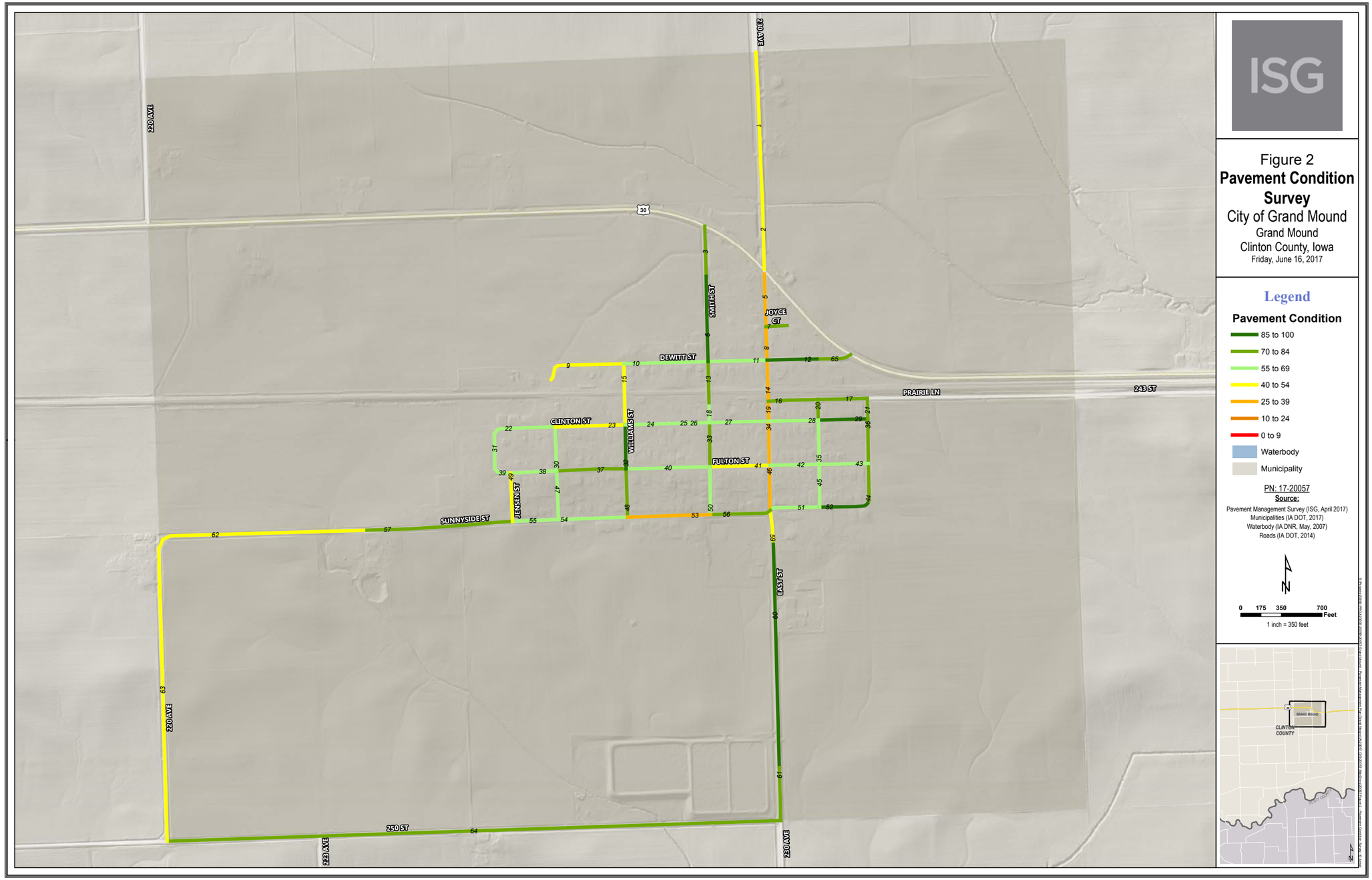
220 AVE
230 AVE
30
SMITH ST
JOYCE CT
DEWITT ST
PRAIRIE LN
243 ST
CLINTON ST
WILLIAMS ST
FULTON ST
JENSEN ST
SUNNYSIDE ST
EAST ST
210 AVE
250 ST
223 AVE
230 AVE
ISG
Figure 2
Pavement Condition Survey
City of Grand Mound
Grand Mound
Clinton County, Iowa
Friday, June 16, 2017
Legend
Pavement Condition
85 to 100
70 to 84
55 to 69
40 to 54
25 to 39
10 to 24
0 to 9
Waterbody
Municipality
PN: 17-20057
Source:
Pavement Management Survey (ISG, April 2017)
Municipalities (IA DOT, 2017)
Waterbody (IA DNR, May, 2007)
Roads (IA DOT, 2014)
N
0 175 350 700 Feet
1 inch = 350 feet
GRAND MOUND
CLINTON COUNTY

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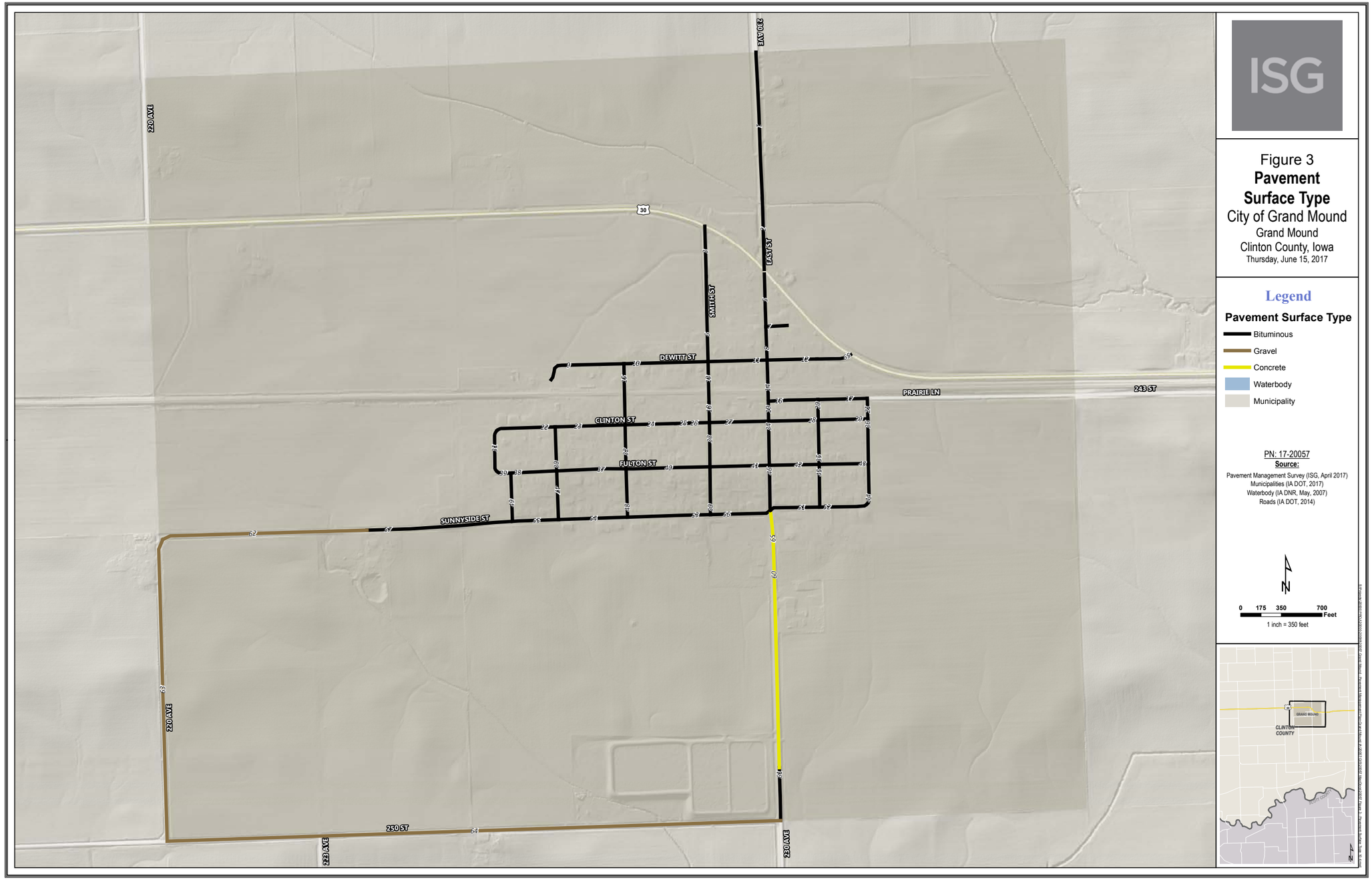
220 AVE
30
EAST ST
SMITH ST
DEWITT ST
PRAIRIE LN
243 ST
CLINTON ST
FULTON ST
SUNNYSIDE ST
220 AVE
250 ST
223 AVE
230 AVE
ISG
Figure 3
Pavement Surface Type
City of Grand Mound
Grand Mound
Clinton County, Iowa
Thursday, June 15, 2017
Legend
Pavement Surface Type
Bituminous
Gravel
Concrete
Waterbody
Municipality
PN: 17-20057
Source:
Pavement Management Survey (ISG, April 2017)
Municipalities (IA DOT, 2017)
Waterbody (IA DNR, May, 2007)
Roads (IA DOT, 2014)
N
0 175 350 700
Feet
1 inch = 350 feet
GRAND MOUND
CLINTON COUNTY

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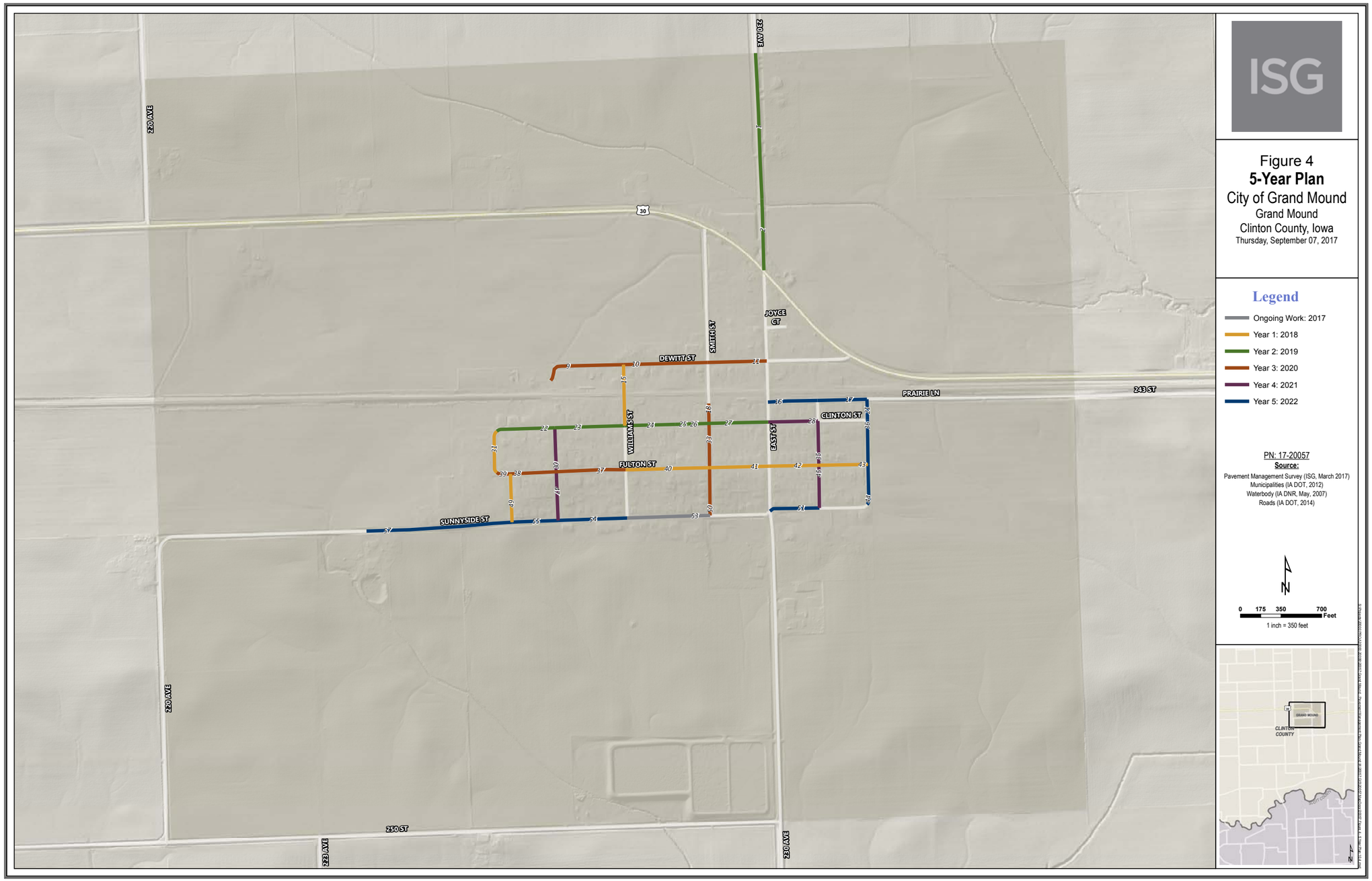
230 AVE
220 AVE
30
JOYCE CT
SMITH ST
DEWITT ST
WILLIAMS ST
EAST ST
CLINTON ST
FULTON ST
SUNNYSIDE ST
PRAIRIE LN
243 ST
250 ST
220 AVE
230 AVE
ISG
Figure 4
5-Year Plan
City of Grand Mound
Grand Mound
Clinton County, Iowa
Thursday, September 07, 2017
Legend
Ongoing Work: 2017
Year 1: 2018
Year 2: 2019
Year 3: 2020
Year 4: 2021
Year 5: 2022
PN: 17-20057
Source:
Pavement Management Survey (ISG, March 2017)
Municipalities (IA DOT, 2012)
Waterbody (IA DNR, May, 2007)
Roads (IA DOT, 2014)
N
0 175 350 700 Feet
1 inch = 350 feet
GRAND MOUND
CLINTON COUNTY

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Appendix B

HMA Pavement Distresses

HMA Pavement Distresses

PAVEMENT DISTRESS TYPE + DESCRIPTION	SEVERITY	SEVERITY DESCRIPTION	REPAIR OPTIONS
Alligator or Fatigue Cracking Alligator or Fatigue Cracking is a series of interconnecting cracks caused by fatigue failure of the asphalt surface under repeated traffic loading. The cracking initiates at the bottom of the asphalt surface (or stabilized base) where tensile stress and strain is highest under a wheel load. The cracks propagate to the surface initially as a series of parallel cracks. After repeated traffic loading, the cracks connect and form many-sided, sharp-angled pieces that develop a pattern resembling chicken wire or the skin of an alligator. The pieces are less than 2 feet on the longest side.	Low	Low (L). Fine, longitudinal hairline cracks running parallel to each other with no or only a few interconnecting cracks. The cracks are not spalled.	Do nothing; surface seal; overlay.
	Medium	Medium (M). Further development of light alligator cracking into a pattern or network of cracks that may be lightly spalled.	Partial- or full-depth patch; overlay; reconstruct.
	High	High (H). Network or pattern cracking progressed so that pieces are well-defined and spalled at the edges; some of the pieces rock under traffic.	Partial- or full-depth patch; overlay; reconstruct.
Bleeding Bleeding is a film of bituminous material on the pavement surface which creates a shiny, glass-like, reflecting surface that usually becomes quite sticky. Bleeding is caused by excessive amounts of asphalt cement or tars in the mix and/or low air-void content. It occurs when asphalt fills the voids of the mix during hot weather and then expands onto the surface of the pavement. Since the bleeding process is not reversible during cold weather, asphalt or tar will accumulate on the surface.	Presence	No degrees of severity are defined. Bleeding should be noted when it is extensive enough to cause a reduction in skid resistance.	Do nothing; apply heat, roll sand, and sweep loose material.
Block Cracks Block Cracks are interconnected cracks that divide the pavement into approximately rectangular pieces. The blocks may range in size from approximately 1 by 1 feet to 10 by 10 feet. Block cracking is caused mainly by shrinkage of the asphalt concrete (AC) and daily temperature cycling. It is not load-associated. The occurrence of block cracking usually indicates that the asphalt has hardened significantly. Block cracking normally occurs over a large proportion of pavement area but sometimes will occur in non-traffic areas. This type of distress differs from alligator cracking in that alligator cracks form smaller, many-sided pieces with sharp angles. Also, unlike block cracks, alligator cracks are caused by repeated traffic loadings and, therefore, are located only in traffic areas.	Low	Low (L). Blocks are defined by cracks that are nonspalled (sides of the crack are vertical) or only lightly spalled. Non-filled cracks have 1/4 inch or less mean width, and filled cracks have filler in satisfactory condition.	Do nothing
	Medium	Medium (M). Blocks are defined by either: (1) filled or non-filled cracks that are moderately spalled; (2) non-filled cracks that are not spalled or have only minor spalling, but have a mean width greater than approximately 1/4 inch, or (3) filled cracks that are not spalled or have only minor spalling, but have filler in unsatisfactory condition.	Seal cracks; recycle surface.
	High	High (H). Blocks are well-defined by cracks that are severely spalled.	Seal cracks; recycle surface.
Corrugation Corrugation is a series of closely spaced ridges and valleys (ripples) occurring at fairly regular intervals (usually less than 5 feet) along the pavement. The ridges are perpendicular to the traffic direction. Traffic action combined with an unstable pavement surface or base usually causes this type of distress.	Low	Corrugations are minor and do not significantly affect ride quality.	Do nothing.
	Medium	Corrugations are noticeable and significantly affect ride quality.	Reconstruct and mill.
	High	Corrugations are easily noticed and severely affect ride quality.	Reconstruct, mill, and overlay.

The information presented here is taken from "United Facilities Criteria (UFC) - Paver Asphalt Surfaced Airfields Pavement Condition Index (PCI)", a pavement condition rating manual produced for the United States Department of Defense.

HMA Pavement Distresses

PAVEMENT DISTRESS TYPE + DESCRIPTION	SEVERITY	SEVERITY DESCRIPTION	REPAIR OPTIONS
Depressions Depressions are localized pavement surface areas having elevations slightly lower than those of the surrounding pavement. In many instances, light depressions are not noticeable until after a rain, when ponding water creates "birdbath" areas; but the depressions can also be located without rain because of stains created by ponding water. Depressions can be caused by settlement of the foundation soil or can be "built up" during construction. Depressions cause roughness and, when filled with water of sufficient depth, can cause hydroplaning.	Low	Depression can be observed or located by stained areas, only slightly affects pavement riding quality, and may cause hydroplaning potential.	Do nothing.
	Medium	The depression can be observed, moderately affects pavement riding quality, and causes hydroplaning potential.	Shallow, partial- or full-depth patch.
	High	The depression can be readily observed, severely affects pavement riding quality, and causes definite hydroplaning potential.	Shallow, partial- or full-depth patch.
Longitudinal Cracks Longitudinal Cracks are parallel to the pavement's center-line or laydown direction. They may be caused by (1) a poorly constructed paving lane joint, (2) shrinkage of the AC surface due to low temperatures or hardening of the asphalt, or (3) a reflective crack caused by cracks beneath the surface course, including cracks in PCC slabs (but not at PCC joints).Transverse Cracks extend across the pavement at approximately right angles to the pavement center line or direction of laydown. They may be caused by items 2 or 3 above. These types of cracks are not usually load-associated. If the pavement is fragmented along a crack, the crack is said to be spalled.	Low	Cracks have either minor spalling or no spalling. The cracks can be filled or non-filled. Non-filled cracks have a mean width of 1/4 inch or less; filled cracks are of any width, but their filler material is in satisfactory condition.	Do nothing; seal cracks over 1/8 inch; surface seal.
	Medium	One of the following conditions exists: (1) cracks are moderately spalled and can be either filled or non-filled of any width; (2) filled cracks are not spalled or are only lightly spalled, but the filler is in unsatisfactory condition; (3) non-filled cracks are not spalled or are only lightly spalled, but mean crack width is greater than 1/4 inch; or(4) lightly random cracking exists near the crack or at the corners of intersecting cracks.	Seal cracks.
	High	Cracks are severely spalled. They can be either filled or non-filled of any width.	Seal cracks; partial-depth patch.
Patch A Patch is considered a defect, regardless of how well it is performing.	Low	Patch is in good condition and is performing satisfactorily.	Do nothing.
	Medium	Patch is somewhat deteriorated and affects riding quality to some extent.	Seal cracks; repair distress in patch; replace patch.
	High	Patch is badly deteriorated and affects riding quality significantly. Patch needs replacement.	Replace patch.
Aggregate Polishing Aggregate Polishing is caused by repeated traffic applications. Polished aggregate is present when close examination of a pavement reveals that the portion of aggregate extending above the asphalt is either very small or there are no rough or angular aggregate particles to provide good skid resistance. Existence of this type of distress is also indicated when the number on a skid resistance rating test is low or has dropped significantly from previous ratings.	Presence	No degrees of severity are defined. However, the degree of polishing should be significant before it is included in the condition survey and rated as a defect.	Do nothing; overlay; surface friction course.

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HMA Pavement Distresses

PAVEMENT DISTRESS TYPE + DESCRIPTION	SEVERITY	SEVERITY DESCRIPTION	REPAIR OPTIONS
Raveling and Weathering Raveling and Weathering are the wearing away of the pavement surface caused by the dislodging of aggregate particles and loss of asphalt or tar binder. They may indicate that the asphalt binder has hardened significantly.	Low	Aggregate or binder has started to wear away.	Do nothing; surface seal.
	Medium	Aggregate and/or binder has worn away. The surface texture is moderately rough and pitted.	Surface seal.
	High	Aggregate and/or binder has worn away. The surface texture is severely rough and pitted.	Overlay; recycle; reconstruct.
Rut A Rut is a surface depression in the wheel path. Pavement uplift may occur along the sides of the rut; however, in many instances ruts are noticeable only after a rainfall, when the wheel paths are filled with water. Rutting stems from a permanent deformation in any of the pavement layers or subgrade. It is usually caused by consolidation or lateral movement of the materials due to traffic loads. Significant rutting can lead to major structural failure of the pavement.	Low	Mean depth of rut is ≥ 1/4 to 1/2 inch	Do nothing.
	Medium	Mean depth of rut is >1/2 inch to 1 inch	Shallow, partial- or full-depth patch; partial or full-depth patch and overlay.
	High	Mean depth of rut is >1 inch	Shallow, partial- or full-depth patch; partial or full-depth patch and overlay.
Slippage Cracks Slippage Cracks are crescent- or half-moon shaped cracks having two ends pointed away from the direction of traffic. They are produced when braking or turning wheels cause the pavement surface to slide and deform. This usually occurs when there is a low- strength surface mix or poor bond between the surface and next layer of pavement structure.	Presence	No degrees of severity are defined. It is sufficient to indicate that a slippage crack exists	Do nothing, partial-, or full-depth patch.
Swell Swell is characterized by an upward bulge in the pavement's surface. A swell may occur sharply over a small area or as a longer, gradual wave. Either type of swell can be accompanied by surface cracking. A swell is usually caused by frost action in the subgrade or by swelling soil, but a small swell can also occur on the surface of an asphalt overlay.	Low	Swell is barely visible and has a minor effect on the pavement's ride quality.	Do nothing.
	Medium	Swell can be observed without difficulty and has a significant effect on the pavement's ride quality.	Reconstruct.
	High	Swell can be readily observed and severely affects the pavement's ride quality.	Reconstruct.

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Appendix C

Concrete Pavement Distresses

Concrete Pavement Distresses

PAVEMENT DISTRESS TYPE + DESCRIPTION	SEVERITY	SEVERITY DESCRIPTION	REPAIR OPTIONS
Corner Breaks Corner Breaks are cracks that intersect perpendicular joints at a distance less than or equal to one-half the slab length on both sides, measured from the corner of the slab. For example, a slab with dimensions of 12 by 20 ft (3.7 by 6.1 m) that has a crack 10 ft (3 m) on the short side and 6 ft (2.3 m) on the long side is not considered a corner break; it is a diagonal crack. However, a crack that intersects 4 ft (1.2 m) on the short side and 8 ft (2.4 m) on the long is considered a corner break. A corner break differs from a corner spall in that the crack extends vertically through the entire slab thickness, while a corner spall intersects the vertical face of a joint at an angle. Load repetition combined with loss of support and curling stresses usually causes corner breaks. Corner breaks are considered a major structural distress.	Low	Low (L). Break is defined by a low-severity crack and the area between the break and the joints is not cracked or contains only one low severity crack.	Do nothing.
	Medium	Medium (M). Break is defined by medium-severity crack and/ or the area between the break and the joints, which contains a medium severity crack or more than one crack.	Do nothing or replace slab.
	High	High (H). Break is defined by a high-severity crack and/or the area between the break and the joints, which contains a high severity crack, more than one medium severity crack, or the majority of the area is missing.	Replace slab.
Divided (Shattered) Slabs Divided (Shattered) Slabs are cracks dividing slabs into four or more pieces. Overloading and/or inadequate support normally cause this distress. Curling and warping stress may contribute to initial cracking. If all pieces or cracks are contained within a corner break, the distress is categorized as a corner break. Medium and high severity divided slabs are considered shattered slabs. Shattered slabs are considered major structural distresses.	Low	Low (L). Slab is divided into four (4) to eight (8) pieces by low severity cracks.	Do nothing or replace slab.
	Medium	Medium (M). Slab is divided into four (4) or more pieces by medium severity cracks.	Replace slab and recompact base.
	High	High (H). Slab is divided into more than eight (8) pieces by high severity cracks.	Replace slab and recompact base.
Faulting Faulting is the difference in elevation across a joint. Some of the common causes of faulting are (1) Settlement because of soft foundation, (2) Pumping or eroding of material from under the slab due to repeated heavy loadings, (3) Curling of the slab edges due to temperature and moisture changes, (4) Poor construction. Most faulting is due to repeated loading, and faulting is considered a major foundation support problem.	Low	Low (L). Difference in elevation is 3/8 to 1/2 inch (10 to 13 mm).	Do nothing or replace slab.
	Medium	Medium (M). Difference in elevation is 1/2 to 1 inch (13 to 25 mm).	Replace slab and recompact base.
	High	High (H). Difference in elevation is greater than 1 inch (25 mm).	Replace slab and recompact base.
Linear Cracking Linear Cracking (Longitudinal, Transverse and Diagonal Cracks) divide the slab into two or three pieces and are usually caused by a combination of repeated traffic loading, thermal gradient curling, and shrinkage stresses. (Slabs divided into four or more pieces are counted as divided slabs). Low-severity cracks are often related to warping or shrinkage and are not considered major structural distresses. Medium or high-severity cracks are usually working cracks caused by a combination of traffic loads and environmental factors and are considered major structural distresses.	Low	Low (L). Unfilled crack with width less than 1 inch (25 mm), spalling (defined later) less than 1 inch (25 mm) and faulting less than 3/8 inch (10 mm). Any filled crack in good condition, with faulting less than 3/8 inch (10 mm).	Seal crack.
	Medium	Medium (M). Unfilled crack with width or spalling greater than 1 inch but less than 3 inches (75 mm). Unfilled crack less than 3 inches (76 mm) wide with faulting greater than 3/8 inch (10 mm) but less than 1 inch (25 mm). Filled crack with faulting less than 1 inch (25 mm), but greater than 3/8 inch (10 mm).	Seal crack.
	High	High (H). Unfilled crack with width or spalling greater than 3 inches (76 mm). Filled or unfilled crack with faulting greater than 1 inch (25 mm).	Seal crack or replace slab.

The information presented here is taken from "United Facilities Criteria (UFC) - Paver Asphalt Surfaced Airfields Pavement Condition Index (PCI)", a pavement condition rating manual produced for the United States Department of Defense.

Concrete Pavement Distresses

PAVEMENT DISTRESS TYPE + DESCRIPTION	SEVERITY	SEVERITY DESCRIPTION	REPAIR OPTIONS
Patching and Utility Cuts Patching and Utility Cuts are areas where the original pavement has been removed and replaced. A utility cut is a patch that has replaced the original pavement after the installation or maintenance of underground utilities. The severity levels of utility cuts are the same as those for regular patching. Patching material can be Portland Cement concrete, asphalt concrete, or other material.	Low	Low (L). Patch is in good condition and functioning well with little or no deterioration.	Do nothing.
	Medium	Medium (M). Patch is moderately deteriorated and/or moderate spalling can be seen around the edges. Patch material can be dislodged with considerable effort, or patch has developed low or medium severity cracks. Low severity faulting has developed between the patch and the slab.	Replace patch.
	High	High (H). Patch is badly deteriorated. The extent of the deterioration warrants replacement of the patch. Patch is missing much of the material or has developed high severity cracking or more than two medium severity cracks. Medium or high severity faulting has developed between the slab and patch.	Replace patch and recompact base.
Scaling/Map Cracking/Crazing Scaling/Map Cracking/Crazing refers to a network of shallow, fine, or hairline cracks which extend only through the upper surface of the concrete. The cracks tend to intersect at angles of 120 degrees. Map cracking or crazing is usually caused by concrete overfinishing and hot weather concrete construction. They may lead to surface scaling, which is the breakdown of the slab surface to a depth of approximately 1/4 to 1/2 in. (6 to 13 mm). Scaling may also be caused by deicing salts, improper construction, freeze-thaw cycles, and poor aggregate.	Low	Low (L). Crazing or map cracking exists and may cover most of the slab area; the surface is in good condition, with only minor scaling present.	Do nothing.
	Medium	Medium (M). Slab is scaled, but less than 15 percent of the slab is affected.	Do nothing or replace slab.
	High	High (H). Slab is scaled over more than 15 percent of its area.	Do nothing or replace slab.
Spalling Spalling is the breakdown of the slab edges or corner within 2 feet (0.6 m) of the joint. A spall usually does not extend vertically through the slab, but intersects the vertical face of the joint at an angle. Spalling results from (1) excessive compressive stresses, excessive deflection of the joint due to loss of support and traffic loading, or by infiltration of incompressible materials into the joint and thermal induced expansion, (2) weak concrete at the joint caused by overworking, or (3) water accumulation in the joint and freeze-thaw action. The spall must be greater than 1 inch (25 mm) wide to be recorded.	Low	Low (L). Spall width is 1 to 4 inches (25 - 100 mm) and less than 2 feet (0.6 m) in length. Spall pieces are tight and cannot be easily removed, or less than two inches (50 mm) wide and the pieces are missing.	Do nothing.
	Medium	Medium (M). Spall width is 1 to 4 inches (25 - 100 mm) and greater than 2 feet (0.6 m) in length or width greater than 4 inches and less than 2 feet (0.6 m) in length. Spall pieces are loose and can be removed and some pieces are missing.	Patch area.
	High	High (H). Spall width is greater than 4 inches and greater than 2 feet (0.6 m) in length. Spall pieces are missing and most pieces have been removed.	Patch area and recompact base.

The information presented here is taken from "United Facilities Criteria (UFC) - Paver Asphalt Surfaced Airfields Pavement Condition Index (PCI)", a pavement condition rating manual produced for the United States Department of Defense.

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Appendix D

Gravel Surfacing Distresses

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Gravel Surfacing Distresses

PAVEMENT DISTRESS TYPE + DESCRIPTION	SEVERITY	SEVERITY DESCRIPTION	REPAIR OPTIONS
Crown Crown refers to making the center of the road higher than the shoulder, enhancing drainage. Normally, a gravel road will have 4" - 6" of crown, or fall, from its center to the edge. A roadway that has no crown will pond water.	High	Travel is difficult.	No maintenance required.
	Medium-High	Road needs additional aggregate layer and major drainage improvements.	Routine maintenance.
	Medium	Roadway shows traffic effects.	Regrading, minor ditch maintenance, and spot gravel application.
	Low-Medium	Road is in adequate condition with minor defects.	Resurfacing and grading.
	Low	Newly constructed road.	Complete rebuilding required.
Drainage Drainage refers to the roadside ditches and culverts. These must be able to handle surface water flow. Without adequate ditches, water will pond on the roadway and soften the road base. The ditch must be wide and deep enough to accommodate all the surface water and allow for flow of the water.	High	Travel is difficult.	No maintenance required.
	Medium-High	Road needs additional aggregate layer and major drainage improvements.	Routine maintenance.
	Medium	Roadway shows traffic effects.	Regrading, minor ditch maintenance, and spot gravel application.
	Low-Medium	Road is in adequate condition with minor defects.	Resurfacing and grading.
	Low	Newly constructed road.	Complete rebuilding required.
Gravel Layer Gravel Layer refers to the thickness and quality of the layer of gravel. Traffic loads require an adequate layer of gravel to carry and distribute the loads to the subsoils. The thickness needed will vary but a minimum layer of 6" is normally required.	High	Travel is difficult.	No maintenance required.
	Medium-High	Road needs additional aggregate layer and major drainage improvements.	Routine maintenance.
	Medium	Roadway shows traffic effects.	Regrading, minor ditch maintenance, and spot gravel application.
	Low-Medium	Road is in adequate condition with minor defects.	Resurfacing and grading.
	Low	Newly constructed road.	Complete rebuilding required.
Surface Deformation Surface Deformation refers to washboard, potholes, and ruts on the roadway. Washboard, or corrugation, across the road is perpendicular to the direction of traffic. Potholes are holes caused by failure of subbase or when surface material is worn away. Ruts are caused by weak underlying soils and is another form of surface depression.	High	Travel is difficult.	No maintenance required.
	Medium-High	Road needs additional aggregate layer and major drainage improvements.	Routine maintenance.
	Medium	Roadway shows traffic effects.	Regrading, minor ditch maintenance, and spot gravel application.
	Low-Medium	Road is in adequate condition with minor defects.	Resurfacing and grading.
	Low	Newly constructed road.	Complete rebuilding required.
Surface Defects Surface Defects refers to dust control and loose aggregate. Both are a nuisance and can cause physical damage. Loose aggregate or unstable surface gravel conditions can develop from loss of fines through heavy dust action or from erosion due to an improper gradation mix of the original aggregate.	High	Travel is difficult.	No maintenance required.
	Medium-High	Road needs additional aggregate layer and major drainage improvements.	Routine maintenance.
	Medium	Roadway shows traffic effects.	Regrading, minor ditch maintenance, and spot gravel application.
	Low-Medium	Road is in adequate condition with minor defects.	Resurfacing and grading.
	Low	Newly constructed road.	Complete rebuilding required.

The information presented here is taken from "United Facilities Criteria (UFC) - Paver Asphalt Surfaced Airfields Pavement Condition Index (PCI)", a pavement condition rating manual produced for the United States Department of Defense.

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Appendix E

Street Condition Summary

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Street Condition Summary

2017 Pavement Condition Inspections Result (by Increasing PCI)								
Pavement Condition Index (PCI)		Segment ID	Street Name	Beginning	Ending	Pavement Type	Area (SF)	Average Reconstruction Cost (PCC/HMA Average, Same Width, and Curb & Gutter)
F	NOT APPLICABLE							
P	NOT APPLICABLE							
POOR	30	005	East St	Hwy 30	Joyce Ct	Bituminous	14,560	$ 310,162
	30	008	East St	Joyce Ct	Dewitt St	Bituminous	8,960	$ 197,125
	30	014	East St	Dewitt St	Prairie Ln	Bituminous	10,880	$ 235,880
	30	019	East St	Prairie Ln	Clinton St	Bituminous	4,960	$ 116,383
	30	034	East St	Clinton St	Fulton St	Bituminous	11,520	$ 248,799
	30	046	East St	Fulton St	Sunnyside St	Bituminous	11,520	$ 248,799
	35	053	Sunnyside St	Williams St	Smith St	Bituminous	18,200	$ 409,540
FAIR	43	059	East St	Sunnyside St	Segment 060	Concrete	7,680	$ 171,287
	44	041	Fulton St	Smith St	East St	Bituminous	11,520	$ 272,481
	45	015	Williams St	Dewitt St	Clinton St	Bituminous	10,605	$ 264,589
	45	049	Jensen St	Fulton St	Sunnyside St	Bituminous	9,360	$ 224,441
	50	023	Clinton St	West St	Williams St	Bituminous	11,400	$ 288,561
	50	062	Sunnyside St	220th Ave	Segment 057	Gravel	43,920	$ 993,093
	50	063	220th Ave	Sunnyside St	250th St	Gravel	62,400	$ 1,404,108
	52	002	East St	Crystal Creek	Hwy 30	Bituminous	12,305	$ 294,340
	53	001	East St	City Limits	Crystal Creek	Bituminous	30,475	$ 704,957
	53	009	Dewitt St	End of Street	Williams St	Bituminous	7,980	$ 240,619
GOOD	55	022	Clinton St	Jensen St	West St	Bituminous	10,300	$ 262,287
	55	028	Clinton St	East St	Lincoln St	Bituminous	9,600	$ 229,779
	56	031	Jensen St	Clinton St	Fulton St	Bituminous	5,040	$ 157,962
	56	039	Fulton St	Jensen St	Jensen St	Bituminous	1,610	$ 61,529
	58	018	Smith St	Segment 013	Clinton St	Bituminous	8,700	$ 167,824
	59	054	Sunnyside St	West ST	Williams St	Bituminous	14,820	$ 336,503
	60	024	Clinton St	Williams St	Segment 025	Bituminous	7,680	$ 187,076
	60	025	Clinton St	Segment 024	Segment 026	Bituminous	5,760	$ 132,532
	60	050	Smith St	Fulton St	Sunnyside St	Bituminous	8,190	$ 208,040
	63	038	Fulton St	Jensen St	West St	Bituminous	8,250	$ 205,920
	63	040	Fulton St	Williams St	Smith St	Bituminous	21,700	$ 458,603
	65	026	Clinton St	Segment 025	Smith St	Bituminous	11,020	$ 208,240
	65	035	Lincoln St	Clinton St	Fulton St	Bituminous	6,480	$ 178,148
	65	042	Fulton St	East St	Lincoln St	Bituminous	9,600	$ 229,779
	65	045	Lincoln St	Fulton St	Sunnyside St	Bituminous	6,480	$ 178,148
	65	051	Sunnyside St	East St	Lincoln St	Bituminous	8,800	$ 218,564
	66	027	Clinton St	Smith St	East St	Bituminous	19,200	$ 380,140
	68	010	Dewitt St	Williams St	Smith St	Bituminous	16,100	$ 380,102
	68	011	Dewitt St	Smith St	East St	Bituminous	11,040	$ 265,753
	68	043	Fulton St	Lincoln St	Washington St	Bituminous	9,600	$ 229,779
	69	030	West St	Clinton St	Fulton St	Bituminous	7,200	$ 188,241
	69	047	West St	Fulton St	Sunnyside St	Bituminous	7,800	$ 202,572
	69	055	Sunnyside St	Jensen St	West St	Bituminous	9,750	$ 226,947
	69	057	Sunnyside St	End of Pavement	Jensen St	Bituminous	21,240	$ 546,884
VERY GOOD	70	016	Prairie Ln	East St	Lincoln St	Bituminous	6,400	$ 184,921
	70	017	Prairie Ln	Lincoln St	Washington St	Bituminous	6,400	$ 184,921
	70	021	Washington St	Prairie Ln	Clinton St	Bituminous	2,790	$ 85,964
	70	036	Washington St	Clinton St	Fulton St	Bituminous	6,480	$ 178,148
	70	044	Washington St	Fulton St	Sunnyside St	Bituminous	6,480	$ 178,148
	72	003	Smith St	Hwy 30	Segment 006	Bituminous	20,640	$ 475,320
	72	037	Fulton St	West St	Williams St	Bituminous	12,540	$ 304,542
	73	048	Williams St	Fulton St	Sunnyside St	Bituminous	8,190	$ 208,040
	74	033	Smith St	Clinton St	Fulton St	Bituminous	20,880	$ 380,008
	75	064	250th St	220th Ave	East St	Gravel	125,760	$ 2,813,304
	78	013	Smith St	Dewitt St	Segment 018	Bituminous	9,450	$ 217,808
	80	056	Sunnyside St	Smith St	East St	Bituminous	12,480	$ 285,939
	80	061	East St	Segment 060	City Limits	Bituminous	10,350	$ 250,160
	80	065	Dewitt St	Segment 012	Hwy 30	Bituminous	11,375	$ 265,515
	81	020	Lincoln St	Prairie Ln	Clinton St	Bituminous	3,410	$ 94,655
	83	007	Joyce Ct	East St	End of Street	Bituminous	8,550	$ 173,615
EXCELLENT	85	012	Dewitt St	East St	Segment 065	Bituminous	7,310	$ 161,167
	85	032	Williams St	Clinton St	Fulton St	Bituminous	7,560	$ 193,288
	85	052	Sunnyside St	Lincoln St	Washington St	Bituminous	8,800	$ 218,564
	85	060	East St	Segment 059	Segment 061	Concrete	44,390	$ 1,019,417
	88	029	Clinton St	Lincoln St	Washington St	Bituminous	8,800	$ 218,564
	95	006	Smith St	Segment 003	Dewitt St	Bituminous	7,420	$ 172,576

= Urban Street Section with Curb and Gutter (Full-Length, Both Sides)

** Disregard Street Segment Numbers 004 and 058. They are not shown in table.

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Appendix F

Detailed Street Conditions

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Detailed Street Conditions

											Field Measurements and Typical Associated Repairs (Select Few Listed)										
											# of Full Width Transverse Cracking Low (Count)	Total Length of Longitudinal Cracking Wheelpath Low (LF)	Patching Good (SF)								
Segment ID	Street Name	Beginning	Ending	Pavement Type	Length (FT)	Width (FT)	Area	Inspection Date	PCI	Curb Condition	Monitor & Repair if Degrades Further	Monitor & Repair if Degrades Further	Monitor & Repair if Degrades Further	Recommended Repairs	Estimated ADA Sidewalk Replacement	Estimated Gravel Repairs	Estimated Seal Coat Cost	Estimated Mill & Overlay Cost with Required Patching	Estimated Addition of Curb & Gutter Cost	Estimated Reconstruction Cost with Curb & Gutter (Asphalt)	Estimated Reconstruction Cost with Curb & Gutter (Concrete)
001	East St	City Limits	Crystal Creek	Bituminous	1325	23	30475	4/4/2017	53	Non-Existent	101	1,434	0	Sealcoat and address ADA Sidewalks	$ -	N/A	$ 8,465	$ 78,188	$ 132,500	$ 499,689	$ 910,224
002	East St	Crystal Creek	Hwy 30	Bituminous	535	23	12305	4/4/2017	52	Non-Existent	29	251	0	Sealcoat and address ADA Sidewalks	$ -	N/A	$ 3,418	$ 32,772	$ 53,500	$ 209,199	$ 379,481
003	Smith St	Hwy 30	Segment 006	Bituminous	860	24	20640	4/4/2017	72	Non-Existent	12	13	0	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ -	N/A	$ 5,733	$ 53,600	$ 86,000	$ 336,727	$ 613,914
005	East St	Hwy 30	Joyce Ct	Bituminous	455	32	14560	4/4/2017	30	Non-Existent	144	585	40	Mill and Resurface but allow for higher PCI roadways to take precedence and Address ADA Sidewalks	$ -	N/A	$ 4,044	$ 38,533	$ 45,500	$ 217,982	$ 402,343
006	Smith St	Segment 003	Dewitt St	Bituminous	265	28	7420	4/4/2017	95	Non-Existent	6	24	234	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ 4,000	N/A	$ 2,061	$ 20,550	$ 26,500	$ 122,277	$ 222,876
007	Joyce Ct	East St	End of Street	Bituminous	190	45	8550	4/4/2017	83	Non-Existent	0	0	0	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ -	N/A	$ 2,375	$ 23,375	$ 19,000	$ 121,332	$ 225,899
008	East St	Joyce Ct	Dewitt St	Bituminous	280	32	8960	4/4/2017	30	Average	144	585	40	Mill and Resurface but allow for higher PCI roadways to take precedence and Address ADA Sidewalks	$ 2,000	N/A	$ 2,489	$ 24,533	$ -	$ 138,941	$ 255,309
009	Dewitt St	End of Street	Williams St	Bituminous	570	14	7980	4/4/2017	53	Non-Existent	1	0	0	Sealcoat and address ADA Sidewalks	$ -	N/A	$ 2,217	$ 21,950	$ 57,000	$ 174,213	$ 307,026
010	Dewitt St	Williams St	Smith St	Bituminous	700	23	16100	4/4/2017	68	Non-Existent	2	18	0	Sealcoat and address ADA Sidewalks	$ 2,000	N/A	$ 4,472	$ 42,250	$ 70,000	$ 269,871	$ 490,333
011	Dewitt St	Smith St	East St	Bituminous	480	23	11040	4/4/2017	68	Non-Existent	4	16	0	Sealcoat and address ADA Sidewalks	$ -	N/A	$ 3,067	$ 29,600	$ 48,000	$ 188,975	$ 342,531
012	Dewitt St	East St	Segment 065	Bituminous	215	34	7310	4/4/2017	85	Non-Existent	19	87	0	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ -	N/A	$ 2,031	$ 20,530	$ 21,500	$ 113,594	$ 208,740
013	Smith St	Dewitt St	Segment 018	Bituminous	350	27	9450	4/4/2017	78	Non-Existent	0	6	0	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ -	N/A	$ 2,625	$ 25,625	$ 35,000	$ 154,232	$ 281,384
014	East St	Dewitt St	Prairie Ln	Bituminous	340	32	10880	4/4/2017	30	Average	144	585	40	Mill and Resurface but allow for higher PCI roadways to take precedence and Address ADA Sidewalks	$ -	N/A	$ 3,022	$ 29,333	$ -	$ 166,041	$ 305,720
015	Williams St	Dewitt St	Clinton St	Bituminous	505	21	10605	4/4/2017	45	Non-Existent	16	133	203	Sealcoat and address ADA Sidewalks	$ 4,000	N/A	$ 2,946	$ 28,517	$ 50,500	$ 188,746	$ 340,432
016	Prairie Ln	East St	Lincoln St	Bituminous	400	16	6400	4/4/2017	70	Non-Existent	1	73	0	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ 6,000	N/A	$ 1,778	$ 18,000	$ 40,000	$ 133,438	$ 236,404
017	Prairie Ln	Lincoln St	Washington St	Bituminous	400	16	6400	4/4/2017	70	Non-Existent	1	73	0	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ -	N/A	$ 1,778	$ 18,000	$ 40,000	$ 133,438	$ 236,404
018	Smith St	Segment 013	Clinton St	Bituminous	150	58	8700	4/4/2017	58	Average	11	51	0	Sealcoat and address ADA Sidewalks	$ 4,000	N/A	$ 2,417	$ 23,750	$ -	$ 116,605	$ 219,043
019	East St	Prairie Ln	Clinton St	Bituminous	155	32	4960	4/4/2017	30	Average	144	585	40	Mill and Resurface but allow for higher PCI roadways to take precedence and Address ADA Sidewalks	$ 4,000	N/A	$ 1,378	$ 14,533	$ -	$ 82,482	$ 150,284
020	Lincoln St	Prairie Ln	Clinton St	Bituminous	155	22	3410	4/4/2017	81	Non-Existent	9	22	0	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ 4,000	N/A	$ 947	$ 10,611	$ 15,500	$ 68,023	$ 121,287
021	Washington St	Prairie Ln	Clinton St	Bituminous	155	18	2790	4/4/2017	70	Non-Existent	1	13	0	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ -	N/A	$ 775	$ 8,975	$ 15,500	$ 62,239	$ 109,689
022	Clinton St	Jensen St	West St	Bituminous	515	20	10300	4/4/2017	55	Non-Existent	24	12	40	Sealcoat and address ADA Sidewalks	$ 4,000	N/A	$ 2,861	$ 27,828	$ 51,500	$ 187,432	$ 337,142
023	Clinton St	West St	Williams St	Bituminous	570	20	11400	4/4/2017	50	Non-Existent	24	12	40	Sealcoat and address ADA Sidewalks	$ -	N/A	$ 3,167	$ 30,578	$ 57,000	$ 206,117	$ 371,005
024	Clinton St	Williams St	Segment 025	Bituminous	320	24	7680	4/4/2017	60	Non-Existent	13	66	0	Sealcoat and address ADA Sidewalks	$ 4,000	N/A	$ 2,133	$ 21,206	$ 32,000	$ 133,126	$ 241,025
025	Clinton St	Segment 024	Segment 026	Bituminous	180	32	5760	4/4/2017	60	Non-Existent	4	0	104	Sealcoat and address ADA Sidewalks	$ -	N/A	$ 1,600	$ 16,400	$ 18,000	$ 93,774	$ 171,289
026	Clinton St	Segment 025	Smith St	Bituminous	190	58	11020	4/4/2017	65	Average	9	33	0	Sealcoat and address ADA Sidewalks	$ 4,000	N/A	$ 3,061	$ 29,993	$ -	$ 144,374	$ 272,106
027	Clinton St	Smith St	East St	Bituminous	480	40	19200	4/4/2017	66	Average	17	19	115	Sealcoat and address ADA Sidewalks	$ 8,000	N/A	$ 5,333	$ 50,779	$ 24,000	$ 265,096	$ 495,185
028	Clinton St	East St	Lincoln St	Bituminous	400	24	9600	4/4/2017	55	Non-Existent	11	29	222	Sealcoat and address ADA Sidewalks	$ 8,000	N/A	$ 2,667	$ 26,000	$ 40,000	$ 163,289	$ 296,268
029	Clinton St	Lincoln St	Washington St	Bituminous	400	22	8800	4/4/2017	88	Non-Existent	5	1	165	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ 4,000	N/A	$ 2,444	$ 24,000	$ 40,000	$ 155,826	$ 281,302
030	West St	Clinton St	Fulton St	Bituminous	360	20	7200	4/4/2017	69	Non-Existent	19	45	0	Sealcoat and address ADA Sidewalks	$ 8,000	N/A	$ 2,000	$ 20,000	$ 36,000	$ 134,775	$ 241,707
031	Jensen St	Clinton St	Fulton St	Bituminous	360	14	5040	4/4/2017	56	Non-Existent	2	21	0	Sealcoat and address ADA Sidewalks	$ -	N/A	$ 1,400	$ 14,600	$ 36,000	$ 114,625	$ 201,299
032	Williams St	Clinton St	Fulton St	Bituminous	360	21	7560	4/4/2017	85	Non-Existent	16	133	203	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ 6,000	N/A	$ 2,100	$ 20,905	$ 36,000	$ 138,133	$ 248,442
033	Smith St	Clinton St	Fulton St	Bituminous	360	58	20880	4/4/2017	74	Average	11	51	0	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ 8,000	N/A	$ 5,800	$ 54,200	$ -	$ 262,389	$ 497,627
034	East St	Clinton St	Fulton St	Bituminous	360	32	11520	4/4/2017	30	Average	144	585	40	Mill and Resurface but allow for higher PCI roadways to take precedence and Address ADA Sidewalks	$ 6,000	N/A	$ 3,200	$ 30,933	$ -	$ 175,074	$ 322,524
035	Lincoln St	Clinton St	Fulton St	Bituminous	360	18	6480	4/4/2017	65	Non-Existent	9	22	0	Sealcoat and address ADA Sidewalks	$ 8,000	N/A	$ 1,800	$ 18,271	$ 36,000	$ 128,058	$ 228,238
036	Washington St	Clinton St	Fulton St	Bituminous	360	18	6480	4/4/2017	70	Non-Existent	1	13	0	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ -	N/A	$ 1,800	$ 18,200	$ 36,000	$ 128,058	$ 228,238
037	Fulton St	West St	Williams St	Bituminous	570	22	12540	4/4/2017	72	Non-Existent	8	20	403	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ 6,000	N/A	$ 3,483	$ 33,350	$ 57,000	$ 216,751	$ 392,332
038	Fulton St	Jensen St	West St	Bituminous	375	22	8250	4/4/2017	63	Non-Existent	8	20	403	Sealcoat and address ADA Sidewalks	$ -	N/A	$ 2,292	$ 22,625	$ 37,500	$ 146,867	$ 264,974
039	Fulton St	Jensen St	Jensen St	Bituminous	115	14	1610	4/4/2017	56	Non-Existent	8	20	403	Sealcoat and address ADA Sidewalks	$ -	N/A	$ 447	$ 6,025	$ 11,500	$ 45,106	$ 77,952
040	Fulton St	Williams St	Smith St	Bituminous	700	31	21700	4/4/2017	63	Non-Existent	7	10	0	Sealcoat and address ADA Sidewalks	$ 6,000	N/A	$ 6,028	$ 56,250	$ 70,000	$ 322,111	$ 595,095

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Detailed Street Conditions

											Field Measurements and Typical Associated Repairs (Select Few Listed)									
											# of Full Width Transverse Cracking Low (Count)	Total Length of Longitudinal Cracking Wheelpath Low (LF)	Patching Good (SF)							
Segment ID	Street Name	Beginning	Ending	Pavement Type	Length (FT)	Width (FT)	Area	Inspection Date	PCI	Curb Condition	Monitor & Repair if Degrades Further	Monitor & Repair if Degrades Further	Monitor & Repair if Degrades Further	Recommended Repairs	Estimated ADA Sidewalk Replacement	Estimated Gravel Repairs	Estimated Seal Coat Cost	Estimated Mill & Overlay Cost with Required Patching	Estimated Addition of Curb & Gutter Cost	Estimated Reconstruction Cost with Curb & Gutter (Asphalt)	Estimated Reconstruction Cost with Curb & Gutter (Concrete)
041	Fulton St	Smith St	East St	Bituminous	480	24	11520	4/4/2017	44	Non-Existent	8	31	306	Mill and Resurface but allow for higher PCI roadways to take precedence and Address ADA Sidewalks	$ 8,000	N/A	$ 3,200	$ 30,800	$ 48,000	$ 193,452	$ 351,510
042	Fulton St	East St	Lincoln St	Bituminous	400	24	9600	4/4/2017	65	Non-Existent	12	13	609	Sealcoat and address ADA Sidewalks	$ 8,000	N/A	$ 2,667	$ 26,000	$ 40,000	$ 163,289	$ 296,268
043	Fulton St	Lincoln St	Washington St	Bituminous	400	24	9600	4/4/2017	68	Non-Existent	5	5	873	Sealcoat and address ADA Sidewalks	$ 4,000	N/A	$ 2,667	$ 26,000	$ 40,000	$ 163,289	$ 296,268
044	Washington St	Fulton St	Sunnyside St	Bituminous	360	18	6480	4/4/2017	70	Non-Existent	1	13	0	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ -	N/A	$ 1,800	$ 18,200	$ 36,000	$ 128,058	$ 228,238
045	Lincoln St	Fulton St	Sunnyside St	Bituminous	360	18	6480	4/4/2017	65	Non-Existent	9	22	0	Sealcoat and address ADA Sidewalks	$ 8,000	N/A	$ 1,800	$ 18,271	$ 36,000	$ 128,058	$ 228,238
046	East St	Fulton St	Sunnyside St	Bituminous	360	32	11520	4/4/2017	30	Average	144	585	40	Mill and Resurface but allow for higher PCI roadways to take precedence and Address ADA Sidewalks	$ 8,000	N/A	$ 3,200	$ 30,933	$ -	$ 175,074	$ 322,524
047	West St	Fulton St	Sunnyside St	Bituminous	390	20	7800	4/4/2017	69	Non-Existent	19	45	0	Sealcoat and address ADA Sidewalks	$ 6,000	N/A	$ 2,167	$ 21,500	$ 39,000	$ 144,966	$ 260,179
048	Williams St	Fulton St	Sunnyside St	Bituminous	390	21	8190	4/4/2017	73	Non-Existent	16	133	203	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ 8,000	N/A	$ 2,275	$ 22,480	$ 39,000	$ 148,604	$ 267,475
049	Jensen St	Fulton St	Sunnyside St	Bituminous	390	24	9360	4/4/2017	45	Non-Existent	6	19	0	Sealcoat and address ADA Sidewalks	$ 2,000	N/A	$ 2,600	$ 25,400	$ 39,000	$ 159,519	$ 289,362
050	Smith St	Fulton St	Sunnyside St	Bituminous	390	21	8190	4/4/2017	60	Non-Existent	8	3	549	Sealcoat and address ADA Sidewalks	$ 6,000	N/A	$ 2,275	$ 22,475	$ 39,000	$ 148,604	$ 267,475
051	Sunnyside St	East St	Lincoln St	Bituminous	400	22	8800	4/4/2017	65	Non-Existent	15	31	256	Sealcoat and address ADA Sidewalks	$ 4,000	N/A	$ 2,444	$ 24,174	$ 40,000	$ 155,826	$ 281,302
052	Sunnyside St	Lincoln St	Washington St	Bituminous	400	22	8800	4/4/2017	85	Non-Existent	15	31	256	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ -	N/A	$ 2,444	$ 24,174	$ 40,000	$ 155,826	$ 281,302
053	Sunnyside St	Williams St	Smith St	Bituminous	700	26	18200	4/4/2017	35	Non-Existent	6	5	165	Mill and Resurface but allow for higher PCI roadways to take precedence and Address ADA Sidewalks	$ -	N/A	$ 5,056	$ 47,550	$ 70,000	$ 289,461	$ 529,619
054	Sunnyside St	West ST	Williams St	Bituminous	570	26	14820	4/4/2017	59	Non-Existent	6	5	165	Sealcoat and address ADA Sidewalks	$ 2,000	N/A	$ 4,117	$ 39,100	$ 57,000	$ 238,020	$ 434,985
055	Sunnyside St	Jensen St	West St	Bituminous	375	26	9750	4/4/2017	69	Non-Existent	8	0	0	Sealcoat and address ADA Sidewalks	$ -	N/A	$ 2,708	$ 26,375	$ 37,500	$ 160,860	$ 293,035
056	Sunnyside St	Smith St	East St	Bituminous	480	26	12480	4/4/2017	80	Non-Existent	6	5	165	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ 6,000	N/A	$ 3,467	$ 33,250	$ 48,000	$ 202,408	$ 369,470
057	Sunnyside St	End of Pavement	Jensen St	Bituminous	1180	18	21240	4/4/2017	69	Non-Existent	2	0	0	Sealcoat and address ADA Sidewalks	$ -	N/A	$ 5,900	$ 55,100	$ 118,000	$ 391,333	$ 702,435
059	East St	Sunnyside St	Segment 060	Concrete	240	32	7680	4/4/2017	43	Average	23	61	0	Full-Depth Patching where required and Crack Seal	$ -	N/A	N/A	N/A	$ -	$ 120,874	$ 221,701
060	East St	Segment 059	Segment 061	Concrete	1930	23	44390	4/4/2017	85	Non-Existent	5	0	0	Monitor, Crack Seal as necessary	$ -	N/A	N/A	N/A	$ 193,000	$ 722,154	$ 1,316,680
061	East St	Segment 060	City Limits	Bituminous	450	23	10350	4/4/2017	80	Non-Existent	71	393	71	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ -	N/A	N/A	N/A	$ 45,000	$ 177,943	$ 322,376
062	Sunnyside St	220th Ave	Segment 057	Gravel	1830	24	43920	4/4/2017	50	Non-Existent	0	0	0	Apply additional aggregate where required & repair ditches	$ -	$ 20,659	$ 12,200	N/A	$ 183,000	$ 702,454	$ 1,283,732
063	220th Ave	Sunnyside St	250th St	Gravel	2600	24	62400	4/4/2017	50	Non-Existent	0	0	0	Apply additional aggregate where required & repair ditches	$ -	$ 29,142	$ 17,333	N/A	$ 260,000	$ 992,773	$ 1,815,443
064	250th St	220th Ave	East St	Gravel	5240	24	125760	4/4/2017	75	Non-Existent	0	0	0	Maintain Dust Control	$ -	$ 58,224	$ 34,933	N/A	$ 524,000	$ 1,988,154	$ 3,638,454
065	Dewitt St	Segment 012	Hwy 30	Bituminous	455	25	11375	4/4/2017	80	Non-Existent	19	87	0	Monitor, initiate sealcoat schedule within two years of PCI reaching 70 and Address ADA Sidewalks	$ -	N/A	$ 3,160	$ 30,625	$ 45,500	$ 188,271	$ 342,759

= Urban Street Section with Curb and Gutter (Full-Length, Both Sides)

** Disregard Street Segment Numbers 004 and 058. They are not shown in table.

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Appendix G

5-Year Capital Plan

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5-Year Capital Plan

PCI	Segment ID	Street Name	Beginning	Ending	Maintenance Type	Estimated Costs	Cumulative Costs
ONGOING WORK							
35	53	Sunnyside St	Williams St	Smith St	Mill and Overlay	$ 47,549.73	**$ 47,550**
YEAR 1							
63	40	Fulton St	Williams St	Smith St		$ 12,027.78	**$ 12,028**
44	41	Fulton St	Smith St	East St		$ 11,200.00	**$ 23,228**
65	42	Fulton St	East St	Lincoln St		$ 10,666.67	**$ 33,894**
68	43	Fulton St	Lincoln St	Washington St	Sealcoat and Address Non-Compliant Sidewalks	$ 6,666.67	**$ 40,561**
56	31	Jensen St	Clinton St	Fulton St		$ 1,400.00	**$ 41,961**
45	49	Jensen St	Fulton St	Sunnyside St		$ 4,600.00	**$ 46,561**
45	15	Williams St	Dewitt St	Clinton St		$ 6,945.83	**$ 53,507**
YEAR 2							
53	1	East St	City Limits	Crystal Creek		$ 8,465.28	**$ 8,465**
52	2	East St	Crystal Creek	Hwy 30		$ 3,418.06	**$ 11,883**
55	22	Clinton St	Jensen St	West St		$ 6,861.11	**$ 18,744**
50	23	Clinton St	West St	Williams St	Sealcoat and Address Non-Compliant Sidewalks	$ 3,166.67	**$ 21,911**
60	24	Clinton St	Williams St	Segment 025		$ 6,133.33	**$ 28,044**
60	25	Clinton St	Segment 024	Segment 026		$ 1,600.00	**$ 29,644**
65	26	Clinton St	Segment 025	Smith St		$ 7,061.11	**$ 36,706**
66	27	Clinton St	Smith St	East St		$ 13,333.33	**$ 50,039**
YEAR 3							
53	9	Dewitt St	End of Street	Williams St		$ 2,216.67	**$ 2,217**
68	10	Dewitt St	Williams St	Smith St		$ 6,472.22	**$ 8,689**
68	11	Dewitt St	Smith St	East St	Sealcoat and Address Non-Compliant Sidewalks	$ 3,066.67	**$ 11,756**
56	39	Fulton St	Jensen St	Jensen St		$ 447.22	**$ 12,203**
63	38	Fulton St	Jensen St	West St		$ 2,291.67	**$ 14,494**
72	37	Fulton St	West St	Williams St	Address ADA Non-Compliant Sidewalks	$ 6,000.00	**$ 20,494**
58	18	Smith St	Segment 013	Clinton St	Sealcoat and Address Non-Compliant Sidewalks	$ 6,416.67	**$ 26,911**
74	33	Smith St	Clinton St	Fulton St	Address ADA Non-Compliant Sidewalks	$ 8,000.00	**$ 34,911**
60	50	Smith St	Fulton St	Sunnyside St	Sealcoat and Address Non-Compliant Sidewalks	$ 8,275.00	**$ 43,186**
YEAR 4							
55	28	Clinton St	East St	Lincoln St		$ 10,666.67	**$ 10,667**
65	35	Lincoln St	Clinton St	Fulton St		$ 9,800.00	**$ 20,467**
65	45	Lincoln St	Fulton St	Sunnyside St	Sealcoat and Address Non-Compliant Sidewalks	$ 9,800.00	**$ 30,267**
69	30	West St	Clinton St	Fulton St		$ 10,000.00	**$ 40,267**
69	47	West St	Fulton St	Sunnyside St		$ 8,166.67	**$ 48,433**
YEAR 5							
69	57	Sunnyside St	End of Pavement	Jensen St		$ 5,900.00	**$ 5,900**
69	55	Sunnyside St	Jensen St	West St		$ 2,708.33	**$ 8,608**
59	54	Sunnyside St	West ST	Williams St		$ 6,116.67	**$ 14,725**
65	51	Sunnyside St	East St	Lincoln St		$ 6,444.44	**$ 21,169**
70	21	Washington St	Prairie Ln	Clinton St	Sealcoat and Address Non-Compliant Sidewalks	$ 775.00	**$ 21,944**
70	36	Washington St	Clinton St	Fulton St		$ 1,800.00	**$ 23,744**
70	44	Washington St	Fulton St	Sunnyside St		$ 1,800.00	**$ 25,544**
70	16	Prairie Ln	East St	Lincoln St		$ 7,777.78	**$ 33,322**
70	17	Prairie Ln	Lincoln St	Washington St		$ 1,777.78	**$ 35,100**
YEAR 6+							
30	5	East St	Hwy 30	Joyce Ct		$217,982.30	**$ 217,982**
30	8	East St	Joyce Ct	Dewitt St		$140,940.65	**$ 358,923**
30	14	East St	Dewitt St	Prairie Ln		$166,040.64	**$ 524,964**
30	19	East St	Prairie Ln	Clinton St	Reconstruction and Full-Depth Patching and Crack Seal	$ 86,482.32	**$ 611,446**
30	34	East St	Clinton St	Fulton St		$181,073.98	**$ 792,520**
30	46	East St	Fulton St	Sunnyside St		$183,073.98	**$ 975,594**
43	59	East St	Sunnyside St	Segment 060		$ 84,286.96	**$ 1,059,881**
80	56	Sunnyside St	Smith St	East St		$ 6,000.00	**$ 1,065,881**
85	32	Williams St	Clinton St	Fulton St		$ 6,000.00	**$ 1,071,881**
73	48	Williams St	Fulton St	Sunnyside St		$ 8,000.00	**$ 1,079,881**
81	20	Lincoln St	Prairie Ln	Clinton St	Address ADA Non-Compliant Sidewalks	$ 4,000.00	**$ 1,083,881**
88	29	Clinton St	Lincoln St	Washington St		$ 4,000.00	**$ 1,087,881**
72	3	Smith St	Hwy 30	Segment 006		$ -	**$ 1,087,881**
95	6	Smith St	Segment 003	Dewitt St		$ 4,000.00	**$ 1,091,881**
78	13	Smith St	Dewitt St	Segment 018		$ -	**$ 1,091,881**
85	52	Sunnyside St	Lincoln St	Washington St		$ -	**$ 1,091,881**
85	12	Dewitt St	East St	Segment 065		$ -	**$ 1,091,881**
80	65	Dewitt St	Segment 012	Hwy 30	Monitor,	$ -	**$ 1,091,881**
85	60	East St	Segment 059	Segment 061	Sealcoat within 2 years of reaching PCI 70	$ -	**$ 1,091,881**
80	61	East St	Segment 060	City Limits		$ -	**$ 1,091,881**
83	7	Joyce Ct	East St	End of Street		$ -	**$ 1,091,881**
50	63	220th Ave	Sunnyside St	250th St		$ 29,141.60	**$ 1,121,022**
50	62	Sunnyside St	220th Ave	Segment 057	Gravel Road Repairs	$ 20,659.28	**$ 1,141,682**
75	64	250th St	220th Ave	East St		$ -	**$ 1,141,682**

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Appendix H

Reference Photos

Reference Photos

HMA STREETS

DEWITT STREET - SEGMENT 012 - HMA STREET - PCI=85

WILLIAMS STREET - SEGMENT 032 - HMA STREET - PCI=85

SUNNYSIDE STREET - SEGMENT 057 - HMA STREET - PCI=71

SUNNYSIDE STREET - SEGMENT 051 - HMA STREET - PCI=65

FULTON STREET - SEGMENT 041 - HMA STREET - PCI=44

SUNNYSIDE STREET - SEGMENT 053 - HMA STREET - PCI=35

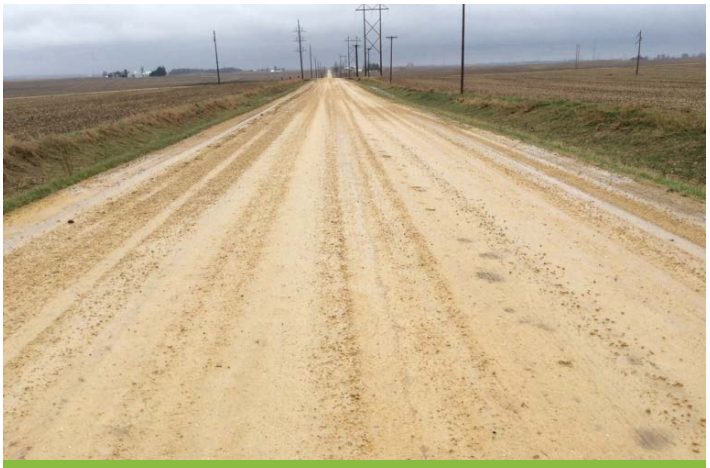
Reference Photos

CONCRETE STREETS

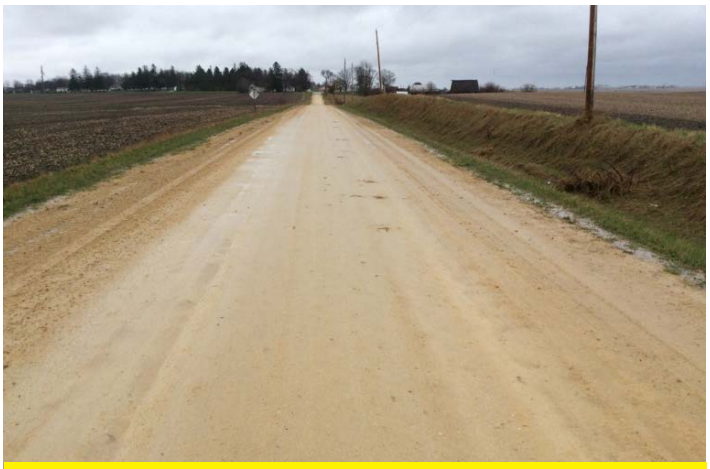
EAST STREET - SEGMENT 060 - CONCRETE STREET - PCI=85

EAST STREET - SEGMENT 059 - CONCRETE STREET - PCI=43

GRAVEL STREETS



250TH STREET - SEGMENT 064 - GRAVEL STREET - PCI=75



SUNNYSIDE STREET - SEGMENT 062 - GRAVEL STREET - PCI=50

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