CENTER FOR
PORTLAND CEMENT CONCRETE
PAVEMENT TECHNOLOGY

Defining the Attributes of Good In-Service Portland Cement Concrete Pavements

Final Report
December 2004

IOWA STATE UNIVERSITY

Sponsored by
the Federal Highway Administration, U.S. Department of Transportation
(Cooperative Agreement DTFH 61-01-X-00042, Project 9)

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About the PCC Center/CTRE

The Center for Portland Cement Concrete Pavement Technology (PCC Center) is housed at the Center for Transportation Research and Education (CTRE) at Iowa State University. The mission of the PCC Center is to advance the state of the art of portland cement concrete pavement technology. The center focuses on improving design, materials science, construction, and maintenance in order to produce a durable, cost-effective, sustainable pavement.

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16. Abstract

Much of the current research in portland cement concrete (PCC) pavements deals with the analysis of early pavement life failures and seeks to find ways to prevent those from reoccurring. The Long Term Pavement Performance (LTPP) portion of the Strategic Highway Research Program (SHRP) has identified some of the key factors in designing and building new PCC pavements. This statement will build on the Iowa Highway Research Board (IHRB) project TR-463, Field Performance Study of Past Iowa Pavement Research: A Look Back.

In Iowa and across the nation, there are multiple pavements that were built more than 20 years ago that have been and are continuing to provide very good service to the public. They are found on both state and local routes and in both low and high traffic volume areas. There is a need to learn what went into those pavements, from the subgrade through the surface, that makes them perform so well.

The purpose of this research project was to conduct a scoping study that could be used to evaluate the need for additional research to study the attributes of well-performing concrete pavements. The concept of “zero-maintenance jointed plain concrete pavements” was iterated in this study for long-lasting, well-performing portland cement concrete pavement sections.

The scope of the study was limited to a brief literature survey, pavement performance data collection from many counties, cities, and primary and interstate roads in Iowa, field visits to many selected pavement sites, and analysis of the collected data. No laboratory or field testing was conducted for this phase of the project. A problem statement with a research plan was created that could be used to guide the second phase of the project.

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DEFINING THE ATTRIBUTES OF GOOD IN-SERVICE PORTLAND CEMENT CONCRETE PAVEMENTS

Federal Highway Administration Project 9
(Cooperative Agreement DTFH61-01-X-00042)

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ACKNOWLEDGMENTS

The authors would like to thank the Iowa Department of Transportation, Office of Pavement Design personnel, and staff from several cities and counties who assisted the researchers in the data collection effort.

INTRODUCTION

Background

Much of the current research in portland cement concrete (PCC) pavements deals with the analysis of early pavement life failures and seeks to find ways to prevent those from reoccurring. The Long Term Pavement Performance (LTPP) portion of the Strategic Highway Research Program (SHRP) has identified some of the key factors in designing and building new PCC pavements. This statement will build on the Iowa Highway Research Board (IHRB) project TR-463, Field Performance Study of Past Iowa Pavement Research: A Look Back.

Problem

In Iowa and across the nation, there are pavements that were built more than 20 years ago that have been, and are continuing, to provide very good service to the public. They are found on both state and local routes and in both low and high traffic volume areas. There is a need to learn what went into those pavements, from the subgrade through the surface, that makes them perform so well.

The interaction between the pavement structure and pavement foundation is very complex, and due to such nature of the pavement systems, more research is needed in this area to identify the common characteristics of long-lasting and well-performing jointed plain concrete pavements (JPCPs).

Research Objective

The objective of this research was the analysis of existing state, county, and city route pavement records in Iowa to determine what design characteristics, materials, and operational characteristics contributed to the long-lasting performance of the concrete pavements that are still in operation.

The work was accomplished in several tasks:

- Data Collection
    - Sampling of local and state records
    - Subset of sample for field and office review of project records
- Data Analysis
- Summary and Conclusions

DATA COLLECTION

This task involved a review of the Iowa Department of Transportation (Iowa DOT) Pavement Management records for well-performing pavements and a survey of the counties and cities for examples of well-performing pavements. A one-page survey form and a letter (see Appendix B) were prepared and sent to the 6 Iowa DOT District Offices, 99 counties, and some 40 cities of over 5,000 population asking the availability of well and poorly performing pavements. The survey form was asking the respondents to identify three well-performing pavements that are over 20 years old and three that are under 20 years old and have serious reoccurring maintenance problems. The well-performing pavements were identified as having less than 10% patched slabs or joints, acceptable ride quality, and minimal maintenance costs. The respondents were asked to identify the level of detailed information that is available regarding the pavement design (subbase and base materials and traffic), construction (subgrade tests, base materials and tests, concrete materials, and mix quality test results) and operational (maintenance project dates, materials, and costs) work.

Twenty-nine counties out of 99 responded to the survey and reported 112 pavement sections, with 47 of them being in good, 40 in fair, and 25 in poor condition. Similarly, 7 cities responded to the survey and reported 36 pavement sections, with 15 of them being in good, 13 in fair, and 8 in poor condition (see Appendix D). Figure 5 (see Appendix A) shows the counties and cities that responded to the survey and the condition of the pavements there. A review of the Iowa DOT Pavement Management records also revealed that 30 pavement sections of varying lengths in the Iowa Interstate system were over 20 years old and had not been rehabilitated (see Appendix H). Similarly, analysis of 6 Iowa DOT District Offices showed that 641 pavement sections have not been resurfaced since the original construction date and they were all over 20 years old. The Pavement Condition Index (PCI) values for these sections varied from 0 to 95, with 0 being the poorest condition and 100 being the best pavement condition (see Appendix F).

The collected pavement performance data for all pavement types (city, county, primary, and Interstate roads) are given in Appendices D, E, F, and H. Appendix D has all the data for the county and city pavement sections reported in the pavement survey forms. Out of 112 pavements reported, 47 sections have been in service for more than 20 years and are still in good condition, as rated by the contact personnel. Upon the collection of the data, a field survey was conducted by the investigators to obtain detailed information about the pavement performances reported. During the survey, 53 pavement sections, which conditions were reported before, were visited (see Appendix A for the visited sites). Information on pavement design, pavement properties and performance, base characteristics, concrete mix design, and traffic conditions was obtained (see Appendix E).

DATA ANALYSIS

The detailed field survey of 53 pavement sites and visits to local road projects (see Appendix E) showed that there is not much data available for the subgrade and subbase layers. The base characteristics, particularly drainability and stability, are very effective on pavement performance. Poor drainage conditions are generally associated with the poor performance of the pavement sections. Additionally, there is lack of data on the durability characteristics of hardened concrete. In this context, permeability should be emphasized: permeability is an effective measure of concrete durability, and determination of it might give significant clue for the long-term performance of the concrete pavements. A limited analysis on the available pavement materials related data showed that the well-performing sections having a rating of 1 or 2 have an average water-to-cement ratio of 0.49, whereas the poorly performing sections having a rating of 5 or 6 have a water-to-cement ratio of 0.55 (see Appendix E). The proposed second phase of the project aims to concentrate on collecting more data on the performance of pavement foundation (subgrade and subbase layers) and PCC materials to find out what makes certain sections perform well and others perform poorly.

Figure 1 shows the condition of a fifty-year-old PCC pavement section located in a residential street in Bettendorf, Iowa. The pavement thickness was reported as 6 in., with 20 ft. slab spacing. The construction records revealed that the subbase material was obtained from a nearby river bed and believed to have provided a well-draining, stable subbase layer which is crucial for good long-lasting performance. The surface condition of the pavement is shown in Figure 2. Exposed aggregates on the pavement surface show that the same river bed material was used in the concrete mix as well. The current surface texture is very similar to the exposed aggregate surface and perhaps is providing a quieter and reflection-free pavement performance.

Figure 1. A view of a fifty-year-old PCC pavement section of a residential street that is still in good condition, City of Bettendorf, Iowa.

Surface condition of a pavement section from Marion County is shown in Figure 3. The picture was taken during a field visit to the pavement site. Investigators believed that the surface deterioration was due to the concrete mix design and construction practices. Investigators seek to find answers for the causes of such distresses by evaluating the pavement sections that have not shown any surface distresses for 20 years and longer. Core samples from pavement sections that do not exhibit such deterioration and from the ones that exhibit surface distresses are planned to be taken for Scanning Electron Microscope (SEM) and for other materials analyses and compared with each other in the second phase of the project.

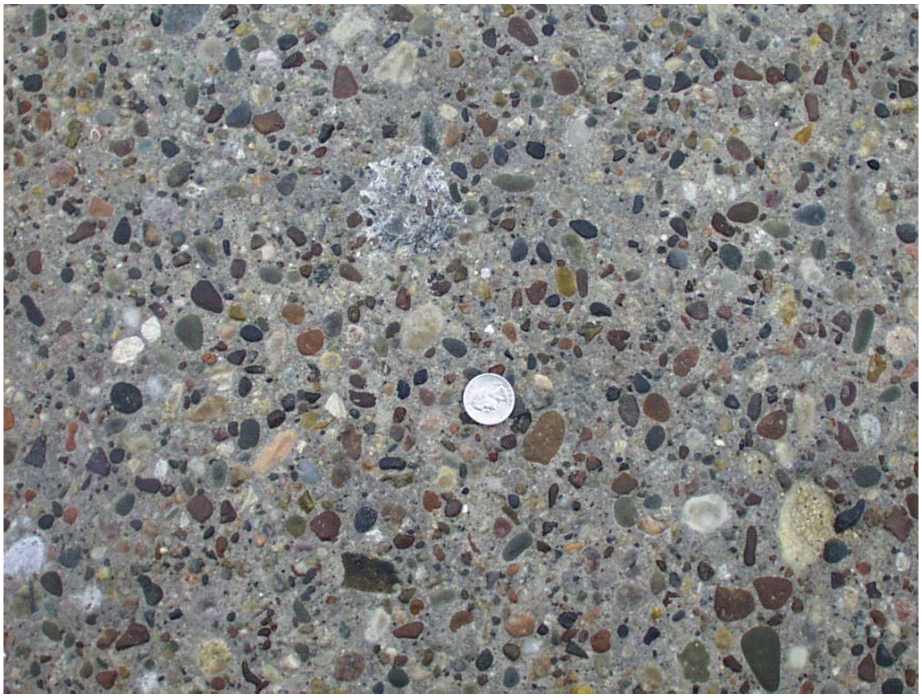

Figure 2. Picture showing the polished aggregate of a fifty-year-old PCC pavement that is still in well-performing condition, City of Bettendorf, Iowa.

Figure 3. A view of a PCC pavement section from Marion County, Iowa, depicting the surface deterioration.

One of the most commonly observed pavement distresses in low- to mid-volume county roads in Iowa is the longitudinal cracking. A section from Pocahontas County with such distresses in both lanes is shown in Figure 4. There can be several reasons for the failure. It can happen from early-age cracking due to concrete materials, mix design, and construction-related practices, as well as from the heavy agricultural loading and subgrade failure. A well-compacted, engineered subgrade designed to meet the traffic loads in varying environmental conditions is crucial for long-lasting performance. In the second phase of the study, it is recommended that soil samples be taken from the subbase and subgrade layers for laboratory testing from both failed and well-performing sections to find out the differences between them. Dynamic Cone Penetrometer (DCP) and other field testing are also recommended to evaluate the pavement foundations in-situ. Subgrade stability, subbase drainage conditions, and the overall embankment quality of the pavement foundations are planned to be investigated to find out the sources of commonly observed longitudinal cracking and other pavement distresses.

Figure 4. Picture showing a PCC pavement section in Pocahontas County, Iowa, depicting the commonly observed longitudinal cracking in relatively low-volume Iowa roads.

A brief analysis of the pavement performance data for primary sections is shown in Figures 6 through 10. The relationships between the pavement cracking and the Pavement Condition Index (PCI) are given in Figures 6 through 9. The PCI values were calculated by the Iowa DOT using an equation. Figure summarizes the relationship between the transverse cracking and the pavement age. Although, there is no distinct relationship between the amount of transverse cracking and the pavement age, cracking tends to increase as the pavements get older. Pavements that have been in service for more than 20 years are included in the pavement performance database. As can be seen from the database, some pavement sections are 70- to 80-year-old.

Similarly, a brief pavement performance data analysis was conducted for the Iowa Interstate sections that are 20 years and older. Results are presented in Figures 11 through 23. As seen in Figures 11 through 13, longitudinal and transverse cracking tend to increase as pavements get older. Pavements with higher PCI values have lower transverse and longitudinal cracking (see Figures 14 through 16). Longitudinal and transverse cracking tend to increase with the increase in the average daily traffic (ADT), but pavement cracking tend to decrease as annual average daily truck traffic (AADTT) increases (see Figures 19 through 22). Figure 23 summarizes the relationship between the transverse cracking and the International Roughness Index (IRI). IRI values increase with higher amounts of transverse cracking in pavement sections.

It should be noted that both primary and interstate databases contain pavement sections with varying levels of performance (ranging from poorly to well-performing). But all sections have been in service for more than 20 years, well beyond the pavement design life. In the second phase of the project, investigators plan to collect field data on pavement foundation, PCC concrete materials, mix design and construction practices, subbase drainage conditions, joint performances, etc., to find out what makes certain sections perform so well beyond the pavement design life of 20 years by comparing these sections with the poorly performing ones.

Darter (1976) conducted a study focusing on the determination of “zero-maintenance” jointed concrete pavement (JCP) characteristics based on an extensive field survey including over 70 heavily trafficked sections throughout the United States. The term “zero-maintenance” refers to the structural adequacy of a pavement that undergoes no distress during its service life. Based on this study, it was concluded that the production of zero-maintenance pavements serving over periods of up to 25 years is quite feasible. Darter (1976) pointed out that use of dowel bars, short joint spacing, good subdrainage, adequate sealing of joints, increased slab thickness (to increase aggregate interlock if there is no dowel bars), and increased slab foundation support are necessary to prevent joint faulting. For adequate performance, subsurface drainage should have adequate capacity and outflow rate should be equal to the infiltration. In addition, erosion should be prevented. The thickness of the shoulders should be equal to mainline pavement thickness, tie bars should be inserted, transverse joints should be identical to traffic lane, longitudinal joints should be sealed, and the subbase should be the same with the adjacent traffic lane. Investigators believe that “zero-maintenance” jointed plain concrete pavements is a feasible concept and, in the proposed second phase of the project, investigators plan to gather detailed data from well-performing concrete pavement sections to validate this concept.

In Table 1, common distress types of a PCC pavement and influencing factors are given. A major factor, which is effective on most of the distress types, is the loading condition of the pavement. In other words, the traffic which the pavement will experience during its service life is a parameter affecting all possible distress types. Moreover, deterioration of a concrete pavement is a continuous process that may start with one specific type of distress and continue with the combination of additional distresses.

Table 1. Common distress types and influencing factors for PCC pavements (modified after Cable and McDaniel 1998)

Distress Type	**Influencing Factors**
Transverse Cracking	Slab Thickness, Shrinkage, Moisture, Age, Strength, Temperature-Moisture Associated Volume Change, Subbase, Joint Sawing Timing, Joint Spacing
Longitudinal Cracking	Slab Thickness, Air Content, Age, Strength, Temperature-Moisture Associated Volume Change, Joint Sawing Timing, Centerline Joint Sawing Depth, Base-Slab Friction, Shoulder Connection
Diagonal Cracking	Slab Thickness, Shrinkage, Moisture, Age, Strength, Temperature-Moisture Associated Volume Change, Joint Design, Joint Sawing Timing
Faulting	Slab Thickness, Age, Strength, Temperature-Moisture Associated Volume Change, Load Transfer (Dowel Bar Diameter & Spacing & Coating), Subbase, Joint Spacing, Joint Sealing
Joint Spalling	Slab Thickness, Air Content, Strength, Alkali-Aggregate Reaction, Dowel Alignment, Joint Spacing, Joint Sealing
Corner Spalling	Slab Thickness, Air Content, Temperature-Moisture Associated Volume Change, Alkali-Aggregate Reaction, Subbase, Construction
Edge Deflection	Shoulder Connection, Mainline Width, Tie-bars, Temperature-Moisture Associated Volume Change, Subbase
Durability “D” Cracking	Moisture, Age, Strength, Temperature-Moisture Associated Volume Change, Aggregate Type, Aggregate Size, Aggregate Soundness
Aggregate Pop-out	Moisture, Aggregate Soundness, Alkali-Aggregate Reaction
Shrinkage Cracking	Water-to-cement Ratio, Cement Content & Type, Shrinkage, Moisture
Scaling	Air Content, Water-to-cement Ratio, Cement Content & Type, Aggregate Type, Aggregate Size, Aggregate Soundness, Alkali-Aggregate Reaction, Overwork, Excess Water
Pumping	Slab Thickness, Load Transfer, Subbase
Punch-out	Slab Thickness, Air Void Structure, Strength, Transverse Crack Spacing
Blow-up	Slab Thickness, Moisture, Age, Strength, Temperature-Moisture Associated Volume Change, Alkali-Aggregate Reaction, Dowel Alignment

Distress processes mutually promote each other. For instance, cracking due to misalignment of dowel bars is followed by the excessive moisture intake of the concrete slab and subsequent freeze-thaw spalling. In pavement degradation, water plays an important role. The water should be either removed from the surface or from the subbase in a rapid manner. The previous studies on well and poorly performing pavements proved that drainage of the subbase layer, together with other subbase characteristics (e.g., type and grading), is very important amongst other pavement parameters (Darter 1977; Khazanovich et al. 1998; Smith et al. 1990a). The investigators believe that a subbase with a good drainability is a must for adequate performance. For future study, the investigators intend to focus on the pavement foundation (subgrade and subbase) and PCC materials characteristics of jointed plain concrete pavements.

SUMMARY AND CONCLUSIONS

This limited study provided that there are many well-performing concrete pavements serving well over 30 years. The available data for those pavements was limited in some cases, but included the following:

1. Identification of a matrix of pavements at state and local levels that contains well and poorly performing concrete pavements
2. Paving inspection notes and test results
3. Mix design and materials information
4. Visual distress surveys
5. Traffic in terms of AADT and truck percentages
6. General description of soils and base construction for the pavements

Limitations included the following:

1. Lack of details on subgrade material types and testing results at construction
2. Lack of profile and pavement structural capacity data over time

The limited study has proved that pavements and records do exist to develop the relationships needed for identification of the “well-performing” pavement attributes.

In the proposed second phase of the study, well and poorly performing concrete pavements having similar traffic loading (low, medium, and heavily trafficked sections) will be determined in Iowa. In the selection of the test sections, deteriorated and well-performing pavements will be chosen based on the major distress types such as cracking, faulting, subbase failure, the ride quality, and pavement service life. Testing will be carried out starting from the subbase characteristics for both well and poorly performing pavements. The gathered data from both well and poorly performing sections will be analyzed. It is anticipated that this study will identify what pavement attributes provide for pavement performance in excess of 20 years, as well as what makes poorly performing pavements fail before the end of their design life. The same type of relationships can be applied in other states and across the nation.

RECOMMENDATIONS

Below is the outline of the steps to accomplish the needed work in the Phase II part of the project.

- Task 1. Selection of candidate projects for in-depth study.

Based on the matrix of projects developed in the first phase of the study, preliminary contacts will be made with the specific highway agencies to establish a field data collection plan and timeline.

During this task, a review of the LTPP reports regarding the attributes of well-performing pavements will be consulted to assess other types of data that would be helpful in the analysis if they exist at the owner agency.

- Task 2. Field survey and data collection for analysis.

This task will consist of field visits to the pavement sites and the offices where the pavement project, construction, and maintenance records are being kept. A database record system will be used to document the information gathered from office records. The research team will also travel to the site to conduct a visual distress survey and record photos of the project site. They would record available maintenance and operational costs, traffic data, and construction data.

At the same time, representative core samples of the pavement would be obtained. At the core locations, Dynamic Cone Penetrometer (DCP) testing and Shelby core samples will be obtained from the subbase and subgrade for lab analysis of soil type, moisture content, permeability, and modulus values. The concrete cores will be used for Scanning Electron Microscope (SEM) analysis of chemical make up and air matrix/content. If possible, with the cooperation of the Iowa DOT staff, a longitudinal profile of the sample pavement will be obtained in both directions with the South Dakota type high speed profiler to document the ride quality.

A portion of the sample pavements tested will be used for the analysis portion of the work, and the second portion of the projects will be used for calibration of the results.

- Task 3. Data Analysis.

This task will be accomplished in three separate, but tied, operations. The first one will be the SEM analysis of the concrete cores. The second one will be a lab analysis of the soil (pavement foundation) materials identified in Task 2. The third one will involve the development of a statistical analysis of the soil, concrete, construction, distress, and maintenance information for relationships.

- Task 4. Results Calibration.

Using a second portion of the sample pavements, the research team will seek to test the conclusions drawn in Task 3. This will be accomplished by using the commonly known parameters of the existing soil maps, concrete mix design, and traffic data. The resulting performance will be predicted with the Task 3 statistical information. These results will be used to make the comparison between predicted and actual performance. Newly released 2002 Mechanistic-Empirical Pavement Design Guide Software will also be used to compare the actual (observed) versus forecasted pavement performance, pavement distress data for the analyzed pavement sections. This comparison will provide invaluable data to the pavement design engineers as an additional information for calibrating the latest pavement analysis and design tools.

- Task 5. Report Development and Implementation.

The results of the field and laboratory analysis will be reported in addition to guidelines for the selection of materials and design of the pavement foundation and pavement structure for future roadways.

PROPOSAL FOR PHASE II PART OF THE PROJECT

Based on the findings provided in the Phase I of the study, principal investigators came up with the proposal below for the Phase II of the project.

I. Resource Needs and Time Frame (*Include resource needs, equipment, personnel, etc.)*

This project will require the cooperation of the following CCEE entities and Iowa DOT:
- Office of Special Investigations, Iowa DOT – Pavement coring and profiling
- Geotechnical Division of CCEE – Dynamic Cone Penetrometer, soil boring and soils analysis, record search, project data analysis, and report development
- MARL – SEM analysis of concrete cores

II. Anticipated Research Period *(Time in person months/years).*

- Task 1 – Selection of candidate projects for in-depth study – 2 months
- Task 2 – Field survey and data collection for analysis – 5 months
- Task 3 – Data Analysis – 7 months
- Task 4 – Results Calibration – 4 months
- Task 5 – Report Development and Implementation – 6 months

Tasks 1-5 will be completed in sequence, while Task 5 will be spread out over the 24-month total contract period.

III. Estimated Level of Funding Required *(Anticipated total level of funding requirements/year, potential organizational funding sources.)*

Level of effort, personnel, and cost (excluding overhead) estimated:

- Task 1 – Cable ¼ month, Ceylan ½ month, one graduate student 2 months, $10K
- Task 2 – Ceylan 2 ½ months, ISU soils rig 1 month, DOT core rig 1 month, two graduate students 5 months, $59K
- Task 3 – Ceylan 4 months, three graduate students 7 months, MARL and soils lab testing, $107K
- Task 4 – Ceylan 2 ½ months, one graduate student 4 months, CTRE Staff, $31K
- Task 5 – Ceylan 1 month, one graduate student 6 months, $17K

Total cost (without overhead estimated): $224K

IV. Intended Result Users (*Who would utilize the benefits that will result from the undertaking.)*

The results of this research will serve as a design aid for engineers to develop pavements of the future that build on the characteristics of the past that provided adequate performance.

V. Implementation (*Include people/organizations and methods that should be considered for implementing the research.)*

The results of this study will be used to train city, county, and state personnel in Iowa in the use of evaluating materials and methods that will be considered in future pavement designs. It will provide guidelines on optimizing current methods and materials to achieve the best performing pavements for the existing conditions and design requirements. This can be done through workshops at local, state, and national meetings. This work builds on that done with the results of SHRP studies on PCC pavement performance.

VI. Level of Importance to Overall Goals *(Very High, High, Required, or Later.)*

The work is of high importance due to the need to learn from new material research and to build on the successes of the past construction practices that provided adequate performance of PCC pavements.

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APPENDIX A: STATE MAP WITH COUNTIES AND CITIES THAT RESPONDED TO CONTACTS, PAVEMENT SITES USED FOR DATA COLLECTION AND FIELD VISITS

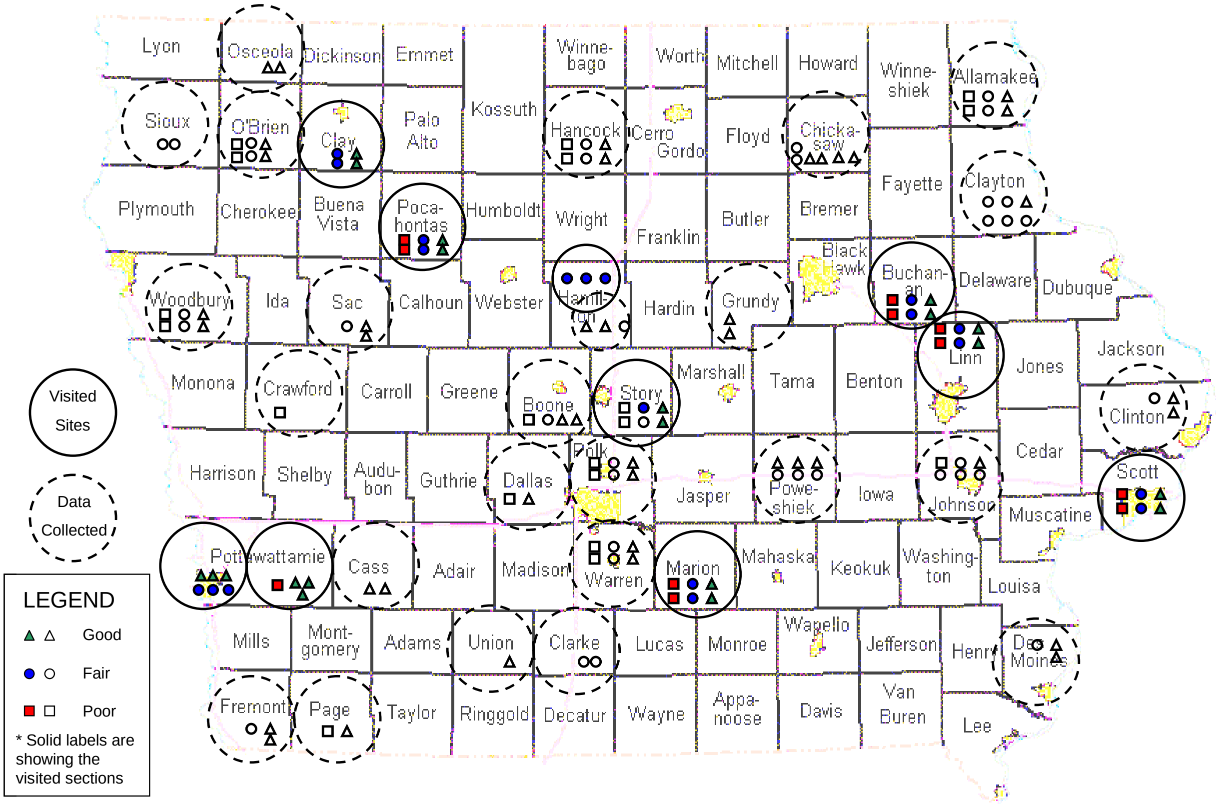

Figure 5. Research sites

APPENDIX B: INITIAL CONTACT FORM AND SAMPLE LETTER FOR IDENTIFICATION OF POTENTIAL PAVEMENT INFORMATION VISITS

To: County Engineers January 8, 2004
Public Works Directors/City Engineers

From: Jim Cable P.E.
Halil Ceylan

Re: Long Term Performance Evaluation of Concrete Pavements

I am writing to request information on the long term performance of concrete pavements in Iowa. Last October, Iowa Highway Research Board (IHRB) approved the research project entitled; “Long Term Performance Evaluation of Concrete Pavements”. This research study is being conducted by the Civil Engineering faculty at Iowa State University.

The objective of this research is the analysis of existing state, county and city route pavement records to determine what design characteristics, materials, and operational characteristics contributed to the long performance of concrete pavements.

The first phase of the project requires the collection of data on the design characteristics, materials, and operational characteristics that contributed to the good or poor performance of concrete pavements that are still in operation. **At this point, we would like you to identify three pavements of 20 years and older that have the best performance records, and three pavements under 20 years old that have serious recurring maintenance problems. The best performing pavements are defined as having less than 10% patched slabs and joints, acceptable ride quality and minimal maintenance costs.**

Please complete the attached pavement survey forms with the required information for the three best performing and three poorest performing concrete pavements in your jurisdiction. The survey results will allow the research team to identify individual project locations (6 good and 6 poor performing pavements) across the state in county and city road systems for detailed analysis. The research team will conduct on site interviews at those locations. You will be contacted prior to our visits if your pavements are selected for the in depth survey. The results of this survey and one being done on state highways in Iowa will be used to develop a statewide research plan that uses lessons learned in the selection of pavement materials and construction methods that will improve future designs based on the lessons of past designs.

You can either submit the attached survey forms electronically to Dr. Halil Ceylan at hceylan@iastate.edu or send them by snail mail to his office address below. We would appreciate your return of the forms prior to January 30, 2004.

Halil Ceylan
490 Town Engineering Building
Department of Civil, Construction, and Environmental Engineering
Ames, IA 50011-3232
Phone: (515) 294-8051

Do not hesitate to contact myself (515) 294-2862 jkcable@iastate.edu or Halil if you have any questions.

Concrete Pavement Survey - Requested Information

Long Term Performance Evaluation of Concrete Pavements

Purpose of Project: Analysis of the existing state, county and city route pavement records to determine what design characteristics, materials, and operational characteristics contributed to the long lasting performance of the concrete pavements that are still in operation.

General Available Information on Individual Selected Pavement

- Geographical project location (route and termini)?
- Pavement age (years)?
- Type of concrete pavement (doweled or no dowels)?
- Pavement width (feet)?
- Pavement depth (inches)?
- Base type (granular, stabilized, none)?
- Pavement joint spacing (feet)?
- Transverse joint angle (skewed, rectangular)?
- Shoulder surface type (ACC, PCC, granular, earth)?
- Number of traffic lanes in each direction?
- Current traffic volume (ADT and % trucks)?
- Current surface condition of the pavement (good. poor)?
- Are material and pavement construction records available (yes, no)?
- Of the pavements reported in this survey please rank this pavement in terms of performance (1 –best, to 6 – poorest performing).

APPENDIX C: DETAILED PAVEMENT DATA COLLECTION FORM FOR SELECTED PAVEMENT SITES

Concrete Pavement Survey - Requested Information

Long Term Performance Evaluation of Concrete Pavements

Purpose of Project: Analysis of the existing state, county and city route pavement records to determine what design characteristics, materials, and operational characteristics contributed to the long lasting performance of the concrete pavements that are still in operation.

General Available Information on Pavement Design & Performance

- Project location?
  - Mile post and traffic direction?
- Functional class (Interstate, primary, city street, etc.)?
- Type of concrete pavement (JPCP, JRCP, CRCP)?
- Design life of the pavement (years)?
- Base/subgrade construction date (month, day, year)?
- Pavement construction date (month, day, year)?
- Traffic opening date (month, day, year)?
- Number of traffic lanes in each direction?
- What pavement design procedure and which version (year) of it was used to design the pavement section (PCA, AASHTO, others – please specify)?
  - Level of reliability used in the design, R (%)?
  - Standard deviation, S_0?
- Resurfacing activities and dates since pavement construction?
- Is FWD or Road Rater testing available (Yes, No)?
- Of the pavements reported in this survey please rank this pavement in terms of performance (1 –best, to 6 – poorest performing).
- Current surface condition of the pavement (good, fair, poor)?
- Slab cracking?
  - Transverse (%)?
  - Longitudinal (%)?
  - Corner breaking (%)?
  - D-Cracking (low, moderate, high)?
- Patching; percent patched slabs (%), and performance of the patches (L, M, H)?
- Pavement roughness; IRI value and measurement year?
- Faulting (in.)?
- Occurrences of pumping and water bleeding?
- Other pavement distresses? (scaling, blowups, popouts, shoulder dropoff, etc.)?

Available Information on Soils Testing and Classification

- ☐ Subgrade
  - o AASHTO or Unified Soil Classification Group?
  - o Atterberg Limits (LL, PI)?
  - o Gradation analysis (percent passing ¾", 3/8", No. 4, …, No. 200, etc.)?
  - o Roadbed Resilient Modulus, M_R (psi)?
  - o CBR, DCP, R-Value?
  - o Strength results (unconfined compressive strength q_u, etc.) (psi)?
  - o Percent Proctor density, (%)?
  - o Maximum dry unit weight, $\gamma_{dry\text{-}max.}$ (pcf)?
  - o Optimum water content, ω_{opt} (%)?
  - o Specific gravity of solids, G_s?
  - o Saturated hydraulic conductivity, K (ft/hr)?
  - o Calculated degree of saturation, S (%)?
  - o QC/QA testing for the subgrade?
  - o Other available information?

- ☐ Subbase/Base
  - o Type of the subbase/base material (crushed stone, stabilized, none, etc.)?
  - o Layer thickness?
  - o Bonding with the PCC layer (bonded, unbonded)?
  - o AASHTO or Unified Soil Classification Group?
  - o Gradation analysis (percent passing ¾", 3/8", No. 4, etc.)?
  - o Resilient Modulus, M_R (psi)?
  - o CBR, DCP, R-Value?
  - o QC/QA testing for the subbase?
  - o Other available information?

Available Information on Portland Cement Concrete Layer

- ☐ Geometric Properties of the Layer
  - o Slab layer thickness, h_{PCC} (in.)?
  - o Pavement joint spacing (slab length), S (ft)?
  - o Slab width, W (ft)?
    - Widened slab width?
  - o Transverse joint angle (skewed or rectangular)?
  - o Pavement cross slope?
  - o Shoulder type and design?
    - PCC
    - AC
    - Granular base

    - Earth
  - Extended-widened shoulders?
  - Shoulder width (ft)?
  - Did shoulders have edge drains?
  - Shoulder cross slope?
  - Thicker edges? If yes, please provide the edge thickness (in.).
  - Load Transfer Mechanism (Dowels or Aggregate Interlock)?
  - If dowels were used:
    - Dowel bar diameter, D (in.)?
    - Dowel bar spacing (in.)?
  - Joint load transfer efficiency (LTE), deflection LTE (%):
    - Initial LTE (%)?
    - Present LTE (%)?
  - Joint design?
  - Saw cut depth and thickness (in.)?
  - Tie bar spacing and diameter (in.)?
  - Elasticity modulus of the concrete, E_{PCC} (psi)?
  - 28-day compressive strength of concrete, f'_c (psi)?
  - Modulus of rupture of concrete, M_R (psi)?
  - Density (unit weight) of concrete, γ_{PCC} (pcf)?
  - Coefficient of thermal expansion of concrete, α_{PCC}?
- ❑ Concrete Mix Design
  - What was the procedure used for mix design? (for example, ACI 211.1, a state specific procedure, past experience or another one)?
  - What were the typical values for the following mix design parameters?
    - w/c
    - Slump (in.)
    - Air content (%)
    - Water content (lb/cu.yd)
    - Cement content (lb/cu.yd)
    - Cement source (Lafarge, Holcim, Lehigh, other …….?)
    - Coarse aggregate (lb/cu.yd)
    - Maximum size of coarse aggregate (in.)
    - Fine aggregate (lb/cu.yd)
  - What combinations of cement type + SCM (supplementary cementitious materials) + chemical admixtures were most commonly used in your paving mixes? Please provide the types and dosages (for example, a Type I/II cement + Class F Fly Ash + Water Reducer).
  - What hardened concrete tests were required? Please cite name/number of specification/test procedure.
    - Resistance to freezing and thawing, and scaling?
    - Strength, what was the typical design strength?
    - Permeability?
    - Shrinkage – restrained or free?
    - Other?

- Has any fibers used in the PCC mix?
    - If so, which fiber type?
        - ☐ Steel
        - ☐ Polypropylene
        - ☐ Polyester
        - ☐ Polyolefin
        - ☐ Nylon
        - ☐ Carbon
        - ☐ Other (describe)
- Please rank the primary concerns about concrete durability in your city, county, district, state? (1 – not a concern, 2 – rarely a concern, 3 – sometimes, 4 – often, 5 - always)
        - ☐ Freeze-thaw resistance / Scaling resistance
        - ☐ DEF susceptibility
        - ☐ ASR susceptibility
        - ☐ Chemical attack
        - ☐ Abrasion resistance
        - ☐ Fatigue cracking
        - ☐ Other (describe)

☐ QC/QA
- What concrete tests were required?
    - Air?
    - Slump?
    - Strength?
        - Maturity?
        - Beams? Center point or third point?
        - Compression?
        - Split tensile?
    - Other? (describe)

☐ Other available information?

Available Information on Traffic

- Design ESALs (initial design value)?
- ESALs per year (presently)?
- $(ADT)_0$ – Average daily traffic at the start of the design period?
- Average daily traffic (ADT)?
- $(ADTT)_0$ – Average daily truck traffic at the start of the design period?
- Average daily truck traffic (ADTT)?
- Percentage of truck traffic in design lane (%)?
- Truck factor?
- Annual traffic growth rate, G (%)?
- How detailed is the traffic data?
    - Hourly, daily, monthly?

    - Single axles, tandem axles, or just ESALs?
    - FHWA vehicle class types, number of axles per truck, etc.?
  - Other available information?

Available Information on Climate

- Average Freeze – Thaw cycles per year?
- No of days that the air temperature is below 32 °F in a year?
- No of days that the air temperature is above 90 °F in a year?
- Number of wet days in a year?
- Average depth of water table?
- Other available information?
- Latitude (°), Longitude (°), and Elevation (ft)?

APPENDIX D: PCC PAVEMENT PERFORMANCE DATA GATHERED FROM IOWA COUNTY AND CITY ROADS

Concrete Pavement Survey - County Data
29 of 99 Counties Responding
112 pavements reported (47 = good, 40 = fair, 25 = poor)

Notes: NR = no response, SC = see comments
Long Term Performance Evaluation of Concrete Pavements

County	County Number	Total No of Responses	Response Number	Performance - good (1-2), fair (3-4) poor(5-6)	Of the pavements reported in this survey please rank this pavement in terms of performance (1 -best, to 6 -poorest performing).	Pavement age (years)	Type of concrete pavement (doweled or no dowels)	Pavement width (feet)	Pavement depth (inches)	Base type (granular, stablized, none)	Pavement joint spacing (feet)	Transverse joint angle (skewed, rectangular)	Shoulder surface type (ACC, PCC, granular, earth)	Number of traffic lanes in each direction	Current traffic volume (ADT)	Percent trucks	Current surface condition of the pavement (good, fair, poor)	Are material and pavement construction records available (yes, no)
					1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Allamakee	3	6	1	good	1	21	no dowels	22	9	granular	20	skew	granular	1	430	15	good	yes
Allamakee	3		2	good	2	22	no dowels	22	8	SC	18	skew	granular	1	710	10	good	yes
Allamakee	3		3	fair	3	17	no dowels	22	6	SC	15	skew	granular	1	SC	5	fair	NR
Allamakee	3		4	fair	4	25	no dowels	22	7	granular	40	skew	granular	1	280	10	fair	yes
Allamakee	3		5	poor	5	12	no dowels	22	6	SC	15	skew	granular	1	SC	7	fair	yes
Allamakee	3		6	poor	6	19	no dowels	22	6	SC	15	skew	granular	1	SC	10	poor	yes
Boone	8	4	1	good	1	23	no dowels	22	7	granular	15	skew	earth	1	SC	15	good	yes
Boone	8		2	good	2	21	no dowels	22	7	ACC	15	skew	earth	1	SC	15	good	NR
Boone	8		3	fair	4	29	no dowels	24	7	granular (SC)	40	rect	earth	1	630	15	fair	yes
Boone	8		4	poor	5	14	no dowels	22	7	PCC	15	skew	earth	1	3000	30	poor	yes
Buchanan	10	6	1	good	1	34	no dowels	22	6	none	40	rect	granular	1	470	NR	good	yes
Buchanan	10		2	good	2	33	no dowels	22	6	none	40	rect	granular	1	SC	NR	good (SC)	yes
Buchanan	10		3	fair	3	31	no dowels	22	6	none	40	rect	granular	1	880	NR	good	yes
Buchanan	10		4	fair	4	31	no dowels	22	6	none	40	rect	granular	1	SC	NR	poor	yes
Buchanan	10		5	poor	5	29	no dowels	22	6	none	40	rect	granular	1	550	NR	poor	yes
Buchanan	10		6	poor	6	16	no dowels	22	6	none	15	skew	granular	1	740	NR	poor (SC)	yes
Cass	15	2	1	good	1	22	no dowels	22	6	none	35	skew	earth	1	150	5	good	yes
Cass	15		2	good	2	25	no dowels	22	6	none	40	rect	earth	1	120	5	fair	yes
Chickasaw	19	6	4	good	1	32	no dowels (SC)	22	6	none	40	rect	granular	1	550	10	fair	yes
Chickasaw	19		1	good	1	20	no dowels (SC)	22	6	ACC	20	rect	granular	1	SC	NR	very good	yes
Chickasaw	19		5	good	2	32	no dowels (SC)	22	6	none	40	rect	earth	1	670	10	fair	yes
Chickasaw	19		2	good	2	17	no dowels (SC)	SC	6	SC	20	rect	granular	1	SC	NR	good	yes
Chickasaw	19		6	fair	3	25	no dowels (SC)	22	6	none	20	rect	granular	1	450	5	fair	yes
Chickasaw	19		3	fair	3	21	no dowels (SC)	20	6	ACC	20	rect	granular	1	SC	NR	good	yes
Clarke	20	2	2	fair	3	23	doweled	22	6	none	NR	rect	granular	1	SC	10	good	no
Clarke	20		1	fair	4	34	doweled	22	6	none	40	rect	granular	1	SC	10	good	no
Clay	21	4	1	good	1	30	doweled	22	SC	none	20	rect	earth	1	SC	15	good	yes
Clay	21		2	good	2	24	doweled	22	6	none	20	rect	earth	1	260	10	poor	yes
Clay	21		3	fair	3	2	doweled	24	8	none	20	skew	earth	1	1500	20	good	yes
Clay	21		4	fair	4	29	doweled	22	6	none	20	rect	earth	1	210	10	poor	yes
Clayton	22	6	3	good	2	15	doweled	22	7	granular	15	skew	granular	1	440	5	good	yes
Clayton	22		5	fair	3	23	doweled	24	7	granular	15	skew	granular	1	950	10	good	yes
Clayton	22		4	fair	3	19	doweled	24	7	granular	15	skew	granular	1	620	8	good	yes
Clayton	22		2	fair	4	26	doweled	22	7	granular	15	skew	granular	1	350	8	good	yes
Clayton	22		6	fair	4	24	doweled	22	7	granular	15	skew	granular	1	330	9	good	yes
Clayton	22		1	fair	4	15	doweled	22	7	granular	15	skew	granular	1	560	12	good	yes
Clinton	23	3	3	good	2	30	no dowels	22	6	none	20	rect	granular	1	780	9	fair	yes
Clinton	23		1	good	2	20	no dowels	22	7	none	20	rect	granular	1	990	9	good	yes
Clinton	23		2	fair	3	29	no dowels	22	6	none	20	rect	granular	1	700	9	fair	yes
Crawford	24	1	1	poor	6	44	no dowels	20	7	granular (SC)	20	rect	granular	1	SC	NR	poor (SC)	yes
Dallas	25	2	1	good	1	15	no dowels (SC)	22	5	SC	15	skew	granular	1	SC	8	good (SC)	yes
Dallas	25		2	poor	6	11	no dowels (SC)	22	5	SC	15	skew	granular	1	1100	8	poor (SC)	yes
Davis	26	0		SC														
Fremont	36	3	3	good	1	29	no dowels	24	8	none	20	rect	granular	1	1030	NR	good	no
Fremont	36		2	good	2	31	no dowels	22	7	none	20	rect	granular	1	230	NR	good	no
Fremont	36		1	fair	3	31	no dowels	22	8	none	20	rect	granular	1	1980	NR	good	no
Grundy	38	2	1	good	1	9	doweled	22	6	stabilized	15	skew	granular	1	680	15	good	yes
Grundy	38		2	good	2	26	doweled	22	6	stabilized	40	rect	granular	1	SC	15	fair	yes
Hamilton	40	3	3	fair	3	31	doweled	22	6	granular (SC)	20	rect	granular	1	SC	10	good	yes
Hamilton	40		1	fair	3	24	doweled	22	6	granular (SC)	20	rect	granular	1	SC	10	good	yes
Hamilton	40		2	fair	4	23	doweled	22	6	granular (SC)	20	rect	granular	1	SC	10	good	yes
Hancock	41	6	1	good	1	11	doweled	22	5	granular	15	skew	granular	1	200	NR	good	yes
Hancock	41		2	good	2	26	doweled	22	6	NR	20	rect	granular	1	350	NR	good	yes
Hancock	41		3	fair	3	26	doweled	22	6	none	20	rect	granular	1	280	NR	good	yes
Hancock	41		4	fair	4	28	NR	22	6	none	15	rect	granular	2	200	NR	good	yes
Hancock	41		5	poor	5	27	doweled	22	6	none	20	rect	granular	1	190	NR	good	yes
Hancock	41		6	poor	6	13	doweled	22	11	none	15	skew	granular	1	1100	15	poor	yes
Linn	57	6	1	good	1	20	no dowels (SC)	24	7	stabilized (SC)	20	skew	granular	1	4830	6	good	yes
Linn	57		2	good	2	22	no dowels (SC)	24	7	none	20	skew	granular	1	3660	7	good	yes
Linn	57		3	fair	3	20	no dowels (SC)	22	6	none	20	skew	granular	1	1000	8	good	yes
Linn	57		4	fair	4	22	no dowels (SC)	24	6	none	20	skew	granular	1	1810	5	good	yes
Linn	57		5	poor	5	22	no dowels (SC)	22	6	none	20	skew	granular	1	600	6	good/fair	yes
Linn	57		6	poor	6	24	no dowels (SC)	24	6	none	20	skew	granular	1	1210	8	good/fair	yes

Marion	63	6	1	good	1	42	no dowels	22	7	none	NR	rect	granular	1	900	NR	good	unknown
Marion	63		2	good	2	24	no dowels	22	7	none	NR	rect	granular	1	440	NR	good	unknown
Marion	63		3	fair	3	26	no dowels	22	8	none	NR	rect	granular	1	SC	NR	good	unknown
Marion	63		4	fair	4	38	no dowels	22	7	none	NR	rect	granular	1	450	NR	poor	unknown
Marion	63		5	poor	5	35	no dowels	22	7	none	NR	rect	granular	1	700	NR	SC	unknown
Marion	63		6	poor	6	37	no dowels	22	7	none	NR	rect	granular	1	NR	NR	SC	unknown
O'brien	71	6	1	good	1	24	no dowels	22	7	none	20	rect	earth	1	400	NR	good	yes
O'brien	71		2	good	2	24	no dowels	22	7	none	20	rect	earth	1	750	NR	good	yes
O'brien	71		3	fair	3	31	no dowels	22	6	none	20	rect	earth	1	SC	NR	good	NR
O'brien	71		4	fair	4	31	no dowels	22	6	none	20	rect	earth	1	SC	NR	good	yes
O'brien	71		5	poor	5	23	no dowels	22	6	none	20	skew	earth	1	200	NR	fair	yes
O'brien	71		6	poor	6	43	no dowels	22	6	none	30	rect	earth	1	SC	NR	poor	yes
Osceola	72	2	1	good	1	22	no dowels	22	6	none	20	skew	earth	1	345	NR	good	yes
Osceola	72		2	good	2	26	no dowels	22	6	none	20	skew	earth	1	785	NR	fair	yes
Page	73	2	1	good	1	40	no dowels (SC)	20	6	none	40	rect	granular/earth	1	SC	10	fair	yes
Page	73		2	poor	6	39	no dowels (SC)	20	6	none	40	rect	earth	1	SC	10	poor	yes
Pocahontas	76	6	1	good	1	23	no dowels (SC)	22	6	granular	40	rect	earth	1	170	NR	very good	unknown
Pocahontas	76		2	good	2	44	no dowels (SC)	21	6	granular	40	rect	granular/earth	1	230	NR	good	unknown
Pocahontas	76		3	fair	3	33	no dowels (SC)	22	6	granular	40	rect	granular/earth	1	230	NR	good	unknown
Pocahontas	76		4	fair	4	15	no dowels (SC)	22	7	granular	40	rect	granular/earth	1	200	NR	very good	unknown
Pocahontas	76		5	poor	5	20	no dowels (SC)	22	8	granular	40	rect	granular	1	240	NR	good	yes
Pocahontas	76		6	poor	6	11	no dowels (SC)	22	7	granular	40	rect	granular/earth	1	SC	NR	fair	yes
Pottawattamie	78	4	3	good	1	unknown	NR	NR	NR	NR	20	rect	granular	2	NR	NR	good	no
Pottawattamie	78		1	good	1	28	no dowels	SC	7	none	20	rect	granular	2	NR	NR	good	yes
Pottawattamie	78		2	good	1	18	no dowels	31	7	none	15	rect	granular/earth	1	900	5	good	yes
Pottawattamie	78		4	poor	5	14	no dowels	22	6	ACC	20	rect	granular	1	380	30	poor	yes
Sac	81	3	3	good	1	26	no dowels (SC)	22	6	none	40	rect	earth	1	90	SC	fair	yes
Sac	81		2	good	2	23	no dowels (SC)	22	7	none	20	rect	earth	1	350	3	fair	yes
Sac	81		1	fair	3	24	no dowels (SC)	22	6	none	20	rect	earth	1	170	3	fair	yes
Sioux	84	2	1	fair	3	28	no dowels	22	6	granular (SC)	SC	rect	earth	1	930	10	good (SC)	yes
Sioux	84		2	fair	3	28	no dowels	22	6	granular (SC)	40	rect	earth	1	430	5	good (SC)	yes
Story	85	6	1	good	1	24	no dowels	22	7.5	none	15	skew	granular	1	SC	7	good	yes
Story	85		2	good	2	18	no dowels	22	7	none	15	skew	granular	1	SC	7	good	yes
Story	85		3	fair	3	20	no dowels	22	7	none	15	skew	granular	1	SC	7	good	yes
Story	85		4	fair	4	38	no dowels	22	6	none	40	rect	granular	1	670	7	poor	yes
Story	85		5	poor	5	32	no dowels	24	8	NR	NR	NR	granular	1	1650	7	poor	yes
Story	85		6	poor	6	36	no dowels	22	6	none	20	rect	granular	1	560	7	poor	yes
Union	88	1	1	good	1	24	no dowels	22	7	none	20	skew	granular	1	SC	10	good	yes
Warren	91	6	1	good	1	26	no dowels	22	6	none	40	rect	granular/earth	1	SC	NR	good	yes
Warren	91		2	good	2	22.5	no dowels	22	6	none	40	rect	granular/earth	1	SC	NR	good	yes
Warren	91		3	fair	3	38	no dowels	22	7	none	40	rect	granular/earth	1	SC	NR	good	yes
Warren	91		4	fair	4	19	no dowels	22	6.75	none	20	skew	granular/earth	1	SC	NR	poor	yes
Warren	91		5	poor	5	9	no dowels	22	7.75	none	15	skew	granular/earth	1	1940	NR	poor	yes
Warren	91		6	poor	6	17	no dowels	22	6.75	none	15	skew	granular/earth	1	SC	NR	poor	yes
Woodbury	97	6	1	good	1	21	no dowels	22	6	SC	15	rect	earth	1	SC	10	good	yes
Woodbury	97		4	good	2	14	no dowels	24	9	none	12	skew	earth	1	2200	8	good	yes
Woodbury	97		3	fair	3	20	no dowels	22	7	none	14	rect	earth	1	SC	10	good	yes
Woodbury	97		6	fair	4	24	no dowels	22	8	none	20	skew	earth	1	370	20	good	yes
Woodbury	97		2	poor	5	20	no dowels	22	7	none	14	rect	earth	1	SC	10	good	yes
Woodbury	97		5	poor	6	24	no dowels	22	7	none	20	skew	earth	1	SC	10	fair	yes

Geographical project location (route and termini)	General Comments
Beginning at the int. of State Hwy 76 and A44, easterly 1.75 miles to state Hwy 9	
Beginning at the int. of X42 and X52 on the south side of Lansing running southeasterly on X52 1.981 miles	Unbonded concrete
Beginning at X52 just south of the Power Plant running south 4.7 miles to the int of X52 and Wexford Hollow Drive	
Beginning at the int. of State Hwy 9 and X20 running north of X20 6.00 miles	
Beginning at the Winneshiek County line on A52 running east 5.9 miles to the intersection of State Hwy 76 in Waukon	Unbonded concrete
Beginning at the east edge of Waukon running east on A52 12.6 miles to the int. of X42	cement was used.
R38 from Old US 30 to E18	New grade laid fro 2 years prior to paving
E18 from R27 to Mackey	Unbonded PCC over ACC
E57 from US 169 to R18	US Hwy 30 traffic has been rerouted on this road 3 times (Saylorville over #30)
Industrial Road (Boone to E41)	Fast track project - PCC over PCC with slurry seal for bond breaker
D47 - Rowley to W35	
D16 from V62 to W13	
W13 from 175th St. to 190th St	
V62 from D16 to IA 281	
C66 from Blackhawk County line to V62	Aggregate deterioration, D-cracking
Fairbank Amish Blvd from IA 281 to D16	
Int. of M56 and US6 North 6 miles to the int. of M56 and G30	
Int. of N28 and G35 east 6.5 miles to the int. of G35 and Hwy 148	
B44: from V56 west to Fayette County line	
V56 from Iowa Hwy 24 running south to int of B54; and V56 from US hwy 18 to Bremer County line	
V48: from Iowa Hwy 24 south to B54	
V18: beginning at Howard Co. line running south to south corporate limits of Alta Vista	
V14: from IA Hwy 346 south to Bremer county line	
V18 from south corporate limits of Alta Vista to int of US Hwy 18	
Green Bay and Franklin Twp., Weldon east on Clarke - Decatur Co. line 7.5 miles, J12	Weldon 1981 Paving
Troy Twp. Hwy 34 South 5 miles R-15	Murray 1970 Paving
From int. of M44 and 340th St. west 2 miles then north 2 miles to int. of Hwy 18	
B17 from Jct N18 east 1 mile	
from int. of B24 north 3 miles then west 2 miles to jct. of Hwy 18 and 71 (on M50)	Poor smoothness
on 150th Ave. between B40 and B53, 4 miles	
X47 (incomplete description)	
X56 (incomplete description)	
C9Y (incomplete description)	
B60 (incomplete description)	
C24 (incomplete description)	
C7X (incomplete description)	
Y34 between City of Lost Nation and 180th St.	
Y46 from E63 to Hwy 136	
Z50 between E50 and Hwy 136	On 5 year program for rehabilitation in 2007. Edge drains were installed in 1998
E16 from SW cor 13-85-41 east to U.S. 59	
P46 from Redfield City Limits north to State Highway 141 south of Dawson	Overlay
R16 from State Hwy 6 north to Dallas Center city limits	Overlay. Research Board project Number HR-341
	Davis County has no active PCC pavements that meet criteria (See letter on file).
J24 Thurman to I-29	
L63 from J18 north to county line (2 miles)	
Local Rd - Airport Rd - Hwy 59 west to Shen Airport	
T65 from IA 175 north to D35	
T55 from IA 175 south to county line (2.5 miles)	
240th St. between R21 and R27	
D20 between R33 and R38	
R27 between D46 and D56	
R56, from B55 to B36	5" overlay
B36, from R68 to R70	
R70 from B36 to US18	
Along route 66, from B63 to B55	
B-30, from R44 to US69	
R35 from City of Brtt to Kanowha	PCC overlay/widening
E36 from Shellsburg Road then east 3 miles to NE 28-84-8	Class C mix
E36 from Palo then west 1.5 miles to Benton County line	Type III cement, Class C mix
Power Plant Road from W36 then east 0.5 miles to N 1/4 of 16-84-8	Class B mix
W36 from Palo then north 2.7 miles to NE 8-84-8	Class B mix
E16 from X20 to Jones County line (3 miles)	Class B mix
W45 from E16 then north 6 miles to D62	Class B mix

T23 from Hwy 5 to G71	
T25 from old Hwy 92 to new Hwy 92	
T17 from Hwy 92 to T15	
G76 from Hwy 14 to S65	
G28 from Hwy 14 to T15	Overlayed with asphalt in 2002.
S45 from G76 to Lucas County line	Overlayed with asphalt in 2003.
Washington St., Sheldon Monroe Ave from Sheldon City limit to Highway 60	Hard copy file contains more detailed information on pavment.
B20 (330th St.) from Monroe Ave. to Nettle Ave (2 miles)	Hard copy file contains more detailed information on pavment.
B62 from L54 to M12	Hard copy file contains more detailed information on pavment.
M12 from Hwy 10 to Cherokee County line	Hard copy file contains more detailed information on pavment.
B62 from L48 to Sorrell Ave. (4.5 miles)	Hard copy file contains more detailed information on pavment.
B14 from Sioux County line to L40 (7 miles)	contains more detailed information on pavment. Segment is scheduled for patching
A48 from Melvin east 4 miles to L58	
A22 from Hwy 59 east 5.5 miles to L58	
J20 from Hwy48 east 6 miles	
J52 from Coin west to the Fremont County line	
D11 on Calhoun County Line, N41 & west	
C29 from N28 east to Ware (<5 miles)	
N41 Calhoun County Line/D11 north to C56 (5 miles)	
P19 from C66 south 2 miles to Calhoun County	
Quarry Rd. from IA 3, Northwesterly 1.4 miles to P15	
N65 from IA 15 north to C15 (4+ miles)	
L52 at Underwood Interstate 80 interchange east side - south of G30 going to McClelland	
Highway 92 - South Frontage Rd., STA 107+39.5 to STA 130+31.7 (incomplete description)	
Wooland Trail from US Hwy 275 to Dumfries Ave.	
M16 from L66 to Hancock	Ettringite problem is very severe at this location. PCC overlay over asphalt
D46 from Jct. M54 east 3.0 miles to IA 196	
D54 from the Jct. of M54 east 3.0 miles to US Hwy 71	
D37 from Jct of M43 east 5.0 miles to US Hwy 71	
K52: Beginning at the int. of 370th St. (B30) and Hickory Ave (K52) then north 5 miles to State Hwy #18 at Hull, IA	
B14: Beginning near Rock Valley on 305th St. to Fillmore Ave. to 300th St. to the int. of 300th St. and Garfield Ave. (K42)	
R38 from Lincoln Way north to E18	
E23 from Hwy 65 east to Marshall County, just south of Zearing	
Cameron School Rd from Boone County line to George Washington Carver, north edge of Ames	
S27 from Polk County line to Hwy 210, near Maxwell	
Lincoln Way east of Nevada under Railroad underpass ??	Scheduled to be removed/replaced in Spring 2004
R77 from E29 north to Roland	
North Cherry Street (P33) from H17 north to Adair County line (3 miles long)	Other possible pavements available for research (See letter on file)
S23 from Lacona to G58	
R57 from Spring Hill to G24	
G16 from US 65/69 to Iowa Hwy 5	
R45 from G14 to Polk County line	
R63 from Iowa 92 to G24	
G24 from US 65/69 to 150th Ave.	
D38 from South Lakeport to D25(formerly IA 982)	
K29 from intersection of Southern Hills Dr. to K45	
County Home Road	
Port Neal Circle from K25 to K25	
D50 from L27 to Ida County line	
D51 from K42 to D25 (Formerly IA 982)	

Comments - 1	Comments - 2	Comments - 3	Comments - 4	Comments - 5	Comments - 6
					4" soil & aggregate subbase, 8" rolled stone base, 2.5" Type B ACC Base
					4" soil & aggregate subbase, 8" rolled stone base, 2.5" Type B ACC Base
					7" old PCC
					4" soil & aggregate subbase, 6" rolled stone base, 4.5" ACC Base
					River rock
		Center line bars only			
		Center line bars only			ACC
		Center line bars only			
		Center line bars only	22 and 56		granular in Alta Vista; ACC in rural areas
		Center line bars only			
		Center line bars only			ACC
				Pavement depth 6" east/west, 7" north/south	
					Pavement was placed over existing gravel road
		CL tie bars			4.5" ACC over 6" granular base
		CL tie bars			5.5" ACC over granular base
					6" graded stone base
					6" graded stone base
					6" graded stone base
		CL tie bars			4" soil/cement base
		CL tie bars			
		CL tie bars			
		CL tie bars			
		CL tie bars			
		CL tie bars			

again in 2004.					
		1/2" diameter x 3 ft dowel bars, CL @ 4' ctrs			
		1/2" diameter x 3 ft dowel bars, CL @ 4' ctrs			
		CL tie bars			
		CL tie bars			
		CL tie bars			
		CL tie bars			
		CL tie bars			
		CL tie bars			
			19 to 22.5		
		1/2" diameter x 3 ft rebars, CL @ 4' ctrs			
		1/2" diameter x 3 ft rebars, CL @ 4' ctrs			
		1/2" diameter x 3 ft rebars, CL @ 4' ctrs			
					natural grvl. subgrade w/ plastic barrier between pvmt and subgrade
					natural grvl. subgrade w/ plastic barrier between pvmt and subgrade
					Concrete Overlay

Comments - 7	Comments - 8	Comments - 9	Comments - 10	Comments - 11	Comments - 12	Comments - 13	Comments - 14
				ADT 400 - 560			
				ADT 390 - 1600			
				ADT 650 - 1750			
				ADT 710 - 2400			
				ADT 510 - 850			
				ADT 730- 1050		Some joint faulting	
				ADT 1100 - 1900			
						joint faulting, poor ride quality	
				ADT 1180 - 1290			
				ADT 840 - 870			
				ADT 840 - 1050			
				ADT 260 - 340			
				ADT 290 - 490			
	ADT is 330 on north end and 1550 on east end						
				ADT 670 - 1330		A 3 3/4" HMA overlay placed over pavement in 1997, reflective cracking	
				ADT 500 - 900		Minor cracking	
						longitudinal cracking, pop outs, spalling	
				ADT 410 - 650			
				ADT 260 - 360			
				ADT 350 - 480			
				ADT 400 - 410			

				ADT 1000 - 1800			
						Surface was in poor condition before asphalt overlay in 2002.	
						Surface was in poor condition before asphalt overlay in 2003.	
				ADT 140 - 200			
				ADT 200 - 310			
				ADT 220 - 490			
				ADT 560 - 720			
				ADT 260 - 390			
				ADT 240 - 340			
					Heavily travelled by trucks due to local gravel pit in area.		
40 ft on 4 miles and 20 feet on 1 mile						Good surface condition after extensive patching. Patching within last 3 yrs.	
						Good surface condition after extensive patching. Patching within last 3 yrs.	
				ADT 700 - 2200			
				ADT 110 - 220			
				ADT 1520 - 2310			
				ADT 1510 - 1730			
				ADT 950 - 1150			
				ADT 1000 - 1200			
				ADT 1190 - 1470			
				ADT 600 - 740			
				ADT 450 - 830			
				ADT 1200 - 1600			
				ADT 100 - 130			
				ADT 140 - 240			
				ADT 230 - 350			

Concrete Pavement Survey - City Data
7 Cities Responding
36 pavements reported (15 = good, 13 = fair, 8 = poor)

Notes: NR = no response, SC = see comments
Long Term Performance Evaluation of Concrete Pavements

City	Total No of Responses	Response Number	Performance - good (1-2), fair (3-4) poor(5-6)	Of the pavements reported in this survey please rank this pavement in terms of performance (1 - best, to 6 -poorest performing).	Pavement age (years)	Type of concrete pavement (doweled or no dowels)	Pavement width (feet)	Pavement depth (inches)	Base type (granular, stablized, none)	Pavement joint spacing (feet)	Transverse joint angle (skewed, rectangular)
				1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Ankeny	6	1	1	good	33	doweled	41	8	stabilized (SC)	20	rect
Ankeny		2	2	good	43	no dowels	35	8	stabilized (SC)	15	rect
Ankeny		3	3	fair	39	no dowels	31	6	stabilized (SC)	15	rect
Ankeny		4	4	fair	11	doweled	60	10	granular (SC)	20	rect
Ankeny		5	5	poor	13	no dowels	29	7	stabilized (SC)	15	rect
Ankeny		6	6	poor	NR	no dowels	29	7	stabilized (SC)	13	rect
Bettendorf	6	1	good	1	50	no dowels	27	6	none	20	rect
Bettendorf		2	good	2	50	no dowels	27	6	none	20	rect
Bettendorf		3	fair	3	20	no dowels	31	6	none	15	rect
Bettendorf		4	fair	4	15	no dowels	31	6	none	15	rect
Bettendorf		5	poor	5	12	no dowels	31	6	none	15	rect
Bettendorf		6	poor	6	23	no dowels	27	6	none	15	rect
Burlington	3	1	good	1	16	no dowels	28	8	none	15	skew
Burlington		2	good	2	8	no dowels	24	6	granular	15	skew
Burlington		3	fair	3	13	unknown	28	6	unknown	20	rect
Coralville	6	4	good	2	24	unknown	31	6	none	SC	rect
Coralville		5	fair	3	30	unknown	29	6	none	SC	rect
Coralville		6	fair	3	30	unknown	31	6	none	SC	rect
Coralville		1	fair	4	4	no dowels (SC)	29	7	stabilized (SC)	SC	rect
Coralville		2	fair	4	8	no dowels (SC)	29	6	stabilized (SC)	SC	rect
Coralville		3	poor	5	12	no dowels (SC)	SC	6	stabilized (SC)	SC	rect
Council Bluffs	6	1	good	1	30	no	24	6	none	unknown	rect
Council Bluffs		2	good	1	29	no	24	8	granular	20	rect
Council Bluffs		3	good	1	29	no	24	8	none	20	rect
Council Bluffs		4	poor	5	5	no	28	8	granular	15	rect
Council Bluffs		5	poor	5	4	no	32	8	granular	15	rect
Council Bluffs		6	poor	5	5	no	25	7	granular	15	rect
Grinnell	6	1	good	1	34	no dowels (SC)	34	10	none	20	rect
Grinnell		2	good	1	27	no dowels (SC)	31	6	none	15	rect
Grinnell		3	good	2	39	no dowels (SC)	37	8	none	15	rect
Grinnell		4	fair	4	37	no dowels (SC)	33	6	none	15	rect
Grinnell		5	fair	4	34	no dowels (SC)	28	6	none	15	rect
Grinnell		6	fair	4	30	no dowels (SC)	28	6	none	20	rect
Webster City	3	1	good	1	31	no dowels (SC)	53	8	none	20	rect
Webster City		2	good	2	28	no dowels (SC)	31	7	none	20	skew
Webster City		3	fair	3	26	no dowels	34	7	none	NR	NR

Shoulder surface type (ACC, PCC, granular, earth)	Number of traffic lanes in each direction	Current traffic volume (ADT)	Percent trucks	Current surface condition of the pavement (good, fair, poor)	Are material and pavement construction records available (yes, no)	Geographical project location (route and termini)
9	**10**	**11**	**12**	**13**	**14**	
earth	2	11875	5	fair/good	unknown (SC	W. 1st St. from State St. to Linden St.
earth	1	NR	1	good	no (SC)	SW. Cherry St. from SW 4th St. to SW Ordnance road
earth	1	NR	2	fair/good	no (SC)	SW 3rd St. from SW Flynn St. to SW Kunes
granular	2	10625	10	fair/poor	unknown (SC	SE Oralabor Rd. from Ramps on E side of I-35 to SE Creekview Dr.
earth	1	NR	1	fair/poor	unknown (SC	NE 10th St. from 186' E of NE Trilen Dr. to NE Lakeview Dr.
earth	1	NR	0	fair/poor	unknown (SC	NE 24th Ct. from NE Delaware Ave. to Termination Cul-de-Sac
earth	1	NR	NR	good	no	Hall St. from 8th St. to 10th St.
earth	1	NR	NR	good	no	Jones St. from 8th St. to 10th St.
earth	1	NR	NR	good	yes	Pepperwood from Crow Creek to Charter Oaks
earth	1	NR	NR	poor	yes	Halcyon Drive from Hollow View to Hartford Dr.
earth	1	NR	NR	poor	yes	Remington Road from Century Heights Ave. to 53rd St.
earth	1	NR	NR	poor	yes	Oakory Lane from Devils Glen to east of cul de sac
earth	1	NR	NR	fair	yes	West Ave., Gear Ave. east 3000 LF
granular	1	NR	NR	fair	yes	W. Burlington Ave., Mt. Pleasant St. to Plank Road
earth	1	NR	NR	poor	yes	Crystal Drive, Florence Ave. to the Cul-de-Sac
earth	1	6150	35	good	no	Holiday Road (1st Ave. to 12th Ave.)
earth	1	200	2	good	no	18th Ave. (5th St. to 19th Ave.)
earth	1	800	SC	good	no	8th Street (12th Ave.to 19th Ave.)
earth	1	SC	4	poor	yes	Forest Hills Drive (Oak Grove SD, east 300' off of Timber Lane
earth	1	SC	SC	poor	yes	Highland Park Ave. (Highland Park SD, Brown Deer Rd. to Forest Hill Dr.)
earth	1	SC	SC	poor	yes	Mesquite Dr/Muddy Creek Lane (Altanna Estates Pt 3)
earth	1	2800	NR	good	yes	Big Lake Road from N 8th St to Hwy 192
granular	1	11700	NR	good	yes	23rd Ave. from south 16th St. to south 24th St.
granular	1	3000	NR	good	yes	South 16th St. from 16th Ave. to 23rd Ave.
earth	1	500	NR	good	yes	Lew Ross Road from south 11 St. to south 15th St.
earth	1	2500	NR	good	yes	2nd Ave. from south 8th St. to south 13th St.
earth	1	2900	NR	good	yes	5th Ave. from south 26th St. to south 35th St.
granular	1	1250	50	good	no	Industrial Avenue
earth	1	420	10	good	no	State St. from 4th Ave. to 5th Ave.
earth	1	780	25	good	no	Washington Avenue from East St. to West St.
earth	1	1750	30	good	no	11th Avenue from Sunset St. to West St.
earth	1	350	5	poor	no	14th Avenue from Spencer St. to Sunset St.
earth	1	330	5	poor	no	Marvin Ave. from Park St. to West St.
earth	2	11700	SC	good (SC)	NR	Superior Street from Second Street to Edgewood Drive
earth	1	6200	SC	good (SC)	NR	Beach Street from Second Street to Ohio Street
earth	1	5300	SC	good	NR	Ohio Street from Superior Street to Beach Street

General Comments	Comments - 1	Comments - 2	Comments - 3	Comments - 4
Solid pavement, but a lot of cracking			#5 bars, 30" long @ 30" on center (longitudinal)	
			#5 bars, 30" long @ 30" on center (longitudinal)	
			#5 bars, 30" long @ 30" on center (longitudinal)	sides
			1/2" diameter, 30" long @ 30" on center (longitudinal)	
			1/2" diameter, 30" long @ 30" on center (longitudinal)	
			1/2" diameter, 30" long @ 30" on center (longitudinal)	
Good surface, but a lot of replacement has been done.			1/2" diameter, 30" long @ 30" on center (longitudinal)	
			1/2" diameter, 30" long @ 30" on center (longitudinal)	
			#5 bars, 30" long @ 30" on center (longitudinal)	
file.			#5 bars, 36" long @ 30" on center (longitudinal)	
file. RH - 22 pavement type.			CL tie bars	
file.				

Comments - 5	Comments - 6	Comments - 7	Comments - 8	Comments - 9	Comments - 10
	Prepared soil subgrade				
	Prepared soil subgrade				
	Prepared soil subgrade				
	6" RAP subbase				
	Prepared soil subgrade				
	Prepared soil subgrade				
		10.3' longitudinal and 15' transverse			
		Longitudinal spacing 9.5', 10.0', 9.5' and 15.0' transverse			
		10.3' longitudinal and 15' transverse			
	Subgrade scarified to a depth of 6" and compacted to 90% modified proctor	9.67' longitudinal and 15' transverse			
	Subgrade scarified to a depth of 6" and compacted to 90% modified proctor	9.67' longitudinal and 15' transverse			
	Subgrade scarified to a depth of 6" and compacted to 90% modified proctor	12.5' longitudinal w/ 2' curb/gutter joint and 15' transversely.			

Comments - 11	Comments - 12	Comments - 13	Comments - 14
			V & K may have records
			plans and specifications only
			plans and specifications only
			Snyder and Assoc. may have records
			Eng. Consultants may have plans
			Snyder and Assoc. may have records
	2% Truck, 5% School buses		
ADT 50 - 200			
ADT 50 - 200	5 - 10% Trucks		
ADT 50 - 200	0 - 3% Trucks		
	Heavy Truck Traffic (See letter on file)	Good surface condition; partial depth patching done in 2002 by DENCO.	
	Some truck traffic (see letter on file)	Good surface condition. Some full depth patching was done in 2002.	
	Not a designated truck route.		

APPENDIX E: DETAILED PCC PAVEMENT PERFORMANCE DATA GATHERED FROM THE VISITED SITES (COUNTY AND CITY ROADS)

				Webster City - 1	Webster City - 2	Webster City - 3
General Information on Pavement Design		Project location	**1**	Superior St. - 2nd St. to Edgewood Drive	Beach St. from Ohio St. to 2nd St. (Old US 20)	Ohio St. from Superior St. to Beach St.
		Project number	**2**	UN-17-3-(9)--41-40	M-6008(809)--81-40	M-6880(1)--81-40
		Project length (mi)	**3**		0.733	0.979
		Mile post and traffic direction	**4**	unknown		
		Functional class (Interstate, primary, city street, etc.)	**5**	city street	city street	city street
		Type of concrete pavement (JPCP, JRCP, CRCP)	**6**	JPCP	JPCP	JPCP
		Design life of the pavement (years)	**7**	20	20	20
		Base/subgrade construction date (month, day, year)	**8**		1976	
		Pavement construction date (month, day, year)	**10**	1973	1976	1978
		Traffic opening date (month, day, year)	**12**		1976	
		Number of traffic lanes in each direction	**13**	2	1	1
		Pavement design procedure	**14**		IADOT/PCA, 8/15/75	PCA
		Level of reliability used in the design, R (%)	**15**			
		Standard deviation, S0	**16**			
		Resurfacing activities and dates since pavement construction	**17**			
		FWD or Road Rater testing available (Yes, No)	**18**			
		Additional comments	**19**			Associated Engineers, Fort Dodge conducted soils investigation and pavement design
Pavement Performance	**General Performance**	pavement performance (1 –best, to 6 – poorest performing).	**20**	1	2	3
		Current surface condition of the pavement (good, fair, poor)	**21**	good	good	good
		General comments	**22**			cracking around intakes
	Slab Cracking	Transverse (%)	**23**		< 5%	
		Longitudinal (%)	**24**		< 5%	
		Corner breaking (%)	**25**		none	
		D-Cracking (low, moderate, high)	**26**		none	
	Patching	Patched slabs (%)	**27**		0	
		Performance of patches (L, M, H)	**28**			
	Pavement Roughness	IRI value	**29**			
		measurement year	**30**			
	Other Distress	Faulting	**31**		none	
		Typical height of faulting (in)	**32**			
		Occurences of pumping and water bleeding (explain)	**33**		none	
		Other pavement distresses (scaling, blowups, popouts, shoulder dropoff, etc)	**34**		none	

				Webster City - 1	Webster City - 2	Webster City - 3
	Subgrade Layer	AASHTO or Unified Soil Classification Group	**35**			CL
		AASHTO Classification Group	**36**			A-6-(14)
		Atterberg Liquid Limit	**37**			35
		Atterberg Plasticity Index	**38**			17
		Gradation analysis	**39**		possibly available	57% passing #200
		Modulus of subgrade reaction, k (pcf)	**40**			100
		Roadbed Resilient Modulus, Mr (pci)	**41**			
		CBR, DCP, R-Value	**42**			
		Strength results (unconfined compressive strength, etc.) (psi)	**43**			
		Percent Proctor density, (%)	**44**		possibly available	
		Maximum dry unit weight (pcf)	**45**		possibly available	94
		Optimum water content (%)	**46**		possibly available	
		Specific gravity of solids	**47**			
		Saturated hydraulic conductivity, K (ft/hr)	**48**			
		Calculated degree of saturation, S (%)	**49**			
		QC/QA testing for the subgrade	**50**			
		Other available information	**51**		Soil borings every 100 lineal feet	
	Subbase Layer	Type of the subbase/base material (crushed stone, stabilized, pavement)	**52**	unknown	no prepared base	gravel (SC)
		Layer thickness (in)	**53**	4.0		1.0
		Bonding with the PCC layer (bonded, unbounded)	**54**			
		AASHTO or Unified Soil Classification Group	**55**			
		Gradation analysis	**56**			
		Resilient Modulus, Mr (psi)	**57**			
		CBR, DCP, R-Value	**58**			
		QC/QA testing for the subbase	**59**			
		Other available information	**60**			
		Slab layer thickness (in)	**61**	8.0	7.0	7.0
		Pavement joint spacing (slab length), S (ft)	**62**	20	20	20
		Slab width, W (ft)	**63**	13.25, 12, 12, 13.25	22 Rural/31 Urban w/ curb	11.5
		Widened slab width (ft)	**64**			
		Transverse joint angle (skew/rectangular)	**65**	NR	rectangular	rectangular
		Pavement cross slope	**66**	parabolic	2.0	parabolic
		Integral curb (yes/no)	**67**	yes	yes	yes

	Pavement Properties	Integral curb height (in)	**68**	9.0	6	6
		Shoulder type (PCC, ACC, granular base, earth)	**69**	earth	earth	earth
		Shoulder design	**70**			
		Extended-widened shoulders (yes/no)	**71**		no	no
		Shoulder width (ft)	**72**	10.0	8.0	
		Do shoulders have edge drains (yes/no)	**73**		yes (SC)	yes (SC)
		Shoulder cross slope (%)	**74**	4.0	4.0	4.0
		Thicker edges (yes/no)	**75**	no	no	
		Edge thickness (in)	**76**	n/a	n/a	
		Load Transfer Mechanism (Dowels/Aggregate Interlock)	**77**	dowels	aggregate interlock	aggregate interlock
		Dowel bar diameter, D (in.)	**78**	1.25" X 18"		
		Dowel bar spacing (in.)	**79**			
		Initial load transfer efficiency (LTE) (%)	**80**			
		Present load transfer efficiency (LTE) (%)	**81**			
		Joint design	**82**			
		Saw cut depth (in.)	**83**			
		Saw cut thickness (in.)	**84**			
		Tie bar spacing (in)	**85**	30	48	
		Tie bar diameter (in)	**86**	0.5	0.5	
		Tie bar length (in)	**87**	36		
		Elasticity modulus of concrete, Epcc (psi)	**88**			
		28-day compressive strength of concrete, f'c (psi)	**89**			
		Modulus of rupture of concrete, Mr (psi)	**90**			650
		Density (unit weight) of concrete, (psi)	**91**			
		Coefficient of thermal expansion of concrete	**92**			

				Webster City - 1	Webster City - 2	Webster City - 3
Concrete Mix Design		Procedure used for mix design (ACI 211.1, state specific, past experience, etc)	**93**	IA DOT C4 Mix (SC)	IA DOT C4 Mix (SC)	IA DOT C4 Mix (SC)
	W/C	Design or Typical w/c	**94**	0.43	0.43	0.43
		Maximum w/c	**95**	0.49	0.49	0.49
	Slump	Low slump (in)	**96**			1.25
		High slump (in)	**97**			1.75
		Average slump (in)	**98**			
	Air content	Low air content (%)	**99**			5.5
		High air content (%)	**100**			6.0
		Typical air content (%)	**101**	6.0	6.0	
	Water content	Typical/basic water content (lb/cy)	**102**	246	246	246
		Max water content (lb/cy)	**103**			
	Cement	Cement content (lb/cy)	**104**	573	573	573
		Cement Type	**105**	unknown	unknown	unknown
		Cement source	**106**	unknown	unknown	unknown
	Fly ash	Fly ash source	**107**	none	none	none
		Fly ash (lb/cy)	**108**			
		Fly ash SPGR	**109**			
	CA	Coarse aggregate (lb/cy)	**110**	1632	1632	1632
		Coarse aggregate type	**111**	unknown	unknown	Crushed limestone (SC)
		Coarse aggregate source	**112**	unknown	unknown	Moberly Mine, Weaver Const
		Coarse aggregate SPGR	**113**	2.57	2.57	2.57
		Maximum size of coarse aggregate (in.)	**114**	unknown	1.5	unknown
	FA	Fine aggregate (lb/cy)	**115**	1380	1380	1380
		Fine aggregate source	**116**	unknown	Hallet Materials, Ames, IA	Hallet Construction
		Fine aggregate SPGR	**117**	2.65	2.65	2.65
	Chemical Admixtures	AEA brand	**118**	unknown	unknown	unknown
		AEA dosage (oz/cy)	**119**	unknown	unknown	unknown
		Water reducer brand	**120**			
		WR dosage (oz/cy)	**121**			
		Curing compound type	**122**			
	Hardened concrete tests	Resistance to freezing and thawing	**123**			
		Test method	**124**			
		Strength	**125**			
		Typical design strength	**126**			
		Test method	**127**			
		Permeability	**128**			
		Test method	**129**			
		Shrinkage	**130**			
		restrained/free	**131**			
		Test method	**132**			
		Creep	**133**			
		Test method	**134**			
	Fibers used in paving mixes	Steel	**135**			
		Polypropylene	**136**			
		Polyester	**137**			
		Polyolefin	**138**			
		Nylon	**139**			
		Carbon	**140**			
		Other (describe)	**141**			

				Webster City - 1	Webster City - 2	Webster City - 3
	Rate the primary concerns about concrete durability, (1)not a concern,	Freeze-thaw resistance / Scaling resistance	**142**			
		DEF susceptibility	**143**			
		ASR susceptibility	**144**			
		Chemical attack	**145**			
		Abrastion resistance	**146**			
		Fatigue cracking	**147**			

(2)rarely a concern, (3)sometimes, (4)often, (5)always	Other (describe)	148			
Quality Control	Air test (yes/no)	150	yes	yes	yes
	comments	151			
	Slump test (yes/no)	152	yes	yes	yes
	comments	153			
	Maturity method (yes/no)	154	no	no	no
	comments	155			
	Center point beams (yes/no)	156		yes	
	comments	157			
	Third point beams (yes/no)	158		no	
	comments	159			
	Compression (yes/no)	160		no	
	comments	161			
	Split tensile (yes/no)	162	no	no	
	comments	163			
	Other tests	164			
	Describe	165			
Traffic Information	Initial design ESALs	166		199290	333000
	ESALs per year (presently)	167			
	Average daily traffic at the beginning of design period	168			3900
	Forecasted average daily traffic at the end of design period	169		5900	6900
	Current average daily traffic, ADT	170	11700	6200	5300
	Average daily truck traffic at the end of the design period	171		350	138
	Average daily truck traffic, ADTT	172			
	Percentage of truck traffic in design lane (%)	173		5.9	4.0
	Truck factor	174			
	Annual traffic growth rate, G (%)	175			
Detail of Traffic Information	Hourly, daily, monthly	176			
	Single axles, tandem axles, or just ESALs	177			
	FHWA vehicle class types, number of axles per truck	178			
	Other available information	179			
Climate Information	Average Freeze-Thaw cycles per year	180			
	No of days that air temperature is below 32 degrees F in a year	181			
	No of days that air temperature is above 90 degrees F in a year	182			
	Number of wet days in a year	183			
	Average depth of water table	184			
	Other available information	185			
	Latitude, Longitude, and Elevation (ft)	186			
	Comments				
	Comment	*			

Pottawattamie - 1	Pottawattamie - 2					Pottawattamie - 3
Highway 92 - south frontage road	Woodland Trail	General Information on Pavement Design		Project location	1	L52 @ Underwood
FN-92-1(10)--21-78	FM-78(37)--55-78			Project number	2	I-80-1(68)12--01-78
				Project length (mi)	3	
				Mile post and traffic direction	4	
local	minor collector			Functional class (Interstate, primary, city street, etc.)	5	major collector
JPCP	JPCP			Type of concrete pavement (JPCP, JRCP, CRCP)	6	JPCP
20	20			Design life of the pavement (years)	7	20
	6/3/1985			Base/subgrade construction date (month, day, year)	8	
1976	7/27/1985			Pavement construction date (month, day, year)	10	
	10/21/1985			Traffic opening date (month, day, year)	12	
1	1			Number of traffic lanes in each direction	13	1
	AASHTO			Pavement design procedure	14	
				Level of reliability used in the design, R (%)	15	
				Standard deviation, S0	16	
				Resurfacing activities and dates since pavement construction	17	
				FWD or Road Rater testing available (Yes, No)	18	
				Additional comments	19	
2	3	Pavement Performance	General Performance	pavement performance (1 –best, to 6 – poorest performing).	20	1
fair	fair			Current surface condition of the pavement (good, fair, poor)	21	good
				General comments	22	
10	2		Slab Cracking	Transverse (%)	23	0
5	25			Longitudinal (%)	24	0
2	0			Corner breaking (%)	25	0
low	low			D-Cracking (low, moderate, high)	26	low
0	1		Patching	Patched slabs (%)	27	0
	H			Performance of patches (L, M, H)	28	
			Pavement Roughness	IRI value	29	
				measurement year	30	
moderate			Other Distress	Faulting	31	
				Typical height of faulting (in)	32	
none	none			Occurences of pumping and water bleeding (explain)	33	none
none				Other pavement distresses (scaling, blowups, popouts, shoulder dropoff, etc)	34	none

Pottawattamie - 1	Pottawattamie - 2				Pottawattamie - 3
		Subgrade Layer	AASHTO or Unified Soil Classification Group	35	
			AASHTO Classification Group	36	
			Atterberg Liquid Limit	37	
			Atterberg Plasticity Index	38	
			Gradation analysis	39	
			Modulus of subgrade reaction, k (pcf)	40	
			Roadbed Resilient Modulus, Mr (pci)	41	
			CBR, DCP, R-Value	42	
			Strength results (unconfined compressive strength, etc.) (psi)	43	
			Percent Proctor density, (%)	44	
			Maximum dry unit weight (pcf)	45	
			Optimum water content (%)	46	
			Specific gravity of solids	47	
			Saturated hydraulic conductivity, K (ft/hr)	48	
			Calculated degree of saturation, S (%)	49	
			QC/QA testing for the subgrade	50	
	Leoss and silt soils		Other available information	51	
none		Subbase Layer	Type of the subbase/base material (crushed stone, stabilized, pavement)	52	
			Layer thickness (in)	53	
			Bonding with the PCC layer (bonded, unbounded)	54	
			AASHTO or Unified Soil Classification Group	55	
			Gradation analysis	56	
			Resilient Modulus, Mr (psi)	57	
			CBR, DCP, R-Value	58	
			QC/QA testing for the subbase	59	
			Other available information	60	
7.0	7.0		Slab layer thickness (in)	61	8.0
20	15		Pavement joint spacing (slab length), S (ft)	62	20
14.5	15.5 (check)		Slab width, W (ft)	63	11
			Widened slab width (ft)	64	
rectangular	skew		Transverse joint angle (skew/rectangular)	65	rectangular
1.5	2.0		Pavement cross slope	66	
yes	yes (check)		Integral curb (yes/no)	67	

6			Pavement Properties	Integral curb height (in)	68	
earth (check)	earth			Shoulder type (PCC, ACC, granular base, earth)	69	granular base
				Shoulder design	70	
				Extended-widened shoulders (yes/no)	71	
6.0 (check)	4.0			Shoulder width (ft)	72	6.0
	no			Do shoulders have edge drains (yes/no)	73	
	4.0			Shoulder cross slope (%)	74	4.0
				Thicker edges (yes/no)	75	no
				Edge thickness (in)	76	n/a
	aggregate interlock			Load Transfer Mechanism (Dowels/Aggregate Interlock)	77	
				Dowel bar diameter, D (in.)	78	
				Dowel bar spacing (in.)	79	
				Initial load transfer efficiency (LTE) (%)	80	
				Present load transfer efficiency (LTE) (%)	81	
				Joint design	82	
	1.75			Saw cut depth (in.)	83	
				Saw cut thickness (in.)	84	
	30			Tie bar spacing (in)	85	
	0.5			Tie bar diameter (in)	86	
	36			Tie bar length (in)	87	
				Elasticity modulus of concrete, Epcc (psi)	88	
				28-day compressive strength of concrete, f'c (psi)	89	
				Modulus of rupture of concrete, Mr (psi)	90	
				Density (unit weight) of concrete, (psi)	91	
				Coefficient of thermal expansion of concrete	92	

Pottawattamie - 1	Pottawattamie - 2					Pottawattamie - 3
	IA DOT C4 Class 5 Mix	Concrete Mix Design		Procedure used for mix design (ACI 211.1, state specific, past experience, etc)	93	
	0.41		W/C	Design or Typical w/c	94	
				Maximum w/c	95	
	0.50		Slump	Low slump (in)	96	
	3.00			High slump (in)	97	
				Average slump (in)	98	
	5.0		Air content	Low air content (%)	99	
	8.0			High air content (%)	100	
				Typical air content (%)	101	
	269		Water content	Typical/basic water content (lb/cy)	102	
	305			Max water content (lb/cy)	103	
	626		Cement	Cement content (lb/cy)	104	
unknown	I			Cement Type	105	unknown
	Ash Grove			Cement source	106	
none	none		Fly ash	Fly ash source	107	none
				Fly ash (lb/cy)	108	
				Fly ash SPGR	109	
	1333		CA	Coarse aggregate (lb/cy)	110	
	Crushed limestone			Coarse aggregate type	111	
	Kerford L.S. Co., Weeping Water, NE			Coarse aggregate source	112	
	2.69			Coarse aggregate SPGR	113	
	unknown			Maximum size of coarse aggregate (in.)	114	
	1623		FA	Fine aggregate (lb/cy)	115	
	Lyman Richey, Orcapolis, NE			Fine aggregate source	116	
	2.62			Fine aggregate SPGR	117	
unknown	Protex Air		Chemical Admixtures	AEA brand	118	unknown
unknown	unknown			AEA dosage (oz/cy)	119	unknown
	none			Water reducer brand	120	
				WR dosage (oz/cy)	121	
				Curing compound type	122	
			Hardened concrete tests	Resistance to freezing and thawing	123	
				Test method	124	
	X			Strength	125	
	MOR = 600 psi			Typical design strength	126	
				Test method	127	
				Permeability	128	
				Test method	129	
				Shrinkage	130	
				restrained/free	131	
				Test method	132	
				Creep	133	
				Test method	134	
			Fibers used in paving mixes	Steel	135	
				Polypropylene	136	
				Polyester	137	
				Polyolefin	138	
				Nylon	139	
				Carbon	140	
				Other (describe)	141	

Pottawattamie - 1	Pottawattamie - 2					Pottawattamie - 3
5	5		Rank the primary concerns about concrete durability, (1)not a	Freeze-thaw resistance / Scaling resistance	142	5
1	1			DEF susceptibility	143	1
3	3			ASR susceptibility	144	3
1	1			Chemical attack	145	1
1	1			Abrastion resistance	146	1
3	3			Fatigue cracking	147	3

			concern, (2)rarely a concern, (3)sometimes, (4)often, (5)always	Other (describe)	148	
yes	yes		**Quality Control**	Air test (yes/no)	150	yes
				comments	151	
yes	yes			Slump test (yes/no)	152	yes
				comments	153	
no	no			Maturity method (yes/no)	154	no
				comments	155	
no	no			Center point beams (yes/no)	156	no
				comments	157	
yes	yes			Third point beams (yes/no)	158	yes
				comments	159	
no	no			Compression (yes/no)	160	no
				comments	161	
no	no			Split tensile (yes/no)	162	no
				comments	163	
				Other tests	164	
				Describe	165	
			Traffic Information	Initial design ESALs	166	
				ESALs per year (presently)	167	
	115 to 560 (check)			Average daily traffic at the beginning of design period	168	
				Forecasted average daily traffic at the end of design period	169	
410 to 780	130 (check)			Current average daily traffic, ADT	170	500
	13 (check)			Average daily truck traffic at the end of the design period	171	
41 to 78	11 to 56 (check)			Average daily truck traffic, ADTT	172	50
				Percentage of truck traffic in design lane (%)	173	
				Truck factor	174	
				Annual traffic growth rate, G (%)	175	
			Detail of Traffic Information	Hourly, daily, monthly	176	
				Single axles, tandem axles, or just ESALs	177	
				FHWA vehicle class types, number of axles per truck	178	
				Other available information	179	
			Climate Information	Average Freeze-Thaw cycles per year	180	
				No of days that air temperature is below 32 degrees F in a year	181	
				No of days that air temperature is above 90 degrees F in a year	182	
				Number of wet days in a year	183	
				Average depth of water table	184	
				Other available information	185	
				Latitude, Longitude, and Elevation (ft)	186	
				Comment	*	

Pottawattamie - 4	Clay - 1	Clay - 2	Clay - 3		
M16 from L66 to Hancock	Airport Ring Rd.	B17 from jct. Of N18 east 1 mile	M50 from the int. of B24, then north 3 mi., then west 2 mi. to jct of hwy 18 and 71		General Information on Pavement Design
SN-6027(4)--51-78	L6773 PC-1	FM-21(6)--55-21	STP-S-CO21(60)--5E-21, LSTPC2--73-21		
	3.93				
	From Int. of M44 and 340th St, west 2 miles, then North 2 mi to Jct Hwy 18				
major collector	county road	county road	county road		
JPCP	JPCP	JPCP	JPCP		
20	20	20	20		
4/29/1993	1973	9/10/80 to 10/10/80	7/11/2001		
6/22/1993	8/1/1973				
1	1	1	1		
	IADOT/PCA	PCA			
	BPR Roadmeter 4.0 at Constr.				
4	1	2	3	Pavement Performance	General Performance
fair	good	poor	good		
	Joints are performing well. Good ride quality	Some transverse cracking at mid-panel. Mid-panel longitudinal cracking.	Ride quality is very rough. Truckers complain about ride quality. Longitudinal tining for surface texture. Grinding work was done.		
0	1	1			Slab Cracking
100	*	10			
10 (check)	1 to 2	1			
high	none	none			
10	1 to 2				Patching
H					
		78in/mi for eastbound, 65in/mi for westbound.	2.8in/mi for northbound, 3.3in/mi for southbound (profilograph).		Pavement Roughness
	none	minimal			Other Distress
none	none				
ASR distress	none	1% joint spall			

Pottawattamie - 4	Clay - 1	Clay - 2	Clay - 3	
		Black soil from the PCC records		Subgrade Layer
ACC/PCC		none	none	Subbase Layer
3"/6"				
bonded				
6.0	6.0" (E-W) and 7.0" (N-S)*	6.0*	8*	
20	20	20	20	
11	11	11	12	
	none		none	
rectangular	rectangular	skew	skew	
2.0	1.5		2.0	

granular base	earth	earth	granular/earth*		**Pavement Properties**
	no				
3.5	8.0	5.0, westbound is 3.0 ft	5.0 to 6.0		
no	no				
4.0	2.0		4.0		
no	no				
n/a	n/a				
aggregate interlock	aggregate interlock		dowels		
			1.25" X 18"		
			12.0		
1.50	saw and seal (pavement thickness/4)				
	48				
	0.5				
	36				
	range of 2865 to 4180 psi, Ave of 3400psi	Range of 2865 to 3465 for 28-day. Range of 3770 to 4500 for 1-year.			
		7-day average of 510, 14-day average of 567.			

Pottawattamie - 4	Clay - 1	Clay - 2	Clay - 3		
C-V47B-C	IADOT B-3	IADOT B-3		**Concrete Mix Design**	
0.44	0.53 0.60	0.55 0.60	0.42 0.49*		**W/C**
0.50 2.50	1.50 2.00	1.00 1.75			**Slump**
5.0 8.0	5.5* 6.5* 6.0*	6.6* 6.8			**Air content**
251 319	256 287	252 287	240 279		**Water content**
481 I/II Ash Grove	479 unknown Northwestern	479 I/II* Northwestern Cement Co., Mason City, IA	485 Type ICA, Gs=3.14. Lehigh, Mason City		**Cement**
North Omaha 89 2.79	none n/a n/a	none n/a n/a	ISG Resources, Port Neal #4 86 2.59		**Fly ash**
929 Crushed limestone Martin Marietta, ANE 002 2.69 1.0	1700 Crushed limestone Hallet, Gilmore City 2.63 1.5	1738 Boggess, Emmetsburg, IA 2.69	1693 IA DOT grad #: 4115 Estherville Rock 4, A32538 2.68 IA DOT grad #: 4110		**CA**
2106 Lyman Richey #5 2.62	1401 IA Sand and Rock, Dickens 2.65	1407 Boggess, Emmetsburg, IA 2.66	1365 Estherville Rock 4, A32538 2.64		**FA**
Daravair R (SC) unknown none	Daravair unknown none	unknown unknown none	Daravair 1400 7.6 WRDA-82 20		**Chemical Admixtures**
X MOR = 500 psi minimum		**X**			**Hardened concrete tests**
					Fibers used in paving mixes

Pottawattamie - 4	Clay - 1	Clay - 2	Clay - 3		
5 1 3 1 1 3					**Rank the primary concerns about concrete durability, (1)not a**

					concern, (2)rarely a concern, (3)sometimes, (4)often, (5)always
yes	yes	yes	yes		**Quality Control**
yes	yes	yes	yes		
no	no	no	yes 2528 TTF (deg C*hr)		
no	yes	yes			
yes	no	no			
no	yes	yes			
no	no	no	no		
250 to 390	North 330 and East 1550	260	1500		**Traffic Information**
25 to 39	15%	10% (check)	20% (check)		
		10% (check)	20% (check)		
					Detail of Traffic Information
					Climate Information
	24) Longitudinal cracking at midpanel and wheel paths. 15% for north-south section. 5 to 10% for east-west section. **61)** Core thickness, 5.80" to 7.40". 6" ave. for E-W. 7" ave. for N-S. **99)** Low hardened air content of 6.7%. **100)** High hardened air content of 8.8%. **101)** Average hardened air content of 7.2%.	**61)** Core thickness from 5.30" to 6.80". **99)** % Hardened air content of 7.1% to 7.9%. **105)** Cement chemical analysis: NA20 - 0.29, K20 - 0.44, NA20 equivalent - 0.58.	**61)** Core thickness from 7.78" to 8.41". Quality index of 1.19, Sigma of 0.208. Average of 8.25. **69)** Source of granular material is county gravel pit. **95)** Problems with adjusting w/c raito. W/C ratio before fix was 0.514, after fixing was 0.489.		

		Clay - 4	Buchanan - 1	Buchanan - 2	Buchanan - 3
Project location	1	B63 north to B40	D47 from Rowley to W35	D16 from V62 to W13	D16 from W13 to (175th St - 190th St)
Project number	2	L5874PC-1	S-3057(3)	SN2556	SN2167(3)--51-10
Project length (mi)	3	3.69	3.50	4.50	2.24
Mile post and traffic direction	4				
Functional class (Interstate, primary, city street, etc.)	5	county road	county road	county road	county road
Type of concrete pavement (JPCP, JRCP, CRCP)	6	JPCP	JPCP	JPCP	JPCP
Design life of the pavement (years)	7	20	20	20	20
Base/subgrade construction date (month, day, year)	8				
Pavement construction date (month, day, year)	10	1979	July 13th to Nov 21, 1970	1971	5/3/1971 to 11/6/1971
Traffic opening date (month, day, year)	12	8/27/1974		October 1971	
Number of traffic lanes in each direction	13	1	1	1	1
Pavement design procedure	14	IA DOT/PCA			
Level of reliability used in the design, R (%)	15				
Standard deviation, S0	16				
Resurfacing activities and dates since pavement construction	17				
FWD or Road Rater testing available (Yes, No)	18				
Additional comments	19				
pavement performance (1 –best, to 6 – poorest performing).	20	4	3	2	3
Current surface condition of the pavement (good, fair, poor)	21	poor	good	good	good
General comments	22	Longitudinal cracking at mid-panel. Corner breaking at centerline with 15% to 20% doing something	corner breaking, some faulting, longitudinal cracking, some pattern, longitudinal mid panel cracking;	couple of corner breaks	
Transverse (%)	23			< 5% (midslab)	
Longitudinal (%)	24	3 to 4		< 5%	
Corner breaking (%)	25	40%			
D-Cracking (low, moderate, high)	26				
Patched slabs (%)	27			< 5%	
Performance of patches (L, M, H)	28				
IRI value	29		62 in/mi -profilograph?		
measurement year	30				
Faulting	31		Joints are performing very well	yes (some, but no complaints)	
Typical height of faulting (in)	32				
Occurences of pumping and water bleeding (explain)	33			none	
Other pavement distresses (scaling, blowups, popouts, shoulder dropoff, etc)	34	Mix problems - surface problems - segregation, 1% of the slabs.		none	

		Clay - 4	Buchanan - 1	Buchanan - 2	Buchanan - 3
AASHTO or Unified Soil Classification Group	35			n/a	
AASHTO Classification Group	36				
Atterberg Liquid Limit	37				
Atterberg Plasticity Index	38				
Gradation analysis	39				
Modulus of subgrade reaction, k (pcf)	40				
Roadbed Resilient Modulus, Mr (pci)	41				
CBR, DCP, R-Value	42				
Strength results (unconfined compressive strength, etc.) (psi)	43				
Percent Proctor density, (%)	44				
Maximum dry unit weight (pcf)	45				
Optimum water content (%)	46				
Specific gravity of solids	47				
Saturated hydraulic conductivity, K (ft/hr)	48				
Calculated degree of saturation, S (%)	49				
QC/QA testing for the subgrade	50				
Other available information	51				
Type of the subbase/base material (crushed stone, stabilized, pavement)	52		none	none	
Layer thickness (in)	53				
Bonding with the PCC layer (bonded, unbounded)	54				
AASHTO or Unified Soil Classification Group	55				
Gradation analysis	56				
Resilient Modulus, Mr (psi)	57				
CBR, DCP, R-Value	58				
QC/QA testing for the subbase	59				
Other available information	60				
Slab layer thickness (in)	61	6.0*	6.0	6.0	6.0*
Pavement joint spacing (slab length), S (ft)	62	20	40	40	40
Slab width, W (ft)	63	10	11	11	11
Widened slab width (ft)	64				
Transverse joint angle (skew/rectangular)	65	rectangular	rectangular	rectangular	
Pavement cross slope	66	2.0		2.0	
Integral curb (yes/no)	67				

Integral curb height (in)	68				
Shoulder type (PCC, ACC, granular base, earth)	69	earth	granular base	granular base	granular base
Shoulder design	70				
Extended-widened shoulders (yes/no)	71	no		no	
Shoulder width (ft)	72	8.0	6.0*	?	
Do shoulders have edge drains (yes/no)	73			no	
Shoulder cross slope (%)	74	4.0		4.0	
Thicker edges (yes/no)	75	no		no	
Edge thickness (in)	76	n/a		n/a	
Load Transfer Mechanism (Dowels/Aggregate Interlock)	77	aggregate interlock	aggregate interlock	aggregate interlock	aggregate interlock
Dowel bar diameter, D (in.)	78				
Dowel bar spacing (in.)	79				
Initial load transfer efficiency (LTE) (%)	80				
Present load transfer efficiency (LTE) (%)	81				
Joint design	82	saw and seal			
Saw cut depth (in.)	83	(pavement thickness/4)			
Saw cut thickness (in.)	84				
Tie bar spacing (in)	85	48		48	
Tie bar diameter (in)	86	0.5			
Tie bar length (in)	87	36			
Elasticity modulus of concrete, Epcc (psi)	88				
28-day compressive strength of concrete, f'c (psi)	89	Range of 3860 to 4240. Average of 4000.			
Modulus of rupture of concrete, Mr (psi)	90	Range of 513 to 636. Average of 575.		Range of 598 to 647psi. Average of 610psi.	14-day (627, 585, 667); 7-day (516)
Density (unit weight) of concrete, (psi)	91				
Coefficient of thermal expansion of concrete	92				

		Clay - 4	Buchanan - 1	Buchanan - 2	Buchanan - 3
Procedure used for mix design (ACI 211.1, state specific, past experience, etc)	93	IADOT B-4 and B-3, gravel mix	Slipform paving, Class B3*	Slipform, IADOT Class B3	Slipform, IADOT Class B3
Design or Typical w/c	94	0.54	0.54	0.54	0.55
Maximum w/c	95	0.60	0.60		
Low slump (in)	96			1.38	1.25
High slump (in)	97			2.00	1.50
Average slump (in)	98			1.5	
Low air content (%)	99			5.7	6.0
High air content (%)	100			6.8	7.0
Typical air content (%)	101			6.0	
Typical/basic water content (lb/cy)	102	278	256	259	264
Max water content (lb/cy)	103	296	287	287	287
Cement content (lb/cy)	104	493	479	479	479
Cement Type	105	unknown	unknown	unknown	I
Cement source	106		Dewey Cement Co., Davenport, IA	Dewey Cement Co., Davenport, IA	Dundee Cement Co. Terminal, Rock Island
Fly ash source	107	none	none	none	none
Fly ash (lb/cy)	108				
Fly ash SPGR	109				
Coarse aggregate (lb/cy)	110	1570	1686	1687	1695
Coarse aggregate type	111	Gravel	NE Iowa, high quality, strong limestone	NE Iowa, high quality, strong limestone	Crushed stone
Coarse aggregate source	112	Hallet (SE1/4-9-91-40)	Bloom Quarry, Paul Niemann, Buchanan County, Jesup	Bloom Quarry, Paul Niemann, Buchanan County, Jesup	Bloom Quarry, Paul Niemann, Buchanan County, Jesup
Coarse aggregate SPGR	113	2.7	2.61	2.61	2.61
Maximum size of coarse aggregate (in.)	114			1.5	
Fine aggregate (lb/cy)	115	1558	1401	1407	1440
Fine aggregate source	116	Hallet (SE1/4-9-91-40)	Paul Nieman (Ward Pit)	Cedar Bend, Wards Farm	Concrete Materials, Waterloo area, Cedar Bend
Fine aggregate SPGR	117	2.68	2.65	2.6	2.65
AEA brand	118	Sealtight	Protex	Protex	Carter (Construction Matls) - water
AEA dosage (oz/cy)	119	unknown	unknown	unknown	unknown
Water reducer brand	120	none			
WR dosage (oz/cy)	121				
Curing compound type	122		curing compound		
Resistance to freezing and thawing	123				
Test method	124				
Strength	125	X			
Typical design strength	126				
Test method	127				
Permeability	128				
Test method	129				
Shrinkage	130				
restrained/free	131				
Test method	132				
Creep	133				
Test method	134				
Steel	135				
Polypropylene	136				
Polyester	137				
Polyolefin	138				
Nylon	139				
Carbon	140				
Other (describe)	141				

		Clay - 4	Buchanan - 1	Buchanan - 2	Buchanan - 3
Freeze-thaw resistance / Scaling resistance	142				
DEF susceptibility	143				
ASR susceptibility	144				
Chemical attack	145				
Abrastion resistance	146				
Fatigue cracking	147				

Other (describe)	148				
Air test (yes/no)	150	yes	yes	yes	yes
comments	151				
Slump test (yes/no)	152	yes	yes	yes	yes
comments	153				
Maturity method (yes/no)	154	no	no	no	no
comments	155				
Center point beams (yes/no)	156	yes	yes	yes	yes
comments	157				
Third point beams (yes/no)	158	no	no	no	no
comments	159				
Compression (yes/no)	160	yes	no	yes	
comments	161				
Split tensile (yes/no)	162	no	no	no	no
comments	163				
Other tests	164				
Describe	165				
Initial design ESALs	166				
ESALs per year (presently)	167				
Average daily traffic at the beginning of design period	168				
Forecasted average daily traffic at the end of design period	169				
Current average daily traffic, ADT	170	210	880	730 to 1050	880
Average daily truck traffic at the end of the design period	171				
Average daily truck traffic, ADTT	172	10% (check)			
Percentage of truck traffic in design lane (%)	173	10% (check)			
Truck factor	174				
Annual traffic growth rate, G (%)	175				
Hourly, daily, monthly	176				
Single axles, tandem axles, or just ESALs	177				
FHWA vehicle class types, number of axles per truck	178				
Other available information	179				
Average Freeze-Thaw cycles per year	180				
No of days that air temperature is below 32 degrees F in a year	181				
No of days that air temperature is above 90 degrees F in a year	182				
Number of wet days in a year	183				
Average depth of water table	184				
Other available information	185				
Latitude, Longitude, and Elevation (ft)	186				

Comments

Comment	*	**61)** Core thickness from 5.05" to 6.60". Average of 6.0"	**72)** 4" low cost class A crushed stone **93)** 37.4 ft^3 batch; 34E mixer size; curing compound; polyethylene; expansion joint, joint sealer; Const. Materials Inc.		**61)** Core thickness range of 5.40" to 6.55". More info available on file.

Buchanan - 4					Buchanan - 5	Buchanan - 7
V62 from D16 to IA281		**General Information on Pavement Design**	Project location	**1**	C66 from Black Hawk Co to V62	C57 from Hazelton east 1.86 miles
S1496(15)			Project number	**2**	S2562	S-246
			Project length (mi)	**3**	1.00	1.86
			Mile post and traffic direction	**4**		
county road			Functional class (Interstate, primary, city street, etc.)	**5**	county road	county road
JPCP			Type of concrete pavement (JPCP, JRCP, CRCP)	**6**	JPCP	JPCP
20			Design life of the pavement (years)	**7**	20	20
9/8/1973			Base/subgrade construction date (month, day, year)	**8**		
10/13/1973			Pavement construction date (month, day, year)	**10**	5/28/1975	1973
			Traffic opening date (month, day, year)	**12**		July 1973
1			Number of traffic lanes in each direction	**13**	1	1
			Pavement design procedure	**14**	IADOT	IADOT
			Level of reliability used in the design, R (%)	**15**		
			Standard deviation, S0	**16**		
			Resurfacing activities and dates since pavement construction	**17**		
			FWD or Road Rater testing available (Yes, No)	**18**		
			Additional comments	**19**		
4	**Pavement Performance**	**General Performance**	pavement performance (1 –best, to 6 – poorest performing).	**20**	5	6
poor			Current surface condition of the pavement (good, fair, poor)	**21**	poor	poor
transverse corner cracking; outer wheel path cracking			General comments	**22**	Aggregate "D" cracking	No field survey
		Slab Cracking	Transverse (%)	**23**		
			Longitudinal (%)	**24**		
			Corner breaking (%)	**25**		
			D-Cracking (low, moderate, high)	**26**	high ??	
		Patching	Patched slabs (%)	**27**	5	0
			Performance of patches (L, M, H)	**28**	L	
		Pavement Roughness	IRI value	**29**		80in/mile average
			measurement year	**30**		1973
visible faulting		**Other Distress**	Faulting	**31**	none	yes
			Typical height of faulting (in)	**32**		
			Occurences of pumping and water bleeding (explain)	**33**	none	none
			Other pavement distresses (scaling, blowups, popouts, shoulder dropoff, etc)	**34**	none	none

Buchanan - 4					Buchanan - 5	Buchanan - 7
Very good granular material		**Subgrade Layer**	AASHTO or Unified Soil Classification Group	**35**		
			AASHTO Classification Group	**36**		
			Atterberg Liquid Limit	**37**		
			Atterberg Plasticity Index	**38**		
			Gradation analysis	**39**		
			Modulus of subgrade reaction, k (pcf)	**40**		
			Roadbed Resilient Modulus, Mr (pci)	**41**		
			CBR, DCP, R-Value	**42**		
			Strength results (unconfined compressive strength, etc.) (psi)	**43**		
			Percent Proctor density, (%)	**44**		
			Maximum dry unit weight (pcf)	**45**		
			Optimum water content (%)	**46**		
			Specific gravity of solids	**47**		
			Saturated hydraulic conductivity, K (ft/hr)	**48**		
			Calculated degree of saturation, S (%)	**49**		
			QC/QA testing for the subgrade	**50**		
			Other available information	**51**		
none		**Subbase Layer**	Type of the subbase/base material (crushed stone, stabilized, pavement)	**52**	n/a	none
			Layer thickness (in)	**53**		
			Bonding with the PCC layer (bonded, unbounded)	**54**		
			AASHTO or Unified Soil Classification Group	**55**		
			Gradation analysis	**56**		
			Resilient Modulus, Mr (psi)	**57**		
			CBR, DCP, R-Value	**58**		
			QC/QA testing for the subbase	**59**		
			Other available information	**60**	none	
6.0*			Slab layer thickness (in)	**61**	6.0*	6.0*
40			Pavement joint spacing (slab length), S (ft)	**62**	40	
11			Slab width, W (ft)	**63**	11	11
			Widened slab width (ft)	**64**		
rectangular			Transverse joint angle (skew/rectangular)	**65**	rectangular	rectangular
1.5			Pavement cross slope	**66**	2.0	2.0
			Integral curb (yes/no)	**67**		

		Pavement Properties	Integral curb height (in)	68		
granular base			Shoulder type (PCC, ACC, granular base, earth)	69	granular base	earth
4" thickness			Shoulder design	70		
			Extended-widened shoulders (yes/no)	71	no	no
6.0			Shoulder width (ft)	72		
			Do shoulders have edge drains (yes/no)	73	no	no
4.0			Shoulder cross slope (%)	74	4.0	4.0
			Thicker edges (yes/no)	75	no	no
			Edge thickness (in)	76	n/a	n/a
aggregate interlock			Load Transfer Mechanism (Dowels/Aggregate Interlock)	77	aggregate interlock	aggregate interlock
			Dowel bar diameter, D (in.)	78		
			Dowel bar spacing (in.)	79		
			Initial load transfer efficiency (LTE) (%)	80		
			Present load transfer efficiency (LTE) (%)	81		
			Joint design	82		rectangular
			Saw cut depth (in.)	83		
			Saw cut thickness (in.)	84		
			Tie bar spacing (in)	85		48
			Tie bar diameter (in)	86		
			Tie bar length (in)	87		
			Elasticity modulus of concrete, Epcc (psi)	88		
			28-day compressive strength of concrete, f'c (psi)	89	core compressive range from 3120psi to 5255psi. Average of 3500psi	Range from 2905psi to 3545psi
14-day (647psi); 7-day (579psi)			Modulus of rupture of concrete, Mr (psi)	90	MOR range from 510psi to 679psi. Average of 600psi.	n/a
			Density (unit weight) of concrete, (psi)	91		
			Coefficient of thermal expansion of concrete	92		

Buchanan - 4					Buchanan - 5	Buchanan - 7
Slipform, IADOT Class B3	Concrete Mix Design		Procedure used for mix design (ACI 211.1, state specific, past experience, etc)	93	Slipform, IADOT Class B3	Slipform, IADOT Class B3
0.53		W/C	Design or Typical w/c	94	0.55	0.534
0.60			Maximum w/c	95	0.60	0.60
1.00		Slump	Low slump (in)	96		0.75
1.50			High slump (in)	97		1.75
			Average slump (in)	98		1.25
6.0		Air content	Low air content (%)	99	6.9 (hardened)	6.4 (hardened)
7.0			High air content (%)	100	9.0 (hardened)	7.5 (hardened)
			Typical air content (%)	101	8.3 (hardened)	7.0 (hardened)
256		Water content	Typical/basic water content (lb/cy)	102	256	256
			Max water content (lb/cy)	103		
479		Cement	Cement content (lb/cy)	104	479	479
unknown			Cement Type	105	unknown	unknown
Martin Marrietta			Cement source	106	Northwestern	Martin Marrietta
none		Fly ash	Fly ash source	107	none	none
			Fly ash (lb/cy)	108		
			Fly ash SPGR	109		
1700		CA	Coarse aggregate (lb/cy)	110	1706	1700
crushed stone			Coarse aggregate type	111		
Bloom Quarry, Paul Niemann, Buchanan County, Jesup			Coarse aggregate source	112	Welp and McCarter Inc., Pints Quarry	Bloom Quarry, Paul Niemann, Buchanan County, Jesup
2.63			Coarse aggregate SPGR	113	2.65	2.63
1.5			Maximum size of coarse aggregate (in.)	114	1.5 (D57)	1.5 (D57)
1386		FA	Fine aggregate (lb/cy)	115	1407	1396
Paul Nieman, Readlyn Pit, Bremer Co			Fine aggregate source	116	Martin Marietta, Cedar Bend	Paul Nieman, Readlyn Pit, Bremer Co
2.64			Fine aggregate SPGR	117	2.66	2.64
Daravair		Chemical Admixtures	AEA brand	118	Daravair	Daravair
unknown			AEA dosage (oz/cy)	119	unknown	unknown
			Water reducer brand	120		
			WR dosage (oz/cy)	121		
Meadows Sealtight white pigamented cure			Curing compound type	122	Meadows - WP36 white cure	Meadows Sealtight white pigamented cure
		Hardened concrete tests	Resistance to freezing and thawing	123		yes
			Test method	124		
			Strength	125		
			Typical design strength	126		
			Test method	127		
			Permeability	128		
			Test method	129		
			Shrinkage	130		
			restrained/free	131		
			Test method	132		
			Creep	133		
			Test method	134		
		Fibers used in paving mixes	Steel	135		
			Polypropylene	136		
			Polyester	137		
			Polyolefin	138		
			Nylon	139		
			Carbon	140		
			Other (describe)	141		

Buchanan - 4					Buchanan - 5	Buchanan - 7
		Rank the primary concerns about concrete durability, (1)not a concern, (2)rarely	Freeze-thaw resistance / Scaling resistance	142		
			DEF susceptibility	143		
			ASR susceptibility	144		
			Chemical attack	145		
			Abrastion resistance	146		
			Fatigue cracking	147		

		concern, (2)rarely a concern, (3)sometimes, (4)often, (5)always	Other (describe)	**148**		
yes		**Quality Control**	Air test (yes/no)	**150**	yes	yes
			comments	**151**		
yes			Slump test (yes/no)	**152**	yes	yes
			comments	**153**		
no			Maturity method (yes/no)	**154**	no	no
			comments	**155**		
yes			Center point beams (yes/no)	**156**	yes	yes
			comments	**157**		
no			Third point beams (yes/no)	**158**	no	no
			comments	**159**		
			Compression (yes/no)	**160**	yes	
			comments	**161**		
no			Split tensile (yes/no)	**162**	no	no
			comments	**163**		
			Other tests	**164**		
			Describe	**165**		
		Traffic Information	Initial design ESALs	**166**		
			ESALs per year (presently)	**167**		
			Average daily traffic at the beginning of design period	**168**		
			Forecasted average daily traffic at the end of design period	**169**		
1100/1500/1900			Current average daily traffic, ADT	**170**	550	
			Average daily truck traffic at the end of the design period	**171**		
			Average daily truck traffic, ADTT	**172**		
			Percentage of truck traffic in design lane (%)	**173**		
			Truck factor	**174**		
			Annual traffic growth rate, G (%)	**175**		
		Detail of Traffic Information	Hourly, daily, monthly	**176**		
			Single axles, tandem axles, or just ESALs	**177**		
			FHWA vehicle class types, number of axles per truck	**178**		
			Other available information	**179**		
		Climate Information	Average Freeze-Thaw cycles per year	**180**		
			No of days that air temperature is below 32 degrees F in a year	**181**		
			No of days that air temperature is above 90 degrees F in a year	**182**		
			Number of wet days in a year	**183**		
			Average depth of water table	**184**		
			Other available information	**185**		
			Latitude, Longitude, and Elevation (ft)	**186**		
	Comments					
61) Average core thickness of 6.06".			Comment	*****	**61)** Core thickness range of 6.60" to 7.75". Average of 7.15".	**61)** Core thickness range of 5.35" to 6.45". Average of 6.13".

Linn - 1	Linn - 2	Linn - 3				
E36 (Blairs Ferry Road) from Shellsburg east 3 miles to paving change	E36 from Palo to Benton County line	W36 east 0.5 miles to N1/4 of 16-84-8	General Information on Pavement Design		Project location	1
					Project number	2
3.35		0.50			Project length (mi)	3
Sta. 251+45 then west to Sta. 428+07.34	Sta. 997+00 east to Sta. 87+92	Sta. 0+12 to Sta 26+29.57			Mile post and traffic direction	4
major collector	major collector	Area service local			Functional class (Interstate, primary, city street, etc.)	5
JPCP	JPCP	JPCP			Type of concrete pavement (JPCP, JRCP, CRCP)	6
30	30	30			Design life of the pavement (years)	7
Base (7/18/84 to 7/30/84); Subgrade (10/19/82 to 9/14/83)	8/12/81 to 9/23/81	7/31/84 to 8/7/84			Base/subgrade construction date (month, day, year)	8
8/13/84 to 8/30/84	5/18/1982	8/8/84 to 8/23/84			Pavement construction date (month, day, year)	10
9/19/1984	6/1/1982	9/6/1984			Traffic opening date (month, day, year)	12
1	1	1			Number of traffic lanes in each direction	13
IADOT 1983 (Empirical)	IADOT 1982 (Empirical)	IADOT 1982 (Empirical)			Pavement design procedure	14
					Level of reliability used in the design, R (%)	15
					Standard deviation, S0	16
					Resurfacing activities and dates since pavement construction	17
					FWD or Road Rater testing available (Yes, No)	18
IMS - Laser Truck - 1995	IMS - Laser Truck - 1995	IMS - Laser Truck - 1995			Additional comments	19
1	2	3	Pavement Performance	General Performance	pavement performance (1 –best, to 6 – poorest performing).	20
good	good	good/fair			Current surface condition of the pavement (good, fair, poor)	21
	dowels are required if h>= 8 in.				General comments	22
1	2	5		Slab Cracking	Transverse (%)	23
1	2	5			Longitudinal (%)	24
3	4	5			Corner breaking (%)	25
low	low	low			D-Cracking (low, moderate, high)	26
0	unknown	1*		Patching	Patched slabs (%)	27
	H	H			Performance of patches (L, M, H)	28
92 to 95	94	95		Pavement Roughness	IRI value	29
1995	1995	1995			measurement year	30
	low faulting			Other Distress	Faulting	31
					Typical height of faulting (in)	32
none	none	none			Occurences of pumping and water bleeding (explain)	33
some shoulder dropoff	some shoulder dropoff	none			Other pavement distresses (scaling, blowups, popouts, shoulder dropoff, etc)	34

Linn - 1	Linn - 2	Linn - 3			
Sand		black soil - wet	Subgrade Layer	AASHTO or Unified Soil Classification Group	35
				AASHTO Classification Group	36
				Atterberg Liquid Limit	37
				Atterberg Plasticity Index	38
				Gradation analysis	39
				Modulus of subgrade reaction, k (pcf)	40
				Roadbed Resilient Modulus, Mr (pci)	41
				CBR, DCP, R-Value	42
				Strength results (unconfined compressive strength, etc.) (psi)	43
100				Percent Proctor density, (%)	44
				Maximum dry unit weight (pcf)	45
6.5				Optimum water content (%)	46
				Specific gravity of solids	47
				Saturated hydraulic conductivity, K (ft/hr)	48
				Calculated degree of saturation, S (%)	49
				QC/QA testing for the subgrade	50
				Other available information	51
Soil/Cement	reclaimed seal coat over crushed stone	Fill lime hauled in from quarry	Subbase Layer	Type of the subbase/base material (crushed stone, stabilized, pavement)	52
4.0	1.0	1.0		Layer thickness (in)	53
bonded with CSS-1H emulsion	unbonded	unbonded		Bonding with the PCC layer (bonded, unbounded)	54
				AASHTO or Unified Soil Classification Group	55
				Gradation analysis	56
				Resilient Modulus, Mr (psi)	57
				CBR, DCP, R-Value	58
				QC/QA testing for the subbase	59
14.5 lb/yd^3 of Portland Cement mixed with sub-base				Other available information	60
7.0	7.0	6.0		Slab layer thickness (in)	61
20	20	20		Pavement joint spacing (slab length), S (ft)	62
12	12	11		Slab width, W (ft)	63
n/a	n/a			Widened slab width (ft)	64
skewed	skewed	skewed		Transverse joint angle (skew/rectangular)	65
2.0	2.0	2.0		Pavement cross slope	66
				Integral curb (yes/no)	67

			Pavement Properties	Integral curb height (in)	68
granular base	granular base	granular base		Shoulder type (PCC, ACC, granular base, earth)	69
				Shoulder design	70
no	no	no		Extended-widened shoulders (yes/no)	71
10.0	10.0	4.0		Shoulder width (ft)	72
no	no	no		Do shoulders have edge drains (yes/no)	73
4.0	4.0	4.0		Shoulder cross slope (%)	74
no	no	no		Thicker edges (yes/no)	75
n/a	n/a	n/a		Edge thickness (in)	76
aggregate interlock	aggregate interlock	aggregate interlock		Load Transfer Mechanism (Dowels/Aggregate Interlock)	77
				Dowel bar diameter, D (in.)	78
				Dowel bar spacing (in.)	79
				Initial load transfer efficiency (LTE) (%)	80
				Present load transfer efficiency (LTE) (%)	81
RH-22 (6/24/1983)	RH-2 (1978)	RH-2A (1983)		Joint design	82
				Saw cut depth (in.)	83
				Saw cut thickness (in.)	84
20 ft	20 ft	20 ft		Tie bar spacing (in)	85
0.5	0.5	0.5		Tie bar diameter (in)	86
				Tie bar length (in)	87
				Elasticity modulus of concrete, Epcc (psi)	88
				28-day compressive strength of concrete, f'c (psi)	89
14-day (600 to 650psi); 7-day (575 to 625psi)	7-day (650psi)	7-day (538psi); 14-day (596psi)		Modulus of rupture of concrete, Mr (psi)	90
				Density (unit weight) of concrete, (psi)	91
				Coefficient of thermal expansion of concrete	92

Linn - 1	Linn - 2	Linn - 3				
IADOT C-3 mix with flyash (1983)	IADOT C-4 mix with Type III cement, 7-day (1982)	IADOT B-3 mix, 14-day (1984)	Concrete Mix Design		Procedure used for mix design (ACI 211.1, state specific, past experience, etc)	93
0.425	0.45	0.557		W/C	Design or Typical w/c	94
		0.60			Maximum w/c	95
1.25				Slump	Low slump (in)	96
2.00					High slump (in)	97
	1.75	1.25			Average slump (in)	98
6.0				Air content	Low air content (%)	99
6.5					High air content (%)	100
	6.5	6.0			Typical air content (%)	101
273	279	267		Water content	Typical/basic water content (lb/cy)	102
					Max water content (lb/cy)	103
513	626	479		Cement	Cement content (lb/cy)	104
unknown	unknown	unknown			Cement Type	105
Continental	Dundee	Continental			Cement source	106
unknown	none	none		Fly ash	Fly ash source	107
91					Fly ash (lb/cy)	108
unknown					Fly ash SPGR	109
1690	1411	1661		CA	Coarse aggregate (lb/cy)	110
	unknown	unknown			Coarse aggregate type	111
unknown	unknown	unknown			Coarse aggregate source	112
					Coarse aggregate SPGR	113
1.5	1.5	1.5			Maximum size of coarse aggregate (in.)	114
1426	1478	1401		FA	Fine aggregate (lb/cy)	115
unknown	unknown	unknown			Fine aggregate source	116
					Fine aggregate SPGR	117
unknown	unknown	unknown		Chemical Admixtures	AEA brand	118
unknown	unknown	unknown			AEA dosage (oz/cy)	119
					Water reducer brand	120
					WR dosage (oz/cy)	121
					Curing compound type	122
IADOT requirements	IADOT requirements	IADOT requirements		Hardened concrete tests	Resistance to freezing and thawing	123
					Test method	124
IADOT requirements	IADOT requirements	IADOT requirements			Strength	125
					Typical design strength	126
					Test method	127
IADOT requirements	IADOT requirements	IADOT requirements			Permeability	128
					Test method	129
IADOT requirements	IADOT requirements	IADOT requirements			Shrinkage	130
					restrained/free	131
					Test method	132
IADOT requirements	IADOT requirements	IADOT requirements			Creep	133
					Test method	134
				Fibers used in paving mixes	Steel	135
					Polypropylene	136
					Polyester	137
					Polyolefin	138
					Nylon	139
					Carbon	140
					Other (describe)	141

Linn - 1	Linn - 2	Linn - 3			
			Rank the primary concerns about concrete durability, (1)not a	Freeze-thaw resistance / Scaling resistance	142
				DEF susceptibility	143
				ASR susceptibility	144
				Chemical attack	145
				Abrastion resistance	146
2	2	2		Fatigue cracking	147

				concern, (2)rarely a concern, (3)sometimes, (4)often, (5)always	Other (describe)	**148**
yes	yes	yes		**Quality Control**	Air test (yes/no)	**150**
					comments	**151**
yes	yes	yes			Slump test (yes/no)	**152**
					comments	**153**
no	no	no			Maturity method (yes/no)	**154**
					comments	**155**
no	no	no			Center point beams (yes/no)	**156**
					comments	**157**
yes	yes	yes			Third point beams (yes/no)	**158**
					comments	**159**
no	no	no			Compression (yes/no)	**160**
					comments	**161**
no	no	no			Split tensile (yes/no)	**162**
					comments	**163**
					Other tests	**164**
					Describe	**165**
				Traffic Information	Initial design ESALs	**166**
					ESALs per year (presently)	**167**
0 (relocation)	2515	330			Average daily traffic at the beginning of design period	**168**
					Forecasted average daily traffic at the end of design period	**169**
4830	3660	1000			Current average daily traffic, ADT	**170**
					Average daily truck traffic at the end of the design period	**171**
200	>100 trucks/day				Average daily truck traffic, ADTT	**172**
5%	6%	5%			Percentage of truck traffic in design lane (%)	**173**
					Truck factor	**174**
					Annual traffic growth rate, G (%)	**175**
				Detail of Traffic Information	Hourly, daily, monthly	**176**
					Single axles, tandem axles, or just ESALs	**177**
					FHWA vehicle class types, number of axles per truck	**178**
					Other available information	**179**
				Climate Information	Average Freeze-Thaw cycles per year	**180**
					No of days that air temperature is below 32 degrees F in a year	**181**
					No of days that air temperature is above 90 degrees F in a year	**182**
					Number of wet days in a year	**183**
fluctuates with Cedar River					Average depth of water table	**184**
					Other available information	**185**
745 ft. Elevation	785 ft. Elevation	752 ft. Elevation			Latitude, Longitude, and Elevation (ft)	**186**

Comments

		27) Patching is at RR tracks.			Comment	*****

Linn - 4	Linn - 5	Linn - 6	Marion - 1	Marion - 2		
W36 from Palo north 2.7 miles to NE 8-84-8	E16 from X20 east to Jones County line	W45 from E16 north 6 miles to D62	T23 beginning at Hwy 5 and ending at G71	T25 beginning at old hwy 92 and ending at new hwy 92		General Information on Pavement Design
				SN-7661(1)-51-63		
2.70	3.01	6.00		1.54		
Sta. 19+50 north to Sta. 161+66.92	Sta. 0+00 east 3.012 miles to Sta 159+03.62	Sta. 0+27 north 6 miles				
Major collector	major collector	major collector	farm to market	county road		
JPCP	JPCP	JPCP	JPCP	JPCP		
30	30	30	20	20		
8/26/81 to 10/28/81	1980	1978 to 1979				
5/18/82 to 6/23/82	6/16/82 to 7/21/82	8/19/80 to 9/23/80	September 1963	9/30/80 TO 10/15/80		
6/14/1982	7/12/1982	9/15/1980				
1	1	1	1	1		
IADOT (Empirical)	IADOT (Empirical)	IADOT (Empirical)				
IMS - Laser Truck - 1995	IMS - Laser Truck - 1995	IMS - Laser Truck - 1995				
4	5	6	1	2	Pavement Performance	General Performance
good/fair	fair	fair	good	good		
		Heavy truck traffic in south bound lane, some sections perform well, outerlane, wheel path	Paint is not holding at the longitudinal joints. Corner breaks on northbound portion. Mid-panel cracks.			
10	8	20		some		Slab Cracking
10	8	20	some	some		
6	5	5	some			
low	low	low				
4	3	3				Patching
H	M	L				
90	95	97	46 to 70, 48, 50 in/mile			Pavement Roughness
1995	1995	1995	1963			
some occurences (low)	some occurences (low)	some occurences (low)				Other Distress
some shoulder dropoff	some shoulder dropoff	some shoulder dropoff	Polished surface.			

Linn - 4	Linn - 5	Linn - 6	Marion - 1	Marion - 2	
sandy loam hauled in from borrow pit	clay and black soil	clay and reclaimed road stone		modified sandy clay	Subgrade Layer
none (sand)	none	none		none	Subbase Layer
6.0	6.0	6.0	7.0*	7.0	
20	20	20	40	20	
12	11	12	11	11	
n/a	n/a	n/a			
skewed	skewed	rectangular	rectangular	rectangular	
2.0	2.0	1.5		1.5	

granular base	granular base	granular base	granular base	Granular base*		**Pavement Properties**
no	none	none				
8.0	6.0	6.0	4.0	7.0		
no	no	none				
4.0	4.0	4.0	4.0	1.5"/12		
no	no	no				
n/a	n/a	n/a				
aggregate interlock	aggregate interlock	aggregate interlock	aggregate interlock	aggregate interlock		
RH-2 (1978)	RH-2 (1978)	RH-2 (1976)				
20 ft	20 ft	20 ft				
0.5	0.5	0.5				
7-day average (583psi); 14-day average (626psi)	7-day average (550psi); 14-day average (679psi)		4600 to 2000; 5500 to 3000 corrected	14-day (695, 697, 873, 574); 9-day(497); 7-day(592)		

Linn - 4	Linn - 5	Linn - 6	Marion - 1	Marion - 2		
IADOT B-4 mix, 14-day (1982)	IADOT B-3 mix, 14-day (1982)	IADOT B-4 mix, 14-day	Type B	Class B (slipform)	**Concrete Mix Design**	
0.525 0.60	0.55 0.60	0.56		0.54		**W/C**
1.75	1.75	1.75	1.00 1.31	1		**Slump**
6.8	6.8	7.0	*	5.9		**Air content**
260	267	276	45.5 gallons	267		**Water content**
493 unknown Dundee	479 unknown unknown	493 unknown Atlas	unknown unknown Hawkeye	493 unknown Penn Dixie Industries, West Des Moines, IA		**Cement**
none	none	none	none	none		**Fly ash**
1471 unknown unknown 1.5	1745 unknown unknown 1.5	1546 unknown unknown 1.5	2350 unknown unknown	1535 Durham mine 2.64		**CA**
1541 unknown	1407 unknown	1541 unknown	1963 unknown	1552 Marion County near Harvey sand pit, Kaser Corp. 2.67		**FA**
unknown unknown	unknown unknown	unknown unknown	unknown unknown	Contractors steel corporation unknown Pittsburgh - Des Moines Steel		**Chemical Admixtures**
IADOT requirements IADOT requirements IADOT requirements IADOT requirements IADOT requirements	IADOT requirements IADOT requirements IADOT requirements IADOT requirements IADOT requirements	IADOT requirements IADOT requirements IADOT requirements IADOT requirements IADOT requirements				**Hardened concrete tests**
						Fibers used in paving mixes

Linn - 4	Linn - 5	Linn - 6	Marion - 1	Marion - 2		
2	2	2				**Rank the primary concerns about concrete durability, (1)not a**

						concern, (2)rarely a concern, (3)sometimes, (4)often, (5)always
yes	yes	yes	yes	yes		**Quality Control**
yes	yes	yes	yes	yes		
no	no	no	no	no		
no	no	no		yes		
yes	yes	yes		no		
no	no	no	yes			
no	no	no	no	no		
558	142	250				**Traffic Information**
1810	600	1210	900	440		
5%	10%	8%				
						Detail of Traffic Information
752 ft. Elevation	950 ft. Elevation	940 ft. Elevation				**Climate Information**
			61) Core thickness range of 6.85" to 7.90". **101)** 6.0% ahead of paver. 5.4% behind paver.	**69)** Class A stone.		

		Marion - 3	Marion - 4	Marion - 5	Marion - 6
Project location	**1**	T17 beginning at Hwy 92 ending at T15	G76 fro Hwy 14 to S-65	G28 from Hwy 14 to T15	S45 from G76 to Lucas County line
Project number	**2**	SN7650(7)			
Project length (mi)	**3**		4.13	7.50	3.00
Mile post and traffic direction	**4**				
Functional class (Interstate, primary, city street, etc.)	**5**	county road	farm to market	farm to market	county road
Type of concrete pavement (JPCP, JRCP, CRCP)	**6**	JPCP	JPCP	JPCP	JPCP
Design life of the pavement (years)	**7**	20	20	20	20
Base/subgrade construction date (month, day, year)	**8**				
Pavement construction date (month, day, year)	**10**	6/11/78 to 6/23/81 ????	1966	4/1/70 to 10/31/70 (SC)	1968
Traffic opening date (month, day, year)	**12**				7/1/1968
Number of traffic lanes in each direction	**13**	1	1	1	1
Pavement design procedure	**14**				
Level of reliability used in the design, R (%)	**15**				
Standard deviation, S0	**16**				
Resurfacing activities and dates since pavement construction	**17**			Overlay in 2002	ACC overlay in 2003
FWD or Road Rater testing available (Yes, No)	**18**				
Additional comments	**19**				
pavement performance (1 –best, to 6 – poorest performing).	**20**	3	4	5	6
Current surface condition of the pavement (good, fair, poor)	**21**	good	poor	good	good
General comments	**22**		A lot of mid-panel longitudinal cracks. Some patches are pretty bad. Good drainage conditions mostly.	no field survey information due to overlay. However, pavement condition was poor before overlay.	no field survey information due to overlay. However, pavement condition was poor before overlay.
Transverse (%)	**23**				
Longitudinal (%)	**24**		yes		
Corner breaking (%)	**25**				
D-Cracking (low, moderate, high)	**26**				
Patched slabs (%)	**27**		yes		
Performance of patches (L, M, H)	**28**		L,M		
IRI value	**29**				
measurement year	**30**				
Faulting	**31**				
Typical height of faulting (in)	**32**				
Occurences of pumping and water bleeding (explain)	**33**				
Other pavement distresses (scaling, blowups, popouts, shoulder dropoff, etc)	**34**				

		Marion - 3	Marion - 4	Marion - 5	Marion - 6
AASHTO or Unified Soil Classification Group	**35**	Clay and Shale			
AASHTO Classification Group	**36**				
Atterberg Liquid Limit	**37**				
Atterberg Plasticity Index	**38**				
Gradation analysis	**39**				
Modulus of subgrade reaction, k (pcf)	**40**				
Roadbed Resilient Modulus, Mr (pci)	**41**				
CBR, DCP, R-Value	**42**				
Strength results (unconfined compressive strength, etc.) (psi)	**43**				
Percent Proctor density, (%)	**44**				
Maximum dry unit weight (pcf)	**45**				
Optimum water content (%)	**46**				
Specific gravity of solids	**47**				
Saturated hydraulic conductivity, K (ft/hr)	**48**				
Calculated degree of saturation, S (%)	**49**				
QC/QA testing for the subgrade	**50**				
Other available information	**51**				
Type of the subbase/base material (crushed stone, stabilized, pavement)	**52**	none		none	none
Layer thickness (in)	**53**				
Bonding with the PCC layer (bonded, unbounded)	**54**				
AASHTO or Unified Soil Classification Group	**55**				
Gradation analysis	**56**				
Resilient Modulus, Mr (psi)	**57**				
CBR, DCP, R-Value	**58**				
QC/QA testing for the subbase	**59**				
Other available information	**60**				
Slab layer thickness (in)	**61**	8.0	7.0*	7.0*	7.0
Pavement joint spacing (slab length), S (ft)	**62**	20	40	20	40
Slab width, W (ft)	**63**	11	11	11	11
Widened slab width (ft)	**64**		n/a		n/a
Transverse joint angle (skew/rectangular)	**65**	rectangular	rectangular	rectangular	rectangular
Pavement cross slope	**66**		2.0	2.0	2.0
Integral curb (yes/no)	**67**				

Integral curb height (in)	68				
Shoulder type (PCC, ACC, granular base, earth)	69	Granular base*	earth	earth	earth
Shoulder design	70				
Extended-widened shoulders (yes/no)	71		no	no	no
Shoulder width (ft)	72	6.0	3.0	7.0	5.0
Do shoulders have edge drains (yes/no)	73		no	no	no
Shoulder cross slope (%)	74		4.0	4.0	4.0
Thicker edges (yes/no)	75		no	no	no
Edge thickness (in)	76		n/a	n/a	n/a
Load Transfer Mechanism (Dowels/Aggregate Interlock)	77	aggregate interlock	aggregate interlock	aggregate interlock	aggregate interlock
Dowel bar diameter, D (in.)	78				
Dowel bar spacing (in.)	79				
Initial load transfer efficiency (LTE) (%)	80				
Present load transfer efficiency (LTE) (%)	81				
Joint design	82		saw and seal	saw and seal	saw and seal
Saw cut depth (in.)	83		1.75	1.75	1.50
Saw cut thickness (in.)	84				
Tie bar spacing (in)	85		48	48	48
Tie bar diameter (in)	86		0.5	0.5	0.5
Tie bar length (in)	87		36	36	36
Elasticity modulus of concrete, Epcc (psi)	88				
28-day compressive strength of concrete, f'c (psi)	89		2220 to 4840 psi		
Modulus of rupture of concrete, Mr (psi)	90		12 beams 465 to 561psi @ 14days		
Density (unit weight) of concrete, (psi)	91				
Coefficient of thermal expansion of concrete	92				

		Marion - 3	Marion - 4	Marion - 5	Marion - 6
Procedure used for mix design (ACI 211.1, state specific, past experience, etc)	93	IADOT C4WR*	IADOT B-3 mix (Gravel mix)	IADOT B-8 (gravel mix)	IADOT Class B
Design or Typical w/c	94	0.49		0.55	
Maximum w/c	95				
Low slump (in)	96	1.00		0.75	
High slump (in)	97	2.00		2.00	
Average slump (in)	98	1.25			
Low air content (%)	99		3.8 (hardened)	6.1	
High air content (%)	100		9.7 (hardened)	9.0	
Typical air content (%)	101	6.6			
Typical/basic water content (lb/cy)	102	253 to 261	818 ????	305	
Max water content (lb/cy)	103				
Cement content (lb/cy)	104	493	663 ???	558	
Cement Type	105	unknown	unknown	unknown	unknown
Cement source	106	unknown	Penn Dixie and Marquette	unknown	
Fly ash source	107	none	none	none	
Fly ash (lb/cy)	108				
Fly ash SPGR	109				
Coarse aggregate (lb/cy)	110	1512	2377	863	
Coarse aggregate type	111		Gravel	Gravel	
Coarse aggregate source	112	Kaser Durham	Richey Sand and Gravel @ Harvey	unknown	
Coarse aggregate SPGR	113	2.6		2.61	
Maximum size of coarse aggregate (in.)	114			unknown	
Fine aggregate (lb/cy)	115	1558	1917	2129	
Fine aggregate source	116	Kaser Harvey	Richey Sand and Gravel @ Harvey	unknown	
Fine aggregate SPGR	117	2.68			
AEA brand	118	unknown	unknown	unknown	
AEA dosage (oz/cy)	119	unknown	unknown	unknown	
Water reducer brand	120	unknown			
WR dosage (oz/cy)	121				
Curing compound type	122				
Resistance to freezing and thawing	123				
Test method	124				
Strength	125				
Typical design strength	126				
Test method	127				
Permeability	128				
Test method	129				
Shrinkage	130				
restrained/free	131				
Test method	132				
Creep	133				
Test method	134				
Steel	135				
Polypropylene	136				
Polyester	137				
Polyolefin	138				
Nylon	139				
Carbon	140				
Other (describe)	141				

		Marion - 3	Marion - 4	Marion - 5	Marion - 6
Freeze-thaw resistance / Scaling resistance	142				
DEF susceptibility	143				
ASR susceptibility	144				
Chemical attack	145				
Abrastion resistance	146				
Fatigue cracking	147				

Other (describe)	148				
Air test (yes/no)	150	yes	yes	yes	yes
comments	151				
Slump test (yes/no)	152	yes	yes	yes	yes
comments	153				
Maturity method (yes/no)	154	no	no	no	no
comments	155				
Center point beams (yes/no)	156		yes		
comments	157				
Third point beams (yes/no)	158		no		
comments	159				
Compression (yes/no)	160		yes		no
comments	161				
Split tensile (yes/no)	162	no	no	no	no
comments	163				
Other tests	164			Info is available on daily variation of depth, slump, air content, and yield.	
Describe	165				
Initial design ESALs	166				
ESALs per year (presently)	167				
Average daily traffic at the beginning of design period	168				
Forecasted average daily traffic at the end of design period	169				
Current average daily traffic, ADT	170	1000 to 1800	450	700	
Average daily truck traffic at the end of the design period	171				
Average daily truck traffic, ADTT	172				
Percentage of truck traffic in design lane (%)	173				
Truck factor	174				
Annual traffic growth rate, G (%)	175				
Hourly, daily, monthly	176				
Single axles, tandem axles, or just ESALs	177				
FHWA vehicle class types, number of axles per truck	178				
Other available information	179				
Average Freeze-Thaw cycles per year	180				
No of days that air temperature is below 32 degrees F in a year	181				
No of days that air temperature is above 90 degrees F in a year	182				
Number of wet days in a year	183				
Average depth of water table	184				
Other available information	185				
Latitude, Longitude, and Elevation (ft)	186				

Comments

Comment	*	**69)** Class A stone. **93)** Slip form paving; Central mixing; Max-min temp (80F to 75F); Surface texture-astro turf drag.	**61)** 24 cores ranging from 6.60 to 7.40".	**10)** Paving was in August **61)** Core depths ranging from 5.75" to 7.70". Average of 7.07".	

Story - 1					Story - 2	Story - 3
R38 from Lincoln Way to E18		General Information on Pavement Design	Project location	1	160th St. from US65 to Marshall County Line	Cameron School Rd from GW Carver Ave. to R38
			Project number	2		
			Project length (mi)	3		
			Mile post and traffic direction	4		
secondary			Functional class (Interstate, primary, city street, etc.)	5	secondary	secondary
JPCP			Type of concrete pavement (JPCP, JRCP, CRCP)	6	JPCP	JPCP
20			Design life of the pavement (years)	7	20	20
July and August of 1975			Base/subgrade construction date (month, day, year)	8	6/7/1905	1981 to 1982 ??
9/19/80 to 11/4/80			Pavement construction date (month, day, year)	10	5/5/86 to 8/21/86	Jul-84
11/4/1980			Traffic opening date (month, day, year)	12		
1			Number of traffic lanes in each direction	13	1	1
			Pavement design procedure	14	PCA	
			Level of reliability used in the design, R (%)	15		
			Standard deviation, S0	16		
			Resurfacing activities and dates since pavement construction	17		
			FWD or Road Rater testing available (Yes, No)	18		
			Additional comments	19		
1	Pavement Performance	General Performance	pavement performance (1 –best, to 6 – poorest performing).	20	2	3
good			Current surface condition of the pavement (good, fair, poor)	21	good	good
Longitudinal cracks are at mid-panel. Shoulders are wide and ditch is deep.			General comments	22	Most longitudinal cracks are at mid-panel (thick edge effect). Corned breaks are skewed angle breaks. Spring traffic from farming activity.	
		Slab Cracking	Transverse (%)	23		
some			Longitudinal (%)	24	some	
			Corner breaking (%)	25	some	
			D-Cracking (low, moderate, high)	26		
		Patching	Patched slabs (%)	27		
			Performance of patches (L, M, H)	28		
		Pavement Roughness	IRI value	29		
			measurement year	30		
some		Other Distress	Faulting	31	some	
			Typical height of faulting (in)	32		
			Occurences of pumping and water bleeding (explain)	33		
			Other pavement distresses (scaling, blowups, popouts, shoulder dropoff, etc)	34		

Story - 1					Story - 2	Story - 3
		Subgrade Layer	AASHTO or Unified Soil Classification Group	35	A6 - A7	
			AASHTO Classification Group	36		
			Atterberg Liquid Limit	37		
			Atterberg Plasticity Index	38		
			Gradation analysis	39		
			Modulus of subgrade reaction, k (pcf)	40		
			Roadbed Resilient Modulus, Mr (pci)	41		
			CBR, DCP, R-Value	42		
			Strength results (unconfined compressive strength, etc.) (psi)	43		
			Percent Proctor density, (%)	44		
			Maximum dry unit weight (pcf)	45		
			Optimum water content (%)	46		
			Specific gravity of solids	47		
			Saturated hydraulic conductivity, K (ft/hr)	48		
			Calculated degree of saturation, S (%)	49		
			QC/QA testing for the subgrade	50		
			Other available information	51		
none		Subbase Layer	Type of the subbase/base material (crushed stone, stabilized, pavement)	52	none	none
			Layer thickness (in)	53		
			Bonding with the PCC layer (bonded, unbounded)	54		
			AASHTO or Unified Soil Classification Group	55		
			Gradation analysis	56		
			Resilient Modulus, Mr (psi)	57		
			CBR, DCP, R-Value	58		
			QC/QA testing for the subbase	59		
			Other available information	60		
7.5			Slab layer thickness (in)	61	6.5	7.0
15			Pavement joint spacing (slab length), S (ft)	62	15	15
11			Slab width, W (ft)	63	11	11
n/a			Widened slab width (ft)	64	n/a	
skewed			Transverse joint angle (skew/rectangular)	65	skewed	skewed
2.0			Pavement cross slope	66	2.0	
			Integral curb (yes/no)	67		

	Pavement Properties	Integral curb height (in)	68		
		Shoulder type (PCC, ACC, granular base, earth)	69	earth	earth
		Shoulder design	70		
		Extended-widened shoulders (yes/no)	71		
6.5		Shoulder width (ft)	72	6 (3ft min)	8.0
		Do shoulders have edge drains (yes/no)	73	no	no
4.0		Shoulder cross slope (%)	74	4.0	3.0
yes		Thicker edges (yes/no)	75	yes	
7.5		Edge thickness (in)	76	7.5	
aggregate interlock		Load Transfer Mechanism (Dowels/Aggregate Interlock)	77	aggregate interlock	aggregate interlock
		Dowel bar diameter, D (in.)	78		
		Dowel bar spacing (in.)	79		
		Initial load transfer efficiency (LTE) (%)	80		
		Present load transfer efficiency (LTE) (%)	81		
		Joint design	82		
		Saw cut depth (in.)	83	T/3	
		Saw cut thickness (in.)	84		
		Tie bar spacing (in)	85		
		Tie bar diameter (in)	86		
		Tie bar length (in)	87		
		Elasticity modulus of concrete, Epcc (psi)	88		
		28-day compressive strength of concrete, f'c (psi)	89		
29 beams 601 to 768psi @ 14days		Modulus of rupture of concrete, Mr (psi)	90	19 beams 507 to 779psi @ 14days	
		Density (unit weight) of concrete, (psi)	91	102% to 106%	
		Coefficient of thermal expansion of concrete	92		

Story - 1					Story - 2	Story - 3
IADOT Class B-3 w/ calcium chloride	Concrete Mix Design		Procedure used for mix design (ACI 211.1, state specific, past experience, etc)	93	IADOT Class B-6	
0.53 ?		W/C	Design or Typical w/c	94	0.48	
			Maximum w/c	95		
1.50		Slump	Low slump (in)	96		1.00
2.00			High slump (in)	97		1.50
			Average slump (in)	98		
6.0		Air content	Low air content (%)	99	6.8 (ahead of paver)	
7.0			High air content (%)	100	7.8 (ahead of paver)	
			Typical air content (%)	101		5.9
243		Water content	Typical/basic water content (lb/cy)	102	249	
			Max water content (lb/cy)	103		
787 ?		Cement	Cement content (lb/cy)	104	523	
unknown			Cement Type	105	unknown	
Martin Marietta			Cement source	106	Holcim	
none		Fly ash	Fly ash source	107	none	
			Fly ash (lb/cy)	108		
			Fly ash SPGR	109		
1531		CA	Coarse aggregate (lb/cy)	110	1176	
			Coarse aggregate type	111	1.5 (D-57)	
Sargent Quarries, Ames, IA			Coarse aggregate source	112	Martin Merietta	
2.53			Coarse aggregate SPGR	113	2.67	
			Maximum size of coarse aggregate (in.)	114		
1287		FA	Fine aggregate (lb/cy)	115	1805	
Hallets, Christensen Pit			Fine aggregate source	116	Hallets	
2.66			Fine aggregate SPGR	117	2.66	
unknown		Chemical Admixtures	AEA brand	118	unknown	unknown
unknown			AEA dosage (oz/cy)	119	unknown	unknown
			Water reducer brand	120		
			WR dosage (oz/cy)	121		
			Curing compound type	122		
IADOT requirements		Hardened concrete tests	Resistance to freezing and thawing	123		
			Test method	124		
IADOT requirements			Strength	125	**X**	
			Typical design strength	126	MOR=550 (14-day)	
			Test method	127		
IADOT requirements			Permeability	128		
			Test method	129		
IADOT requirements			Shrinkage	130		
			restrained/free	131		
			Test method	132		
IADOT requirements			Creep	133		
			Test method	134		
		Fibers used in paving mixes	Steel	135		
			Polypropylene	136		
			Polyester	137		
			Polyolefin	138		
			Nylon	139		
			Carbon	140		
			Other (describe)	141		

Story - 1					Story - 2	Story - 3
X		Rank the primary concerns about concrete durability, (1)not a concern, (2)rarely	Freeze-thaw resistance / Scaling resistance	142	X	X
			DEF susceptibility	143		
			ASR susceptibility	144		
			Chemical attack	145		
			Abrastion resistance	146		
2			Fatigue cracking	147	2	2

		concern, (2)rarely a concern, (3)sometimes, (4)often, (5)always	Other (describe)	148		
yes		**Quality Control**	Air test (yes/no)	150	yes	yes
			comments	151		
yes			Slump test (yes/no)	152	yes	yes
			comments	153		
no			Maturity method (yes/no)	154	no	no
			comments	155		
no			Center point beams (yes/no)	156	no	no
			comments	157		
yes			Third point beams (yes/no)	158	yes	yes
			comments	159		
no			Compression (yes/no)	160	no	no
			comments	161		
no			Split tensile (yes/no)	162	no	no
			comments	163		
			Other tests	164		
			Describe	165		
		Traffic Information	Initial design ESALs	166		
			ESALs per year (presently)	167		
			Average daily traffic at the beginning of design period	168	110	260 to 350
			Forecasted average daily traffic at the end of design period	169		
			Current average daily traffic, ADT	170		
			Average daily truck traffic at the end of the design period	171		
			Average daily truck traffic, ADTT	172		
			Percentage of truck traffic in design lane (%)	173	10%	20%
			Truck factor	174		
			Annual traffic growth rate, G (%)	175		
		Detail of Traffic Information	Hourly, daily, monthly	176		
			Single axles, tandem axles, or just ESALs	177		
			FHWA vehicle class types, number of axles per truck	178		
			Other available information	179		
		Climate Information	Average Freeze-Thaw cycles per year	180		
			No of days that air temperature is below 32 degrees F in a year	181		
			No of days that air temperature is above 90 degrees F in a year	182		
			Number of wet days in a year	183		
			Average depth of water table	184		
			Other available information	185		
			Latitude, Longitude, and Elevation (ft)	186		
			Comments			
			Comment	*		

Pocahontas -1	Pocahontas -2	Pocahontas - 3				
D11 on Calhoun County line, N41 and West	C29 from N28 east to Ware	N41 Calhoun County Line/D11 north to C56		General Information on Pavement Design	Project location	1
FM-76(4)	S-289(6)	S-2175(3)--50-76			Project number	2
	< 5	5.00			Project length (mi)	3
					Mile post and traffic direction	4
farm to market	county road	county road			Functional class (Interstate, primary, city street, etc.)	5
JPCP	JPCP	JPCP			Type of concrete pavement (JPCP, JRCP, CRCP)	6
20	20	20			Design life of the pavement (years)	7
July 1978 ??	1957				Base/subgrade construction date (month, day, year)	8
1978/1981	1960	1971			Pavement construction date (month, day, year)	10
					Traffic opening date (month, day, year)	12
1	1	1			Number of traffic lanes in each direction	13
	IADOT PCA	IADOT PCA			Pavement design procedure	14
					Level of reliability used in the design, R (%)	15
					Standard deviation, S0	16
					Resurfacing activities and dates since pavement construction	17
					FWD or Road Rater testing available (Yes, No)	18
					Additional comments	19
1	2	3	Pavement Performance	General Performance	pavement performance (1 –best, to 6 – poorest performing).	20
very good	good	good			Current surface condition of the pavement (good, fair, poor)	21
Cracking related to subgrade. Deep and wide ditches. Good drainage. Couple mid panel and longitudinal cracks.	some longitudinal cracking, mid-panel cracking. Patches were corner breaks occurred.	Wide shoulders, good drainage.			General comments	22
3	2	2		Slab Cracking	Transverse (%)	23
5	2	2			Longitudinal (%)	24
		0			Corner breaking (%)	25
		none			D-Cracking (low, moderate, high)	26
	some	some		Patching	Patched slabs (%)	27
	H	L			Performance of patches (L, M, H)	28
				Pavement Roughness	IRI value	29
					measurement year	30
	minor	none		Other Distress	Faulting	31
	low				Typical height of faulting (in)	32
		none			Occurences of pumping and water bleeding (explain)	33
		none			Other pavement distresses (scaling, blowups, popouts, shoulder dropoff, etc)	34

Pocahontas -1	Pocahontas -2	Pocahontas - 3			
Black dirt and gravel			Subgrade Layer	AASHTO or Unified Soil Classification Group	35
				AASHTO Classification Group	36
				Atterberg Liquid Limit	37
				Atterberg Plasticity Index	38
				Gradation analysis	39
				Modulus of subgrade reaction, k (pcf)	40
				Roadbed Resilient Modulus, Mr (pci)	41
				CBR, DCP, R-Value	42
				Strength results (unconfined compressive strength, etc.) (psi)	43
				Percent Proctor density, (%)	44
				Maximum dry unit weight (pcf)	45
				Optimum water content (%)	46
				Specific gravity of solids	47
				Saturated hydraulic conductivity, K (ft/hr)	48
				Calculated degree of saturation, S (%)	49
				QC/QA testing for the subgrade	50
				Other available information	51
			Subbase Layer	Type of the subbase/base material (crushed stone, stabilized, pavement)	52
				Layer thickness (in)	53
				Bonding with the PCC layer (bonded, unbounded)	54
				AASHTO or Unified Soil Classification Group	55
				Gradation analysis	56
				Resilient Modulus, Mr (psi)	57
				CBR, DCP, R-Value	58
				QC/QA testing for the subbase	59
				Other available information	60
6.0*	6.0	6.0		Slab layer thickness (in)	61
40	40	15		Pavement joint spacing (slab length), S (ft)	62
11	10.5	11		Slab width, W (ft)	63
				Widened slab width (ft)	64
skewed	rectangular	skewed		Transverse joint angle (skew/rectangular)	65
	2.0	2.0		Pavement cross slope	66
				Integral curb (yes/no)	67

			Pavement Properties		Integral curb height (in)	68
earth	granular	granular/earth			Shoulder type (PCC, ACC, granular base, earth)	69
					Shoulder design	70
	no	no			Extended-widened shoulders (yes/no)	71
4.0	3.0	6.0			Shoulder width (ft)	72
	no	no			Do shoulders have edge drains (yes/no)	73
	4.0	4.0			Shoulder cross slope (%)	74
	no	no			Thicker edges (yes/no)	75
	n/a	n/a			Edge thickness (in)	76
aggregate interlock	aggregate interlock	aggregate interlock			Load Transfer Mechanism (Dowels/Aggregate Interlock)	77
					Dowel bar diameter, D (in.)	78
					Dowel bar spacing (in.)	79
					Initial load transfer efficiency (LTE) (%)	80
					Present load transfer efficiency (LTE) (%)	81
	saw and seal	saw and seal			Joint design	82
	1.50	1.50			Saw cut depth (in.)	83
					Saw cut thickness (in.)	84
	48	48			Tie bar spacing (in)	85
	0.5	0.5			Tie bar diameter (in)	86
	36	36			Tie bar length (in)	87
					Elasticity modulus of concrete, Epcc (psi)	88
Range of (2895psi to 4240psi). 1 year from 4800 to 5900psi.					28-day compressive strength of concrete, f'c (psi)	89
14-day (571, 587, 687, 638, 573)					Modulus of rupture of concrete, Mr (psi)	90
					Density (unit weight) of concrete, (psi)	91
					Coefficient of thermal expansion of concrete	92

Pocahontas -1	Pocahontas -2	Pocahontas - 3				
IADOT Class B, slipform	IADOT B-3		Concrete Mix Design		Procedure used for mix design (ACI 211.1, state specific, past experience, etc)	93
0.51				**W/C**	Design or Typical w/c	94
					Maximum w/c	95
1.25				**Slump**	Low slump (in)	96
3.00					High slump (in)	97
					Average slump (in)	98
5.9				**Air content**	Low air content (%)	99
7.6					High air content (%)	100
					Typical air content (%)	101
275				**Water content**	Typical/basic water content (lb/cy)	102
					Max water content (lb/cy)	103
493				**Cement**	Cement content (lb/cy)	104
					Cement Type	105
Northwestern States Cement Co., Mason City, IA					Cement source	106
none				**Fly ash**	Fly ash source	107
					Fly ash (lb/cy)	108
					Fly ash SPGR	109
1541				**CA**	Coarse aggregate (lb/cy)	110
					Coarse aggregate type	111
Hallet, Gilmore City					Coarse aggregate source	112
2.65					Coarse aggregate SPGR	113
					Maximum size of coarse aggregate (in.)	114
1546				**FA**	Fine aggregate (lb/cy)	115
Hallet, Lake View, IA					Fine aggregate source	116
2.66					Fine aggregate SPGR	117
unknown	unknown	unknown		**Chemical Admixtures**	AEA brand	118
unknown	unknown	unknown			AEA dosage (oz/cy)	119
					Water reducer brand	120
					WR dosage (oz/cy)	121
spray white pigment					Curing compound type	122
				Hardened concrete tests	Resistance to freezing and thawing	123
					Test method	124
					Strength	125
					Typical design strength	126
					Test method	127
					Permeability	128
					Test method	129
					Shrinkage	130
					restrained/free	131
					Test method	132
					Creep	133
					Test method	134
				Fibers used in paving mixes	Steel	135
					Polypropylene	136
					Polyester	137
					Polyolefin	138
					Nylon	139
					Carbon	140
					Other (describe)	141

Pocahontas -1	Pocahontas -2	Pocahontas - 3				
				Rank the primary concerns about concrete durability, (1)not a concern, (2)rarely	Freeze-thaw resistance / Scaling resistance	142
					DEF susceptibility	143
					ASR susceptibility	144
					Chemical attack	145
					Abrastion resistance	146
					Fatigue cracking	147

				concern, (2)rarely a concern, (3)sometimes, (4)often, (5)always	Other (describe)	**148**
yes		yes		**Quality Control**	Air test (yes/no)	**150**
					comments	**151**
yes		yes			Slump test (yes/no)	**152**
					comments	**153**
no		no			Maturity method (yes/no)	**154**
					comments	**155**
		yes			Center point beams (yes/no)	**156**
					comments	**157**
		no			Third point beams (yes/no)	**158**
					comments	**159**
yes		no			Compression (yes/no)	**160**
					comments	**161**
no		no			Split tensile (yes/no)	**162**
					comments	**163**
					Other tests	**164**
					Describe	**165**
				Traffic Information	Initial design ESALs	**166**
					ESALs per year (presently)	**167**
					Average daily traffic at the beginning of design period	**168**
					Forecasted average daily traffic at the end of design period	**169**
170	230	330			Current average daily traffic, ADT	**170**
					Average daily truck traffic at the end of the design period	**171**
					Average daily truck traffic, ADTT	**172**
					Percentage of truck traffic in design lane (%)	**173**
					Truck factor	**174**
					Annual traffic growth rate, G (%)	**175**
				Detail of Traffic Information	Hourly, daily, monthly	**176**
					Single axles, tandem axles, or just ESALs	**177**
					FHWA vehicle class types, number of axles per truck	**178**
					Other available information	**179**
				Climate Information	Average Freeze-Thaw cycles per year	**180**
					No of days that air temperature is below 32 degrees F in a year	**181**
					No of days that air temperature is above 90 degrees F in a year	**182**
					Number of wet days in a year	**183**
					Average depth of water table	**184**
					Other available information	**185**
					Latitude, Longitude, and Elevation (ft)	**186**

Comments

61) Cores thickness from 5.80" to 6.20"					Comment	*****

Pocahontas - 4	Pocahontas - 5	Pocahontas - 6	Council Bluffs - 1	Council Bluffs - 2		
P19 from Calhoun County line to C66 FM-76(26)--55-76 1.99 county road JPCP 20 1988 1 IADOT PCA	Quarry Rd. from IA hwy 3 N.W to P15 FM-76(24)--55-76 1.40 county road JPCP 20 1983 06/01/84 6/30/1984 1 IADOT PCA	N65 from IA Hwy 15 north to C15 FM-76(30)--55-76 4+ county road JPCP 20 6/14/1993 09/30/93 1	Big Lake Road from N 8th St to Hwy 192 residential city street JPCP unknown 1974 1	23rd Ave. from south 16th St. to south 24th St. city street JPCP unknown 1975 1		**General Information on Pavement Design**
4 very good Longitudinal, mid panel cracks	5 Mid panel longitudinal cracking	6 fair Mid panel cracks caused by subgrade.	1 good some longitudinal cracks, some potholing, some shattered slabs, near bridge and railroad viaduct. Not much heavy truck traffic.	1 good no field survey info	**Pavement Performance**	**General Performance**
2 2 none	2	some 15	3 3			**Slab Cracking**
	2 patches M					**Patching**
	Profile, 13.4in/mi and 12.86in/mi; Roadmeter, 81in/mi 1984	3.3in/mi and 5.3in/mi 1993				**Pavement Roughness**
						Other Distress

Pocahontas - 4	Pocahontas - 5	Pocahontas - 6	Council Bluffs - 1	Council Bluffs - 2	
		Limestone, black soil			**Subgrade Layer**
	none		none	granular	**Subbase Layer**
7.0 15 11 n/a skewed 2.0	8.0 15 10 n/a rectangular 2.0	7.0* 15 11 skewed 2.0	6.0 15 12 no rectangular likely ??	8.0 20 12 no rectangular	

granular	granular	earth	earth	granular	**Pavement Properties**
no	no	no			
??	6.0	4.5			
no	no	no			
4.0	4.0	4.0			
	no	no			
	n/a	n/a			
aggregate interlock	aggregate interlock	aggregate interlock	aggregate interlock	aggregate interlock	
saw and seal	saw and seal				
1.50	1.50				
48	48				
0.5	0.5				
36	36				
	Range of 553psi to 835psi, Average of 650psi	14-day (526, 610, 738, 640, 670, 582, 564); 7-day (497, 543, 623, 634, 505)			

Pocahontas - 4	Pocahontas - 5	Pocahontas - 6	Council Bluffs - 1	Council Bluffs - 2		
	IADOT B-3	IADOT B-4-C			**Concrete Mix Design**	
	0.60	0.54 0.60				**W/C**
	1.25 2.75 1.75	2.00 3.00				**Slump**
	5.4 7.0 6.4	6.0 7.0				**Air content**
	287	263 293				**Water content**
	479 Northwestern	418 unknown				**Cement**
	none	Class C Fly ash 71 unknown				**Fly ash**
	1706 Class 2 durability Midwest L., Gilmore City 2.64 1.5	1540 Gilmore City (A76004) 2.71				**CA**
	1407 Midwest Const. Matls., Spencer 2.66	1543 Giese, Emmetsburg (A74502) 2.68				**FA**
unknown unknown	Protex unknown WR meadows Inc	unknown unknown				**Chemical Admixtures**
						Hardened concrete tests
						Fibers used in paving mixes

Pocahontas - 4	Pocahontas - 5	Pocahontas - 6	Council Bluffs - 1	Council Bluffs - 2		
						Rank the primary concerns about concrete durability, (1)not a

						concern, (2)rarely a concern, (3)sometimes, (4)often, (5)always
	yes yes no yes no no no	yes yes no yes no no no				**Quality Control**
200	240	240 to 340	2800	11700		**Traffic Information**
						Detail of Traffic Information
						Climate Information
		61) Core thickness range from 6.75" to 7.5". Average of 7.12".				

		Council Bluffs - 3	Council Bluffs - 4	Council Bluffs - 5	Council Bluffs - 6
Project location	**1**	South 16th St. from 16th Ave. to 23rd Ave.	Lew Ross Road from south 11 St. to south 15th St.	2nd Ave. from south 8th St. to south 13th St.	5th Ave. from south 26th St. to south 35th St.
Project number	**2**				
Project length (mi)	**3**				
Mile post and traffic direction	**4**				
Functional class (Interstate, primary, city street, etc.)	**5**	city street	city street	city street	city street
Type of concrete pavement (JPCP, JRCP, CRCP)	**6**	JPCP	JPCP	JPCP	JPCP
Design life of the pavement (years)	**7**	unknown	unknown	unknown	unknown
Base/subgrade construction date (month, day, year)	**8**				
Pavement construction date (month, day, year)	**10**	1975	1999	2000	1999
Traffic opening date (month, day, year)	**12**				
Number of traffic lanes in each direction	**13**	1	1	1	1
Pavement design procedure	**14**				
Level of reliability used in the design, R (%)	**15**				
Standard deviation, S0	**16**				
Resurfacing activities and dates since pavement construction	**17**				
FWD or Road Rater testing available (Yes, No)	**18**				
Additional comments	**19**				
pavement performance (1 –best, to 6 – poorest performing).	**20**	1	5	5	5
Current surface condition of the pavement (good, fair, poor)	**21**	good	good	good	good
General comments	**22**	no field survey info	Couple of utility patches. Heavy truck traffic.	longitudinal cracking @ inside wheel path.	Longitudinal cracking at isolated locations. Two shattered slabs by intakes
Transverse (%)	**23**				
Longitudinal (%)	**24**			1	3
Corner breaking (%)	**25**				
D-Cracking (low, moderate, high)	**26**				
Patched slabs (%)	**27**		some		
Performance of patches (L, M, H)	**28**				
IRI value	**29**				
measurement year	**30**				
Faulting	**31**				
Typical height of faulting (in)	**32**				
Occurences of pumping and water bleeding (explain)	**33**				
Other pavement distresses (scaling, blowups, popouts, shoulder dropoff, etc)	**34**				

		Council Bluffs - 3	Council Bluffs - 4	Council Bluffs - 5	Council Bluffs - 6
AASHTO or Unified Soil Classification Group	**35**				
AASHTO Classification Group	**36**				
Atterberg Liquid Limit	**37**				
Atterberg Plasticity Index	**38**				
Gradation analysis	**39**				
Modulus of subgrade reaction, k (pcf)	**40**				
Roadbed Resilient Modulus, Mr (pci)	**41**				
CBR, DCP, R-Value	**42**				
Strength results (unconfined compressive strength, etc.) (psi)	**43**				
Percent Proctor density, (%)	**44**				
Maximum dry unit weight (pcf)	**45**				
Optimum water content (%)	**46**				
Specific gravity of solids	**47**				
Saturated hydraulic conductivity, K (ft/hr)	**48**				
Calculated degree of saturation, S (%)	**49**				
QC/QA testing for the subgrade	**50**				
Other available information	**51**				Fly ash was used to modify subgrade. Initial subgrade lacked support.
Type of the subbase/base material (crushed stone, stabilized, pavement)	**52**	none	granular	granular	granular
Layer thickness (in)	**53**			7.0	7.0
Bonding with the PCC layer (bonded, unbounded)	**54**				
AASHTO or Unified Soil Classification Group	**55**				
Gradation analysis	**56**				
Resilient Modulus, Mr (psi)	**57**				
CBR, DCP, R-Value	**58**				
QC/QA testing for the subbase	**59**				
Other available information	**60**				
Slab layer thickness (in)	**61**	8.0	8.0	8.0	7.0
Pavement joint spacing (slab length), S (ft)	**62**	20	15	15	15
Slab width, W (ft)	**63**	12	14	41 feet total	12.5
Widened slab width (ft)	**64**	no			
Transverse joint angle (skew/rectangular)	**65**	rectangular	rectangular	rectangular	rectangular
Pavement cross slope	**66**				
Integral curb (yes/no)	**67**				

Integral curb height (in)	**68**				
Shoulder type (PCC, ACC, granular base, earth)	**69**	granular	earth	earth	earth
Shoulder design	**70**				
Extended-widened shoulders (yes/no)	**71**				
Shoulder width (ft)	**72**				
Do shoulders have edge drains (yes/no)	**73**				
Shoulder cross slope (%)	**74**				
Thicker edges (yes/no)	**75**				
Edge thickness (in)	**76**				
Load Transfer Mechanism (Dowels/Aggregate Interlock)	**77**	aggregate interlock	aggregate interlock	aggregate interlock	aggregate interlock
Dowel bar diameter, D (in.)	**78**				
Dowel bar spacing (in.)	**79**				
Initial load transfer efficiency (LTE) (%)	**80**				
Present load transfer efficiency (LTE) (%)	**81**				
Joint design	**82**				
Saw cut depth (in.)	**83**				
Saw cut thickness (in.)	**84**				
Tie bar spacing (in)	**85**				
Tie bar diameter (in)	**86**				
Tie bar length (in)	**87**				
Elasticity modulus of concrete, Epcc (psi)	**88**				
28-day compressive strength of concrete, f'c (psi)	**89**				
Modulus of rupture of concrete, Mr (psi)	**90**				
Density (unit weight) of concrete, (psi)	**91**				
Coefficient of thermal expansion of concrete	**92**				

		Council Bluffs - 3	Council Bluffs - 4	Council Bluffs - 5	Council Bluffs - 6
Procedure used for mix design (ACI 211.1, state specific, past experience, etc)	**93**				
Design or Typical w/c	**94**				
Maximum w/c	**95**				
Low slump (in)	**96**				
High slump (in)	**97**				
Average slump (in)	**98**				
Low air content (%)	**99**				
High air content (%)	**100**				
Typical air content (%)	**101**				
Typical/basic water content (lb/cy)	**102**				
Max water content (lb/cy)	**103**				
Cement content (lb/cy)	**104**				
Cement Type	**105**				
Cement source	**106**				
Fly ash source	**107**				
Fly ash (lb/cy)	**108**				
Fly ash SPGR	**109**				
Coarse aggregate (lb/cy)	**110**				
Coarse aggregate type	**111**				
Coarse aggregate source	**112**				
Coarse aggregate SPGR	**113**				
Maximum size of coarse aggregate (in.)	**114**				
Fine aggregate (lb/cy)	**115**				
Fine aggregate source	**116**				
Fine aggregate SPGR	**117**				
AEA brand	**118**				
AEA dosage (oz/cy)	**119**				
Water reducer brand	**120**				
WR dosage (oz/cy)	**121**				
Curing compound type	**122**				
Resistance to freezing and thawing	**123**				
Test method	**124**				
Strength	**125**				
Typical design strength	**126**				
Test method	**127**				
Permeability	**128**				
Test method	**129**				
Shrinkage	**130**				
restrained/free	**131**				
Test method	**132**				
Creep	**133**				
Test method	**134**				
Steel	**135**				
Polypropylene	**136**				
Polyester	**137**				
Polyolefin	**138**				
Nylon	**139**				
Carbon	**140**				
Other (describe)	**141**				

		Council Bluffs - 3	Council Bluffs - 4	Council Bluffs - 5	Council Bluffs - 6
Freeze-thaw resistance / Scaling resistance	**142**				
DEF susceptibility	**143**				
ASR susceptibility	**144**				
Chemical attack	**145**				
Abrastion resistance	**146**				
Fatigue cracking	**147**				

Other (describe)	**148**				
Air test (yes/no)	**150**				
comments	**151**				
Slump test (yes/no)	**152**				
comments	**153**				
Maturity method (yes/no)	**154**				
comments	**155**				
Center point beams (yes/no)	**156**				
comments	**157**				
Third point beams (yes/no)	**158**				
comments	**159**				
Compression (yes/no)	**160**				
comments	**161**				
Split tensile (yes/no)	**162**				
comments	**163**				
Other tests	**164**				
Describe	**165**				
Initial design ESALs	**166**				
ESALs per year (presently)	**167**				
Average daily traffic at the beginning of design period	**168**				
Forecasted average daily traffic at the end of design period	**169**				
Current average daily traffic, ADT	**170**	3000	500	2500	2900
Average daily truck traffic at the end of the design period	**171**				
Average daily truck traffic, ADTT	**172**				
Percentage of truck traffic in design lane (%)	**173**				
Truck factor	**174**				
Annual traffic growth rate, G (%)	**175**				
Hourly, daily, monthly	**176**				
Single axles, tandem axles, or just ESALs	**177**				
FHWA vehicle class types, number of axles per truck	**178**				
Other available information	**179**				
Average Freeze-Thaw cycles per year	**180**				
No of days that air temperature is below 32 degrees F in a year	**181**				
No of days that air temperature is above 90 degrees F in a year	**182**				
Number of wet days in a year	**183**				
Average depth of water table	**184**				
Other available information	**185**				
Latitude, Longitude, and Elevation (ft)	**186**				

Comments

Comment	*				

APPENDIX F: PCC PAVEMENT PERFORMANCE DATA FOR IOWA PRIMARY SECTIONS

ROUTE	DIR	BPOST	EPOST	SYSTEM	PAVTYP	COUNTY	DESCRIPT
1	1	000 00	001 59	3	1	89	From JCT IA 1/IA 2 North 1.6 Miles
1	1	002 10	003 62	3	1	89	From 2.1 Miles N Of JCT IA 1/IA 2 North To SCL Keosauqua
1	1	004 04	004 34	3	1	89	From Int Main & 1st North To Int Dodge St. & Broad St.
1	1	054 82	057 90	3	1	92	From S JCT IA 1/IA 92 North To N JCT IA 1/IA 92
1	1	068 04	068 35	3	1	92	From INT C Ave & 1st St N To 0.2 Mi N of JCT IA 1/IA 22
1	1	082 69	084 14	3	1	52	From 0.1 Mi W of Kitty Lee Rd NE to 0.1 Mi N SCL Iowa City
1	1	084 14	085 24	3	1	52	0.1 Mi N of SCL Iowa City N to 0.1 Mi N of JCT IA 1/US 6
1	1	085 24	086 54	3	1	52	0.1 Mi N of JCT IA 1/US 6 North to 0.1 Mi N of Gilbert St.
1	1	086 97	087 61	3	1	52	0.1 Mi N Burlington/Governor St. N to 0.1 Mi N Church St.
1	1	087 61	087 96	3	1	52	From 0.1 Mi N of Church St. to Governor/Dodge St. Iowa Cty
1	2	082 69	084 14	3	1	52	From 0.12 Mi W Of Kitty Lee Road NE To SCL Iowa City
1	2	084 14	085 16	3	1	52	From SCL Iowa City North To Jct IA 1/US 6 Iowa City
2	1	016 98	018 28	3	1	36	0.95 E of Sidney East To 1.19 Miles W of JCT IA 2/CoRd L68
2	1	018 28	028 61	3	1	36	1.19 Miles W of JCT Co Rd L68 East To Fremont/Page Co Line
2	1	048 15	050 08	3	1	73	From 0.1 Mi W of State St. (Clarinda) East to W JCT US 71
2	1	053 64	056 84	3	1	73	From JCT IA 2/Co N14 East To Page/Taylor Co Line
2	1	056 84	068 70	3	1	87	From Page/Taylor Co Line East To WCL Bedford
2	1	068 70	069 09	3	1	87	From WCL Bedford East To E JCT IA 2/IA 148
2	1	069 09	070 00	3	1	87	From E JCT IA 2/IA 148 East To JCT IA 2/IA 49
2	1	137 46	144 58	3	1	93	From JCT IA 2/US 65 East To JCT IA 2/Co S23
2	1	144 58	147 08	3	1	93	From JCT IA 2/Co S23 East To WCL Corydon
2	1	147 08	147 95	3	1	93	From WCL Corydon East To ECL Corydon
2	1	159 26	170 21	3	1	4	From Wayne/Appanoose Co Line East To WCL Centerville
2	1	170 21	170 74	3	1	4	From WCL Centerville East To West Maple St
2	1	170 74	171 59	3	1	4	From West Maple St To Int IA 5
2	1	248 29	248 77	3	1	56	From WCL Donnellson East To ECL Donnellson
2	1	248 77	254 18	3	1	56	From ECL Donnellson East To 2 Mi W of JCT IA 2/Co Rd X23
2	1	254 18	257 57	3	1	56	From 2 Mi W Of JCT IA 2/Co Rd X23 East To W JCT IA 2/US 61
3	1	017 47	026 87	3	1	75	From S JCT IA 3/Co Rd K22 East To WCL Le Mars
3	1	026 87	027 46	3	1	75	From WCL Le Mars East To 0.12Mi W Int Plymouth St & 6th Av
3	1	066 60	069 60	3	1	18	From JCT IA 3/IA 7 East To Cherokee/Buena Vista Co Line
3	1	069 60	073 59	3	1	11	From Cherokee/Buena Vista Co Line East To JCT IA 3/Co M31
3	1	073 59	081 61	3	1	11	From JCT IA 3/Co M31 East To JCT IA 3/US 71
3	1	106 64	107 42	3	1	76	From 2nd St. To 0.5Mi East of ECL Pocahontas
3	1	129 30	130 28	3	1	46	From Int IA 3 & 13th St & HWY 169 To ECL Humboldt
3	1	130 28	131 52	3	1	46	From ECL Humboldt East To 1/4 Mi E Of JCT IA 3/Co Rd P56
3	1	171 71	172 69	3	1	35	From 0.5 Mi W of Jct I-35 E To 0.5 Mi E of Jct I-35
3	1	178 69	180 50	3	1	35	From JCT IA 3/Co S41 East To JCT IA 3/Co S42
3	1	181 67	182 69	3	1	35	100' E of Int Central & 7th To 320' E of Int Central & 8th
3	1	251 56	252 17	3	1	33	From 0.1Mi N of NCL Oelwien S&E To Jct Frederick Ave N
3	1	252 17	253 10	3	1	33	From Jct Frederick Ave N To Int Charles St E & 9th
4	1	010 22	011 82	3	1	39	From S JCT IA 4/IA 141 North To Guthrie/Greene Co Line
4	1	011 82	016 80	3	1	37	From Guthrie/Greene Co Line North To N JCT IA 4/Co E57
4	1	016 80	021 11	3	1	37	From N JCT IA 4/Co E57 North to 0.5 Mi S of SCL Jefferson
4	1	022 57	023 88	3	1	37	From Int W Lincoln Way & S Elm St To Jct IA 4/US 30
4	1	023 88	025 74	3	1	37	From JCT IA 4/US 30 North To 1.56 Miles N Of NCL Jefferson
4	1	025 74	036 81	3	1	37	From 1.56 Mi N Of NCL Jefferson N & W To JCT IA 4/Co E19
4	1	036 81	040 87	3	1	37	From JCT IA 4/Co E19 North To Greene/Calhoun Co Line
4	1	040 87	044 85	3	1	13	From Greene/Calhoun Co Line North To E JCT IA 4/IA 175
4	1	086 56	086 87	3	1	76	From SCL Pocahontas North To Int SW 7th St & Elm Ave
4	1	101 04	112 07	3	1	74	From JCT IA 4/Co B63 North To SCL Emmetsburg
4	1	112 07	113 13	3	1	74	From SCL Emmetsburg To E JCT IA 4/US 18
4	1	136 51	137 34	3	1	32	From 0.2 Mi S of SCL to S 9th St at Overpass CRI&P RR
5	1	003 93	004 69	3	1	4	From WCL Cincinnati East To Int Pleasant St & Liberty St
5	1	060 26	065 30	3	1	63	From E JCT IA 5/IA 92 to 0.2 Mi W of White Breast Creek
5	2	060 26	065 44	3	1	63	From E JCT IA 5/IA 92 to White Breast Creek
5	2	083 70	084 50	3	1	91	From 0.3 Mi NW of Vine St. Northwest to Cleveland Place
6	1	002 98	003 36	2	1	78	From 0.1 Mi E of 16th St. East to 0.2 Mi W of 8th St. C.B.
6	1	003 76	004 58	2	1	78	From 8th St. Northeast to 6th St. in Council Bluffs
6	1	004 58	005 52	2	1	78	From 6th St. Northeast to 0.1 Mi NE of College Rd. in C.B.
6	1	007 27	007 87	2	1	78	From 0.3 Mi W JCT I-80 East to 0.1 Mi W of Co Rd G6L
6	1	054 67	056 68	2	1	15	From W JCT US 6/US 71 East To E JCT US 6/US 71
6	1	139 90	140 36	2	1	77	From 0.1 Mi W of W. Int. E 33rd St. East to E. 38th St.
6	1	140 36	141 38	2	1	77	From E. 38th St. Northeast to NE 44th Dr. (Des Moines)
6	1	141 38	142 18	2	1	77	From NE 44th Dr. NE to 0.1 Mi E of JCT US 6/Co Rd F52
6	1	166 20	167 17	2	1	50	From JCT US 6/US 65 North to 0.1 Mi S of N JCT US 6/IA 14
6	1	167 17	167 52	2	1	50	From 0.1 Mi S of N JCT IA 14 East to 0.1 Mi E of W 16th St
6	1	187 02	187 75	2	1	79	160' E of Int 6th Ave & Park St To Int 6th Ave & PenroseSt
6	1	193 82	202 28	2	1	79	From W JCT US 6/US 63 East To 0.63 Mi E Of E JCT Co Rd V18
6	1	202 28	208 89	2	1	79	From 0.63 Mi E Of E JCT V18 East To Poweshiek/Iowa Co Line
6	1	235 72	240 43	2	1	52	From W Oxford Turnoff East 4.72 Miles
6	1	245 33	246 69	2	1	52	From 0.5 Mi SE US 6/I380/US 218 to 0.3 Mi NW JCT IA 965
6	1	246 69	247 21	2	1	52	From 0.3 Mi NW JCT IA 965 Southeast 0.3 Miles in Iowa City
6	1	247 21	249 89	2	1	52	From 0.3 Mi SE JCT IA 965 Southeast to WCL Iowa City
6	1	250 26	250 96	2	1	52	From 0.2 Mi SE Hawkins Dr./Rocky Shore Rd to Riverside Dr.
6	1	250 96	254 64	2	1	52	From Riverside Dr. East To ECL Iowa City
6	1	254 64	260 08	2	1	52	From ECL Iowa City East To JCT US 6/Co F46
6	1	280 39	282 52	2	1	70	From S JCT US 6/IA 38 North To Muscatine/Cedar Co Line
6	1	303 62	305 46	2	1	82	From Hickory Grove Rd. To North Pine St.
6	1	305 46	306 49	2	1	82	From N. Pine St. East to Marquette St.
6	1	309 43	309 82	2	1	82	From Elmore Ave. East to JCT US 6 / I-74
6	2	002 77	003 36	2	1	78	From 16th St. East to 0.2 Mi W of 8th St in Council Bluff
6	2	003 36	003 76	2	1	78	From 0.2 Mi W of 8th St. East to 6th St. in Council Bluffs
6	2	003 76	004 58	2	1	78	From 6th St. NE to Ridge St./N. Broadway in Council Bluffs
6	2	004 58	005 43	2	1	78	From Ridge St./N. Broadway NE to College Rd. in Council Bl
6	2	007 36	007 90	2	1	78	From 0.2 Mi W of JCT I-80 East to 0.3 Mi E of JCT I-80 CB
6	2	166 20	167 44	2	1	50	From JCT US 6/US 65 to W. 16th St. N
6	2	246 74	247 30	2	1	52	From Int US 6 & IA 965 To 320' SE of Int US 6 & 25th Ave
6	2	250 91	251 34	2	1	52	From Jct Riverside Dr To 0.15 Mi NW of Int Riverside &IA
6	2	251 87	254 51	2	1	52	From Int Riverside Dr & Sturgis Corner Dr To ECL Iowa Cit
6	2	303 91	305 46	2	1	82	From 0.05 Mi W of Fairmont St. East to N. Pine St.
6	2	305 46	306 49	2	1	82	From N. Pine St. East to Marquette St.
6	2	307 22	308 76	2	1	82	From JCT US 6 / US 61 NB East to Jersey Ridge Rd.

ROUTE	DIR	BPOST	EPOST	SYSTEM	PAVTYP	COUNTY	DESCRIPT
6	2	308 76	309 43	2	1	82	From Jersey Ridge Rd. East to Elmore Ave.
6	2	309 43	309 82	2	1	82	From Elmore Ave. East to JCT US 6 / I-74
7	1	015 15	015 84	3	1	11	From Barton St. (Storm Lake) to JCT IA 7 / IA 914
9	1	019 86	021 05	3	1	60	From 0.8 Mi E of Int US 75 To 0.37 Mi W of ECL Rock Rapids
9	1	070 04	073 23	3	1	30	From JCT IA 9/IA 86 East To W JCT IA 9/US 71
9	1	126 50	132 54	3	1	55	From E JCT IA 9/US 169 East To Kossuth/Winnebago Co Line
9	1	132 54	133 48	3	1	95	From Kossuth/Winnebago Co Line East To WCL Buffalo Center
9	1	133 48	133 98	3	1	95	From WCL Buffalo Center East To ECL Buffalo Center
9	1	133 98	141 51	3	1	95	From ECL Buffalo Center East To 1 Mi W Of JCT IA 9/Co R34
9	1	141 51	150 05	3	1	95	From 1 Mi W Of JCT IA 9/Co R34 East To N JCT IA 9/US 69
9	1	157 08	157 40	3	1	95	From S JCT IA 9/US 69 East To ECL Forest City
9	1	157 40	159 81	3	1	95	From ECL Forest City East 2.4 Miles
9	1	198 86	199 41	3	1	66	From 210' W of Int Main & 1st St To 100' W of Int HWY 218
9	1	216 86	217 21	3	1	66	From WCL Riceville East To Mitchell/Howard Co Line
9	1	217 21	217 82	3	1	45	From Mitchell/Howard Co Line East To ECL Riceville
9	1	230 46	238 93	3	1	45	From JCT IA 9/US 63 East To WCL Cresco
9	1	241 48	251 37	3	1	96	From Howard/Winneshiek Co Line SE To 2 Mi E Of Ridgeway
9	1	251 37	255 83	3	1	96	From 2 Mi E Of Ridgeway East 4.5 Miles
9	1	278 84	279 56	3	1	3	From Int 2nd Ave NE & Allamakee St To NCL Waukon
9	2	070 04	073 23	3	1	30	From JCT IA 9/IA 86 East To W JCT IA 9/US 71
10	1	028 74	036 62	3	1	84	From E JCT IA 10/IA 60 East To Sioux/O'Brien Co Line
10	1	036 62	045 07	3	1	71	From Sioux/O'Brien Co Line East To WCL Paullina
10	1	045 07	045 60	3	1	71	From WCL Paullina East To ECL Paullina
12	1	003 64	004 45	3	1	97	Distance Covering Gordon Drive Viaduct Sioux City
12	1	005 06	005 64	3	1	97	From Pearl St. West to E JCT IA 12/I-29 Sioux City
12	2	000 47	000 88	3	1	97	From JCT IA 12/US 20 West to ECL Sioux City
12	2	003 69	004 44	3	1	97	Distance Over Gordon Drive Viaduct
12	2	004 89	005 18	3	1	97	From Nebraska St To Pearl St Sioux City
13	1	012 57	020 46	3	1	57	From 0.9 Mi N of JCT E34 North to 0.9 Mi N of N JCT E16
13	1	020 46	027 92	3	1	57	From 0.9 Mi N of N JCT E16 North To Linn/Delaware Co Line
13	1	027 92	039 54	3	1	28	From Linn/Delaware Co Line North To JCT IA 13/US 20
13	1	044 32	045 62	3	1	28	From 1 Mi N of JCT CoRd D13 To 2.3 Mi N of NCL Manchester
13	1	045 62	047 54	3	1	28	From 2.3Mi N of NCL Manchester N to 0.5 Mi N of 165th St.
13	1	047 54	049 17	3	1	28	From 0.5 Mi N of 165th St. North to 0.5 mi N JCT C64
13	1	049 17	050 69	3	1	28	From 0.5 Mi N Of JCT C64 N To 2Mi N of JCT IA 13/C64
13	1	050 69	052 21	3	1	28	From 2 Mi N Of JCT C64 N To 1.45MI S of S JCT IA 13/IA 3
13	1	052 21	053 69	3	1	28	From 1.45MI S of S JCT IA 13/IA 3 N To Clayton Co Line
13	1	059 81	073 27	3	1	22	From 0.3 Mi S of NCL Strawberry Point North To JCT IA 56
13	1	073 27	076 40	3	1	22	From JCT IA 13/IA 56 North to Roberts Creek
13	2	007 71	011 16	3	1	57	From N JCT IA 13/US 151 North to 0.6 Mi S of JCT IA 13/E34
13	2	017 38	019 68	3	1	57	From 1.5 Mi S Of S JCT Co E16 North To N JCT IA 13/Co E16
14	1	000 56	001 22	3	1	93	From 0.2 Mi S to 0.5 Mi N of the NCL Corydon
14	1	023 90	031 16	3	1	59	From JCT IA 14/IA 253 Northeast To Lucas/Marion Co Line
14	1	031 16	035 06	3	1	63	From Lucas/Marion Co Line North To JCT IA 14/Co G76
14	1	043 92	044 72	3	1	63	From Int S Lincoln St at N&W RY To NCL Knoxville
14	1	052 04	056 80	3	1	63	From JCT IA 14/Co. G28 N To Marion/Jasper Co Line
14	1	056 80	057 43	3	1	50	From Marion/Jasper Co Line North To Int Hwy 163
14	1	057 43	058 30	3	1	50	From Int HWY 163 To NCL Monroe
14	1	058 30	069 23	3	1	50	From NCL Monroe North To South JCT IA 14/US 6
14	1	070 31	070 96	3	1	50	From N JCT IA 14/US 6 North to N 4th Avenue in Newton
14	1	070 96	072 46	3	1	50	From N 4th Avenue In Newton North To NCL Newton
14	1	084 56	085 22	3	1	50	From Alloway Creek East & North To Int Ivory St./84th St
14	1	086 37	089 11	3	1	50	0.1 Mi S of Alloway Creek E & N to Jasper/Marshall Co Line
14	1	089 11	090 35	3	1	64	From Jasper/Marshall Co Line North To SCL Laurel
14	1	090 35	090 84	3	1	64	From SCL Laurel North To NCL Laurel
14	1	090 84	093 06	3	1	64	From NCL Laurel North to 0.1 mi S of 300th St.
14	1	100 90	101 45	3	1	64	From Int Columbus Dr To Int West Anson St.
14	1	102 46	103 07	3	1	64	From Int E Main St & N 3rd Ave To Int Riverside St
14	1	103 07	106 04	3	1	64	From INT Riverside St to 1.5 Mi S JCT IA 14/IA 330
14	1	138 17	139 50	3	1	38	From S Jct US 20 N To 0.5 Mi N of Jct Co Rd D-15
14	1	140 50	144 13	3	1	38	From 0.5 Mi S of S Jct Co Rd D-17 N To Butler Co Line
14	1	159 11	167 34	3	1	12	From W JCT IA 14/IA 3 North to 0.2 Mi N of Blue Bird Rd.
14	1	167 34	170 43	3	1	12	From 0.2 Mi N of Blue Bird Rd. N to Butler/Floyd Co Line
14	2	103 48	104 76	3	1	64	From 0.1 Mi N of Iowa River Br N to 0.6 Mi S of JCT E27
15	1	000 00	005 51	3	1	76	From JCT IA 15/IA 3 North To WCL Rolfe
15	1	005 51	006 50	3	1	76	From WCL Rolfe East, North, & East To ECL Rolfe
15	1	015 68	017 33	3	1	46	From Pocahontas/Humboldt Co E & N To Humboldt/Kossuth Co
15	1	017 33	020 57	3	1	55	From Humboldt/Kossuth Co Line North To SCL West Bend
15	1	020 57	021 01	3	1	55	From SCL West Bend North To 100' N of Int IA 15 & Division
16	1	010 78	014 77	3	1	89	From Selma Southeast To JCT IA 16/IA 98
16	1	024 42	035 61	3	1	89	From S JCT IA 16/IA 1 East To Van Buren/Lee Co Line
17	1	021 63	032 76	3	1	8	From E JCT IA 17/Co E41 North To Boone/Hamilton Co Line
17	1	032 76	036 54	3	1	40	From Boone/Hamilton Co Line North To S JCT IA 17/IA 175
17	1	036 54	039 75	3	1	40	From S JCT IA 17/IA 175 North To JCT IA 17/Co D56
17	1	039 75	046 92	3	1	40	From JCT IA 17/Co D56 North To 1 Mi S Of Webster City
17	1	046 92	049 56	3	1	40	From 1 Mi S Of Webster City North To E JCT IA 17/US 20
17	1	054 47	056 02	3	1	40	From W JCT IA 17/US 20 North To E JCT IA 17/IA 928
17	1	069 10	069 90	3	1	99	From Int Commercial Ave & 10th St To Int 1st St & Commerci
17	1	069 90	070 23	3	1	99	From Int Commercial Ave & 1st St To Int Iowa Ave & Commerc
17	1	070 23	070 70	3	1	99	Int Iowa Av & Commercial Av To 160'N Int 12th St & Iowa Av
17	1	074 39	074 58	3	1	99	From SCL Goldfield North & West To WCL Goldfield
18	1	007 97	018 91	2	1	84	From Lyon/Sioux Co Line South & East To JCT US 18/Co K30
18	1	079 69	080 35	2	1	21	From Jct 7th St. Spencer South To Jct 8th. St. Spencer
18	1	093 36	094 10	2	1	74	From Clay/Palo Alto Co Line East to JCT US 18/IA 341
18	1	094 10	095 56	2	1	74	From JCT US 18/IA 341 East to 360th Ave.
18	1	098 12	098 65	2	1	74	From 0.2 Mi W of CMSTP&P RR Underpass East to 390th Ave.
18	1	099 17	099 77	2	1	74	From 0.1 Mi W of 400th Ave. East to 0.4 Mi W of 410th Ave.
18	1	103 18	104 54	2	1	74	From 440th Ave. Southeast to 1st St. Emmetsburg
18	1	105 47	106 48	2	1	74	From Jct US 18/Superior St Emmetsburg E To Jct Huron St.
18	1	138 36	141 24	2	1	55	From 0.2 Mi W of 200th Ave. East to 0.5 Mi E of JCT P-66
18	1	142 93	143 85	2	1	55	From Near Co Rd R-14 E To Hancock Co Line
18	1	147 98	151 77	2	1	41	From W JCT US 18/Co R26 East To WCL Britt
18	1	151 77	152 29	2	1	41	From WCL Britt East to 0.1 Mi W of Main Ave.

ROUTE	DIR	BPOST	EPOST	SYSTEM	PAVTYP	COUNTY	DESCRIPT
18	1	152 29	161 01	2	1	41	From .1Mi W of Main Ave To .16Mi E Of W JCT US 18 / US 69
18	1	214D21	214D56	2	1	34	From 5th Ave. East to 0.1 Mi E of ECL Charles City
18	1	281 42	281 73	2	1	3	From Jct. Military Rd.E&S TO Allamakee/Clayton Co. Line
18	1	304 77	305 18	2	1	22	Bridge over Mississippi River, Iowa/Wisconsin State Line
18	2	079 72	080 40	2	1	21	From N 12th St. Int 24th St N To 260'S Int 8th St Spencer
20	1	000 16	001 64	2	1	97	From JCT US 20/I-29/I-129/US 75 E To JCT US 20/S Lakeport
20	1	001 64	004 37	2	1	97	From JCT US 20/S Lakeport St Northeast To JCT US 20/IA 12
20	1	012 51	013 00	2	1	97	From 0.1 Mi E to 0.6 Mi E of Cedar St. (Lawton)
20	1	018 00	021 07	2	1	97	From 0.2 Mi W of JCT IA 140 East to JCT CoRd D22 (End 4L)
20	1	032 95	039 07	2	1	97	From ECL Correctionville East To Woodbury/Ida Co Line
20	1	039 07	042 56	2	1	47	From Woodbury/Ida Co Line E to 0.2 Mi E of Carriage Ave. N
20	1	042 56	044 43	2	1	47	From 0.2 Mi E of Carriage Ave. N East to Eagle Ave. N
20	1	048 89	049 90	2	1	47	Ivory Ave East to 0.3 Mi W of Maple River Tributary Bridge
20	1	050 71	052 62	2	1	47	0.3 Mi E of Keystone Ave. East to 0.2 Mi E of Marshall Ave
20	1	136 10	140 09	2	1	40	From W IA 17/Co R21 Interchg East to E IA 17 Interchange
20	1	140 09	141 50	2	1	40	From E IA 17 Intchg East to 0.1 Mi W of ECL Webster City
20	1	141 50	149 50	2	1	40	From 0.1 Mi W of ECL Webster City East to US 69 Interchg
20	1	238 74	245 23	2	1	7	From JCT US 20/I-380 East To Black Hawk/Buchanan Co Line
20	1	245 23	248 67	2	1	10	From Black Hawk/Buchanan Co Line East to 0.5 Mi E of V71
20	1	248 67	254 19	2	1	10	From 0.5 Mi E of V71 East to JCT US 20/IA 150
20	1	254 19	260 64	2	1	10	From JCT JS 20/IA 150 East To Bridge W Of JCT US 20/IA282
20	1	260 64	266 70	2	1	10	From Bridge W Of JCT US 20/IA 282 East To JCT US 20/IA187
20	1	319 63	320 29	2	1	31	From Julian Dubuque Bridge East to the Iowa State Line
20	2	000 16	001 64	2	1	97	From JCT US 20/I-29/I-129/US 75 E To JCT US 20/S Lakeport
20	2	001 64	004 37	2	1	97	From JCT US 20/S Lakeport St Northeast To JCT US 20/IA 12
20	2	136 10	140 09	2	1	40	From 0.2 Mi E of W JCT IA 17 E to W Side of E JCT IA 17
20	2	140 09	141 50	2	1	40	From W Side of E JCT US 20/IA 17 East To Boone River
20	2	141 50	149 50	2	1	40	From Boone River East To JCT US 20/US 69
20	2	149 50	153 47	2	1	40	From JCT US 20/US 69 East to JCT US 20/Co Rd R61
20	2	238 74	245 23	2	1	7	From JCT US 20/I-380 East To Black Hawk/Buchanan Co Line
20	2	245 23	248 67	2	1	10	From Black Hawk/Buchanan Co Line East to 0.5 Mi E of V71
20	2	248 67	254 19	2	1	10	From 0.5 Mi E of JCT US 20/Co V71 East to JCT US 20/IA 150
20	2	254 19	260 64	2	1	10	From JCT US 20/IA 150 East To Bridge W Of JCT US 20/IA282
20	2	260 64	266 70	2	1	10	From Bridge W Of JCT US 20/IA 282 East To JCT US 20/IA187
21	1	000 55	011 56	3	1	54	From JCT IA 21/IA 149 North To NCL Delta
21	1	011 56	013 00	3	1	54	From NCL Delta Northwest To JCT IA 21/IA 92
21	1	045 55	052 72	3	1	48	From E Jct US 6 N To Near Jct IA-212
21	1	053 84	054 45	3	1	6	From Iowa/Benton Co Line North 0.6 Miles
21	1	056 07	056 51	3	1	6	From Int 11th St To NCL Belle Plaine
21	1	056 51	061 49	3	1	6	From NCL Belle Plaine North To JCT IA 21/US 30
22	1	035 18	036 56	3	1	92	From JCT IA 22/IA 1 (WCL Kalona) East To ECL Kalona
22	1	036 56	042 16	3	1	92	From ECL Kalona East To WCL Riverside
22	1	043 90	045 38	3	1	92	From W Ramp JCT IA 22/US 218 East To 0.5 Mi E Of IA 923
22	1	089 09	093 65	3	1	82	JCT IA22/Co Y40 To .2Mi S INT Rockingham Rd/Tennessee Ave.
22	1	094 17	096 77	3	1	82	From 0.15Mi N Int Vermont Av/Rock'ham To NB US 61 @ IA 22
22	2	093 48	095 72	3	1	82	From WCL Davenport To 160' N IA 22 at I280 WB Ramps
22	2	096 14	096 45	3	1	82	From Int Nobis Ct To 100' N Int Buckey St & Rockingham Rd
24	1	001 35	001A10	3	1	19	From Old INT IA24/US63/Co. Rd. B57 To Int 4th Av & Main St
25	1	009 60	015 56	3	1	80	(Begin) From JCT IA 25/IA 2 North To SCL Clearfield
25	1	015 56	021 56	3	1	80	From SCL Clearfield North To JCT IA 25/Co J13
25	1	036 30	037 46	3	1	88	From 100'N Int Sumner Av/Russell St To JCT IA 25/IA 186
25	1	048 22	048 97	3	1	1	From SCL Orient North & West To WCL Orient
25	1	057 00	057 41	3	1	1	From 0.17Mi S Int SE 6th St/SE Noble St To 160' N Jct IA92
25	1	097 35	100 36	3	1	39	From E JCT IA 25/IA 141 West To W JCT IA 25/IA 141
25	1	100 36	101 35	3	1	39	From W JCT IA 25/IA 141 North To Guthrie/Greene Co Line
25	1	101 35	102 41	3	1	37	From Guthrie/Greene Co Line North To JCT IA 25/Co E63
28	1	017 71	019 61	3	1	77	From West D.M. CL North To S JCT IA 28/US 6 (Hickman Rd.)
30	1	019 08	019 64	2	1	43	From Int. 7th St. Logan Northeast To JCT US 30/Co Rd L34
30	1	046 12	051 43	2	1	24	0.2 Mi NE of ECL Dow City NE to 0.6 Mi SW M24/Wescott Road
30	1	051 43	053 53	2	1	24	From 0.6 Mi SW of M24/Wescott Road NE to WCL Denison
30	1	053 53	053 97	2	1	24	From WCL Denison NE & E To S Jct US 59/IA 141
30	1	054 68	055 58	2	1	24	From 10th St East to 0.1 Mi E of 20th St. (Denison)
30	1	093 18	094 59	2	1	14	From 0.2 Mi W of Zephyr Ave. East to Carroll/Greene Co Ln
30	1	094 59	099 10	2	1	37	From Carroll/Greene Co Line SE & East To JCT US 30/IA 25
30	1	108 90	112 33	2	1	37	From 0.3Mi East Mulberry St. to 3.3Mi E of ECL Jefferson
30	1	112 33	115 12	2	1	37	From 3.3Mi East of ECL Jefferson to JCT US 30/IA 144
30	1	115 12	117 23	2	1	37	From JCT US 30/IA 144 East To JCT US 30/Co P46
30	1	125 22	126 25	2	1	8	From 0.5 Mi W Of Ogden Turnoff East To E JCT US 30/US 169
30	1	126 25	131 31	2	1	8	From E JCT US 30/US 169 E to 0.2 Mi W of Des Moines Rvr Br
30	1	131 31	137 99	2	1	8	0.2 Mi W of Des Moines River Br E to 0.2 Mi W of E41/T Ave
30	1	155 93	157 60	2	1	85	From Airport Road (Nevada) East To 0.1 Mi E Of JCT IA 133
30	1	158 26	159 96	2	1	85	From 0.8 Mi E Of JCT US 30/IA 133 East To INT Co. Rd S27
30	1	164 72	168 87	2	1	85	From Colo Turnoff East To Story/Marshall Co Line
30	1	168 87	172 22	2	1	64	From Story/Marshall Co Line East to 0.1 Mi W of E JCT S52
30	1	188 86	191 86	2	1	64	From U.P. RR Overpass East To JCT US 30/IA 146 (LeGrand)
30	1	192 52	192 85	2	1	64	From 0.2 Past Jct Webster St E To Marshall/Tama Co Line
30	1	192 85	201 95	2	1	86	From Marshall/Tama Co Line East To WCL Toledo
30	1	201 95	204 42	2	1	86	From WCL Toledo Southeast To ECL Tama
30	1	248 17	252 35	2	1	57	From Stoney Point Road Overpass East To CR & IC RR
30	1	252 35	253 66	2	1	57	From CR & IC RR East To Kirkwood Boulevard
30	1	285 34	293 74	2	1	16	From ECL Clarence East To Cedar/Clinton Co Line
30	1	293 74	299 70	2	1	23	From Cedar/Clinton Co Line East To JCT US 30/Old US 30
30	1	332 18	332 50	2	1	23	From JCT 11th Ave. To Mississippi River Bridge (Clinton)
30	2	053 53	053 97	2	1	24	From WCL Denison NE & E To S JCT US 59/IA 141
30	2	125 05	126 25	2	1	8	From 0.5 Mi W Of Ogden Turnoff East To E JCT US 30/US 169
30	2	126 25	131 31	2	1	8	From E JCT US 30/US 169 East To Des Moines River Bridge
30	2	131 31	137 99	2	1	8	0.2 Mi W of Des Moines River Br E to 0.2 Mi W of E41/T Ave
30	2	156 80	157 79	2	1	85	From 0.2 Mi W of JCT S14 E To 0.2 Mi W of 11th St (Nevada)
30	2	164 06	165 57	2	1	85	0.2 Mi W of West St. (Colo) E to 1.0 Mi E of JCT US 65
30	2	172 03	172 59	2	1	64	At JCT 3rd Ave. West (State Center)
30	2	179 11	179 97	2	1	64	0.3 Mi W of IA 330 Interchange E to E Side of JCT IA 330
30	2	248 17	252 35	2	1	57	From 0.1 Mi NW of ECL Cedar Rapids East to CR & IC RR
30	2	252 35	253 55	2	1	57	From CR & IC RR East To Kirkwood Blvd.

ROUTE	DIR	BPOST	EPOST	SYSTEM	PAVTYP	COUNTY	DESCRIPT
32	1	000 00	000 88	3	1	31	Northwest Arterial From US 20 to Penn. Ave.
34	1	000 00	003 17	2	1	65	From Nebraska/Iowa State Line East To S JCT US 34/I-29
34	1	004 33	008 09	2	1	65	From N JCT US 34/I-29 East To W JCT US 34/US 275/IA 385
34	1	008 09	011 94	2	1	65	From W JCT US 275/IA 385 East to 0.4 Mi W of E JCT US 275
34	1	084 72	092 80	2	1	88	From ECL Creston East To W JCT US 34/US 169
34	1	127 65	132 37	2	1	59	From Clarke/Lucas Co Line East to 0.2 Mi E of W JCT US 65
34	1	188 79	189 98	2	1	90	From Jct US34/US63 Ottmwa E To Bridge Over DM River
34	1	258 56	261 16	2	1	29	From Mt. Pleasant St. Interchange East to JCT US 34/US 61
34	1	261 16	262 82	2	1	29	From JCT US 34/US 61 East To Osborn Street Overpass
34	2	004 33	008 09	2	1	65	From N JCT US 34/I-29 East To JCT US 34/US 275/IA 385
34	2	008 09	011 94	2	1	65	From W JCT US 275/IA 385 East to 0.4 Mi W of E JCT US 275
34	2	188 79	189 98	2	1	90	From Past Jct US34/US63 Ottumwa to Bridge Over DM River
34	2	258 56	261 16	2	1	29	From Mt. Pleasant St. Interchange East to JCT US 34/US 61
34	2	261 16	262 82	2	1	29	From JCT US 34/US 61 East To Osborn Street Overpass
38	1	002 35	002 74	3	1	70	From 0.1 Mi SE to 0.3 Mi NW of NCL Muscatine
38	1	002 74	004 24	3	1	70	From 0.3 Mi NW of NCL Muscatine NW to 0.4 Mi NW of JCT G14
38	1	006 41	008 29	3	1	70	From 0.4 Mi S of 150th St. North to 0.4 Mi N of 140th St.
38	1	016 68	018 74	3	1	16	From W JCT IA 38/I-80 North To JCT IA 38/Co F44
38	1	042 82	043 22	3	1	53	From Walnut Creek Br To Int Union St & Jackson St
38	1	065 11	068 41	3	1	53	From NCL Monticello North To Jones/Delaware Co Line
38	1	068 41	073 58	3	1	28	Jones/Delaware Co Line N & W to 0.4 Mi SE of ECL Hopkinton
38	1	074 83	081 84	3	1	28	From 0.2 Mi N of Sand Creek Bridge Northwest to ECL Delhi
38	1	082 95	085 41	3	1	28	From NCL Delhi North To JCT IA 38/US 20
38	1	085 71	096 95	3	1	28	From Int Jefferson St & 5th St To Delaware/Crawford Co Ln
44	1	020 95	022 13	3	1	83	From JCT IA 44/US 59 To Int 6th St & Chatburn Ave
44	1	022 13	022 52	3	1	83	From Int 6th St & Chatburn Ave To ECL Harlan
44	1	035 75	036 56	3	1	5	From E. 1st St. Kimballton East to Crane Ave.
44	1	046 48	053 99	3	1	5	From 0.2 Mi E of 235th St. East to Audubon/Guthrie Co Line
44	1	053 99	060 10	3	1	39	From Audubon/Guthrie Co Line E to 0.4 Mi W of Frost Trail
44	1	060 10	066 16	3	1	39	From 0.4 Mi W of Frost Trail East To WCL Guthrie Center
44	1	066 16	066 47	3	1	39	From WCL Guthrie Center East to 1st St.
44	1	066 47	067 13	3	1	39	From 1st St. East to 12th St. (Guthrie Center)
44	1	067 13	068 04	3	1	39	From 12th St. East to ECL Guthrie Center
44	1	068 04	073 66	3	1	39	From ECL Guthrie Center East To WCL Panora
44	1	073 66	074 12	3	1	39	From WCL Panora To 160'E Int W 2nd St
44	1	091 99	092 51	3	1	25	From JCT US 169 East to 0.5 Mi E of WCL Dallas Center
44	1	094 66	095 59	3	1	25	From 0.1 Mi W of W JCT R16 East to 0.1 Mi E of 10th St.
44	1	099 63	101 16	3	1	25	0.2 Mi W of V Ave. East to 0.3 Mi E of Walnut Creek Bridge
44	1	102 88	105 06	3	1	77	From Dallas/Polk Co Line East To JCT IA 44/IA 141
48	1	021 70	022 08	3	1	69	From SCL Red Oak To 100' S Int Broadway & Short St
48	1	023 01	023 62	3	1	69	From 160' S Int Broadway/Linden St To Int US 34
52	1	018 26	019 41	2	1	49	From JCT Co Z34/435th Ave. North to 0.5 Mi N of JCT IA 985
52	1	022 87	023 22	2	1	49	From Elm St. NW to Jefferson St. in Bellevue
52	1	049 69	050 38	2	1	31	From 0.2 Mi N of Aquin St. NW to Sageville Rd.
52	1	050 38	051 92	2	1	31	From Sageville Rd. North to North JCT US 52/IA 386
52	1	085 05	086 69	2	1	22	From SCL Guttenberg North To 0.03 past Hayden Street
52	1	087 57	088 11	2	1	22	From Jct. Lorenz St. North To NCL Guttenberg
52	1	088 11	092 78	2	1	22	From NCL Guttenberg West to 0.5 Mi E of 270th St.
52	1	092 78	106 61	2	1	22	From 0.5 Mi E of 270th St. NW to E JCT US 52/US 18
52	1	140 13	149 65	2	1	96	From JCT IA 24/IA 150/Maryville St To JCT US 52/IA 9
52	1	149 65	153 68	2	1	96	From JCT US 52/IA 9 North to 0.1 Mi N of College View Dr.
56	1	022 92	023 29	3	1	22	From WCL Elkader To Int Pine St & 2nd St
59	1	000 00	010 61	2	1	36	From Missouri/Iowa State Line North To Fremont/Page Co Li
59	1	010 61	020 06	2	1	73	From Fremont/Page Co Line North To JCT US 59/IA 184
59	1	051 57	063 53	2	1	78	From N JCT US 59/US 6 North To SCL Avoca
59	1	139 79	140 06	2	1	47	From W JCT US 59/US 20 To 0.17Mi S SCL Holstein
59	1	157 93	158 86	2	1	18	From SCL Cherokee To Int S 2nd St/E Elm St/Greenwood
59	1	185 87	186 62	2	1	71	From SCL Primghar North To NCL Primghar
60	1	015 00	015 50	3	1	84	From Jct. 11th St. Alton North To Jct Minnesota St.
60	1	031 84	032 08	3	1	71	From 11th St. North to 8th St. (Sheldon)
60	1	032 08	032 42	3	1	71	From 8th St. North to JCT IA 60/US 18 (Sheldon)
60	1	047 85	048 61	3	1	72	From 11th St. North to 2nd St. (Sibley)
61	1	020 31	022 10	2	1	56	From 41st St. NE to E Int 20th St. (Ft. Madison)
61	1	040 08	041 26	2	1	29	0.3 Mi S of SCL Burlington N to 0.1 Mi S of Agency St.
61	1	041 63	041 98	2	1	29	From North Side US 34 Intchg N to 0.1 Mi S of Frontage Rd.
61	1	041 98	042 45	2	1	29	From 0.1 Mi S of Frontage Rd. N to Lenox Ave. (Burlington)
61	1	042 45	042 94	2	1	29	From Lenox Ave. North to 0.1 Mi S of NCL Burlington
61	1	042 94	044 05	2	1	29	From 0.1 Mi S of NCL Burlington NW to Plank Rd.
61	1	073 03	074 03	2	1	58	From 1.0 Mi S of JCT IA 92/IA 252 to JCT IA 92/IA 252
61	1	112 50	113 45	2	1	82	From Beginning Of 4 Lane Div E To Rockingham Rd. (Ia 22)
61	1	113 45	116 08	2	1	82	From Rockingham Rd. (Ia 22) East To Sturdevant St.
61	1	121 80	123 02	2	1	82	From Bridge on Brady St. (NB Lanes) To JCT US 61/I-80
61	1	123 02	127 55	2	1	82	From JCT US 61/I-80 North To NCL Eldridge
61	1	127 55	134 69	2	1	82	From NCL Eldridge North To Scott/Clinton Co Line
61	1	134 69	137 85	2	1	23	From Scott/Clinton Co Line North To S JCT US 61/US 30
61	1	190 82	191 90	2	1	31	From E 16th Street East To Iowa/Wisconsin State Line
61	2	040 08	041 26	2	1	29	From SCL Burlington N To 0.1 S Of Center
61	2	041 63	041 98	2	1	29	From 0.3 N Of Jct US 34 N To Near Jct Mt Pleasant St
61	2	041 98	042 45	2	1	29	From Near Jct Mt Pleasant St N To Jct Sunnyside Ave
61	2	042 45	042 94	2	1	29	From Jct Sunnyside Ave N To NCL Burlington
61	2	042 94	044 05	2	1	29	From NCL Burlington North 1.1 Miles
61	2	112 50	113 45	2	1	82	From Beginning Of 4 Lane Div E To Rockingham Rd. (Ia 22)
61	2	113 45	116 08	2	1	82	From Rockingham Rd. (Ia 22) East To Sturdevant St.
61	2	119 32	119 95	2	1	82	From Central Park To W. 35th St On Harrison (SB 1-Way)
61	2	122 60	123 02	2	1	82	From E 53rd Street North To JCT US 61/I-80
61	2	123 02	127 55	2	1	82	From JCT US 61/I-80 North To NCL Eldridge
61	2	127 55	134 69	2	1	82	From NCL Eldridge North To Scott/Clinton Co Line
61	2	134 69	137 85	2	1	23	From Scott/Clinton Co Line North To S JCT US 61/US 30
61	2	174 74	175 28	2	1	31	From Jackson/Dubuque Co Line North to 0.1 Mi S NCL Zwingl
61	2	182 75	183 08	2	1	31	0.4 Mi N Dubuque Airport Ent North to 0.1 Mi S US 151 Ichg
62	1	017 37	018 85	3	1	49	From 1.5 SW Of Bellevue Northeast To WCL Bellevue
63	1	010 84	013 52	2	1	26	0.5 Mi W of JCT US 63/IA 2/Co V17 E to 0.3 Mi W of Co J40
63	1	013 52	016 06	2	1	26	From 0.3 Mi W of Co Rd J40 East to Franklin St.

ROUTE	DIR	BPOST	EPOST	SYSTEM	PAVTYP	COUNTY	DESCRIPT
63	1	016 06	016 41	2	1	26	From Franklin St. North to Arkansas St. (Bloomfield)
63	1	023 30	026 72	2	1	26	From JCT US 63/Co Rd J15 North To Davis/Wapello Co Line
63	1	026 72	031 33	2	1	90	From Davis/Wapello Co Line North To JCT US 63/IA 958
63	1	031 33	033 02	2	1	90	From JCT US 63/IA 958 North To SCL Ottumwa
63	1	033 02	033 82	2	1	90	From SCL Ottumwa North To E JCT US 63/US 34
63	1	035 12	035 93	2	1	90	From W JCT US 63/US 34 West to 4th St. in Ottumwa
63	1	035 93	038 12	2	1	90	4th Street In Ottumwa, Northerly To N. Court St.
63	1	038 12	038 80	2	1	90	From 0.1 Mi S of Bonita Ave North to Joseph Ave. (Ottumwa)
63	1	053 44	054 06	2	1	90	From JCT US 63/IA 137 NW to the Wapello/Mahaska Co Line
63	1	054 06	055 87	2	1	62	From Wapello/Mahaska Co Line N to 0.5 Mi N of Kirby Ave.
63	1	061 16	062 05	2	1	62	From 0.1 Mi N of 270th St. North to 0.1 Mi N of 21st Ave.
63	1	062 05	062 73	2	1	62	From 0.1 Mi N of 21st Ave. North to Int 11th Ave. E
63	1	062 73	063 04	2	1	62	From Int 11th Ave. E North to Int Rock Island Ave.
63	1	063 69	064 36	2	1	62	From B Ave. North to Rosenberger Ave. (Oskaloosa)
63	1	065 42	066 34	2	1	62	From 0.6 Mi N of JCT US 63/Co Rd T65 NW to JCT US 63/G39
63	1	067 42	068 31	2	1	62	From 1.1 Mi NW of JCT US 63/G39 North to JCT US 63/G7T
63	1	075 31	075 95	2	1	62	From SCL New Sharon To Int Mulberry St & Market St
63	1	087 78	088 91	2	1	79	From SCL Montezuma To 0.09Mi N Int Irwin St & IA 63FrontSt
63	1	096 69	097 06	2	1	79	From JCT US 63/I-80 To 160' S SCL Malcom
63	1	097 45	097 75	2	1	79	From Int 2nd St & Montezuma St To NCL Malcom
63	1	102 11	110 16	2	1	79	From W JCT US 63/US 6 North To Poweshiek/Tama Co Line
63	1	110 16	116 49	2	1	86	From Poweshiek/Tama Co Line North To SCL Tama
63	1	116 49	117 16	2	1	86	From SCL Tama To Int State St & 1st St
63	1	117 16	118 39	2	1	86	From Int State St & 1st St To 16th St.
63	1	119 20	120 48	2	1	86	From JCT US 63/US 30 North to 0.3 Mi N of Minnow Crk Brdg
63	1	120 48	125 63	2	1	86	From 0.3 Mi N of Minnow Crk Br N to 0.1 Mi S of 250th St.
63	1	125 63	131 78	2	1	86	From 0.1 Mi S of 250th St. North to 190th St.
63	1	177 48	178 11	2	1	9	From Near 1.4 Mi S of Jct IA 3 N To 0.8 Mi S of Jct IA 3
63	1	205 36	206 22	2	1	19	.1Mi N of Pleasant Hill Ave To .2Mi N of Pleasant Hill Av
63	2	033 45	033 82	2	1	90	0.1 Mi N of Rabbit Run Rd./Mary St. N to E JCT US 63/US 34
63	2	035 12	035 93	2	1	90	From W JCT US 63/US 34 West to 6th St. in Ottumwa
63	2	035 93	038 12	2	1	90	From 6th St. in Ottumwa to 0.1 Mi S of Bonita Ave
63	2	038 12	038 80	2	1	90	From 0.1 Mi S of Bonita Ave North to Joseph Ave. (Ottumwa)
63	2	096 48	097 04	2	1	79	From 0.2Mi South of JCT I-80 North to SCL Malcom
63	2	164 59	165 79	2	1	7	From Parker St To Donald St In Waterloo
64	1	034 25	034 89	3	1	49	From Int E.Platt/S.Clark St To ECL Maquoketa
65	1	022 43	030 49	2	1	59	From Wayne/Lucas Co Line N to 1.2 Mi S of Whitebreast Crk
65	1	031 25	031 97	2	1	59	From 0.5 Mi S of Whitebreast Crk Br N to E JCT US 65/US 34
65	1	045 90	050 39	2	1	91	From Stone St. North to JCT US 65/IA 205
65	1	058 73	059 74	2	1	91	From JCT US 65/IA 92 North to 0.1 Mi N of Kentucky Ave.
65	1	087 63	092 92	2	1	77	0.2 Mi NE of Lincoln St SE NE to 0.4 Mi NE of NE 102nd Ave
65	1	195 22	196 87	2	1	17	From Federal St at IT RR To Int 5th St NW/Fed.Av
65	2	060 16	064 73	2	1	91	From NCL Indianola North 4.57 Miles
65	2	087 90	088 88	2	1	77	0.2 Mi NE of Lincoln St SE NE to 0.2 Mi NE ECL Bondurant
67	1	000 98	001 46	2	1	82	From E JCT US 67/US 61 Northeast to E. 3rd St. (Davenport)
67	1	002 40	004 00	2	1	82	From 0.2 Mi NE of Mississippi Ave To 8th St.
67	1	004 00	005 29	2	1	82	From 8th St. Northeast to 26th St. (Bettendorf)
67	1	024 72	026 48	2	1	23	From Scott/Clinton Co Line North To JCT IA 67/Co Z36
67	1	030 23	033 26	2	1	23	From SCL Camanche NE To Washington Blvd In Camanche
67	1	033 26	034 49	2	1	23	From Washington Blvd In Camanche N To W JCT US 67/US 30
67	1	040 64	041 69	2	1	23	From Int N.3rd St/25th Ave N To 100'N Int N.3rd St/38th Av
67	1	041 69	042 32	2	1	23	From 100'N Int N.3rd St/38th Av N. To NCL Clinton
67	1	042 32	046 06	2	1	23	From NCL Clinton North to 0.2 Mi North of 160th St.
67	1	046 58	048 00	2	1	23	From 0.2 Mi N of 155th St. North to Elk River Junction
67	2	003 83	005 31	2	1	82	From 6th St. East to 26th St. (one-way WB)
67	2	013 07	014 16	2	1	82	At US 67/I-80 Interchange
67	2	033 06	033 76	2	1	23	At Washington Blvd In Camanche
69	1	004 37	004 99	2	1	27	From Int Main St/Maple St To ECL Lamoni
69	1	004 99	006 42	2	1	27	From ECL Lamoni East To JCT US 69/I-35
69	1	019 20	019 26	2	1	27	From Grade Sep. 1st St over BN RR To Int Sand St
69	1	039 60	040 76	2	1	20	From SCL Osceola North to 100' N Int Main & McKinley
69	1	085 04	085 56	2	1	77	From End Of RR Viaduct To Grand Ave Des Moines
69	1	087 75	088 19	2	1	77	From Int Ovid Ave & E.14th St N to Shawnee Ave.
69	1	088 85	089 47	2	1	77	From NE Broadway Ave. North to JCT US 69/I-35/I-80
69	1	094 13	095 03	2	1	77	From S Ordnance Rd (Ankeny) To Int N.Ankeny Blvd/NE 1st St
69	1	113 74	114 40	2	1	85	From 100' N Begin Div Sect To 100' S Int S.Duff/S.16th
69	1	115 88	116 11	2	1	85	From Int Grand Ave To 100'N Int 5th/Grand
69	1	117 61	117 94	2	1	85	From 0.1 Mi N of 24th St. North to 0.1 Mi N of 30th St.
69	1	117 94	118 34	2	1	85	0.1 Mi N of 30th St North to 0.1 Mi N of Top-O-Hollow Rd.
69	1	118 34	119 87	2	1	85	From 0.1 Mi N of Top-O-Hollow Rd. To 0.2 Mi N of Moose Rd.
69	1	147 90	149 12	2	1	40	From E JCT US 69/IA 928 (Old 20) N To NCL Blairsburg
69	1	174 02	174 97	2	1	99	From 0.1 Mi S of Iowa River (Belmond) N to C & NW Railroad
69	1	212 16	212 79	2	1	95	From N JCT US 69/IA 9 North & East To Pike Run Creek
69	2	088 85	089 24	2	1	77	From NE Broadway Ave North to S End of I35/I80 Interchange
69	2	113 64	114 47	2	1	85	From SCL Ames North to S. 16th St. (Ames)
69	2	117 94	118 39	2	1	85	From 0.1 Mi N of 30th St. North to 0.1 Mi S of NCL Ames
71	1	012 21	013 51	2	1	73	From 0.05Mi E of JCT US71/IA 2 to 1.4 Mi NE of E JCT IA 2
71	1	013 51	024 15	2	1	73	From 1.4 Mi NE of E JCT IA 2 N to Page/Montgomery Co Line
71	1	024 15	029 56	2	1	69	From Page/Montgomery Co Line North To JCT US 71/US 34
71	1	113 06	113 92	2	1	14	From 0.2 Mi N of 19th St. North to 0.2 Mi N of 180th St.
71	1	141 83	142 41	2	1	81	From Boyer River Bridge W & N To N Of W JCT US 71/IA 175
71	1	153 43	154 28	2	1	81	From N JCT US 71/US 20 North 0.85 Miles
71	1	176 95	183 99	2	1	11	From JCT US 71/IA 3 North To S JCT US 71/IA 10
71	1	183 99	188 13	2	1	11	From S JCT US 71/IA 10 North To Buena Vista/Clay Co Line
71	1	226 62	227 41	2	1	30	From E Okoboji Lake Brdg E to 0.1 Mi W of ECL Spirit Lake
75	1	119 04	119 40	2	1	75	From 4th Street to NCL of LeMars
75	1	126 79	129 10	2	1	84	From Plymouth/Sioux Co Line North to 0.3 Mi N of 490th St.
75	1	151 98	153 07	2	1	60	From 1.12 Mi N Of Co Line North 1.09 Miles
75	1	162 95	163 24	2	1	60	Int 1st Av (Main St)/Union St/Hwy 9 To Int IA 9/Fairlamb
75	1	163 24	163 94	2	1	60	From WCL Rock Rapids West To W JCT US 75/IA 9
75	2	119 02	119 94	2	1	75	From 3rd St. N Le Mars NW to 0.1 Mi N of JCT US 75/IA 60
77	1	000 00	000 42	2	1	97	From Nebraska/Iowa State Line North To JCT US 77/I-29
78	1	043 52	048 86	3	1	44	From JCT IA 78/IA 249 South & East To Henry/Louisa Co Lin

ROUTE	DIR	BPOST	EPOST	SYSTEM	PAVTYP	COUNTY	DESCRIPT
78	1	048 86	054 64	3	1	58	From Henry/Louisa Co Line East To WCL Morning Sun
78	1	054 64	055 10	3	1	58	From WCL Morning Sun East To ECL Morning Sun
83	1	033 97	034 74	3	1	15	From WCL Atlantic To Int 2nd St & Locust St
92	1	008 44	017 21	3	1	78	From 0.6 Mi E of Somerset Ave. East To WCL Treynor
92	1	017 21	018 20	3	1	78	From WCL Treynor To Int Main St & Ehrig Ave
92	1	106 07	106 81	3	1	61	From E JCT US 169 East to 0.7 Mi E of E JCT US 169
92	1	157 95	159 78	3	1	63	From E JCT IA 92/IA 5 East 1.8Mi
92	1	172 20	175 86	3	1	62	3.6 Mi E of Marion Co. Line E to 3.8 Mi W of WCL Oskaloosa
92	1	179 83	180 15	3	1	62	From JCT IA 92/IA 163 To Int L Street
92	1	180 15	180 65	3	1	62	From Int L Street To Int D Street
92	1	180 65	181 98	3	1	62	From Int D Street To E Jct IA 92/US 63
92	1	181 98	183 17	3	1	62	From E JCT US 63 East to 0.1 Mi E of S 35th St/Osburn Ave.
92	1	185 15	188 23	3	1	62	0.3 Mi E of Plymouth Ave. NE to 0.2 Mi NE of Snyder Ave. N
92	1	189 02	191 72	3	1	62	0.2 Mi NE of Teller Ave. NE to 0.2 Mi NE of Vermillion Ave
92	1	193 61	196 58	3	1	54	From Mahaska/Keokuk Co Line East To JCT IA 92/IA 21
92	1	196 58	203 74	3	1	54	From JCT IA 92/IA 21 East to 0.1 Mi E of WCL Sigourney
92	1	205 09	211 57	3	1	54	From ECL Sigourney East to 0.1 Mi W of JCT IA 92/Co Rd V67
92	1	217 77	222 02	3	1	92	From Keokuk/Washington Co Line East To E JCT IA 92/Co W21
92	1	275 06	275 43	3	1	70	From Jct IA 38 To Iowa/Illinois State Line
92	2	157 93	159 10	3	1	63	From E JCT IA 92/IA 5 East 1.17 Miles
92	2	181 60	182 38	3	1	62	From 0.2 mile West of JCT IA 23 East to ECL Oskaloosa
93	1	005 86	006 77	3	1	9	From 0.75 Mi N Of Tripoli N & NE To JCT IA 93/Co V5C
98	1	000 00	000 92	3	1	89	From JCT IA 98/Co Rd V64 NE to 0.7 Mi NE of JCT IA 98/J23
98	1	000 92	001 79	3	1	89	From 0.7 Mi NE of JCT J23 North To JCT IA 98/IA 16/V64
100	1	001 35	004 04	3	1	57	From Near I-380 Intchg E To JCT 1st Ave (Cedar Rapids)
110	1	014 08	014 86	3	1	11	From WCL Storm Lake Northeast To JCT IA 110/IA 7
117	1	001 00	001 57	3	1	50	From E JCT IA 117/IA 392 North to NCL Prarie City
122	1	010 65	011 54	3	1	17	0.14Mi W Int Farmstead Sq To .18Mi W Int Iowa Av & College
122	1	011 90	012 69	3	1	17	From 0.2 Mi E of Iowa Ave & College Dr E to ECL Mason City
130	1	000 41	000 79	3	1	16	From Int Claire St/7th St To ECL Tipton
130	1	000 79	014 24	3	1	16	From ECL Tipton East Southeast To Cedar/Scott Co Line
130	1	031 84	032 24	3	1	82	From JCT IA 130/I-80 Southeast To S Ramp Jct IA 130/I-80
130	2	031 45	032 23	3	1	82	From JCT IA 130/I-80 Southeast To S Ramp JCT IA 130/I-80
136	1	102 34	102 97	2	1	56	From Near Soap Creek Bridge To Jct Johnston St (Keokuk)
136	1	102 97	103 40	2	1	56	From Jct Johnston St To Jct 2nd St Keokuk
136	1	000 00	000 46	3	1	23	From Illinois/Iowa State Line West To S JCT IA 136/US 67
139	1	000 00	000 65	3	1	96	From JCT IA 139 / IA 9 North 0.4Mi
140	1	000 57	000 95	3	1	97	From Main St. NE to NCL Moville
140	1	000 95	006 51	3	1	97	From NCL Moville North To Woodbury/Plymouth Co Line
140	1	006 51	008 84	3	1	75	From Woodbury/Plymouth Co Line Northeast To WCL Kingsley
140	1	008 84	009 59	3	1	75	From WCL Kingsley To Jct 1st St & Main St
141	1	000 00	007 36	3	1	97	From JCT IA 141/I-29 East To JCT IA 141/Co K64
141	1	007 36	010 50	3	1	97	From JCT IA 141/Co K64 East to 0.1 W of JCT Co K67
141	1	011 44	015 96	3	1	97	From 0.8 Mi E of JCT Co K67 East to Church St. (Smithland)
141	1	024 32	024 88	3	1	67	From NCL Mapleton To Int Main St & 4th St
141	1	024 88	025 51	3	1	67	From Int Main St/4th St To SCL Mapleton
141	1	036 11	037 61	3	1	67	From ECL Ute East To Monona/Crawford Co Line
141	1	076 59	077 33	3	1	14	From WCL Manning To Int 6th St & May St
141	1	096 30	097 55	3	1	14	From 0.8 Mi NW of JCT Co N44 SE to 0.1 Mi SE of JCT Co N46
141	1	097 55	098 53	3	1	14	From 0.1 Mi SE of JCT Co N46 SE to Carroll/Guthrie Co Line
141	1	098 53	104 56	3	1	39	From Carroll/Guthrie Co Line East To WCL Bayard
141	1	104 56	105 08	3	1	39	From WCL Bayard East To W JCT IA 141/IA 25
141	1	108 09	111 07	3	1	39	From E JCT IA 141/IA 25 East To JCT IA 141/Co P18
141	1	127 64	130 82	3	1	25	From WCL Perry East To ECL Perry
141	1	130 82	133 18	3	1	25	From ECL Perry East To 0.5 mi W JCT IA 141/R30
141	1	146 06	146 67	3	1	25	From SCL Granger Southeast To Dallas/Polk Co Line
141	2	128 31	130 82	3	1	25	From WCL Perry East To ECL Perry
141	2	130 82	133 74	3	1	25	From ECL Perry East to JCT IA 141/Co Rd R30
141	2	146 06	146 67	3	1	25	From 0.1 Mi SE of Sycamore St. SE to Dallas/Polk Co Line
143	1	001 00	006 95	3	1	18	From 1.0 Mile North IA 3 To Cherokee/O'Brien Co Line
143	1	006 95	011 99	3	1	71	From Cherokee/O'Brien Co Line North To JCT IA 143/IA 10
144	1	000 00	000 96	3	1	25	From JCT IA 144/IA 141 To 0.10Mi S Int Warford St & 1st Av
144	1	000 96	002 28	3	1	25	From 0.10Mi S Int Warford St/1st Ave To 210'N NCL Perry
146	1	018 63	020 94	3	1	79	From 0.3 Mi N Of JCT IA 146/I-80 North To SCL Grinnell
146	1	020 94	021 94	3	1	79	From SCL Grinnell To Int 6th Ave & West St/Hwy 6
148	1	030 59	031 18	3	1	2	160' N Int 6th St/Quincy St To 0.04Mi S Int 16th/Quincy St
149	1	064 77	066 37	3	1	48	From Old Man's Creek North To JCT IA 149/I-80
150	1	001 12	001 53	3	1	6	From 4th St. North to NCL Vinton
150	1	039 14	039 67	3	1	10	From 0.1 Mi N of 240th St. North to 0.2 Mi N of JCT US 20
150	1	058 78	063 15	3	1	33	From N JCT IA 150/IA 3 East & North To JCT IA 150/Co C33
150	1	063 15	068 03	3	1	33	From JCT IA 150/Co C33 East To JCT IA 150/IA 187
150	1	090 03	097 15	3	1	96	From Fayette/Winneshiek Co Line North To SCL Calmar
150	1	097 15	097 61	3	1	96	From SCL Calmar North To JCT IA 150/IA 24/US 52
151	1	007 58	009 62	2	1	48	From E JCT US 151/US 6 North 2.0 Miles
163	1	000 56	001 10	3	1	77	From Before I-235 Overpass To Hubbell Ave Des Moines
163	1	003 67	005 32	3	1	77	From Des Moines CL To Shadyview Blvd Pleasant Hills
163	1	005 32	007 09	3	1	77	From Shadyview Blvd Pleasant Hills E to JCT IA 163/Co S14
163	1	007 09	012 61	3	1	77	From JCT IA 163/Co S14 East To JCT IA 163/IA 316
163	2	000 41	001 09	3	1	77	From Before I-235 Overpass To Hubbell Ave Des Moines
163	2	002 08	002 53	3	1	77	From Before Jct IA 163/IA 46 To E 33rd St Des Moines
163	2	003 58	005 32	3	1	77	From Virginia Ave. East To E JCT IA 163/US 65
163	2	005 32	007 09	3	1	77	From E JCT IA 163/US 65 East To JCT IA 163/Co S14
163	2	008 68	010 42	3	1	77	From 0.4 Mi W of NE 88th St. East To Ivy Turnoff
165	1	000 00	000 46	3	1	78	From Nebr/Iowa Line NE To Iowa/Nebr Line In Carter Lake
169	1	088 33	088 97	2	1	25	From N JCT US 6 North To NCL Adel
169	1	088 97	089 32	2	1	25	From NCL Adel North to 0.3 Mi S of North Raccoon River Brg
169	1	089 32	090 18	2	1	25	0.3 Mi S of N. Raccoon Rvr Br N to 0.3 Mi N of 270th St
169	1	156 70	157 82	2	1	94	From JCT IA 934 (Old US 20) N To Near N Jct IA 926
169	1	157 82	158 13	2	1	94	From Near N Jct IA 926 N To Near NCL Fort Dodge
169	1	158 13	159 24	2	1	94	From Near NCL Fort Dodge N To Jct IA 7
169	1	159 24	166 49	2	1	94	From JCT US 169/IA 7 N to 0.2Mi N of S Jct Co Rd C56
169	1	188 03	188 77	2	1	55	1.6Mi N of Humboldt/Kossuth Co Lineto 0.6Mi S of Jct B63
169	1	192 23	193 20	2	1	55	From 0.8Mi N of Jct Co B58 N to 0.2Mi S of Jct Co B55

ROUTE	DIR	BPOST	EPOST	SYSTEM	PAVTYP	COUNTY	DESCRIPT
169	1	195 53	196 90	2	1	55	From 0.1Mi N of Jct Old IA 274 N to 0.3Mi Past SCL Algona
169	1	198 44	198 81	2	1	55	From 0.17 Past Jct Maple St North To Jct US 160/US 18
169	1	198 81	199 47	2	1	55	From JCT US 169/US 18 North to 0.4Mi N of NCL Algona
169	1	201 47	202 41	2	1	55	From 0.4Mi S of Jct Co B30 N to 0.6Mi N of Jct Co B30
169	1	206 65	208 02	2	1	55	From 1.0Mi S of Jct Co Rd B19 NE to JCT US 169/Co B19
169	2	156 70	159 10	2	1	94	From JCT IA 934 (Old US 20) N To 0.1 Mi S of JCT IA 7
169	2	159 10	159 51	2	1	94	From 0.1 Mi S of JCT IA 7 NW to 0.3 Mi N Of JCT IA 7
173	1	000 00	005 51	3	1	15	From JCT IA 173/IA 83 North To Cass/Shelby Co Line
175	1	004 66	005 41	3	1	67	From E Entrance Lewis & Clark E To W Ramp JCT IA 175/I-29
175	1	005 41	006 01	3	1	67	From W Ramp JCT IA 175/I-29 E To E Ramp JCT IA 175/I-29
175	1	006 01	006 83	3	1	67	From E Ramp JCT IA 175/I-29 East To WCL Onawa
175	1	006 83	007 83	3	1	67	From WCL Onawa To Int Iowa Ave & 3rd St
175	1	008 70	014 37	3	1	67	From ECL Onawa East To INT 1st St & Walnut St.
175	1	029 40	032 70	3	1	67	From N JCT IA 175/IA 141 North To Monona/Woodbury Co Line
175	1	032 70	039 52	3	1	97	From Monona/Woodbury Co Line NE To Woodbury/Ida Co Line
175	1	044 51	049 92	3	1	47	From JCT IA 175/Co Rd L51 To W JCT IA 175/US 59
175	1	155 40	156 45	3	1	40	From N JCT IA 175/US 69 East To ECL Jewell
175	1	156 45	158 20	3	1	40	From ECL Jewell East To WCL Ellsworth
175	1	158 20	158 62	3	1	40	From WCL Ellsworth To 100' E Int IA 175 & Dewitt St
175	1	158 62	158 95	3	1	40	From 100' E Int IA 175 & Dewitt St To Jct IA 175/I-35
175	1	187 15	187 60	3	1	42	From Edgington at C&NW RR To Int Edg'ton Av & 3rd St
175	1	187 93	192 15	3	1	42	From ECL Eldora East To Hardin/Grundy Co Line
175	1	192 15	197 10	3	1	38	From Hardin/Grundy Co Line East To W JCT IA 175/IA 14
183	1	051 15	057 37	3	1	67	From JCT IA 183/Co E54 Northeast To JCT IA 183/IA 37
183	1	057 37	057 80	3	1	67	From Jct IA 183/IA 37 To NCL Soldier
183	1	057 80	063 21	3	1	67	From NCL Soldier Northeast To SCL Ute
183	1	063 21	063 55	3	1	67	From SCL Ute To Monona Ave at CMStP&P RR
187	1	026 62	027 85	3	1	33	From 1 mile S of JCT IA 187/IA 150 N to JCT IA 187/IA 150
191	1	019 45	020 10	3	1	78	From JCT IA 191/IA 83 N To Pottawattamie/Harrison Co Line
191	1	020 10	027 15	3	1	43	From Pottawattamie/Harrison Co L N To Harrison/Shelby Co L
191	1	027 15	030 84	3	1	83	From Harrison/Shelby Co Line NE To JCT IA 191/IA 44
191	1	030 84	031 49	3	1	83	From JCT IA 191/IA 44 North To NCL Portsmouth
191	1	031 49	042 08	3	1	83	From NCL Portsmouth Northeast To JCT IA 191/IA 37
192	1	000 00	000 80	3	1	78	From JCT IA 192/I-80 To 0.11Mi S Int IA 192 & 19th Ave
192	1	001 12	001 82	3	1	78	From Grd Sep on 192 ovr 16th Av To Int 6th Av & S.6th St
192	2	000 00	000 80	3	1	78	From JCT IA 192/I-80 To 0.11Mi S Int IA 192 & 19th Ave
192	2	001 12	001 64	3	1	78	From Grd Sep on 192 ovr 16th Av To Beg One-way NB
210	1	006 87	007 87	3	1	8	From WCL Madrid East To ECL Madrid
210	1	007 87	013 81	3	1	8	From ECL Madrid East To Boone/Story Co Line
218	1	001 70	003 52	2	1	56	From 0.14Mi NW Int Boulevard/218 To S JCT US 218/US 61
218	1	009 14	014 68	2	1	56	From N JCT US 218/US 61 North To N New Boston Turnoff
218	1	014 68	018 34	2	1	56	From N New Boston Turnoff N To 0.5 Mi SE of Jct IA-394
218	1	081 23	082 57	2	1	92	From IA 22 Interchange North to Washington/Johnson Co Line
218	1	082 57	086 03	2	1	52	From Washington/Johnson Co Line North To JCT US 218/CoF62
218	1	086 03	090 08	2	1	52	From JCT US 218/Co F62 N To 0.5 Mi N Of JCT US 218/IA 921
218	1	090 08	096 98	2	1	52	From 0.5 Mi N Of JCT US 218/IA 921 N To JCT US 218/I-80
218	2	079 93	082 57	2	1	92	From 0.3 Mi N of 130th St N to Washington/Johnson Co Line
218	2	082 57	086 03	2	1	52	From Washington/Johnson Co Line North To JCT US 218/CoF62
218	2	086 03	090 08	2	1	52	From JCT US 218/Co F62 N To 0.5 Mi N Of JCT US 218/IA 921
218	2	090 08	096 98	2	1	52	From 0.5 Mi N Of JCT US 218/IA 921 N To JCT US 218/I-80
220	1	005 91	007 82	3	1	48	From WCL Middle Amana East To JCT IA 220/US 151
275	1	001 85	002 36	2	1	36	From Lake St. To Int H Street & Washington St.
275	1	012 65	017 62	2	1	36	From NCL Sidney North To JCT US 275/IA 145
281	1	008 62	010 30	3	1	7	From JCT IA 281/Co D20/Co V51 To 0.1Mi S of Jct Co Rd D16
281	1	011 47	013 38	3	1	7	From 1.1Mi N of Jct Co Rd D16 North To SCL Dunkerton
316	1	000 17	002 51	3	1	63	From Warren/Marion Co Line North to Marion/Warren Co Line
316	1	002 51	003 48	3	1	91	From Marion/Warren Co Line W & NW To Warren/Polk Co Line
330	1	000 65	005 50	3	1	50	From 0.4 Mi SW of JCT Co Rd F17 NE To Jasper/Story Co Line
330	1	005 50	005 55	3	1	85	From Jasper/Story Co Line NE To Story/Marshall Co Line
330	1	005 55	013 42	3	1	64	Story/Marshall Co Line NE To 0.69Mi SW of M'bourneTurnoff
330	1	022 03	025 20	3	1	64	From JCT IA 330/Co S75 North To S JCT IA 330/Co E29
330	2	014 29	020 21	3	1	64	From N Melbourne Turnoff Northeast To JCT IA 330/US 30
331	1	000 00	003 80	3	1	77	From NW Corner of Section 32, T78N, R25W East to JCT IA 28
333	1	000 00	001 10	3	1	36	From JCT IA 333/Co Rd J64 East to Int North St & Main St
376	1	092 41	093 65	3	1	97	From 0.9 Mi N of JCT US 20 North to 1.0 Mi S of JCT IA 12
376	1	093 65	094 51	3	1	97	From 1.0 Mi S of JCT IA 12 North to Int Leech Av/S.Lewis
376	1	094 93	095 66	3	1	97	From Int 3rd St/Lewis Blvd To 0.11Mi S Int 14th St/Lewis
376	1	097 42	099 24	3	1	97	0.3 Mi N Int Lewis Blvd/31st St. NE to 0.7 Mi SW of US 75
376	2	090 77	093 65	3	1	97	From JCT IA 376/I-29 North to 1.0 Mi S of JCT IA 376/IA 12
376	2	093 65	094 93	3	1	97	From 1.0 Mi S of JCT IA 376/IA 12 N to Int 3rd St/Lewis
376	2	094 93	095 15	3	1	97	From Int 3rd St/Lewis Blvd To 0.09Mi N Int 11th St/Lewis
376	2	097 56	098 20	3	1	97	0.1 Mi S Smiths Riv Rd/Lewis Blvd NE to 0.7 Mi SW of US 7
415	1	011 06	013 11	3	1	77	0.2 Mi SE of NW 58th St. NW to NW 112th Ave
922	1	001 27	002 09	3	1	57	From Int Wiley Blvd To 0.05mi SW Int 16th Ave
922	1	003 21	003 90	3	1	57	From Int 15th St To Int 6th Ave
922	1	003 90	004 31	3	1	57	From Int 6th Ave To Int 1st Ave at Cedar River
922	1	005 13	006 38	3	1	57	From Int 1st Ave/10th St E. To Int 1st Ave & 20th St NE
922	2	001 27	002 21	3	1	57	From Int IA 922/Westdale Dr To 0.06mi NE Int 16th Av/IA922
926	1	000 00	001 62	3	1	94	From S JCT IA 926/US 169 To Old Jct US 20 & IA 7
926	1	001 62	002 24	3	1	94	From Old Jct US 20 & IA 7 To 100' N Int 2nd Av S./5th St
926	1	002 24	003 17	3	1	94	From 100' N Int 2nd Av S./5th St To Jct IA 926/US 169
926	2	001 08	001 65	3	1	94	From DM River In Ft Dodge North To 2nd Ave S
926	2	002 24	003 17	3	1	94	From Corner Of 2nd Ave S/8th St W To N JCT IA 926/US 169

CONYR	PCI	ADT	TRUCKS	IRI	STRUCAV	AVEK	ISTRIC	PROJECT1	PROJECT2
1963	48	1460	130	3.05	4.5	45.5952	5	F-165(4)	
1963	32	1840	139	2.88	4.13	42.3384	5	F-165(4)	
1936	39	3710	156	2.66	4.47	53.4658	5	NA	
1956	45	4570	313	2.45	4.96	47.7664	5	MP-1-5(700)55--76-92	F-71(11)
1951	34	5800	351	3.64	3.66	34.1964	5	NA	
1982	69	18500	860	2.19	5.92	54.28	6	F-1-5(4)--20-52	
1982	55	26500	1134	3.02	4.97	50.7518	6	F-1-5(4)--20-52*<1>	
1967	14	24000	554	5.82			6	?	
1926	7	9100	198	4.52	2.38	20.8978	6	?	
1926	0	10900	244	6.32			6	?	
1982	61	19600	892	2.77	4.25	34.4678	6	F-1-5(4)--20-52	
1982	48	26500	1134	2.76	5.64	54.28	6	F-1-5(4)--20-52*<1>	
1954	14	1950	189	3.98	2.67	17.3696	4	F-235(2)	
1975	46	1990	189	2.11	3.58	36.0962	4	RF-2-1(11)--35-87	
1973	36	2340	213	3.11	4.14	46.9522	4	F-2-2(6)--20-73	
1978	26	2680	166	3.85	2.95	20.355	4	TQF-2-2(16)--29-73	
1978	23	1440	166	5.18	3.18	24.6974	4	TQF-2-3(15)--29-87	
1978	39	1790	166	5.18	3.58	33.1108	4	NA	
1978	13	2560	297	5.16	3.39	31.7538	4	TQF-2-3(18)--29-87	
1972	36	1470	235	2.59	3.53	35.5534	5	MP-2-5(701)37--76-93	FN-2-6(8)--21-93
1971	30	3300	255	3.33	3.88	42.6098	5	MP-2-5(701)37--76-93	FN-2-6(7)--21-93
1970	30	4730	290	3.6	4.34	44.2382	5	NA	
1972	46	2370	365	2.61	3.31	27.6828	5	FN-2-7(8)--21-04	
1971	21	4640	389	4.11	4.81	50.209	5	FN-2-7(5)--21-04	
1954	11	6900	431	4.24	3.38	32.2966	5	NA	
1978	54	2810	225	3.16	3.64	33.3822	5	NA	
1979	60	2840	229	2.42	3.14	28.7684	5	F-2-9(11)--20-56	
1979	58	2820	228	2.75	3.04	24.9688	5	FN-2-9(17)--21-56	
1954	20	1840	145	3.21	3.59	33.925	3	F-910(3)	
1981	50	2930	161	3.07			3	NA	
1958	27	1840	409	2.81	3.66	36.0962	3	F-939(6)	
1958	23	1680	409	2.92	3.07	27.14	3	F-939(6)	
1958	26	1490	409	2.8	3.64	37.1818	3	DF-939(7)	
1969	46	4070	606	3.51	3.77	27.4114	3	F-3-3(3)--20-76	
1956	48	5800	612	1.99	3.81	26.3258	2	NA	
1956	60	3750	630	1.59	3.52	27.9542	2	F-730(8)	
1970	62	3000	564	1.91	5.45	48.0378	2	NHS-3-5(50)--19-35	NA
1970	87	4390	651	1.63	6.68	52.1088	2	NHS-3-5(50)--19-35	FN-3-5(5)
1958	30	6800	636	2.81	4.24	32.568	2	NA	
1955	10	4950	321	4.35	5.04	44.5096	2	NA	
1966	16	4750	206	4.47	4.85	40.4386	2	NA	
1957	35	1930	300	2.68	3.79	42.8812	4	FN-402	
1957	27	1630	245	2.85	3.83	38.5388	1	FN-402	
1954	27	2220	245	2.69	3.9	33.1108	1	F-402(5)(6)	
1966	35	6900	371	2.5			1	NA	
1979	57	2220	182	2.46	4.3	51.566	1	TQF-4-2(8)--29-37	
1940	21	1380	150	2.4	3.72	32.568	1	F-193A(2)	
1952	28	730	135	2.49	3.17	21.4406	1	FN-193	
1952	29	630	139	2.15	3.37	31.7538	3	FN-193	
1975	64	2030	272	2.5			3	NA	
1967	56	2390	337	2.2	4.59	45.8666	3	MP-4-3(701)106--76-74	FN-17-5(2)--20-74
1956	33	5700	362	3.39	3.37	35.0106	3	NA	
1981	36	3040	246	3.19	3.74	33.925	3	NA	
1982	46	1500	142	2.33	4.19	54.5514	5	FN-5-1(19)--21-04	
1978	43	3500	662	2.4	3.74	36.9104	5	TQF-592-2(6)--29-63*<1>	
1978	41	3590	669	2.76	4.28	41.2528	5	TQF-592-2(6)--29-63*<1>	
1970	68	6700	393	1.68	4.21	42.067	5	NA	
1953	32	31600	809	4.46	4.68	54.28	4	UG-926(3)	
1981	34	21400	659	3.6	4.17	31.4824	4	F-6-1(32)--20-78	
1968	22	14000	504	3.96	3.27	17.641	4	U-6-1(12)--40-78	
1968	35	7200	261	2.61	3.71	26.3258	4	U-6-1(12)--40-78	
1979	63	4620	282	2.69	5.37	48.5806	4	F-6-2(14)--20-15	
1969	43	14300	289	3.7			1	UN-6-4(12)--41-77	
1956	29	17500	436	3.71			1	NA	
1956	48	12500	461	2.21	4.38	41.2528	1	U-206(14)	
1963	17	7900	501	4.09	4.22	40.71	1	NA	
1963	51	9800	289	3.16			1	NA	
1956	23	6800	228	3.5	3.66	25.5116	1	NA	
1955	26	1880	174	3.32	4.02	30.6682	1	F-799(7)	
1956	25	1440	127	3.03	4.63	40.9814	1	F-799(9)	
1955	38	3510	233	3.28	4.74	44.5096	6	F-289(4)	
1956	40	5500	311	3.33	5.65	48.0378	6	P-1093	
1961	67	12600	494	1.44			6	F-289(6)	
1951	39	26200	731	2.71	6.06	53.7372	6	HES-6-7(49)--24-52	U-128(3)
1958	14	22300	658	4.46	5.59	48.852	6	UN-9	
1958	20	24400	1143	3.58	4.94	44.2382	6	DU-DF-1052(5)	
1958	49	5100	518	2.31	5.04	48.3092	6	DF-1052(4)	
1965	42	5000	680	2.94	4.22	36.639	5	F-FG-87(9)	
1982	57	14100	343	3.02	4.9	38.2674	6	NA	
1972	44	22100	448	3.95	5.04	43.1526	6	NA	
1971	23	32400	428	3.97			6	NA	
1953	56	31600	809	2.04			4	UG-926(3)	
1983	21	26400	710	4.95	4.95	26.5972	4	F-6-1(48)--20-78	
1981	30	21400	659	3.99	3.2	20.0836	4	F-6-1(32)--20-78	
1968	28	14500	521	3.97	3.76	27.14	4	U-6-1(12)--40-78	
1968	37	7200	261	2.49			4	U-6-1(12)--40-78	
1963	25	8000	485	3.62	4.76	44.2382	1	NA	
1961	66	14900	544	1.56			6	F-289(6)	
1960	22	28800	982	5.86			6	DU-DF-1052(5)	
1958	46	24000	1211	3.18	4.93	51.2946	6	DU-DF-1052(5)	
1982	45	15400	357	2.91	4.98	39.0816	6	NA	
1972	40	22100	448	4.1	3.87	27.9542	6	NA	
1964	24	34200	497	4.09	4.59	38.5388	6	NA	

CONYR	PCI	ADT	TRUCKS	IRI	STRUCAV	AVEK	ISTRIC	PROJECT1	PROJECT2
1937	30	36500	497	3.25	2.86	24.1546	6	NA	NA
1971	22	32400	428	4.07			6	NA	
1967	21	8700	390	3.73	3.96	40.9814	3	FU-5-2(1)--25-11	
1973	24	3780	298	3.79	4.2	46.9522	3	NA	
1972	26	7800	482	3.53	3.27	27.4114	3	FN-9-3(6)--21-30	
1978	59	1460	242	2.55	3.62	33.6536	2	TQF-9-4(24)--29-55	
1978	57	1890	242	2.09	3.51	31.4824	2	TQF-9-4(24)--29-55	
1976	46	2350	242	3.41	3.75	31.4824	2	NA	
1977	60	1470	235	2.07	4	39.353	2	RF-9-5(12)--35-95	
1977	56	1730	235	2.47	3.73	32.2966	2	RF-9-5(9)--35-95	
1974	27	3950	357	3.84			2	NA	
1976	40	3500	357	2.74	4.34	46.4094	2	FN-9-5(3)--21-95	
1939	47	5200	339	2.56	4.87	40.71	2	NA	
1979	71	2370	264	2.04	3.67	35.8248	2	MP-9-2(700)217--76-66	NA
1979	72	2160	234	1.97			2	MP-9-2(700)217--76-66	NA
1974	42	2930	600	2.15	3.12	26.3258	2	FN-9-7(6)--21-45	
1975	56	3080	454	2.25	3.58	39.0816	2	FN-9-8(10)--21-96	
1975	43	3600	429	2.21	3.25	36.3676	2	FN-9-8(11)--21-96	
1980	52	3820	237	2.92	5.34	50.209	2	NA	
1972	22	7900	488	3.92	3.87	37.7246	3	FN-9-3(6)--21-30	
1954	24	1860	303	2.73	3.68	33.1108	3	F-269(2)	
1952	25	1750	239	2.76	3.99	37.996	3	F-986(1)	
1969	21	1960	180	3.9	3.27	28.497	3	FN-10-2(5)--21-71	
1964	48	26000	787		4.12	41.2528	3	F-20-1(30)--20-97	U-604(3)
1980	64	14000	442	3.21			3	?	
1954	15	11900	689	3.71	4.2	35.0106	3	F-2(10)	
1964	63	26000	787	2.66			3	U-20-1(32)--40-97	U-604(3)
1966	30	14400	442	3.02			3	MP-12-3(701)4--76-97	??
1974	42	9000	522	1.82	3.92	46.4094	6	FN-13-1(15)--21-57	
1976	59	6200	521	2.65	5.13	56.4512	6	RF-13-1(16)--35-57	
1976	57	5000	521	2.22	3.87	39.8958	6	FN-13-2(10)--21-28	
1931	92	4500	306	1.76	5.33	56.4512	6	STP-13-2(33)--2C-28	FN-13-2(21)--21-28
1931	92	4500	306	1.76	5.45	52.3802	6	STP-13-2(33)--2C-28	FN-13-2(21)--21-28
1931	92	3750	286	1.78	5.65	57.5368	6	STP-13-2(33)--2C-28	F-13-2(21)--21-28
1931	95	2430	251	1.87	5.74	58.8938	6	STP-13-2(33)--2C-28	F-13-2(13)--20-28
1931	86	2430	251	1.94	4.45	46.4094	6	STP-13-2(33)--2C-28	F-13-2(13)--20-28
1931	88	2430	251	2.05	5.23	56.7226	6	STP-13-2(33)--2C-28	F-13-2(13)--20-28
1978	51	2760	367	2.96	3.8	42.067	2	TQF-13-3(15)--29-22	
1983	65	3550	475	2.85	5.66	56.7226	2	FN-13-3(27)--21-22	
1974	54	7700	630	1.99	4.38	53.4658	6	FN-13-1(15)--21-57	
1974	38	9200	522	2.25	4.07	51.566	6	FN-13-1(15)--21-57	
1964	29	2200	166	3.34	4.23	34.7392	5	NA	
1955	18	2170	278	3.24	3.55	39.353	5	F-63(11)	
1955	37	2000	313	2.81	3.7	40.9814	5	F-75(5)	
1983	45	7900	455	2.88	6.6	59.1652	5	F-14-3(10)--20-63	
1955	14	4570	446	3.51	3.29	30.9396	5	FN-231	
1956	50	5100	470	2.01	5.31	42.8812	1	NA	
1971	30	5200	473	3.63	3.86	28.497	1	NA	
1972	39	4330	477	2.44	4.09	37.4532	1	MP-14-1(702)58--76-50	FN-14-4(11)--21-50
1965	29	4160	403	3.55	4.09	34.1964	1	NA	
1965	45	3250	379	3.1	3.68	29.3112	1	F-14-4(2)--17-50	
1950	34	1460	213	3.01	3.76	28.2256	1	F-764(2)(4)	
1950	37	2220	272	2.68	3.7	31.211	1	F-764(2)(4)	
1950	37	2220	272	2.62	3.43	21.4406	1	F-791(3)	
1949	40	2630	272	3.23	3.34	27.9542	1	NA	
1950	32	3200	272	3.08	3.61	24.9688	1	F-791(3)	
1955	17	15400	435	3.72			1	NA	
1957	16	9600	449	3.88			1	NA	
1968	59	6100	454	1.96	4.38	49.6662	1	F-14-5(5)--20-64	
1954	33	3450	510	2.58	3.58	30.3968	1	F-556(1)	
1954	42	3450	510	2.64	3.45	23.8832	1	MP-14-2(703)138--76-38	F-556(1)
1953	33	1650	190	2.45	3.81	30.3968	2	MP-14-2(703)138--76-38	FN-85
1968	31	1530	190	3.27	3.46	27.6828	2	FN-14-7(2)--21-12	
1968	64	6300	454	2.06	5.27	54.28	1	F-14-5(5)--20-64	
1946	25	1010	134	2.6	3.94	34.4678	3	F-878(1)	
1937	16	1120	110	2.86	3.4	25.5116	3	NA	
1959	45	730	91	2.08	2.91	19.8122	2	MP-15-3(702)7--76-76	F-976(2)
1959	56	860	94	2.27	3.45	34.4678	2	F-607(5)	
1958	56	1710	138	2.35	3.23	27.14	2	NA	
1963	23	1120	169	3.16	3.49	43.1526	5	F-849(5)	
1961	18	970	142	3.49	2.89	29.5826	5	F-492(3)	
1980	43	2630	374	2.21	3.8	37.996	1	F-17-2(8)--20-08	
1980	47	2490	370	2.22	3.1	21.1692	1	DP-17-3(20)--36-40	
1978	49	2720	368	3.03	3.39	33.925	1	FN-17-3(18)--21-40	
1978	69	2900	391	2.1	2.92	21.9834	1	FN-17-3(14)--21-40	
1974	64	4170	406	2.52	3.14	18.7266	1	FN-17-3(12)--21-40	
1979	68	1690	476	2.18	4.44	42.8812	1	FN-17-3(11)--21-40	
1965	19	4600	582	4.25	4.05	28.2256	2	NA	
1933	0	4240	562	5.49			2	NA	
1965	45	3700	560	3.81			2	NA	
1961	22	3050	560	3.56			2	NA	
1949	47	2230	372	2.74	3.74	37.996	3	FA-542(9)	
1969	26	12000	655	3.72	4.02	45.0524	3	UN-18-2(7)--41-21	
1966	67	3810	420	1.14	5.43	55.3656	3	FN-362*<2>	
1966	73	3250	407	1.36	4.76	48.3092	3	FN-362*<2>	
1966	62	3470	557	2.68	5.22	49.6662	3	FN-362*<2>	
1966	68	3470	557	2.1	4.41	40.9814	3	FN-362*<2>	
1966	68	4060	609	1.78	4.52	48.3092	3	FN-362*<2>	
1957	23	6400	515	4.12	3.86	34.4678	3	FN-307*<1>	
1961	58	2650	411	1.51	4.64	35.0106	2	F-94(9)	
1961	69	2050	411	1.46	4.97	49.1234	2	F-94(9)	
1961	60	2280	391	1.34	4.32	32.8394	2	FN-94(8)	
1961	48	2180	352	1.36	4.45	30.9396	2	F-94(8)	

CONYR	PCI	ADT	TRUCKS	IRI	STRUCAV	AVEK	ISTRIC	PROJECT1	PROJECT2
1959	54	4170	492	1.75	4.66	39.8958	2	F-94(7)	
1983	74	3620	261	2.03			2	BRF-18-6(15)--38-34	
1958	17	4950	1074	3.83			2	FN-166	
1974	49	7500	643	3.98			2	BRIDGE	
1968	25	12000	655	3.73	4.04	37.4532	3	NA	
1976	36	21000	930	2.84	4.5	54.5514	3	FF-520-1(7)--18-97	
1978	38	14300	1110	2.6	3.87	39.6244	3	FF-520-1(5)--66-97	
1964	71	8900	1057	1.21	6.13	56.7226	3	FN-2(2)	
1958	26	5100	730	3.22	4.6	45.8666	3	F-2(17)*<1>	
1958	28	2960	646	2.71	4.2	39.0816	3	DF-2(16)	
1958	24	2950	646	2.93	3.95	42.067	3	DF-248(3)	
1963	32	3030	646	2.54	4.35	49.3948	3	F-248(5)	
1964	31	1940	393	2.81	4.21	39.8958	3	F-445(3)	
1964	33	1940	393	2.68	4	47.2236	3	F-445(3)	
1979	68	7500	1648	1.42	3.07	30.9396	1	DP-F-520-4(16)	
1976	66	5900	1580	1.78	4.74	51.8374	1	DP-F-520-4(18)	
1976	61	6700	1809	1.92	3.2	46.6808	1	DP-F-520-4(20)--39-40	
1983	66	9800	1259	2.16	5.8	53.7372	2	FN-520-6(21)-21-07	
1983	70	8100	1199	1.69	6.1	51.8374	6	F-520-7(9)--20-10	
1983	77	7700	1185	1.88	6.1	53.7372	6	F-520-7(16)--20-10	
1979	64	5900	1074	2.01	3.82	35.282	6	TQF-520-7(10)--29-10	
1979	60	5600	1092	2.28	4.05	40.1672	6	TQF-520-7(18)--29-10	
1956	47	26700	1267				6	NA	
1976	45	21000	930	2.6	5.26	47.495	3	FF-520-1(7)--18-97	
1978	43	14300	1110	2.45	4.14	46.9522	3	FF-520-1(5)--66-97	
1979	60	7500	1648	1.52	3.29	41.2528	1	DP-F-520-4(16)	
1976	63	5900	1580	1.8	4.29	47.495	1	DP-F-520-4(18)	
1976	62	6700	1809	1.89	3.76	40.9814	1	DP-F-520-4(20)--39-40	
1968	47	5400	1664	2.94	4.23	42.3384	1	F-520-4(7)--20-40	
1983	64	9800	1259	2.35	5.36	47.7664	2	FN-520-6(21)-21-07	
1983	77	8100	1199	1.68	6.19	53.1944	6	F-520-7(9)--20-10	
1983	72	7700	1185	1.76	5.77	55.0942	6	F-520-7(16)--20-10	
1979	66	5900	1074	1.99	3.93	42.067	6	TQF-520-7(10)--29-10	
1979	61	5600	1092	2.15	3.47	34.1964	6	TQF-520-7(18)--29-	
1965	33	1080	161	2.58	3.07	33.3822	5	S-269(4) & S-269(5	
1975	51	1210	145	2.55	3	24.1546	5	SN-1832(2)--51-54	
1961	82	1340	135	1.7	3.76	42.6098	6	MP-21-6(701)46--76-48	STP-21-3(10)--2C-48
1982	63	2720	263	2.62	3.87	47.7664	6	BRF-21-3(6)--38-48	
1964	45	5000	276	3.24			6	NA	
1979	35	2370	214	3.03	3.78	43.1526	6	F-21-4(6)--20-06	
1963	43	4790	335	2.92	4.05	42.067	5	NA	
1963	53	2710	335	2.29	3.98	37.1818	5	F-484(2)	
1982	62	3380	506	2.81	4.51	45.5952	5	FN-22-2(17)-21-92	
1974	47	4860	669	3.14	4.04	35.282	6	FN-22-5(2)--21-82	
1962	38	7400	1400	3.17	5.72	39.6244	6	NA	
1962	51	6800	1507	3.07			6	NA	
1962	46	8600	1301	3.54			6	NA	
1965	25	4480	385	3.44			2	NA	
1965	35	520	100	2.27	4.42	52.6516	4	F-383(4)	
1964	36	1120	148	2.14	4.36	49.6662	4	F-451(9)	
1975	33	6900	258	3.37	3.38	23.8832	4	NA	
1977	42	1820	195	2.64	3.23	24.6974	4	FN-25-3(10)--21-01	
1977	39	2800	208	2.81			4	FN-25-3(9)--21-01	
1952	29	2620	354	2.46	4.15	39.0816	4	F-51(5)	
1967	33	950	146	2.87	4.2	43.9668	4	FN-25-4(1)--21-39	
1967	33	930	146	2.82	4.24	48.3092	1	FN-25-5(1)--21-37	
1950	38	19500	479	2.5			1	?	
1954	12	6300	806	4.31	2.7	14.1128	4	FN-14	
1960	52	4960	579	1.92	3.99	29.5826	3	F-232(9)	
1962	59	5800	668	1.55	4.62	37.7246	3	F-232(10)	
1962	56	5700	829	2.01			3	F-232(10)	
1958	9	11600	841	4.65			3	F-1053(1)	
1955	32	4320	534	2.7	3.94	35.0106	3	F-1029(2)	
1955	35	3340	532	2.37	4.05	41.5242	1	F-1029(2)	
1958	35	4300	596	2.51	4.19	40.1672	1	F-1029(7)	
1958	32	4300	595	2.43	4.6	43.6954	1	F-1029(7)	
1958	29	3910	566	2.98	3.71	26.5972	1	F-1029(7)	
1973	29	4810	421	3.36	4.23	41.7956	1	FN-30-4(11)--21-08	
1964	19	7000	793	3.43	4.29	43.1526	1	F-936(6)	
1964	27	10400	899	2.72	3.97	38.2674	1	F-936(7)	
1964	48	11200	1149	2.29	4.34	43.6954	1	F-FG-1065(18)	
1964	49	8500	921	2.24	6.36	57.8082	1	F-FG-1065(18)	
1963	67	5600	769	1.68	4.49	42.6098	1	F-1065(12)	
1963	44	5600	773	1.56	4.64	44.5096	1	F-1065(12)	
1954	37	10800	1192	3.11	4.22	32.8394	1	F-211(5)	
1954	35	9400	901	3.06			1	F-988(6)	
1954	27	9100	901	2.96	4.4	42.6098	1	F-988(6)	
1954	42	6300	837		4.39	47.2236	1	F-988(6)	
1981	47	21800	1758	2.28	4.22	45.0524	6	F-30-7(35)--20-57	
1976	38	27800	2062	2.88	5.45	59.1652	6	RF-30-7(1)--35-57	
1956	37	2510	518	2.7	4.08	35.8248	6	F-57(7)	
1956	41	2850	516	2.51	4.23	41.2528	6	F-147(9)	
1957	46	8400	620	2.71			6	FN-30-9(43)--21-23	UN-922*<1>
1962	54	5700	829	1.55			3	F-232(10)	
1973	27	4890	423	3.02	3.98	38.2674	1	FN-30-4(11)--21-08	
1964	30	7000	793	2.25	4.01	36.0962	1	F-936(6)	
1964	38	10400	899	2.86	3.95	36.3676	1	F-936(7)	
1964	60	9400	1072	2.27	4.39	40.4386	1	F-FG-1065(18)	
1963	63	5700	807	1.94	4.72	43.9668	1	F-1065(12)	
1963	59	5500	773	2.14	3.57	44.781	1	F-1065(11)	
1963	43	6700	801	1.76	4.71	54.5514	1	F-1065(11)	
1981	53	21800	1758	2	4.59	45.5952	6	F-30-7(35)--20-57	
1976	37	27700	2050	3.05	5.1	51.2946	6	RF-30-7(1)--35-57	

CONYR	PCI	ADT	TRUCKS	IRI	STRUCAV	AVEK	ISTRIC	PROJECT1	PROJECT2
1981	50	19500	767	3.13	3.78	33.1108	6	NA	
1946	14	1270	156	3.58	3.79	38.8102	4	FA-842C	
1974	36	8100	624	2.97	2.85	16.5554	4	F-FG-34-1(20)--24-65	
1974	38	6300	590	2.8	3.47	30.1254	4	RF-34-1(24)--35-65	
1973	56	5300	656	2.17	3.62	33.6536	4	F-FG-34-4(8)--24-88	
1965	42	3140	608	2.28	4.84	46.138	5	FN-223	
1966	32	12500	1133	3.21	2.69	18.1838	5	FU-63-2(1)--90-7	
1977	58	9200	956	2.71	5.21	52.1088	5	FF-FFG-534-9(9)--37-29	
1975	55	16300	1509	2.45	5.06	46.138	5	U-534-9(8)--40-29	
1974	37	8400	644	3	3.07	23.8832	4	F-FG-34-1(20)--24-	
1974	40	6300	590	2.7	3.47	32.0252	4	RF-34-1(24)--35-65	
1966	48	12500	1133	2.87	2.35	15.4698	5	FU-63-2(1)--90-7	
1977	53	9700	993	2.67	4.97	46.4094	5	FF-FFG-534-9(9)--37-29	
1975	54	16300	1509	2.65	6.18	54.5514	5	U-534-9(8)--40-29	
1972	38	6400	567	3.72	3.47	35.282	5	NA	
1973	61	5400	442	2.52	4.09	42.6098	5	FN-38-1(3)--21-70	
1973	60	4820	442	2.9	3.64	37.7246	5	FN-38-1(3)--21-70	
1960	39	2350	372	2.14	4.45	38.5388	6	FN-869	
1930	0	1980	213	5.08			6	NA	
1974	42	2910	281	3.16	3.54	31.7538	6	FN-38-3(10)--21-53	
1974	51	2180	234	2.9	3.99	43.9668	6	FN-38-4(4)--21-28	
1952	36	1390	203	3.11	2.94	24.1546	6	FN-249(4)	
1978	66	2280	238	2.41	2.79	25.783	6	FN-38-4(6)--21-28	
1960	35	920	154	3.09	3.27	30.3968	6	F-934(3)*<1>	
1978	45	6900	307	3.16	3.39	28.7684	4	F-44-2(2)--20-83	
1976	42	5400	268	3.57	2.51	13.8414	4	NA	
1981	61	840	103	3	3.2	19.2694	4	BRF-44-3(17)--38-0	
1978	58	820	222	2.01	3.6	34.7392	4	RF-44-3(6)--35-05	
1978	45	1150	222	2.32	3.34	34.7392	4	TQF-44-4(1)--29-39	
1978	58	1480	222	2.15	3.49	30.3968	4	FN-44-4(13)--21-39	
1978	13	2180	223	5.4			4	NA	
1952	0	4540	222	9.18	3.71	28.2256	4	NA	
1973	0	3310	222	8.84	3.62	27.6828	4	NA	
1974	15	3410	222	6.72	3.45	29.0398	4	FN-44-4(16)--21-39	
1973	44	4240	205	3.79			4	FN-44-4(19)--21-39	
1981	61	5400	533	2.69	4.06	31.7538	4	F-44-5(5)--20-25	
1981	44	5600	533	2.72	4.91	44.781	4	F-44-5(5)--20-25	
1981	67	5500	533	2.66	3.4	25.2402	4	F-44-5(5)--20-25	
1980	38	9400	564	3.15	4.34	39.353	1	EACF-44-5(15)--2K-25	
1956	21	3560	335	3.47	4.22	38.5388	4	NA	
1965	31	9600	410	3.31	4.69	51.2946	4	NA	
1979	55	1470	136	2.96	3.03	19.2694	6	FN-52-1(9)--21-49	
1954	23	3400	130	3.03			6	NA	
1927	22	9400	972	2.76	4.65	50.4804	6	U-148(4)	NA
1976	40	5200	353	3.42	4.27	50.4804	6	FN-3-9(6)--21-31	
1978	46	5800	365	2.17	5.16	50.7518	2	FN-52-2(10)--21-22	
1978	46	3630	322	2.81	4.02	37.1818	2	FN-52-2(10)--21-22	
1978	57	2640	322	2.4	3.94	36.9104	2	FN-52-2(10)--21-22	
1978	49	2500	367	2.62	3.89	39.6244	2	FN-52-2(6)--21-22	
1961	45	5500	599	1.68	4.54	45.8666	2	F-98(8)	
1964	52	3510	397	2.79	5.97	52.6516	2	F-1112(2)	
1970	21	1880	217	4.19			2	NA	
1959	32	1830	245	2.66	3.25	27.14	4	F-472(2)	
1960	35	3460	326	2.44	2.95	22.7976	4	F-442(8)	
1952	28	2020	226	2.67	3.78	35.8248	4	FN-554	
1971	69	3370	432	2.21	5.6	43.6954	3	NA	
1971	22	6500	565	4.03	4.89	51.566	3	NA	
1973	26	2140	283	3.57	3.07	16.0126	3	FN-59-8(6)--21-71	
1958	25	3670	885	3.1	3.72	40.1672	3	FN-342	
1955	3	7000	992	5.06			3	F-342(18)	
1937	9	7400	1070	3.47			3	FA-498	
1966	18	4750	879	4.29	5.67	55.3656	3	F-33-4(1)--72-04	
1983	66	15400	1125	2.8	7.18	59.1652	5	F-61-1(35)--20-56	
1978	42	13600	1148	2.75	4.9	49.3948	5	FN-61-2(19)--21-29	
1977	53	16200	1102	3.24	4.89	46.9522	5	FN-61-2(7)--21-29	
1978	43	14800	969	4.31	4.17	40.9814	5	FN-61-2(18)--21-42	
1977	54	9600	867	3.16	4.65	48.5806	5	FN-61-2(13)--21-29	
1977	64	7500	841	2.66	5.14	49.1234	5	FN-61-2(13)--21-29	
1970	60	4510	795	2.1	5.24	55.3656	5	F-61-3(2)--20-58	
1958	36	8800	1183	2.43	4.58	43.6954	6	F-217(4)*<1>	
1958	31	12100	1325	3.85	5.15	42.067	6	U-831(7)	
1951	47	22400	966	3.23	6.09	53.1944	6	?	F-927(10)
1983	44	26100	2417	3.46	4.67	44.2382	6	FFD-561-1(6)--2N-82	
1983	53	17100	2026	2.69	4.41	37.4532	6	F-561-1(7)--20-82	
1982	60	15300	1929	3.06	5.48	53.7372	6	FFD-561-2(4)	
1982	66	15400	1713				6	NA	
1978	36	13800	1162	3.35	4.97	47.7664	5	FN-61-2(19)--21-29	
1977	27	16200	1102	3.8	4.2	46.138	5	FN-61-2(7)--21-29	
1978	21	14800	969	4.51	4.13	41.5242	5	FN-61-2(18)--21-29	
1977	46	9600	867	3.39	4.57	50.4804	5	FN-61-2(13)--21-29	
1977	53	7500	841	2.81	5.55	51.0232	5	FN-61-2(13)--21-29	
1958	47	8800	1183	2.17	4.17	29.854	6	F-217(4)	
1958	37	12100	1325	3.74	3.89	27.9542	6	U-831(7)	
1960	12	20600	512	4.27	4.72	36.9104	6	????????	
1983	53	22000	1022	2.97	5.16	49.6662	6	FFD-61-5(50)--2N-82	
1983	45	26100	2417	3.91	4.64	45.3238	6	FFD-561-1(6)--2N-8	
1983	55	17100	2026	3.01	4.45	48.0378	6	F-561-1(7)--20-82	
1982	69	15300	1929	2.37	4.82	51.566	6	FFD-561-2(4)	
1968	76	6400	1211	1.14	5.6	45.8666	6	F-61-8(4)--20-31	
1968	78	8500	1207	1.43	6.21	61.065	6	F-61-8(5)--20-31	
1976	54	1900	121	2.73	3.68	38.5388	6	FN-62-1(4)--21-49	
1977	45	3250	660	2.3	4.19	41.7956	5	FN-63-1(20)--21-26	
1977	29	3600	603	3.62	4.31	45.5952	5	FN-63-1(14)--21-26	

CONYR	PCI	ADT	TRUCKS	IRI	STRUCAV	AVEK	ISTRIC	PROJECT1	PROJECT2
1963	6	6500	707	5.22			5	F-50(9)	
1965	37	5400	730	2.89	5.23	45.5952	5	F-42(6)	
1965	33	5700	730	3.11	5.18	48.5806	5	F-42(7)	
1966	37	6400	652	2.57	4.93	49.9376	5	FU-63-2(1)--90-7	
1966	33	9900	800	2.95	3.59	27.9542	5	FU-63-2(1)--90-7	
1964	5	24100	1203	5.41			5	U-159(10)	
1957	19	15600	1046	3.91	4.18	40.71	5	U-159(4)*<1>	
1963	20	13100	1217	4.15	4.44	29.5826	5	U-UG-F-159(6)	U-UG-F-159(6)
1949	49	9400	1857	2.94	3.86	39.6244	5	NA	
1949	45	9400	1743	2.99	3.93	37.996	5	F-146(3)	
1963	44	6200	695	2.9	3.43	31.4824	5	F-146(7)	
1963	27	7900	695	3.5	3.55	33.1108	5	NA	
1954	40	8800	695	3.54	4.24	44.2382	5	NA	
1965	6	8300	609	5.67	3.61	28.7684	5	NA	
1962	34	4660	590	3.06	5.44	51.0232	5	F-70(14)	
1979	34	3980	579	3.45	4.39	40.1672	5	F-63-3(25)--20-62	
1955	22	4440	531	4.43	3.55	32.8394	5	NA	
1937	7	3360	358	3.54	3.47	27.4114	1	NA	
1964	26	2800	427	3.38	4.55	49.6662	1	NA	
1935	0	2640	339	4.27			1	NA	
1980	60	1930	393	2.4	4.88	49.1234	1	FN-63-4(6)--21-79	
1979	74	2460	393	2.39	5.6	53.1944	1	FN-63-5(29)--21-86	
1978	60	3640	393	3.37	3.75	37.1818	1	NA	
1966	20	6400	406	4.15	3.79	36.9104	1	NA	
1975	45	6900	631	3.77	4.72	43.1526	1	RF-63-5(11)--35-86	
1976	65	4060	558	2.32	5.02	49.9376	1	RF-63-5(28)--35-86	
1976	70	3180	560	2.44	4.44	44.2382	1	RF-63-5(27)--35-86	
1978	52	6600	879	3.56	3.74	33.925	2	FN-63-7(9)--21-09	
1963	54	3520	682	1.64	4.59	52.6516	2	F-35(9)	
1966	39	10900	810	3.34	3.8	32.2966	5	FU-63-2(1)--90-7	
1964	12	24900	1228	4.67			5	U-159(10)	
1957	18	15600	1046	3.89	3.31	20.8978	5	U-159(4)*<1>	
1963	23	13100	1217	4.13	5.03	42.067	5	U-UG-F-159(6)	U-UG-F-159(6)
1964	14	3230	547	4.57	5.06	55.0942	1		
1962	61	14600	825	2.04			2	U-202(7)	
1930	38	6300	251	3.05	4.44	48.3092	6	NA	
1954	37	1640	293	2.82	3.49	24.6974	5	F-344(4)	
1954	53	1590	306	1.83	4.32	43.424	5	F-344(4)	
1959	35	2970	296	2.6	4.8	50.209	5	F-1074(3)	
1973	36	18700	679	4.05			5	U-69-3(3)--40-91	
1980	48	7700	954	2.3	4.37	48.852	1	F-FG-65-4(18)--24-77	
1964	32	10600	395	3.76	4	52.3802	2	FN-65-8(31)--21-17	NA
1972	42	17800	785	2.5	4.09	34.4678	5	FN-69-3(8)--21-91	
1980	40	8200	913	2.92	4.05	33.1108	1	F-FG-65-4(18)--24-77	
1954	57	16700	1092	2			6	NA	
1934	18	24700	1300	3.03	3.61	31.211	6	NA	
1972	28	12900	915	3.77	3.7	26.8686	6	UN-67-1(3)--41-82	
1983	63	3500	498	2.9	5.81	58.0796	6	BRF-67-2(29)--2P-23	
1982	63	3520	446	2.46	4.62	47.495	6	FN-67-2(12)--20-23	
1978	48	10500	816	3.14			6	FN-67-2(13)--21-23	
1949	9	7300	180	4.17	3.4	29.5826	6	NA	
1977	33	4200	180	2.82	3.22	24.6974	6	NA	
1978	59	2470	130	2.36	3.69	36.639	6	F-67-2(19)--20-23	
1978	55	2350	111	2.33	3.33	39.353	6	F-67-2(19)--20-23	
1972	28	14600	866	3.53			6	UN-67-1(3)--41-82	
1958	33	10200	808	3.08	4.97	48.5806	6	NA	
1978	62	7600	703	2.31			6	NA	
1976	35	3710	200	4.41	4.06	40.9814	5	NA	
1977	50	2890	214	2.82	3.68	55.0942	5	FN-69-1(11)--21-27	
1952	41	4040	349	3.49			5	NA	
1948	50	4940	199	1.91	3.87	37.4532	5	NA	
1968	40	22600	1087	4.52			1	?	
1981	26	19400	1190	4.35			1	FN-69-4(31)--21-77	
1960	41	22200	1618	3.44	5.45	53.4658	1	NA	
1966	18	16000	344	4.18			1	NA	
1963	26	18600	867	3.26			1	NA	
1938	30	14600	518	3.12			1	FAGM-72E	
1965	21	11200	337	3.91			1	NA	
1965	27	10000	281	3.28			1	NA	
1957	42	9200	244	1.84	4.89	42.6098	1	FN-57	
1974	74	1370	325	1.51	3.63	26.8686	1	FN-69-6(2)--21-40	
1968	55	3700	375	2.23	5.11	47.2236	2	F-69-7(2)--20-99	
1968	56	1540	393	2.23	4.22	33.3822	2	F-69-9(3)--21-95	
1960	33	23000	1818	4.72	4.76	42.6098	1	NA	
1963	31	18200	846	2.78			1	NA	
1965	19	10000	281	4.11			1	NA	
1972	37	1910	201	2.74	3.84	40.4386	4	F-71-1(11)--20-73	
1972	35	1640	201	2.95	3.68	39.8958	4	F-71-1(6)--20-73	
1972	34	1910	191	3.05	3.52	33.925	4	F-FG-71-2(8)--24-69	
1962	70	5800	604	1.21	4.89	40.4386	3	F-154(7)	
1974	38	2410	511	2.91	4.21	37.4532	3	FN-71-6(5)--21-81	
1970	27	2310	373	3.34	4.09	46.138	3	FN-20-2(1)--20-81	
1937	72	2670	437	1.84	5.01	40.9814	3	FR-71-7(32)--2G-11	FA-37BI
1977	60	3020	448	2.36	4.16	42.067	3	FN-71-7(14)--21-11	
1980	29	6600	506	3.84	4.06	42.067	3	F-71-9(15)--20-30	
1972	43	8800	1621	2.25	4.54	47.2236	3	FN-75-5(8)--21-75	
1973	44	2430	576	2.05	4.07	36.3676	3	FN-75-6(3)--21-84	
1977	51	1920	412	2.64	3.39	26.3258	3	FN-75-7(4)--21-60	
1973	22	4100	375	4.26			3	NA	
1974	42	3500	404	2.36	3.51	24.1546	3	FN-9-1(5)--21-60	
1972	26	8200	1515	3.48	3.5	22.7976	3	FN-75-5(8)--21-75	
1980	60	17700	568	3.18			3	NA	
1953	13	1000	118	3.48	3.82	39.0816	5	FN-352*<1>	

CONYR	PCI	ADT	TRUCKS	IRI	STRUCAV	AVEK	ISTRIC	PROJECT1	PROJECT2
1953	12	880	111	3.83	3.24	29.5826	5	FN-352	
1953	17	1010	121	3.58			5	NA	
1967	42	3800	160	3.29	3.45	23.8832	4	STPN-83-1(18)--2J-15	NA
1956	53	5400	485	1.67	4.74	37.1818	4	F-773(3)	
1956	31	4800	473	2.82	3.74	24.9688	4	NA	
1977	79	3890	452	1.36	4.01	40.4386	4	FN-92-4(9)--21-61	
1978	49	1950	414	1.94	4.18	44.2382	5	TQF-592-2(7)--29-63	
1965	39	2360	445	2.46	4.59	49.9376	5	F-146(9)	
1953	18	10100	716	4.63			5	NA	
1973	39	12700	707	3.16	4.95	50.7518	5	UN-92-7(12)--41-62	
1949	13	11200	636	4.26	4.89	41.7956	5	FN-92-7(23)--21-62	NA
1960	21	5400	551	4.06	4.2	33.6536	5	FN-293	
1960	35	3680	481	2.85	4.75	40.71	5	FN-70*<1>	
1960	48	3100	465	2.77	5.22	45.8666	5	FN-70*<1>	
1964	56	2730	458	2.01	5.28	52.6516	5	FN-92-7(31)--21-62	FN-92-8(10)--21-54
1964	39	2330	385	2.71	5.22	46.4094	5	F-34(5)*<1>	
1968	32	2160	328	3.19	4.35	43.9668	5	F-92-8(2)--20-54	
1970	58	1780	297	2.37	3.83	47.2236	5	STPN-92-9(75)--2J-92	FN-92-9(3)--21-92
1972	19	5200	334	5.6			5	NA	
1978	42	1930	404	2.5	4.25	41.2528	5	TQF-592-2(7)--29-63	
1973	17	8300	590	4.83	3.83	33.3822	5	NA	
1978	56	1320	187	2.78	3.22	27.14	2	FN-93-1(6)--21-09	
1963	29	1270	125	3.94	3.54	45.3238	5	NA	
1963	24	1270	125	3.24	3.36	34.1964	5	F-737(4)	
1969	33	23900	617	3.15	5.34	45.8666	6	???	
1973	18	3010	189	4.19	3.46	28.2256	3		
1966	27	2050	297	3.21	3.07	30.6682	1	NA	
1954	57	7100	264	2.59	5.39	45.8666	2	NA	
1954	57	4160	171	2.46	5.24	41.7956	2	NA	
1936	41	2200	125	2.59			6	NA	
1936	14	1350	126	2.98	3.23	27.9542	6	FA-213	
1960	35	11200	1109	3.38			6	NA	
1960	46	11200	1449	2.94	4.5	39.6244	6	NA	
1977	39	5600	456	3.82	3.53	29.5826	5	FN-136-1(6)	
1967	53	9900	585	3.11	4.13	29.854	5	UN-136-1(1)	
1973	25	9800	294	5.15			6	NA	
1957	25	1020	151	2.95	3.42	40.4386	2	F-1007(2)	
1946	15	2070	210	3.32			3	NA	
1946	19	1840	185	2.88	2.88	23.3404	3	F-453(2)	
1946	17	1430	171	3.1	2.87	21.1692	3	F-453(2)	
1946	14	1660	151	3.28	2.54	14.1128	3	NA	
1960	42	2730	305	2.1	5.4	52.1088	3	FN-1040	
1961	35	2090	289	2.35	4.59	44.2382	3	F-1083	
1961	33	2100	291	2.65	4.05	32.0252	3	F-1083	
1967	0	3690	210	7.99	3.43	24.9688	3	NA	
1961	3	2700	168	7.25	5.24	45.3238	3	NA	
1976	56	1930	168	2.58	2.71	18.1838	3	FN-141-2(6)--21-67	
1961	20	3470	433	3.75			3	MP-141-3(701)77--76-14	NA
1955	44	1880	341	2.57	4.15	37.7246	3	F-1023(1)	
1956	39	2050	361	2.68	4.55	44.5096	3	NA	
1956	31	2420	383	2.59	3.16	28.2256	4	F-1023(1)	
1956	49	2200	383	2.62	3.45	31.211	4	NA	
1952	28	2100	390	2.53	4.6	48.852	4	F-619(7)	
1977	51	7000	647	2.79	5.44	53.4658	4	FN-141-6(8)--21-25	
1977	57	9100	708	2.38	4.13	46.4094	4	FN-141-6(24)--21-25	
1976	76	10000	824	1.14	4.37	42.067	4	FN-141-7(7)--21-77	
1977	63	7700	661	2.85	5.26	50.209	4	FN-141-6(8)--21-25	
1977	55	9000	715	2.47	4.64	47.7664	4	FN-141-6(24)--21-25	
1976	73	10000	824	1.25	4.08	38.8102	4	FN-141-7(7)--21-77	
1960	33	1160	243	2.3	2.71	21.712	3	F-1036(3)	
1960	32	880	242	2.28	2.65	18.4552	3	F-1036(3)	
1976	53	7900	272	3.85	5.01	49.1234	4	UN-144-1(1)--41-25	
1962	36	5700	190	3.63	4.69	45.8666	4	NA	
1983	62	9600	870	2.21	4.6	49.1234	1	F-146-2(6)--20-79	
1959	16	11800	834	4.14	4.54	35.8248	1	NA	
1979	47	3270	247	4.03	4.18	42.8812	4	FN-148-2(3)--21-02	
1983	52	6700	256	2.27	5.44	48.3092	6	F-149-2(29)--20-48	
1979	16	4160	339	5.18			6	NA	
1979	65	7100	631	2.37	4.99	52.1088	6	NA	
1971	58	2180	245	2.41	4.42	47.2236	2	FN-150-6(9)--21-33	
1971	48	2150	337	2.72	4.18	47.2236	2	FN-150-6(14)--21-33	
1958	48	2390	316	2.79	4.19	45.8666	2	DF-1011(2)	
1958	15	3160	316	4.01			2	NA	
1975	52	5600	529	2.73	4.81	49.3948	6	MP-151-6(700)8--76-48	FN-149-2(13)--21-48
1966	33	21300	922	4.51			1	FN-163-1(40)--21-77	U-216(9)
1965	34	18100	959	2.61			1	F-UG-U-216(10)*<1>	
1965	44	15700	1776	2.82	3.76	27.14	1	F-UG-U-216(10)	
1964	44	13200	1828	2.56	3.97	42.067	1	FA-216(8)	
1966	35	21300	922	3.69			1	U-216(9)	
1983	83	22600	1007	1.08			1	HES-163-1(31)	
1965	44	17900	960	2.95	3.83	29.3112	1	F-UG-U-216(10)	
1965	42	15700	1776	2.5	4.5	40.4386	1	F-UG-U-216(10)	
1964	31	13200	1838	2.76	4.45	38.8102	1	FA-216(8)	
1955	46	17400	1149	2.61	3.5	22.5262	4	NA	
1979	33	7800	718	3.7	5.61	51.8374	4	FN-169-4(17)--21-25	
1973	32	4970	390	3.57	3.66	28.2256	4	FN-169-4(5)--21-25	
1973	44	4970	390	2.39	3.84	30.9396	4	FN-169-4(5)--21-25	
1960	57	7800	1063	3.07	4.67	46.138	1	F-U-UG-422(6)	
1973	55	6400	865	3.06	3.74	24.9688	1	UN-169-6(9)--41-94	
1960	22	8500	987	3.72	4.43	42.3384	1	F-U-UG-422(6)	
1960	61	5500	748	1.2	5.11	50.7518	1	F-422(5)	
1972	61	2860	597	2.59	4.83	40.9814	2	F-169-8(3)--20-55	
1972	75	2860	597	1.75	3.11	26.8686	2	F-169-8(3)--20-55	

CONYR	PCI	ADT	TRUCKS	IRI	STRUCAV	AVEK	ISTRIC	PROJECT1	PROJECT2
1972	62	3650	588	1.87	4.05	32.0252	2	F-169-8(3)--20-55	
1954	33	7400	468	3.2			2	U-111(5)	
1964	50	3820	353	2.13	3.44	20.8978	2	FN-111(10)	
1964	50	3240	349	2.76	4.19	43.6954	2	FN-111(10)	
1964	34	2130	349	2.84	4.95	48.0378	2	FN-111(10)	
1960	40	7900	996	3.29	4.43	45.0524	1	F-U-UG-422(6)	
1960	51	5500	743	2.25	4.55	43.424	1	F-422(5)	
1968	49	1610	286	2.26	3.65	32.568	4	S-584(5)--50-15	
1961	57	2730	238	2.04	4.64	52.6516	3	F-993(1)	
1965	46	4320	475	2.62	4.11	42.067	3	I-29-5(16)108	
1961	47	5900	520	2.24	4.12	42.6098	3	F-993(1)	
1965	11	6100	449	4.84	5.34	54.0086	3	NA	
1938	15	2600	282	2.85	3.76	42.6098	3	FA-426	
1953	44	1630	112	2.63	3.46	26.3258	3	FN-291(2)	
1953	35	1180	89	2.78	3.18	23.069	3	F-245(2)	
1941	19	2040	202	2.77	3.62	35.5534	3	FA-732B	
1980	58	2100	156	2.83			1	NA	
1980	55	2010	157	2.41	2.95	20.0836	1	F-175-7(13)-20-40	
1980	67	1890	159	1.91			1	NA	
1967	48	2390	278	3.07			1	NA	
1921	0	5400	550	5.76			1	NA	
1975	37	3210	549	2.87	3.03	26.5972	1	FN-175-8(4)--21-42	
1973	51	3090	550	2.72	3.39	38.8102	1	FN-175-9(2)--21-38	
1954	36	580	144	2.52	3.11	21.712	3	F-356(11)	
1950	39	580	98	3.58			3	NA	
1950	43	730	98	2.57	3.1	23.069	3	F-356(9)	
1950	44	1040	98	3.1			3	NA	
1970	61	1860	407	2.27	4.8	59.4366	2	FN-154-1(3)--21-33	
1955	40	1930	127	2.47	3.58	30.9396	4	F-459(3)	
1955	47	1760	127	2.55	3.1	23.3404	4	F-459(3)	
1955	44	1300	127	2.76	3.2	24.6974	4	F-459(3)	
1957	42	970	185	2.72	3.56	27.9542	4	NA	
1957	36	930	185	2.96	3.25	24.1546	4	F-521(4)	
1960	34	22400	1108	3.77	4.91	48.5806	4	NA	
1973	11	15300	517	5.63	3.66	29.5826	4	NA	
1960	27	22400	1108	3.64	3.46	21.712	4	NA	
1973	37	17800	619	5.06			4	NA	
1971	11	2670	58	5.09	3.4	26.8686	1	NA	
1967	35	2180	173	2.35	2.98	24.426	1	SN-587(3)--51-08	
1980	73	8400	650	2.13	6.16	54.0086	5	F-218-1(22)--20-56	
1976	57	2980	611	2.83	3.75	32.0252	5	RF-218-1(16)--35-56	
1976	58	2980	611	2.86	4.02	40.9814	5	FN-218-1(17)--21-56	
1982	77	15000	2167	1.85	4.86	39.8958	5	F-518-3(12)--20-92	
1982	75	15000	2160	2.13	4.93	44.2382	6	F-518-5(10)--20-52	
1983	79	15600	2216	2.02	5.92	49.6662	6	F-518-4(21)--20-52	
1983	74	19700	2733	2.31	5.99	51.0232	6	F-518-4(12)--20-52	
1982	59	12700	1867	2.91	4.43	41.5242	5	F-518-3(12)--20-92	
1982	65	15000	2160	2.34	4.43	43.9668	6	F-518-5(10)--20-52	
1983	70	15600	2216	2.19	5.92	51.2946	6	F-518-4(21)--20-52	
1983	68	19700	2733	2.57	6.2	54.5514	6	F-518-4(12)--20-52	
1954	41	5200	383	2.22	3.47	24.426	6	F-1018(2)	
1954	4	2100	182	5.01	3.39	27.14	4	NA	
1967	48	1600	164	2.11	4.49	46.6808	4	F-275-1(1)--20-36	
1940	30	2950	208	2.98	3.6	26.3258	2	FA-832A(1)	
1940	30	2950	208	2.79	3.33	17.641	2	FA-832A(1)	
1968	49	1130	127	2.41	3.23	24.6974	5	S-2960(1)--50-91	
1968	53	1130	127	2.46	3	18.7266	5	S-2960(1)--50-91	
1983	46	6400	909	2.35	4.42	37.7246	1	F-330-1(11)--20-50	
1983	73	6400	909	2.13			1	F-330-2(19)--20-64	
1983	48	6400	909	2.11	4.88	43.6954	1	F-330-2(19)--20-64	
1974	43	2810	307	2.69	3.13	27.6828	1	SN-642(8)--51-64	
1983	59	7200	1028	2.39	4.89	49.1234	1	F-330-2(20)--20-64	
1957	60	1530	132				1	F-859(3)	
1972	41	1690	226	3.55	2.9	28.2256	4	NA	
1980	39	13700	1623	3.61	6.45	52.1088	3	NA	
1980	40	16100	1765	4.03	4.9	40.71	3	NA	
1974	25	24700	2330	4.16	4.53	45.3238	3	NA	
1957	50	9000	1820	2.88	3.74	33.1108	3	NA	
1980	56	10900	1586	2.63	5.44	52.6516	3	NA	
1980	32	16000	1847	3.63	4.5	34.1964	3	NA	
1974	21	20400	2209	4.55	4.03	42.8812	3	NA	
1957	25	9500	1910	3.02			3	NA	
1974	32	4770	175	2.96	2.56	23.3404	1	?	
1963	25	11100	283	3.35			6	NA	
1950	47	14900	473	2.77			6	NA	
1980	49	15300	637	4.31			6	NA	
1955	54	27100	548	2.36			6	NA	
1963	52	11500	290	3.05			6	NA	
1976	37	14200	584	4.08			1	NA	
1954	0	7900	424	6.06			1	NA	
1960	14	4600	303	4.24			1	NA	
1976	31	17300	592	4.69			1	NA	
1960	24	4600	303	4.44			1	NA	

PROJECT3	PROJECT4	PROJECT5	JE	JE	JE	CRACK	CRACK	CRACK	CRACK	CRACK	CRACK	RACKV	RACKV	CRACKV	CRACKT	CRACKL	
						2	2	0	0	7	14	0	1	207	0	4	
						5	6	50	4	10	3	32	10	36	11	20	
						0	74	0	78	123	46	55	175	114	22	146	
						4	4	2	2	3	40	0	0	0	1	33	
						6	8	0	1	2	0	1	0	0	2	4	
						2	3	0	0	3	104	0	0	16	2	19	
						8	6	2	1	4	1	0	0	0	0	0	
						10	20	1	3	27	6	1	13	3	4	18	
						4	44	0	13	79	8	0	132	48	3	71	
						5	35	2	2	80	20	1	101	54	5	33	
						7	2	0	0	3	27	0	0	5	1	8	
						13	1	6	0	7	8	0	0	0	0	4	
						11	76	7	7	17	9	0	0	0	10	3	
						6	2	5	0	0	0	0	0	0	0	0	
						24	8	6	4	29	1	0	0	0	0	0	
						14	4	5	0	6	27	0	0	0	1	98	
						7	34	3	0	14	6	0	0	0	0	2	
						0	49	1	10	120	6	0	17	3	4	30	
						5	20	6	14	55	9	1	17	2	1	50	
						6	29	12	4	11	13	1	3	8	1	54	
						21	13	13	0	1	5	0	1	0	1	52	
						46	8	26	83	66	15	0	0	0	1	3	
						19	0	2	0	6	11	0	0	0	0	1	
						20	3	15	0	31	17	0	3	17	0	10	
						16	14	5	7	13	41	0	2	15	1	8	
						5	0	0	0	0	58	0	0	0	0	2	
						1	0	0	0	0	7	0	0	0	0	0	
						2	0	0	0	0	4	0	0	0	0	2	
						6	7	62	0	13	4	0	9	0	1	1	
						4	2	3	0	4	0	0	0	0	0	0	
						4	2	36	0	1	7	0	0	0	1	4	
						20	4	11	0	0	0	0	0	0	0	0	
						19	13	24	0	3	1	0	0	0	0	1	
						3	2	0	0	0	64	0	0	0	1	6	
						3	5	2	0	0	7	0	0	3	0	2	
						3	4	0	0	8	5	0	0	3	0	1	
						2	8	9	0	3	4	0	20	0	0	7	
						2	3	0	0	0	0	0	0	0	0	2	
						2	12	67	0	27	15	0	0	0	1	8	
						10	6	10	31	33	0	0	0	0	5	0	
						16	13	12	23	57	1	3	3	0	6	4	
						7	12	2	0	1	19	0	0	10	14	26	
						13	1	30	0	1	49	0	0	0	2	7	
						10	1	27	0	1	11	0	0	0	0	4	
						24	4	43	0	3	0	0	0	0	0	1	
						1	7	0	0	6	3	0	1	0	0	1	
						12	82	32	3	20	2	4	0	0	29	5	
						8	18	18	0	23	0	0	0	0	0	2	
						2	15	56	1	1	12	0	0	1	0	15	
						0	4	2	0	0	13	0	0	0	0	0	
						4	7	0	1	6	20	0	0	0	1	7	
						9	17	1	30	62	4	15	19	0	30	3	
						66	12	28	10	16	0	0	1	0	4	9	
						19	4	57	190	86	13	0	1	3	2	6	
						35	1	17	2	3	1	0	0	0	1	1	
						87	1	11	0	0	1	0	0	0	0	1	
						0	0	0	0	0	0	0	0	0	0	0	
						0	0	0	0	0	0	0	0	0	0	0	
						30	6	24	0	27	26	0	0	0	3	2	
						8	2	9	0	42	4	0	0	0	0	1	
						10	13	12	0	5	0	0	6	0	0	1	
						5	11	0	5	12	2	1	2	2	0	8	
						7	61	0	24	25	19	1	41	19	1	49	
						11	3	2	0	0	26	0	0	0	0	12	
						10	10	2	2	43	6	0	0	0	0	4	
						3	39	9	3	38	10	0	33	116	4	49	
						0	29	11	3	122	146	0	3	14	2	47	
						10	6	7	12	3	7	6	0	0	3	3	
						28	3	8	0	3	3	0	0	0	0	2	
						25	6	8	0	15	6	0	5	0	0	2	
						1	4	1	0	4	5	0	0	0	1	1	
						20	3	1	0	13	2	0	0	0	1	1	
						0	2	0	0	0	15	0	0	0	0	4	
						9	28	2	38	9	79	14	78	40	21	20	
						43	4	12	0	11	2	0	0	0	0	3	
						22	2	24	1	15	3	0	0	0	1	1	
						3	0	1	2	14	3	0	0	0	0	0	
						4	4	2	0	14	30	0	0	322	0	21	
						19	17	1	26	34	4	39	65	10	12	6	
						9	4	1	4	150	1	0	0	0	0	2	
						36	12	47	1	0	37	0	0	0	6	2	
						0	35	0	0	0	0	0	0	0	0	0	
						14	11	11	0	14	6	0	0	0	0	0	
						12	4	17	11	12	25	0	0	0	1	1	
						7	2	8	0	12	10	0	0	0	0	3	
						20	0	20	0	5	0	0	0	0	0	0	
						3	5	6	0	8	0	0	0	0	0	0	
						0	0	0	0	0	0	0	0	0	0	0	
						0	9	3	0	70	3	0	0	0	0	0	
						5	2	0	0	8	0	0	0	0	0	1	
						2	3	6	15	7	0	0	0	0	0	0	
						1	4	3	9	73	0	0	0	0	0	0	
						6	5	13	6	18	1	0	0	0	2	1	

PROJECT3	PROJECT4	PROJECT5	JE	JE	JE	CRACK	CRACK	CRACK	CRACK	CRACK	CRACK	RACKV	RACKV	CRACKV	CRACK	CRACKL	
						3	3	4	5	1	10	0	3	4	17	39	
						27	5	63	2	22	1	0	0	0	6	6	
						5	3	94	0	0	12	0	0	0	0	31	
						12	6	53	4	26	4	0	0	0	2	1	
						31	9	74	8	33	0	0	0	0	1	2	
						8	1	0	0	18	45	0	0	0	0	3	
						7	2	1	0	47	5	0	0	0	0	3	
						29	2	1	0	20	0	0	0	0	2	2	
						2	3	1	1	56	3	0	0	0	0	1	
						4	7	1	0	70	4	0	0	0	1	1	
						10	6	57	0	4	0	0	0	0	0	6	
						2	1	52	0	6	3	0	0	0	0	2	
						0	7	2	0	0	0	0	0	0	0	0	
						0	2	0	72	1	0	41	0	0	191	16	
						0	14	0	242	43	1	182	10	0	181	1	
						22	4	113	0	4	1	0	0	0	0	0	
						7	1	4	0	8	2	0	0	0	0	1	
						32	9	5	0	0	3	0	0	0	0	5	
						2	8	4	0	44	0	0	0	0	2	2	
						62	4	42	0	33	2	0	0	0	1	3	
						8	4	30	0	1	2	0	0	0	1	1	
						13	1	99	0	6	3	0	0	0	0	2	
						12	10	15	0	33	7	0	0	0	0	2	
						2	0	4	0	0	0	0	0	0	0	9	
						6	7	23	0	26	9	0	0	0	0	3	
						0	5	0	0	9	3	0	5	5	1	3	
						9	22	16	8	5	0	0	11	0	0	13	
						16	7	5	0	6	3	0	0	0	0	1	
						2	4	0	0	3	1	0	0	0	0	1	
						2	1	2	0	1	3	0	0	0	0	1	
FN-103	P-236ABC					0	0	0	0	0	2	0	0	0	0	0	
FN-103	P-236ABC					0	0	0	0	0	0	0	0	0	0	1	
FN-103	P-236ABC					0	0	0	0	0	0	0	0	0	0	0	
FN-103	P-236ABC					0	0	0	0	0	0	0	0	0	0	0	
FN-103	P-236ABC					0	0	0	0	0	0	0	0	0	0	0	
FN-103	P-236ABC					0	10	0	42	33	13	21	83	23	3	9	
						6	0	0	0	0	11	0	0	0	0	3	
						2	15	0	0	0	0	0	0	0	0	16	
						13	8	2	1	1	7	0	0	0	0	8	
						20	14	7	0	9	11	0	0	0	1	3	
						26	35	25	27	68	3	0	15	3	5	18	
						5	4	15	0	8	1	0	1	0	1	1	
						1	2	1	0	4	2	0	0	0	0	6	
						11	6	9	0	0	0	0	0	0	2	5	
						8	5	12	0	6	1	0	0	0	1	0	
						8	3	2	0	0	0	0	0	0	0	0	
						9	4	14	0	5	0	0	0	0	3	0	
						34	4	54	0	2	3	0	0	0	0	4	
						44	4	11	0	2	15	0	0	0	0	0	
						55	2	4	0	0	22	0	0	0	0	2	
						1	67	28	0	4	0	0	0	0	0	3	
						1	80	32	1	7	2	0	2	1	0	11	
						1	14	18	0	0	5	0	0	0	3	133	
						0	71	16	0	0	3	0	0	0	0	79	
						1	120	12	0	7	3	0	0	2	9	28	
						11	29	15	1	51	9	1	23	6	1	7	
						13	9	12	4	46	6	0	0	0	1	18	
						13	16	3	33	36	12	4	19	4	0	7	
						9	8	8	14	3	0	1	10	0	5	1	
						17	22	1	0	1	0	0	0	0	0	2	
						34	11	32	1	3	1	0	0	0	0	8	
						68	2	25	0	4	4	0	0	0	0	1	
						10	0	0	0	0	0	0	0	0	0	0	
						3	72	57	0	4	1	0	0	0	13	8	
						2	91	35	37	59	0	7	17	1	33	20	
						2	31	3	7	22	20	9	18	5	4	12	
						0	3	0	0	20	3	0	0	0	0	0	
						0	24	0	14	160	0	0	0	0	1	3	
						23	8	59	0	6	6	0	2	0	2	4	
						5	46	16	0	26	0	0	64	1	2	14	
						31	1	11	0	10	1	0	0	0	0	1	
						3	3	10	0	13	37	0	0	0	0	1	
						3	3	4	0	11	39	0	0	0	0	2	
						0	1	0	0	5	3	0	0	0	0	1	
						0	0	0	0	0	0	0	0	0	0	0	
						4	24	0	2	12	33	4	38	7	5	3	
						7	5	12	0	11	28	0	0	0	0	4	
						4	8	9	0	19	38	0	0	0	0	13	
						0	6	3	0	34	21	0	0	0	0	0	
						14	0	14	0	36	157	0	0	0	0	7	
						0	76	6	2	9	1	0	1	0	2	15	
						2	26	21	1	32	49	0	0	0	4	12	
						3	6	1	0	5	6	0	0	0	20	11	
						0	4	0	0	4	5	0	0	1	3	12	
						0	7	0	0	0	0	2	12	0	9	4	
						0	25	0	2	12	0	1	5	0	12	4	
						0	18	0	135	190	10	53	71	3	80	3	
						1	23	1	5	62	23	3	8	24	1	23	
						13	4	2	0	7	0	0	0	0	2	0	
						0	11	0	60	5	32	53	6	23	102	24	
						1	1	1	0	3	27	0	0	0	0	5	
						14	9	24	0	22	0	0	0	0	0	0	

PROJECT3	PROJECT4	PROJECT5	JE	JE	JE	CRACK	CRACK	CRACK	CRACK	CRACK	CRACK	CRACKV	RACKV	CRACKV	CRACKT	CRACKL	
						9	9	3	4	7	3	1	0	0	29	1	
						0	27	4	1	1	0	166	60	344	40	14	
						21	13	23	31	29	19	0	0	0	6	4	
						0	8	0	0	0	5	0	0	0	0	0	
						14	43	14	3	75	41	0	1	1	9	4	
						12	5	33	0	4	12	0	0	0	0	0	
						17	6	20	0	3	1	0	0	0	0	0	
						0	4	0	4	22	481	0	9	104	15	12	
						13	3	26	0	15	8	0	0	0	3	0	
						22	8	29	0	12	4	0	0	0	2	6	
						12	4	41	11	11	21	2	1	3	4	7	
						6	3	94	12	15	24	3	2	50	1	17	
						11	1	105	5	5	10	0	1	2	1	9	
						6	32	51	42	110	155	4	13	16	6	43	
						6	1	0	0	0	0	0	0	0	0	2	
						11	5	0	0	4	2	0	0	0	0	9	
						7	1	0	0	3	4	0	0	0	0	2	
						6	0	1	0	1	0	0	0	0	0	0	
						8	0	1	0	0	0	0	0	0	0	0	
						1	1	0	0	11	0	0	0	0	0	0	
						1	3	0	0	0	0	0	0	0	0	2	
						1	4	0	0	1	1	0	0	0	0	2	
						0	0	0	0	0	0	0	0	0	0	0	
						2	4	47	0	0	9	0	0	0	1	0	
						7	2	40	0	1	0	0	0	0	0	0	
						5	1	1	0	0	2	0	0	0	0	3	
						4	2	0	0	27	9	0	0	0	0	5	
						8	0	0	0	5	6	0	0	0	0	2	
						8	1	1	0	7	1	0	0	0	0	1	
						3	0	1	0	0	0	0	0	0	0	0	
						7	0	0	0	0	0	0	0	0	0	0	
						4	1	0	0	1	0	0	0	0	0	0	
						1	1	0	0	0	0	0	0	0	0	1	
						1	2	0	0	1	1	0	0	0	0	2	
						2	32	5	11	86	33	2	19	22	1	39	
						2	6	1	0	35	0	0	0	0	0	1	
MP-21-6(1)46--76-4	F-505	F-505(7)				0	16	0	0	39	3	0	56	0	0	2	
						0	49	0	0	29	11	0	0	0	0	9	
						9	29	0	19	30	6	2	16	6	8	11	
						9	5	37	5	6	8	1	8	8	2	8	
						6	2	1	0	1	0	0	0	0	1	3	
						3	0	0	0	0	0	0	0	0	0	0	
						1	24	0	1	8	0	3	36	2	0	18	
						2	9	2	6	25	2	0	1	0	2	2	
						3	9	2	2	20	3	0	1	0	4	5	
						0	3	0	0	0	3	0	0	0	0	1	
						0	20	0	0	6	1	1	11	1	4	8	
						53	57	5	33	43	6	40	97	4	21	29	
						39	1	14	0	0	2	0	0	0	1	2	
						30	0	13	0	0	2	0	0	0	1	2	
						45	6	25	0	1	4	3	3	0	2	1	
						30	3	22	0	32	32	0	0	0	0	0	
						30	0	27	3	152	62	0	0	2	0	9	
						8	18	33	2	3	7	0	0	0	1	39	
						27	3	54	0	5	4	0	0	0	1	3	
						32	2	81	0	0	0	0	0	0	0	2	
						1	4	9	2	10	0	0	0	1	1	9	
						16	32	7	15	86	3	0	0	0	9	19	
						3	1	0	0	58	1	0	0	0	0	0	
						1	1	0	0	3	0	0	0	0	1	0	
						1	22	0	0	18	0	0	44	0	0	0	
						7	10	9	0	56	12	0	0	0	2	1	
						5	1	58	1	21	1	0	0	0	0	3	
						12	3	24	0	10	6	0	3	0	1	2	
						13	3	40	0	10	1	0	0	0	0	1	
						12	5	56	0	13	1	0	0	0	0	0	
						10	5	95	1	17	0	0	0	0	1	1	
						27	9	14	0	15	0	0	0	0	3	1	
						28	4	17	1	7	2	0	0	0	1	1	
						28	3	29	2	2	3	1	0	0	5	2	
						1	12	2	0	0	2	0	0	0	0	7	
						1	4	1	0	1	0	0	0	0	0	4	
						0	3	13	0	0	0	0	0	0	0	0	
						12	1	22	0	1	1	0	0	0	0	1	
						16	5	2	0	9	8	0	0	0	0	5	
						12	10	2	93	61	0	77	1	0	17	4	
						15	2	17	0	4	3	0	0	0	0	0	
						27	4	12	0	0	2	0	0	0	1	1	
						20	23	10	1	0	4	0	0	0	8	10	
						3	8	1	0	39	17	0	0	2	1	2	
						10	19	1	2	29	17	3	1	12	6	6	
UN-922*<1>						2	0	0	0	0	0	0	0	0	0	4	
						2	3	2	0	0	0	0	0	0	0	0	
						7	7	34	0	35	1	0	0	0	2	1	
						9	2	22	0	20	0	0	0	0	0	0	
						1	8	20	0	3	1	1	0	0	4	4	
						0	3	0	0	0	0	0	0	0	0	1	
						0	2	0	0	0	0	0	0	0	1	11	
						0	0	7	0	0	0	0	0	0	0	0	
						11	2	17	0	5	0	0	0	0	0	4	
						10	4	8	0	1	0	0	0	0	0	1	
						15	7	10	0	1	0	0	0	0	0	5	

PROJECT3	PROJECT4	PROJECT5	JE	)JE	)JE	CRACK	CRACK	CRACK	CRACK	CRACK	CRACK	RACKV	RACKV	CRACKV	CRACKT	CRACKL	
						1	12	1	8	28	4	1	18	5	1	6	
						2	31	7	0	20	49	0	0	0	1	105	
						4	7	13	0	10	33	0	0	0	0	10	
						7	4	10	0	36	5	0	0	0	1	3	
						21	3	3	0	6	2	0	2	1	0	2	
						23	9	10	5	12	7	0	6	5	1	6	
						9	29	55	0	1	0	0	0	0	6	2	
						10	1	0	0	1	12	0	0	0	0	1	
						10	1	4	0	0	0	0	0	0	0	1	
						11	5	16	0	15	8	0	0	0	0	4	
						7	2	12	7	16	29	0	0	0	0	1	
						29	16	3	0	0	13	0	0	0	1	11	
						8	1	4	0	25	10	0	0	0	0	1	
						11	1	2	1	0	2	0	0	0	0	2	
						3	6	3	0	0	0	0	0	0	0	0	
						1	2	0	0	16	4	0	0	0	0	0	
						0	4	0	0	16	1	0	0	0	0	0	
						2	1	8	0	6	0	0	0	0	1	1	
						1	45	3	212	107	146	133	50	44	92	34	
						4	42	1	0	15	1	0	0	0	2	1	
						7	4	0	4	2	0	4	0	0	1	2	
						1	7	1	1	4	4	2	5	3	3	2	
						0	1	1	1	2	2	0	0	1	6	1	
						8	31	1	7	18	9	2	1	5	3	15	
						5	12	2	5	444	9	2	1	2	1	3	
						3	3	0	0	0	0	0	0	0	0	0	
						0	0	0	0	8	4	0	0	0	0	0	
						41	0	3	1	2	3	0	0	0	0	1	
						6	0	50	0	3	2	0	0	0	0	1	
						1	1	32	0	2	7	0	0	0	6	9	
						13	4	40	9	0	0	0	0	0	0	0	
						44	3	4	0	0	17	0	0	0	0	4	
						20	5	4	0	149	0	0	0	0	0	3	
						3	3	0	1	23	84	0	0	1	0	4	
						1	0	0	0	5	60	0	0	0	0	5	
						2	1	0	1	0	0	0	0	0	0	2	
						8	1	13	0	2	0	0	0	0	0	0	
						0	1	0	0	6	0	0	0	0	0	1	
						17	6	11	0	48	15	0	0	0	3	9	
						27	22	5	0	26	2	1	8	1	13	10	
						6	6	56	0	11	0	0	0	0	0	4	
						2	4	0	0	9	6	6	2	7	9	4	
						46	4	6	19	32	16	54	3	8	57	11	
						9	57	2	49	170	27	53	62	8	28	8	
						8	4	2	0	11	3	0	0	0	0	1	
						10	13	5	2	36	4	7	1	0	2	1	
						7	18	1	1	54	75	1	23	0	3	2	
						1	3	0	0	30	23	0	0	0	0	0	
						8	6	4	1	17	6	2	4	19	1	4	
						30	2	10	1	7	2	0	0	0	0	2	
						11	7	2	0	0	2	0	0	0	0	3	
						7	7	15	83	86	0	14	9	0	5	3	
						22	0	17	0	1	8	0	0	0	0	3	
						22	6	12	11	54	28	0	0	0	5	8	
						10	37	10	0	2	2	0	0	0	3	9	
						0	14	0	68	14	17	79	0	4	150	7	
						52	21	12	0	51	9	0	2	0	4	4	
						21	2	34	0	39	273	0	0	0	0	3	
						26	6	34	0	2	222	0	0	109	0	35	
						3	18	24	0	0	37	0	0	0	5	18	
						2	60	24	0	34	75	0	0	15	17	23	
						18	15	108	0	98	12	0	0	0	3	10	
						23	4	0	0	7	14	0	1	0	0	11	
						6	10	6	22	94	20	0	0	0	3	4	
						5	9	0	7	19	18	0	0	0	4	7	
						14	8	0	8	21	4	0	0	0	3	3	
						13	6	0	10	43	18	0	0	0	2	6	
						1	2	0	0	0	0	0	0	0	0	4	
						3	35	3	5	148	5	3	73	1	34	4	
						8	6	20	14	33	3	0	0	0	18	1	
						1	13	4	2	192	34	0	1	4	3	10	
U-927(2)						0	59	1	49	127	235	20	83	169	21	98	
						4	3	1	3	5	0	0	0	0	1	0	
						8	7	1	0	13	0	0	0	0	1	1	
						0	69	0	7	6	0	0	0	0	7	8	
						0	0	0	0	0	0	0	0	0	0	0	
						18	21	12	18	79	17	0	0	0	5	4	
						11	7	5	0	4	21	0	0	0	4	11	
						9	31	5	51	103	12	7	23	0	13	16	
						17	4	2	7	29	5	0	0	0	0	0	
						3	1	1	0	3	0	0	0	0	0	2	
						44	10	2	57	7	6	3	5	3	19	5	
						13	9	3	10	16	9	6	4	6	4	14	
						35	9	10	5	15	6	0	0	0	2	3	
						11	55	0	69	114	229	4	63	129	11	47	
						7	5	0	0	18	1	0	0	0	0	3	
						4	2	0	0	2	1	0	0	0	0	2	
						0	40	0	0	1	3	0	0	0	2	12	
						0	34	0	1	0	0	0	1	0	0	33	
						0	2	0	136	2	69	0	0	0	32	7	
						1	2	0	4	3	5	2	2	1	22	17	
						10	4	30	0	1	0	0	0	0	1	1	
						12	8	26	1	14	7	0	0	0	6	2	

PROJECT3	PROJECT4	PROJECT5	JE	OJE	OJE	CRACK	CRACK	CRACK	CRACK	CRACK	CRACK	RACKV	RACKV	CRACKV	CRACKT	CRACKL	
						7	15	75	37	129	13	2	7	10	2	9	
						8	10	36	0	7	0	0	1	0	1	1	
						34	20	28	12	65	6	2	30	7	1	8	
						24	5	5	0	11	3	0	2	0	0	3	
						20	0	30	0	0	11	0	0	0	0	3	
						31	5	14	0	0	5	0	0	0	0	6	
						24	6	41	0	6	6	1	11	1	1	13	
FA-159						40	5	11	0	0	12	0	0	0	0	8	
						0	100	0	0	0	0	0	0	0	32	81	
						0	130	2	0	10	32	0	0	2	45	29	
						8	7	4	8	6	40	4	16	23	0	28	
						15	9	15	3	74	2	0	0	0	0	2	
						10	40	0	15	17	18	0	5	55	0	38	
						3	19	79	0	63	0	0	0	0	0	5	
						14	10	13	3	33	15	0	9	5	7	15	
						40	15	8	18	102	25	15	38	46	11	22	
						14	58	3	5	84	18	7	93	4	5	23	
						4	101	10	0	21	2	0	0	1	1	6	
						56	5	7	0	11	44	0	0	0	0	5	
						6	109	30	0	4	4	0	0	0	4	14	
						10	1	1	1	4	0	1	0	0	0	2	
						0	0	0	0	6	2	0	0	0	0	0	
						0	3	2	0	0	0	0	0	0	0	0	
						9	10	5	0	17	10	0	0	0	0	2	
						3	5	3	0	8	24	0	0	0	0	2	
						1	1	0	0	28	0	0	0	0	0	0	
						0	1	0	0	44	0	0	0	0	0	0	
						2	4	0	0	4	0	0	0	0	0	0	
						31	3	1	0	0	1	0	0	0	0	4	
						47	15	2	0	7	0	0	0	0	0	3	
						23	10	23	1	11	0	0	1	0	1	6	
						21	15	46	2	11	2	0	4	0	0	9	
FA-159						30	15	23	0	3	10	2	2	1	2	9	
						86	22	14	0	0	0	0	0	0	0	0	
						0	88	0	56	33	128	17	19	50	45	20	
						0	17	0	102	7	104	67	21	71	111	65	
						19	2	2	0	59	98	0	0	2	0	30	
						2	2	0	0	0	2	0	0	0	0	0	
						12	1	12	3	29	13	0	1	0	1	6	
						13	4	4	0	1	0	0	0	0	1	2	
						17	3	11	1	2	0	0	0	0	2	0	
NA						7	44	4	103	66	10	200	29	1	50	14	
						9	6	8	7	15	3	1	0	0	5	5	
						23	4	32	0	0	1	0	0	0	0	7	
						0	25	0	209	91	3	155	76	7	135	24	
						3	65	12	48	52	7	10	12	13	51	12	
						27	40	18	8	167	0	1	2	5	2	2	
						3	17	0	0	0	39	0	2	53	1	89	
						10	9	0	0	0	10	0	0	0	0	45	
						12	39	1	0	7	20	0	0	0	0	45	
						5	107	7	0	14	0	0	0	0	30	4	
						11	5	7	36	19	0	0	0	0	0	0	
						4	2	0	0	5	1	0	0	0	0	1	
						6	7	0	40	24	34	16	5	4	11	7	
						36	28	16	1	44	7	0	0	0	6	4	
						17	31	13	2	17	1	0	0	0	0	1	
						19	4	0	0	0	11	0	0	0	0	17	
						21	2	4	0	63	6	0	0	0	0	5	
						13	17	2	12	46	8	3	44	1	5	3	
						0	30	0	56	0	25	4	0	0	60	10	
						1	129	0	11	428	37	1	109	7	4	55	
						0	12	0	0	9	0	0	0	0	0	0	
						4	44	13	43	47	16	0	26	4	10	8	
						4	37	3	7	89	35	0	20	6	1	27	
						33	13	41	2	41	2	0	4	0	1	3	
						5	5	43	0	0	53	0	0	0	0	17	
						3	5	0	0	0	0	0	0	0	0	8	
						26	2	62	18	37	175	0	0	6	2	4	
						24	10	42	1	6	382	0	0	0	0	0	
						14	3	12	2	3	30	0	0	2	15	10	
						0	1	0	1	0	0	0	4	0	1	0	
						3	7	3	0	4	9	0	0	0	0	7	
						3	22	0	0	0	6	0	0	0	0	4	
						0	136	0	28	183	90	12	104	46	18	57	
						8	18	58	41	2	50	6	4	0	14	9	
						39	9	64	0	11	5	0	0	0	4	3	
						14	15	54	0	18	0	0	0	0	0	0	
						6	2	5	0	13	0	0	0	0	0	0	
						2	5	10	0	7	0	1	1	0	0	2	
						1	1	0	0	10	0	0	0	0	1	4	
						19	3	14	0	37	29	0	0	0	0	0	
						16	7	45	0	2	2	0	0	0	0	3	
						1	148	0	0	2	107	0	0	0	1	1	
						8	3	0	0	4	1	0	0	0	0	0	
						52	7	15	0	112	3	0	0	0	0	6	
						7	0	53	0	0	121	0	0	8	0	3	
						7	2	79	0	6	69	0	0	0	0	1	
						3	7	3	5	6	5	0	9	0	1	15	
						2	8	16	0	487	31	0	0	0	0	4	
						5	3	83	0	0	5	0	0	0	2	2	
						28	6	11	3	21	27	0	0	3	3	13	
						0	0	0	0	0	0	0	0	0	0	0	
						18	5	22	2	0	1	0	0	0	2	1	

PROJECT3	PROJECT4	PROJECT5	JE	JE	JE	CRACK	CRACK	CRACK	CRACK	CRACK	CRACK	RACKV	RACKV	CRACKV	CRACKT	CRACKL	
						24	13	43	0	4	0	0	0	0	5	3	
						24	5	27	7	4	8	17	1	6	70	25	
						27	8	1	0	14	0	0	5	0	1	3	
						3	1	2	1	6	4	1	2	0	1	2	
						2	5	21	0	1	4	0	0	0	6	1	
						0	1	0	3	1	16	2	0	0	109	8	
						37	9	13	0	0	0	0	0	0	1	6	
						19	22	10	1	22	13	1	25	30	11	11	
						6	29	4	0	20	14	0	53	2	31	6	
						6	12	16	0	5	2	0	0	0	6	5	
						10	51	12	11	84	84	5	99	11	2	40	
						22	8	14	0	1	29	0	0	0	4	12	
						20	2	8	1	3	7	0	0	0	8	5	
						12	2	1	0	3	30	0	1	4	5	12	
FN-92-8(1)--21-54	F-34(5)*<1>					3	18	3	7	60	4	0	26	5	51	12	
						3	1	6	0	8	1	0	0	0	0	0	
						3	18	7	7	49	30	6	28	62	3	21	
						14	2	0	0	9	6	0	0	1	2	1	
						5	5	3	0	0	0	0	0	0	0	0	
						26	7	5	0	1	0	0	0	0	0	0	
						10	11	73	0	30	0	0	0	0	6	2	
						2	5	0	2	17	0	1	16	0	1	1	
						29	5	1	0	0	26	0	0	0	0	9	
						29	2	15	0	1	3	0	0	0	0	1	
						28	5	8	0	0	9	0	0	0	1	7	
						4	2	5	0	21	45	0	0	0	0	21	
						38	17	12	18	5	18	6	4	3	21	3	
						0	0	0	0	0	0	0	0	0	1	1	
						0	1	0	1	0	1	0	0	0	1	0	
						0	79	0	2	44	25	1	11	11	72	67	
						13	63	8	0	12	3	0	0	0	25	10	
						2	5	2	0	0	0	0	0	0	0	0	
						11	7	1	14	15	39	6	2	19	19	10	
						3	7	2	22	57	0	0	5	0	0	1	
						0	9	0	0	28	0	0	0	0	0	10	
						1	8	3	0	22	0	0	0	0	0	3	
						17	7	20	0	11	6	0	0	0	4	1	
						8	32	15	0	9	16	0	4	24	7	14	
						3	30	6	0	96	4	0	0	0	3	3	
						2	22	7	0	208	37	0	0	0	0	5	
						2	17	10	8	51	10	0	0	0	0	6	
						6	22	43	2	12	2	0	2	1	3	5	
						4	23	56	4	5	2	0	0	0	3	1	
						5	27	21	2	6	1	2	5	0	2	7	
						5	11	3	0	2	0	0	0	0	0	11	
						11	6	2	0	0	18	0	0	0	0	9	
						2	4	0	0	8	0	0	0	0	2	1	
						11	6	10	0	0	15	0	0	101	0	93	
						5	2	1	0	11	9	0	0	0	0	0	
						6	6	3	0	0	0	0	0	0	1	1	
						12	2	6	0	2	7	0	0	0	0	4	
						9	2	0	0	5	5	0	0	0	0	2	
						29	40	28	0	5	10	0	0	0	1	23	
						2	2	1	0	5	0	0	0	0	0	1	
						1	3	0	1	67	1	0	0	0	0	1	
						0	5	0	3	0	0	0	0	2	1	20	
						0	4	1	0	1	15	0	0	0	0	1	
						2	2	1	0	13	0	0	0	0	0	0	
						0	15	0	3	41	0	0	3	0	0	19	
						2	35	8	1	19	6	0	4	0	0	2	
						4	66	9	0	63	6	0	41	0	1	3	
						0	2	0	0	78	3	0	0	0	0	5	
						1	9	1	0	13	2	0	1	0	3	1	
						18	3	1	0	12	3	0	0	0	1	2	
						13	15	13	1	54	0	0	3	0	1	4	
						7	3	0	25	98	0	8	0	0	3	4	
						36	2	12	0	0	0	0	0	0	1	0	
						28	8	26	2	25	0	0	0	0	8	3	
						5	5	0	0	0	0	0	0	0	0	0	
						5	2	0	0	17	1	0	0	0	0	0	
						15	3	1	1	31	4	0	0	0	0	0	
						7	3	0	0	1	0	0	0	0	0	0	
						20	4	16	92	3	3	0	0	0	10	3	
						22	31	1	0	32	1	0	64	54	1	14	
						1	20	0	6	25	193	0	4	175	2	94	
						16	5	5	0	5	1	0	0	0	0	0	
						6	7	4	0	1	0	0	0	0	0	3	
						10	3	1	0	0	3	0	0	0	0	8	
						1	19	3	0	22	6	0	3	0	2	13	
						0	12	0	0	5	2	0	43	4	0	12	
						15	4	3	1	7	3	0	0	0	0	1	
						19	2	4	0	3	3	0	0	0	0	0	
						20	10	16	1	7	6	0	0	3	6	5	
						5	0	1	0	0	0	0	0	0	0	0	
						15	9	36	0	39	0	0	0	0	0	2	
						24	36	37	0	10	0	0	0	0	5	7	
						10	7	20	2	0	1	0	0	0	75	4	
						0	2	1	0	0	0	0	0	0	0	0	
						0	0	2	0	0	11	0	0	0	0	0	
						2	4	9	0	28	20	0	0	0	0	2	
						3	1	3	0	3	19	0	1	0	0	1	
						0	12	0	8	6	0	22	27	0	3	0	
						0	7	0	0	13	0	0	0	0	1	1	

PROJECT3	PROJECT4	PROJECT5	JE	JE	JE	CRACK	CRACK	CRACK	CRACK	CRACK	CRACK	RACKV	RACKV	CRACKV	CRACKT	CRACKL	
						1	3	0	1	34	0	3	0	1	2	0	
						9	13	4	0	4	0	0	0	0	0	0	
						5	9	4	0	4	6	0	0	0	0	0	
						3	5	0	0	3	14	0	0	5	0	2	
						17	2	10	3	6	6	0	0	0	0	3	
						5	8	3	0	22	4	0	0	0	0	2	
						5	0	0	0	11	36	0	0	0	0	6	
						1	32	23	4	64	8	0	23	1	5	9	
						8	1	0	5	27	11	0	0	0	0	1	
						2	4	4	0	13	0	0	0	0	0	8	
						4	1	2	0	19	4	0	0	0	0	0	
						6	9	8	0	17	3	0	0	0	0	0	
						3	76	30	0	1	23	0	0	0	2	61	
						1	2	0	0	12	3	0	0	0	0	0	
						4	4	2	0	3	3	0	1	0	0	1	
						5	51	14	0	2	2	10	0	1	6	21	
						7	0	0	0	2	7	0	0	0	0	11	
						1	0	0	0	43	30	0	0	0	0	4	
						5	0	0	0	0	0	0	0	0	0	6	
						13	0	0	0	0	8	0	0	0	0	6	
						6	21	63	12	215	0	41	43	0	14	10	
						4	1	28	0	3	3	0	0	2	0	1	
						11	5	3	2	3	3	0	0	0	12	1	
						6	2	1	0	0	11	0	0	0	0	4	
						0	86	2	0	18	0	0	0	0	5	17	
						1	62	0	0	4	33	0	0	0	5	56	
						0	85	0	0	0	14	0	0	0	4	78	
						3	7	0	37	6	0	0	3	0	1	2	
						2	12	1	1	7	2	0	0	0	0	5	
						3	2	0	1	4	14	0	0	0	0	2	
						2	2	0	0	0	11	0	0	1	0	2	
						6	4	0	0	0	0	0	0	0	0	6	
						4	1	1	0	1	14	0	0	0	0	5	
						3	6	4	0	51	7	0	0	0	0	4	
						3	2	9	27	0	1	8	0	0	4	2	
						3	3	8	0	55	0	0	0	0	2	5	
						0	0	0	0	0	0	0	0	0	0	0	
						9	20	30	63	101	2	15	4	8	12	2	
						5	69	14	0	13	0	0	0	0	15	0	
						0	2	1	0	21	0	0	0	0	0	0	
						6	0	0	0	0	11	0	0	0	0	2	
						3	5	0	0	5	5	0	28	0	14	4	
						0	0	0	0	0	0	0	0	0	0	0	
						0	0	0	0	0	0	0	0	0	0	1	
						0	0	0	0	1	1	0	0	0	0	0	
						0	0	0	0	0	0	0	0	0	0	0	
						12	3	0	0	2	4	0	0	0	0	1	
						3	0	0	0	0	0	0	0	0	0	0	
						12	0	0	0	0	0	0	0	0	0	0	
						3	1	0	0	0	0	0	0	0	0	1	
						7	10	4	1	20	6	0	0	0	1	1	
						11	56	14	222	155	42	0	7	63	55	32	
						15	6	1	0	4	1	0	0	0	0	1	
						19	14	3	0	6	3	1	3	0	2	3	
						25	5	3	0	10	16	0	0	0	1	7	
						2	29	4	0	36	2	0	0	0	2	1	
						1	2	0	0	14	14	0	0	0	0	6	
						21	1	30	1	17	5	0	0	0	0	0	
						0	0	33	0	0	0	0	0	0	0	0	
						27	3	6	1	7	2	0	0	0	1	1	
						11	38	3	3	6	3	2	1	1	4	10	
						9	1	4	9	10	18	0	0	0	0	1	
						1	58	4	5	203	3	0	0	0	7	2	
						12	4	10	0	5	5	0	0	0	0	2	
						1	2	10	0	21	0	0	0	0	0	1	
						12	18	52	0	45	4	0	0	0	2	2	
						0	23	15	0	15	2	0	0	1	2	5	
						1	4	2	1	10	15	0	0	1	0	22	
						8	7	9	0	74	15	0	0	0	0	1	
						5	12	51	0	34	4	0	0	0	0	3	
						2	27	10	10	16	79	5	4	61	2	20	
						44	10	12	0	39	62	0	0	1	1	8	
						8	8	15	82	14	2	111	9	10	39	4	
						0	25	0	13	43	116	2	19	40	5	67	
						0	84	0	57	68	207	32	36	102	52	71	
						0	34	0	428	86	263	328	75	198	134	147	
						0	20	1	80	15	40	53	7	36	45	15	
						1	4	2	0	7	21	0	0	0	1	5	
						4	5	17	0	17	8	0	0	0	0	4	
						3	3	7	0	17	25	0	0	0	0	11	
						2	0	2	0	0	36	0	0	0	0	9	
						1	11	7	12	23	11	0	0	0	0	7	

APPENDIX G: FIGURES SHOWING THE PAVEMENT CRACKING VERSUS PAVEMENT PARAMETERS FOR IOWA PRIMARY PCC PAVEMENT SECTIONS

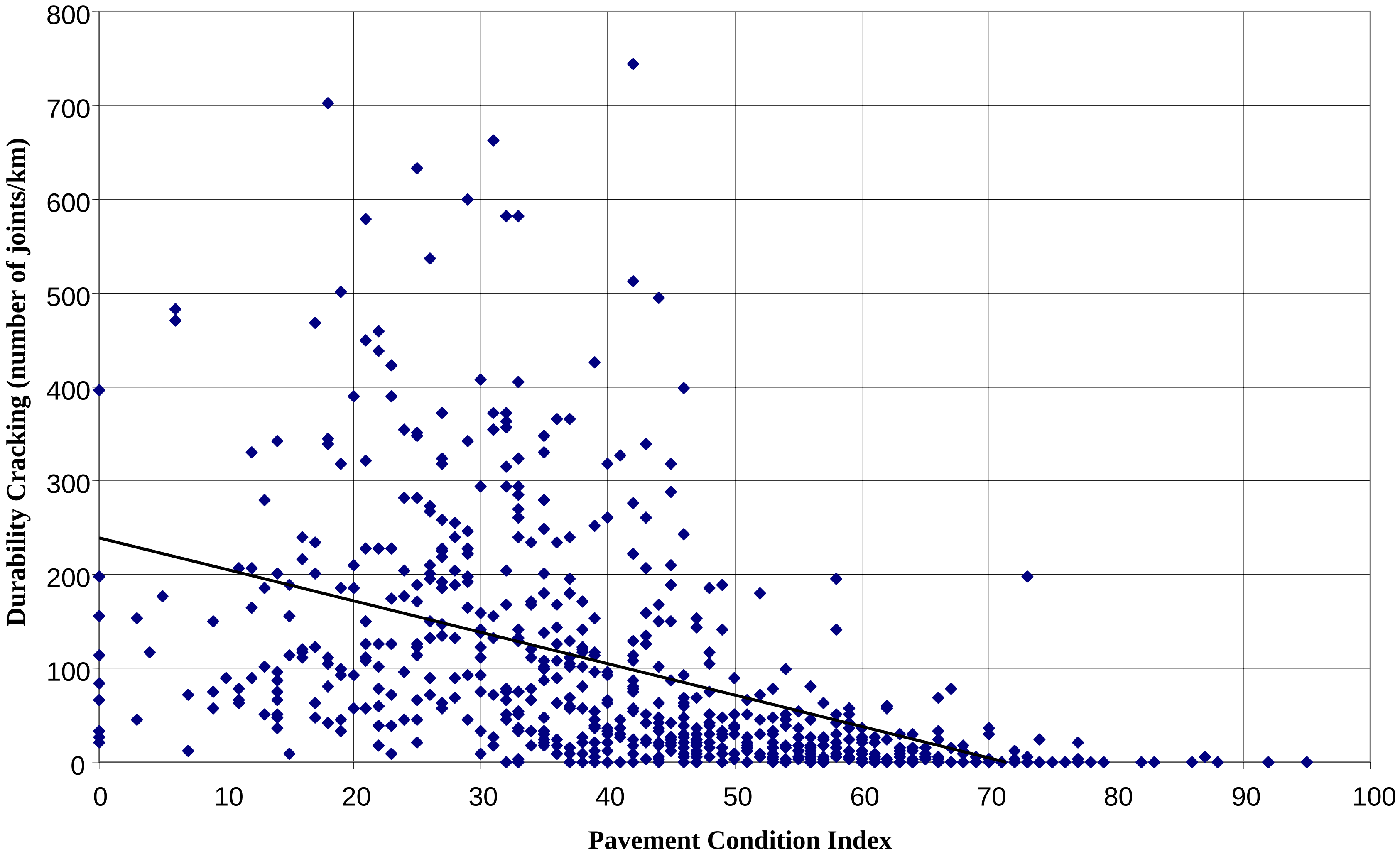

Figure 6. Durability cracking vs. Pavement Condition Index

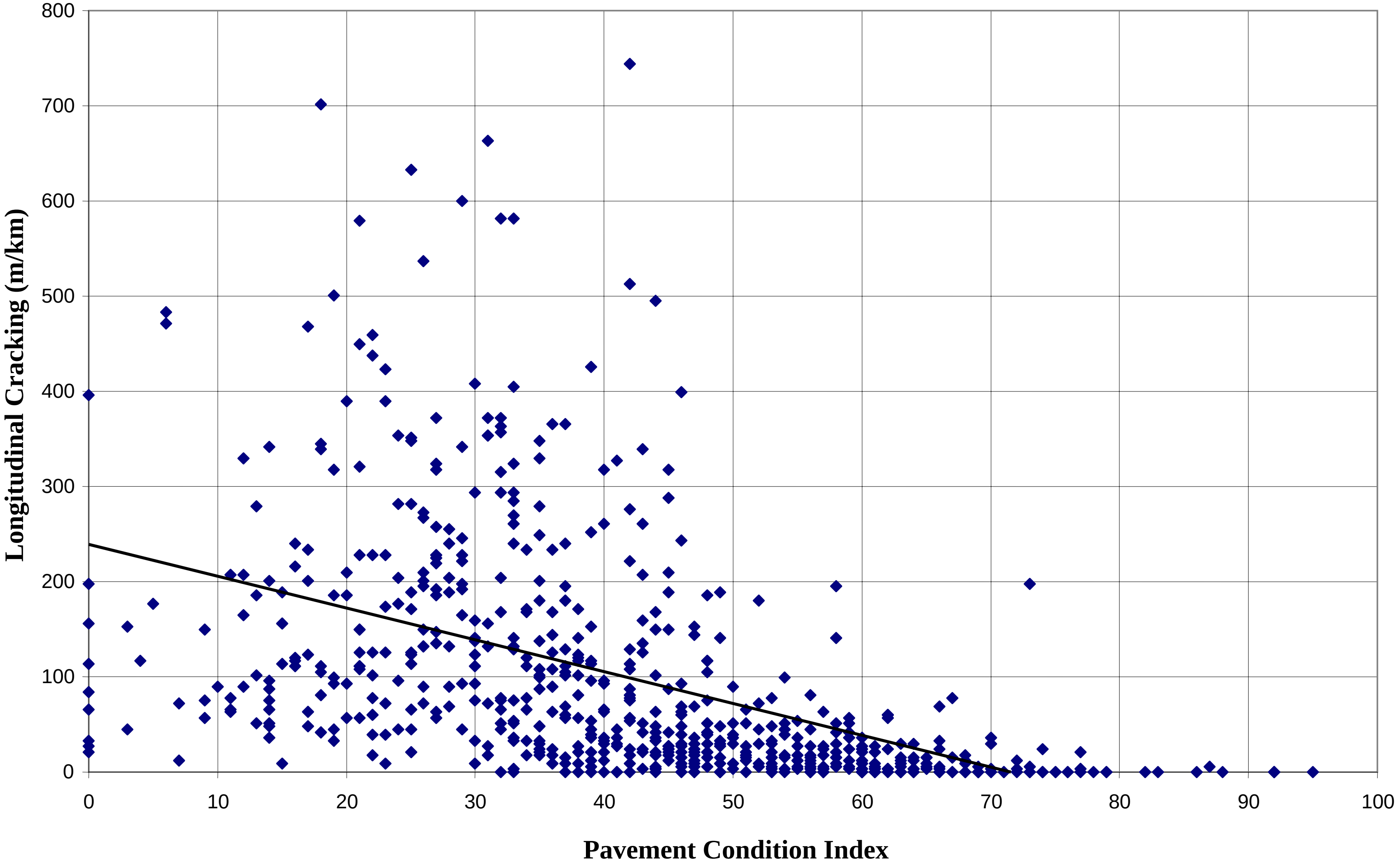

Figure 7. Longitudinal cracking vs. Pavement Condition Index

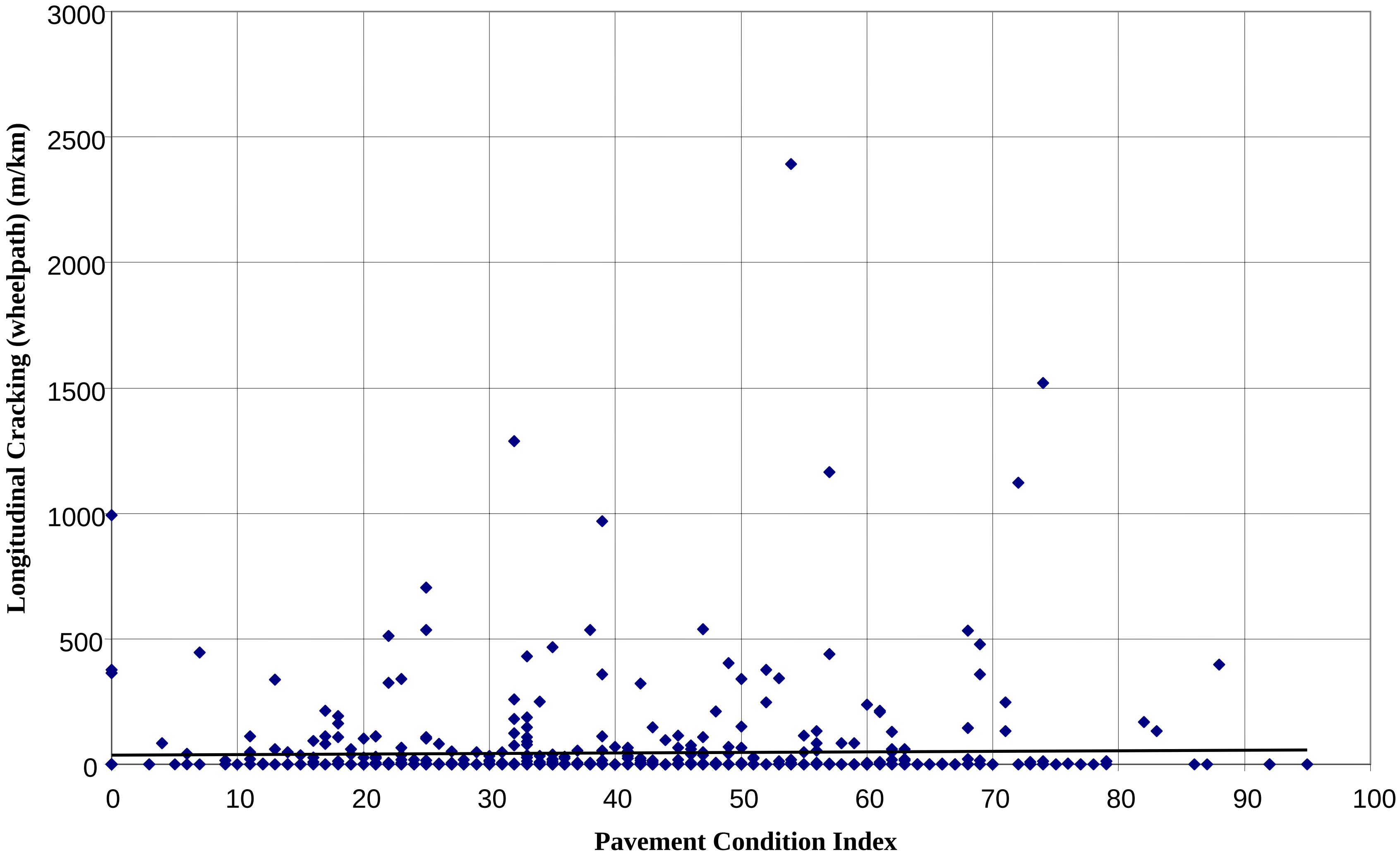

Figure 8. Longitudinal cracking in wheelpath vs. Pavement Condition Index

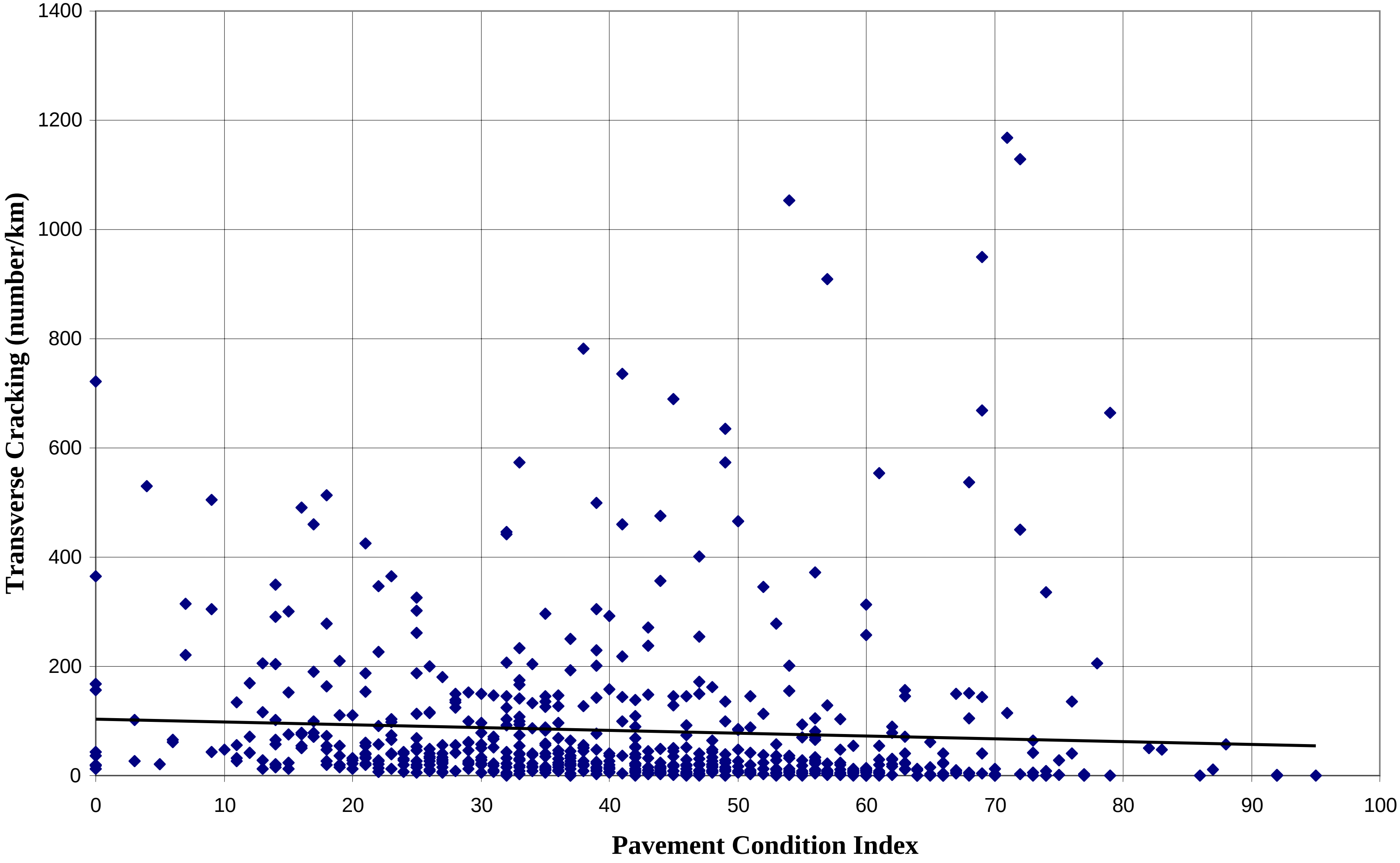

Figure 9. Transverse cracking vs. Pavement Condition Index

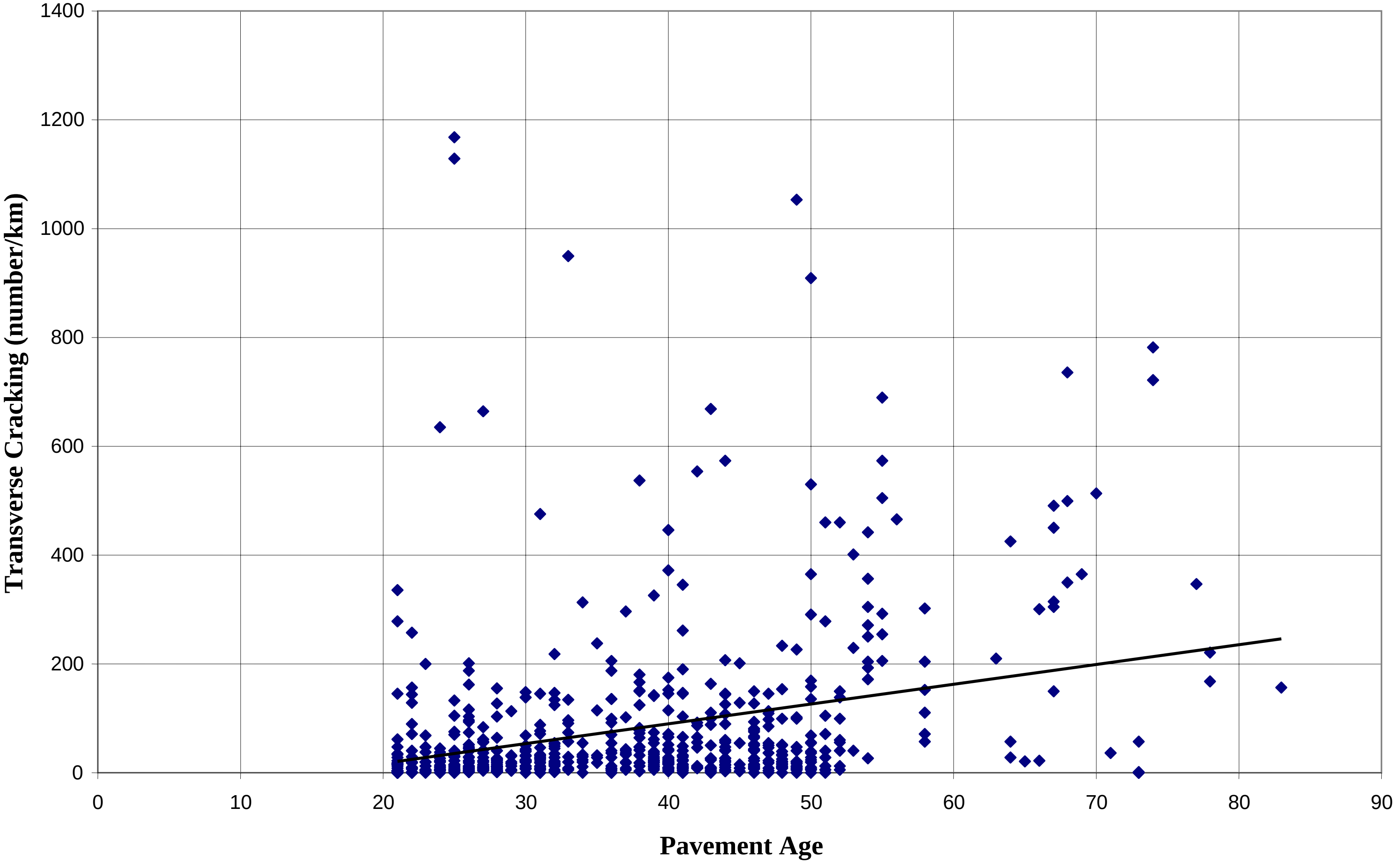

Figure 10. Transverse cracking vs. pavement age

APPENDIX H: PCC PAVEMENT PERFORMANCE DATA FOR IOWA INTERSTATE SECTIONS

ROUTE	DIR	BPOST	EPOST	SYSTEM	PAVTYP	COUNTY	DESCRIPT
29	1	112 30	120 25	1	1	67	From JCT I-29/IA 175 North To JCT I-29/Co E24
29	1	120 25	126 63	1	1	67	From JCT I-29/Co E24 North To Monona/Woodbury Co Line
29	2	112 30	120 25	1	1	67	From JCT I-29/IA 175 North To JCT I-29/Co E24
29	2	120 25	126 63	1	1	67	From JCT I-29/Co E24 North To Monona/Woodbury Co Line
29	1	054 56	056 34	1	1	78	From N Ramp of JCT I-480 North to 0.4 Mi S of JCT IA 192
29	2	054 56	056 34	1	1	78	From N Ramp of JCT I-480 North to 0.4 Mi S of JCT IA 192
35	1	134 01	140 19	1	1	40	From 1.0 Mi N of JCT IA 175 N to 1.1 Mi N of JCT R61/D41
35	1	112 72	117 15	1	1	85	From Co E41 Overpass (Old 30) North To 0.75 Mi N Of CoE29
35	1	130 60	134 01	1	1	40	2.1 Mi S of IA 175 Intchg. N to 1.0 Mi N of IA 175 Intchg.
35	2	131 03	134 01	1	1	40	From 1.7 Mi S of IA 175 Intchg N to 1.0 Mi N of JCT IA 175
80	2	183 67	192 82	1	1	79	From 1 Mi E Of JCT I80/IA 146 E To 1 Mi E Of JCT I80/US63
80	2	035 09	039 29	1	1	78	0.1 Mi W of Silver Creek Brdg E to W Nishnabotna River Brg
80	2	093 86	097 25	1	1	1	From E Ramp JCT I-80/Co P28 East To Adair/Madison Co Line
80	2	097 25	099 21	1	1	61	From Adair/Madison Co Line E & NE To Madison/Dallas Co Li
80	2	085 75	093 86	1	1	1	From W Ramp JCT I-80/IA 25 East To E Ramp JCT I-80/Co P28
129	1	000 00	000 28	1	1	97	From Nebraska/Iowa State Line East To JCT I-129/I-29
129	2	000 00	000 28	1	1	97	From Nebraska/Iowa State Line East To JCT I-129/I-29
235	1	000 00	010 43	1	1	77	From West JCT I-235/I-35/I-80 East To JCT I-235/IA 163
235	1	010 43	014 26	1	1	77	From JCT I-235/IA 163 North To East JCT I-235/I-35/I-80
235	2	000 00	010 43	1	1	77	From West JCT I-235/I-35/I-80 East To JCT I-235/IA 163
235	2	010 43	014 26	1	1	77	From JCT I-235/IA 163 North To East JCT I-235/I-35/I-80
380	1	017 34	019 43	1	1	57	From CNW RR Bridge North To Just N Of CR & IC RR Bridge
380	2	017 34	019 43	1	1	57	From CNW RR Bridge North To Just N Of CR & IC RR Bridge
380	1	019 43	022 37	1	1	57	From Just N Of CR & IC RR Bridge N To Glass Road
380	2	019 43	022 37	1	1	57	From Just N Of CR & IC RR Bridge N To Glass Road
380	1	022 37	025 31	1	1	57	From Glass Road North To N Ramp JCT I-380/Boyson Road
380	1	025 31	030 29	1	1	57	N Ramp JCT I-380/Boyson Rd N 1.4Mi to Co Rd E34 Intrch.
380	1	030 29	037 19	1	1	57	From 1.4Mi NW Co Rd E34 Intrch. N To Co Rd E16 Overpass
380	2	022 37	025 31	1	1	57	From Glass Road North To N Ramp JCT I-380/Boyson Road
380	2	025 31	030 29	1	1	57	N Ramp JCT I-380/Boyson Rd N To 1.4Mi to Co Rd E34Intrch.
380	2	030 29	037 19	1	1	57	From 1.4MI NW Co Rd E34 Intrch. to Co Rd E16 Overpass
480	1	000 00	000 75	1	1	78	From Nebraska/Iowa State Line East To JCT I-480/I-29
480	2	000 00	000 75	1	1	78	From Nebraska/Iowa State Line East To JCT I-480/I-29

CONYR	RESYR	PCI	ADT	TRUCKS	IRI	STRUCAV	AVEK	DISTRICT	PROJECT1	PROJECT2
1961		34	11700	2716	1.58	4.34	36.639	3	I-29-6(7)114	
1961		36	12300	2718	1.8	3.66	28.7684	3	I-29-6(8)122	
1961		37	11700	2716	1.82	4.45	38.2674	3	I-29-6(7)114	
1961		37	12300	2718	1.71	4.62	40.1672	3	I-29-6(8)122	
1968		46	19100	2805	3.14	4.75	56.1798	4	I-IG-29-3(9)57--04-78	
1968		46	19100	2805	3.02	5.36	40.9814	4	I-IG-29-3(9)57--04-78	
1967	1992	50	18600	4459	1.36	6.92	53.7372	1	IR-35-5(56)133	I-35-5(16)134
1983		56	22500	4662	1.51	4.61	36.639	1	IR-35-5(35)111	
1983		59	19200	4417	1.69	4.96	46.138	1	IR-35-5(36)133	
1983		59	19100	4418	1.66	5.68	51.2946	1	IR-35-5(36)133	
1964	1984	49	27200	8763	2.53	6.63	54.0086	1	IR-80-5(106)183	I-80-5(31)188
1966	1988	49	22100	7519	2.46	6.26	55.0942	4	IR-80-1(167)34	I-80-1(36)34
1979		27	23200	7890	1.56	6.15	52.923	4	I-IR-80-2(82)86--14-01	I-80-2(12)96
1979		28	23200	7884	1.58	6.12	51.566	4	I-IR-80-2(82)86--14-01	I-80-2(12)96
1981		36	21300	7393	1.52	5.97	54.8228	4	IM-80-2(135)86--13-01	I-IR-80-2(89)86--14-01
1976		49	15100	1297				3		
1976		49	15100	1297	3.32			3		
1968		41	88100	3144	3.1	5.08	48.0378	1	VARIOUS PROJECTS & YEARS	
1968		31	50200	2597	2.68	4.79	40.4386	1	VARIOUS PROJECTS & YEARS	
1968		41	88100	3144	3.01	4.55	40.4386	1	VARIOUS PROJECTS & YEARS	
1968		42	50200	2597	2.8	4.81	45.5952	1	VARIOUS PROJECTS & YEARS	
1976		45	61300	5547	3.26	7.5	56.7226	6	I-380-60(45)260--01-57	
1976		45	61300	5547	2.97	8.13	54.28	6	I-380-60(45)260--01-57	
1981		52	71000	5965	2.76	5.72	56.4512	6	I-IG-380-6(124)264--04-57	
1981		52	71000	5965	2.78	4.16	45.8666	6	I-IG-380-6(124)264--04-57	
1983		61	48600	5031	1.97	4.89	48.5806	6	I-F-380-6(114)266	
1983		63	24500	3820	1.62	6.59	57.2654	6	I-380-6(72)267	
1983		64	20600	3539	2.02	5.72	53.7372	6	I-380-6(75)273	
1983		62	48600	5031	2.2	5.39	51.2946	6	I-F-380-6(114)266	
1983		63	24500	3820	1.61	5.79	53.7372	6	I-380-6(72)267	
1983		64	20600	3539	1.94	6.58	58.351	6	I-380-6(75)273	
1966		40	37500	2250	2.51			4	I-480-1(27)0	
1966		44	37500	2250	2.44			4	I-480-1(27)0	

PROJECT3	PROJECT4	PROJECT5	PROJECT6	PROJECT7	PROJECT8	DCRACKM	TCRACKM	DCRACKH	LCRACKH
						1	2	3	1
						5	5	3	0
						1	7	3	1
						2	11	3	0
						2	18	11	0
						1	18	16	0
						0	31	0	0
						1	3	0	0
						1	4	0	0
						2	3	5	0
						5	11	3	0
						0	814	1	1
						0	0	0	0
						0	1	0	0
I-80-2(11)89						0	2	0	0
						0	0	0	0
						0	0	0	0
						15	29	16	0
						9	34	11	12
						3	19	17	0
						0	25	12	0
						1	2	1	0
						3	1	1	0
						3	2	10	0
						16	2	2	0
						5	1	9	0
						9	6	2	0
						37	1	5	0
						30	1	1	0
						10	1	0	0
						37	6	35	1
						4	17	5	3
						4	19	4	0

LCRACKM	LCRACKL	LCRACKWH	LCRACKWM	LCRACKWL	TCRACKH	TCRACKL	
27	3	0	0	1	0	33	
7	13	0	0	0	0	63	
1	6	0	0	1	0	28	
3	6	0	0	0	0	54	
4	0	0	0	0	1	120	
0	0	0	0	0	1	129	
41	24	0	0	0	1	1098	91.5
0	7	0	0	0	0	6	
0	0	0	0	0	0	1	
3	0	0	0	0	0	1	
0	3	0	0	0	1	133	
16	32	0	0	0	0	422	
0	0	0	0	0	0	0	
0	1	0	0	0	0	1	
0	0	0	0	0	0	2	
0	0	0	0	0	0	0	
0	0	0	0	0	0	0	
7	3	0	2	1	2	38	
12	84	1	8	18	4	78	
2	3	0	0	0	8	29	
4	0	0	1	0	16	32	
1	1	0	0	0	1	2	
0	6	0	0	0	0	5	
0	2	0	0	0	1	2	
0	1	0	0	0	0	3	
1	0	0	0	0	0	0	
3	9	0	0	0	0	11	
4	4	0	0	0	0	9	
0	0	0	0	0	0	2	
2	5	0	0	0	0	2	
3	7	0	0	0	0	7	
18	29	0	1	2	2	59	
0	6	0	0	0	0	57	

APPENDIX I: FIGURES SHOWING THE PAVEMENT CRACKING VERSUS PAVEMENT PARAMETERS FOR INTERSTATE SECTIONS

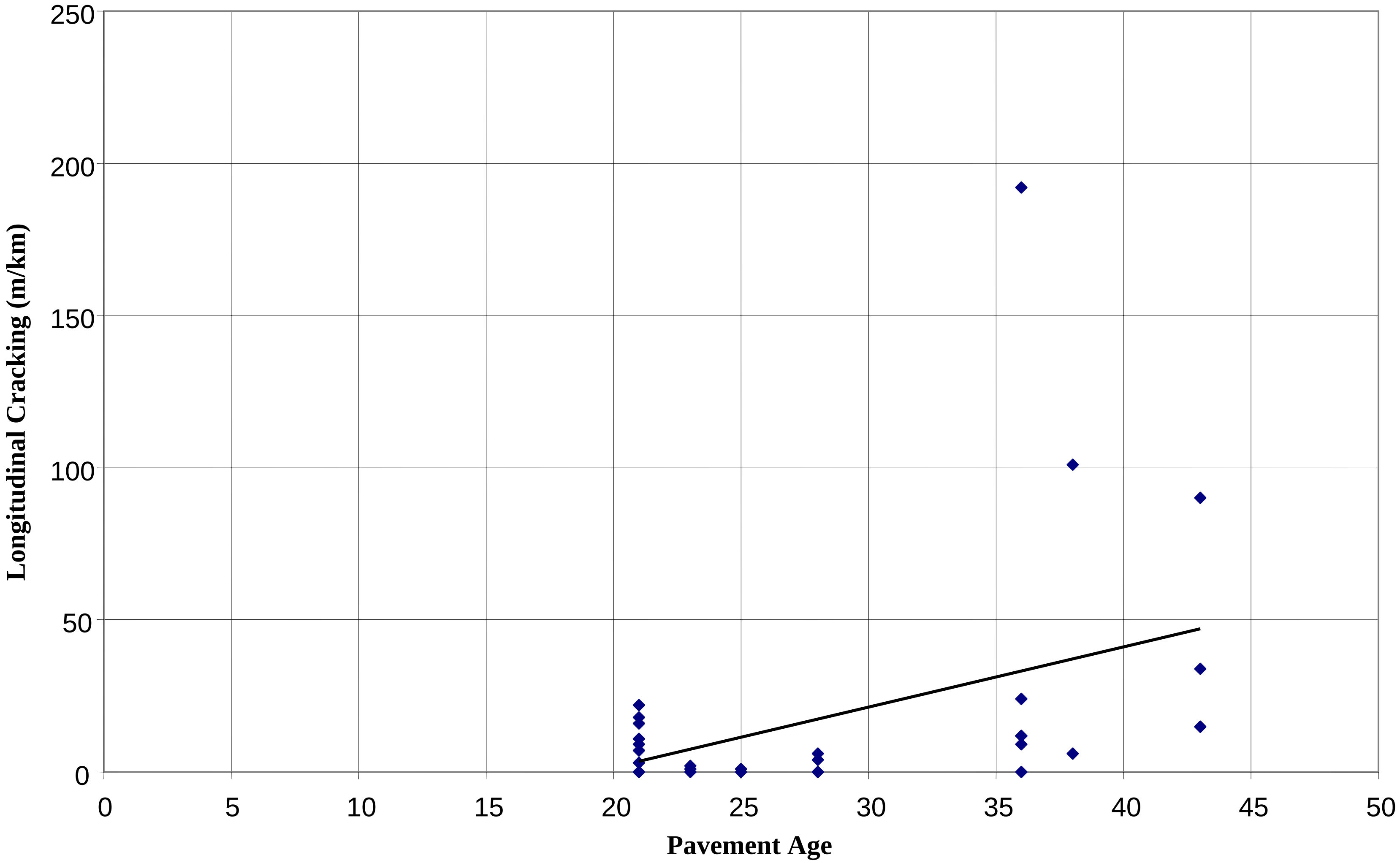

Figure 11. Longitudinal cracking vs. pavement age

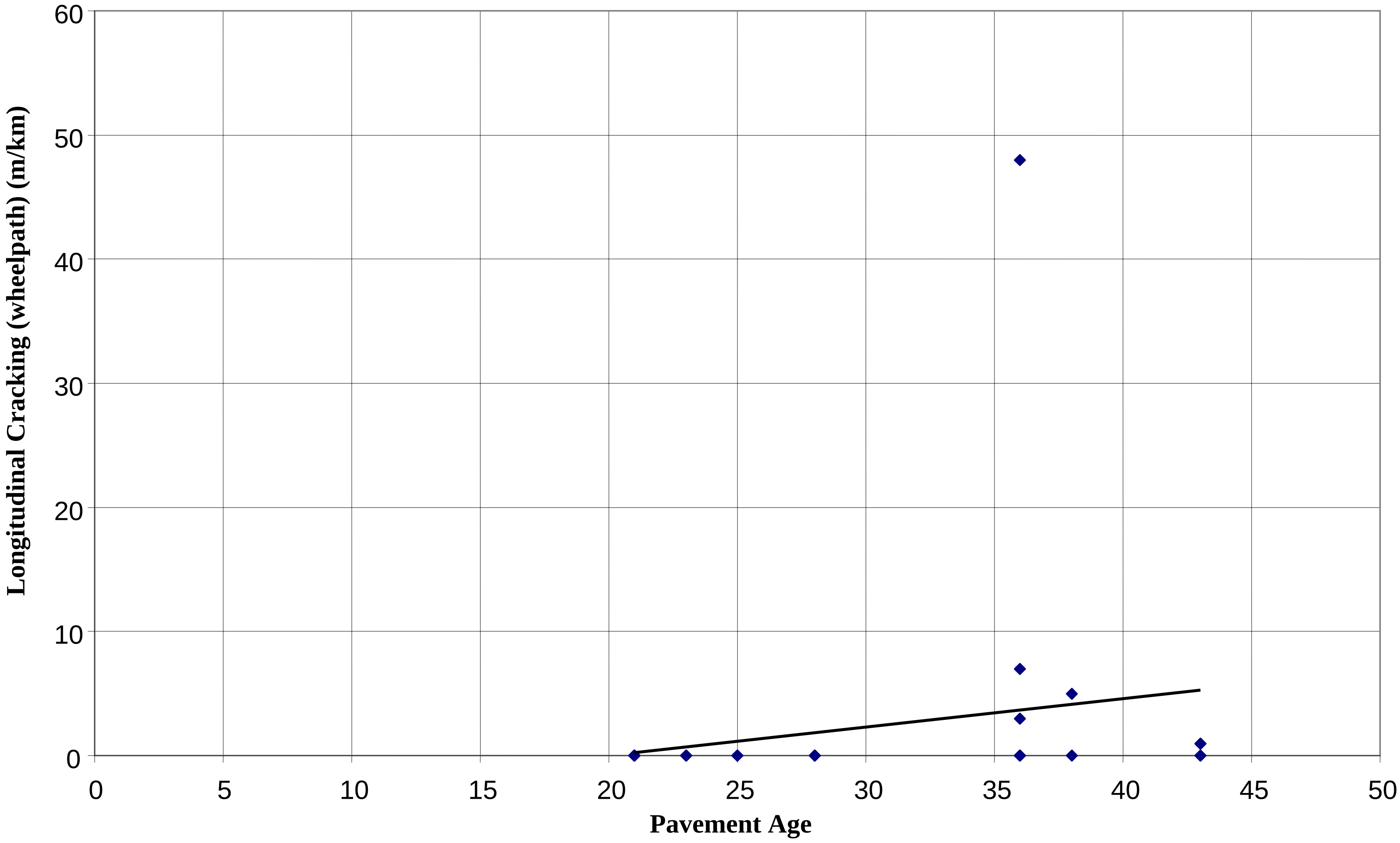

Figure 12. Longitudinal cracking in wheelpath vs. pavement age

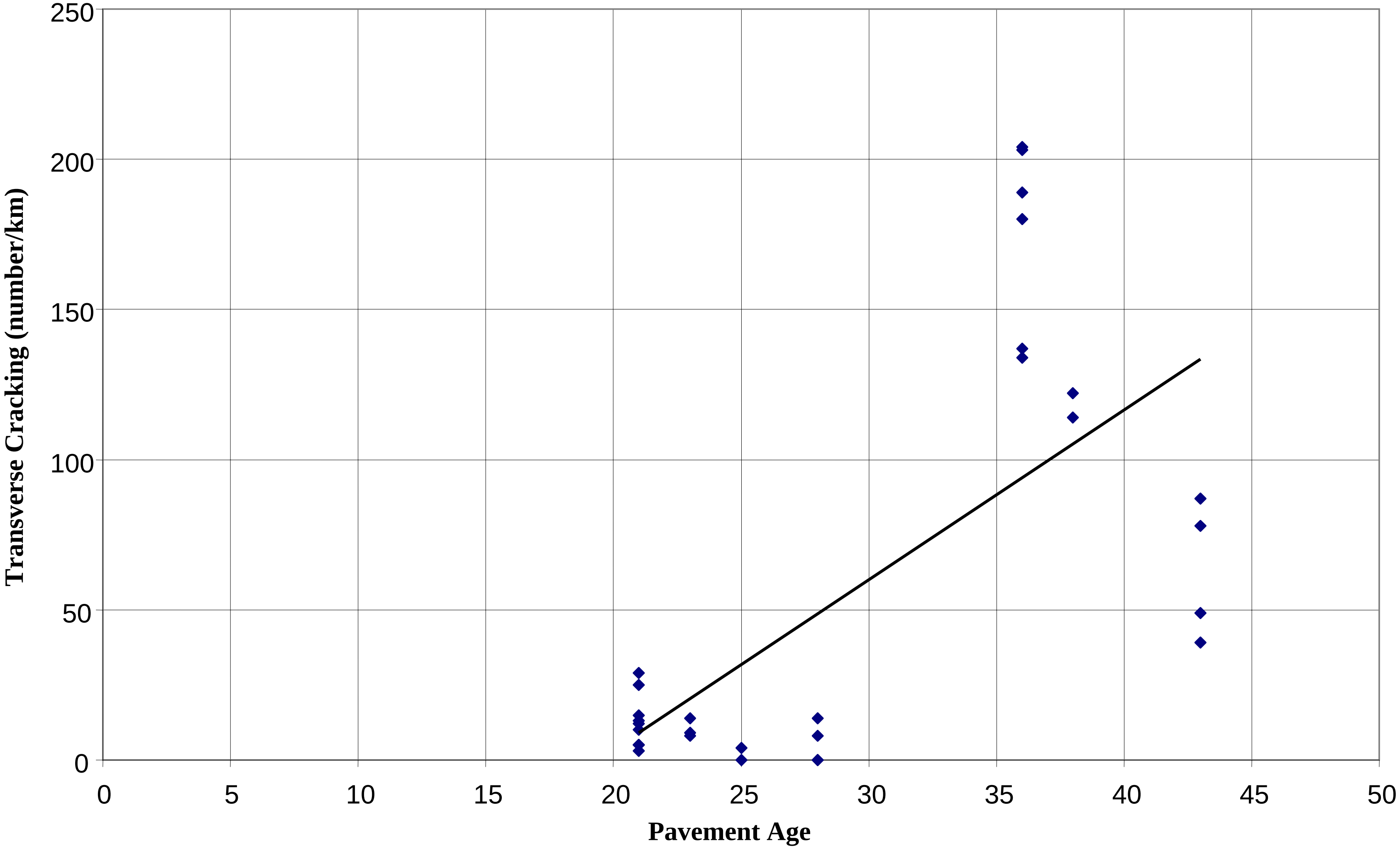

Figure 13. Transverse cracking vs. pavement age

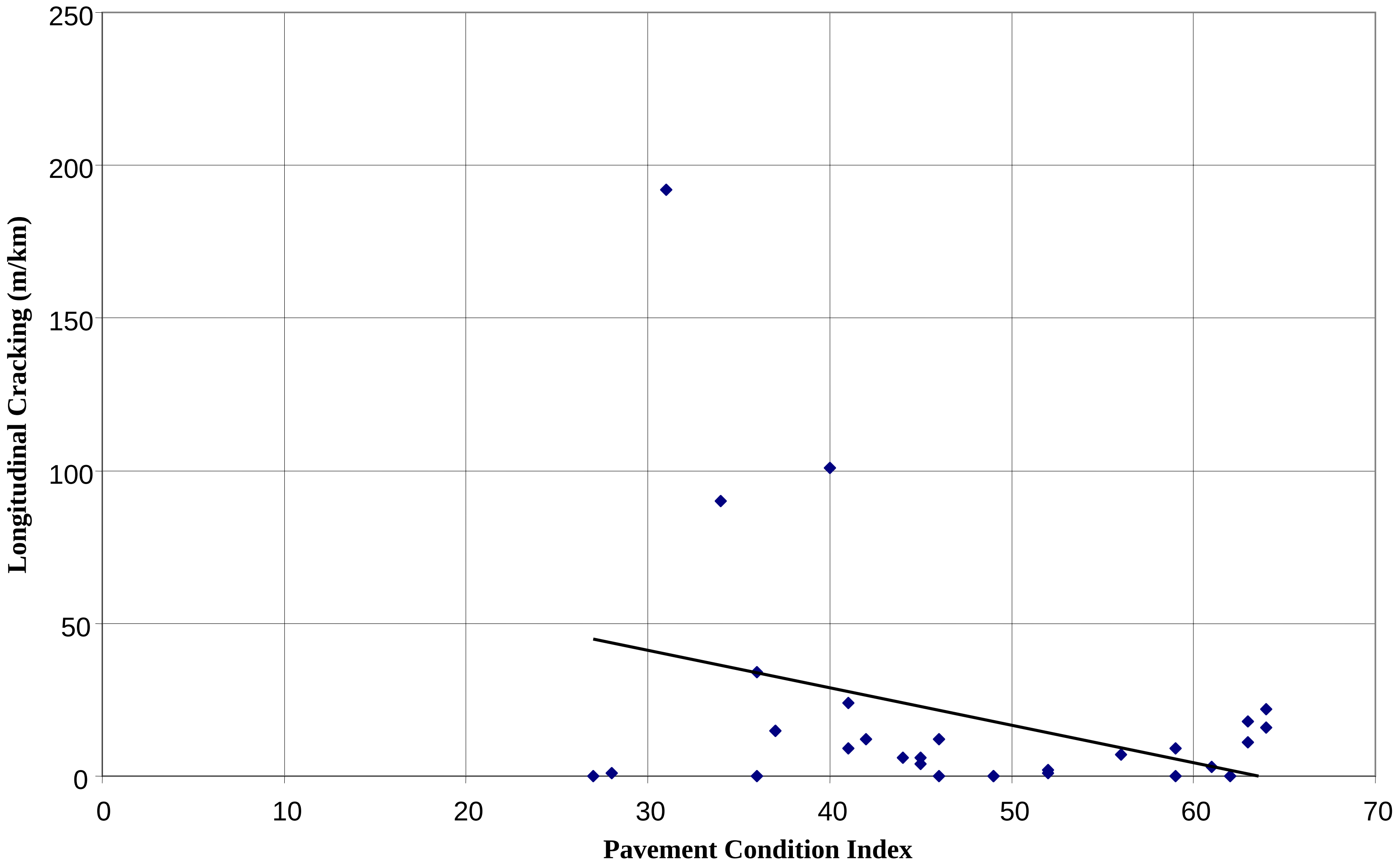

Figure 14. Longitudinal cracking vs. Pavement Condition Index

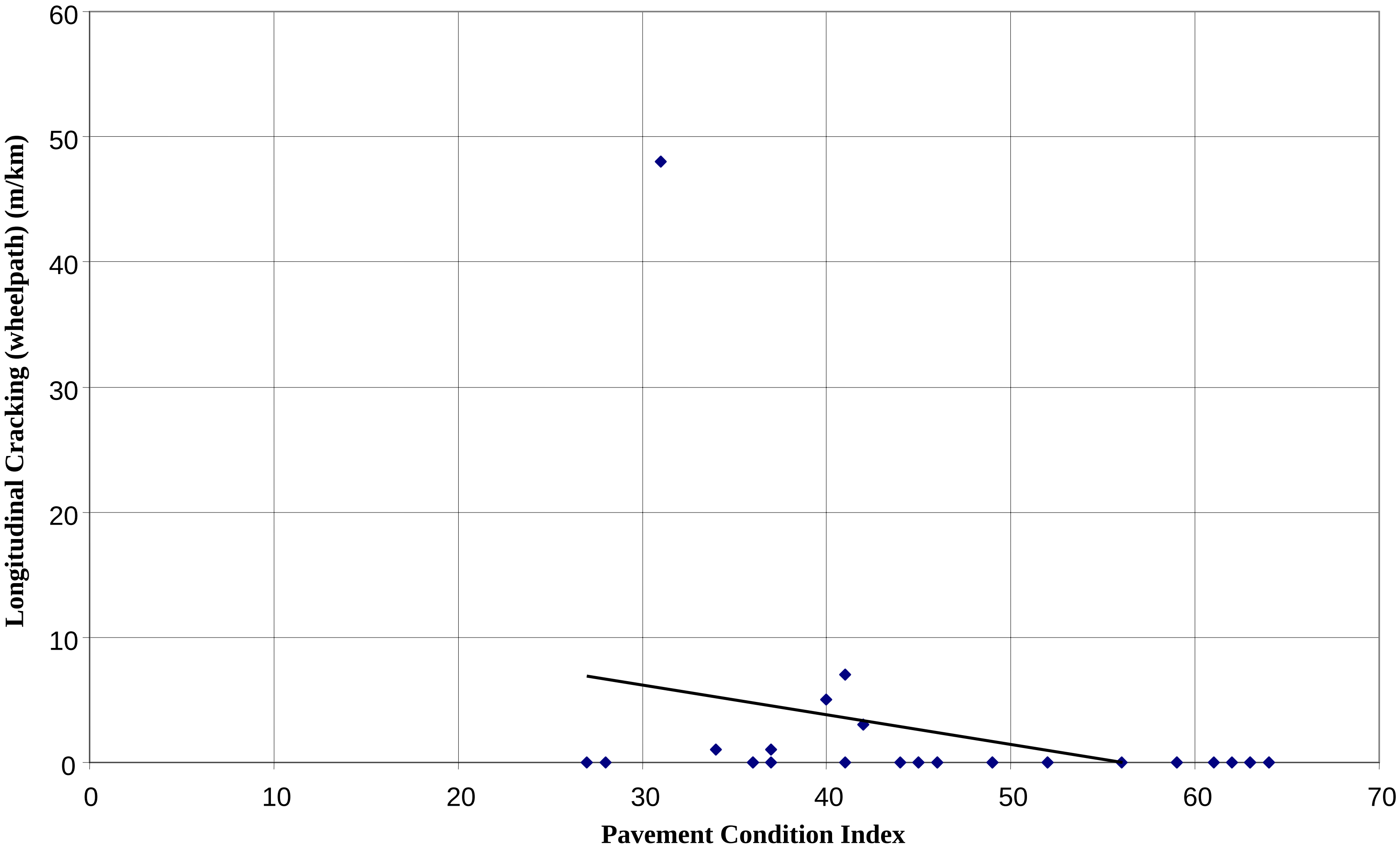

Figure 15. Longitudinal cracking in wheelpath vs. Pavement Condition Index

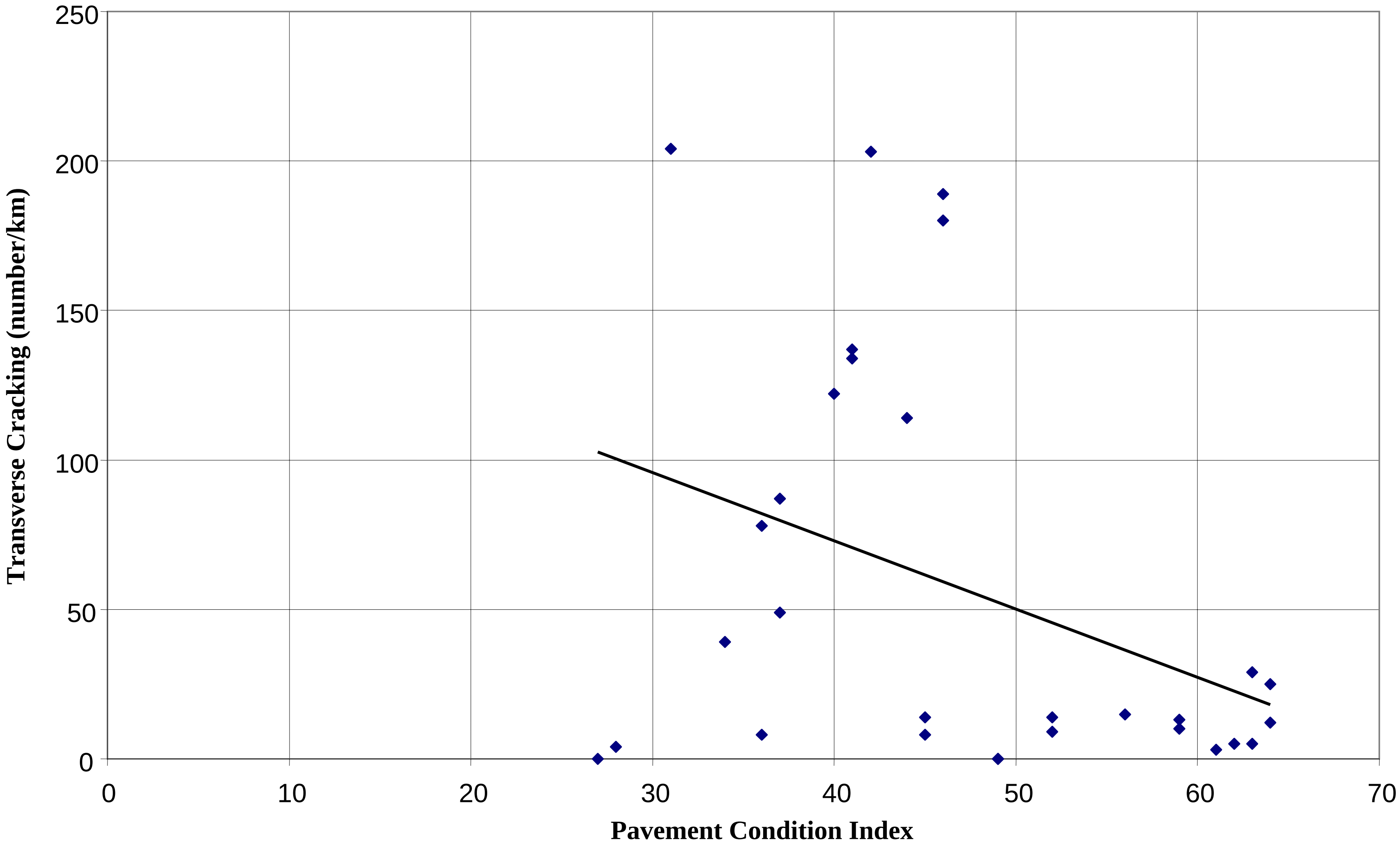

Figure 16. Transverse cracking vs. Pavement Condition Index

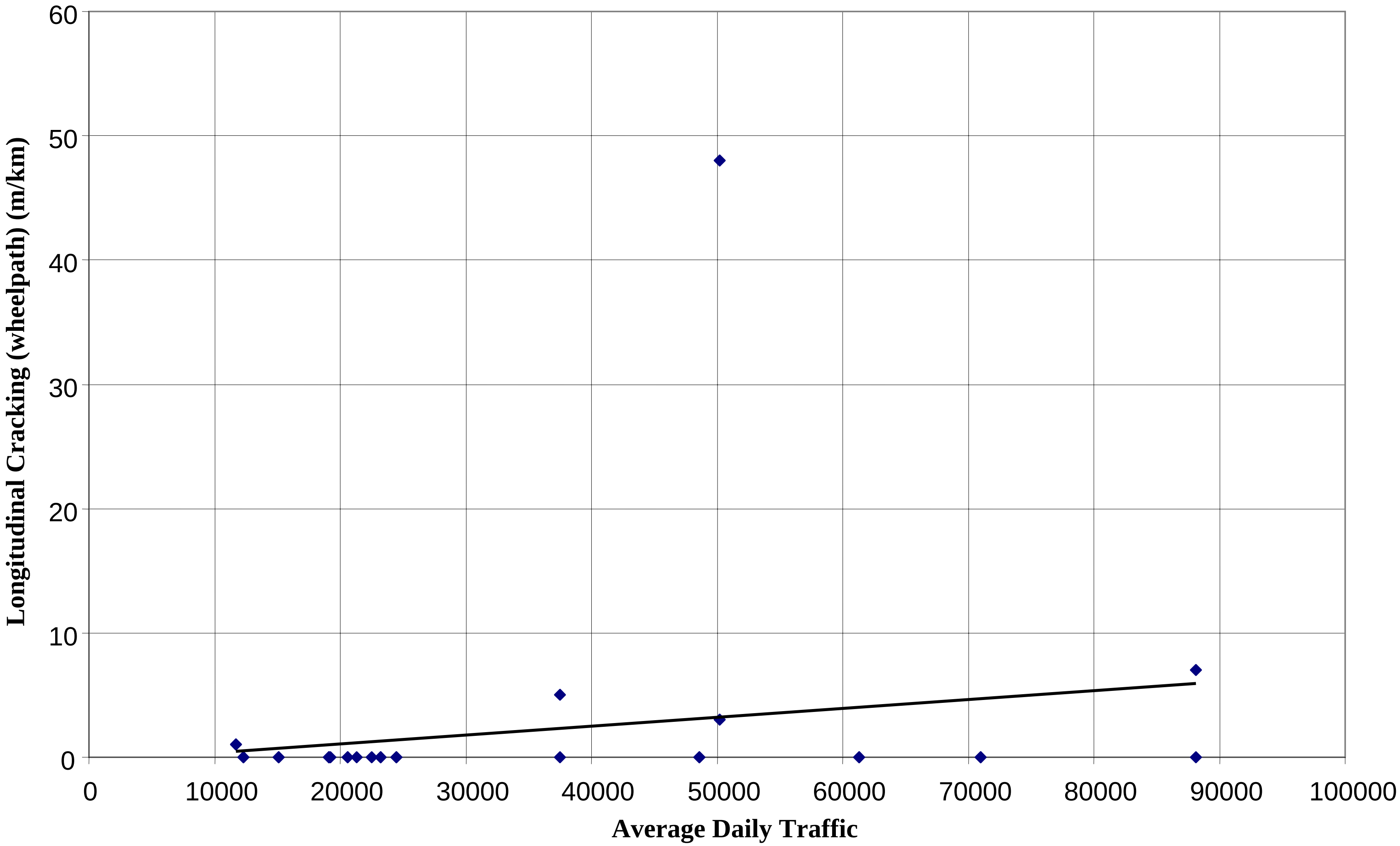

Figure 17. Longitudinal cracking in wheelpath vs. Average Daily Traffic

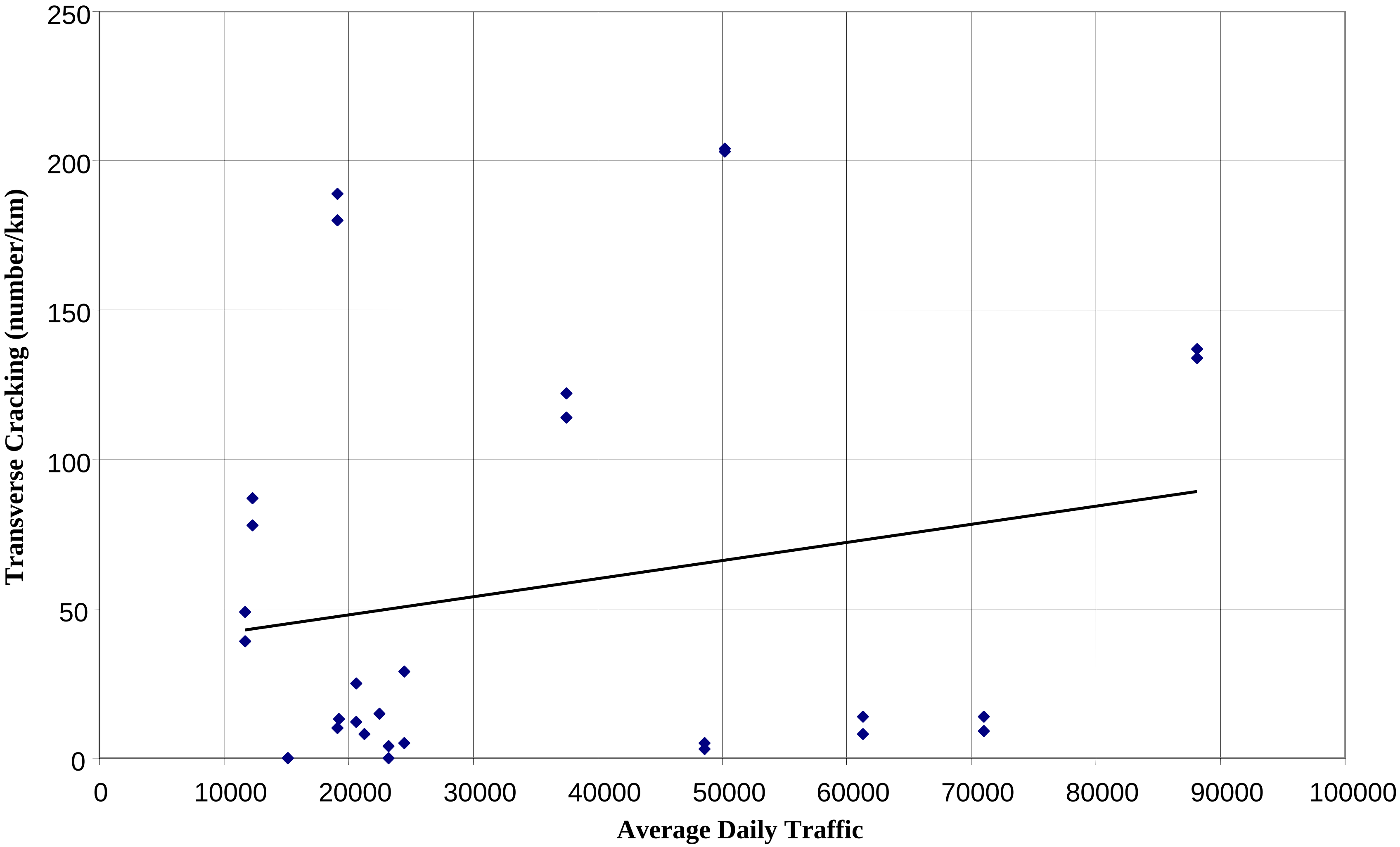

Figure 18. Transverse cracking vs. Average Daily Traffic

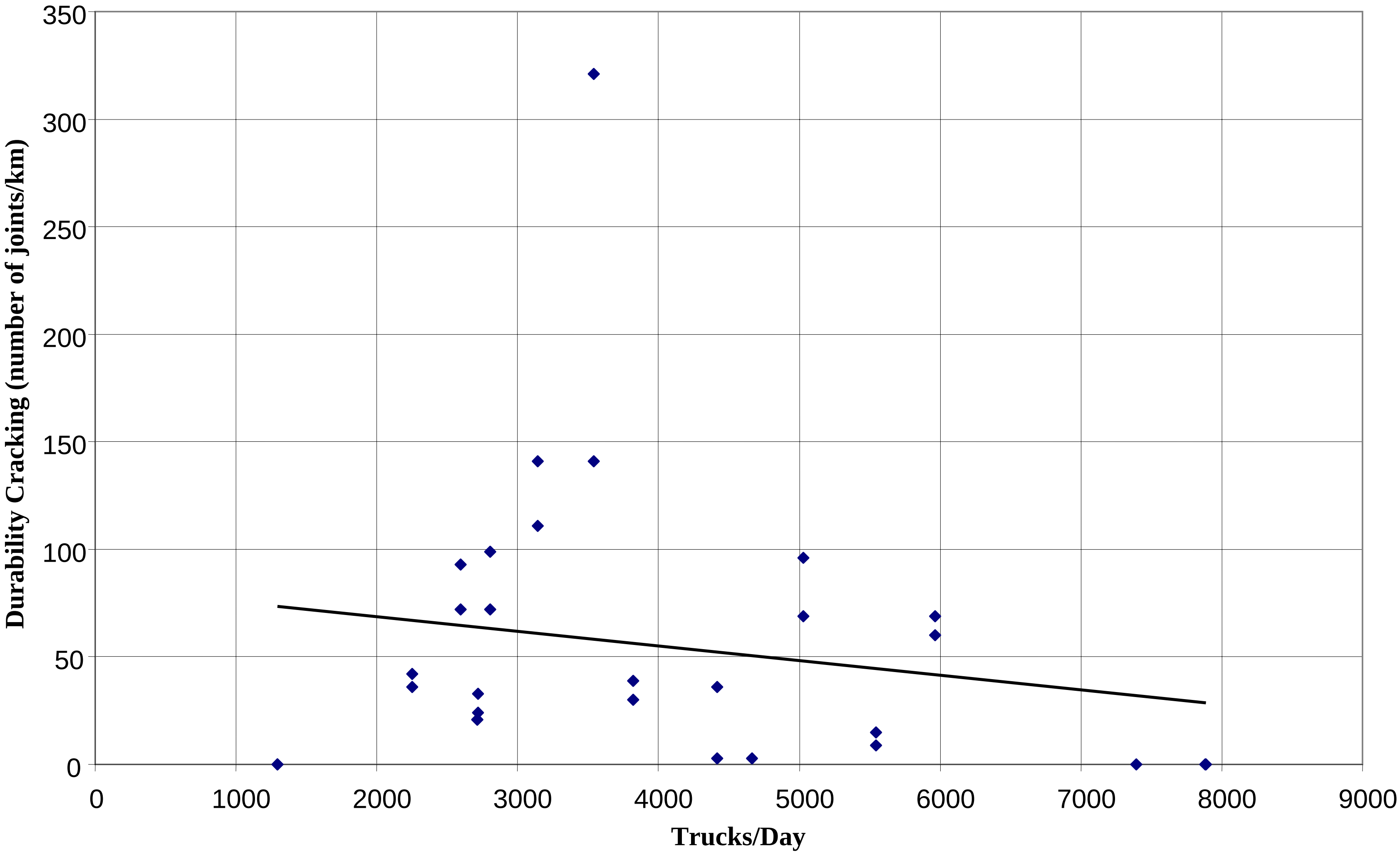

Figure 19. Durability cracking vs. trucks/day

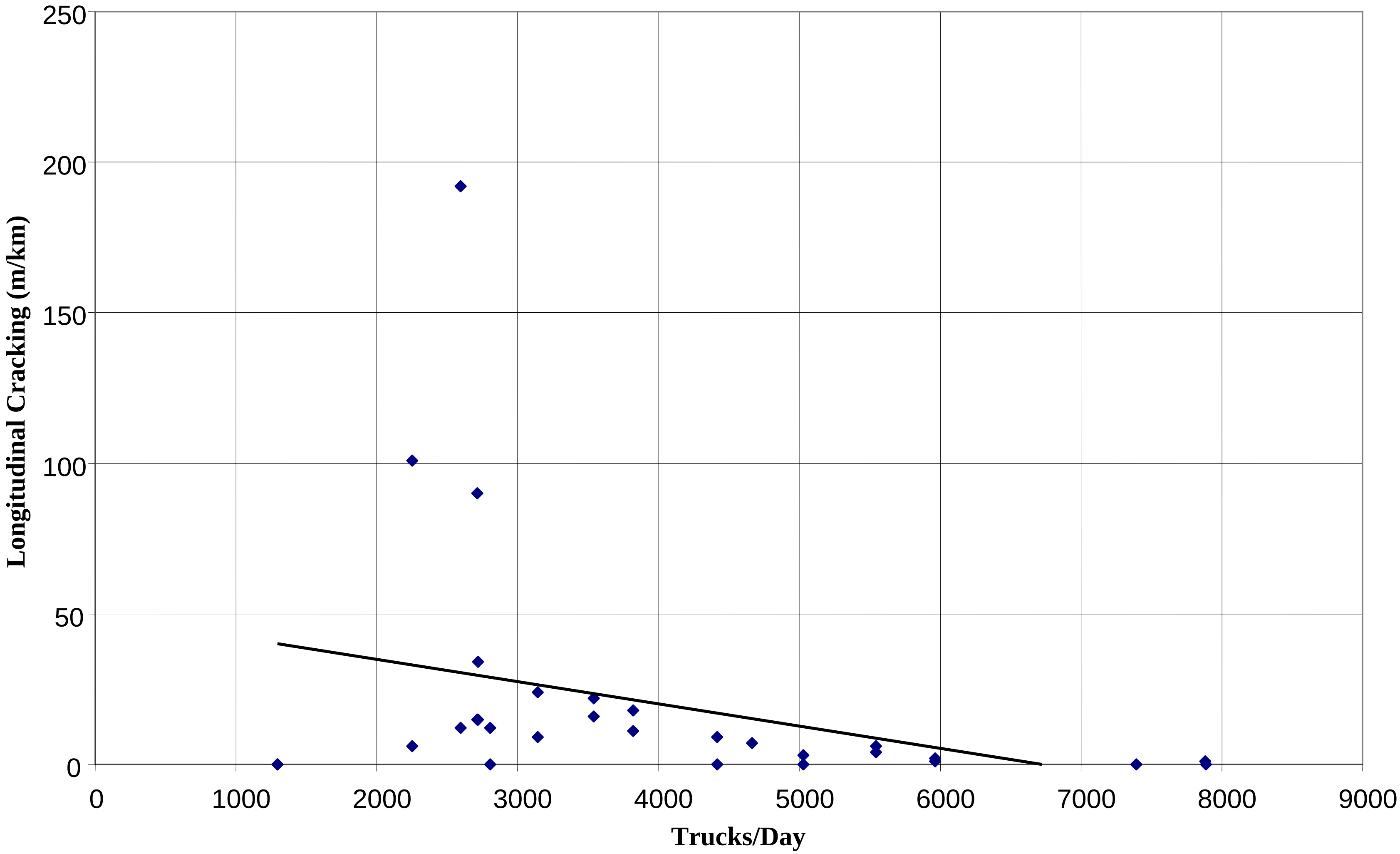

Figure 20. Longitudinal cracking vs. trucks/day

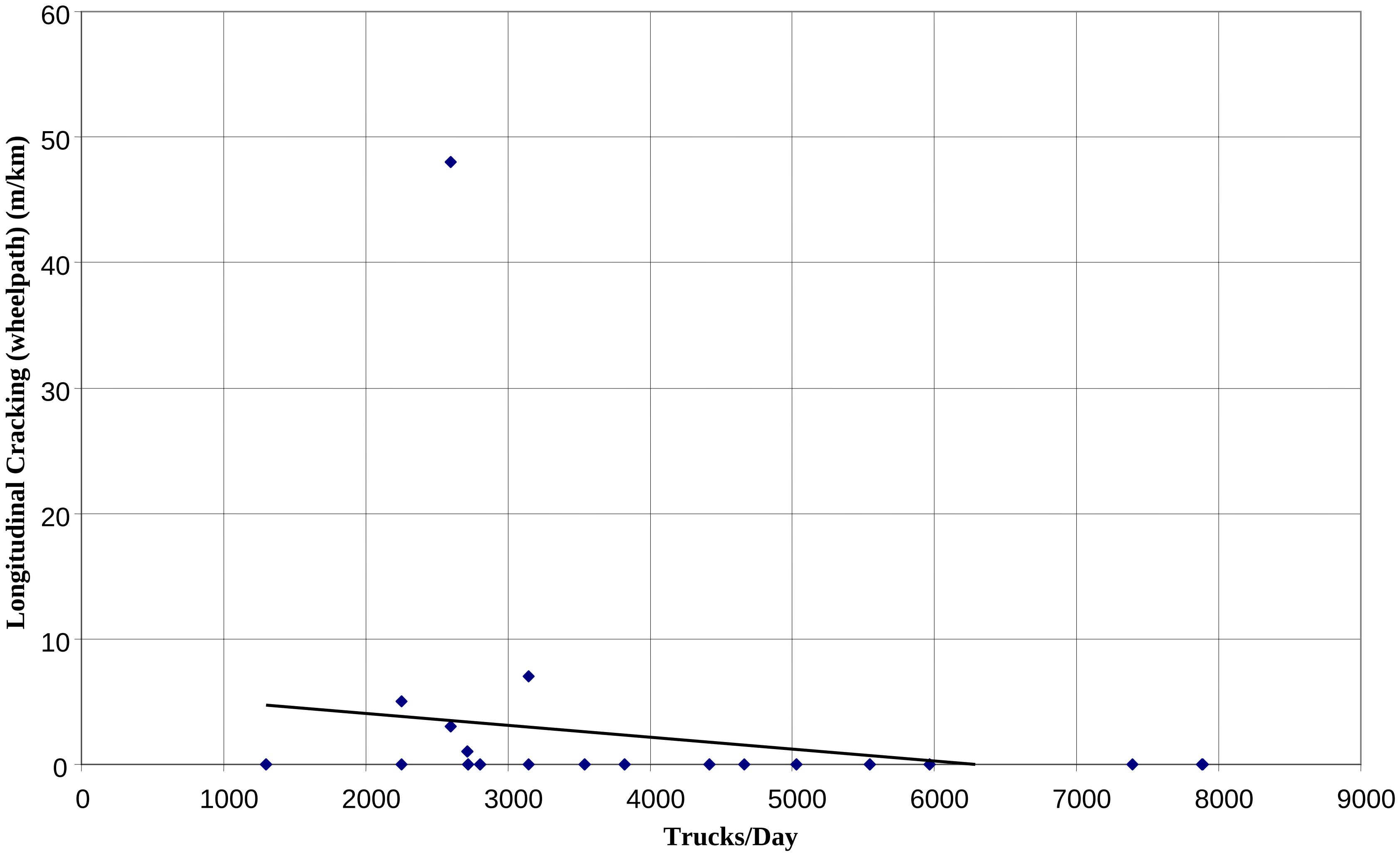

Figure 21. Longitudinal cracking in wheelpath vs. trucks/day

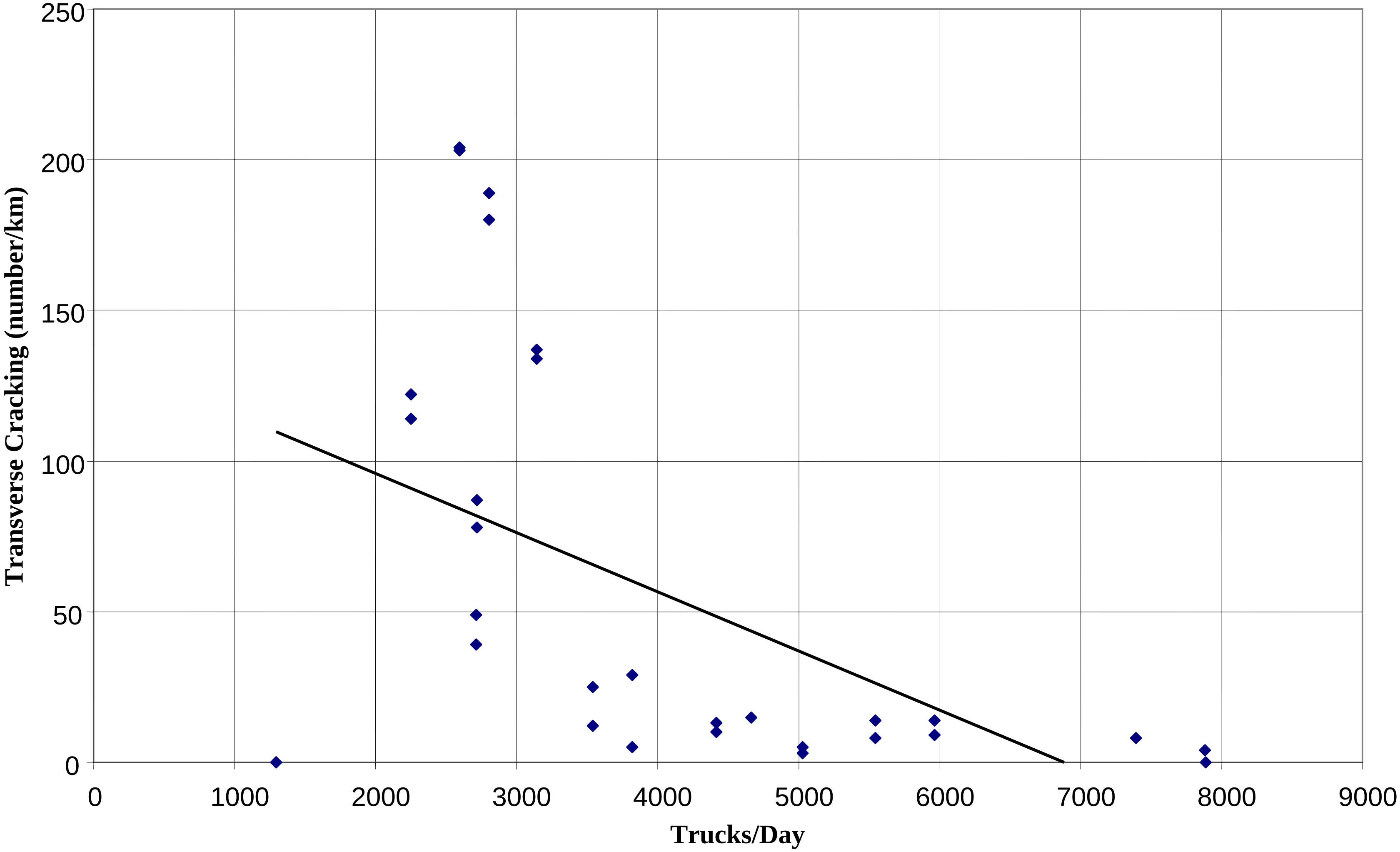

Figure 22. Transverse cracking vs. trucks/day

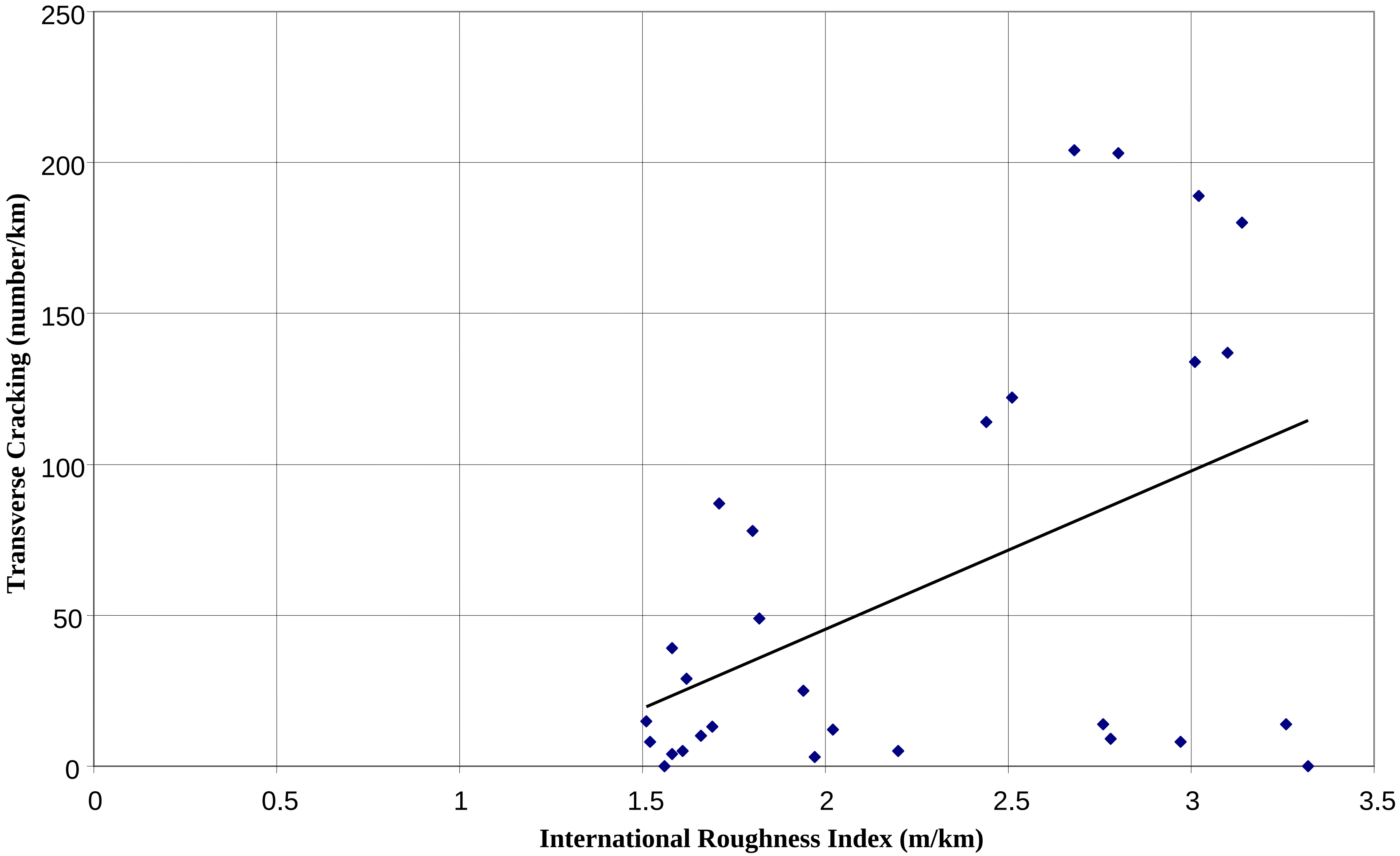

Figure 23. Transverse cracking vs. International Roughness Index