

2016 - 2021 Performance Monitoring of Mechanistic- Empirical Designed Pavements

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16. Abstract The Illinois Department of Transportation (IDOT) began conducting pavement performance monitoring surveys on mechanistic-empirical designed pavements in 1986. These surveys and analyses provide the necessary data to verify and validate the design procedures and life-cycle cost models used in the pavement selection process. The pavement distress surveys were conducted by IDOT's Bureau of Research (BR) staff until 2000 when staffing shortage caused the effort to cease. BR resumed the monitoring efforts in 2010 and has since used a consulting engineering firm to help with these activities. Monitoring of M-E designed pavements ensures the department is meeting the requirements of 20 ILCS 2705/2705-590. Three types of pavements are currently being utilized and monitored by the department: full-depth hot-mix asphalt (HMA), jointed plain concrete pavements (JPCP), and continuously reinforced concrete pavements (CRCP). IDOT has three supplement designs that are being tracked, Full-Depth HMA pavement over rubblized PCC, Unbonded JPCP overlay, and CRCP Unbonded Overlays. There are a total of 170 contracts (split into 324 sections) that make up the monitoring effort, of which 156 are HMA, 104 are JPCP, and 64 are CRCP. Contracts may be further broken down into sections based on differences in cross sectional elements (i.e. thickness, joint spacing, etc.). For each section, BR collects distress data, weighted average rut depth, weighted average ride quality, weighted average daily traffic values, and maintenance activities. Graphs comparing patching quantities and overlays as a function of the pavement age are presented for each of the three types of pavements.			
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**2016 - 2021 PERFORMANCE MONITORING OF
MECHANISTIC-EMPIRICAL DESIGNED PAVEMENTS**

**ILLINOIS DEPARTMENT OF TRANSPORTATION
BUREAU OF RESEARCH
SPRINGFIELD, ILLINOIS**

November 2025

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DISCLAIMER

The contents of this report reflect the views of the authors, who are responsible for the facts and accuracy of the data represented in this report. The contents do not necessarily reflect the official views or policies of IDOT. This report does not constitute a standard, specification, or regulation at IDOT.

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Executive Summary

This report is an update on the monitoring efforts tracking performance of mechanistic-empirical (M-E) designed pavements. These efforts by the Illinois Department of Transportation (IDOT) have been active since the original sections were built in 1986, with a short pause from 2000-2009 due to staffing shortages. The purpose of this effort is to evaluate the design procedures and the maintenance and rehabilitation models developed by the department for use in life-cycle cost analyses (LCCA) for selecting the most cost-effective pavement type. Additionally, these monitoring efforts meet the requirements of Illinois Compiled Statute 20 ILCS 2705/2705-590 to use real-world data to support those models.

Construction bulletins are reviewed to identify new construction and pavement replacement projects using M-E design procedures, as well as projects and Additional projects were included in each pavement type matrix for this reporting cycle and beyond. Since 2011 supplemental designs have been included in LCCA. To capture performance trends of these designs, separate matrices have been developed with each supplemental design: Full-Depth Hot-Mix Asphalt Pavement over Rubblized Portland Cement Concrete Pavement (F-D over Rubblized), Jointed Plain Concrete Pavement Unbonded Concrete Overlay (Unbonded JPCP), and Continuously Reinforced Concrete Pavement Unbonded Concrete Overlay (Unbonded CRCP). This report describes the methods used in the performance monitoring efforts and gives details of the results that were observed from the field surveys.

Data from the 2016-2021 cycle were collected and analyzed for this report. The current list of projects being monitored contains 170 contracts of which 76 are full-depth hot-mix asphalt (HMA) pavements, 49 are jointed plain concrete pavements (JPCP), 28 are continuously reinforced concrete pavements (CRCP), 13 are F-D over Rubblized PCC, 1 Unbonded JPCP, and 3 Unbonded CRCP. Data collection included traffic counts, distress surveys, rut depths, ride quality, Condition Rating Survey (CRS) values, and maintenance activities. The two top areas of focus of the analysis were the patching quantities and service life of the wearing surface (new construction or overlay) for all pavement types. Separate graphs by pavement type were created looking at the percentage patching versus pavement age. Corresponding rehabilitation model patching quantities are plotted on each graph as well. The service life of the wearing surface was analyzed by comparing the ages at which the sections received overlays. In previous reports, separate graphs displayed data according to the regions, but no clear trends can be drawn from those graphs, so they were omitted from this report. Patching quantities for all pavement types appear to be underestimated in the current life cycle models. The Bureau of Research will investigate the cause of the patching prior to recommending any changes to the life cycle models. Formal recommendations will occur in the next reporting period. Appendix E details the Bureau of Research's proposed revisions to life cycle models for HMA.

Upon careful review and analysis of the data, IDOT found minor revisions to the life cycle models and life cycle cost analysis procedures are warranted. These revisions are detailed in Appendix E. The Bureau of Research (BR) will continue monitoring the performance of the sections included in this report and any sections that will be added to further populate the matrices. Pavement preservation treatments and supplemental designs have been included in the research effort and will be reviewed in future reports.

Introduction

The Illinois Department of Transportation (IDOT) continues to monitor performance of the current pavement designs to verify the life-cycle cost models that are an integral part of the pavement selection process. There are three pavement types considered for new construction and six pavement types considered for pavement replacement. Those considered for new construction are Full-Depth Hot-Mix Asphalt Pavement (FDHMA), Continuously Reinforced Concrete Pavement (CRCP), and Jointed Plain Concrete Pavement (JPCP). Three additional pavement types are considered for pavement replacement projects using the same alignment: Full-Depth Hot-Mix Asphalt Pavement over Rubblized Portland Cement Concrete Pavement (F-D over Rubblized), Jointed Plain Concrete Pavement Unbonded Concrete Overlay (Unbonded JPCP), and Continuously Reinforced Concrete Pavement Unbonded Concrete Overlay (Unbonded CRCP).

The BR's Pavement Technology Section develops and maintains pavement design and rehabilitation policy for the department, which includes collecting and analyzing performance data. IDOT agreed to provide a report on M-E pavement performance periodically to allow the department and industry to review validity of the activities in the rehabilitation and maintenance models. This report details the data collection and analysis for the 2016 - 2021 performance monitoring cycle.

Summary of Previous Monitoring and Reporting

The department has been monitoring M-E designed pavements since 1986, except for a pause from 2000-2009 due to a staffing shortage. Sections have been added and removed as the monitoring progressed to focus on the pavement types that are currently being used in pavement selection.

Selection of Monitored Sections

A full discussion of the initial development of the monitored section list is contained in previous reports described in the next subsection of this report. The list of sections included in each matrix was reviewed prior to this monitoring cycle and adjustments were made to improve sampling for monitoring current pavement designs. The BR continues to review every construction letting to identify projects that may contain pavement cross sections not included in the current matrices.

To track pavement performance over the widest range of design variables, matrices were developed for each pavement type: FDHMA, JPCP, and CRCP. Contracts were selected for inclusion in each pavement type matrix based on location in the state and pavement thickness. Districts 1 and 2 were considered northern districts (North); Districts 3 – 7 were considered central districts, and Districts 8 and 9 were considered southern districts (South). The central districts were further broken down into Central-North (Districts 3 - 4) and Central-South (Districts 5 - 7) (4). These groupings correspond to the pavement temperatures found on the HMA Mixture Temperature map in the full-depth HMA design procedure (1). The matrices for all six pavement types are in Tables 1 through 6.

Pavement Distress Surveys and Other Performance Data

Monitoring the sections included several non-destructive test methods. BR collected the surface characteristics (i.e., smoothness and rutting) of the selected pavements, as well as any

major rehabilitation performed on the sections. In previous reports, pavement condition data was collected using manual pavement distress surveys (PDS) to collect either the entire length of the contract for shorter projects or a sampling method was used on longer projects (> 5 miles in one direction). To reduce safety risks of walking along highways and minimize cost, manual surveys were halted, and a video van with data sensors has been used since 2018. Consultant staff collected video of each section every two years. The videos are reviewed to document distresses, maintenance activities, and overlays. A summary on each section is provided to the department. When switching collection methods, a comparison between manual and video surveys was conducted to ensure a high level of reliability would be achieved.

Previous Reporting

Documentation of the M-E designed pavements has been taking place ever since the first experimental feature was built. The first report on M-E pavement performance was published in February 1993, Physical Research Report (PRR) #112 (2), and only focused on the first experimental sections on US 20 and US 50. Over the next 17 years, several internal reports were published to summarize performance and assist BR in revising design procedures and maintenance models.

After 20 ILCS 2705-590 took effect in 2009, the department agreed to publish a periodical report to summarize performance trends and impacts on life-cycle maintenance models. The first report that summarized data pertinent to the statute was PRR #159 published in 2011 (3) which established a new process for data collection and analysis. A second report was PRR #165, published in 2016 (4), which provided an update on performance of the monitored sections and described changes to the process used for collecting PDS data.

Pavement Performance Models

The rehabilitation and maintenance models have not changed since they were updated in 2011. IDOT continues to work closely with industry, Illinois Division of Federal Highway Administration (FHWA), the University of Illinois (U of I), and other academia to advance the models to reflect performance impacted by design and construction practices. Meetings are held periodically with industry and research efforts through U of I are currently underway to review changes and innovations in materials used to construct pavement. Both endeavors will continue to shape the practices that IDOT uses in designing, constructing, and maintaining pavements.

IDOT – Industry Meetings

Technical staff meetings were held with each industry group in coordination with their annual meetings. This presented an opportunity to discuss any potential changes in materials and design elements used in pavements to determine if any changes were needed in monitoring efforts. Additionally, industry members were included in any Technical Review Panels for research projects that pertain to any of the M-E pavement types.

University of Illinois Research

Several research projects were conducted or are ongoing during the monitoring period that may impact design procedures and life-cycle models. These efforts are summarized below.

Completed Projects

R27-149-1 Mechanistic-Empirical (M-E) Design Implementation & Monitoring for Flexible Pavements; Completed 6/30/2018.

Mechanistic-Empirical (M-E) - based flexible pavement design concepts and procedures were developed in previous IHR Projects (IHR-510, IHR-524) and ICT projects (ICT- R28, ICT-R27-60) and have been implemented by IDOT. Many reports and "white papers" have been prepared in the various projects and provided to IDOT BM&PR. The current state of the knowledge was (is being) utilized. IDOT continues to support a variety of M-E flexible pavement analysis, design, implementation and monitoring activities. The objective of this project is for University of Illinois Staff to provide IDOT with technical research support in adjusting, implementing, and monitoring activities associated with their flexible pavement design methods.

R27-149-2 Mechanistic-Empirical (M-E) Design Implementation & Monitoring for Rigid Pavements; Completed 8/31/2018.

The objective of this project is to first provide IDOT with technical research support in adjusting, implementing, and monitoring activities associated with their rigid pavement design methods specifically JPCP, CRCP, UTW, and composite pavements (HMA/PCC and HMA/RCC). The second major objective is to develop mixture design and constituent guidelines for RCC in order to achieve the same long-term performance as JPCP. Finally, this project will provide research and technical services to IDOT on rigid pavement design, analysis, construction, and material issues as needed.

R27-161 Construction and Performance Monitoring of Various Asphalt Mixes; Completed 12/31/ 2017.

Five sites/locations in the Chicago area have been selected to evaluate the field performance of various mixes which incorporate varying asphalt binder grades in combination with varying types and proportions of recycled materials. Tasks include a pre-construction pavement evaluation, construction survey and quality assurance, laboratory characterization of materials collected at the time of production, and a post construction survey and in-service field survey. The findings and details of each task will be summarized in a final report.

R27-162 Chemical and Compositional Characterization of Recycled Binders; Completed 1/31/2017.

In our ongoing project R27-128 (Testing Protocols to Ensure Performance of High Asphalt Binder Replacement Mixes Using RAP and RAS), test methods and procedures are sought to identify key performance indicators of asphalt mixes (produced in the plants) with high recycled content (RAP and/or RAS). However, there is also a need to understand how addition of recycled binder from RAP and RAS affects the structural and compositional information of virgin/aged binder and how that translates to binder's physical characteristics and performance of mixes during service life. This forms the objective of current project.

R27-175 Development of Long-Term Aging Protocol for Implementation of the Illinois Flexibility Index Test (I-FIT); Completed 8/31/2019.

As a result of ICT project R27-128, a practical and reliable test method, Illinois Flexibility Index Test (I-FIT), was developed to screen AC mixes' capacity for cracking resistance. This test method evaluates AC mixes at 25°C and at a loading head displacement rate of 50 mm/min. The flexibility index (FI), derived from the IFIT results, is a simple index parameter correlated to

fundamental crack growth mechanisms in the process zone. The parameter has the ability to distinguish mixes with varying characteristics that may result in different cracking resistance capacities. A provisional AASHTO test specification was prepared and accepted by the relevant AASHTO subcommittee as TP-124. Integration of the I-FIT method into IDOT's AC mix design specifications is under way. Several steps are required to complete the implementation. Therefore, the following research objectives are identified as follows: • Development of Long-Term Aging Protocol with specification criteria • Development of thresholds for long-term aged plant and laboratory produced mixtures

R27-193-1 Flexible Pavement Recycling Techniques; Completed 7/15/2021.

The objective of this project is to further develop and refine specifications, procedures, and policies for flexible pavement recycling techniques (CCPR & FDRC).

R27-193-2 Flexible Pavement Design (Full-Depth and Rubblization); Completed 7/15/2021.

Project activities will focus on utilizing BDAT (Best Demonstrated Available Technology) as related to Full-Depth HMA pavements and Rubblized PCCP with HMA overlay.

R27-193-4 Premature Cracking Mechanisms for Jointed Plain Concrete Pavement (JPCP); Completed 1/15/2021.

The objectives of this concrete pavement research project are to provide IDOT with likely mechanisms that are causing the premature cracks in urban JPCP sections and offer relevant solutions to minimize this premature cracking.

R27-193-5 Review of Improved Subgrade and Stabilized Subbases to Evaluate Performance of Concrete; Completed 6/15/2021.

The objective of this research is to provide IDOT with geotechnical solutions for highway and pavement applications that will advance current practice and ensure that the pavements in the State of Illinois are constructed to the necessary levels of performance, economy and durability, without being overly conservative in thickness. The outcome of this project will be to provide recommendations and draft specifications to update the standard specifications and manuals of IDOT regarding foundation issues that are currently pressing for IDOT.

R27-196-HS Rheology-Chemical Based Procedure to Evaluate Additives/Modifiers used in Asphalt Binders for Performance Enhancements (Phase 2); Completed 6/30/2021.

The overall goal of the project will be to develop an advanced and systematic binder screening protocol that includes a long-term aging procedure for modified binders with rheological and chemical characterization methods. At the end of the proposed study, it is also expected that preliminary thresholds established in project ICT R27-162 will be validated and fine-tuned based on various combinations of rheology-chemistry space diagrams.

Projects Active During Reporting Period

R27-204 Optimized Hot-mix Asphalt (HMA) Lift Configuration for Performance; Completed 5/31/2023.

R27-208 Measuring Transport Properties of Portland Cement Concrete Using Electrical Resistivity; Started 8/16/2019; Completed 08/15/2023.

R27-216 Optimizing the Use of Local Aggregates in Stone-matrix Asphalt (SMA); Started 8/16/2020.

R27-230 Performance and Design of Continuously Reinforced Concrete Pavements (CRCP); Started 5/16/2021.

R27-233 Mechanistic - Empirical Design Procedures for Flexible Pavements; Started 5/16/2021.

R27-235 Thickness Design for Cement-Treated Base Pavements; Started 7/1/2021.

2016-2021 Performance Cycle

A total of 105 sections were monitored and discussed in PRR #165. After publishing that report, the BR reviewed the list of M-E designed pavements created from construction bulletins since 2004. The current LCCA maintenance and rehabilitation models include two pavement types per model.

- Jointed Plain Concrete Pavement and Unbonded Jointed Plain Concrete Overlay
- Continuously Reinforced Concrete Pavement and Unbonded Continuously Reinforced Concrete Overlay
- Full-Depth HMA Pavement and Full-Depth HMA Pavement on Rubblized PCC Pavement

To gain a better understanding if maintenance and rehabilitation activities are different between a new pavement and a supplemental design, three additional matrices were added to track projects that follow the supplemental designs and projects were shifted to the appropriate matrix.

Modifications were made to the list of sections to address design methods or data issues, reclassification, and increased sampling size. Fifteen sections were removed that were not current designs or had issues with data inconsistencies. Three contracts were shifted from a new pavement type matrix to a supplemental design matrix. Finally, 81 contracts were added to fill gaps in the matrices. These new contracts were reviewed to locate sections with a length of at least one mile and no more than five miles, little to no omissions, and consistent cross sections. A total of 170 contracts were monitored between 2016 and 2021 with the following distribution between pavement types.

- 76 - Full-Depth HMA Pavement
- 49 - Jointed Plain Concrete Pavement
- 28 - Continuously Reinforced Concrete Pavement
- 13 - Full-Depth HMA Pavement on Rubblized PCC Pavement
- 1 - Unbonded Jointed Plain Concrete Overlay
- 3 - Unbonded Continuously Reinforced Concrete Overlay

BR will continue tracking preventive maintenance activities that are being used on the monitored sections. These efforts will help determine if those activities should be considered for incorporation into the models. Regarding design procedures, the addition of limiting strain criterion design could impact pavement performance. BR will identify sections using standard and limiting strain criterion designs to determine if performance is impacted.

Data Collection Effort

The BR utilized a consultant contract with Applied Pavement Technology, Inc. (APTech) to collect condition data on the monitored sections. During the previous reporting period, data was collected by conducting a manual PDS of the sections (either in full or by a sampling method). The sampling method was used on longer sections (> 5 miles in one direction). Only half of the sections were collected each year to manage the workload. To remove the risk of walking along the pavement and reduce collection time, beginning in 2018 the BR allowed APTech to use the Enhanced Data Gathering Equipment (EDGE) system to collect all condition data moving forward. This ensures the entire monitored section was collected each time.

Sections were collected every other year to alternate with the Condition Rating Survey (CRS) collection effort managed by the Bureau of Programming. APTech collected data on sections in Cook County in District 1 and Districts 4, 5, 8, and 9 in the even years, and sections located in the collar counties of District 1 and Districts 2, 3, 6, and 7 in the odd years. The CRS images were reviewed if a section received an overlay or had a large discrepancy in distresses and/or patching quantities between two surveys to provide another data reference to establish when the work was performed. All distresses were collected in the surveys according to the *Bureau of Research Pavement Distress Manual*, which documents the various distresses, and the severity levels identified and summarized for each pavement type, which may be found in Appendix A of PRR #159 (3).

The survey videos were reviewed to document cracking/distresses in each section and track maintenance activities. Cracking and distress quantities were summarized upon survey completion. Upon completion of each survey, BR staff cross-checked the survey data with the previous survey to identify large discrepancies and new overlays. When a discrepancy was found, the pavement section was investigated in IRIS or with the district. If sections were found to have an overlay, the overlay construction plans were reviewed to determine the percentage of the section that was overlaid. Dates and limits of overlays were confirmed and were reported on the individual distress summaries.

Splitting into Subsections

Contracts for the various monitored sections often needed to be split into smaller sections due to maintenance and rehabilitation activities, multiple counties, and thickness differences. This process was documented in PRR #165 and still applies to this dataset.

Distress Summaries

Prior to 2000, the PDS summaries were placed into the Illinois Pavement Feedback System (IPFS) database. Data collection took place between 1986 and 1998. The effort was suspended at that time due to staffing shortages. The construction history and traffic data input into IPFS was suspended in 2000, due to the lack of staff needed to maintain IPFS and continue data processing efforts. An Excel spreadsheet was used to store the data for the 2010 update

when data collection resumed. Graphs and summary reports were developed from this spreadsheet. During the work on this report an Access database was created to store the contract information, overlay history, PDS summaries, and traffic data. This database was used to organize the data for the graphs and summary reports for the 2015 update.

Distress summaries also include weighted averages of rut depth, ride quality (i.e., International Roughness Index (IRI)), and average daily traffic (ADT) values for each section. Rut depth, IRI, and ADT were obtained from OPP and represent the latest year data was available, generally 2014 or 2015, depending upon the data collection schedule.

Data Analysis

The data obtained from the 2016 - 2021 cycle were added to the database including 2010 through 2015 data to provide a complete analysis of the M-E dataset. For each pavement type, the PDS data were analyzed to determine the validity of the maintenance models used in IDOT's life-cycle cost analysis (LCCA). The three matrices for the supplemental designs have very small numbers of contracts, so these projects were not separated from the new pavement types (FDHMA, JPCP, and CRCP) for the analysis. The datasets will remain combined until a significant sample size is achieved for each supplemental pavement type. The data analysis information is presented graphically in Figures 1-17 and discussed in the following sections.

Patching Quantities as a Function of Age

An analysis was completed to review patching quantities using the same method as PRR #165. Patching quantities from historical PDSs are shown in Appendix A, *Patching Quantities from Full-Depth HMA Pavement Historical Distress Surveys*; Appendix B, *Patching Quantities from JPCP Historical Distress Surveys*; and Appendix C, *Patching Quantities from CRCP Historical Distress Surveys*.

Using data from Appendix A, an analysis of patching quantities as a function of age on FDHMA was conducted and is shown in Figures 5 and 6. The patching quantities in Figure 5 include all the monitored sections listed in the current matrices and are broken down into the type of surface at the time of survey (i.e., bare, first overlay, or second overlay). The patching quantities in Figure 6 are the same data at Figure 1, but the y-axis range was limited to 0.0-1.0 percent patching to expand the view and spread the data points.

Similar analyses were performed for JPCP and CRCP. Data from Appendix B included patching quantities for JPCP. These data are plotted in Figures 10 and 11 as a function of age using the same date ranges and surface types as those used for the FDHMA graphs. These comparisons were also conducted for CRCP using data presented in Appendix C. Figures 16 and 17 show the data trends for CRCP.

All three pavement types use a 45-year life-cycle analysis period. The tables for the maintenance and rehabilitation activity schedules for each pavement type can be found in Appendix D. Note that each point shown in Figures 5, 6, 10, 11, 16, and 17 represents a distress survey; a contract may have more than one point depending on the number of subsections and the amount of historical data available.

The data for the HMA pavements in Figure 5 highlights the life-cycle models have slightly underestimated the percent patching. The average percentage patching from years 5-10 is 0.17% according to 114 observations. The percentage patching drops back down from years

10-15 due to sections receiving their first overlay. The observations recorded from years 15-20 show an increase in patching due to higher patching quantities on sections that are still using their original surface. There are two outliers in Figure 5. These belong to a single contract in a southern district that patched long sections of an entire lane. The reason behind this practice is unknown. It is possible that an overlay was needed but was delayed due to lack of funding.

For the JPCP pavements in Figure 10, patching quantities that are much higher than the quantities predicted by the model. Figure 11 contains the same data as Figure 10, but the y-axis range was limited to 0.0-1.0 percent patching to expand the view and spread the data points. The data in Figures 10 and 11 continue to indicate that the JPCP maintenance model may be under predicting the patching quantities up through 20 years. The average patching percentage for the JPCP observations is as follows.

Years 0 to 10 – 0.15% (170 observations)
Years 10 to 15 – 0.38% (79 observations)
Years 15 to 20 – 0.41% (70 observations)

The number of data points beyond year 20 drops off significantly and thus we do not have enough observations to define clear trends and draw conclusions. There are a couple projects that have overlays well before age 30, which warrants a closer look at the causes for those overlays.

For the CRCP pavements in Figure 16, their patching quantities are much higher than the quantities predicted by the model. Figure 17 contains the same data as Figure 16, but the y-axis range was limited to 0.0-1.0 percent patching to expand the view and spread the data points. The average patching percentage for the CRCP observations is as follows.

Years 0 to 10 – 0.01% (70 observations)
Years 10 to 15 – 0.10% (28 observations)
Years 15 to 20 – 0.58% (40 observations)
Years 20 to 25 – 1.0% (33 observations)

The number of data points beyond year 25 drops off significantly and thus we do not have enough observations to define clear trends and draw conclusions.

There is a significant number of projects that have received an overlay before the model predicts. Further analysis should be completed to determine the cause for overlaying at an earlier age.

Overlays as a Function of Age

Analyses of overlays on the different pavement types were also completed. An analysis of overlays on FDHMA, JPCP, and CRCP as a function of age are shown in Figures 1, 7, and 12, respectively. Graphs showing the distribution of the age of each section in 2021 along with the type of surface on the section (i.e., bare, first overlay, etc.) are shown in Figures 2, 8, and 13.

The charts showing the number of bare sections versus age by regions for each pavement type are shown in Figures 3, 9, and 14. Graphs depicting the age at which each contract received its first overlay for FDHMA and CRCP are shown in Figure 4 and 15, respectively. There are only a small number of JPCP contracts that have received an overlay, so this graph was omitted for this pavement type.

Note that each bar shown in Figures 1, 7, and 12 represents the number of sections, not the number of projects or contracts that have reached that age. A contract may contribute more than one section to a bar depending on the number of subsections.

Taking a closer look at Figures 1 and 4, we see that many of the sections are receiving their first overlay in year 15. This coincides with the current HMA model that recommends an overlay at 15 years. IDOT has begun implementing several new practices that should see this number grow as balanced mix design and longitudinal joint sealant projects begin to reach years 15 through 20.

Implementation of Longitudinal Joint Sealant

IDOT began investigating solutions to poor longitudinal joint construction on its HMA surfaces in 2000. They tried several different options, including notched wedges, crack sealant on the unconfined face, and an asphalt sealant placed below the lift. The asphalt sealant placed below the HMA lift outperformed any of the other options tested. Further testing and development continued through 2016, when IDOT completed several pilot projects. The subsequent years saw the gradual implementation of this system, with full implementation in 2018. The BR has been tracking the performance of all the installations since 2016. The longitudinal joints on these contracts have shown little to no deterioration over the first 5 years as seen in typical HMA contracts without longitudinal joint sealant.

This data is consistent with all the initial test sections of this product. This system is now fully implemented in IDOT's practices and should be added to the life cycle cost analysis procedures for FDHMA. The performance of this system also shows the Centerline Joint Routing and Sealing in year 5 should be removed from the life cycle models.

Pavement Management System

Monitoring the performance of a highway network requires a comprehensive tracking system such as a Pavement Management System (PMS). Illinois has used several systems to monitor performance of pavements. One of the first databases was IPFS, but it did not cover the entire system of highways under IDOT's jurisdiction. IPFS was designed and constructed in the 1990s and is operated in a mainframe format. This system contains data regarding pavement design, traffic, ride quality, rehabilitation, and distress information for the Interstate System and some supplemental freeways. As mentioned earlier, data input into IPFS was suspended in 2000, due to the lack of staff needed to maintain IPFS and continue data processing efforts.

The current system used by IDOT to manage the highway network does not meet the traditional definition of a PMS. This system utilizes several databases and spreadsheets maintained by the Office of Planning and Programming (OPP). The Illinois Roadway Information System (IRIS) contains data from all routes under IDOT's jurisdiction. IRIS is a very useful database for network planning, but IRIS does not meet the definition of a PMS. It is lacking critical data, such as pavement thickness and distress quantities, required for a PMS. Specific pavement, construction, and performance details are also required to produce an analysis of performance by pavement type.

A new database was developed under the consultant contract for performance monitoring. This database tracks all the critical elements necessary to review the maintenance and rehabilitation activities in the models and make revisions as necessary. BR will continue to work with the

consultant to maintain the database with the distress survey data and manage sections that will be monitored.

Future Monitoring Effort

Staffing levels at the BR have not increased, but the consultant contract collecting performance data is still in effect. Annual data collection and summarizing will continue to add real-world data to the database to work toward filling the entire cycle of the LCCA analysis (45 years).

In-house consultants continue to review construction bulletins to maintain list of potential projects for each matrix. Another evaluation of the sampling will be conducted to determine if any gaps in the matrices can be filled to add projects for data collection and summarizing.

Security restrictions on sending macro-enabled spreadsheets has created problems in the workflow of pavement design submittals. The spreadsheet used for this process is being converted to a web application. The BR will be conducting beta testing with the districts with the goal to have the final process in place by the end of 2025.

Conclusion

The findings from this report indicate revisions might be needed to the maintenance and rehabilitation models. Patching quantities are elevated from the estimations in the models. The Bureau of Research will investigate the cause of these elevated patching results to determine if there are revisions needed to our pavement standards and details or if this is just a function of the pavement design and revisions to the models are warranted. The Bureau of Research will complete the investigations in time for the next reporting period and formally propose recommendations in the subsequent report.

The issues raised in this report will be assessed by looking at performing additional analyses that may determine if additional revisions are necessary to improve the maintenance and rehabilitation models. If revisions are warranted, the BR will develop a proposal and schedule a meeting with industry groups to discuss the data and proposed changes.

REFERENCES

1. Illinois Department of Transportation. "Bureau of Design and Environment Manual, Chapter 54." <http://www.idot.illinois.gov/Assets/uploads/files/Doing-Business/Manuals-Guides-&-Handbooks/Highways/Design-and-Environment/Illinois%20BDE%20Manual.pdf> , Illinois Department of Transportation, 02/2011.
2. C. M. Reed, P.E. and A. M. Schutzbach, P.E. Evaluating Pavement Design Features – Five Year Performance Evaluation of FA 401 and FA 409. PRR #112. Illinois Department of Transportation, Division of Highways, Bureau of Materials and Physical Research, Springfield, Illinois, October 31, 1993.
3. Juan D. Pava. Performance Monitoring of Mechanistically-Designed Pavements 2010 Data Collection. PRR #159. Illinois Department of Transportation, Division of Highways, Bureau of Materials and Physical Research, Springfield, Illinois, March 2011.
4. Illinois Department of Transportation. 2012-2015 Performance Monitoring of Mechanistically-Designed Pavements. PRR #165. Illinois Department of Transportation, Division of Highways, Bureau of Materials and Physical Research, Springfield, Illinois, October 201

Figure 1: Overlay as a Function of Age:
Full-Depth HMA

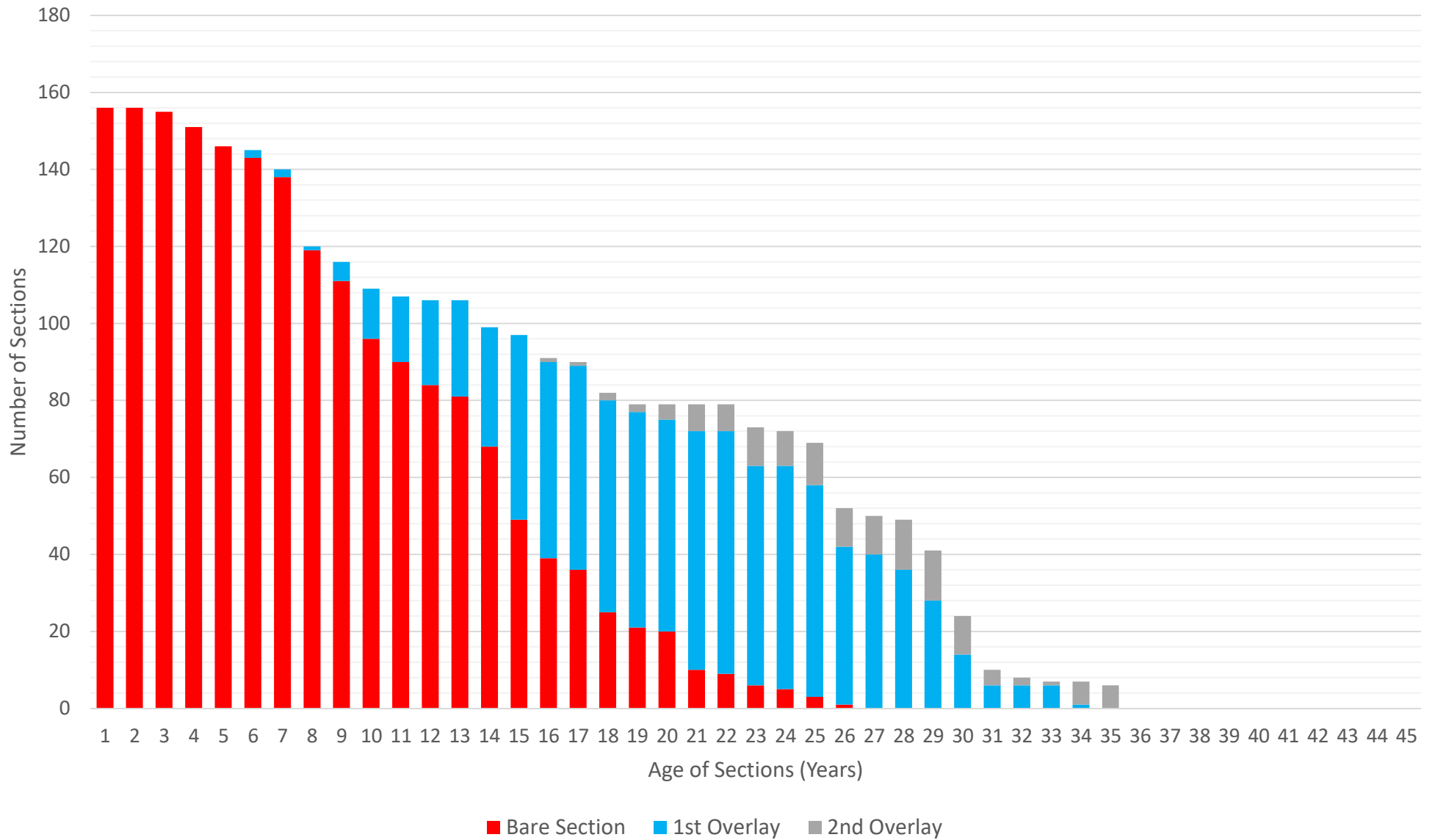


Figure 2 : Snapshot in 2021
Full-Depth HMA

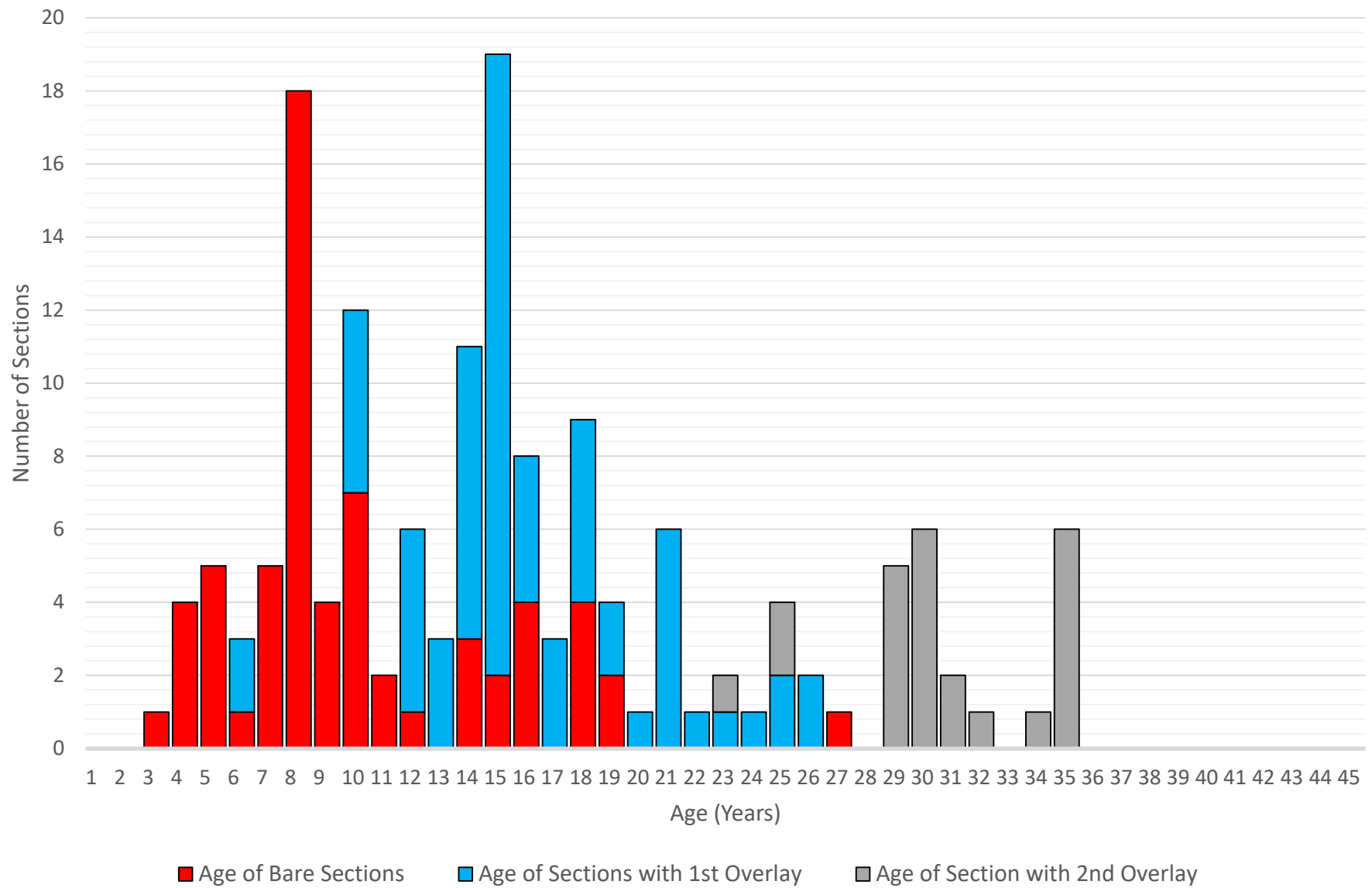


Figure 3: Bare Sections versus Age by Regions
Full-Depth HMA

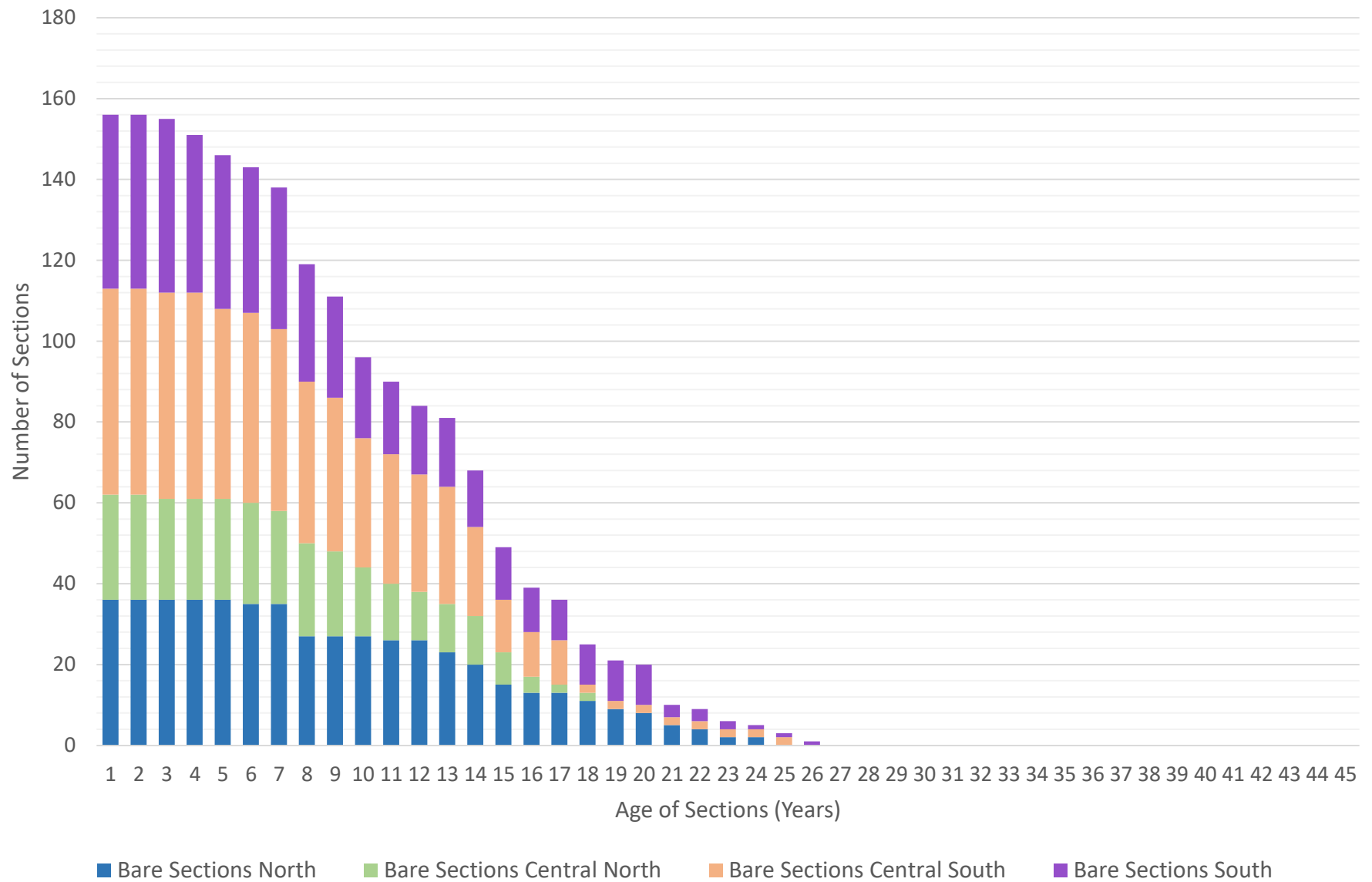


Figure 4: Age when 1st Overlay was Constructed

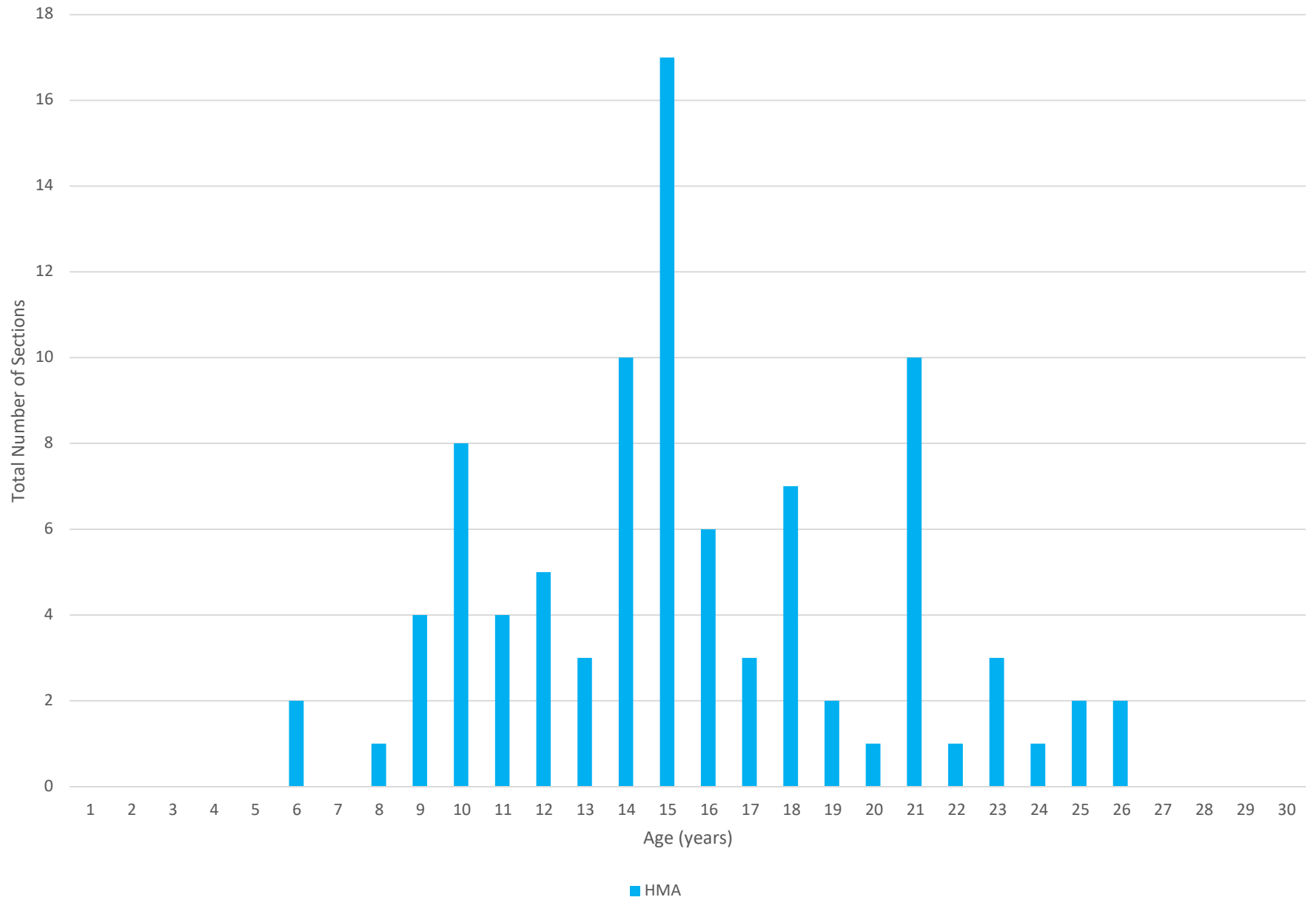


Figure 5: Percent Patching as a Function of Age
Full-Depth HMA

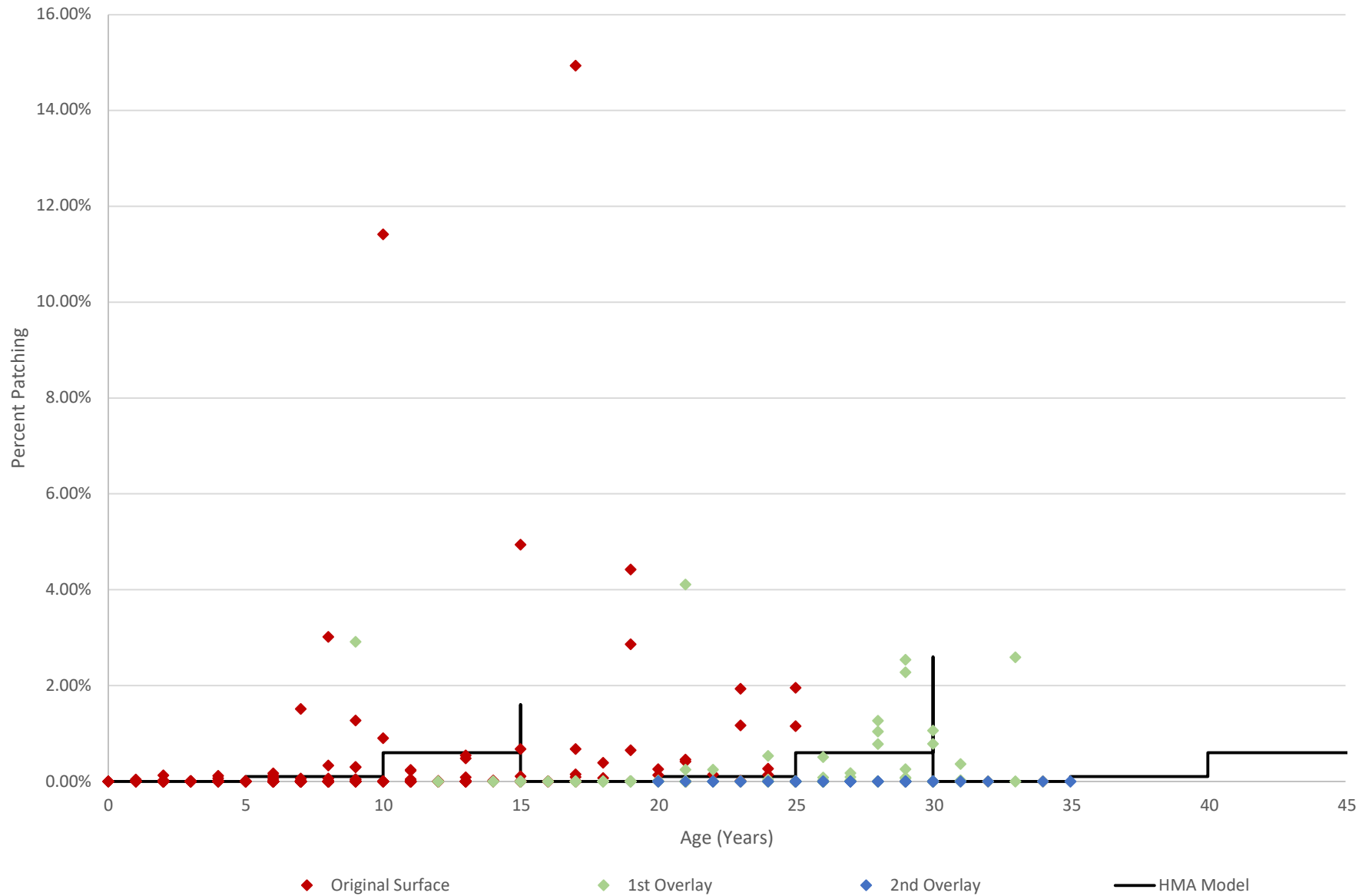


Figure 6: Percent Patching as a Function of Age
Full-Depth HMA

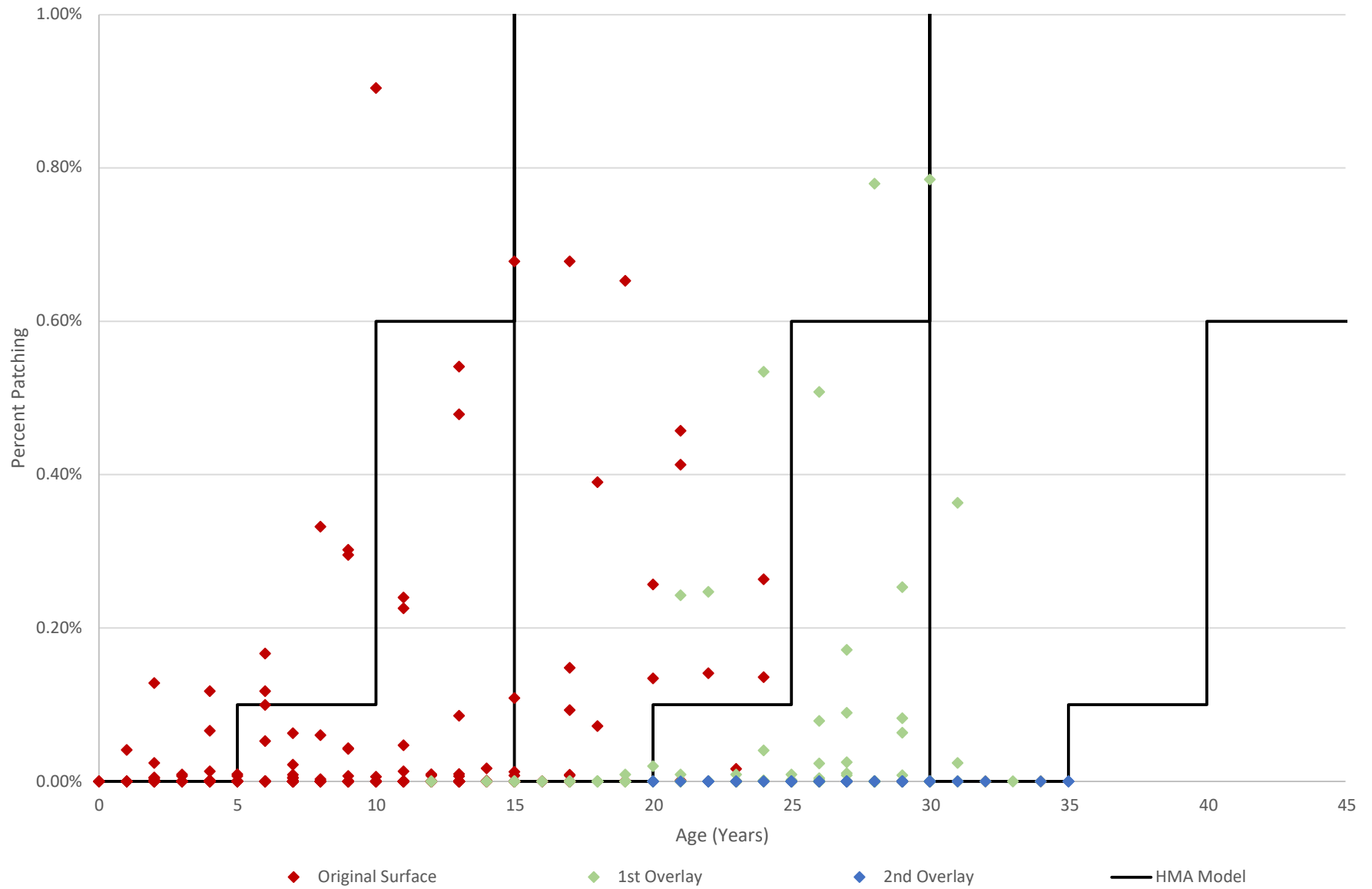


Figure 7: Overlay as a Function of Age:
JPCP

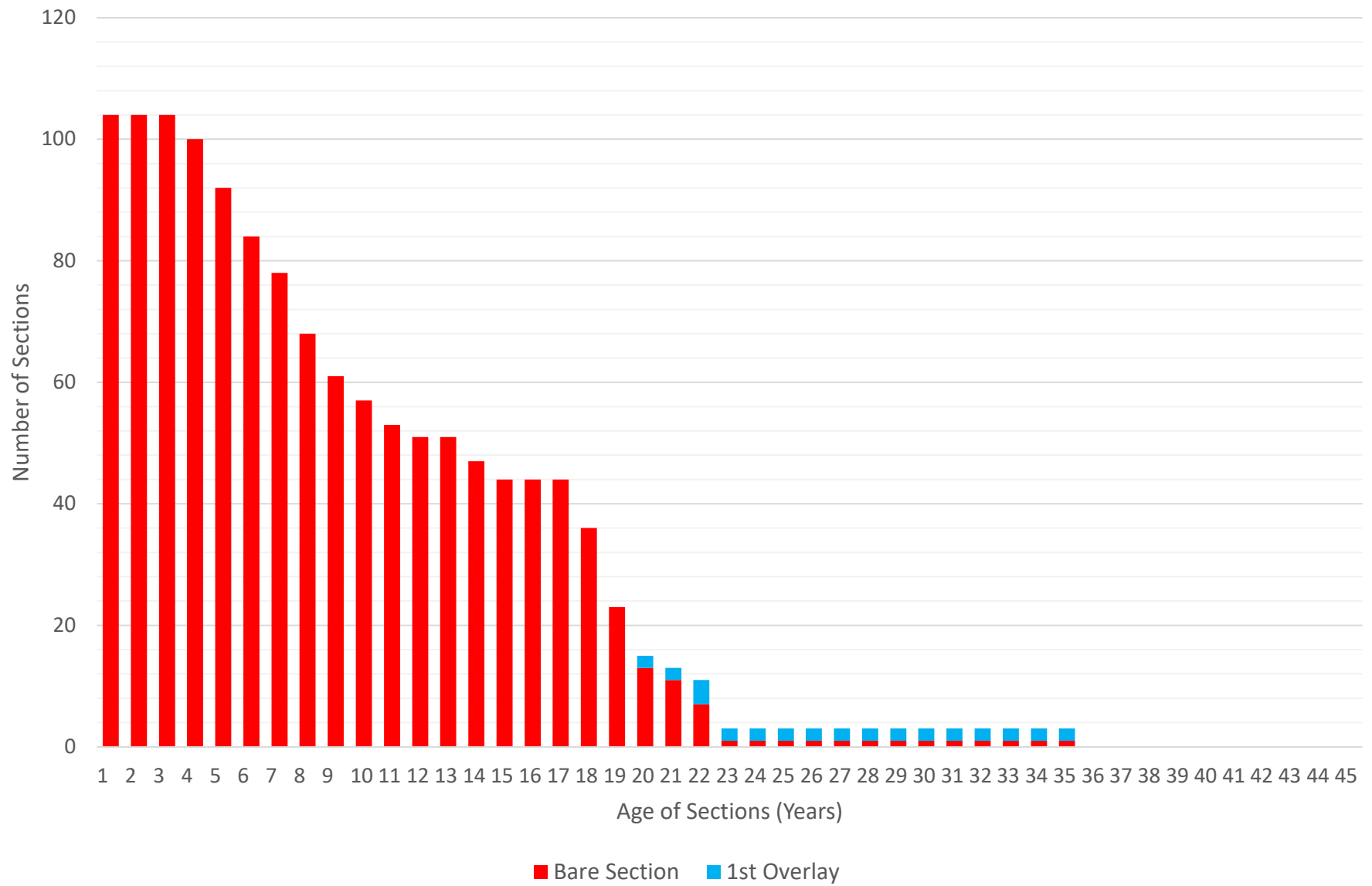


Figure 8 : Snapshot in 2021
JPCP

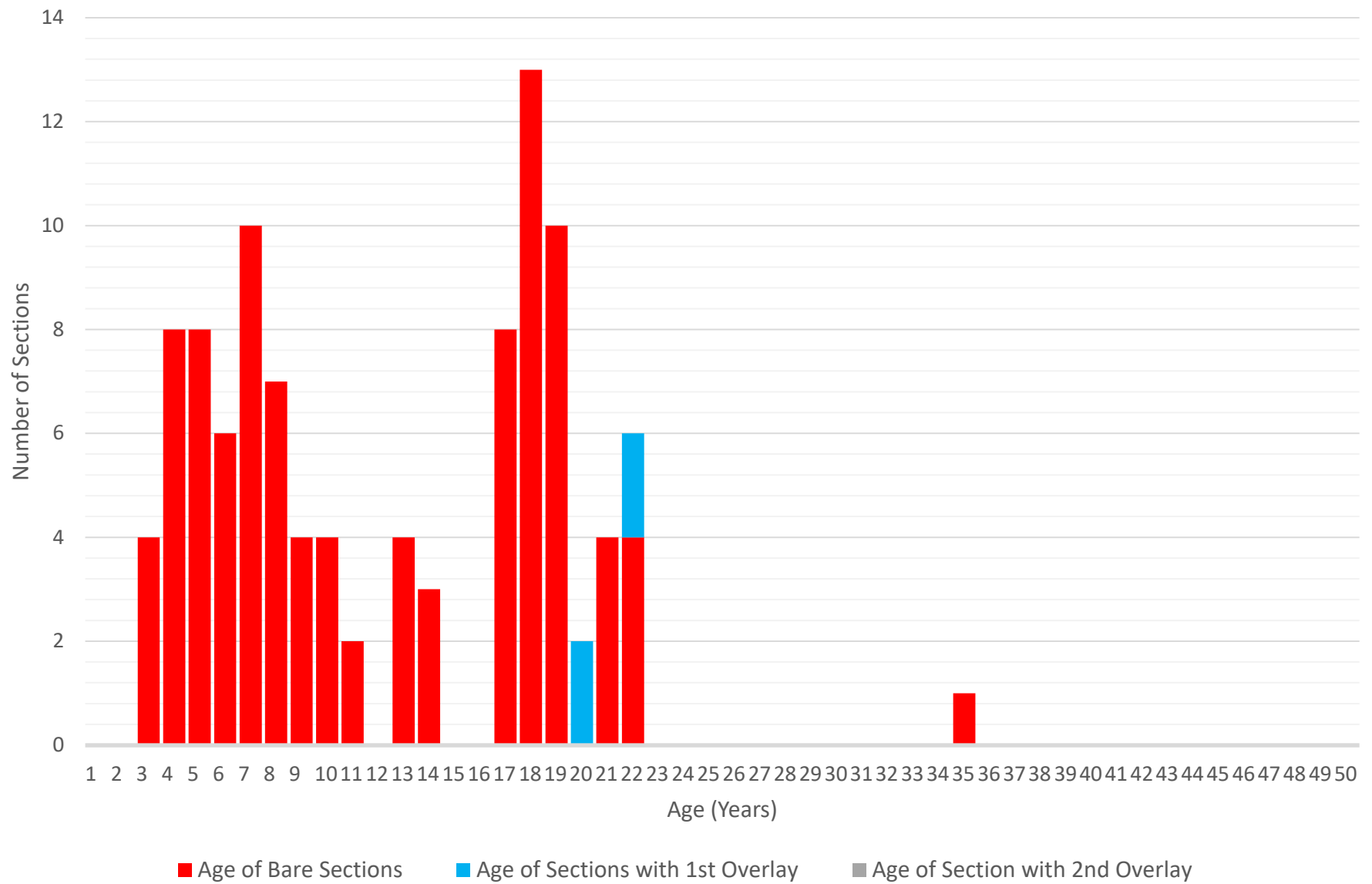


Figure 9: Bare Sections versus Age by Regions
JPCP

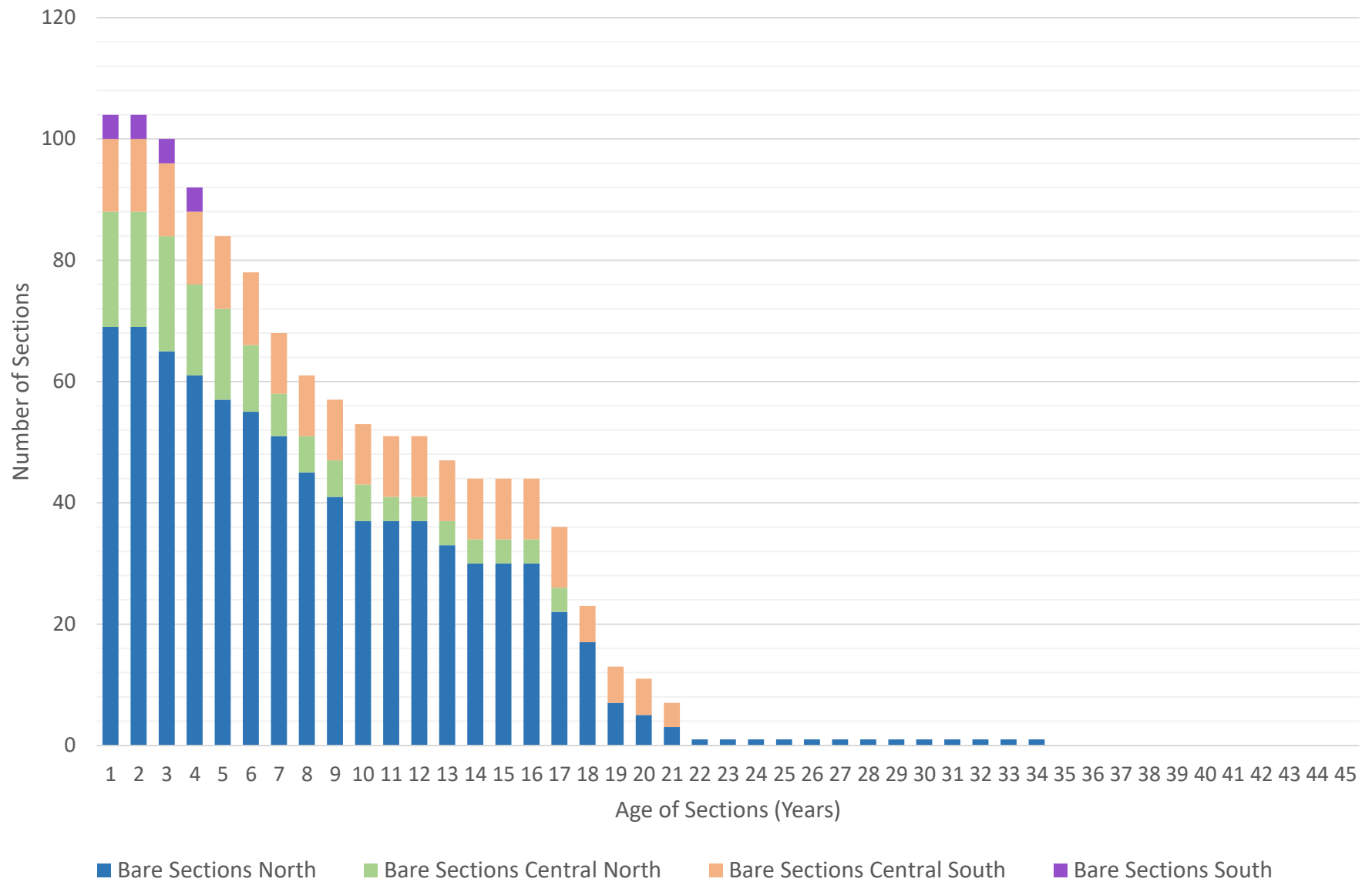


Figure 10: Percent Patching as a Function of Age
JPCP

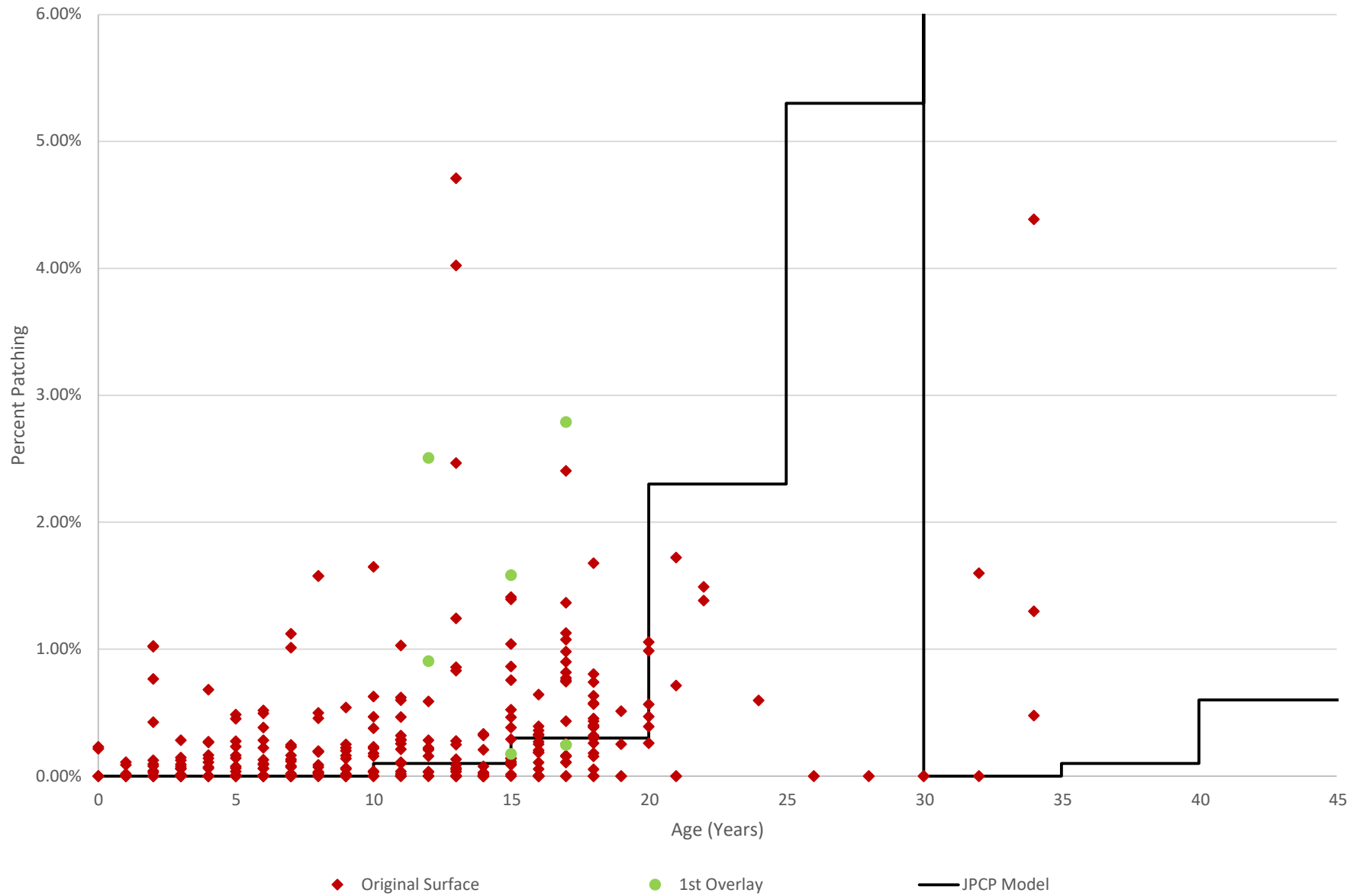


Figure 11: Percent Patching as a Function of Age
JPCP

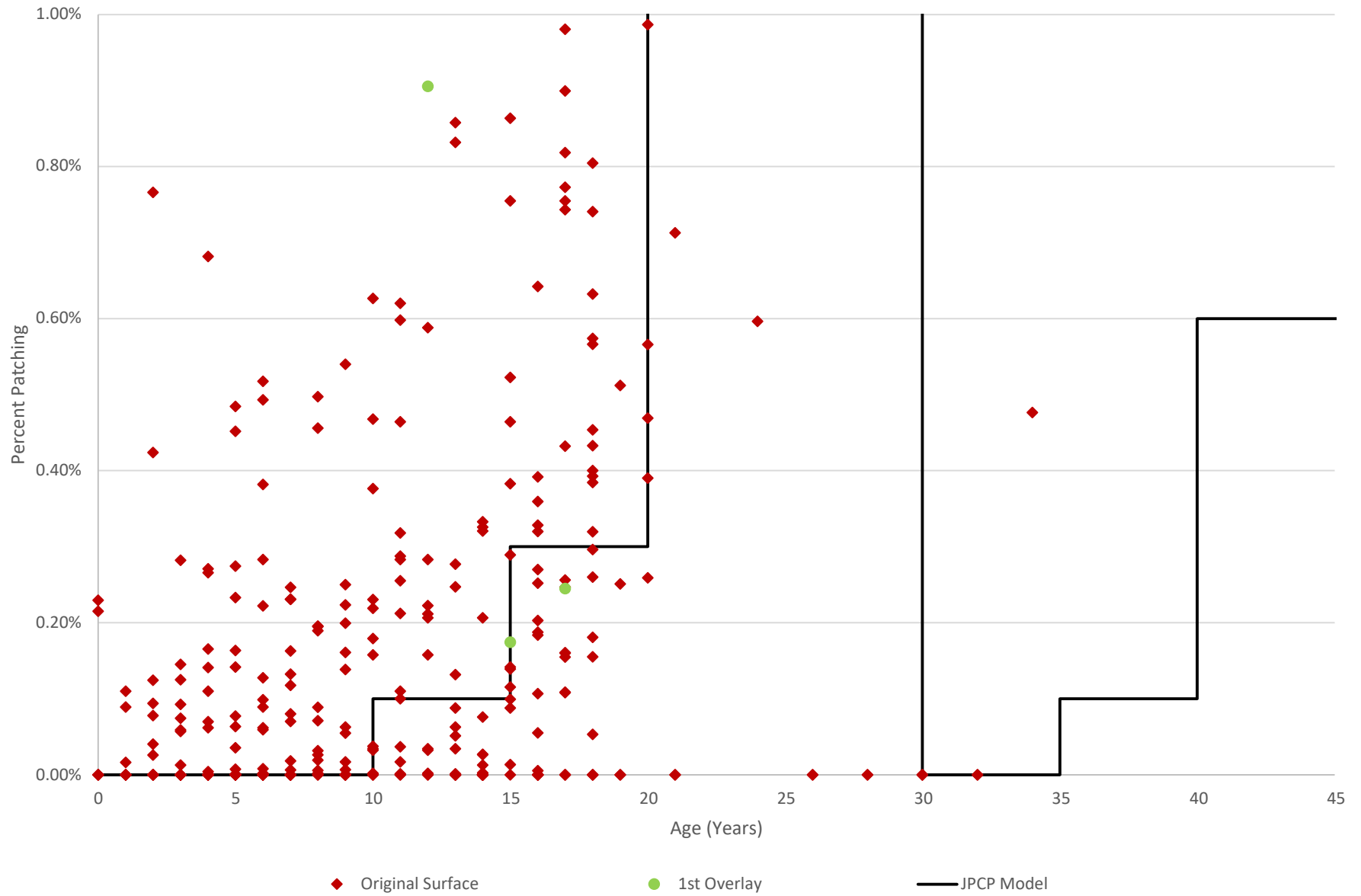


Figure 12: Overlay as a Function of Age
CRCP

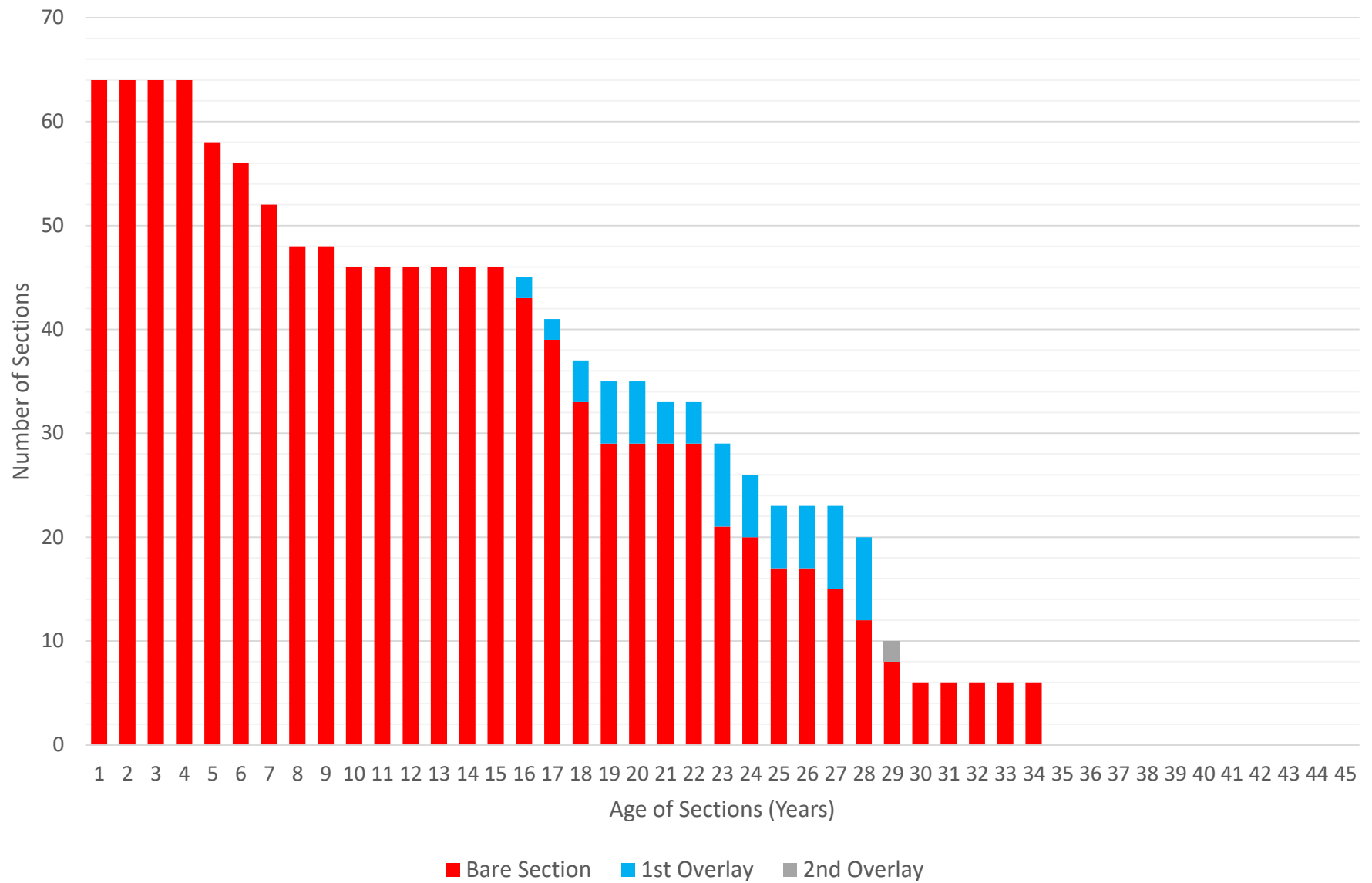


Figure 13 : Snapshot in 2021
CRCP

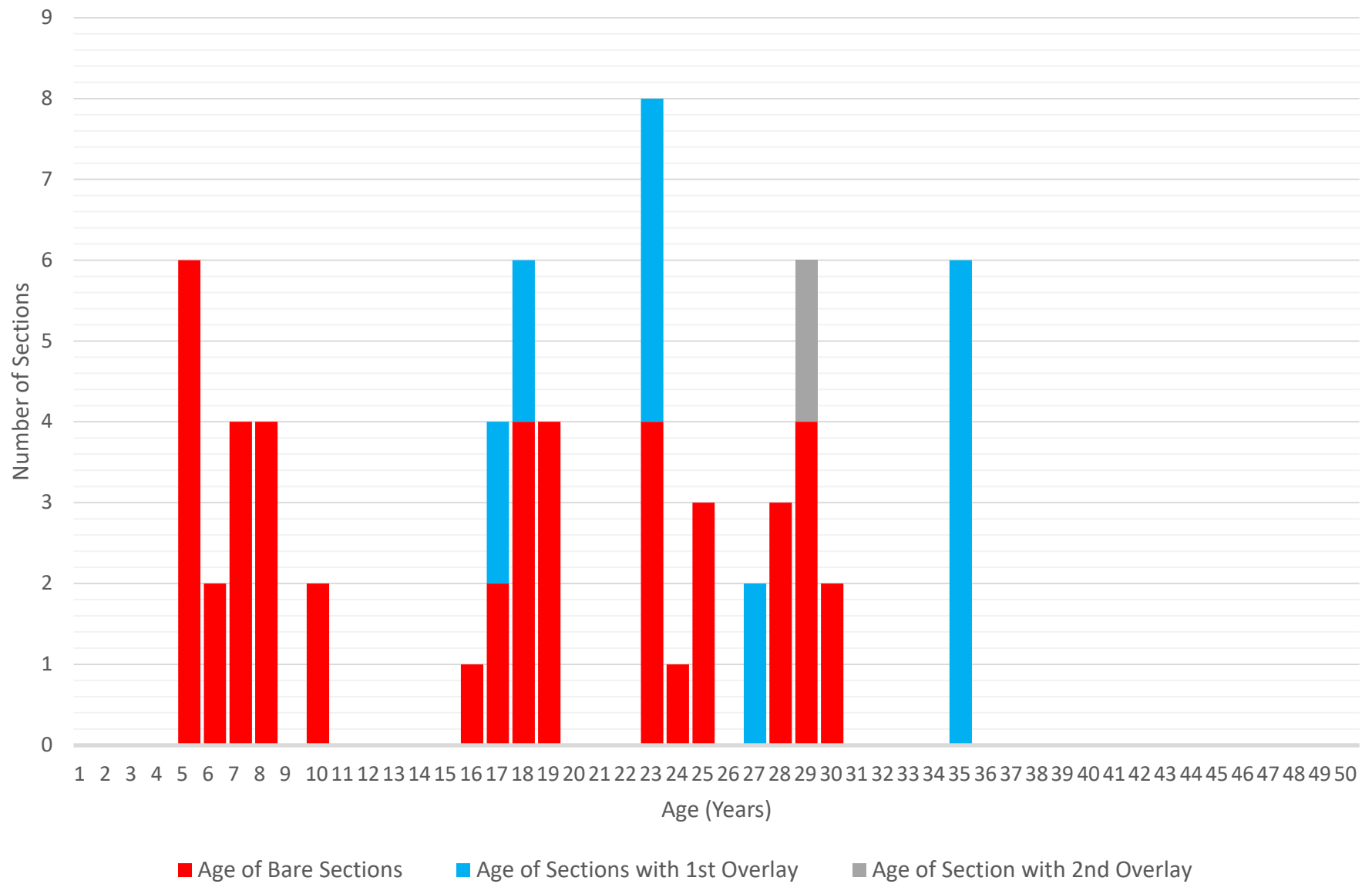


Figure 14: Bare Sections versus Age by Regions
CRCP

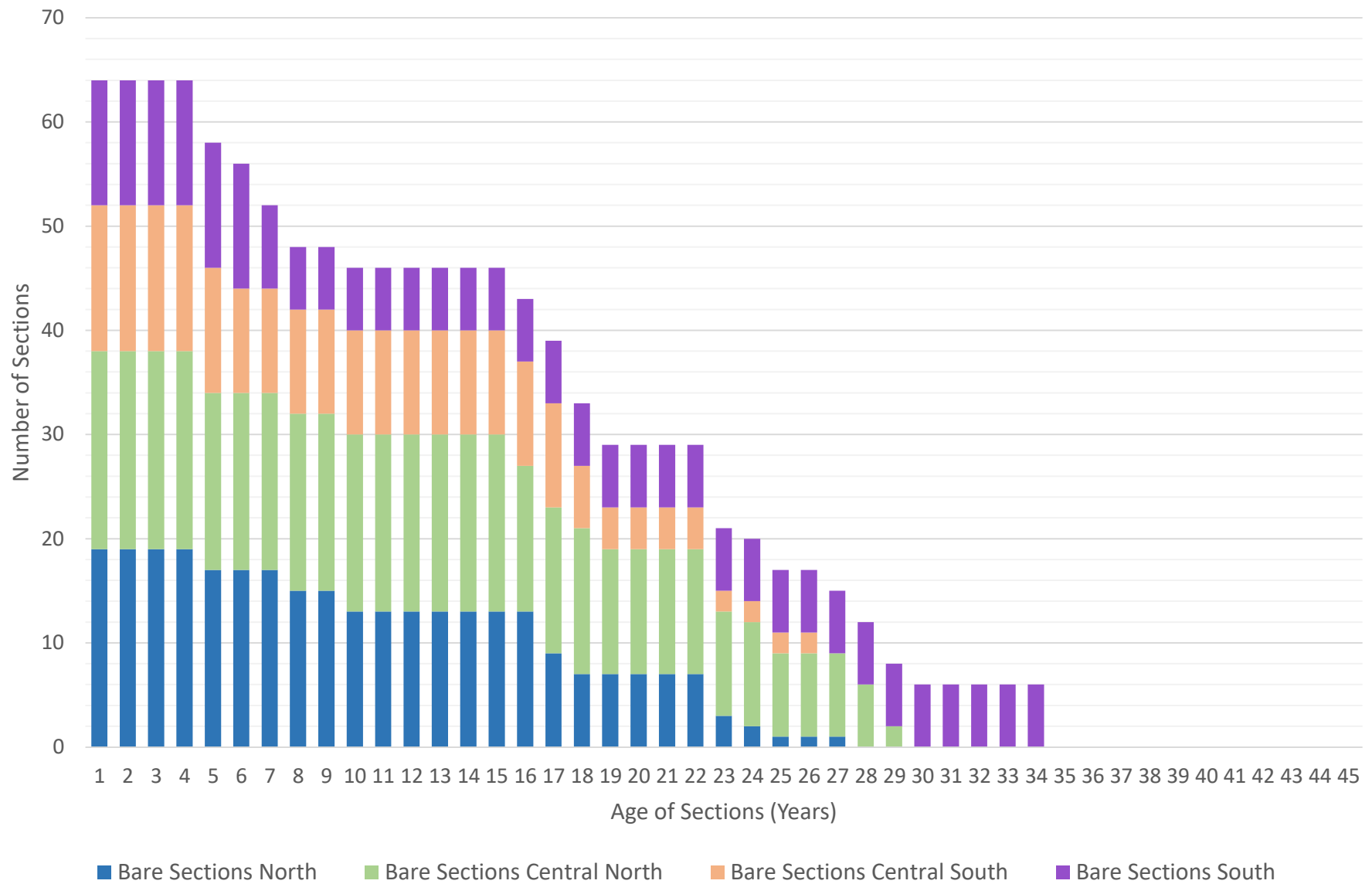


Figure 15: Age when 1st Overlay was Constructed
CRCP

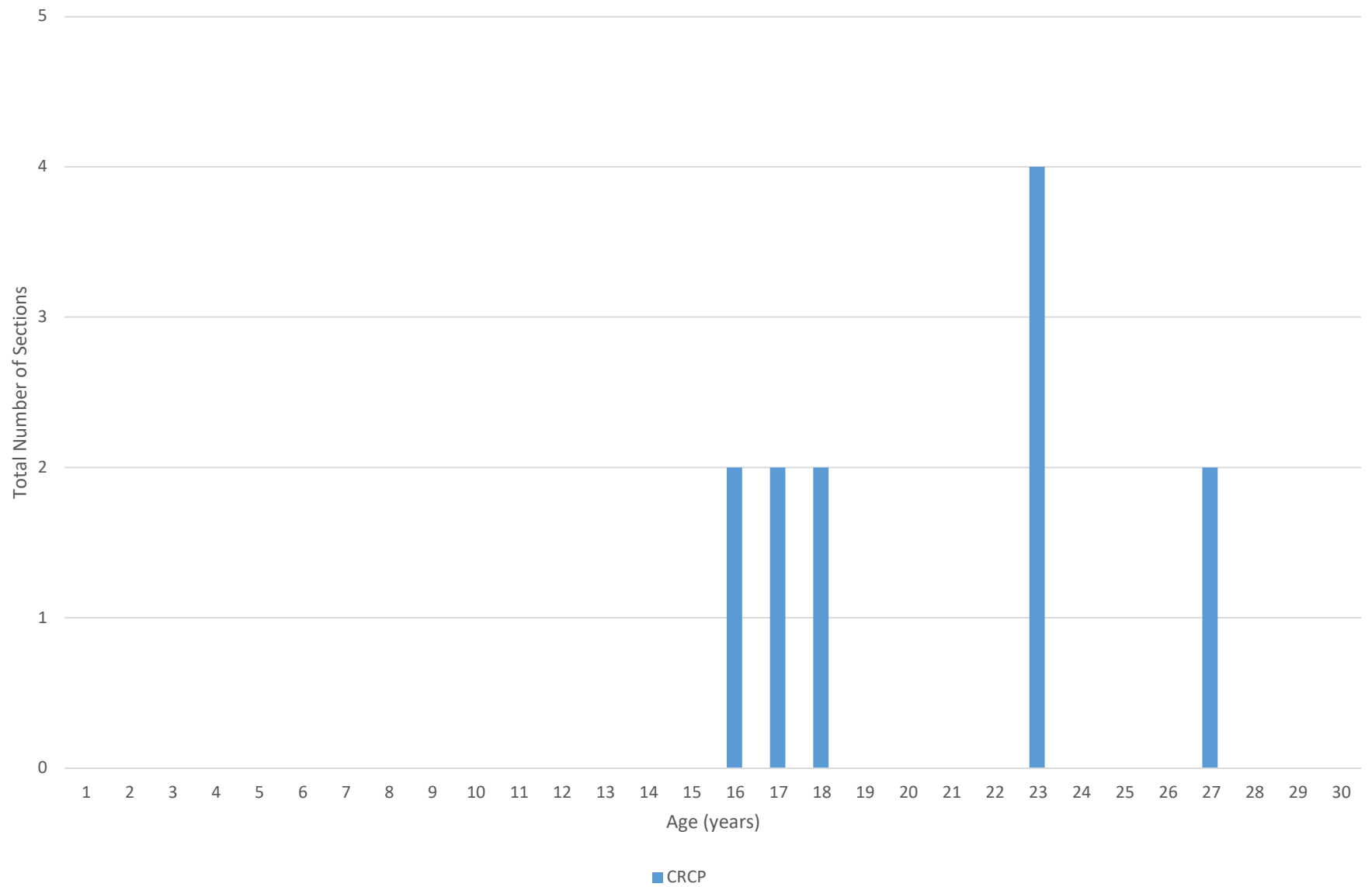


Figure 16: Percent Patching as a Function of Age
CRCP

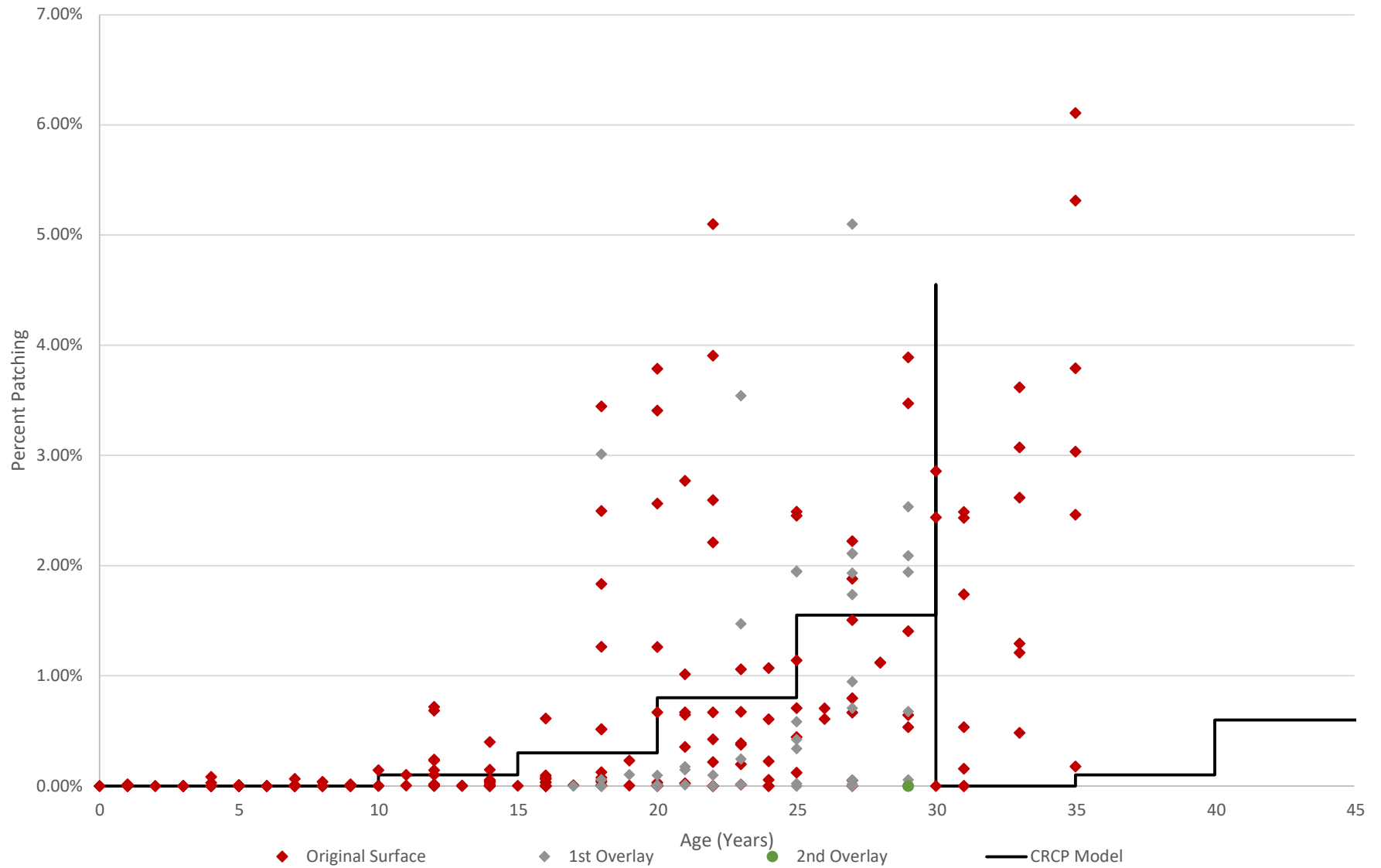
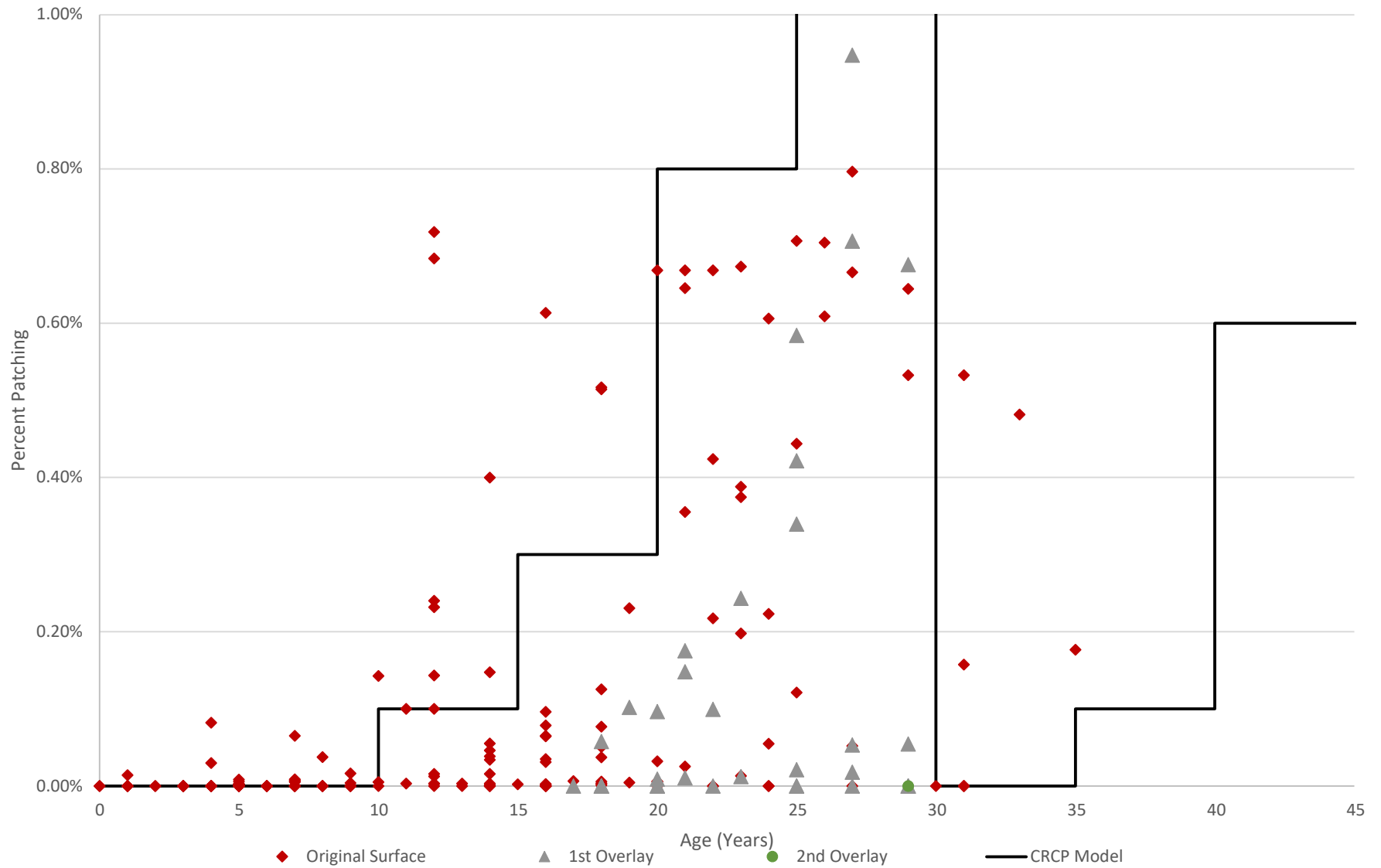


Figure 17: Percent Patching as a Function of Age
CRCP



Location	T _{HMA} , inches	8.0- 8.99	9.0- 9.99	10.0- 10.99	11.0- 11.99	12.0- 12.99	13.0- 13.99	14.0- 14.99	15.0- 15.99	16.0- 16.99	17.0- 17.99	18.0- 18.99	19.0- 19.99	20.0- 20.99
NORTH	1			80169	80497		62291	80482 62419 62420	80742					
	2				84199 64H70	84167 84161 84125 84200 64594 64813	40463 84659 84220 64860	64577						
CENTRAL NORTH	3					66052								
	4			68B44		68159 68409	88067★ 88261 86068 88624 68000 88679	88067★	88051 88048	88031 88047				
CENTRAL SOUTH	5				40662			86602			90046/ 90049/ 90123 90023/ 90122			
	6	92339				92328	92434 72536 92677 72932 72829 72961	92228 92108	92109 92230					
	7						94037	90278	90281					
SOUTH	8		96625		40315P•		96232	96397 76300	96737/ 96739 96484 76311 76323					96349
	9				78077			98119 98290 98420 78058	78060 78290	78401 78314				

NOTE: ★Contract contains 2 pavement thicknesses

Table 1: Selected Performance Monitoring Sections – Full-Depth HMA Matrix

Location	T _{JPCP} , inches	7.0- 7.99	8.0- 8.99	9.0-9.99	10.0- 10.99	11.0- 11.99	12.0- 12.99	13.0- 13.99	14.0- 14.99	15.0- 15.99	16.0- 16.99	17.0- 17.99	18.0- 18.99
NORTH	1		62376	82196 60748/ 60927 82712 62295 62416 62387 60953 62478 60T35 62517 60L72	62277/ 82385 82514/ 82634 60881 62030 62882 62410 60P95 60C31								
	2			64210 64147 84790 64E17 64988 64821 64C21	40455 64555/ 84984 64244 64B83								
CENTRAL NORTH	3			66160/ 66013 66985 60I32	66671 66B84 66884								
	4		88795		68258 68370								
CENTRAL SOUTH	5				86854								
	6			92774	92763 72667								
	7												
SOUTH	8												
	9												

NOTE: ★Contract contains 2 pavement thicknesses

Table 2: Selected Performance Monitoring Sections – JPCP Matrix

Location	T _{CRCP} , inches	7.0- 7.99	8.0- 8.99	9.0- 9.99	10.0- 10.99	11.0- 11.99	12.0- 12.99	13.0- 13.99	14.0- 14.99	15.0- 15.99	16.0- 16.99	17.0- 17.99	18.0- 18.99
NORTH	1				60H45		82106 82589/ 82590 82587/ 82588 82989		60401				
	2			64039			64933 64C29						
CENTRAL NORTH	3				86074	86399 86562		66044 66051					
	4				86209 86210	68197 68620							
CENTRAL SOUTH	5				86184		86856						
	6												
	7							74296(V) 74299 74295					
SOUTH	8	40317				76C43	76A91						
	9												

Table 3: Selected Performance Monitoring Sections – CRCP Matrix

Location	Rubblization Thickness, inches Pavement Type	7 CRCP	8 CRCP	8 CRCP	8 CRCP	10 CRCP	10.75 Hinge Joint PCCP	10 JRCP	10 JRCP	10 JRCP
	Thickness HMA, inches	11.25	11.25	11.5	17.5	8	8	11.5	11.75	10
North	1									
	2									
Central North	3									
	4									
Central South	5	70716(13)				*70A28(14)	70634(13) *70A28			
	6									
	7		94859(04)	74416(13) 74417(11)	70059(03)					
South	8							76D99(13) 76C93(10)		
	9							78289(12)	78380(15)	78175(10) 78176(10)

Table 4: Selected Performance Monitoring Sections – Rubblization Matrix

Location	T _{JPCP} , inches	7.0- 7.99	8.0- 8.99	9.0- 9.99	10.0- 10.99	11.0- 11.99	12.0- 12.99	13.0- 13.99	14.0- 14.99	15.0- 15.99	16.0- 16.99	17.0- 17.99	18.0- 18.99
NORTH	1												
	2												
CENTRAL NORTH	3												
	4												
CENTRAL SOUTH	5												
	6												
	7												
SOUTH	8												
	9			78286(15)									

Table 5: Selected Performance Monitoring Sections – Unbonded JPCP Matrix

Location	T _{CRCP} , inches	7.0- 7.99	8.0- 8.99	9.0- 9.99	10.0- 10.99	11.0- 11.99	12.0- 12.99	13.0- 13.99	14.0- 14.99	15.0- 15.99	16.0- 16.99	17.0- 17.99	18.0- 18.99
NORTH	1												
	2			64219									
CENTRAL NORTH	3												
	4												
CENTRAL SOUTH	5												
	6												
	7						70044						
SOUTH	8												
	9						78172(11)						

Table 6: Selected Performance Monitoring Sections – Unbonded CRCP Matrix

Appendix A -
Patching Quantities from Full-
Depth HMA Pavement
Distress Surveys

Full-Depth HMA Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
40315P	8	Clinton	US 50	1986	1990	4	0.00	0.473	0
40315P	8	Clinton	US 50	1986	1992	6	0.00	0.682	0
40315P	8	Clinton	US 50	1986	1993	7	0.00	0.791	0
40315P	8	Clinton	US 50	1986	1995	9	0.00	1.021	0
40315P	8	Clinton	US 50	1986	1997	11	0.00	1.280	0
40315P	8	Clinton	US 50	1986	1998	12	0.00	1.441	0
40315P	8	Clinton	US 50	1986	1999	13	0.01	1.621	0
40315P	8	Clinton	US 50	1986	2010	24	0.00	3.458	1
40315P	8	Clinton	US 50	1986	2013	27	0.00	3.982	1
40315P	8	Clinton	US 50	1986	2015	29	0.00	4.384	1
40315P	8	Clinton	US 50	1986	2017	31	0.00	4.708	1
40315P	8	Clinton	US 50	1986	2019	33	0.86	5.026	1
40315P	8	Clinton	US 50	1986	2021	35	0.00	5.323	2
40463	2	Stephenson	US 20	1986	2010	24	0.00	7.995	1
40463A	2	Stephenson	US 20	1986	1990	4	0.00	0.464	0
40463A	2	Stephenson	US 20	1986	1992	6	0.00	0.669	0
40463A	2	Stephenson	US 20	1986	1993	7	0.00	0.777	0
40463A	2	Stephenson	US 20	1986	1995	9	0.00	1.001	0
40463A	2	Stephenson	US 20	1986	1997	11	0.00	1.248	0
40463A	2	Stephenson	US 20	1986	2012	26	0.00	4.134	1
40463A	2	Stephenson	US 20	1986	2014	28	0.00	4.548	1
40463A	2	Stephenson	US 20	1986	2016	30	0.00	4.993	1
40463A	2	Stephenson	US 20	1986	2018	32	0.00	5.485	1
40463A	2	Stephenson	US 20	1986	2020	34	0.00	5.761	1
40463B	2	Stephenson	US 20	1986	1990	4	0.00	0.540	0
40463B	2	Stephenson	US 20	1986	1992	6	0.00	0.779	0
40463B	2	Stephenson	US 20	1986	1993	7	0.02	0.904	0
40463B	2	Stephenson	US 20	1986	1995	9	0.00	1.166	0
40463B	2	Stephenson	US 20	1986	1997	11	0.01	1.439	0
40463B	2	Stephenson	US 20	1986	2012	26	0.00	4.473	1

0 - Denotes Bare Pavement
1 - Denotes 1st Overlay
2 - Denoted 2nd Overlay

Full-Depth HMA Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
40463B	2	Stephenson	US 20	1986	2014	28	0.00	4.891	1
40463B	2	Stephenson	US 20	1986	2016	30	0.00	5.191	0
40463B	2	Stephenson	US 20	1986	2018	32	0.00	5.714	0
40463B	2	Stephenson	US 20	1986	2020	34	0.00	6.006	0
40662	5	Champaign	IL 130	1987	1990	3	0.01	0.092	0
40662	5	Champaign	IL 130	1987	1992	5	0.01	0.142	0
40662	5	Champaign	IL 130	1987	1993	6	0.00	0.168	0
40662	5	Champaign	IL 130	1987	1995	8	0.00	0.223	0
40662	5	Champaign	IL 130	1987	1997	10	0.00	0.282	0
40662	5	Champaign	IL 130	1987	1999	12	0.00	0.345	0
40662	5	Champaign	IL 130	1987	2010	23	0.00	0.886	1
40662	5	Champaign	IL 130	1987	2013	26	0.00	1.010	1
40662	5	Champaign	IL 130	1987	2015	28	0.00	1.068	1
40662	5	Champaign	IL 130	1987	2017	30	0.00	1.127	2
40662	5	Champaign	IL 130	1987	2019	32	0.00	1.177	2
40662	5	Champaign	IL 130	1987	2021	34	0.00	1.211	2
62291	1	DuPage	IL 56	2007	2016	9	0.30	0.924	0
62291	1	DuPage	IL 56	2007	2018	11	0.23	1.064	0
62291	1	DuPage	IL 56	2007	2020	13	0.51	1.336	0
62419	1	DuPage	IL 56	2013	2016	3	0.00	0.496	0
62419	1	DuPage	IL 56	2013	2018	5	0.00	0.808	0
62419	1	DuPage	IL 56	2013	2020	7	0.00	0.990	0
62420	1	DuPage	IL 56	2013	2016	3	0.00	0.441	0
62420	1	DuPage	IL 56	2013	2018	5	0.00	0.620	0
62420	1	DuPage	IL 56	2013	2020	7	0.00	0.738	0
64577	2	Stephenson	US 20	1986	2016	30	0.00	5.001	0
64577	2	Stephenson	US 20	1986	2018	32	0.00	5.525	0
64577	2	Stephenson	US 20	1986	2020	34	0.00	5.817	0
64594	2	Winnebago	IL 173	2007	2016	9	0.00	0.878	0
64594	2	Winnebago	IL 173	2007	2018	11	0.00	1.179	0

0 - Denotes Bare Pavement
1 - Denotes 1st Overlay
2 - Denoted 2nd Overlay

Full-Depth HMA Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
64813	2	Winnebago	IL 2	2013	2016	3	0.00	0.359	0
64813	2	Winnebago	IL 2	2013	2018	5	0.00	0.559	0
64813	2	Winnebago	IL 2	2013	2020	7	0.00	0.688	0
64860	2	Stephenson	US 20	2013	2016	3	0.00	1.145	0
64860	2	Stephenson	US 20	2013	2018	5	0.00	1.794	0
64860	2	Stephenson	US 20	2013	2020	7	0.00	2.263	0
66052	3	Kendall	US 34	2005	2016	11	0.00	1.141	0
66052	3	Kendall	US 34	2005	2018	13	0.00	1.327	0
66052	3	Kendall	US 34	2005	2020	15	0.00	1.442	0
68000	4	McDonough	US 136	2005	2017	12	0.00	0.483	0
68000	4	McDonough	US 136	2005	2019	14	0.00	0.659	0
68000	4	McDonough	US 136	2005	2021	16	0.00	0.821	0
68159	4	Knox	IL 41	2005	2010	5	0.00	0.313	0
68159	4	Knox	IL 41	2005	2013	8	0.00	0.470	0
68159	4	Knox	IL 41	2005	2015	10	0.00	0.589	0
68159A	4	Knox	IL 41	2005	2017	12	0.00	0.693	1
68159A	4	Knox	IL 41	2005	2019	14	0.00	0.756	1
68159A	4	Knox	IL 41	2005	2021	16	0.00	0.774	1
68159B	4	Knox	IL 41	2005	2017	12	0.00	0.698	1
68159B	4	Knox	IL 41	2005	2019	14	0.00	0.781	1
68159B	4	Knox	IL 41	2005	2021	16	0.00	0.803	1
68409	4	Henderson	US 34	2014	2017	3	0.00	1.021	0
68409	4	Henderson	US 34	2014	2019	5	0.00	1.483	0
68409	4	Henderson	US 34	2014	2021	7	0.00	1.956	0
70059	7	Clark	I 70	2003	2010	7	0.06	16.534	0
70059	7	Clark	I 70	2003	2012	9	0.04	20.173	0
70059	7	Clark	I 70	2003	2014	11	0.05	23.754	0
70059	7	Clark	I 70	2003	2016	13	0.05	27.347	0
70059	7	Clark	I 70	2003	2018	15	0.06	31.594	0
70059	7	Clark	I 70	2003	2020	17	0.05	36.504	0

0 - Denotes Bare Pavement
1 - Denotes 1st Overlay
2 - Denoted 2nd Overlay

Full-Depth HMA Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
70634	5	McLean	I 39	2013	2017	4	0.12	5.959	0
70634	5	McLean	I 39	2013	2019	6	0.12	8.250	0
70634	5	McLean	I 39	2013	2021	8	0.06	10.742	0
70716	5	Champaign	I 57	2013	2017	4	0.00	5.673	0
70716	5	Champaign	I 57	2013	2019	6	0.00	7.507	0
70716	5	Champaign	I 57	2013	2021	8	0.00	8.386	0
72536	6	Christian	IL 29	2006	2016	10	0.00	1.186	0
72536	6	Christian	IL 29	2006	2018	12	0.00	1.403	0
72536	6	Christian	IL 29	2006	2020	14	0.01	1.567	0
72829	6	Christian	IL 29	2016	2016	0	0.00	0.043	0
72829	6	Christian	IL 29	2016	2018	2	0.00	0.226	0
72829	6	Christian	IL 29	2016	2020	4	0.01	0.392	0
72932	6	Christian	US 51	2013	2016	3	0.00	0.452	0
72932	6	Christian	US 51	2013	2018	5	0.00	0.680	0
72932	6	Christian	US 51	2013	2020	7	0.00	0.875	0
72961	6	Christian	US 51	2016	2016	0	0.00	0.107	0
72961	6	Christian	US 51	2016	2018	2	0.00	0.327	0
72961	6	Christian	US 51	2016	2020	4	0.00	0.521	0
74416	7	Cumberland	I 70	2013	2016	3	0.00	8.364	0
74416	7	Cumberland	I 70	2013	2020	7	0.00	14.084	0
74417	7	Effingham	I 57	2011	2016	5	0.00	8.772	0
74417	7	Effingham	I 57	2011	2020	9	0.00	15.675	0
76300	8	St. Clair	IL 13/15	2009	2017	8	0.00	1.272	0
76300	8	St. Clair	IL 13/15	2009	2019	10	0.00	1.652	0
76300	8	St. Clair	IL 13/15	2009	2021	12	0.00	1.774	0
76311	8	Madison	US 67	2013	2017	4	0.00	0.844	0
76311	8	Madison	US 67	2013	2019	6	0.00	1.156	0
76311	8	Madison	US 67	2013	2021	8	0.00	1.190	0
76323	8	Madison	IL 255	2013	2017	4	0.00	1.177	0
76323	8	Madison	IL 255	2013	2019	6	0.00	1.722	0

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Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
76323	8	Madison	IL 255	2013	2021	8	0.00	1.841	0
78058	9	Saline	IL 13	2012	2017	5	0.00	0.736	0
78058	9	Saline	IL 13	2012	2019	7	0.00	0.999	0
78058	9	Saline	IL 13	2012	2021	9	0.00	1.149	0
78060	9	Alexander	IL 146	2012	2017	5	0.00	1.236	0
78060	9	Alexander	IL 146	2012	2019	7	0.00	1.580	0
78060	9	Alexander	IL 146	2012	2021	9	0.00	1.905	0
78077	9	Saline	US 45	2017	2019	2	0.00	0.344	0
78077	9	Saline	US 45	2017	2021	4	0.00	0.504	0
78175	9	Franklin	I 57	2010	2017	7	0.76	17.147	0
78175	9	Franklin	I 57	2010	2019	9	2.09	23.176	0
78176	9	Jefferson	I 57	2011	2017	6	0.05	15.507	0
78176	9	Jefferson	I 57	2011	2019	8	0.17	21.563	0
78176	9	Jefferson	I 57	2011	2021	10	6.16	25.463	0
78289_1	9	Union	I 57	2013	2017	4	0.00	5.601	0
78289_1	9	Union	I 57	2013	2019	6	0.00	8.210	0
78289_1	9	Union	I 57	2013	2021	8	3.02	10.104	0
78289_2	9	Pulaski	I 57	2013	2017	4	0.00	5.648	0
78289_2	9	Pulaski	I 57	2013	2019	6	0.00	8.197	0
78289_2	9	Pulaski	I 57	2013	2021	8	0.00	8.737	0
78290	9	Saline	IL 34	2012	2017	5	0.00	1.209	0
78290	9	Saline	IL 34	2012	2019	7	0.00	1.412	0
78290	9	Saline	IL 34	2012	2021	9	0.04	1.435	0
78314	9	Saline	IL 34	2016	2017	1	0.00	0.356	0
78314	9	Saline	IL 34	2016	2019	3	0.00	0.592	0
78314	9	Saline	IL 34	2016	2021	5	0.00	0.667	0
78380	9	Williamson	I 57	2017	2017	0	0.00	2.312	0
78380	9	Williamson	I 57	2017	2019	2	0.00	7.591	0
78380	9	Williamson	I 57	2017	2021	4	0.00	10.761	0
78401	9	Saline	IL 34	2014	2017	3	0.00	0.825	0

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78401	9	Saline	IL 34	2014	2019	5	0.00	1.071	0
78401	9	Saline	IL 34	2014	2021	7	0.00	1.169	0
80169	1	Cook	111th St.	1990	1993	3	0.00	0.227	0
80169	1	Cook	111th St.	1990	1997	7	0.01	0.483	0
80169	1	Cook	111th St.	1990	1999	9	0.01	0.622	0
80169	1	Cook	111th St.	1990	2010	20	0.02	1.462	1
80169	1	Cook	111th St.	1990	2013	23	0.00	1.619	1
80169	1	Cook	111th St.	1990	2015	25	0.00	1.736	1
80169	1	Cook	111th St.	1990	2017	27	0.01	1.845	1
80169	1	Cook	111th St.	1990	2019	29	0.07	1.952	1
80169	1	Cook	111th St.	1990	2021	31	0.19	2.056	1
80482	1	Will	US 45	1992	1993	1	0.00	0.261	0
80482	1	Will	US 45	1992	1998	6	0.00	1.051	0
80482	1	Will	US 45	1992	2010	18	0.39	4.703	0
80482	1	Will	US 45	1992	2012	20	0.26	5.146	0
80482	1	Will	US 45	1992	2014	22	0.25	5.518	0
80482	1	Will	US 45	1992	2016	24	0.20	5.649	0
80482	1	Will	US 45	1992	2018	26	0.00	6.194	1
80482	1	Will	US 45	1992	2020	28	0.00	6.525	1
80497	1	Lake	IL 137	1990	1998	8	0.00	0.624	0
80497	1	Lake	IL 137	1990	2010	20	0.00	1.932	1
80497	1	Lake	IL 137	1990	2012	22	0.00	2.035	1
80497	1	Lake	IL 137	1990	2014	24	0.00	2.117	1
80497	1	Lake	IL 137	1990	2016	26	0.00	1.803	1
80497	1	Lake	IL 137	1990	2018	28	0.00	1.883	1
80497	1	Lake	IL 137	1990	2020	30	0.00	1.932	1
80742	1	Dupage	IL 53	1991	1993	2	0.00	0.448	0
80742	1	Dupage	IL 53	1991	1998	7	0.00	1.357	0
80742_1	1	Dupage	IL 53	1991	2010	19	2.86	4.230	0
80742_1	1	Dupage	IL 53	1991	2012	21	0.00	4.504	1

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80742_1	1	Dupage	IL 53	1991	2014	23	0.00	4.997	1
80742_1	1	DuPage	IL 53	1991	2016	25	0.00	5.718	1
80742_1	1	DuPage	IL 53	1991	2018	27	0.09	6.914	1
80742_1	1	DuPage	IL 53	1991	2020	29	0.13	7.300	1
80742_2	1	Will	IL 53	1991	2010	19	0.00	4.230	0
80742_2	1	Will	IL 53	1991	2012	21	0.00	4.504	0
80742_2	1	Will	IL 53	1991	2014	23	0.00	4.997	0
80742_2	1	Will	IL 53	1991	2016	25	0.00	5.786	0
80742_2	1	Will	IL 53	1991	2018	27	0.00	6.674	0
80742_2	1	Will	IL 53	1991	2020	29	0.00	7.381	0
84125	2	Carroll	IL 73	1989	2010	21	0.00	1.059	1
84125	2	Carroll	IL 73	1989	2012	23	0.00	1.158	2
84125	2	Carroll	IL 73	1989	2014	25	0.00	1.272	2
84125	2	Carroll	IL 73	1989	2016	27	0.00	1.374	2
84125	2	Carroll	IL 73	1989	2018	29	0.00	1.506	2
84125	2	Carroll	IL 73	1989	2020	31	0.00	1.648	2
84161	2	Ogle	IL 2	1998	1999	1	0.00	0.121	0
84161	2	Ogle	IL 2	1998	2010	12	0.00	0.959	0
84161	2	Ogle	IL 2	1998	2012	14	0.00	1.099	0
84161	2	Ogle	IL 2	1998	2014	16	0.00	1.282	0
84161	2	Ogle	IL 2	1998	2016	18	0.07	1.511	0
84161	2	Ogle	IL 2	1998	2018	20	0.13	1.672	0
84161	2	Ogle	IL 2	1998	2020	22	0.14	1.749	0
84167	2	Stephenson	IL 26	1991	1998	7	0.00	0.434	0
84167	2	Stephenson	IL 26	1991	2010	19	0.00	1.222	1
84167	2	Stephenson	IL 26	1991	2012	21	0.00	1.383	1
84167	2	Stephenson	IL 26	1991	2014	23	0.00	1.535	1
84167	2	Stephenson	IL 26	1991	2016	25	0.00	1.695	1
84167	2	Stephenson	IL 26	1991	2018	27	0.00	1.871	1
84167	2	Stephenson	IL 26	1991	2020	29	0.00	1.969	1

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84199	2	Ogle	IL 26/72	1991	1993	2	0.00	0.093	0
84199	2	Ogle	IL 26/72	1991	1995	4	0.00	0.160	0
84199	2	Ogle	IL 26/72	1991	1998	7	0.00	0.291	0
84199	2	Ogle	IL 26/72	1991	2010	19	0.00	0.810	1
84199	2	Ogle	IL 26/72	1991	2012	21	0.00	0.897	1
84199	2	Ogle	IL 26/72	1991	2014	23	0.00	0.992	1
84199	2	Ogle	IL 26/72	1991	2016	25	0.00	1.308	2
84199	2	Ogle	IL 26/72	1991	2018	27	0.00	1.390	2
84199	2	Ogle	IL 26/72	1991	2020	29	0.00	1.440	2
84200	2	Jo Daviess	US 20	1992	2010	18	0.00	2.139	1
84200	2	Jo Daviess	US 20	1992	2012	20	0.00	2.361	1
84200	2	Jo Daviess	US 20	1992	2014	22	0.00	2.605	1
84200	2	Jo Daviess	US 20	1992	2016	24	0.00	2.894	1
84200	2	Jo Daviess	US 20	1992	2018	26	0.00	3.195	1
84200	2	Jo Daviess	US 20	1992	2020	28	0.00	3.329	1
84220	2	Lee	IL 2	1992	2010	18	0.00	1.109	1
84220	2	Lee	IL 2	1992	2012	20	0.00	1.183	2
84220	2	Lee	IL 2	1992	2014	22	0.00	1.263	2
84220	2	Lee	IL 2	1992	2016	24	0.00	1.356	1
84220	2	Lee	IL 2	1992	2018	26	0.00	1.517	1
84220	2	Lee	IL 2	1992	2020	28	0.00	1.646	1
84659	2	Stephenson	US 20	1995	1997	2	0.01	0.723	0
84659	2	Stephenson	US 20	1995	1999	4	0.00	1.269	0
84659	2	Stephenson	US 20	1995	2010	15	0.00	4.585	1
84659	2	Stephenson	US 20	1995	2012	17	0.00	5.196	1
84659	2	Stephenson	US 20	1995	2014	19	0.00	5.896	1
84659_1	2	Stephenson	US 20	1995	2016	21	0.00	6.256	1
84659_1	2	Stephenson	US 20	1995	2018	23	0.00	6.984	1
84659_1	2	Stephenson	US 20	1995	2020	25	0.00	7.434	1
84659_2	2	Winnebago	US 20	1995	2016	21	0.00	6.720	1

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84659_2	2	Winnebago	US 20	1995	2018	23	0.00	7.454	1
84659_2	2	Winnebago	US 20	1995	2020	25	0.00	8.183	1
86068	4	Woodford	US 24	1990	2010	20	0.00	2.773	2
86068	4	Woodford	US 24	1990	2013	23	0.00	3.130	2
86068	4	Woodford	US 24	1990	2015	25	0.00	3.368	2
86068	4	Woodford	US 24	1990	2017	27	0.00	3.601	2
86068	4	Woodford	US 24	1990	2019	29	0.00	3.795	2
86068	4	Woodford	US 24	1990	2021	31	0.00	3.856	2
86602	5	McLean	IL 9	1996	1998	2	0.00	0.205	0
86602	5	McLean	IL 9	1996	2010	14	0.00	1.106	0
86602	5	McLean	IL 9	1996	2013	17	14.94	1.358	0
86602	5	McLean	IL 9	1996	2015	19	0.00	1.554	1
86602	5	McLean	IL 9	1996	2017	21	0.00	1.749	1
86602	5	McLean	IL 9	1996	2019	23	0.00	1.879	1
86602	5	McLean	IL 9	1996	2021	25	0.00	1.915	1
88031	4	Tazewell	I 155	1991	1993	2	0.00	1.118	0
88031	4	Tazewell	I 155	1991	1995	4	0.00	1.921	0
88031	4	Tazewell	I 155	1991	1999	8	0.00	3.791	0
88031	4	Tazewell	I 155	1991	2010	19	0.00	9.279	1
88031	4	Tazewell	I 155	1991	2013	22	0.00	10.670	2
88031	4	Tazewell	I 155	1991	2015	24	0.00	11.547	2
88031	4	Tazewell	I 155	1991	2017	26	0.00	12.421	2
88031	4	Tazewell	I 155	1991	2019	28	0.00	13.113	2
88031	4	Tazewell	I 155	1991	2021	30	0.00	13.542	2
88047	4	Tazewell	I 155	1991	1993	2	0.00	1.052	0
88047	4	Tazewell	I 155	1991	1995	4	0.00	1.807	0
88047	4	Tazewell	I 155	1991	1999	8	0.00	3.555	0
88047	4	Tazewell	I 155	1991	2010	19	0.00	8.740	1
88047	4	Tazewell	I 155	1991	2013	22	0.00	9.995	2
88047	4	Tazewell	I 155	1991	2015	24	0.00	10.758	2

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88047	4	Tazewell	I 155	1991	2017	26	0.00	11.291	2
88047	4	Tazewell	I 155	1991	2019	28	0.00	11.975	2
88047	4	Tazewell	I 155	1991	2021	30	0.00	12.435	2
88048	4	Tazewell	I 155	1992	1993	1	0.00	0.667	0
88048	4	Tazewell	I 155	1992	1995	3	0.00	1.375	0
88048	4	Tazewell	I 155	1992	1998	6	0.00	2.557	0
88048	4	Tazewell	I 155	1992	2010	18	0.00	7.790	1
88048	4	Tazewell	I 155	1992	2013	21	0.00	9.042	2
88048	4	Tazewell	I 155	1992	2015	23	0.00	9.845	2
88048	4	Tazewell	I 155	1992	2017	25	0.00	10.622	2
88048	4	Tazewell	I 155	1992	2019	27	0.00	11.512	2
88048	4	Tazewell	I 155	1992	2021	29	0.00	12.477	2
88051	4	Tazewell	I 155	1992	1993	1	0.04	0.508	0
88051	4	Tazewell	I 155	1992	1995	3	0.00	1.047	0
88051	4	Tazewell	I 155	1992	1998	6	0.17	1.972	0
88051	4	Tazewell	I 155	1992	2010	18	0.00	7.111	1
88051	4	Tazewell	I 155	1992	2013	21	0.00	8.233	1
88051	4	Tazewell	I 155	1992	2015	23	0.00	8.922	1
88051	4	Tazewell	I 155	1992	2017	25	0.00	9.588	2
88051	4	Tazewell	I 155	1992	2019	27	0.00	10.322	2
88051	4	Tazewell	I 155	1992	2021	29	0.00	11.012	2
88067	4	Tazewell	US 24	1995	1997	2	0.00	9.283	0
88067	4	Tazewell	US 24	1995	1999	4	0.00	9.283	0
88067	4	Tazewell	US 24	1995	2010	15	0.00	9.283	1
88067	4	Tazewell	US 24	1995	2010	15	0.00	9.283	1
88067A	4	Tazewell	US 24	1995	2013	18	0.00	1.397	1
88067A	4	Tazewell	US 24	1995	2015	20	0.00	1.515	1
88067A_1	4	Tazewell	US 24	1995	2017	22	0.00	1.783	1
88067A_1	4	Tazewell	US 24	1995	2019	24	0.00	1.918	1
88067A_1	4	Tazewell	US 24	1995	2021	26	0.00	2.076	1

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88067A_2	4	Woodford	US 24	1995	2017	22	0.00	1.618	1
88067A_2	4	Woodford	US 24	1995	2019	24	0.00	1.711	1
88067A_2	4	Woodford	US 24	1995	2021	26	0.00	1.814	1
88067B	4	Woodford	US 24	1995	2013	18	0.00	1.923	1
88067B	4	Woodford	US 24	1995	2015	20	0.00	2.191	1
88067B	4	Tazewell	US 24	1995	2017	22	0.00	2.372	1
88067B	4	Tazewell	US 24	1995	2019	24	0.00	2.545	1
88067B	4	Tazewell	US 24	1995	2021	26	0.00	2.654	1
88261	4	McDonough	US 67	1996	2010	14	0.00	1.844	0
88261	4	McDonough	US 67	1996	2013	17	0.00	2.231	1
88261	4	McDonough	US 67	1996	2015	19	0.00	2.507	1
88261	4	McDonough	US 67	1996	2017	21	0.00	2.831	1
88261	4	McDonough	US 67	1996	2019	23	0.00	3.074	1
88261	4	McDonough	US 67	1996	2021	25	0.00	3.222	1
88624	4	Warren	US 67	2002	2010	8	0.00	1.017	0
88624	4	Warren	US 67	2002	2013	11	0.00	1.362	0
88624	4	Warren	US 67	2002	2015	13	0.00	1.594	0
88624	4	Warren	US 67	2002	2017	15	0.00	1.843	0
88624	4	Warren	US 67	2002	2019	17	0.00	2.025	0
88624	4	Warren	US 67	2002	2021	19	0.00	2.114	0
88679	4	Peoria	IL 40	2011	2017	6	0.00	0.552	0
88679	4	Peoria	IL 40	2011	2019	8	0.00	0.699	0
88679	4	Peoria	IL 40	2011	2021	10	0.00	0.838	0
90023	5	Champaign	I 74	1992	2010	18	0.00	30.335	1
90023	5	Champaign	I 74	1992	2013	21	0.00	34.608	1
90023	5	Champaign	I 74	1992	2015	23	0.00	37.650	1
90023	5	Champaign	I 74	1992	2017	25	8.94	38.441	1
90023	5	Champaign	I 74	1992	2019	27	9.75	41.120	1
90023	5	Champaign	I 74	1992	2021	29	9.73	42.171	1
90046	5	Champaign	I 74	1991	1993	2	0.00	3.190	0

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90046	5	Champaign	I 74	1991	1995	4	0.00	5.480	0
90046	5	Champaign	I 74	1991	1998	7	0.00	9.582	0
90046	5	Champaign	I 74	1991	2010	19	0.00	30.598	1
90046	5	Champaign	I 74	1991	2013	22	0.00	34.829	1
90046	5	Champaign	I 74	1991	2015	24	0.00	38.029	1
90046	5	Champaign	I 74	1991	2017	26	9.55	38.756	1
90046	5	Champaign	I 74	1991	2019	28	10.67	41.384	1
90046	5	Champaign	I 74	1991	2021	30	0.00	42.325	1
90049	5	Champaign	I 74	1991	1993	2	0.13	3.189	0
90049	5	Champaign	I 74	1991	1995	4	0.00	5.478	0
90049	5	Champaign	I 74	1991	1998	7	0.00	9.318	0
90049	5	Champaign	I 74	1991	2010	19	0.00	29.150	1
90049	5	Champaign	I 74	1991	2013	22	0.00	33.443	1
90049	5	Champaign	I 74	1991	2015	24	0.00	36.376	1
90049	5	Champaign	I 74	1991	2017	26	13.34	38.490	1
90049	5	Champaign	I 74	1991	2019	28	13.57	40.784	1
90049	5	Champaign	I 74	1991	2021	30	6.58	42.271	1
90122	5	Champaign	I 74	1992	1993	1	0.00	2.158	0
90122	5	Champaign	I 74	1992	1995	3	0.00	4.448	0
90122	5	Champaign	I 74	1992	1998	6	0.00	8.445	0
90122	5	Champaign	I 74	1992	2010	18	0.00	29.329	1
90122	5	Champaign	I 74	1992	2013	21	0.00	33.692	1
90122	5	Champaign	I 74	1992	2015	23	0.00	36.816	1
90122	5	Champaign	I 74	1992	2017	25	9.51	38.730	1
90122	5	Champaign	I 74	1992	2019	27	10.70	40.878	1
90122	5	Champaign	I 74	1992	2021	29	2.41	41.836	1
90123	5	Champaign	I 74	1991	1993	2	0.00	3.189	0
90123	5	Champaign	I 74	1991	1995	4	0.00	5.479	0
90123	5	Champaign	I 74	1991	1998	7	0.00	9.503	0
90123	5	Champaign	I 74	1991	2010	19	0.00	29.827	1

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2 - Denoted 2nd Overlay

Full-Depth HMA Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
90123	5	Champaign	I 74	1991	2013	22	0.00	34.017	1
90123	5	Champaign	I 74	1991	2015	24	0.00	37.375	1
90123	5	Champaign	I 74	1991	2017	26	11.89	38.254	1
90123	5	Champaign	I 74	1991	2019	28	16.06	40.820	1
90123	5	Champaign	I 74	1991	2021	30	0.00	41.598	1
90278	7	Macon	US 51	1995	1997	2	0.00	0.213	0
90278	7	Macon	US 51	1995	1999	4	0.00	0.409	0
90278	7	Macon	US 51	1995	2010	15	0.00	1.589	0
90278	7	Macon	US 51	1995	2012	17	0.00	1.804	0
90278	7	Macon	US 51	1995	2014	19	0.65	2.032	0
90278	7	Macon	US 51	1995	2016	21	0.44	2.261	0
90278	7	Macon	US 51	1995	2018	23	1.55	2.504	0
90278	7	Macon	US 51	1995	2020	25	1.55	2.759	0
90281	7	Shelby	US 51	2003	2010	7	0.00	0.902	0
90281	7	Shelby	US 51	2003	2012	9	0.00	1.159	0
90281	7	Shelby	US 51	2003	2014	11	0.00	1.439	0
90281_1	7	Shelby	US 51	2003	2016	13	0.00	1.654	0
90281_1	7	Shelby	US 51	2003	2018	15	0.00	1.920	0
90281_1	7	Shelby	US 51	2003	2020	17	0.07	2.203	0
90281_2	7	Christian	US 51	2003	2016	13	0.00	1.741	0
90281_2	7	Christian	US 51	2003	2018	15	0.34	2.000	0
90281_2	7	Christian	US 51	2003	2020	17	0.34	2.251	0
90281_3	7	Macon	US 51	2003	2016	13	0.00	1.653	0
90281_3	7	Macon	US 51	2003	2018	15	0.00	1.877	0
90281_3	7	Macon	US 51	2003	2020	17	0.00	1.985	0
92108	6	Logan	I 155	1990	2010	20	0.00	6.661	1
92108	6	Logan	I 155	1990	2012	22	0.00	7.448	1
92108	6	Logan	I 155	1990	2014	24	0.00	8.318	1
92108	6	Logan	I 155	1990	2016	26	0.00	8.885	1
92108	6	Logan	I 155	1990	2018	28	0.00	9.592	1

0 - Denotes Bare Pavement
1 - Denotes 1st Overlay
2 - Denoted 2nd Overlay

Full-Depth HMA Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
92108	6	Logan	I 155	1990	2020	30	0.00	10.296	1
92109	6	Scott	I 72	1990	1992	2	0.00	0.425	0
92109	6	Scott	I 72	1990	1993	3	0.00	0.575	0
92109	6	Scott	I 72	1990	1995	5	0.00	0.889	0
92109	6	Scott	I 72	1990	1998	8	0.00	1.518	0
92109	6	Scott	I 72	1990	2010	20	0.00	5.707	1
92109	6	Scott	I 72	1990	2012	22	0.00	6.509	1
92109	6	Scott	I 72	1990	2014	24	0.04	7.474	1
92109	6	Scott	I 72	1990	2016	26	0.05	7.598	1
92109	6	Scott	I 72	1990	2018	28	0.91	8.558	1
92109	6	Scott	I 72	1990	2020	30	0.92	9.398	1
92228	6	Logan	I 155	1992	2010	18	0.00	6.832	1
92228	6	Logan	I 155	1992	2012	20	0.00	7.587	1
92228	6	Logan	I 155	1992	2014	22	0.00	8.315	1
92228	6	Logan	I 155	1992	2016	24	0.00	9.202	1
92228	6	Logan	I 155	1992	2018	26	0.00	9.950	1
92228	6	Logan	I 155	1992	2020	28	0.00	10.756	1
92230	6	Pike	I 72	1991	1992	1	0.00	0.268	0
92230	6	Pike	I 72	1991	1993	2	0.00	0.409	0
92230	6	Pike	I 72	1991	1998	7	0.00	1.265	0
92230	6	Pike	I 72	1991	2010	19	0.01	4.954	1
92230	6	Pike	I 72	1991	2012	21	0.01	5.622	1
92230	6	Pike	I 72	1991	2014	23	0.01	6.411	1
92230	6	Pike	I 72	1991	2016	25	0.00	6.875	1
92230	6	Pike	I 72	1991	2018	27	0.00	7.866	1
92230	6	Pike	I 72	1991	2020	29	0.00	8.522	1
92328	6	Sangamon	Williamsville Rd.	1991	2010	19	0.00	0.477	1
92328	6	Sangamon	Williamsville Rd.	1991	2012	21	0.00	0.836	1
92328	6	Sangamon	Williamsville Rd.	1991	2014	23	0.00	1.007	1
92328	6	Sangamon	Williamsville Rd.	1991	2016	25	0.00	1.054	1

0 - Denotes Bare Pavement
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Full-Depth HMA Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
92328	6	Sangamon	Williamsville Rd.	1991	2018	27	0.01	1.116	1
92328	6	Sangamon	Williamsville Rd.	1991	2020	29	0.00	1.177	1
92339	6	Macoupin	Shipman Rd.	1995	2016	21	0.00	0.859	0
92339	6	Macoupin	Shipman Rd.	1995	2018	23	0.00	0.932	0
92339	6	Macoupin	Shipman Rd.	1995	2020	25	0.00	0.963	0
92434	6	Adams	IL 336	1995	2010	15	0.00	0.945	1
92434	6	Adams	IL 336	1995	2012	17	0.00	1.108	1
92434	6	Adams	IL 336	1995	2014	19	0.00	1.336	1
92434	6	Adams	IL 336	1995	2016	21	0.00	1.603	1
92434	6	Adams	IL 336	1995	2018	23	0.00	1.867	1
92434	6	Adams	IL 336	1995	2020	25	0.00	2.114	1
92677	6	Christian	US 51	2007	2016	9	0.00	1.064	0
92677	6	Christian	US 51	2007	2018	11	0.00	1.329	0
92677	6	Christian	US 51	2007	2020	13	0.00	1.528	0
94037	7	Clay	US 50	1990	2010	20	0.00	1.914	1
94037	7	Clay	US 50	1990	2012	22	0.00	2.090	1
94037	7	Clay	US 50	1990	2014	24	0.00	2.300	1
94037	7	Clay	US 50	1990	2016	26	0.00	2.207	2
94037	7	Clay	US 50	1990	2020	30	0.00	2.575	2
94859	7	Effingham	I 57	2004	2016	12	0.00	16.762	1
94859	7	Effingham	I 57	2004	2020	16	0.00	22.064	1
96232	8	Madison	US 67	1993	1995	2	0.02	0.271	0
96232	8	Madison	US 67	1993	1997	4	0.07	0.475	0
96232	8	Madison	US 67	1993	1999	6	0.05	0.731	0
96232	8	Madison	US 67	1993	2010	17	0.00	2.243	1
96232	8	Madison	US 67	1993	2013	20	0.00	2.540	1
96232	8	Madison	US 67	1993	2015	22	0.00	2.727	1
96232	8	Madison	US 67	1993	2017	24	0.00	2.888	1
96232	8	Madison	US 67	1993	2019	26	0.00	3.088	1
96232	8	Madison	US 67	1993	2021	28	1.27	3.230	1

0 - Denotes Bare Pavement
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Full-Depth HMA Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
96349	8	Madison	I 70	1996	1998	2	0.00	4.804	0
96349	8	Madison	I 70	1996	2010	14	0.00	27.970	1
96349	8	Madison	I 70	1996	2013	17	0.00	33.265	1
96349	8	Madison	I 70	1996	2015	19	0.00	36.928	1
96349	8	Madison	I 70	1996	2017	21	0.00	40.300	1
96349	8	Madison	I 70	1996	2019	23	0.00	43.410	1
96349	8	Madison	I 70	1996	2021	25	0.00	46.165	1
96397	8	St. Clair	IL 161	1994	2010	16	0.00	1.116	0
96397	8	St. Clair	IL 161	1994	2013	19	0.00	1.299	0
96397	8	St. Clair	IL 161	1994	2015	21	0.00	1.458	0
96397	8	St. Clair	IL 161	1994	2017	23	0.02	1.697	0
96397	8	St. Clair	IL 161	1994	2019	25	0.00	1.924	1
96397	8	St. Clair	IL 161	1994	2021	27	0.09	1.995	1
96484	8	Washington	US 51	1995	2010	15	0.00	1.545	1
96484_1	8	Washington	US 51	1995	2017	22	0.00	2.048	1
96484_1	8	Washington	US 51	1995	2019	24	0.00	2.218	1
96484_1	8	Washington	US 51	1995	2021	26	0.00	2.408	1
96484_2	9	Jefferson	US 51	1995	2017	22	0.00	2.377	1
96484_2	9	Jefferson	US 51	1995	2019	24	0.00	2.620	1
96484_2	9	Jefferson	US 51	1995	2021	26	0.00	2.867	1
96484A	8	Washington	US 51	1995	2013	18	0.00	1.666	1
96484A	8	Washington	US 51	1995	2015	20	0.00	1.887	1
96484B	8	Washington	US 51	1995	2013	18	0.00	1.901	1
96484B	8	Washington	US 51	1995	2015	20	0.00	2.141	1
96625	8	Madison	New Poag Rd.	1995	1998	3	0.00	0.001	0
96625	8	Madison	New Poag Rd.	1995	2010	15	0.00	0.004	1
96625	8	Madison	New Poag Rd.	1995	2013	18	0.00	0.005	1
96625	8	Madison	New Poag Rd.	1995	2015	20	0.00	0.006	1
96625	8	Madison	New Poag Rd.	1995	2017	22	0.00	0.019	1
96625	8	Madison	New Poag Rd.	1995	2019	24	0.53	0.082	1

0 - Denotes Bare Pavement
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Full-Depth HMA Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
96625	8	Madison	New Poag Rd.	1995	2021	26	0.51	0.193	1
96737	8	Madison	IL 255	1998	2010	12	0.01	3.943	0
96737	8	Madison	IL 255	1998	2013	15	0.01	5.323	0
96737	8	Madison	IL 255	1998	2015	17	0.01	6.718	0
96737	8	Madison	IL 255	1998	2017	19	4.42	8.244	0
96737	8	Madison	IL 255	1998	2019	21	4.11	9.378	1
96737	8	Madison	IL 255	1998	2021	23	0.00	9.969	1
96737_1	8	Madison	I 255	1998	2017	19	0.00	8.122	0
96737_1	8	Madison	I 255	1998	2019	21	0.00	9.505	0
96737_1	8	Madison	I 255	1998	2021	23	0.00	10.897	0
96737_2	8	Madison	IL 255	1998	2017	19	0.00	8.245	0
96737_2	8	Madison	IL 255	1998	2019	21	0.24	9.381	1
96737_2	8	Madison	IL 255	1998	2021	23	0.00	9.976	1
96739	8	Madison	IL 255	1998	2010	12	0.00	2.644	0
96739	8	Madison	IL 255	1998	2013	15	0.00	3.641	0
96739	8	Madison	IL 255	1998	2015	17	0.00	4.571	0
96739	8	Madison	IL 255	1998	2017	19	0.00	5.720	0
96739	8	Madison	IL 255	1998	2019	21	0.00	6.669	1
96739	8	Madison	IL 255	1998	2021	23	0.00	7.247	1
98119	9	Alexander	IL 3	1994	1995	1	0.00	0.060	0
98119	9	Alexander	IL 3	1994	1997	3	0.00	0.122	0
98119	9	Alexander	IL 3	1994	1999	5	0.00	0.183	0
98119	9	Alexander	IL 3	1994	2010	16	0.00	0.674	0
98119	9	Alexander	IL 3	1994	2013	19	0.00	0.892	0
98119	9	Alexander	IL 3	1994	2015	21	0.00	1.075	0
98119	9	Alexander	IL 3	1994	2017	23	0.00	1.229	0
98119	9	Alexander	IL 3	1994	2019	25	0.00	1.363	0
98119	9	Alexander	IL 3	1994	2021	27	0.00	1.494	0
98290	9	Union	US 51	1998	2010	12	0.00	0.359	1
98290	9	Union	US 51	1998	2013	15	0.00	0.457	1

0 - Denotes Bare Pavement
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Full-Depth HMA Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
98290	9	Union	US 51	1998	2015	17	0.00	0.514	1
98290	9	Union	US 51	1998	2017	19	0.00	0.602	0
98290	9	Union	US 51	1998	2019	21	0.00	0.676	0
98290	9	Union	US 51	1998	2021	23	0.00	0.717	0
98420	9	Jackson	US 51	2002	2010	8	0.00	0.620	0
98420	9	Jackson	US 51	2002	2013	11	0.00	0.879	0
98420	9	Jackson	US 51	2002	2015	13	0.00	1.026	0
98420	9	Jackson	US 51	2002	2017	15	4.94	1.175	0
98420	9	Jackson	US 51	2002	2019	17	0.00	1.280	1
98420	9	Jackson	US 51	2002	2021	19	0.00	1.325	1
64H70	2	Winnebago	IL 2	2015	2016	1	0.00	0.128	0
64H70	2	Winnebago	IL 2	2015	2018	3	0.00	0.217	0
64H70	2	Winnebago	IL 2	2015	2020	5	0.00	0.272	0
68B44	4	McDonough	IL 336	2018	2021	3	0.00	0.032	0
70A28	5	McLean	I 39	2014	2017	3	0.00	4.377	0
70A28	5	McLean	I 39	2014	2019	5	0.00	6.571	0
70A28	5	McLean	I 39	2014	2021	7	0.00	9.014	0
76C93	8	Madison	I 55	2011	2017	6	0.00	11.828	0
76C93	8	Madison	I 55	2011	2019	8	0.00	14.479	0
76C93	8	Madison	I 55	2011	2021	10	0.00	16.909	0
76D99	8	Madison	I 55	2013	2017	4	0.00	7.607	0
76D99	8	Madison	I 55	2013	2019	6	0.00	10.708	0
76D99	8	Madison	I 55	2013	2021	8	0.00	11.657	0

0 - Denotes Bare Pavement
1 - Denotes 1st Overlay
2 - Denoted 2nd Overlay

Appendix B –
Patching Quantities from
Jointed Plain Concrete
Pavement Distress Surveys

JPCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
40455	2	Stephenson	US 20	1986	2010	24	0.60	3.416	0
40455E	2	Stephenson	US 20	1986	1990	4	0.00	0.758	0
40455E	2	Stephenson	US 20	1986	1992	6	0.00	1.093	0
40455E	2	Stephenson	US 20	1986	1995	9	0.00	1.636	0
40455E	2	Stephenson	US 20	1986	1997	11	0.00	2.019	0
40455E	2	Stephenson	US 20	1986	2012	26	0.00	6.512	0
40455E	2	Stephenson	US 20	1986	2014	28	0.00	7.238	0
40455E	2	Stephenson	US 20	1986	2016	30	0.00	8.052	0
40455E	2	Stephenson	US 20	1986	2018	32	0.00	8.911	0
40455E	2	Stephenson	US 20	1986	2020	34	4.39	9.357	0
40455H	2	Stephenson	US 20	1986	1990	4	0.00	0.758	0
40455H	2	Stephenson	US 20	1986	1992	6	0.00	1.093	0
40455H	2	Stephenson	US 20	1986	1995	9	0.00	1.636	0
40455H	2	Stephenson	US 20	1986	1997	11	0.00	2.019	0
40455H	2	Stephenson	US 20	1986	2012	26	0.00	6.512	0
40455H	2	Stephenson	US 20	1986	2014	28	0.00	7.238	0
40455H	2	Stephenson	US 20	1986	2016	30	0.00	8.063	0
40455H	2	Stephenson	US 20	1986	2018	32	0.80	8.837	0
40455H	2	Stephenson	US 20	1986	2020	34	0.89	9.181	0
60748	1	Cook	US 12/20/45	2004	2010	6	0.06	3.670	0
60748	1	Cook	US 12/20/45	2004	2013	9	0.00	4.494	0
60748	1	Cook	US 12/20/45	2004	2015	11	0.11	4.974	0
60748	1	Cook	US 12/20/45	2004	2017	13	0.00	5.437	0
60748	1	Cook	US 12/20/45	2004	2019	15	0.06	5.678	0
60748	1	Cook	US 12/20/45	2004	2021	17	0.21	5.744	0
60881	1	Lake	IL 22	2008	2016	8	0.24	1.272	0
60881	1	Lake	IL 22	2008	2018	10	0.21	1.610	0
60881	1	Lake	IL 22	2008	2020	12	0.40	1.864	0
60927	1	Cook	US 12/20/45	2004	2010	6	0.09	3.539	0

0 - Denotes Bare Pavement

1 - Denotes 1st Overlay

2 - Denoted 2nd Overlay

JPCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
60927	1	Cook	US 12/20/45	2004	2013	9	0.06	4.357	0
60927	1	Cook	US 12/20/45	2004	2015	11	0.10	4.833	0
60927	1	Cook	US 12/20/45	2004	2017	13	0.08	5.335	0
60927	1	Cook	US 12/20/45	2004	2019	15	0.09	5.572	0
60927	1	Cook	US 12/20/45	2004	2021	17	0.13	5.655	0
60953	1	Lake	IL 21	2014	2016	2	0.05	0.355	0
60953	1	Lake	IL 21	2014	2018	4	0.27	0.628	0
60953	1	Lake	IL 21	2014	2020	6	0.45	0.845	0
62030	1	Lake	IL 22	2008	2016	8	0.19	1.459	0
62030	1	Lake	IL 22	2008	2018	10	1.14	2.037	0
62030	1	Lake	IL 22	2008	2020	12	1.71	2.429	1
62277	1	Cook	US 30	2004	2010	6	0.22	3.246	0
62277	1	Cook	US 30	2004	2013	9	0.22	4.493	0
62277	1	Cook	US 30	2004	2015	11	0.28	5.480	0
62277	1	Cook	US 30	2004	2017	13	0.16	6.330	0
62277	1	Cook	US 30	2004	2019	15	0.33	7.003	0
62277	1	Cook	US 30	2004	2021	17	1.09	7.256	0
62295	1	DuPage	US 20	2007	2016	9	0.07	3.177	0
62295	1	DuPage	US 20	2007	2018	11	0.25	3.553	0
62295	1	DuPage	US 20	2007	2020	13	4.37	3.797	0
62376	1	DuPage	Chicago Ave.	2007	2016	9	0.54	0.412	0
62376	1	DuPage	Chicago Ave.	2007	2018	11	1.03	0.458	0
62376	1	DuPage	Chicago Ave.	2007	2020	13	2.47	0.504	0
62387	1	Cook	IL 21	2011	2017	6	0.00	0.998	0
62387	1	Cook	IL 21	2011	2019	8	0.00	1.353	0
62387	1	Cook	IL 21	2011	2021	10	0.23	3.606	0
62410	1	DuPage	IL 64	2013	2016	3	0.03	1.908	0
62410	1	DuPage	IL 64	2013	2018	5	0.08	3.121	0
62410	1	DuPage	IL 64	2013	2020	7	0.08	4.104	0

0 - Denotes Bare Pavement

1 - Denotes 1st Overlay

2 - Denoted 2nd Overlay

JPCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
62416	1	Will	IL 59	2011	2016	5	0.09	1.803	0
62416	1	Will	IL 59	2011	2018	7	0.11	2.370	0
62416	1	Will	IL 59	2011	2020	9	0.11	2.771	0
62478_1	1	Will	US 30	2013	2016	3	0.07	0.507	0
62478_1	1	Will	US 30	2013	2018	5	0.07	0.798	0
62478_1	1	Will	US 30	2013	2020	7	0.15	0.997	0
62478_2	1	Will	US 30	2013	2016	3	0.00	0.799	0
62478_2	1	Will	US 30	2013	2018	5	0.00	1.010	0
62478_2	1	Will	US 30	2013	2020	7	0.00	1.215	0
62517	1	McHenry	US 14	2016	2018	2	0.08	0.459	0
62517	1	McHenry	US 14	2016	2020	4	0.40	0.704	0
62882	1	McHenry	IL 47	2012	2016	4	0.04	1.318	0
62882	1	McHenry	IL 47	2012	2018	6	0.09	1.795	0
62882	1	McHenry	IL 47	2012	2020	8	1.58	2.232	0
64147	2	JoDaviess	US 20	2003	2010	7	0.00	1.584	0
64147	2	JoDaviess	US 20	2003	2013	10	0.23	2.297	0
64147	2	JoDaviess	US 20	2003	2015	12	0.22	2.860	0
64147	2	JoDaviess	US 20	2003	2016	13	0.83	3.162	0
64147	2	JoDaviess	US 20	2003	2018	15	1.04	3.730	0
64147	2	JoDaviess	US 20	2003	2020	17	1.13	4.064	0
64210	2	Lee	IL 2	2000	2010	10	0.18	1.443	0
64210	2	Lee	IL 2	2000	2012	12	0.28	1.614	0
64210	2	Lee	IL 2	2000	2014	14	0.33	1.863	0
64210	2	Lee	IL 2	2000	2016	16	0.34	2.215	0
64210	2	Lee	IL 2	2000	2018	18	0.44	2.531	0
64210	2	Lee	IL 2	2000	2020	20	0.43	2.834	0
64244	2	Rock Island	I 74	2003	2010	7	0.25	4.918	0
64244	2	Rock Island	I 74	2003	2012	9	0.20	5.565	0
64244	2	Rock Island	I 74	2003	2014	11	0.60	6.231	0

0 - Denotes Bare Pavement

1 - Denotes 1st Overlay

2 - Denoted 2nd Overlay

JPCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
64244_1	2	Rock Island	I 74	2003	2016	13	0.43	7.313	0
64244_1	2	Rock Island	I 74	2003	2018	15	0.38	9.409	0
64244_1	2	Rock Island	I 74	2003	2020	17	0.38	10.755	0
64244_2	2	Rock Island	US 6	2003	2016	13	0.74	6.797	0
64244_2	2	Rock Island	US 6	2003	2018	15	1.40	7.015	0
64244_2	2	Rock Island	US 6	2003	2020	17	1.74	7.221	0
64555	2	Winnebago	IL 75	2002	2010	8	0.00	0.314	0
64555	2	Winnebago	IL 75	2002	2012	10	0.00	0.468	0
64555	2	Winnebago	IL 75	2002	2014	12	0.00	0.652	0
64555	2	Winnebago	IL 75	2002	2016	14	0.00	0.879	0
64555	2	Winnebago	IL 75	2002	2018	16	0.00	1.223	0
64555	2	Winnebago	IL 75	2002	2020	18	0.51	1.626	0
64821	2	Winnebago	IL 2	2016	2016	0	0.00	0.088	0
64821	2	Winnebago	IL 2	2016	2018	2	0.05	0.290	0
64821	2	Winnebago	IL 2	2016	2020	4	0.15	0.504	0
64988	2	Winnebago	IL 173	2015	2016	1	0.00	0.299	0
64988	2	Winnebago	IL 173	2015	2018	3	0.00	0.763	0
64988	2	Winnebago	IL 173	2015	2020	5	0.00	1.010	0
66013	3	Kendall	US 34	2003	2010	7	0.00	2.294	0
66013	3	Kendall	US 34	2003	2012	9	0.01	2.774	0
66013	3	Kendall	US 34	2003	2014	11	0.00	3.296	0
66013	3	Kendall	US 34	2003	2016	13	0.00	4.047	0
66013	3	Kendall	US 34	2003	2018	15	0.66	4.531	0
66013	3	Kendall	US 34	2003	2020	17	0.86	4.785	0
66160	3	Kendall	US 34	2003	2010	7	0.02	1.962	0
66160	3	Kendall	US 34	2003	2012	9	0.02	2.465	0
66160	3	Kendall	US 34	2003	2014	11	0.02	2.850	0
66160	3	Kendall	US 34	2003	2016	13	0.02	3.432	0
66160	3	Kendall	US 34	2003	2018	15	0.34	3.751	0

0 - Denotes Bare Pavement

1 - Denotes 1st Overlay

2 - Denoted 2nd Overlay

JPCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
66160	3	Kendall	US 34	2003	2020	17	0.84	3.915	0
66671	3	Kendall	IL 47	2015	2016	1	0.05	0.625	0
66671	3	Kendall	IL 47	2015	2018	3	0.11	1.533	0
66671	3	Kendall	IL 47	2015	2020	5	0.47	2.088	0
66884	3	Kendall	US 34	2017	2020	3	0.01	0.296	0
66985	3	Kendall	US 34	2014	2016	2	0.00	0.396	0
66985	3	Kendall	US 34	2014	2018	4	0.03	0.622	0
66985	3	Kendall	US 34	2014	2020	6	0.00	0.884	0
68258	4	Tazewell	IL 8	2010	2017	7	0.00	0.593	0
68258	4	Tazewell	IL 8	2010	2019	9	0.00	0.797	0
68258	4	Tazewell	IL 8	2010	2021	11	0.54	0.966	0
68370	4	Tazewell	IL 8	2014	2017	3	0.00	0.398	0
68370	4	Tazewell	IL 8	2014	2019	5	0.00	0.572	0
68370	4	Tazewell	IL 8	2014	2021	7	0.62	0.730	0
72667	6	Morgan	US 67 / IL 104	2014	2016	2	0.00	0.432	0
72667	6	Morgan	US 67 / IL 104	2014	2018	4	0.00	0.763	0
72667	6	Morgan	US 67 / IL 104	2014	2020	6	0.14	1.080	0
82196	1	Cook	IL 83	1999	2010	11	0.32	2.138	0
82196	1	Cook	IL 83	1999	2013	14	0.33	2.512	0
82196	1	Cook	IL 83	1999	2015	16	0.64	2.750	0
82196	1	Cook	IL 83	1999	2017	18	0.77	2.908	0
82196	1	Cook	IL 83	1999	2019	20	1.02	3.110	0
82196	1	Cook	IL 83	1999	2021	22	1.44	3.245	0
82385	1	Cook	US 30	2004	2010	6	0.49	4.190	0
82385	1	Cook	US 30	2004	2013	9	0.25	5.114	0
82385	1	Cook	US 30	2004	2015	11	0.26	5.681	0
82385	1	Cook	US 30	2004	2019	15	0.88	6.743	1
82385	1	Cook	US 30	2004	2021	17	1.52	6.891	1
82514	1	DuPage	IL 64	2002	2010	8	0.02	7.305	0

0 - Denotes Bare Pavement

1 - Denotes 1st Overlay

2 - Denoted 2nd Overlay

JPCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
82514	1	DuPage	IL 64	2002	2012	10	0.03	8.416	0
82514	1	DuPage	IL 64	2002	2014	12	0.03	9.599	0
82514	1	DuPage	IL 64	2002	2016	14	0.02	10.856	0
82514	1	DuPage	IL 64	2002	2018	16	0.30	12.509	0
82514	1	DuPage	IL 64	2002	2020	18	0.39	13.641	0
82634	1	DuPage	IL 64	2002	2010	8	0.00	7.630	0
82634	1	DuPage	IL 64	2002	2012	10	0.00	9.624	0
82634	1	DuPage	IL 64	2002	2014	12	0.00	11.476	0
82634	1	DuPage	IL 64	2002	2016	14	0.00	13.249	0
82634	1	DuPage	IL 64	2002	2018	16	0.23	14.747	0
82634	1	DuPage	IL 64	2002	2020	18	0.25	15.699	0
82712	1	Lake	US 45	2002	2010	8	0.03	2.355	0
82712	1	Lake	US 45	2002	2012	10	0.03	2.653	0
82712	1	Lake	US 45	2002	2014	12	0.03	2.955	0
82712	1	Lake	US 45	2002	2016	14	0.05	3.265	0
82712	1	Lake	US 45	2002	2018	16	0.08	3.577	0
82712	1	Lake	US 45	2002	2020	18	1.13	3.822	0
84984	2	Winnebago	IL 75	2002	2010	8	0.19	2.133	0
84984	2	Winnebago	IL 75	2002	2012	10	0.16	2.943	0
84984	2	Winnebago	IL 75	2002	2014	12	0.16	3.920	0
84984	2	Winnebago	IL 75	2002	2016	14	0.16	5.080	0
84984	2	Winnebago	IL 75	2002	2018	16	0.16	6.404	0
84984	2	Winnebago	IL 75	2002	2020	18	0.28	7.543	0
86854	5	McLean	I 55 BUS	2003	2010	7	0.00	1.886	0
86854	5	McLean	I 55 BUS	2003	2013	10	0.00	2.359	0
86854	5	McLean	I 55 BUS	2003	2015	12	0.00	2.591	0
86854_1	5	McLean	I 55 BUS	2003	2017	14	0.00	2.950	0
86854_1	5	McLean	I 55 BUS	2003	2019	16	0.00	3.381	0
86854_1	5	McLean	I 55 BUS	2003	2021	18	0.00	3.843	0
86854_2	5	McLean	I 55 BUS	2003	2017	14	0.00	2.694	0

0 - Denotes Bare Pavement

1 - Denotes 1st Overlay

2 - Denoted 2nd Overlay

JPCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
86854_2	5	McLean	I 55 BUS	2003	2019	16	0.00	2.754	0
86854_2	5	McLean	I 55 BUS	2003	2021	18	0.10	2.809	0
88795	4	Fulton	US 24	2013	2017	4	0.00	0.238	0
88795	4	Fulton	US 24	2013	2019	6	0.01	0.355	0
88795	4	Fulton	US 24	2013	2021	8	0.09	0.408	0
92763	6	Pike	I 72	2000	2010	10	0.22	6.193	0
92763	6	Pike	I 72	2000	2012	12	0.21	7.360	0
92763	6	Pike	I 72	2000	2014	14	0.21	8.733	0
92763	6	Pike	I 72	2000	2016	16	0.22	10.372	0
92763	6	Pike	I 72	2000	2018	18	0.28	12.328	0
92763	6	Pike	I 72	2000	2020	20	0.41	14.324	0
92774	6	Morgan	US 67	1999	2010	11	0.04	1.788	0
92774	6	Morgan	US 67	1999	2012	13	0.13	2.067	0
92774	6	Morgan	US 67	1999	2014	15	0.14	2.397	0
92774A	6	Morgan	US 67	1999	2016	17	0.27	2.789	0
92774A	6	Morgan	US 67	1999	2018	19	0.38	3.199	0
92774A	6	Morgan	US 67	1999	2020	21	1.22	3.483	0
92774B	6	Morgan	US 67	1999	2016	17	0.00	2.780	0
92774B	6	Morgan	US 67	1999	2018	19	0.00	3.153	0
92774B	6	Morgan	US 67	1999	2020	21	0.00	3.365	0
64E17	2	Ogle	IL 2	2012	2016	4	0.00	0.420	0
64E17	2	Ogle	IL 2	2012	2018	6	0.00	0.574	0
64E17	2	Ogle	IL 2	2012	2020	8	0.07	0.714	0
60C31	1	Will	I 55 West Front Rd	2012	2016	4	0.00	0.622	0
60C31	1	Will	I 55 West Front Rd	2012	2018	6	0.10	0.926	0
60C31	1	Will	I 55 West Front Rd	2012	2020	8	0.50	1.080	0
60I32	3	Kendall	US 30	2015	2016	1	0.00	0.588	0
60I32	3	Kendall	US 30	2015	2018	3	0.06	1.260	0
60I32	3	Kendall	US 30	2015	2020	5	0.12	1.894	0

0 - Denotes Bare Pavement

1 - Denotes 1st Overlay

2 - Denoted 2nd Overlay

JPCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
60P95	1	Will	US 30	2017	2018	1	0.05	0.793	0
60P95	1	Will	US 30	2017	2020	3	0.00	1.532	0
60T35	1	Cook	Willow Road	2014	2017	3	0.14	0.941	0
60T35	1	Cook	Willow Road	2014	2019	5	0.14	1.344	0
60T35	1	Cook	Willow Road	2014	2021	7	0.62	1.427	0
64B83	2	Rock Island	IL 5	2018	2018	0	0.00	0.302	0
64B83	2	Rock Island	IL 5	2018	2020	2	0.72	0.584	0
64C21	2	Winnebago	IL 2	2018	2018	0	0.22	0.128	0
64C21	2	Winnebago	IL 2	2018	2020	2	0.90	0.276	0
66B84	3	Kendall	IL 47	2017	2020	3	0.00	1.287	0

0 - Denotes Bare Pavement
 1 - Denotes 1st Overlay
 2 - Denoted 2nd Overlay

Appendix C –
Patching Quantities from
Continuously Reinforced
Concrete Pavement Distress
Surveys

CRCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
40317	8	Clinton	US 50	1986	2010	24	0.05	4.597	0
40317A	8	Clinton	US 50	1986	1990	4	0.00	0.615	0
40317A	8	Clinton	US 50	1986	1992	6	0.00	0.888	0
40317A	8	Clinton	US 50	1986	1995	9	0.00	1.328	0
40317A	8	Clinton	US 50	1986	1998	12	0.23	1.878	0
40317A	8	Clinton	US 50	1986	2013	27	0.00	5.165	0
40317A	8	Clinton	US 50	1986	2015	29	0.53	5.679	0
40317A	8	Clinton	US 50	1986	2017	31	0.53	6.080	0
40317A	8	Clinton	US 50	1986	2019	33	1.21	6.423	0
40317A	8	Clinton	US 50	1986	2021	35	3.79	6.581	0
40317B	8	Clinton	US 50	1986	1990	4	0.00	0.620	0
40317B	8	Clinton	US 50	1986	1992	6	0.00	0.894	0
40317B	8	Clinton	US 50	1986	1995	9	0.00	1.338	0
40317B	8	Clinton	US 50	1986	1998	12	0.01	1.878	0
40317B	8	Clinton	US 50	1986	2013	27	0.05	4.984	0
40317B	8	Clinton	US 50	1986	2015	29	0.64	5.461	0
40317Ba	8	Clinton	US 50	1986	2017	31	1.74	5.806	0
40317Ba	8	Clinton	US 50	1986	2019	33	3.62	6.124	0
40317Ba	8	Clinton	US 50	1986	2021	35	5.31	6.360	0
40317Bb	8	Clinton	US 50	1986	2017	31	1.32	5.845	0
40317Bb	8	Clinton	US 50	1986	2019	33	2.18	6.243	0
40317Bb	8	Clinton	US 50	1986	2021	35	4.29	6.675	0
40317Bc	8	Clinton	US 50	1986	2017	31	0.00	5.843	0
40317Bc	8	Clinton	US 50	1986	2019	33	0.48	6.200	0
40317Bc	8	Clinton	US 50	1986	2021	35	0.18	6.440	0
40317C	8	Clinton	US 50	1986	1990	4	0.00	0.628	0
40317C	8	Clinton	US 50	1986	1992	6	0.00	0.906	0
40317C	8	Clinton	US 50	1986	1995	9	0.00	1.356	0
40317C	8	Clinton	US 50	1986	1998	12	0.72	1.876	0
40317C	8	Clinton	US 50	1986	2013	27	0.80	4.722	0

0 - Denotes Bare Pavement
1 - Denotes 1st Overlay
2 - Denoted 2nd Overlay

CRCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
40317C	8	Clinton	US 50	1986	2015	29	1.40	5.163	0
40317C	8	Clinton	US 50	1986	2017	31	2.43	5.552	0
40317C	8	Clinton	US 50	1986	2019	33	2.62	5.860	0
40317C	8	Clinton	US 50	1986	2021	35	3.03	6.061	0
64039	2	Henry	I 74	1998	2010	12	0.68	15.678	0
64039	2	Henry	I 74	1998	2012	14	0.40	18.572	0
64039	2	Henry	I 74	1998	2014	16	0.61	21.366	0
64039_1	2	Henry	I 74	1998	2016	18	2.16	23.900	0
64039_1	2	Henry	I 74	1998	2018	20	2.98	25.885	0
64039_1	2	Henry	I 74	1998	2020	22	3.66	27.133	0
64039_2	2	Henry	I 74	1998	2016	18	1.51	23.900	1
64039_2	2	Henry	I 74	1998	2018	20	0.05	25.885	1
64039_2	2	Henry	I 74	1998	2020	22	0.05	27.177	1
64039_3	2	Henry	I 74	1998	2016	18	2.35	24.111	0
64039_3	2	Henry	I 74	1998	2018	20	2.52	26.942	0
64039_3	2	Henry	I 74	1998	2020	22	3.25	28.650	0
64219	2	Whiteside	I 88	2001	2010	9	0.02	8.494	0
64219	2	Whiteside	I 88	2001	2013	12	0.02	11.097	0
64219	2	Whiteside	I 88	2001	2015	14	0.02	12.897	0
64219	2	Whiteside	I 88	2001	2017	16	0.02	14.880	0
64219	2	Whiteside	I 88	2001	2019	18	0.02	16.643	0
64219	2	Whiteside	I 88	2001	2021	20	0.02	18.034	0
64933	2	Rock Island	I 80	2011	2016	5	0.00	13.758	0
64933	2	Rock Island	I 80	2011	2018	7	0.00	18.337	0
64933	2	Rock Island	I 80	2011	2020	9	0.00	23.311	0
66044	3	Grundy	I 80	2002	2010	8	0.00	27.265	0
66044	3	Grundy	I 80	2002	2013	11	0.00	38.453	0
66044	3	Grundy	I 80	2002	2014	12	0.00	42.410	0
66044	3	Grundy	I 80	2002	2015	13	0.00	46.022	0
66051	3	Grundy	I 80	2002	2010	8	0.00	27.265	0

0 - Denotes Bare Pavement
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CRCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
66051	3	Grundy	I 80	2002	2012	10	0.01	34.151	0
66051	3	Grundy	I 80	2002	2014	12	0.00	42.410	0
66051	3	Grundy	I 80	2002	2016	14	0.00	49.815	0
66051	3	Grundy	I 80	2002	2018	16	0.00	56.399	0
66051	3	Grundy	I 80	2002	2020	18	0.00	60.422	0
68197	4	Peoria	I 74	2005	2017	12	0.00	6.168	0
68197	4	Peoria	I 74	2005	2019	14	0.00	7.084	0
68197	4	Peoria	I 74	2005	2021	16	0.00	7.356	0
68620	4	Tazewell	I 74	2016	2017	1	0.01	2.948	0
68620	4	Tazewell	I 74	2016	2019	3	0.00	5.801	0
68620	4	Tazewell	I 74	2016	2021	5	0.00	7.389	0
70044	7	Clark	I 70	2002	2010	8	0.04	27.663	0
70044	7	Clark	I 70	2002	2013	11	0.10	36.230	0
70044	7	Clark	I 70	2002	2014	12	0.10	39.219	0
70044	7	Clark	I 70	2002	2016	14	0.10	45.433	0
70044	7	Clark	I 70	2002	2018	16	0.07	51.224	0
70044	7	Clark	I 70	2002	2020	18	0.06	55.673	0
74295	7	Effingham	I 57/70	2016	2020	4	0.06	18.419	0
74299	7	Effingham	I 57/70	2015	2016	1	0.00	7.270	0
74299	7	Effingham	I 57/70	2015	2020	5	0.00	21.666	0
78172	9	Jefferson	I 57/64	2013	2017	4	0.00	16.528	0
78172	9	Jefferson	I 57/64	2013	2019	6	0.00	24.680	0
78172	9	Jefferson	I 57/64	2013	2021	8	0.00	27.772	0
82587	1	Will	I 80	1997	2010	13	0.00	43.538	0
82587	1	Will	I 80	1997	2012	15	0.00	50.002	0
82587	1	Will	I 80	1997	2014	17	0.01	57.714	0
82587	1	Will	I 80	1997	2016	19	0.00	65.344	0
82587	1	Will	I 80	1997	2018	21	0.03	69.915	0
82587	1	Will	I 80	1997	2020	23	0.01	72.918	0
82589	1	Will	I 80	1996	2010	14	0.00	46.306	0

0 - Denotes Bare Pavement
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CRCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
82589	1	Will	I 80	1996	2012	16	0.00	52.769	0
82589	1	Will	I 80	1996	2014	18	0.00	60.482	0
82589	1	Will	I 80	1996	2016	20	0.00	69.261	0
82589	1	Will	I 80	1996	2018	22	0.00	73.822	0
82589	1	Will	I 80	1996	2020	24	0.00	76.790	0
86074	3	LaSalle	I 39	1991	2010	19	0.23	31.427	0
86074	3	LaSalle	I 39	1991	2013	22	0.42	36.182	0
86074	3	LaSalle	I 39	1991	2015	24	0.61	39.815	0
86074	3	LaSalle	I 39	1991	2017	26	0.66	42.937	0
86074	3	LaSalle	I 39	1991	2019	28	1.12	45.424	0
86074	3	LaSalle	I 39	1991	2021	30	2.65	46.217	0
86184	5	McLean	I 39	1992	2010	18	0.51	28.437	0
86184	5	McLean	I 39	1992	2013	21	1.01	32.903	0
86184	5	McLean	I 39	1992	2015	23	1.47	35.881	1
86184_1	5	McLean	I 39	1992	2017	25	1.95	39.149	1
86184_1	5	McLean	I 39	1992	2019	27	2.02	41.492	1
86184_1	5	McLean	I 39	1992	2021	29	2.02	44.003	1
86184_2	5	Woodford	I 39	1992	2017	25	2.47	38.529	0
86184_2	5	Woodford	I 39	1992	2019	27	3.61	41.570	1
86184_2	5	Woodford	I 39	1992	2021	29	0.00	44.207	1
86209	4	Woodford	I 39	1992	1997	5	0.01	37.414	0
86209	4	Woodford	I 39	1992	1999	7	0.01	37.414	0
86209A	4	Woodford	I 39	1992	2010	18	0.06	28.370	1
86209A	4	Woodford	I 39	1992	2012	20	0.01	31.598	1
86209A	4	Woodford	I 39	1992	2012	20	0.00	31.598	1
86209A	4	Woodford	I 39	1992	2013	21	0.15	33.208	1
86209A	4	Woodford	I 39	1992	2013	21	0.01	33.208	1
86209A	4	Woodford	I 39	1992	2015	23	0.24	36.420	1
86209A	4	Woodford	I 39	1992	2015	23	0.01	36.420	1
86209A	4	Woodford	I 39	1992	2017	25	0.22	38.464	1

0 - Denotes Bare Pavement
1 - Denotes 1st Overlay
2 - Denoted 2nd Overlay

CRCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
86209A	4	Woodford	I 39	1992	2019	27	0.48	40.886	1
86209A	4	Woodford	I 39	1992	2021	29	0.00	43.192	2
86209B	4	Woodford	I 39	1992	2010	18	0.13	28.917	0
86209B	4	Woodford	I 39	1992	2013	21	0.36	33.571	0
86209B	4	Woodford	I 39	1992	2013	21	0.65	33.571	0
86209B	4	Woodford	I 39	1992	2015	23	0.39	36.565	0
86209B	4	Woodford	I 39	1992	2015	23	0.67	36.565	0
86209B_1	4	Woodford	I 39	1992	2017	25	0.41	39.185	0
86209B_1	4	Woodford	I 39	1992	2019	27	2.05	42.041	0
86209B_1	4	Woodford	I 39	1992	2021	29	3.68	44.033	0
86209B_2	4	Marshall	I 39	1992	2017	25	0.46	39.375	1
86209B_2	4	Marshall	I 39	1992	2019	27	1.22	42.174	1
86209B_2	4	Marshall	I 39	1992	2021	29	1.60	44.036	1
86210	4	Marshall	I 39	1992	2010	18	0.52	30.109	0
86210	4	Marshall	I 39	1992	2013	21	2.77	34.713	0
86210	4	Marshall	I 39	1992	2015	23	3.54	38.270	1
86210	4	Marshall	I 39	1992	2017	25	0.00	40.411	1
86210	4	Marshall	I 39	1992	2019	27	0.03	42.557	1
86210	4	Marshall	I 39	1992	2021	29	0.03	43.714	1
86399	3	Grundy	I 80	1993	2010	17	0.00	48.376	1
86399	3	Grundy	I 80	1993	2012	19	0.10	53.787	1
86399	3	Grundy	I 80	1993	2014	21	0.18	59.881	1
86399	3	Grundy	I 80	1993	2016	23	0.29	65.234	0
86399	3	Grundy	I 80	1993	2018	25	0.79	70.837	0
86399	3	Grundy	I 80	1993	2020	27	1.09	73.805	0
86562	3	Grundy	I 80	1996	1997	1	0.00	4.763	0
86562	3	Grundy	I 80	1996	1999	3	0.00	10.502	0
86562	3	Grundy	I 80	1996	2010	14	0.00	43.622	0
86562	3	Grundy	I 80	1996	2012	16	0.00	49.100	0
86562	3	Grundy	I 80	1996	2014	18	0.01	55.527	0

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CRCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
86562	3	Grundy	I 80	1996	2016	20	0.01	62.446	0
86562	3	Grundy	I 80	1996	2018	22	0.11	68.907	0
86562	3	Grundy	I 80	1996	2020	24	0.11	73.170	0
86856	5	McLean	I 55/74	2003	2010	7	0.00	2.701	0
86856	5	McLean	I 55/74	2003	2010	7	0.06	2.701	0
86856A	5	McLean	I 55/74	2003	2013	10	0.14	45.549	0
86856A	5	McLean	I 55/74	2003	2015	12	0.14	53.314	0
86856A	5	McLean	I 55/74	2003	2017	14	0.04	60.682	0
86856A	5	McLean	I 55/74	2003	2019	16	0.05	65.761	0
86856A	5	McLean	I 55/74	2003	2021	18	0.00	67.964	1
86856B	5	McLean	I 55/74	2003	2013	10	0.00	41.096	0
86856B	5	McLean	I 55/74	2003	2017	14	0.02	56.011	0
86856B	5	McLean	I 55/74	2003	2019	16	0.05	60.674	0
86856B	5	McLean	I 55/74	2003	2021	18	0.00	61.919	1
60H45	1	Kane	US 20	2016	2016	0	0.00	0.834	0
60H45	1	Kane	US 20	2016	2018	2	0.00	1.828	0
60H45	1	Kane	US 20	2016	2020	4	0.00	2.622	0
64C29	2	Winnebago	I 90	2013	2016	3	0.00	12.638	0
64C29	2	Winnebago	I 90	2013	2018	5	0.00	20.415	0
64C29	2	Winnebago	I 90	2013	2020	7	0.00	26.012	0
76A91	8	Madison	I 270	2014	2017	3	0.00	6.984	0
76A91	8	Madison	I 270	2014	2019	5	0.00	11.998	0
76A91	8	Madison	I 270	2014	2021	7	0.00	13.819	0
76C43	8	St. Clair	I 70	2014	2017	3	0.00	6.043	0
76C43	8	St. Clair	I 70	2014	2019	5	0.00	10.094	0
76C43	8	St. Clair	I 70	2014	2021	7	0.01	13.188	0
60401	1	Cook	IL 53	2004	2016	12	0.12	35.692	0
60401	1	Cook	IL 53	2004	2017	13	0.00	38.479	0
82106	1	Cook	IL 94	1993	2013	20	0.67	63.444	0
82106	1	Cook	IL 94	1993	2014	21	0.67	65.987	0

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CRCP Patching Quantities from Historical Distress Surveys

Contract Number	District	County	Marked Route	Year of Construction	Survey Year	Pavevment Age	Percent Patching	Cumulative ESALs (x10 ⁶)	Overlay Status
82106	1	Cook	IL 94	1993	2015	22	0.67	68.530	0
82106	1	Cook	IL 94	1993	2016	23	1.06	71.073	0
82106	1	Cook	IL 94	1993	2017	24	1.07	73.216	0

0 - Denotes Bare Pavement
 1 - Denotes 1st Overlay
 2 - Denoted 2nd Overlay

Appendix D – Maintenance and Rehabilitation Activity Schedules

ACTIVITY 1 — YEAR 10 • 0.10% Class B Pavement Patching
ACTIVITY 2 — YEAR 15 • 0.20% Class B Pavement Patching
ACTIVITY 3 — YEAR 20 • 2.0% Class B Pavement Patching • 0.50% Class C Shoulder Patching • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing
ACTIVITY 4 — YEAR 25 • 3.0% Class B Pavement Patching • 1.0% Class C Shoulder Patching
ACTIVITY 5 — YEAR 30 • 4.0% Class B Pavement Patching • 1.5% Class C Shoulder Patching • Policy HMA Overlay of Pavement and Shoulder (see Chapter 53-4.04 for thickness)
ACTIVITY 6 — YEAR 35 • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random Crack Routing & Sealing (see Note) • 40% Reflective Transverse Crack Routing & Sealing • 0.10% Partial-Depth Pavement Patching (Mill & Fill Surface - Interstates; Mill & Fill 2.50 in. - Non-Interstates)
ACTIVITY 7 — YEAR 40 • 0.50% Class B Pavement Patching • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 60% Reflective Transverse Crack Routing & Sealing • 50% Random Crack Routing & Sealing (see Note) • 0.50% Partial-Depth Pavement Patching (Mill & Fill Surface - Interstates; Mill & Fill 2.50 in. - Non-Interstates)

Note: For random crack routing and sealing, assume 100 ft/station/lane.

**MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE
JOINTED PLAIN CONCRETE PAVEMENT
AND UNBONDED JOINTED PLAIN CONCRETE OVERLAY**

Figure 54-7.A

ACTIVITY 1 — YEAR 10
• 0.10% Class A Pavement Patching
ACTIVITY 2 — YEAR 15
• 0.20% Class A Pavement Patching
ACTIVITY 3 — YEAR 20
• 0.50% Class A Pavement Patching • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing
ACTIVITY 4 — YEAR 25
• 0.75% Class A Pavement Patching • 0.50% Class C Shoulder Patching
ACTIVITY 5 — YEAR 30
• 3.0% Class A Pavement Patching • 1.0% Class C Shoulder Patching • Policy HMA Overlay of Pavement and Shoulder (see Chapter 53-4.04 for thickness)
ACTIVITY 6 — YEAR 35
• 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random Crack Routing & Sealing (see Note) • 0.10% Partial-Depth Pavement Patching (Mill & Fill Surface)
ACTIVITY 7 — YEAR 40
• 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random Crack Routing & Sealing (see Note) • 0.50% Class A Pavement Patching • 0.50% Partial-Depth Patching (Mill & Fill Surface)

Note: For random crack routing and sealing, assume 100 ft/station/lane.

**MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
AND UNBONDED CONTINUOUSLY REINFORCED CONCRETE OVERLAY**

Figure 54-7.B

ACTIVITY 1 — YEAR 5 • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random/Thermal Crack Routing & Sealing (see Note) • 0.10% Partial-Depth Pavement Patching (Mill & Fill Surface)
ACTIVITY 2 — YEAR 10 • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random/Thermal Crack Routing & Sealing (see Note) • 0.50% Partial-Depth Pavement Patching (Mill & Fill Surface)
ACTIVITY 3 — YEAR 15 • 2.00 in. Milling - Pavement & Shoulder • 1.0% Partial-Depth Pavement Patching (Mill & Fill Additional 2.00 in.) • 2.00 in. HMA Overlay - Pavement & Shoulder
ACTIVITY 4 — YEAR 20 • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random/Thermal Crack Routing & Sealing (see Note) • 0.10% Partial-Depth Pavement Patching (Mill & Fill Surface)
ACTIVITY 5 — YEAR 25 • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random/Thermal Crack Routing & Sealing (see Note) • 0.50% Partial-Depth Pavement Patching (Mill & Fill Surface)
ACTIVITY 6 — YEAR 30 Interstate Standard Design: • 2.00 in. Milling - Pavement Only • 2.0% Partial-Depth Pavement Patching (Mill & Fill Additional 2.00 in.) • 1.0% Partial-Depth Shoulder Patching (Mill & Fill Surface) • 3.75 in. HMA Overlay Pavement • 1.75 in. HMA Overlay Shoulder Other State Maintained Route Standard Design: • 2.00 in. Milling - Pavement & Shoulder • 2.0% Partial-Depth Pavement Patching (Mill & Fill Additional 2.00 in.) • 1.0% Partial-Depth Shoulder Patching (Mill & Fill Additional 2.00 in.) • 2.25 in. HMA Overlay Pavement & Shoulder All Limiting Strain Criterion Designs: • 2.00 in. Milling - Pavement & Shoulder • 2.0% Partial-Depth Pavement Patching (Mill & Fill Additional 2.00 in.) • 1.0% Partial-Depth Shoulder Patching (Mill & Fill Additional 2.00 in.) • 2.00 in. HMA Overlay - Pavement & Shoulder

**MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE
FULL-DEPTH HMA PAVEMENT
AND HMA OVERLAY OF RUBBLIZED PCC PAVEMENT**

Figure 54-7.C

ACTIVITY 7 — YEAR 35 • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random/Thermal Crack Routing & Sealing (see Note) • 0.10% Partial-Depth Pavement Patching (Mill & Fill Surface)
ACTIVITY 8 — YEAR 40 • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random/Thermal Crack Routing & Sealing (see Note) • 0.50% Partial-Depth Pavement Patching (Mill & Fill Surface)

Note: For random/thermal crack routing and sealing, assume 110 ft/station/lane.

**MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE
FULL-DEPTH HMA PAVEMENT
AND HMA OVERLAY OF RUBBLIZED PCC PAVEMENT**

**Figure 54-7.C
(Continued)**

54-7.04 Cost Analysis

The costs of all major pay items will be based upon the anticipated quantities for the contract. Computations that are used to develop costs will be documented for each major pay item. Contact the BDE for the Department's computer analysis procedures for life-cycle cost estimation.

54-7.05 Selection Process

Pavement selection will be based on the annual costs of initial construction and life-cycle activities amortized over the 45-year service life of the pavement. A discount rate of 3% will be used to determine annual costs and no adjustment for inflation will be required. Use the following equation to determine annual costs of alternatives during the selection process:

$$A = D + M + CRF_n [C + R_1(PWF_{n1}) + R_2(PWF_{n2}) + \dots + R_n(PWF_{nn})] \quad \text{Equation 54-7.1}$$

where:

- A = total annual cost per mile
- D = annual administrative and overhead cost per mile (assumed to be equal for all pavement types; therefore, do not include in analysis)
- M = total annual maintenance cost per mile (assumed to be equal for all pavement types; therefore, do not include in analysis)

Appendix E –
Proposed Revisions to
Maintenance and
Rehabilitation Activity
Schedules

ACTIVITY 1 — YEAR 5 • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random/Thermal Crack Routing & Sealing (see Note) • 0.10% Partial-Depth Pavement Patching (Mill & Fill Surface)
ACTIVITY 2 — YEAR 10 • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random/Thermal Crack Routing & Sealing (see Note) • 0.50% Partial-Depth Pavement Patching (Mill & Fill Surface)
ACTIVITY 3 — YEAR 15 • 2.00 in. Milling - Pavement & Shoulder • 1.0% Partial-Depth Pavement Patching (Mill & Fill Additional 2.00 in.) • 2.00 in. HMA Overlay - Pavement & Shoulder
ACTIVITY 4 — YEAR 20 • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random/Thermal Crack Routing & Sealing (see Note) • 0.10% Partial-Depth Pavement Patching (Mill & Fill Surface)
ACTIVITY 5 — YEAR 25 • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random/Thermal Crack Routing & Sealing (see Note) • 0.50% Partial-Depth Pavement Patching (Mill & Fill Surface)
ACTIVITY 6 — YEAR 30 Interstate Standard Design: • 2.00 in. Milling - Pavement Only • 2.0% Partial-Depth Pavement Patching (Mill & Fill Additional 2.00 in.) • 1.0% Partial-Depth Shoulder Patching (Mill & Fill Surface) • 3.75 in. HMA Overlay Pavement • 1.75 in. HMA Overlay Shoulder Other State Maintained Route Standard Design: • 2.00 in. Milling - Pavement & Shoulder • 2.0% Partial-Depth Pavement Patching (Mill & Fill Additional 2.00 in.) • 1.0% Partial-Depth Shoulder Patching (Mill & Fill Additional 2.00 in.) • 2.25 in. HMA Overlay Pavement & Shoulder All Limiting Strain Criterion Designs: • 2.00 in. Milling - Pavement & Shoulder • 2.0% Partial-Depth Pavement Patching (Mill & Fill Additional 2.00 in.) • 1.0% Partial-Depth Shoulder Patching (Mill & Fill Additional 2.00 in.) • 2.00 in. HMA Overlay - Pavement & Shoulder

**MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE
FULL-DEPTH HMA PAVEMENT
AND HMA OVERLAY OF RUBBLIZED PCC PAVEMENT**

Figure 54-7.C

ACTIVITY 7 — YEAR 35 • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random/Thermal Crack Routing & Sealing (see Note) • 0.10% Partial-Depth Pavement Patching (Mill & Fill Surface)
ACTIVITY 8 — YEAR 40 • 100% Longitudinal Shoulder Joint Routing & Sealing • 100% Centerline Joint Routing & Sealing • 50% Random/Thermal Crack Routing & Sealing (see Note) • 0.50% Partial-Depth Pavement Patching (Mill & Fill Surface)

Note: For random/thermal crack routing and sealing, assume 110 ft/station/lane.

**MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE
FULL-DEPTH HMA PAVEMENT
AND HMA OVERLAY OF RUBBLIZED PCC PAVEMENT**

**Figure 54-7.C
(Continued)**

54-7.04 Cost Analysis

The costs of all major pay items will be based upon the anticipated quantities for the contract. Computations that are used to develop costs will be documented for each major pay item. Contact the BDE for the Department's computer analysis procedures for life-cycle cost estimation.

54-7.05 Selection Process

Pavement selection will be based on the annual costs of initial construction and life-cycle activities amortized over the 45-year service life of the pavement. A discount rate of 3% will be used to determine annual costs and no adjustment for inflation will be required. Use the following equation to determine annual costs of alternatives during the selection process:

$$A = D + M + CRF_n [C + R_1(PWF_{n1}) + R_2(PWF_{n2}) + \dots + R_n(PWF_{nn})] \quad \text{Equation 54-7.1}$$

where:

- A = total annual cost per mile
- D = annual administrative and overhead cost per mile (assumed to be equal for all pavement types; therefore, do not include in analysis)
- M = total annual maintenance cost per mile (assumed to be equal for all pavement types; therefore, do not include in analysis)