WSDOT Pavement Preservation Guide for Local Agencies

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WSDOT Pavement Preservation Guide for Local Agencies

An assessment of the outreach and implementation needs for WSDOT Local Programs to improve pavement preservation within the State

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16. ABSTRACT

This report was intended to address two key objectives: (1) identify usage and implementation gaps found in local agency asset management practices due to decreased resources and develop guidance for local agencies on recommended practices and tools to effectively manage their roadway assets, and (2) identify knowledge gaps across WSDOT and local agencies with respect to pavement preservation and pavement maintenance practices and provide WSDOT a recommendation on how to address training and outreach needs for increased pavement preservation and maintenance demands statewide.

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DISCLAIMER

The contents of this report reflect the views of the author, who is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Washington State Department of Transportation or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

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Executive Summary

The constraints on state and local agency resources have increased the importance of using best practices and policies to properly manage and maintain roadway assets. Given the importance of these assets to the functioning of the roadway network system, the extensive asset inventories each agency must manage, costs of data collection and management, selection of appropriate treatments, and proper application of treatments, it is important to carefully consider how to best allocate scarce resources to ensure proper management of roadway assets.

This report was intended to address two key objectives: (1) identify usage and implementation gaps found in local agency asset management practices due to decreased resources and develop guidance for local agencies on recommended practices and tools to effectively manage their roadway assets, and (2) identify knowledge gaps across WSDOT and local agencies with respect to pavement preservation and pavement maintenance practices and provide WSDOT a recommendation on how to address training and outreach needs for increased pavement preservation and maintenance demands statewide.

To understand the landscape in Washington State and ultimately generate recommendations, a review of the available literature, tools, and state-of-the-practice in asset management was performed to identify practices and tools in use by other agencies that can assist local agency partners in managing their assets effectively. Second, this report relied on the results of two different surveys and numerous discussions amongst statewide agency participants in order to identify state-of-the-practice and current implementation of pavement preservation within Washington State.

Based on the results of the outreach the following implementation and usage gaps of pavement preservation programs were identified: (1) Not all stakeholders understand the financial impacts of managing and maintaining their largest asset effectively, (2) there are different practices for conducting pavement management within the state and no “minimum standard” by which to operate, (3) there is a wide variety of data collection practices used to assess pavement conditions increasing risk of inconsistent, unreliable data, (4) treatment type selection is inconsistent across the state and does not always follow industry best practices, and (5) there are incongruent performance indicators and measurements making it difficult to administer resources across agency boundaries and the state.

To address the outreach and implementation gaps identified in this report it is recommended that WSDOT Local Programs pursue a systematic approach to raise awareness and facilitate rapid adoption of pavement preservation best practices that addresses three core areas: (1) providing training and tools to local agencies in order to address the large knowledge gaps that exist with regard to asset management and pavement preservation within the local community, (2) work with local agencies and regional organizations to incentivize consistent condition rating and reporting practices such that agencies can better evaluate over time and amongst each other, and (3) set, measure, and manage key performance indicators around proper use and implementation of pavement preservation techniques and asset management.

WSDOT Pavement Preservation Guidelines for Local Agencies

Introduction

The constraints on state and local agency resources have increased the importance of using best practices and policies to properly manage and maintain roadway assets. Given the importance of these assets to the functioning of the roadway network system, the extensive asset inventories each agency must manage, costs of data collection and management, selection of appropriate treatments, and proper application of treatments, it is important to carefully consider how to best allocate scarce resources to ensure proper management of roadway assets.

Objectives

The objective of this research is to examine the current state of pavement preservation practices in Washington State and develop guidance and a broader roadmap of activities to address the agency's outreach and implementation goals across the state. The goals of this report are:

1. Identify usage and implementation gaps found in local agency asset management practices due to decreased resources and develop guidance for local agencies on recommended practices and tools to effectively manage their roadway assets
2. Identify knowledge gaps across WSDOT and local agencies with respect to pavement preservation and pavement maintenance practices and provide WSDOT a recommendation on how to address training and outreach needs for increased pavement preservation and maintenance demands statewide

This report will attempt to identify the knowledge and implementation gaps within the study scope and provide recommended next steps to the agency in order to address the gaps effectively and efficiently. The recommendations are intended for agency personnel to be used as guidance on appropriate outreach and development efforts to ensure successful pavement preservation across Washington State.

Background

The following section presents key definitions and concepts related to the discussion contained within this report.

Pavement Preservation

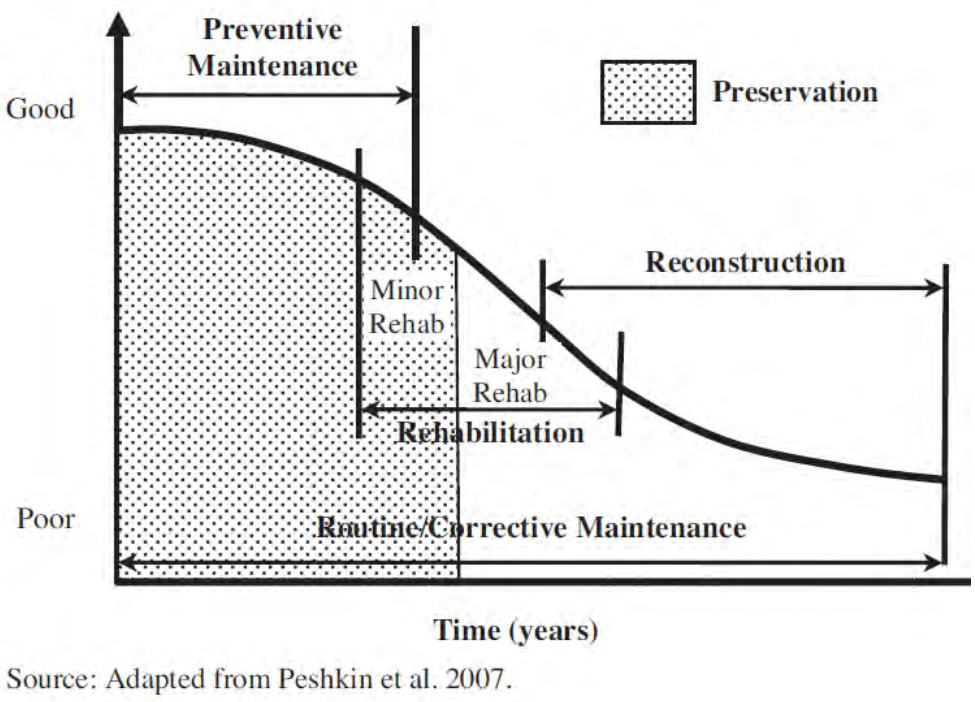
Pavement Preservation is defined as "a program employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety and meet motorist expectations." (Geiger, 2005)

An effective pavement preservation program will address pavements while they are still in good condition and before the onset of serious damage. By applying a cost-effective treatment at the right time, the pavement is restored to its "almost original" condition. The cumulative effect of systematic, successive preservation treatments is to postpone costly rehabilitation and reconstruction. During the life of a pavement, the cumulative discount value of the series of pavement preservation treatments is

substantially less than the discounted value of the more extensive, higher cost of reconstruction and generally more economical than the cost of major rehabilitation. Additionally, performing a series of successive pavement preservation treatments during the life of a pavement is less disruptive to uniform traffic flow than the long closures normally associated with reconstruction projects.

Treatment Classification

There are several different treatment classifications that relate to pavement preservation. As seen in the pavement performance curve in Figure 1 below (FHWA, Peshkin et. al), this report will focus on the preservation treatments indicated by the shaded region.



Source: Adapted from Peshkin et al. 2007.

Figure 1. Relationship of Pavement Condition and Different Categories of pavement treatment (FHWA, Peshkin et. al).

Pavement Preservation programs commonly include a number of different treatment activities, including a combination of the following:

Preventive Maintenance

Preventive Maintenance is defined as "a planned strategy of cost-effective treatments to an existing roadway system and its appurtenances that preserves the system, retards future deterioration, and maintains or improves the functional condition of the system (without significantly increasing the structural capacity)." (AASHTO)

Preventive maintenance is typically applied to pavements in good condition having significant remaining service life. As a major component of pavement preservation, preventive maintenance is a strategy of extending the service life by applying cost-effective treatments to the surface or near-surface of structurally sound pavements. Examples of preventive treatments include asphalt crack sealing, chip

sealing, slurry or micro-surfacing, thin and ultra-thin asphalt overlays, concrete joint sealing, diamond grinding, dowel-bar retrofit, and isolated, partial and/or full-depth repairs.

Minor Rehabilitation

A minor rehabilitation normally occurs in the earlier years of a pavement's life when serviceability becomes a concern, but structural integrity remains. These treatments involve nonstructural enhancements (e.g., thin asphalt overlay, mill and thin asphalt overlay) made to an existing pavement section to either eliminate age-related, top-down surface cracking that develops in flexible pavements due to environmental exposure or to restore functionality of concrete pavements. Because of the nonstructural nature of minor rehabilitation techniques, these types of rehabilitation techniques are placed in the category of pavement preservation (Geiger, 2005).

Routine/Corrective Maintenance

Routine Maintenance "consists of work that is planned and performed on a routine basis to maintain and preserve the condition of the highway system or to respond to specific conditions and events that restore the highway system to an adequate level of service." (AASHTO)

Routine maintenance consists of day-to-day activities that are scheduled by maintenance personnel to maintain and preserve the condition of the highway system at a satisfactory level of service. Examples of pavement-related routine maintenance activities include cleaning of roadside ditches and structures, maintenance of pavement markings and crack filling, pothole patching and isolated overlays. Crack filling is another routine maintenance activity which consists of placing a bituminous or slurry material into "non-working" cracks to substantially reduce water infiltration. Depending on the timing of application, the nature of the distress, and the type of activity, certain routine maintenance activities may be classified as preservation. Routine Maintenance activities are often "in-house" or agency-performed and are not normally eligible for Federal-aid funding.

Treatment Selection

There are many factors that affect the selection of the appropriate treatment within a pavement preservation context. Guidelines for project and treatment selections for pavement preservation as described by Peshkin et al in SHRP R-26 list the following as the primary factors affecting treatment selection:

- Traffic levels
- Pavement condition
- Climate/environment
- Work zone duration restrictions
- Treatment performance, and
- Cost

While all of these factors are important in the pavement type selection, this report will focus on pavement condition and treatment performance as it pertains to network data collection as a part of an agency's asset management program.

In selecting the right preservation treatment for a pavement, the condition of the existing pavement and the desired treatment performance all have a large factor in cost. Not only is the overall condition important, but the specific distresses present on the pavement also impact the selection of the proper preservation treatment.

Asset Management

Transportation Asset Management is defined as: "… a strategic and systematic process of operating, maintaining, upgrading and expanding physical assets effectively throughout their lifecycle. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision making based upon quality information and well-defined objectives." (FHWA)

In the context of this report we focus on the pavement management component of asset management as it relates to a preservation program given that most agency's roadway infrastructure is the largest asset they own and manage.

Research Approach

To help generate the conclusions and recommendations found in this report, several different methods were utilized to assess the current state of the industry in Washington State.

First a review of the available literature, tools, and state-of-the-practice in asset management was performed to identify practices and tools in use by other agencies that can assist local agency partners in managing their assets effectively. The documents included in this review can be found in the "Resources" section at the conclusion of this report.

Second, this report relied on the results of two different surveys and numerous discussions amongst industry participants in order to identify state-of-the-practice and current implementation of pavement preservation within Washington State. The survey results included were:

1. **MRSC Pavement Preservation/Maintenance Program Survey – Washington (MRSC).** This survey was conducted in August of 2012 and included 62 responses from Washington State. The survey was distributed through three main methods: (1) an MRSC internal city-county email distribution list, (2) through WSDOT's "The Pavement Community Listserv" and (3) through the North West Pavement Management Association (NWPMA).

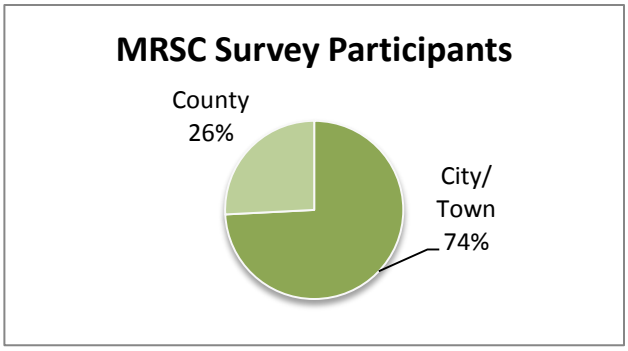


Figure 2. MRSC Survey Participants.

2. **WSDOT Preservation Survey (WPS).** This survey was conducted September 2012 and included 34 respondents from Washington State. The survey was conducted electronically and was distributed through WSDOT's "The Pavement Community Listserv".

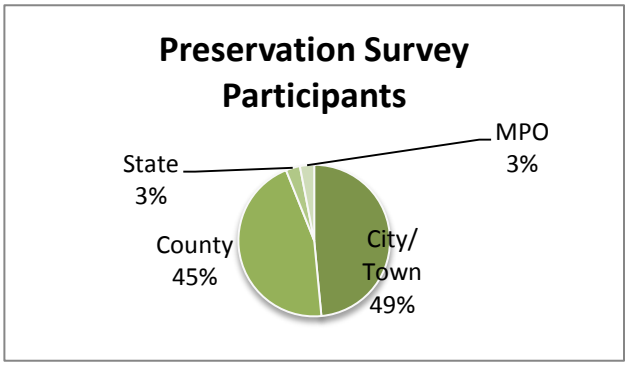


Figure 3. WSDOT Preservation Survey Participants.

Finally, informal discussions with local and state agency personnel, industry experts, and members of academia were conducted to gather a national perspective on the issues affecting Washington State for this report.

Preservation Program Assessment

This report considered the key elements of a Preservation Program including those of Pavement Management (data collection, condition rating, and decision making) to be those as seen in Figure 4 Figure 4. A diagram of the elements considered for this research in the pavement preservation programbelow.

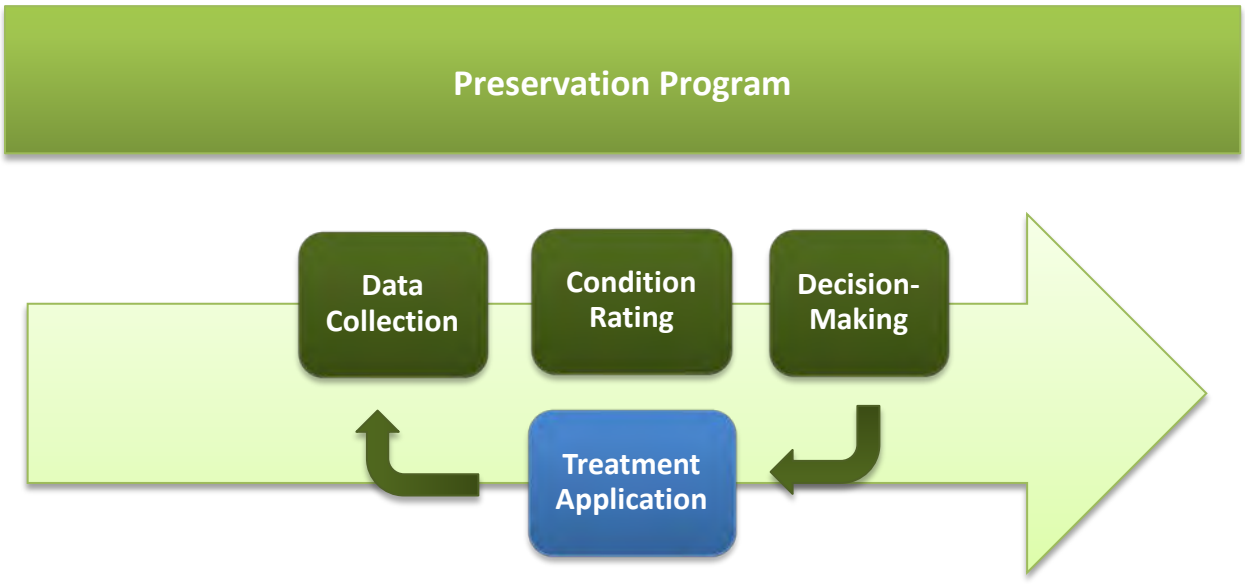


Figure 4. A diagram of the elements considered for this research in the pavement preservation program.

In order to effectively assess the current state of the practice within Washington State the critical knowledge and implementation factors for defining success are shown in Table 1 for each element. Each of these goals and objectives outline what is common to successful, sustainable pavement preservation programs. Further in this report, these success factors will be compared to the current state of the practice in Washington in order to generate conclusions and recommendations.

Table 1. Critical knowledge and implementation factors for each element of a pavement preservation program.

Element	Critical knowledge and implementation factors for success
Preservation Program	• Understanding the importance of asset management for effective maintenance of a road network • Ability to identify the assets and resources involved in a pavement preservation program • Ability to allocate resources cost-effectively across a network of agencies and/or roads within an agency
Data Collection	• Data and information needs required to manage road network assets • Ability to produce consistent inputs and observations (quality control) • Ability to reproduce results (quality assurance)

Condition Rating	• Ability to project future pavement condition • Ability to compare results across different data collection and analysis processes • Defining congruent performance indicators and measurements to effectively administer resources amongst agency needs
Decision Making	• Proper timing of treatments to provide maximum effectiveness • Proper treatment selection that balances all selection factors for maximum impact • Use of a decision tree for pavement management decisions
Treatment Application	• An understanding of common preservation and maintenance treatments in Washington State • Best practices for treatment application to ensure treatment effectiveness • Case studies to evaluate and demonstrate evolving preservation treatments

Stakeholders

The application of the critical knowledge and implementation factors depends on numerous stakeholders. The following table describes the various audience types and their role in a pavement preservation program.

Table 2. A description of the stakeholders involved in a Pavement Preservation program and their key responsibilities.

Stakeholder Group	Key Characteristics
Executives (Administration, Management, Elected/Regional Officials)	• Responsible for policy making, priorities, and resource allocation • Require consistent data and information to allocate resources effectively
Pavement Management (Pavement Managers, Road Supervisor, City Engineers, Public Works Officials)	• Responsible for administration and oversight of preservation program and treatment application • Identify and plan future maintenance and rehabilitation work
Project Level Engineers (Design Engineer, Consulting Engineers)	• Participant in treatment selection • Responsible for project level design
Field Personnel (Condition Rating Personnel, Field Inspectors, Consultants)	• Responsible for collecting consistent data for asset management program • Responsible for providing consistent, repeatable, pavement condition ratings
Maintenance/Construction (Road crews, contractors, field staff)	• Responsible for proper application of treatment to maximize treatment effectiveness • Require knowledge of treatment application best practices

In order to identify the most effective knowledge and implementation efforts the stakeholder participation in the various elements of a preservation program were analyzed and categorized as seen in Table 3 below. This is subsequently used to classify what knowledge and tools should be available to each stakeholder to successfully accomplish their role in an element.

Table 3. Stakeholder participation in each element of Pavement Preservation.

	Element				
Stakeholder Audience	**Preservation Program**	**Data Collection**	**Condition Rating**	**Decision Making**	**Treatment Application**
Executives	✓				
Pavement Managers	✓	✓	✓	✓	
Engineers		✓	✓	✓	
Inspectors/ Field Personnel		✓	✓		✓
Maintenance Construction Road Crews					✓

It should be noted that the stakeholder definitions and responsibilities defined above vary from agency to agency depending on size, but in general, each agency will have an individual that fits one or more of these roles.

Data Collection

The data and information needs required to manage road network assets are a critical element to a successful preservation program. The attributes listed in Table 4 have been identified as having a contributing factor to success irrespective of the amount of resources available to an agency.

Table 4. Attributes of data collection across varying resource levels.

Resource requirements	Less	More
Collection method	• Walking survey • Windshield survey	• Electronic/Vehicle Mounted Sensors and Cameras
Sampling practice	• Representative segments or complete sample • 100% sample of outermost (most-traveled) lane •	• 100% sample of outermost (most-traveled) lane
Distress evaluation	• Human eye	• Cameras for surface distress classification (still images or video) • Laser profiler or accelerometer for roughness • Rut depth sensors (number of sensors varies)
Distresses identified	• Surface distresses via on-location visual inspection	• Surface distresses via on-location visual inspection • Ride/Roughness • Rut Depth
Issues to Consider	• Reliant on inspector consistency • Minimal quality assurance techniques (no stored raw data)	• Sensor readings are repeatable • Reliant on inspector consistency • Raw data is captured to perform quality assurance

Observations

Several notable observations the research team made regarding data collection techniques currently in use amongst Washington State local agencies include:

- A majority of agencies are using manual visual survey methods (windshield or walking) that do not store raw visual data for later processing
- There is a wide degree of tools and software used to collect data within the state, not surprising many are home-grown solutions. Outside of the common tools, over 37.5% used other tools which primarily consisted on some type of hand written or paper based form, and a couple of vehicle mounted camera/laser surface testers.
- While agencies vary in their data collection coverage (representative sample vs. 100% coverage) there is a strong feeling that either method is measuring what needs to be managed
- The frequency of condition rating varies dramatically between 1 and 6 years for data collection for cities. Currently counties in Washington are mandated to do it every 2 years while cities are strongly encouraged to do so.

The following plots have been generated from select questions of the survey results. The entire survey and its results can be found in the Appendix.

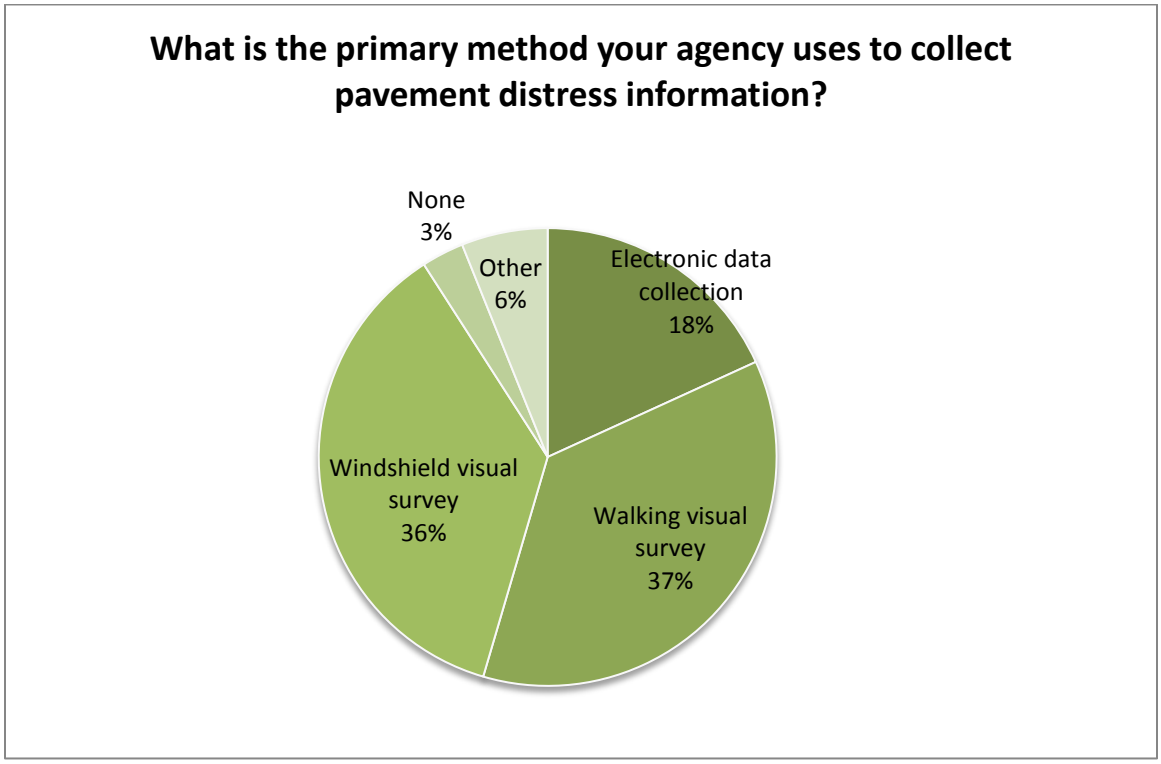


Figure 5. Distribution of data collection techniques within Washington State (from WPS).

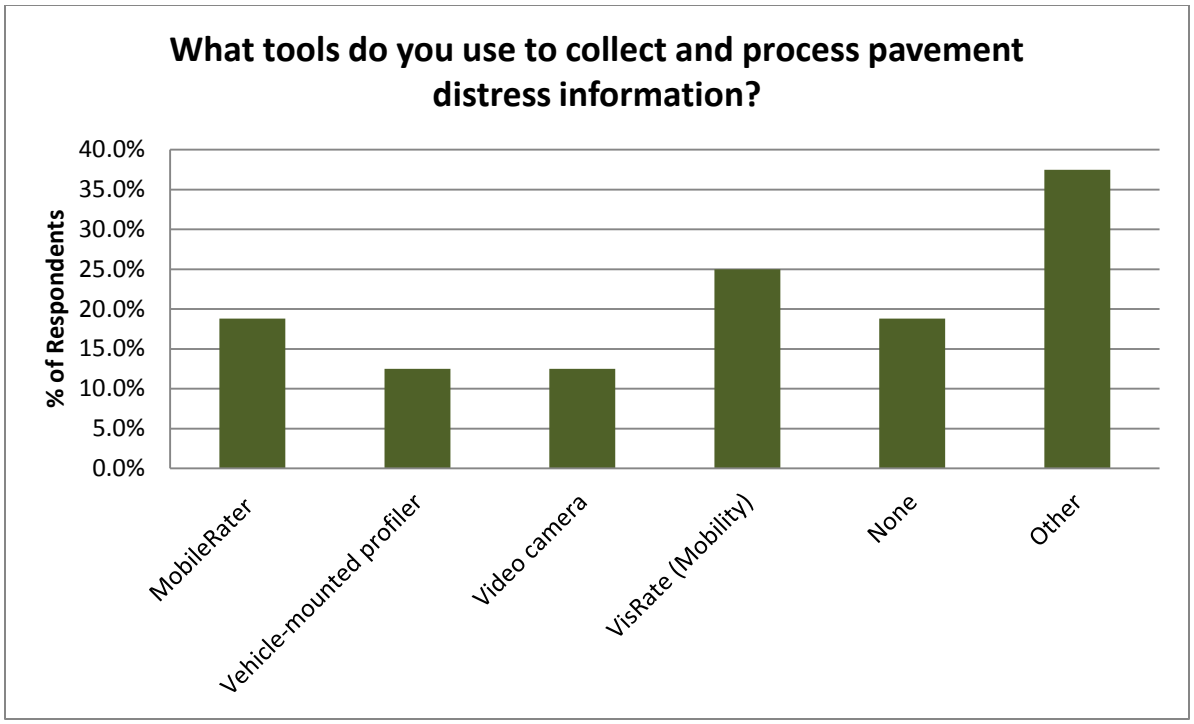


Figure 6. Tools used by local agencies in Washington State for data collection (from WPS).

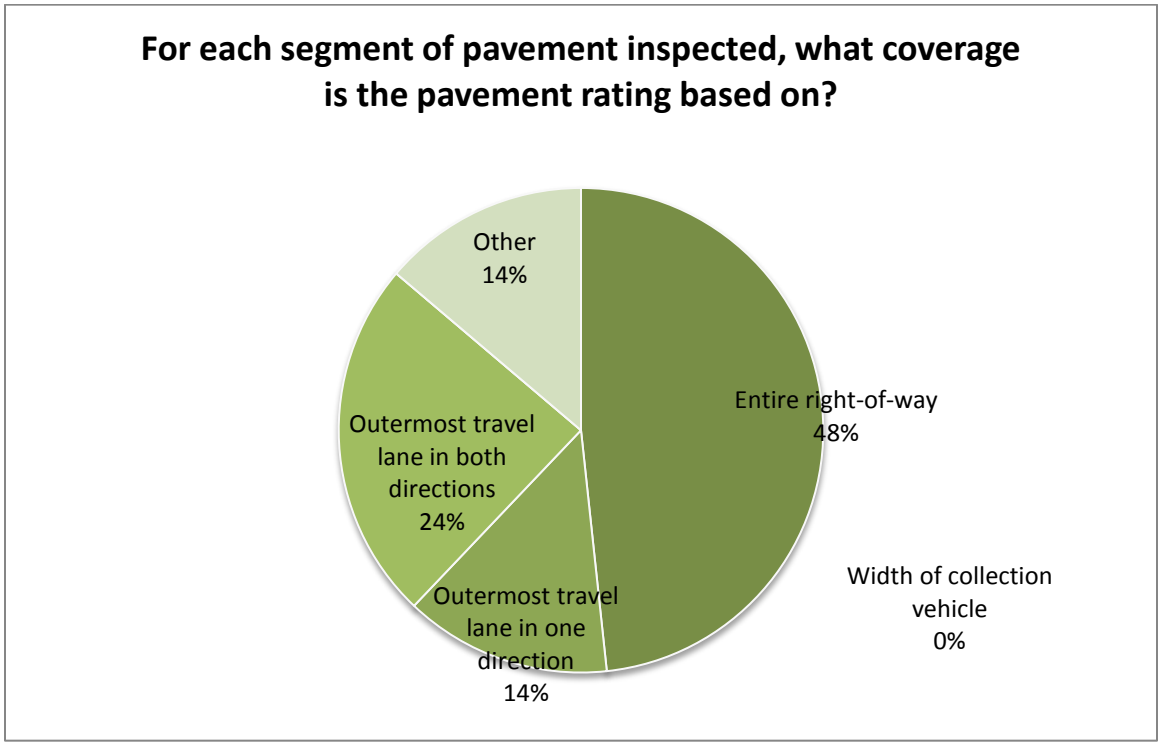


Figure 7. Coverage of pavement inspected (from WPS).

Condition Rating

The condition rating process is an extremely important element in determining an objective pavement condition that can be compared across the network. The following range of practices listed in Table 5 have been identified as they measure against the goal of objective condition rating.

Table 5. Attributes of condition rating across varying levels of objectivity.

Objectivity	Less → More			
Rating type	• Binary assessment	• Numeric quality rating	• Deduct-based index	• Semi or Automated rating
Rating quality indicators	• Surface distress	• Surface distress • Riding qualities	• Surface distress • Smoothness	• Surface distress • Smoothness • Rutting
Example form of rating	• Acceptable/ Unacceptable	• 0-5	• Scale of 100	• Multiple variables indexed (distress, roughness, etc.)
Example rating standard	• None (inspector judgment)	• PSR or PSI (AASHO Road Test)	• PSC, PCR, PCI (U.S. Army Corps of Engineers)	• PCI, IRI, and other classification systems
Issues to consider	• Does not distinguish between distress types	• Does not distinguish between distress types • Minimum requirement for HPMS	• How to convert between measures in order to compare	• How to convert between measures in order to compare

Observations

Several notable observations regarding condition rating techniques currently in use amongst Washington State local agencies include:

- There is no consistent choice in pavement condition format amongst participating agencies
- It is difficult to compare pavement conditions between various condition rating systems
- Agencies are currently recording a large enough number of distress measurements to use a common reporting platform
- There are still a significant number of agencies that are not performing a standard condition rating of their network
- Almost half of agencies contract out the rating service to a vendor or third party

The following plot(s) have been generated from select questions of the survey results. The entire survey and its results can be found in the Appendix.

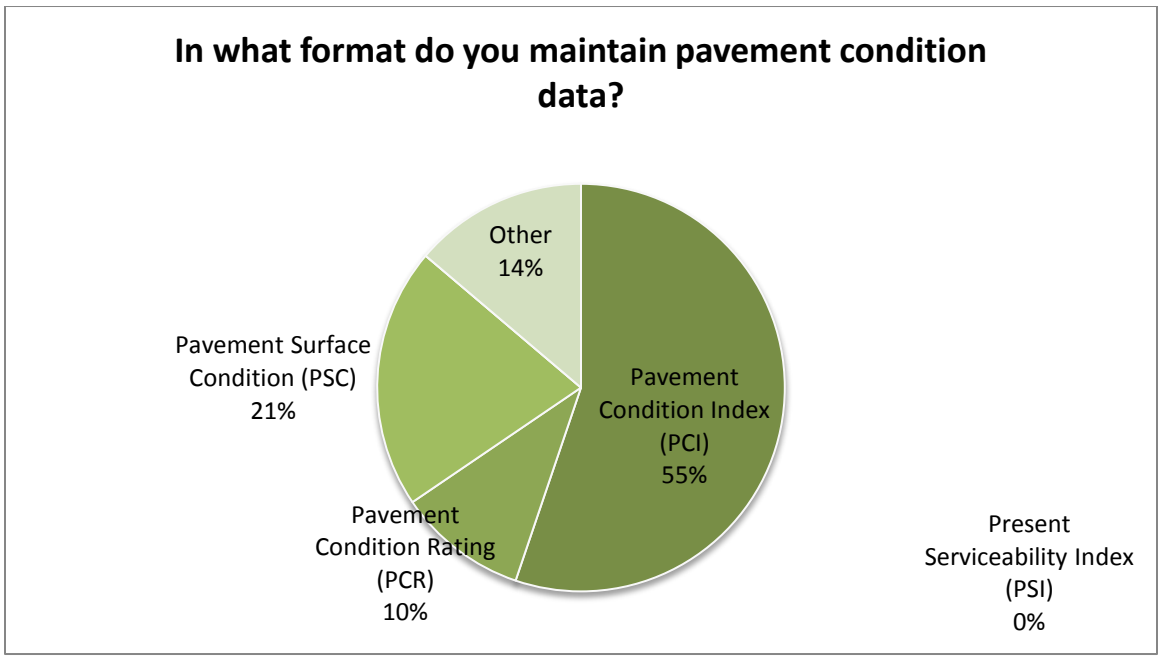


Figure 8. Distribution of various rating systems used in Washington State (from WPS).

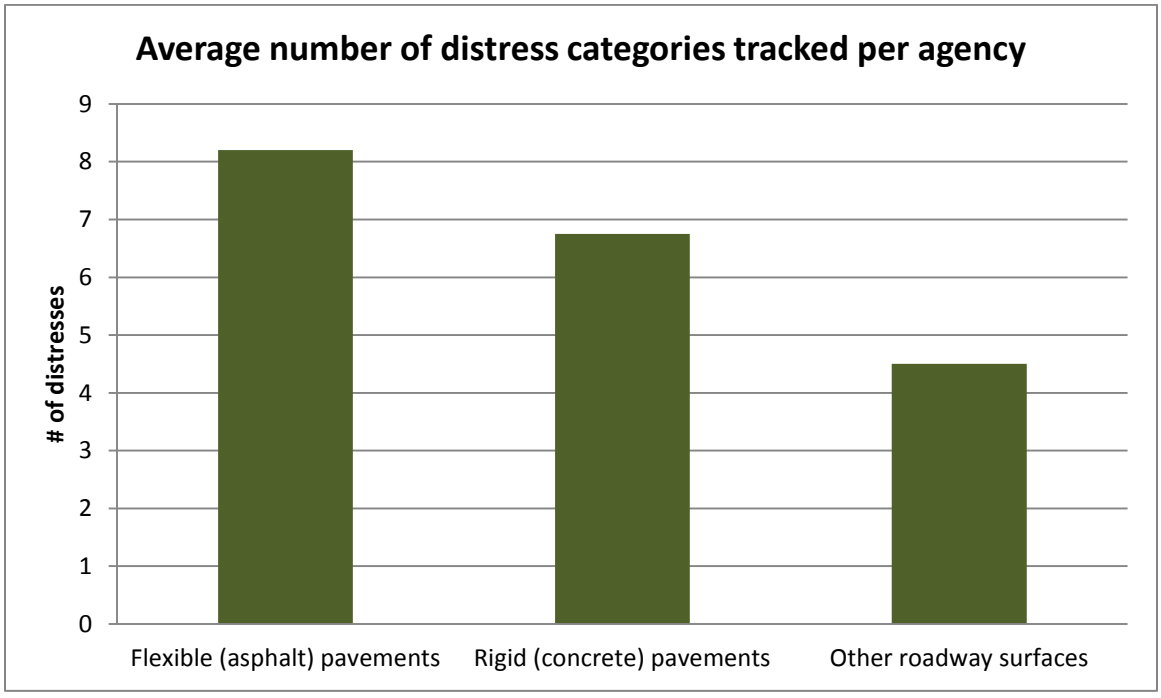


Figure 9. Average number of distress categories tracked per agency (from WPS).

Decision-Making

The decision making element of the pavement preservation process requires a thorough understanding of the options available to meet the agencies objectives as well as sound data to base those decisions on. The following range of practices listed in Table 6 have been identified as they measure against the goal of objective condition rating.

Table 6. Attributes of a pavement management system across varying levels of technology usage.

Unbiased	Less		More
Data management characteristics	• Paper forms • Spreadsheet	• Database • Maintains Historical information	• Database • Historical information • Analytical tools • GIS enabled
Data management abilities	• Pavement	• Pavement	• Pavement • Other assets
Project decision making tools	• Worst first • Administrator judgment • Street or project level	• Standard deterioration curves • Worst first • Street or project level	• Calibrated deterioration curves • Run multiple scenarios based on funding and policy • Network level
Pavement type selection	• Based on past experience	• Based on past experience • Design engineer recommendations	• Decision trees • Budgets and scenarios • Easier to combine with other local projects • Manage constraints • Spatial analysis
Issues to consider	• Inconsistent treatment selection – may not be what is best suited for effective preservation	• Limited ability to run scenarios for different treatment types • Hard to perform tradeoff analysis between treatments	• Higher cost to implement and manage • Can provide Life-cycle cost analysis (LCCA) • Not always appropriate for each agency

Observations

Below are several notable observations regarding decision making and pavement management practices currently in use amongst Washington State local agencies. They include:

- Most all agencies (85%) have some form of a pavement management program
- There is a wide variety of software tools available and in use by local agencies. Outside of the common tools, other tools identified were Carte Graph, Lucity, and in-house legacy solutions.
- A majority of agencies using pavement management software require no customization for it to work for their program and policies
- Over half (61.3%) of all agencies have a defined goal for its pavement condition index (or equivalent measure) although there is no common standard for break points for rating between agencies.
- There is an increasing amount of emphasis put on using pavement management decision trees to select treatments and properly allocate resources
- There is no common Preservation Treatment Decision Matrix to guide treatment type selection, meaning similarly deficient roadways may not get a similar treatment performed based primarily on lack of knowledge of available treatment options.

The following plot(s) have been generated from select questions of the survey results. The entire survey and its results can be found in the Appendix.

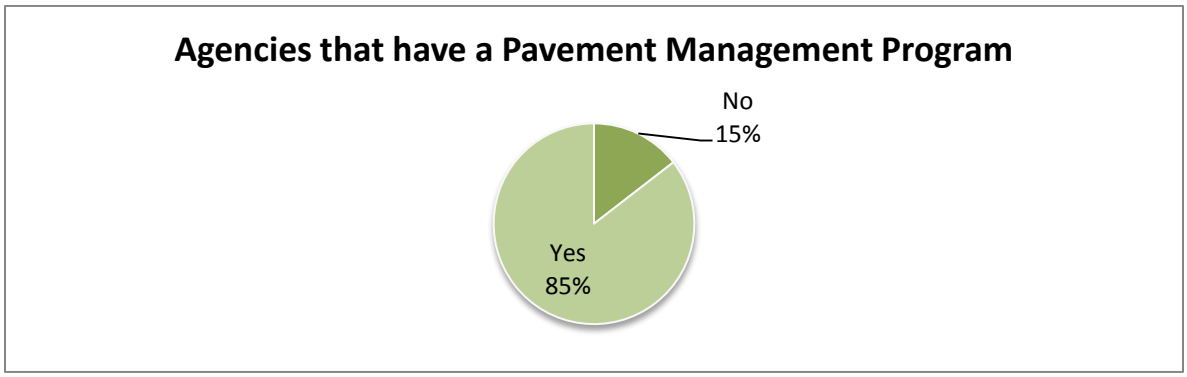


Figure 10. Washington State agencies with a pavement management program.

Table 7. Primary influence factors in preservation treatment selection.

	Amount of Influence on preservation treatment selection	Weighted Ranking (higher)
1.	Availability of funds	238
2.	Decision tree and recommendations from your pavement management system	191
3.	Requirements imposed by funding sources	159
4.	Length of time since a pavement was last treated	152
5.	Public input such as volume of complaints about specific roadways	135
6.	Priorities of elected officials	124
7.	Availability of contractors and needed materials	77

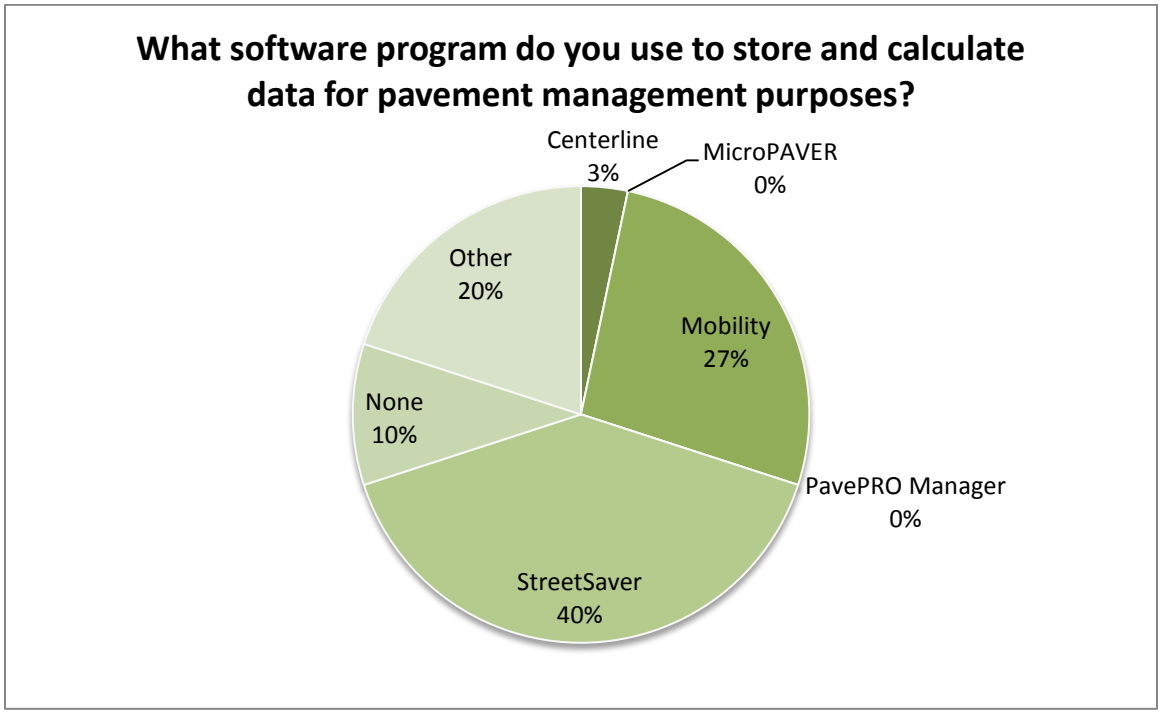


Figure 11. Software tools used by local agencies to manage their pavements.

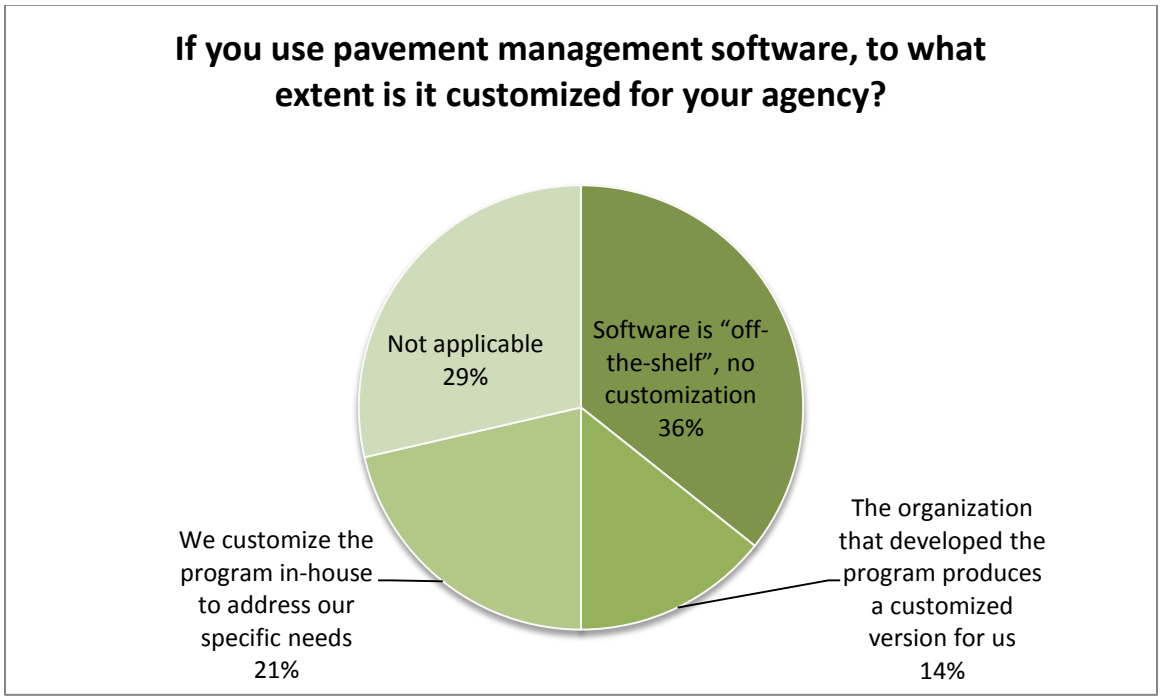


Figure 12. Level of customization required to integrate pavement management software to agency needs.

Treatment Application

The effectiveness of the application of preservation and maintenance treatments depend largely on the practices and techniques used by the road crew. It is important that best practices and procedures are followed to provide maximum effect (i.e.: no premature failures) and meet agency expectations. This report does not attempt to itemize the best practices for each treatment although provides the following observations regarding treatment application and access to resources to aid in this goal.

Observations

Several notable observations made regarding treatment application currently in use amongst Washington State local agencies include:

- Surface treatments and overlays are the predominant preservation treatment selected
- Many of the roadways being treated are lower volume roads where ride quality is less important than high speed Interstate routes
- There is a general lack of familiarity of the range of treatment options and conditions under which they should be applied
- Road crews are not all equal – there is no unifying standard of practice or body of knowledge used to apply treatments
- There is no data available regarding treatment lifespan although agencies are typically satisfied with their performance

The following plot(s) have been generated from select questions of the survey results. The entire survey and its results can be found in the Appendix.

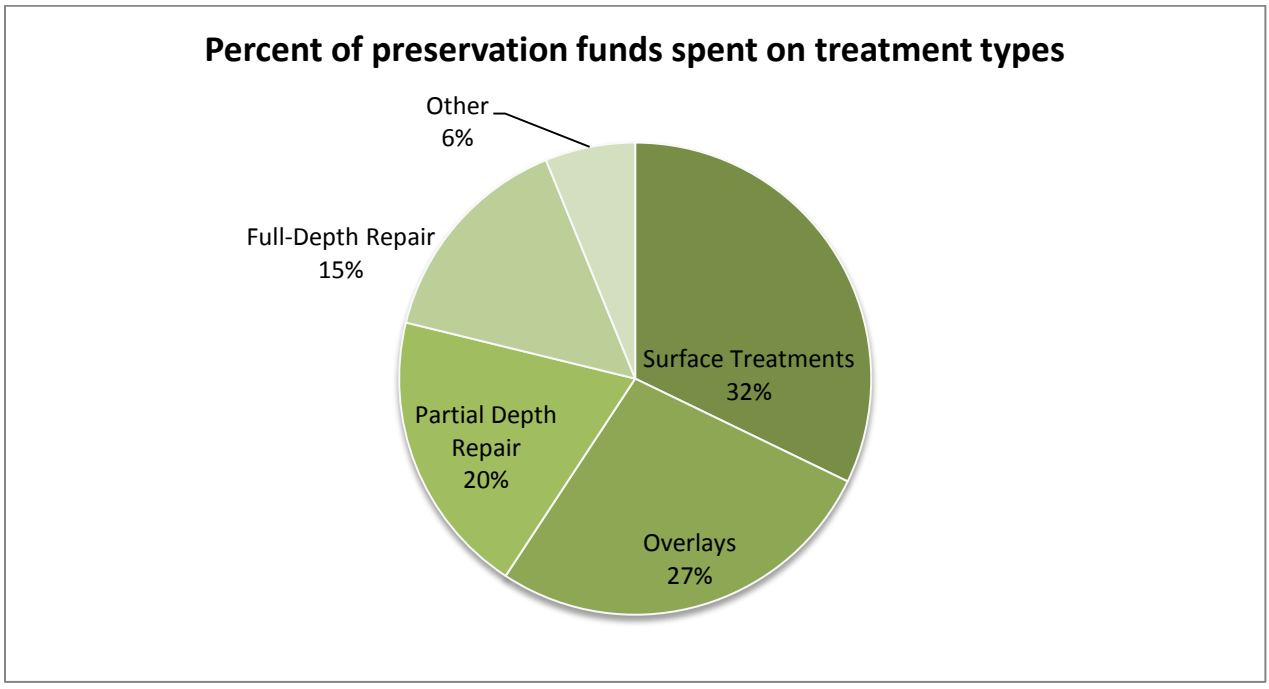


Figure 13. Percent of preservation funds spent on treatment types (from MRSC).

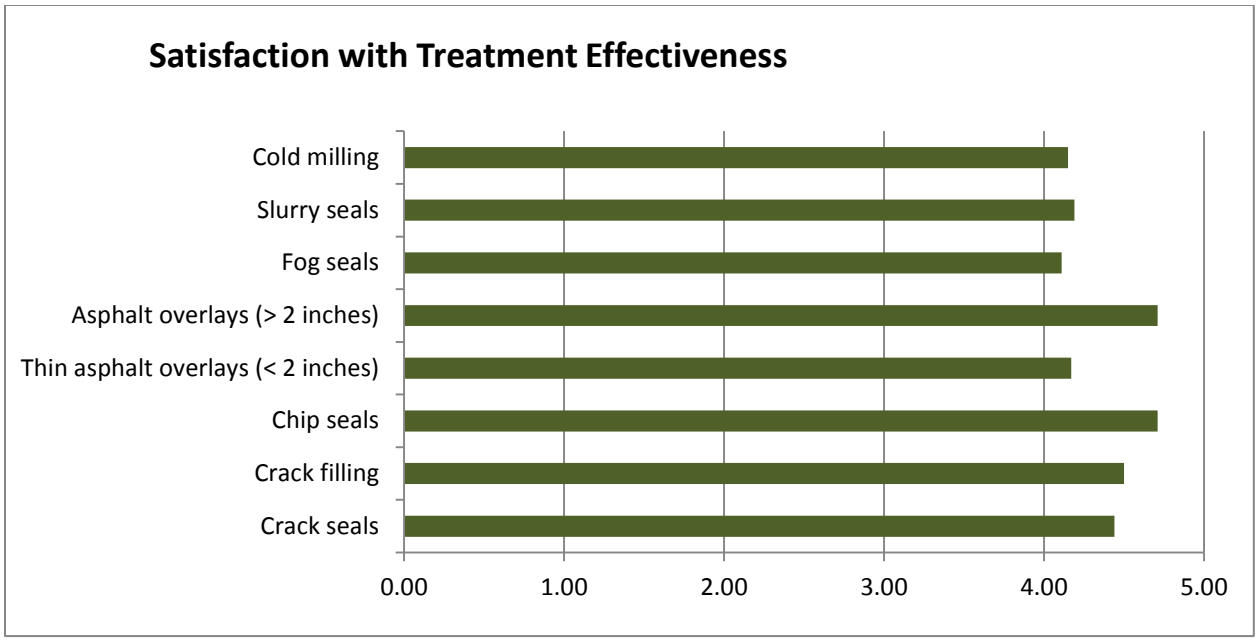


Figure 14. Agency satisfaction with preservation treatment effectiveness (lifespan) on a scale of 0 (not satisfied) – 5 (completely satisfied).

Other treatments receiving mention in the survey:

- Full Depth Reclamation
- Chip Seal with Fog Seal
- Cape Seal (Chip Seal with Slurry on Top)
- Micro-surfacing/micro grinding

Conclusions

As a result of this study, the following implementation and usage gaps of pavement preservation program best practices amongst road owning agencies in Washington State have been identified:

- **Not all stakeholders understand the financial impacts of managing and maintaining their largest asset effectively.** A common understanding of the importance and cost benefit of a properly executed pavement preservation program is critical for each executive stakeholder. Without a clear understanding of the benefits it can provide, an executive will be unwilling to make the proper investment needed to sustain a successful, cost effective, pavement program.

- **There are different practices for conducting pavement management within the state and no "minimum standard" by which to operate.** There is a wide disparity in the frequency, quality, and consistency by which pavement management practices are applied amongst cities and counties within the state. When allocating funds, this can allow for subjective data to corrupt the decision making process.

- **There is a wide variety of data collection practices used to assess pavement conditions increasing risk of inconsistent, unreliable data.** Condition ratings by which subsequent resources are allocated are significantly impacted by the ability of the human rater to be consistent both across different pavements in a given year and the same pavement year over year. In addition, where data collection is more objective, subjective, inconsistent break points for action are used. Given funding scenarios, it is critically important that each agency or consultant that performs condition ratings be trained and calibrated much like a sensor would to ensure repeatable, reliable, and comparable results.

- **Treatment type selection is inconsistent across the state and does not always follow industry best practices.** In many cases, the treatments selected have more to do engineer familiarity and road crew capabilities rather than what treatment will provide the most cost effective benefit in the long term. It seems that many agencies and consultants are not familiar with all of the options at their disposal, nor the tradeoffs associated with each in terms of cost benefit leading to resistance in implementation. In addition, in cases where the options are known, there may be resistance by local stakeholders to implement due to unfamiliarity with treatment and application.

- **There are incongruent performance indicators and measurements making it difficult to administer resources across agency boundaries and the state.** Many funds for highway and roadway improvements are now allocated by centralized organizations that assess demand across the network they represent. Without a common measuring unit for quantifying asset condition, the agency is left to create conversions or take a best guess at how pavements are performing comparatively to make resource allocations.

Recommendations

To address the outreach and implementation gaps identified in this report it is recommended that WSDOT Local Programs pursue a systematic approach to raise awareness and facilitate rapid adoption of pavement preservation best practices.

Figure 15. A systematic approach to improve outreach and implementation of pavement preservation practices.

Provide Training and Tools

- Address educational gaps in asset management and pavement preservation to ensure it is a priority within each agency and/or organization.
    - Key learning objectives to address for each element are identified in Table 1
    - Start with executives and work your way down each stakeholder group as identified in Table 3
    - Select appropriate delivery formats (online, in-person) and methods to reach each intended stakeholder group

- Provide asset management implementation guidance
    - Identify the critical must have elements of an asset management program irrespective of what type of equipment or resources are available to the agency
    - Provide best practices for achieving those elements with a varying degree of resources
        - Provide minimum quality control standards
        - Provide minimum quality assurance standards
        - Factors to be considered within pavement management program

- Develop and promote tools to aid in proper treatment selection
    - Develop guidance for consistent application of treatment selection tradeoffs
        - Based on proper identification of distresses, present possible options to user to address problem and provide tradeoff analysis
        - A primary resource for this should be the SHRP R-26 research report noted in the Resources section. It contains a nationwide decision matrix to provide guidance on appropriate treatment selection for various distress types that are present within Washington State.
        - To facilitate broad usage and acceptance of decision matrix described above a web tool calibrated for local conditions (for example – adjusting the matrix to

accommodate how long a chip seal lasts in Washington State vs. the industry average)

- Suggest a web-based approach to provide transparency and foster collaboration amongst agencies (similar to TIB Dashboard) and improve visibility to management of data-driven decisions.

Set Statewide Standards

- Standardize condition rating and reporting practices
  - Strive towards common reporting units among participants to allow better communication and coordination amongst funding agencies in prioritization across the entire network
  - Reach out to other funding bodies and form local committee with goals of standardized accountability measures. Potential parties to include: WSDOT, County Road Administration Board (CRAB), Public Works Trust Fund (PWTF), Transportation Improvement Board (TIB), various regional MPO's around the state
  - Create an incentive structure for local agencies to adopt measures – provide guidance on how to convert at low cost

- Provide resources to ensure proper and consistent treatment application
  - Develop or encourage training program targeted towards road crew personnel to ensure familiarity with treatments
  - Establish centralized statewide best practice resource that is widely available – can use existing resources identified in the Resource section as a primer for this effort.
  - Develop several case studies to aid in broader acceptance of various treatment types and combinations among local engineers and management.

Measure and Evaluate

- Set, measure and manage key performance indicators around preservation adoption and asset management
- Evaluate success of preservation outreach and training efforts
- Refine outreach as needed to focus on new gaps

Report Limitations

The conclusions and recommendations provided in this report are drawn from the sample set of Washington State road owning agencies that participated in the surveys and discussions. While no indications that the outcomes identified here will deviate significantly from a full population, it is important to note that not all agency conditions are the same and must be treated on a case by case basis when implementing a pavement preservation program.

Tools and Resources

The following section identifies resources currently available to Executives, Pavement Managers, and other stakeholders involved with pavement preservation in Washington State. While this report did not attempt to research and synthesize all available tools and resources, the listing below provides a recommended starting point for further discovery.

Table 8. Element specific resources and links currently available.

Element	Resources and Links
Preservation Program	• **WSDOT: Local Agency Pavement Management Application Guide** http://www.wsdot.wa.gov/Publications/Manuals/PMAG.htm
Data Collection	• **FHWA Pavement Management Catalog** (covers pavement management software and data collection equipment – note circa 2008) http://pavementmanagement.org/other_references/Pavement_Management_Catalog_2008.pdf
Condition Rating	• **WSDOT: Washington State Pavement Surface Condition Rating Manual** http://www.wsdot.wa.gov/Publications/Manuals/AsphaltPavementCondition.htm
Decision Making	• **SHRP: Guidelines for the Preservation of High-Traffic-Volume Roadways** http://onlinepubs.trb.org/onlinepubs/shrp2/SHRP2-S2-R26-RR-2.pdf
Treatment Application	• **NHI: Pavement Preservation Treatment Construction Guide** https://connectdot.connectsolutions.com/nhi-pptcg/default/index1.htm

General Knowledge

- **Pavement Interactive.** A free online resource for all things pavement that was originally developed by the Pavement Tools Consortium. www.pavementinteractive.org

Local Organizations

- **Washington State Department of Transportation Local Programs.** http://www.wsdot.wa.gov/LocalPrograms/LTAP/Pavement.htm
- **Northwest Pavement Management Association.** http://www.nwpma-online.org
- **Washington Transportation Improvement Board.** http://www.tib.wa.gov/
- **Washington State County Road Administration Board.** http://www.crab.wa.gov/

References

Asset Management Definition: *http://www.fhwa.dot.gov/asset/hif10023.cfm*

AASHTO Preventative Maintenance: *AASHTO Standing Committee on Highways, 1997*

Geiger, D. 2005. Pavement Preservation Definitions. Memorandum. Federal Highway Administration, U.S. Department of Transportation. http://www.fhwa.dot.gov/pavement/preservation/091205.pdf

Peshkin, D., SHRP R-26: Guidelines for the Preservation of High-Traffic-Volume Roadways
http://onlinepubs.trb.org/onlinepubs/shrp2/SHRP2-S2-R26-RR-2.pdf

NCHRP Synthesis Report 334, *Automated Pavement Distress Collection Techniques*
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_334.pdf

NCHRP Synthesis Report 335, *Pavement Management Applications Using Geographic Information Systems*
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_335.pdf

Texas Transportation Institute, *The Impact of Semi-Automated Pavement Distress Collection Methods on Pavement Management Network-Level Analysis Using the MTC StreetSaver*
http://www.mtcpms.org/publications/MTC-Auto-Data-Report-Final.pdf

Daisuke Mizusawa, *Road Management Commercial Off-The-Shelf Systems Catalog* (covers pavement, bridge, and asset management systems)
http://pavementmanagement.org/other_references/Pavement_Management_Catalog_2008.pdf

State Funding Distribution. http://www.crab.wa.gov/Funding/MVFT/mvft.cfm. Another document:
http://www.crab.wa.gov/Funding/MVFT/documents/2008/2008MVFTStatutoryDistribution.pdf

Appendix

Survey Results

1. **WSDOT Preservation Survey (WPS)**
2. **MRSC Pavement Preservation/Maintenance Program Survey – Washington (MRSC)**

WSDOT Pavement Preservation Survey

SurveyMonkey

1. Is your agency a:

		Response Percent	Response Count
City/Town		**47.1%**	**16**
County		44.1%	15
State		2.9%	1
Other (please describe):		5.9%	2
		answered question	**34**
		skipped question	**1**

2. How many lane-miles of pavement does your agency maintain?

	Response Count
	34
answered question	**34**
skipped question	**1**

3. What size of population does your agency serve?

	Response Count
	33
answered question	**33**
skipped question	**2**

4. Please provide your name and contact information for your agency:

	Response Count
	31
answered question	**31**
skipped question	**4**

5. How many personnel (in-house as well as contractor/consultant/temp) do you use when conducting pavement rating inspections?

	Response Count
	33
answered question	**33**
skipped question	**2**

6. What is the primary method your agency uses to collect pavement distress information?

		Response Percent	Response Count
Electronic data collection		18.2%	6
Walking visual survey		**36.4%**	**12**
Windshield visual survey		**36.4%**	**12**
None		3.0%	1
Other (please describe):		6.1%	2
	answered question		**33**
	skipped question		**2**

7. What tools do you use to collect and process pavement distress information? (choose all that apply)

	Response Percent	Response Count
MobileRater (StreetSaver)	18.8%	6
Vehicle-mounted profiler	12.5%	4
Video camera	12.5%	4
VisRate (Mobility)	25.0%	8
None	18.8%	6
Other (please describe):	**37.5%**	**12**
	answered question	**32**
	skipped question	**3**

8. For each segment of pavement inspected, what coverage is the pavement rating based on?

	Response Percent	Response Count
Entire right-of-way	**48.3%**	**14**
Outermost travel lane in one direction	13.8%	4
Outermost travel lane in both directions	24.1%	7
Width of collection vehicle	0.0%	0
Other (please describe):	13.8%	4
	answered question	**29**
	skipped question	**6**

9. How satisfied are you with this coverage as being representative of the pavement condition based on working with the data collected?

	Very dissatisfied	Somewhat dissatisfied	Neutral / I don't know	Somewhat satisfied	Very satisfied	Rating Average	Respons Count
	0.0% (0)	3.4% (1)	10.3% (3)	**51.7% (15)**	34.5% (10)	4.17	
						answered question	
						skipped question	

10. How many categories of pavement distress do you track for each pavement type? (For example: the MTC system uses 7 asphalt distress types and 7 concrete distress types, while ASTM D6433 has 20 asphalt distress types and 19 concrete distress types)

	Response Percent	Response Count
Flexible (asphalt) pavements:	**100.0%**	**25**
Rigid (concrete) pavements:	68.0%	17
Other roadway surfaces, if any:	28.0%	7
answered question	**25**	
skipped question	**10**	

11. In what format do you maintain pavement condition data?

	Response Percent	Response Count
Pavement Condition Index (PCI)	**55.2%**	**16**
Pavement Condition Rating (PCR)	10.3%	3
Pavement Surface Condition (PSC)	20.7%	6
Present Serviceability Index (PSI)	0.0%	0
Other (please describe):	13.8%	4
	answered question	**29**
	skipped question	**6**

12. What software program do you use to store and calculate data for pavement management purposes?

	Response Percent	Response Count
Centerline	3.3%	1
MicroPAVER	0.0%	0
Mobility	26.7%	8
PavePRO Manager	0.0%	0
StreetSaver	**40.0%**	**12**
None	10.0%	3
Other (please describe):	20.0%	6
	answered question	**30**
	skipped question	**5**

13. If you use pavement management software, to what extent is it customized for your agency?

	Response Percent	Response Count
Software is “off-the-shelf”, no customization	**35.7%**	**10**
The organization that developed the program produces a customized version for us	14.3%	4
We customize the program in-house to address our specific needs	21.4%	6
Not applicable	28.6%	8
	answered question	**28**
	skipped question	**7**

14. Does your pavement management system include a decision tree to assist in selecting preservation and maintenance treatments?

	Response Percent	Response Count
Yes	**85.7%**	**24**
No	14.3%	4
I don't know	0.0%	0
	answered question	**28**
	skipped question	**7**

15. Please rate the following in terms of the amount of influence they have on the preservation pavements are selected for treatment. Rate on a scale of 1-10 (1=least influential, 10=most inf

Choose a number from 1 to 10

	1	2	3	4	5	6	
Decision tree and recommendations from your pavement management system	14.3% (4)	0.0% (0)	0.0% (0)	3.6% (1)	7.1% (2)	0.0% (0)	10
Length of time since a pavement was last treated	10.7% (3)	7.1% (2)	14.3% (4)	10.7% (3)	0.0% (0)	7.1% (2)	**21**
Availability of funds	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	7.1% (2)	7.1% (2)	14
Requirements imposed by funding sources	10.7% (3)	7.1% (2)	7.1% (2)	10.7% (3)	**14.3% (4)**	7.1% (2)	10
Priorities of elected officials	14.3% (4)	14.3% (4)	14.3% (4)	**17.9% (5)**	7.1% (2)	7.1% (2)	10
Public input such as volume of complaints about specific roadways	10.7% (3)	7.1% (2)	**17.9% (5)**	7.1% (2)	**17.9% (5)**	7.1% (2)	**17**
Availability of contractors and needed materials	**46.4% (13)**	7.1% (2)	14.3% (4)	14.3% (4)	10.7% (3)	0.0% (0)	0.

16. Based on their performance on your agency's pavements, how satisfied are you with the effectiveness of the following treatments?

	Very dissatisfied	Somewhat dissatisfied	Neutral / I don't know	Somewhat satisfied	Very satisfied	Do not use / No experience	Rati Avera
Crack seals	3.6% (1)	0.0% (0)	3.6% (1)	32.1% (9)	**57.1% (16)**	3.6% (1)	4
Crack filling	0.0% (0)	0.0% (0)	7.1% (2)	17.9% (5)	**39.3% (11)**	35.7% (10)	4
Chip seals	0.0% (0)	0.0% (0)	3.6% (1)	17.9% (5)	**64.3% (18)**	14.3% (4)	4
Thin asphalt overlays (< 2 inches)	3.6% (1)	0.0% (0)	14.3% (4)	25.0% (7)	**39.3% (11)**	17.9% (5)	4
Asphalt overlays (> 2 inches)	0.0% (0)	3.6% (1)	3.6% (1)	10.7% (3)	**82.1% (23)**	0.0% (0)	4
Fog seals	0.0% (0)	7.1% (2)	10.7% (3)	14.3% (4)	32.1% (9)	**35.7% (10)**	4
Slurry seals	0.0% (0)	7.1% (2)	0.0% (0)	25.0% (7)	25.0% (7)	**42.9% (12)**	4
Cold milling	0.0% (0)	0.0% (0)	11.1% (3)	18.5% (5)	18.5% (5)	**51.9% (14)**	4
							answered questi
							skipped questi

17. Based on their performance on your agency's pavements, how satisfied are you with the effectiveness of the following treatments?

	Very dissatisfied	Somewhat dissatisfied	Neutral / I don't know	Somewhat satisfied	Very satisfied	Do not use / No experience	Rati Avera
Other treatment 1	7.7% (1)	0.0% (0)	7.7% (1)	15.4% (2)	**61.5% (8)**	7.7% (1)	4
Fill in name of treatment:							
Other treatment 2	0.0% (0)	0.0% (0)	11.1% (1)	**44.4% (4)**	33.3% (3)	11.1% (1)	4
Fill in name of treatment:							
Other treatment 3	0.0% (0)	0.0% (0)	12.5% (1)	**37.5% (3)**	**37.5% (3)**	12.5% (1)	4
Fill in name of treatment:							

Fill in name of treatme

answered questi	
skipped questi	

18. If you would like to elaborate on your response regarding any of the treatments in the previous two questions, please use this space:

	Response Count
	10

answered question	**10**
skipped question	**25**

Page 1, Q1. Is your agency a:		
1	metropolitan planning organization (MPO)	Oct 3, 2012 9:21 AM
2	Pavia Systems	Sep 28, 2012 10:14 AM

Page 1, Q2. How many lane-miles of pavement does your agency maintain?		
1	2223	Oct 12, 2012 3:49 PM
2	145	Oct 11, 2012 8:22 AM
3	538	Oct 10, 2012 8:06 AM
4	2025 +/-	Oct 9, 2012 12:00 PM
5	1,815.254	Oct 5, 2012 10:13 AM
6	222	Oct 5, 2012 10:13 AM
7	545	Oct 4, 2012 3:49 PM
8	910	Oct 4, 2012 11:02 AM
9	1600	Oct 4, 2012 7:22 AM
10	40	Oct 3, 2012 4:54 PM
11	82.47	Oct 3, 2012 3:42 PM
12	857	Oct 3, 2012 2:16 PM
13	120	Oct 3, 2012 12:09 PM
14	585	Oct 3, 2012 12:07 PM
15	0	Oct 3, 2012 9:21 AM
16	345	Oct 3, 2012 9:08 AM
17	600	Oct 3, 2012 8:40 AM
18	220	Oct 3, 2012 8:27 AM
19	950	Oct 3, 2012 8:07 AM
20	106	Oct 3, 2012 7:09 AM
21	700	Oct 3, 2012 7:00 AM
22	673.42	Oct 3, 2012 6:51 AM
23	495.67	Oct 2, 2012 4:48 PM
24	20,500	Oct 2, 2012 3:53 PM
25	216	Oct 2, 2012 3:39 PM
26	570	Oct 2, 2012 3:37 PM
27	586	Oct 2, 2012 3:37 PM

Page 1, Q2. How many lane-miles of pavement does your agency maintain?		
28	2600	Oct 2, 2012 3:26 PM
29	3,174	Oct 2, 2012 3:21 PM
30	990	Oct 2, 2012 3:18 PM
31	593	Oct 2, 2012 3:10 PM
32	130	Oct 2, 2012 3:05 PM
33	1800	Oct 2, 2012 3:05 PM
34	0	Sep 28, 2012 10:14 AM

Page 1, Q3. What size of population does your agency serve?		
1	315,335	Oct 12, 2012 3:49 PM
2	21000	Oct 11, 2012 8:22 AM
3	27,000	Oct 10, 2012 8:06 AM
4	260,000 +/-	Oct 9, 2012 12:00 PM
5	251,133	Oct 5, 2012 10:13 AM
6	18,000	Oct 5, 2012 10:13 AM
7	20,855	Oct 4, 2012 3:49 PM
8	10400	Oct 4, 2012 11:02 AM
9	118,000	Oct 4, 2012 7:22 AM
10	8800	Oct 3, 2012 4:54 PM
11	16,500	Oct 3, 2012 3:42 PM
12	180,678	Oct 3, 2012 2:16 PM
13	19,500	Oct 3, 2012 12:09 PM
14	50000	Oct 3, 2012 12:07 PM
15	7 million	Oct 3, 2012 9:21 AM
16	37,240	Oct 3, 2012 9:08 AM
17	68000	Oct 3, 2012 8:40 AM
18	92,350	Oct 3, 2012 8:27 AM
19	122,000	Oct 3, 2012 8:07 AM
20	18500	Oct 3, 2012 7:09 AM
21	150,000	Oct 3, 2012 7:00 AM
22	49,571	Oct 3, 2012 6:51 AM
23	40,500	Oct 2, 2012 4:48 PM
24	6.8 million	Oct 2, 2012 3:53 PM
25	35,000	Oct 2, 2012 3:39 PM
26	Incorporated, 78,000	Oct 2, 2012 3:37 PM
27	78971	Oct 2, 2012 3:37 PM

Page 1, Q3. What size of population does your agency serve?		
28	428,000	Oct 2, 2012 3:26 PM
29	95000	Oct 2, 2012 3:18 PM
30	84,000	Oct 2, 2012 3:10 PM
31	4100	Oct 2, 2012 3:05 PM
32	160,000	Oct 2, 2012 3:05 PM
33	0	Sep 28, 2012 10:14 AM

Page 1, Q4. Please provide your name and contact information for your agency:		
1	Spencer Hohenshelt Marion County Public Works 5155 Silverton Rd NE Salem, OR 97305 (503) 588-5036 FAX (503) 588-7970	Oct 12, 2012 3:49 PM
2	Jim Niggemyer Assistant City Engineer, Mukilteo, WA jniggemyer@ci.mukilteo.wa.us (425) 263-8081	Oct 11, 2012 8:22 AM
3	Liane Welch lwelch@co.tillamook.or.us 503-842-3419	Oct 10, 2012 8:06 AM
4	Diane Sheesley - Thurston County 360-867-2366 (my line) 360-867-2300 (reception) 9605 Tilley Road S, Olympia, WA 98512	Oct 9, 2012 12:00 PM
5	Yvonne Iskra 614 Division St, Port Orchard, WA 98366-4679 360.377.5777 ext.3128	Oct 5, 2012 10:13 AM
6	Jeff Englund, Sr. Engr Tech jenglund@cityofcamas.us (360) 817-7233	Oct 5, 2012 10:13 AM
7	Penny Keller 541 447 4644 penny.keller@co.crook.or.us	Oct 4, 2012 3:49 PM
8	Robert Breshears bbreshears@co.lincoln.wa.us	Oct 4, 2012 11:02 AM
9	Forrest Jones Skagit County Public Works Transportation Programs 360-336-9400	Oct 4, 2012 7:22 AM
10	Brian Shay	Oct 3, 2012 4:54 PM
11	Kim Ashmore 360-623-1928 kashmore@cityofcentralia.com	Oct 3, 2012 3:42 PM
12	Lee Rawlings 509-222-2305	Oct 3, 2012 2:16 PM
13	Jeff Peters Transportation & Development Manager (509) 942-7504 jpeters@ci.richland.wa.us	Oct 3, 2012 12:07 PM
14	Sui Tan, 510-817-5844, stan@mtc.ca.gov	Oct 3, 2012 9:21 AM
15	Ken Davies, Street Supervisor City of Puyallup KenDavies@ci.puyallup.wa.us Ph: 253-841-5507	Oct 3, 2012 9:08 AM
16	Connie Bowers Assistant County Engineer, Island County 360-679-7336	Oct 3, 2012 8:40 AM
17	Teresa Gibson City of Hillsboro 503-681-6146	Oct 3, 2012 8:27 AM
18	Teresa Becker Pavement Manager tbecker@bellevuewa.gov 425-452-7942	Oct 3, 2012 8:07 AM
19	Scott Smith, City Engineer, 425-921-5708	Oct 3, 2012 7:09 AM
20	Tom Shamberger - Road Operations Manager Tom.Shamberger@Deschutes.org	Oct 3, 2012 7:00 AM
21	David Pardini Street Maint. Supervisor Division Public Works Dept. 2700 Duportail St MS-15 Richland WA 99320	Oct 3, 2012 6:51 AM
22	Maria Fischer, Eng. Technician 509-933-8217 maria.fischer@co.kittitas.wa.us	Oct 2, 2012 4:48 PM
23	David Luhr State Pavement Management Engineer WSDOT (360) 709-5405	Oct 2, 2012 3:53 PM

Page 1, Q4. Please provide your name and contact information for your agency:		
	LuhrD@wsdot.wa.gov	
24	Ronnie Bennett ronnie.bennett@ci.bothell.wa.us	Oct 2, 2012 3:39 PM
25	Tad S. Blanton	Oct 2, 2012 3:37 PM
26	Joe Araucto, P.E. Consruction Manager	Oct 2, 2012 3:37 PM
27	Linda Small, Pavement Preservation Program Manager; Linda.small@clark.wa.gov; 360-397-6118, ext. 1622	Oct 2, 2012 3:26 PM
28	Steve M. Worley, PE 509-720-5014	Oct 2, 2012 3:18 PM
29	Andrea Swisstack aswisstack@kirklandwa.gov 425.587.3827	Oct 2, 2012 3:10 PM
30	Ryan Miles City of Vancouver PO Box 1995 Vancouver, WA 98668	Oct 2, 2012 3:05 PM
31	George White Pavia Systems	Sep 28, 2012 10:14 AM

Page 2, Q5. How many personnel (in-house as well as contractor/consultant/temp) do you use when conducting pavement rating inspections?		
1	2	Oct 12, 2012 3:49 PM
2	Consultant	Oct 11, 2012 8:33 AM
3	3	Oct 10, 2012 8:06 AM
4	1	Oct 9, 2012 12:52 PM
5	2	Oct 9, 2012 12:04 PM
6	6	Oct 5, 2012 10:17 AM
7	1	Oct 5, 2012 10:15 AM
8	3	Oct 4, 2012 3:50 PM
9	1	Oct 4, 2012 11:03 AM
10	2	Oct 4, 2012 7:23 AM
11	1	Oct 3, 2012 4:55 PM
12	1	Oct 3, 2012 12:10 PM
13	2 - 4	Oct 3, 2012 12:10 PM
14	7-consultant team	Oct 3, 2012 9:24 AM
15	2	Oct 3, 2012 9:13 AM
16	3	Oct 3, 2012 8:41 AM
17	3-4	Oct 3, 2012 8:28 AM
18	4	Oct 3, 2012 8:11 AM
19	1	Oct 3, 2012 7:09 AM
20	2	Oct 3, 2012 7:01 AM
21	2	Oct 3, 2012 6:52 AM
22	2	Oct 2, 2012 4:49 PM
23	5	Oct 2, 2012 3:55 PM
24	Consultant only	Oct 2, 2012 3:40 PM
25	3	Oct 2, 2012 3:38 PM
26	2	Oct 2, 2012 3:37 PM
27	3	Oct 2, 2012 3:32 PM

Page 2, Q5. How many personnel (in-house as well as contractor/consultant/temp) do you use when conducting pavement rating inspections?		
28	2	Oct 2, 2012 3:27 PM
29	2	Oct 2, 2012 3:19 PM
30	Consultant	Oct 2, 2012 3:11 PM
31	2	Oct 2, 2012 3:06 PM
32	3-5	Oct 2, 2012 3:06 PM
33	3	Sep 28, 2012 10:14 AM

Page 2, Q6. What is the primary method your agency uses to collect pavement distress information?		
1	Historically, windshield visual survey. We are currently planning on getting an electronic, city-wide survey done.	Oct 3, 2012 12:10 PM
2	To date - vendor contract has included combination of electronic data collection procedures and visual windshield observations	Oct 2, 2012 3:32 PM

Page 2, Q7. What tools do you use to collect and process pavement distress information? (choose all that apply)		
1	visual	Oct 9, 2012 12:52 PM
2	We have a van with a computer in it. The driver gives the information to a passenger who inputs the data directly into VisRate. The roads are filmed as they are driven and rated. We also have a JILS falling weight deflectometer that we only use for roads we are applying for certain types of grant funding for.	Oct 9, 2012 12:04 PM
3	Macro photography of pavement surfaces	Oct 5, 2012 10:15 AM
4	Hand written forms	Oct 3, 2012 12:10 PM
5	paper and pencil	Oct 3, 2012 9:24 AM
6	ArcPad (collecting field distress data) Centerline Software (process data)	Oct 3, 2012 9:13 AM
7	Paper forms from StreetSaver	Oct 3, 2012 8:28 AM
8	vehicle mounted video and laser road surface tester(lrst)	Oct 3, 2012 8:11 AM
9	Laser measured cross-section (for rutting)	Oct 2, 2012 3:55 PM
10	Work is contracted out. Last contractor used computers and data collection algorithms to aid in collecting, processing and validating data.	Oct 2, 2012 3:32 PM
11	manual forms	Oct 2, 2012 3:27 PM
12	Consultant - I'm assuming they use MobileRater	Oct 2, 2012 3:11 PM

Page 3, Q8. For each segment of pavement inspected, what coverage is the pavement rating based on?		
1	Curb to curb width for walking survey and 12' traffic lane for semi-automated.	Oct 3, 2012 9:29 AM
2	entire width of travel area (this may include bike lanes)	Oct 3, 2012 8:30 AM
3	Outermost travel lane in both directions for arterials and collector and one direction on residential streets	Oct 3, 2012 8:19 AM
4	outside lane in one direction for 2-lane roads outside lane in both directions for multi-lane roads	Oct 2, 2012 4:00 PM

Page 3, Q10. How many categories of pavement distress do you track for each pavement type? (For example: the MTC system uses 7 asphalt distress types and 7 concrete distress types, while ASTM D6433 has 20 asphalt distress types and 19 concrete distress types)

	Flexible (asphalt) pavements:	
1	7	Oct 12, 2012 3:50 PM
2	6	Oct 9, 2012 12:54 PM
3	5	Oct 9, 2012 12:04 PM
4	12	Oct 5, 2012 10:49 AM
5	7	Oct 4, 2012 3:51 PM
6	7	Oct 4, 2012 11:04 AM
7	5	Oct 4, 2012 7:26 AM
8	7	Oct 3, 2012 12:11 PM
9	7	Oct 3, 2012 9:29 AM
10	13	Oct 3, 2012 9:19 AM
11	7	Oct 3, 2012 8:30 AM
12	20	Oct 3, 2012 7:14 AM
13	7	Oct 3, 2012 7:02 AM
14	4	Oct 3, 2012 6:53 AM
15	11	Oct 2, 2012 4:50 PM
16	10	Oct 2, 2012 4:01 PM
17	7	Oct 2, 2012 4:00 PM
18	5	Oct 2, 2012 3:59 PM
19	7	Oct 2, 2012 3:41 PM
20	13	Oct 2, 2012 3:39 PM
21	7	Oct 2, 2012 3:38 PM
22	11	Oct 2, 2012 3:28 PM
23	7	Oct 2, 2012 3:12 PM
24	7	Oct 2, 2012 3:08 PM
25	6	Oct 2, 2012 3:07 PM

Page 3, Q10. How many categories of pavement distress do you track for each pavement type? (For example: the MTC system uses 7 asphalt distress types and 7 concrete distress types, while ASTM D6433 has 20 asphalt distress types and 19 concrete distress types)

	Rigid (concrete) pavements:	
1	7	Oct 12, 2012 3:50 PM
2	5	Oct 9, 2012 12:54 PM
4	N/A	Oct 5, 2012 10:49 AM
6	7	Oct 4, 2012 11:04 AM
7	5	Oct 4, 2012 7:26 AM
9	7	Oct 3, 2012 9:29 AM
10	13	Oct 3, 2012 9:19 AM
11	7	Oct 3, 2012 8:30 AM
12	N/A	Oct 3, 2012 7:14 AM
14	4	Oct 3, 2012 6:53 AM
17	5	Oct 2, 2012 4:00 PM
19	7	Oct 2, 2012 3:41 PM
20	N/A	Oct 2, 2012 3:39 PM
21	7	Oct 2, 2012 3:38 PM
23	7	Oct 2, 2012 3:12 PM
24	N/A	Oct 2, 2012 3:08 PM
25	0 - Don't Rate	Oct 2, 2012 3:07 PM
	Other roadway surfaces, if any:	
2	4	Oct 9, 2012 12:54 PM
5	5	Oct 4, 2012 3:51 PM
10	n/a	Oct 3, 2012 9:19 AM
12	N/A	Oct 3, 2012 7:14 AM
19	n/a	Oct 2, 2012 3:41 PM
20	N/A	Oct 2, 2012 3:39 PM
25	N/A	Oct 2, 2012 3:07 PM

Page 4, Q11. In what format do you maintain pavement condition data?		
1	Treatment history maps	Oct 5, 2012 10:19 AM
2	None	Oct 3, 2012 4:56 PM
3	OCI - includes Pavement Age and Pavement Type/Structure	Oct 2, 2012 4:54 PM
4	IRI (roughness) Pavement Surface Condition (PSC) Rutting Index	Oct 2, 2012 4:03 PM

Page 4, Q12. What software program do you use to store and calculate data for pavement management purposes?		
1	Lucity	Oct 9, 2012 12:55 PM
2	Carte Graph	Oct 2, 2012 4:54 PM
3	custom legacy system Washington State Pavement Management System (WSPMS)	Oct 2, 2012 4:03 PM
4	Cartegraph Pavement View Plus	Oct 2, 2012 3:41 PM
5	DSS currently, in the process of contracting to convert the data to MicroPAVER; we acquired the software earlier this year and will be updating to 7.0/network version as soon as its available.	Oct 2, 2012 3:30 PM
6	Hansen AMS	Oct 2, 2012 3:08 PM

Page 6, Q17. Based on their performance on your agency's pavements, how satisfied are you with the effectiveness of the following treatments?

	Fill in name of treatment:	
1	Chip seal	Oct 11, 2012 8:35 AM
2	Crack Seal	Oct 4, 2012 3:53 PM
3	Cold in place recycling	Oct 3, 2012 10:48 AM
4	Chip Seal with Fog Seal	Oct 3, 2012 9:38 AM
5	Micro-Surfacing	Oct 3, 2012 8:37 AM
6	full depth reclaimation	Oct 3, 2012 7:20 AM
7	Overlays	Oct 3, 2012 6:59 AM
8	Polymer Emulsion Scrub-seals/Microsurfacing	Oct 2, 2012 3:46 PM
9	Crack Filling	Oct 2, 2012 3:44 PM
10	structural overlays	Oct 2, 2012 3:32 PM
11	Micro-Surfacing	Oct 2, 2012 3:14 PM
	Fill in name of treatment:	
2	chip seal	Oct 4, 2012 3:53 PM
3	Full depth reclamation	Oct 3, 2012 10:48 AM
7	Slurry seal	Oct 3, 2012 6:59 AM
8	Asphalt Rubber chip seals/Microsurfacing	Oct 2, 2012 3:46 PM
9	Thin Overlay	Oct 2, 2012 3:44 PM
10	microsurfacing	Oct 2, 2012 3:32 PM
11	Cape Seal - combination chip seal with slurry on top	Oct 2, 2012 3:14 PM
	Fill in name of treatment:	
2	overlays	Oct 4, 2012 3:53 PM
3	rubber asphalt	Oct 3, 2012 10:48 AM
7	chipseal	Oct 3, 2012 6:59 AM
8	Fiber reinforced microsurfacing	Oct 2, 2012 3:46 PM
9	Mill and Fill	Oct 2, 2012 3:44 PM
10	rubbarized asphalt chip seal	Oct 2, 2012 3:32 PM

Page 6, Q18. If you would like to elaborate on your response regarding any of the treatments in the previous two questions, please use this space:		
1	We did a 1/4" in a subdivision this year. So far we are happy with it. Waiting to see how it does over time.	Oct 9, 2012 12:27 PM
2	We have very little money for paving or street repairs	Oct 3, 2012 4:58 PM
3	Have very few roads we chip seal, but the ones we do work well. Have only done a small trial on slurry seals but are pleased with the performance and plan to incorporate more.	Oct 3, 2012 12:17 PM
4	MTC is promoting sustainable treatments that are also cost savings to our local agencies in the SF Bay Area so that they can really stretch their maintenance dollars. The reason why I chose Somewhat Satisfied is because the treatments are still not widely used. The technologies are proven, just need more agencies to use them.	Oct 3, 2012 10:48 AM
5	We always use Fog Seals with a Chip Seal. My rating of Fog Seal in question 16 is based on this.	Oct 3, 2012 9:38 AM
6	We have had a learning curve with the Micro-Surfacing as we have recently added to our tool box for Arterials/Collectors. Once we get dialed in it will move to very satisfied. Can see the benefits of its use.	Oct 3, 2012 8:37 AM
7	Thin overlays have not had a long life span, less than 10 years, and are not worth the cost and associated ADA upgrades. If you're going to do an overlay, go all in and do a mill-and-fill to get the most bang for your buck.	Oct 3, 2012 7:18 AM
8	Don't have the winters freeze-thaw cycles to evaluate the A.R. and fiber micro. yet. But if they perform well, we would be very happy with those treatments.	Oct 2, 2012 3:46 PM
9	We tried Chip Seals in 2002 and had to overlay the streets due to the public uproar over the look. We still have issues with selling the public on slurry seals, but it is becoming more accepted.	Oct 2, 2012 3:16 PM
10	The satisfaction level is dependent on using the right treatment on the right road at the right time. The answers assume that we are placing treatments appropriately.	Oct 2, 2012 3:14 PM

Pavement Preservation/Maintenance Program Survey – Washington
August 2012

Research Request Summary

This Research Request Summary is a response to a request from a local government agency in Washington State for research and information filed with John Carpita, Public Works Consultant for the Municipal Research and Services Center (MRSC).

On occasion, it is necessary to post these requests to appropriate APWA National **infoNOW** communities and/or a cross section of Washington State city and county public works officials and special districts to gather sample documents or best practices. John summarizes these responses for the benefit of the inquiring party. As many of these responses are of general interest and, invariably, people who respond want copies of the information, he also posts the responses on the Forum web page of the Washington State American Public Works Association Chapter for the benefit of the greater Washington State public works community.

You can email John at jcarpita@mrsc.org with information requests or suggestions for research of use to the Washington State public works community. If your agency or company has done research or gathered information of general interest, please send it to John for possible posting on this Forum page.

Research Request Statement

This survey, and identical surveys for Oregon and other states covered by WSDOT's Pavement Community T2 Center Listserv, are intended to answer inquiries earlier in 2012 on several different aspects of pavement management programs.

Distribution of the survey was through three main methods: (1) my internal (Washington) city-county email distribution list, (2) through WSDOT's "The Pavement Community Listserv" and (3) through the North West Pavement Management Association (NWPMA). As the latter two have members outside Washington, there are three versions of this survey: Washington, Oregon, and Other States. There were 62 responses from Washington State, 11 from Oregon amd 4 from other states.

For quick reference, the survey questions are shown on the next three pages. The actual survey results and an attempt at reconciling a few of the open ended questions are included in this document. Also available on request (to jcarpita@mrsc.org) is an Excel spreadsheet with the raw survey data, which will give contact agencies for the responding agencies.

Survey Questions
Pavement Preservation/Maintenance Program Survey - Washington

Introduction
This survey is in response to recent inquiries on pavement preservation/maintenance programs and is intended to be as comprehensive as possible, but let me know if there is a better set of questions to ask. Email me at jcarpita@mrsc.org .

Also, distribution of the survey is through three main methods: (1) my internal (Washington) city-county email distribution list, (2) through WSDOT's "The Pavement Community Listserv" and (3) through the North West Pavement Management Association (NWPMA). As the latter two have members outside Washington, there are three versions of this survey: Washington, Oregon, and Other States. Please be sure you are on the right survey.

Your agency is?
- City/Town
- County
- Other
  - What?

Contact Information for your Agency
What is the population served by your agency?
How many lane miles of paved surfaces do you maintain?
Does your agency have a pavement management (preservation) program in place?
- Yes
- No

Is funding for this program a consistent, annual thing?
- Yes
- No

If yes, how much is set aside annually to fund this program?
- $0 to $100K
- $100K to $250K
- $250Kto $500K
- $500K to $1M
- $1M to $2M
- $2M to $5M
- Over $5M

Do you contract for pavement rating or do it in-house?
- Contract
- In-House
- Other
  - What?

What program/rating method do you use?
How often do you rate your streets/roads?
Does your agency have an overall goal for its pavement condition index (PCI)?
Is your funding level adequate to achieve or maintain that goal?
- Yes
- No

Do you have separate program and/or funding sources s for residential vs arterial street preservation?
What are your funding sources for this program and the percentage from each source?

How much (%) is spent on

- Surface Treatments (seals)
- Overlays
- Partial-Depth Repair
- Full-Depth Repair
- Other(s)

What types of pavement management (preservation) techniques does your agency use and where?

	Arterial	Collector	Local (Residential)
Chip Seal			
Slurry Seal			
Micro Seal			
Fog Seal			
Crack Seal			
Crack Filling			
Hot-Mix Asphalt Overlay (over 2 inches)			
Thin (less than 2 inches) Hot-Mix Asphalt Overlay			
Cold Milling			
Microsurfacing			
Cold In-Place Recycling (CIR)			
Hot In-Place Recycling (HIR)			
Other			

Technique definitions below are from SELECTING A PREVENTIVE MAINTENANCE TREATMENT FOR FLEXIBLE PAVEMENTS

Chip Seal – A surface treatment in which a pavement surface is sprayed with asphalt (generally emulsified) and then immediately covered with aggregate and rolled. Chip seals are used primarily to seal the surface of a pavement with non load-associated cracks and to improve surface friction, although they also are commonly used as a wearing course on low volume roads.

Cold In-Place Recycling (CIR) – A process in which a portion of an existing bituminous pavement is pulverized or milled, the reclaimed material is mixed with new binder and, in some instances, virgin aggregates. The resultant blend is placed as a base for a subsequent overlay. Emulsified asphalt is especially suited for cold in-place recycling. Although not necessarily required, a softening agent may be used along with the emulsified asphalt.

Cold Milling – A process of removing pavement material from the surface of the pavement either to prepare the surface (by removing rutting and surface irregularities) to receive overlays, to restore pavement cross slopes and profile, or even to re-establish the pavement's surface friction characteristics.

Crack Filling – The placement of materials into non-working cracks to substantially reduce infiltration of water and to reinforce the adjacent pavement. Working cracks are defined as those that experience significant horizontal movements, generally greater than about 2 mm (0.1 in.). Crack filling should be distinguished from crack sealing.

Crack Sealing – A maintenance procedure that involves placement of specialized materials into working cracks using unique configurations to reduce the intrusion of incompressibles into the crack and to prevent intrusion of water into the underlying pavement layers. Working cracks are defined as those that experience significant horizontal movements, generally greater than about 2 mm (0.1 in.).

Asphalt Overlay – An overlay course consisting of a mix of asphalt cement and a well graded (also called dense-graded) aggregate. A well graded aggregate is uniformly distributed throughout the full range of sieve sizes.

Emulsified Asphalt – An emulsion of asphalt cement and water, which contains a small amount of an emulsifying agent. Emulsified asphalt droplets, which are suspended in water, may be either the anionic (negative charge) or cationic (positive charge) type, depending upon the emulsifying agent.
Hot In-Place Recycling (HIR) – A process which consists of softening the existing asphalt surface with heat, mechanically removing the surface material, mixing the material with a recycling agent, adding (if required) virgin asphalt and aggregate to the material, and then replacing the material back on the pavement.
Hot Mix Asphalt (HMA) – High quality, thoroughly controlled hot mixture of asphalt cement and well graded, high quality aggregate thoroughly compacted into a uniform dense mass.
Microsurfacing – A mixture of polymer modified asphalt emulsion, mineral aggregate, mineral filler, water, and other additives, properly proportioned, mixed and spread on a paved surface.
Open-Graded Friction Course (OGFC) – An overlay course consisting of a mix of asphalt cement and open-graded (also called uniformly graded) aggregate. An open-graded aggregate consists of particles of predominantly a single size.
Pavement Reconstruction – Construction of the equivalent of a new pavement structure which usually involves complete removal and replacement of the existing pavement structure including new and/or recycled materials.
Recycling Agents – Organic materials with chemical and physical characteristics selected to address binder deficiencies and to restore aged asphalt material to desired specifications.
Rejuvenating Agent – Similar to recycling agents in material composition, these products are added to existing aged or oxidized HMA pavements in order to restore flexibility and retard cracking.
Rubberized Asphalt Chip Seal – A variation on conventional chip seals in which the asphalt binder is replaced with a blend of ground tire rubber (or latex rubber) and asphalt cement to enhance the elasticity and adhesion characteristics of the binder. Commonly used in conjunction with an overlay to retard reflection cracking.
Sand Seal – An application of asphalt material covered with fine aggregate. It may be used to improve the skid resistance of slippery pavements and to seal against air and water intrusion.
Sandwich Seal – A surface treatment that consists of application of a large aggregate, followed by a spray of asphalt emulsion that is in turn covered with an application of smaller aggregate. Sandwich seals are used to seal the surface and improve skid resistance.
Scrub Seal – Application of a polymer modified asphalt to the pavement surface followed by the broom scrubbing of the asphalt into cracks and voids, then the application of an even coat of sand or small aggregate, and finally a second brooming of the aggregate and asphalt mixture. This seal is then rolled with a pneumatic tire roller.
Slurry Seal – A mixture of slow setting emulsified asphalt, well graded fine aggregate, mineral filler, and water. It is used to fill cracks and seal areas of old pavements, to restore a uniform surface texture, to seal the surface to prevent moisture and air intrusion into the pavement, and to provide skid resistance.

Pavement Preservation/Maintenance Program Survey - Washington

1. Your agency is?

		Response Percent	Response Count
City/Town		**74.2%**	**46**
County		25.8%	16
		Other (please specify)	4
		answered question	**62**
		skipped question	**0**

2. Contact Information for your Agency

	Response Count
	60
answered question	**60**
skipped question	**2**

3. What is the population served by your agency?

	Response Count
	60
answered question	**60**
skipped question	**2**

4. How many lane miles of paved surfaces do you maintain?

	Response Count
	61
answered question	**61**
skipped question	**1**

5. Does your agency have a pavement management (preservation) program in place?

		Response Percent	Response Count
Yes		**85.5%**	**53**
No		14.5%	9
		Commentts	16
answered question			**62**
skipped question			**0**

6. Is funding for this program a consistent, annual thing?

		Response Percent	Response Count
Yes		**67.2%**	**41**
No		32.8%	20
		Comment	16
answered question			**61**
skipped question			**1**

7. If yes, how much is set aside annually to fund this program?

	Response Percent	Response Count
$0 to $100K	**24.5%**	**13**
$100K to $250K	7.5%	4
$250Kto $500K	13.2%	7
$500K to $1M	15.1%	8
$1M to $2M	17.0%	9
$2M to $5M	15.1%	8
Over $5M	7.5%	4
	Comment	15
	answered question	**53**
	skipped question	**9**

8. Do you contract for pavement rating services or do it in-house?

	Response Percent	Response Count
Contract	43.9%	25
In-House	**56.1%**	**32**
	Other (please specify)	16
	answered question	**57**
	skipped question	**5**

9. What program/rating method do you use?

	Response Count
	55
answered question	**55**
skipped question	**7**

10. How often do you rate your streets/roads?

	Response Count
	58
answered question	**58**
skipped question	**4**

11. Does your agency have an overall goal for its pavement condition index (PCI)?

		Response Percent	Response Count
Yes		**61.3%**	**38**
No		38.7%	24
		Comment	33
answered question			**62**
skipped question			**0**

12. Is your funding level adequate to achieve or maintain that goal?

	Response Percent	Response Count
Yes	21.4%	12
No	**78.6%**	**44**
	Comment	25
	answered question	**56**
	skipped question	**6**

13. Do you have separate program and/or funding sources s for residential vs arterial street preservation?

	Response Percent	Response Count
Yes	30.6%	19
No	**69.4%**	**43**
	Comment	13
	answered question	**62**
	skipped question	**0**

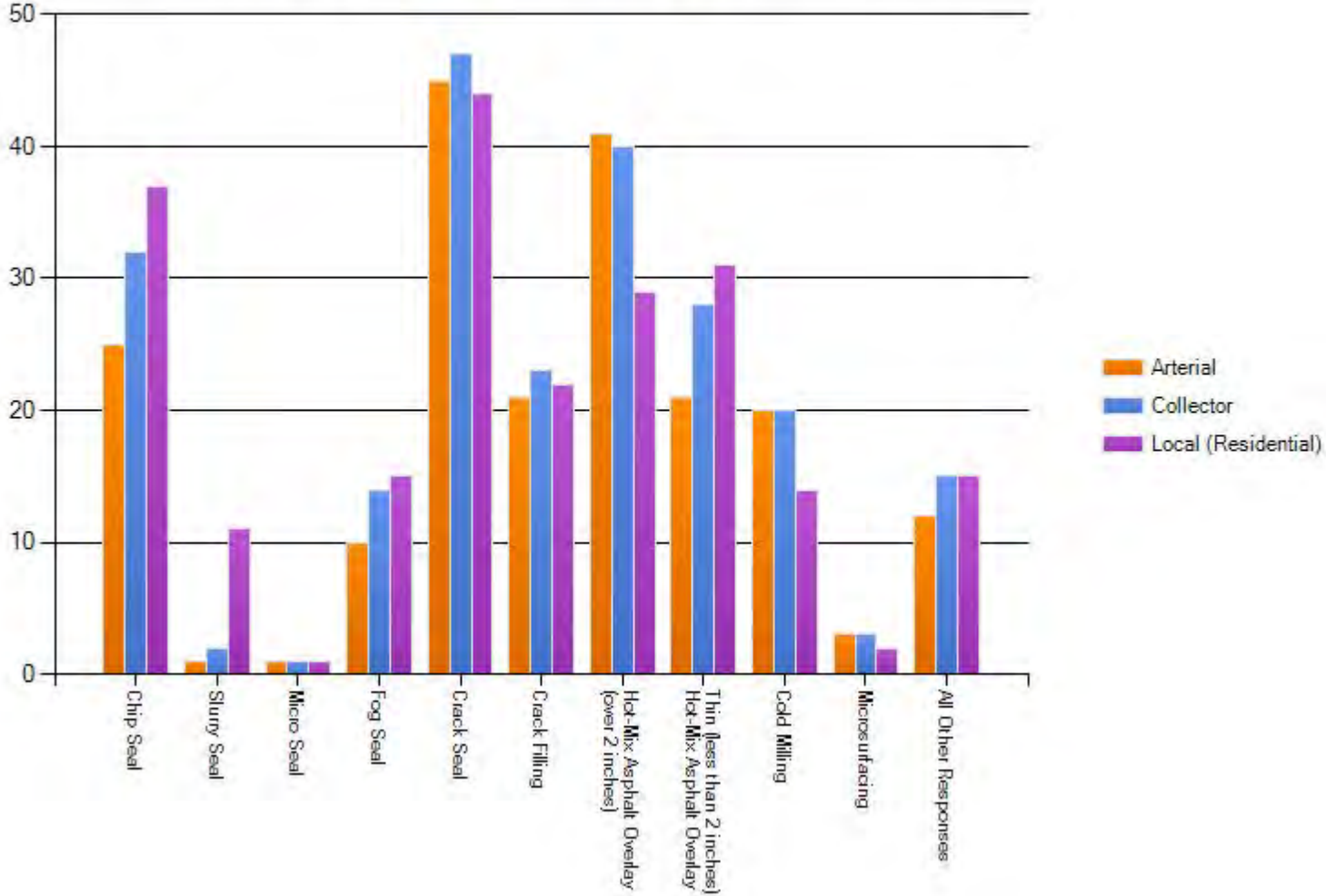
14. What are your funding sources for this program and the percentage from each source?

	Response Count
	47
answered question	**47**
skipped question	**15**

15. What types of pavement management (preservation) techniques does your agency use and where?

	Arterial	Collector	Local (Residential)	Response Count
Chip Seal	62.5% (25)	80.0% (32)	**92.5% (37)**	40
Slurry Seal	9.1% (1)	18.2% (2)	**100.0% (11)**	11
Micro Seal	**50.0% (1)**	**50.0% (1)**	**50.0% (1)**	2
Fog Seal	62.5% (10)	87.5% (14)	**93.8% (15)**	16
Crack Seal	90.0% (45)	**94.0% (47)**	88.0% (44)	50
Crack Filling	87.5% (21)	**95.8% (23)**	91.7% (22)	24
Hot-Mix Asphalt Overlay (over 2 inches)	**95.3% (41)**	93.0% (40)	67.4% (29)	43
Thin (less than 2 inches) Hot-Mix Asphalt Overlay	56.8% (21)	75.7% (28)	**83.8% (31)**	37
Cold Milling	**90.9% (20)**	**90.9% (20)**	63.6% (14)	22
Microsurfacing	**75.0% (3)**	**75.0% (3)**	50.0% (2)	4
Cold In-Place Recycling (CIR)	50.0% (3)	66.7% (4)	**83.3% (5)**	6
Hot In-Place Recycling (HIR)	**100.0% (2)**	**100.0% (2)**	50.0% (1)	2
Other	77.8% (7)	**100.0% (9)**	**100.0% (9)**	9
			Comment	23
			answered question	**60**
			skipped question	**2**

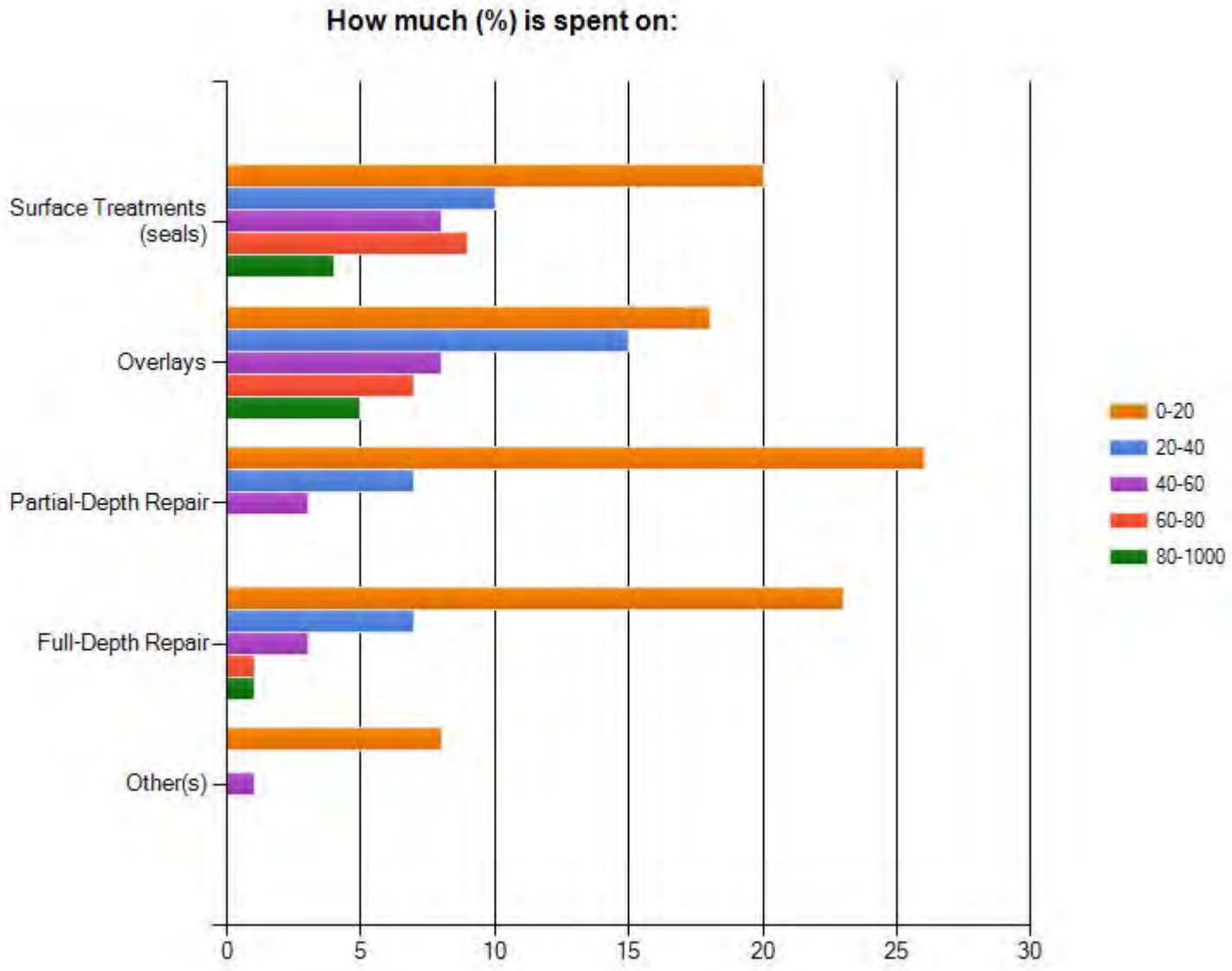
What types of pavement management (preservation) techniques does your agency use and where?



16. How much (%) is spent on:

	0-20	20-40	40-60	60-80	80-1000	Response Count
Surface Treatments (seals)	**39.2% (20)**	19.6% (10)	15.7% (8)	17.6% (9)	7.8% (4)	51
Overlays	**34.0% (18)**	28.3% (15)	15.1% (8)	13.2% (7)	9.4% (5)	53
Partial-Depth Repair	**72.2% (26)**	19.4% (7)	8.3% (3)	0.0% (0)	0.0% (0)	36
Full-Depth Repair	**65.7% (23)**	20.0% (7)	8.6% (3)	2.9% (1)	2.9% (1)	35
Other(s)	**88.9% (8)**	0.0% (0)	11.1% (1)	0.0% (0)	0.0% (0)	9
					Comment	10

answered question	**59**
skipped question	**3**


How much (%) is spent on:
Surface Treatments (seals)
Overlays
Partial-Depth Repair
Full-Depth Repair
Other(s)
0
5
10
15
20
25
30
0-20
20-40
40-60
60-80
80-1000

Q1. Your agency is?		
1	Pierce	Jul 26, 2012 5:46 PM
2	Granite Falls	Jul 17, 2012 3:58 PM
3	Poulsbo	Jul 13, 2012 2:04 PM
4	Spokane	Jul 11, 2012 10:51 AM

Q2. Contact Information for your Agency		
1	City of Camas PO Box 1055 Camas, WA 98607 http://www.ci.camas.wa.us	Jul 31, 2012 1:57 PM
2	Howard Hamby Pavement Manager 509-477-7458	Jul 30, 2012 2:00 PM
3	Bruce Wagner Road Operations Manager Pierce County Public Works & Utilities Road Operations Division 4812 186 St E Spanaway, WA 98387	Jul 26, 2012 5:46 PM
4	Tim Peterson City of Yelm 901 Rhoton Rd Yelm WA. 98597	Jul 26, 2012 1:00 PM
5	Josh Johnson City of Longview 1525 Broadway Longview, WA 98632 360 442-5004	Jul 26, 2012 7:54 AM
6	Samir Basheh, Maintenance Manager 206-391-1642	Jul 24, 2012 2:25 PM
7	Kirk Holmes, Director Kittitas County Public Works 411 N. Ruby St, Suite 1 Ellensburg, WA 98926 509-962-7523 kirk.holmes@co.kittitas.wa.us	Jul 24, 2012 10:23 AM
8	Franklin County Public Works 3416 Stearman Ave. Pasco, WA 99301	Jul 24, 2012 9:11 AM
9	Troy A. Saghafi 615 N. 5th Avenue Sequim, WA (360) 582-2479 email: tsaghafi@sequimwa.gov	Jul 24, 2012 8:58 AM
10	George Bell Street Supervisor 509.527.4363 gbell@ci.walla-walla.wa.us	Jul 24, 2012 6:57 AM
11	Justin Knox, P.E. Design Engineer City of Lacey 420 College St SE Lacey, WA 98503	Jul 23, 2012 4:24 PM
12	Tricia Thomson Bridge and Pavement Management Program Manager City of Redmond Public Works Department 425-556-2776	Jul 23, 2012 12:29 PM
13	Ahmad Qayoumi, PE Public Works Director City of Pasco 525 North 3rd Avenue Pasco, WA 99301	Jul 23, 2012 11:29 AM
14	Russ Harvey, Operations Manager russh@sjcpublicworks.org	Jul 23, 2012 11:04 AM
15	Port Angeles, WA Clallam County Jim Mahlum, contact	Jul 23, 2012 10:35 AM
16	Jim Whitbread, P.E. Stevens County Engineer/Public Works Director	Jul 23, 2012 10:07 AM
17	City of Ocean Shores Karla R Roberts Public Works Technical Assistant PO Box 909 Ocean Shores, WA 98569 360.581.2708 kroberts@osgov.com	Jul 23, 2012 8:38 AM
18	City of Castle Rock PO Box 370 Castle Rock WA, 98611 Public Works Director, David Vorse 360-274-7478 crpwd@ci.castle-rock.wa.us	Jul 23, 2012 8:16 AM
19	Kardy Schuknecht Yakima County Public Services Maint. Mangmnt. Prog. Analyst 1216 S. 18th St. Yakima, WA. 98901 509.574.2342 desk 509.574.2298 fax	Jul 23, 2012 7:19 AM
20	Michelle Faltaous, Pavement Management Analyst Department of Public Works, City of Kent 220 Fourth Avenue S Kent, WA 98032 (253) 856-5664 mfaltaous@kentwa.gov	Jul 20, 2012 3:18 PM
21	Donald L. McGahuey, P.E. 271 9th Street N.E. East Wenatchee, WA. 98801	Jul 17, 2012 1:08 PM

Q2. Contact Information for your Agency		
	dmcgahuey@east-wenatchee.com 509-884-1829	
22	Clint Morris Street Engineer City of Mercer Island 206-275-7807 clint.morris@mercergov.org	Jul 16, 2012 6:53 PM
23	City of Kalama POB 1007 Kalama,Wa 98625	Jul 16, 2012 10:33 AM
24	Rae Bailey City of Tacoma 2324 C Street Tacoma, WA 98402	Jul 16, 2012 10:27 AM
25	Derek Pohle, PE 124 Enterprise St. SE Ephrata, WA 98823 (509) 754-6082	Jul 16, 2012 9:27 AM
26	Russ Esses, County Engineer Grays Harbor County 100 West Broadway, Suite 31 Montesano, Wash. 98563	Jul 16, 2012 8:11 AM
27	Pete Rogalsky, Public Works Director City of Richland 505 Swift Blvd. P.O. Box 190 MS-26 Richland, Washington 99352 509-942-7500	Jul 14, 2012 7:02 AM
28	Lance Newkirk, Publie Works Director 206.780.3713 lnewkirk@bainbridgewa.gov	Jul 13, 2012 3:04 PM
29	Joe Rosenlund Streets & Traffic Operations Manager 2301 Fruitvale Blvd Yakima, Wa 98902 jrosenlu@ci.yakima.wa.us (509)576-6430	Jul 13, 2012 3:01 PM
30	Barry Loveless 360-779-4078 bloveless@cityofpoulsbo.com	Jul 13, 2012 2:04 PM
31	City of Marysville Public Works Attn: Jeff Laycock, PE 80 Columbia Ave Marysville, WA 98270	Jul 13, 2012 1:40 PM
32	City of Medina PO Box 144 Medina, WA 98039	Jul 13, 2012 1:23 PM
33	Ryan Miles City of Vancouver ryan.miles@cityofvancouver.us PO Box 1995 Vancouver, WA 98668	Jul 13, 2012 11:38 AM
34	Jeff Huynh Street Systems Engineer City of Federal Way - Public Works Department 33325 8th Ave S Federal Way, WA 98003 (253) 835-2721	Jul 12, 2012 11:52 AM
35	Chris Cafaro - GIS Specialist City Of Spokane - Street Dept. Ph# (509)625-7752 CCafaro@SpokaneCity.org	Jul 11, 2012 10:51 AM
36	Randy Wesselman Transportation Engineering and Planning Manager City of Olympia, Public Works Department 601 4th Avenue E P.O. Box 1967 Olympia, WA 98507-1967 (360) 753-8477 rwesselm@ci.olympia.wa.us	Jul 10, 2012 7:53 PM
37	Randy Glaeser - Public Works Director/County Engineer Wayne John - Chief, Road O&M Gerald Mason - Assistant Chief Road O&M	Jul 10, 2012 12:58 PM
38	Jayson Grant 3555 N.E. 2nd Street Renton Wa, 98056	Jul 10, 2012 10:57 AM
39	Ken Clow Public Works Director 250 Madison Street, Ste 2R Port Townsend, WA 98368	Jul 10, 2012 9:36 AM
40	Larry Waters Public Works Director/City Engineer	Jul 9, 2012 10:29 AM
41	Tim Homann, P.E. County Engineer	Jul 9, 2012 8:53 AM

Q2. Contact Information for your Agency

42	Linda M. Small, PMP Pavement Preservation Program Manager Clark County Public Works Transportation Division 1300 Franklin Street, 3rd Floor PO Box 9810 Vancouver, WA 98666-9810 360-397-6118, ext. 4753	Jul 6, 2012 9:15 AM
43	DAN GRIGSBY, Public Works Director grigsbyd@ci.bonney-lake.wa.us	Jul 5, 2012 11:50 AM
44	City of Prosser 601 7th Street Prosser, WA 99350	Jul 3, 2012 12:19 PM
45	Dave Pardini Street Maintenance Supervisor 2700 Duportail St. MS-15 Richland, WA 99352 dpardin@ci.richland.wa.us (509) 942-7524	Jul 2, 2012 2:42 PM
46	Kitsap County Public Works 614 Division Street MS#26 Port Orchard, WA 98366-4679 Yvonne Iskra yiskra@co.kitsap.wa.us 360-337-5777 ext.3128	Jul 2, 2012 2:07 PM
47	City of Bellevue Pavement Manager - Teresa Becker tbecker@bellevuewa.gov or phone 425-452-7942	Jul 2, 2012 12:28 PM
48	Seattle Department of Transportation PO Box 34996 Seattle, WA 98124-4996 206-684-7623	Jul 2, 2012 10:18 AM
49	Gary Cooper, Director of P.W. City of University Place WA.	Jul 2, 2012 8:13 AM
50	Don Zimmer County Road Administration Board 360 350-6084 don@crab.wa.gov	Jul 2, 2012 7:55 AM
51	Kim Ashmore Street/Stormwater/Fleet Manager 2600 Reynolds Ave Centralia, WA 98531 360-623-1928 kashmore@cityofcentralia.com	Jul 2, 2012 6:48 AM
52	Ronnie Bennett ronnie.bennett@ci.bothell.wa.us	Jun 29, 2012 2:55 PM
53	Chad Bedlington Superintendent - Maintenance 2221 Pacific St. Bellingham, WA 98229 360-778-7700	Jun 29, 2012 2:37 PM
54	Andrea Swisstack, P.E. Project Engineer City of Kirkland, Department of Public Works 123 5th Avenue Kirkland, WA 98033 425.587.3827 | aswisstack@kirklandwa.gov	Jun 29, 2012 1:26 PM
55	Snohomish County Public Works 3000 Rockefeller Ave Everett, WA 98201 425-388-3488	Jun 29, 2012 11:04 AM
56	City of Nooksack 103 W Madison St Nooksack, WA 98276	Jun 29, 2012 10:24 AM
57	Steve Clark, Public Works Director City of Maple Valley PO Box 320 Maple Valley, WA 98038 (425)413-8800	Jun 29, 2012 9:37 AM
58	Andrzej Kasiniak	Jun 29, 2012 9:30 AM
59	Mark Rigos, Public Works Director Newcastle City Hall (425) 649-4444	Jun 29, 2012 9:19 AM
60	9605 Tilley Road S Olympia, WA 98512	Jun 22, 2012 1:44 PM

Q3. What is the population served by your agency?		
1	18,000	Jul 31, 2012 1:57 PM
2	473,761	Jul 30, 2012 2:00 PM
3	2011 Official Estimated Population Unicorporated Population = 372,110 Incorporated population = 430,040	Jul 26, 2012 5:46 PM
4	7005	Jul 26, 2012 1:00 PM
5	38,000	Jul 26, 2012 7:54 AM
6	44,000	Jul 24, 2012 2:25 PM
7	40,500	Jul 24, 2012 10:23 AM
8	78,163	Jul 24, 2012 9:11 AM
9	6,606	Jul 24, 2012 8:58 AM
10	31,000	Jul 24, 2012 6:57 AM
11	42,393 (2010 census)	Jul 23, 2012 4:24 PM
12	55,000 residents/100,000 with employees	Jul 23, 2012 12:29 PM
13	65,000	Jul 23, 2012 11:29 AM
14	16000	Jul 23, 2012 11:04 AM
15	19000	Jul 23, 2012 10:35 AM
16	44000	Jul 23, 2012 10:07 AM
17	5600	Jul 23, 2012 8:38 AM
18	2130	Jul 23, 2012 8:16 AM
19	247,141	Jul 23, 2012 7:19 AM
20	119,100	Jul 20, 2012 3:18 PM
21	11,000	Jul 17, 2012 1:08 PM
22	23,000	Jul 16, 2012 6:53 PM
23	2500	Jul 16, 2012 10:33 AM
24	198,397	Jul 16, 2012 10:27 AM
25	90,000, 40k in the unincorp.	Jul 16, 2012 9:27 AM
26	73,000	Jul 16, 2012 8:11 AM
27	49,000	Jul 14, 2012 7:02 AM

Q3. What is the population served by your agency?		
28	23,000	Jul 13, 2012 3:04 PM
29	92,000	Jul 13, 2012 3:01 PM
30	9360	Jul 13, 2012 2:04 PM
31	60,000	Jul 13, 2012 1:40 PM
32	3000	Jul 13, 2012 1:23 PM
33	150,000	Jul 13, 2012 11:38 AM
34	89,370	Jul 12, 2012 11:52 AM
35	208,900 (2010 Census)	Jul 11, 2012 10:51 AM
36	46,780	Jul 10, 2012 7:53 PM
37	The population of Walla Walla County is 59,588 as of 2011	Jul 10, 2012 12:58 PM
38	93,910	Jul 10, 2012 10:57 AM
39	9000	Jul 10, 2012 9:36 AM
40	7600	Jul 10, 2012 7:55 AM
41	20,100	Jul 9, 2012 10:29 AM
42	11,100	Jul 9, 2012 8:53 AM
43	428,000	Jul 6, 2012 9:15 AM
44	17,500	Jul 5, 2012 11:50 AM
45	5470 approx	Jul 3, 2012 12:19 PM
46	57,000	Jul 2, 2012 2:42 PM
47	251,133	Jul 2, 2012 2:07 PM
48	over 120,000	Jul 2, 2012 12:28 PM
49	608,660 (2010 census)	Jul 2, 2012 10:18 AM
50	32,000	Jul 2, 2012 8:13 AM
51	2.4 million in the counties	Jul 2, 2012 7:55 AM
52	16,500	Jul 2, 2012 6:48 AM
53	35,000	Jun 29, 2012 2:55 PM
54	82,000	Jun 29, 2012 2:37 PM

Q3. What is the population served by your agency?		
55	80,505	Jun 29, 2012 1:26 PM
56	1335	Jun 29, 2012 10:24 AM
57	24,000	Jun 29, 2012 9:37 AM
58	10,000	Jun 29, 2012 9:30 AM
59	11,000	Jun 29, 2012 9:19 AM
60	250,000 +/-	Jun 22, 2012 1:44 PM

Q4. How many lane miles of paved surfaces do you maintain?		
1	220	Jul 31, 2012 1:57 PM
2	4,689	Jul 30, 2012 2:00 PM
3	Approximately 3,150	Jul 26, 2012 5:46 PM
4	30.27	Jul 26, 2012 1:00 PM
5	138	Jul 26, 2012 7:54 AM
6	303 lane miles	Jul 24, 2012 2:25 PM
7	495.67	Jul 24, 2012 10:23 AM
8	1192 Miles	Jul 24, 2012 9:11 AM
9	54	Jul 24, 2012 8:58 AM
10	320	Jul 24, 2012 6:57 AM
11	352	Jul 23, 2012 4:24 PM
12	300	Jul 23, 2012 12:29 PM
13	850	Jul 23, 2012 11:29 AM
14	275	Jul 23, 2012 11:04 AM
15	110.8 miles of Streets 35.0 miles of alleys	Jul 23, 2012 10:35 AM
16	661.64	Jul 23, 2012 10:07 AM
17	120	Jul 23, 2012 8:38 AM
18	20	Jul 23, 2012 8:16 AM
19	1100	Jul 23, 2012 7:19 AM
20	319.8 Centerline Miles 725.9 Lane Miles	Jul 20, 2012 3:18 PM
21	50	Jul 17, 2012 1:08 PM
22	160	Jul 16, 2012 6:53 PM
23	10	Jul 16, 2012 10:33 AM
24	2146	Jul 16, 2012 10:27 AM
25	5060+/-	Jul 16, 2012 9:27 AM
26	530	Jul 16, 2012 8:11 AM
27	Approximately 300	Jul 14, 2012 7:02 AM

Q4. How many lane miles of paved surfaces do you maintain?		
28	Approximately 280 lane miles	Jul 13, 2012 3:04 PM
29	365	Jul 13, 2012 3:01 PM
30	44	Jul 13, 2012 2:04 PM
31	282	Jul 13, 2012 1:40 PM
32	14.7	Jul 13, 2012 1:23 PM
33	1,800	Jul 13, 2012 11:38 AM
34	536.50	Jul 12, 2012 11:52 AM
35	2098 Lane Miles	Jul 11, 2012 10:51 AM
36	510	Jul 10, 2012 7:53 PM
37	585.47 Road Miles 1170.94 Lane Miles	Jul 10, 2012 12:58 PM
38	619	Jul 10, 2012 10:57 AM
39	80 miles	Jul 10, 2012 9:36 AM
40	30	Jul 10, 2012 7:55 AM
41	60	Jul 9, 2012 10:29 AM
42	413	Jul 9, 2012 8:53 AM
43	2600-2700	Jul 6, 2012 9:15 AM
44	145	Jul 5, 2012 11:50 AM
45	54	Jul 3, 2012 12:19 PM
46	584.25	Jul 2, 2012 2:42 PM
47	1,815	Jul 2, 2012 2:07 PM
48	942 lane miles calculated on a 12' width	Jul 2, 2012 12:28 PM
49	3,952 12-ft lane-miles (1,540 arterial / 2,412 non-arterial)	Jul 2, 2012 10:18 AM
50	208	Jul 2, 2012 8:13 AM
51	approx. 26,000 for all 39 counties	Jul 2, 2012 7:55 AM
52	82.47	Jul 2, 2012 6:48 AM
53	216	Jun 29, 2012 2:55 PM
54	298 centerline miles of which: 35 are principal routes 44 are secondary arterials 27 are collectors 191 are residential/other	Jun 29, 2012 2:37 PM

Q4. How many lane miles of paved surfaces do you maintain?		
55	593	Jun 29, 2012 1:26 PM
56	3,173.646	Jun 29, 2012 11:04 AM
57	6	Jun 29, 2012 10:24 AM
58	100	Jun 29, 2012 9:37 AM
59	40	Jun 29, 2012 9:30 AM
60	44 miles	Jun 29, 2012 9:19 AM
61	1003	Jun 22, 2012 1:44 PM

Q5. Does your agency have a pavement management (preservation) program in place?		
1	Pierce County Road Operations utilizes the Mobility software program provided by the County Road Administration Board.	Jul 26, 2012 5:46 PM
2	Limited. Surveyed every 5-years. Street maintenance underfunded by a factor of 5! Tiraging the worst salvagable streets, handling customer and council complaints, and emergency repairs (including potholes) is about all we can do.	Jul 26, 2012 7:54 AM
3	The City of Sequim just started setting a pavment managment program in place on February 2012.	Jul 24, 2012 8:58 AM
4	While we have pavement management currently it is unfunded and hard to complete consistently with lack of personnel.	Jul 23, 2012 10:35 AM
5	since 1983, see CRAB database for all this info	Jul 16, 2012 9:27 AM
6	Just launched it this year	Jul 14, 2012 7:02 AM
7	Consists of potholing, crack sealing, and overlays. No seal coats such as chip seals or slurry seals to date.	Jul 13, 2012 1:40 PM
8	We use Chip Seals, Crack Seals and Pre Leveling for our preservation. We are currently on a 10 year cycle.	Jul 10, 2012 12:58 PM
9	use to use MRC measurement research corporation last year was 2010. some time in 2012 our roads will be rated by Street Saver program	Jul 10, 2012 10:57 AM
10	WSDOT has provided a pavement mangement assessment service in the past.	Jul 10, 2012 9:36 AM
11	We are currently working on getting our data in place using StreetSaver Online.	Jul 2, 2012 2:42 PM
12	We use Mobility provided by the Washington State County Road Administration Board (CRAB).	Jul 2, 2012 2:07 PM
13	Currently transitioning from the Centerline pavement management database to Streetsaver.	Jul 2, 2012 12:28 PM
14	Mobility PMS provided to all counties through Mobility	Jul 2, 2012 7:55 AM
15	Streetsaver Online	Jun 29, 2012 1:26 PM
16	Currently using County Road Administration Board's (CRAB) Mobility software program but also researching other systems for possible acquisition.	Jun 29, 2012 11:04 AM

Q6. Is funding for this program a consistent, annual thing?		
1	This program is funded by the Road Operations Division Budget.	Jul 26, 2012 5:46 PM
2	Just started with the program.	Jul 24, 2012 8:58 AM
3	The funding for the program, varies from year to year, depending on the budget. The funds are from the general fund and competes with other departments, i.e, emergency, police, parks and recreation, and finance.	Jul 23, 2012 10:35 AM
4	Funding amounts have varied in previous years but we are working on sustainable funding solutions.	Jul 20, 2012 3:18 PM
5	CAPP, County funds, Fed STP funds	Jul 16, 2012 9:27 AM
6	Since 2008, there has been no budget for pavement preservation other than potholing, crack sealing and thin overlays using City crews. The City has received ARRA and other grants for overlays.	Jul 13, 2012 1:40 PM
7	The level of funding can vary from year to year. Establishment of our Transportation Benefit District (TBD) is a good start to sustainable funding for pavement management. Gas tax revenue and Real Estate Excise Tax (REET) is also used to fund this program. Grants are also needed to sustain this program.	Jul 10, 2012 7:53 PM
8	Only a portion is funded. Our funding we received from Gas Tax - Arterial Preservation (CAPP) for 2012 was $443,250 Our estimated amount for Preservation for 2012 is $1,733,360.00 for Chip Seal. $470,099 for Pre Level. $111,084 for Crack Sealing. Total is $2,314,543 The remaining $1,871,293 is used from County Road Funds	Jul 10, 2012 12:58 PM
9	The pavement management program has been funded annually since 1986 through the City of Bellevue's annual overlay program	Jul 2, 2012 12:28 PM
10	Yes. Arterial system surveyed 3 years, annual system updates.	Jul 2, 2012 10:18 AM
11	MVFT	Jul 2, 2012 7:55 AM
12	we will be completeing the PMI every other year	Jul 2, 2012 6:48 AM
13	We have both committed gas and sales tax for our overlay amounting to about 1.8 million proposed in 2013. Another 1.5 million in 2013 from our voter approved TBD which was created in 2010.	Jun 29, 2012 2:37 PM
14	Funded through our Capital Improvement Program	Jun 29, 2012 1:26 PM
15	Generally, a couple years have been missed though.	Jun 29, 2012 9:19 AM
16	It varies based on many factors from gas tax revenue to other budgetary concerns	Jun 22, 2012 1:44 PM

Q7. If yes, how much is set aside annually to fund this program?		
1	Total Program Budget is approximately 11.9 million. Includes all labor, equipment, and material associated with program development, data collection, data management, work order genration, reporting, and application and inspection of all resurfacing program functions.	Jul 26, 2012 5:46 PM
2	~$65K every five years	Jul 26, 2012 7:54 AM
3	This funding was based on past dollars used for street maintenance.	Jul 24, 2012 8:58 AM
4	currently the funds are from the Solid Waste Division of Public Works and used only for alley improvements.	Jul 23, 2012 10:35 AM
5	Historically, the city has not budgeted specifically for pavement preservation. In 2012 the city budgeted $10,000 for pothole patching and asphalt repairs and is working with Snohomish county to contract out services such as chip sealing and crack sealing moving forward.	Jul 17, 2012 3:58 PM
6	I have analyzed our lane miles in terms of an annualized amount of funds needed to overlay all the streets but no dedication of funds has been made.	Jul 17, 2012 1:08 PM
7	3 to 4 million annually for seal coat and related activities, about one third CAPP funds and the rest County funds, approximately 1+ million in Fed STP funds used for HMA overlays	Jul 16, 2012 9:27 AM
8	This level of funding has been for the past 2 years. Prior to that it had been in the $2-$5 million range.	Jul 13, 2012 11:38 AM
9	Funding assumptions for this program are: Annual Grants: $750,000 Operating Budget: $250,000 Capital Facilities Plan - Gas Tax: $275,000 CIP Fund: $1,205,000 Transportation Benefit District: $545,000	Jul 10, 2012 7:53 PM
10	We use all of our funding we receive for preservation plus an additional $1,871,293 from County Road.	Jul 10, 2012 12:58 PM
11	Pavement maintenance funding has dropped from $150K to 0 over the past several years. It was never consistent before then however.	Jul 10, 2012 9:36 AM
12	For Pavement Management (Ratings) only.	Jul 2, 2012 2:07 PM
13	Previous years funding exceeded $5 million, but budget cuts of 20% in 2011 have the new annual allocation slightly below $5 million.	Jul 2, 2012 12:28 PM
14	This represents a combined expenditure for all in-house chip seal / preservation work and contract overlay work.	Jun 29, 2012 11:04 AM
15	Generally we have approx. 1.6-2 million for contracting for chipseal and overlay, plus we have an internal budget for prep work and gravel road upgrades.	Jun 22, 2012 1:44 PM

Q8. Do you contract for pavement rating services or do it in-house?		
1	Pierce County Road Operations currently uses in-house resources to collect information but has used consultant services in the past.	Jul 26, 2012 5:46 PM
2	The pavement rating services was initially contracted out; however, in the future, the pavement rating will be conducted "In-House"	Jul 24, 2012 8:58 AM
3	Northwest Management Systems	Jul 23, 2012 12:29 PM
4	Currently WSDOT rates the arterial streets annually.	Jul 23, 2012 10:35 AM
5	Use TIB ratings done annually for city	Jul 17, 2012 3:58 PM
6	Used to do it in-house, but not enough staff available for this work.	Jul 16, 2012 6:53 PM
7	We contract it out, but haven't performed one since 2007.	Jul 16, 2012 10:27 AM
8	In-house so far. Intend to contract to advance implementation	Jul 14, 2012 7:02 AM
9	No	Jul 13, 2012 2:04 PM
10	The last rating was performed in 2008.	Jul 13, 2012 1:40 PM
11	We use temporary employees to collect the data for us	Jul 13, 2012 11:38 AM
12	WSDOT	Jul 10, 2012 9:36 AM
13	Calibration and site specific rating projects are done by in-house staff, but the larger projects area contracted.	Jul 2, 2012 10:18 AM
14	Last rating was 2008 due to lack of funding to do the maintenance the ratings prescribed	Jul 2, 2012 8:13 AM
15	36 of 39 counties do their own pavement rating	Jul 2, 2012 7:55 AM
16	We will begin contracting rating services in 2012. Previously performed in-house.	Jun 29, 2012 2:37 PM

Q9. What program/rating method do you use?		
1	Windshield survey	Jul 31, 2012 1:57 PM
2	WSDOT Method A	Jul 30, 2012 2:00 PM
3	Pierce County Road Operations uses the Mobility Pavement Rating software module and distress collection criteria that follows the Washington State Pavement Surface Condition Rating Manual option "B".	Jul 26, 2012 5:46 PM
4	StreetWise	Jul 26, 2012 1:00 PM
5	... please clarify.	Jul 26, 2012 7:54 AM
6	Pave Pro Manager	Jul 24, 2012 2:25 PM
7	VisRate	Jul 24, 2012 10:23 AM
8	Vizrate provided by CRAB and also use the Pavement Surface Condition Field Rating Manual for Asphalt Pavement	Jul 24, 2012 9:11 AM
9	The City of Sequim uses the Streetsaver 9.0 Program using the MTC Standards.	Jul 24, 2012 8:58 AM
10	TIB	Jul 24, 2012 6:57 AM
11	We use Street Saver. PCI data based upon WSDOT guideline	Jul 23, 2012 4:24 PM
12	Visual Rating Street Saver Software	Jul 23, 2012 12:29 PM
13	Numerical rating (100% being the best 0% Being the worst) using a spreadsheet	Jul 23, 2012 11:29 AM
14	VisRate	Jul 23, 2012 11:04 AM
15	Visual inspection using MTC software	Jul 23, 2012 10:35 AM
16	Vis-Rate	Jul 23, 2012 10:07 AM
17	Washington's Pavement Condition Rating by TIB	Jul 23, 2012 8:16 AM
18	CRAB's Mobility	Jul 23, 2012 7:19 AM
19	We use Centerline Software and rate the roads using a walking survey.	Jul 20, 2012 3:18 PM
20	IRI and/or PCI	Jul 17, 2012 3:58 PM
21	Visual distress survey using mobile data collection.	Jul 16, 2012 6:53 PM
22	WSDOT StreetWise	Jul 16, 2012 10:33 AM
23	WSDOT Extended Methodology	Jul 16, 2012 10:27 AM
24	See CRAB data base for most if not all this info.	Jul 16, 2012 9:27 AM
25	visual pavement rating	Jul 16, 2012 8:11 AM
26	MicroPaver	Jul 13, 2012 3:04 PM

Q9. What program/rating method do you use?		
27	MicroPaver	Jul 13, 2012 3:01 PM
28	The City uses StreetSaver and follows the program's rating methods.	Jul 13, 2012 1:40 PM
29	Washington State Pavement rating system	Jul 13, 2012 1:23 PM
30	WSDOT rating manual with some slight modifications. We do not collect data on all of the distress types but only alligator cracking, transverse and longitudinal joints, patching, and aging/raveling.	Jul 13, 2012 11:38 AM
31	PavePRO Manager	Jul 12, 2012 11:52 AM
32	MTC Streetsaver Software - Washington Extended Visual Rating Method.	Jul 11, 2012 10:51 AM
33	Street Saver - Metropolitan Transportation Commission Pavement Management Software Visual inspection of the pavement is conducted.	Jul 10, 2012 7:53 PM
34	We use VisRate software from CRAB. It is done by vehicle through the windshield and side window.	Jul 10, 2012 12:58 PM
35	will be using Street Saver Program and a contracted company to do a walking survey of the roads.	Jul 10, 2012 10:57 AM
36	street wise	Jul 10, 2012 7:55 AM
37	Metropolitan Transportation Commission	Jul 9, 2012 10:29 AM
38	VisRate	Jul 9, 2012 8:53 AM
39	WSDOT visual rating manual non-destructive falling weight deflectometer (JILS)	Jul 6, 2012 9:15 AM
40	GBA/PCI	Jul 5, 2012 11:50 AM
41	StreetSaver	Jul 2, 2012 2:42 PM
42	Mobility - Northwest Pavement Management Association	Jul 2, 2012 2:07 PM
43	In the past we have used a walking survey to rate the roadways to the NWPMA (Pavement Surface Condition Field Rating Manual's guidelines). In 2012 we utilized a LSRT video mobile rating service.	Jul 2, 2012 12:28 PM
44	SDOT uses the Metropolitan Transportation Commission (MTC) pavement management system and rating methodology. The MTC rating method is based on the Pavement Condition Index (PCI) rating procedure developed by the US Army Corps of Engineers in the 1970’s and described in ASTM standard D6433.	Jul 2, 2012 10:18 AM
45	VisRate Pavement Rating Program provided by CRAB using the "Pavement Surface Condition Field Rating Manual for Asphalt Pavements provided by WSDOT H&LP	Jul 2, 2012 7:55 AM
46	85-100 = excellent 60-84 = good 40-59 = fair 21-39 = poor below 21 = failed	Jul 2, 2012 6:48 AM
47	FHWA/WSDOT	Jun 29, 2012 2:55 PM

Q9. What program/rating method do you use?		
48	Sidewalk inspections every 5-years performed visually. Pavement rating previously done by walking survey. Rating frequency will remain the same for sidewalks, and pavement rating will change in 2012 to utilize Laser RST (meeting ASTM E1656-94)combined with windshield and walking surveys of the entire network in 2012.	Jun 29, 2012 2:37 PM
49	Streetsaver.	Jun 29, 2012 1:26 PM
50	Currently using WSDOT / CRAB Pavement Structural Condition (PSC) algorithm but considering using version of ASTM Pavement Condition Index (PCI) in future in order to include non-structural distress and rutting in overall condition score.	Jun 29, 2012 11:04 AM
51	TIB	Jun 29, 2012 10:24 AM
52	PMS Pro	Jun 29, 2012 9:37 AM
53	Excellent – no action Good – no action/on the list for minor repairs Fair – ready for overlay, limited subgarde repairs, less than 30% Failed – reconstruction	Jun 29, 2012 9:30 AM
54	PCI	Jun 29, 2012 9:19 AM
55	We use Vizrate and we have a van that we use with a computer in it to input the data directly while driving the roads and we use a camera to film the road using county road view while the rating is occuring	Jun 22, 2012 1:44 PM

Q10. How often do you rate your streets/roads?		
1	Annually.	Jul 31, 2012 1:57 PM
2	Full Network including Local Access Roads every 2 years	Jul 30, 2012 2:00 PM
3	All Pierce County roads are assessed every other year. The county accomplishes this by rating roughly half of the road system every year.	Jul 26, 2012 5:46 PM
4	Annually	Jul 26, 2012 1:00 PM
5	Every year, every street in-house, by supervisor. Very subjective. Every five years, every street, by consultant. State-of-the-art, quantitative.	Jul 26, 2012 7:54 AM
6	Completed in 2007	Jul 24, 2012 2:25 PM
7	Every other year	Jul 24, 2012 10:23 AM
8	We rate our roads every two years. We do half of the roads one year and the other half another years and just keep those going on a continuous loop.	Jul 24, 2012 9:11 AM
9	The City of Sequim will be rating the streets once every 2 years.	Jul 24, 2012 8:58 AM
10	We are in the process of rating our streets now. It has been 10 years since our last official rating.	Jul 24, 2012 6:57 AM
11	The whole network annually.	Jul 23, 2012 4:24 PM
12	Every two years	Jul 23, 2012 12:29 PM
13	Every two years	Jul 23, 2012 11:29 AM
14	Every 2 years	Jul 23, 2012 11:04 AM
15	The residential streets currently have not been rated since 2003, due to lack of personnel and no budget. The goal is to rate a portion every year so that each street is rated 3 to 4 years.	Jul 23, 2012 10:35 AM
16	Annually	Jul 23, 2012 10:07 AM
17	4 years	Jul 23, 2012 8:16 AM
18	every two years	Jul 23, 2012 7:19 AM
19	Every other year.	Jul 20, 2012 3:18 PM
20	TIB does an annual rating of major arterial. No other ratings currently done	Jul 17, 2012 3:58 PM
21	WSDOT has performed a rating on federally classified roadways. Residential streets have not been rated.	Jul 17, 2012 1:08 PM
22	First time for contracted mobile collection was 2009. Scheduled again for 2013, and will include ground penetrating radar to collect pavement thickness info.	Jul 16, 2012 6:53 PM
23	Bi Annualy	Jul 16, 2012 10:33 AM

Q10. How often do you rate your streets/roads?		
24	The last time we rated our streets was in 2007. We currently do not have a schedule for performing another review of our streets.	Jul 16, 2012 10:27 AM
25	every two years	Jul 16, 2012 9:27 AM
26	We rate our collector roads every 2 years.	Jul 16, 2012 8:11 AM
27	Still working this out, but likely every 2-3 years for arterials and every 4-5 years for local streets	Jul 14, 2012 7:02 AM
28	We implemented in-house pavement rating in 2010 and hope to establish a rerating on a four year cycle.	Jul 13, 2012 3:04 PM
29	Classified streets every two years, 1/2 each year Residential every 5 years, 20% each year	Jul 13, 2012 3:01 PM
30	Should be arterials every 2-3 years, residential streets every 5-6 years, but due to staffing and budget constraints the last rating was performed in 2008 (and in 2000 prior to that).	Jul 13, 2012 1:40 PM
31	annually	Jul 13, 2012 1:23 PM
32	Once every 2 years.	Jul 13, 2012 11:38 AM
33	Every other year.	Jul 12, 2012 11:52 AM
34	Arterials every 2 years Residentials every 4 years	Jul 11, 2012 10:51 AM
35	One-half of the lane miles are rated on a yearly basis.	Jul 10, 2012 7:53 PM
36	We rate 50% each year.	Jul 10, 2012 12:58 PM
37	use to have Residential streets one year and then Arterial the next year and than repeat so every other year.	Jul 10, 2012 10:57 AM
38	anually	Jul 10, 2012 7:55 AM
39	4-6 years	Jul 9, 2012 10:29 AM
40	Every 2 years	Jul 9, 2012 8:53 AM
41	1/2 every other year	Jul 6, 2012 9:15 AM
42	Bi-annually	Jul 5, 2012 11:50 AM
43	Every 3-5 years	Jul 3, 2012 12:19 PM
44	Every 2 years	Jul 2, 2012 2:42 PM
45	Arterials and Collectors - every 2 years Local Access - every 3 to 4 years	Jul 2, 2012 2:07 PM
46	every 2 years	Jul 2, 2012 12:28 PM
47	Arterials on a 3-yr cycle. No funding for non-arterial rating.	Jul 2, 2012 10:18 AM

Q10. How often do you rate your streets/roads?		
48	In the past we performed ratings every other year	Jul 2, 2012 8:13 AM
49	Collectors and Arterials every two years at a minimum, most counties also rate their Local Access roads	Jul 2, 2012 7:55 AM
50	every 2 years	Jul 2, 2012 6:48 AM
51	2 years	Jun 29, 2012 2:55 PM
52	Sidewalk every 5-years performed visually. Pavement rating every 3 years for residential, and annually for arterials. Rating frequency will remain the same for sidewalks, and pavement rating will change in 2012 to utilize Laser RST combined with windshield and walking surveys of the entire network in 2012. Frequency of rating arterials will likely change to every two-years, and residential to every 4 years depending on rating update results in 2012.	Jun 29, 2012 2:37 PM
53	2-4 years.	Jun 29, 2012 1:26 PM
54	Arterials / collectors every 2 years Local access roads every 4 years	Jun 29, 2012 11:04 AM
55	3 year cycle	Jun 29, 2012 9:37 AM
56	Every 2 years	Jun 29, 2012 9:30 AM
57	Once every 5 years	Jun 29, 2012 9:19 AM
58	We rate arterials/collectors every other year and local roads every 4 years (we rate every year, but only do portions each year).	Jun 22, 2012 1:44 PM

Q11. Does your agency have an overall goal for its pavement condition index (PCI)?		
1	70	Jul 30, 2012 2:00 PM
2	Road Operations target PCI goal is 75.	Jul 26, 2012 5:46 PM
3	No. Our PCI is at 68 and dropping almost 2 points per year. Depressing. Between 2003 and 2005, our material budget has be halved. Plus, we've have almost no alotment for inflation since then - so we've lost >4x or maintenace capacity.	Jul 26, 2012 7:54 AM
4	PCI betwen 80-100	Jul 24, 2012 9:11 AM
5	A PCI of 80	Jul 24, 2012 8:58 AM
6	A PCI between 80 and 85.	Jul 23, 2012 4:24 PM
7	Around 75	Jul 23, 2012 12:29 PM
8	Not at this time. Hopefully by end of 2013, after second set of data is collected and compared to 2009.	Jul 16, 2012 6:53 PM
9	unofficial goals, 95% good or fair	Jul 16, 2012 9:27 AM
10	Intend to set one after program further developed.	Jul 14, 2012 7:02 AM
11	City council has not formally adopted a PCI goal for staff to build the pavement managemnent program towards. However, we would would like see a 65 to 70 PCI rating selected.	Jul 13, 2012 3:04 PM
12	PCI of 50 with no streets in failure.	Jul 13, 2012 3:01 PM
13	The goal is to maintain above PCI = 70, but this is not an adopted policy.	Jul 13, 2012 1:40 PM
14	greater than 60 PCI	Jul 13, 2012 1:23 PM
15	78	Jul 12, 2012 11:52 AM
16	Key Result Measure: 100% of lane miles in fair or better condition. As of 2011, 80% of the City streets are in fair or better condition (a rating of 50 and higher).	Jul 10, 2012 7:53 PM
17	70 and above.	Jul 10, 2012 12:58 PM
18	80 and above	Jul 10, 2012 10:57 AM
19	Min. of 71	Jul 9, 2012 10:29 AM
20	Up to now, our roads have almost universally exceeded any distressed PCI level. Reduced budgets are curtailing our maintenance program and our roads will soon begin to move into distressed levels.	Jul 9, 2012 8:53 AM
21	80	Jul 6, 2012 9:15 AM
22	greater then 80	Jul 5, 2012 11:50 AM
23	Above 70 PCI	Jul 2, 2012 2:42 PM

Q11. Does your agency have an overall goal for its pavement condition index (PCI)?		
24	No Federal Functional Class Roads fall into re-construct category (PSC<60)	Jul 2, 2012 2:07 PM
25	We set our targets in terms of their impact on the PCI and backlog of deferred maintenance.	Jul 2, 2012 10:18 AM
26	Currently estimated at 70	Jul 2, 2012 8:13 AM
27	Low to mid 80's, counties use PSC (Pavement Surface Condition)	Jul 2, 2012 7:55 AM
28	80	Jun 29, 2012 2:55 PM
29	PCI average over 80	Jun 29, 2012 2:37 PM
30	70 Arterials/65 Non-Arterials	Jun 29, 2012 1:26 PM
31	Currently, our network condition goal is a PSC of 80. If a new software program is implemented and PCI is used as a condition index, the target goal will likely be a lower value.	Jun 29, 2012 11:04 AM
32	See above	Jun 29, 2012 9:30 AM
33	Stay above 70	Jun 22, 2012 1:44 PM

Q12. Is your funding level adequate to achieve or maintain that goal?		
1	Current funding for preservation planning, management, and resurfacing activities are adequate to acheive the target PCI goal.	Jul 26, 2012 5:46 PM
2	HAHAHAHAHAHAHAHAHAHAHAHA. Our citizens pay only $15/person/year to maintain the network, but lose over $3.2 millon per year in network value.	Jul 26, 2012 7:54 AM
3	The rise of oil prices has made it so that we have had to go longer stretches between chip seals and crack seals on regularlly maintained roads.	Jul 24, 2012 9:11 AM
4	We are asking for an increase in the upcoming 2013-2014 budget.	Jul 23, 2012 12:29 PM
5	Annual budget is seriously underfunded each year.	Jul 23, 2012 10:35 AM
6	We are proposing a Transportation Benefit District to secure sustainable funding.	Jul 23, 2012 8:16 AM
7	Current annual Streets Fund expenditures are $115k, but the only revenue being put into the fund is the gas tax which is roughly $67k. The fund has $230k in reserves that will be depleted in 4 years without additional funding sources.	Jul 17, 2012 3:58 PM
8	We think our present funding is adequate for our system. In the last five years, we have expanded our preservation programs to include crack filling, HMA patching, and chip seal to stretch our funding and treat more miles.	Jul 16, 2012 6:53 PM
9	we are losing ground each year, we just had to extend our program from a seven year cycle to nine years for sealcoats, we are over 20 years for overlays/inlays on our HMA system	Jul 16, 2012 9:27 AM
10	n/a	Jul 16, 2012 8:11 AM
11	City council and staff are engaged in this conversation and working to determine and provide a means to provide a sustainable level of funding.	Jul 13, 2012 3:04 PM
12	N/A	Jul 13, 2012 2:04 PM
13	In 2008, the City required $2.3 million annually to maintain a PCI = 76.	Jul 13, 2012 1:40 PM
14	We received 19% of what we needed for Preservation for 2012. The price of CRS-2P has increased from $352.00 per ton in 2008 to $ 558.00 per ton this year. This has set us back from a 7 to a 10 year cycle for our Chip Seal. The remaining 81% is from our County Road Budget.	Jul 10, 2012 12:58 PM
15	Street/pavement maintenance is the most underfunded public works program in the City.	Jul 10, 2012 9:36 AM
16	We think so at this point (going into the sixth year of the program). Our goal is to preserve all asphalt in the City on a 10-12 year cycle (using, primarily, chip seals). By 2014, or 2015 at the latest, we will have a good handle on whether we are going to meet the goal or have fallen behind.	Jul 9, 2012 10:29 AM
17	Current funding levels will make it unlikely to maintain all of our roads in good condition.	Jul 9, 2012 8:53 AM
18	Due to the recession and downturn in the economy, we have not funded pavement overlay and reconstruction for a couple of years. Local funding is	Jul 5, 2012 11:50 AM

Q12. Is your funding level adequate to achieve or maintain that goal?		
	available for crack sealing and chip sealing each year by contract. Spot repairs and pot hole filling is accomplished as needed using in-house work force. In 2012 we have a small budget for overlay; however, the amount spent will be dependent on actual revenue.	
19	Yes, at the cost of deferring Local Acess	Jul 2, 2012 2:07 PM
20	Historically the funding level was adequate to maintain the street system at our goal. With the temporary budget reductions and the added cost of implementing ADA ramps with the overlay program we have found our ratings to be decreasing though still meeting target at this time.	Jul 2, 2012 12:28 PM
21	Materials cost continue to rise, MVFT revenue continue to decline	Jul 2, 2012 7:55 AM
22	Currently pursuing alternative funding sources.	Jun 29, 2012 1:26 PM
23	We currently meet that target but existing funding is not adequate to maintain that network condition for more than a few more years.	Jun 29, 2012 11:04 AM
24	most of the time	Jun 29, 2012 10:24 AM
25	Within 10 years we would be below that rating	Jun 22, 2012 1:44 PM

Q13. Do you have separate program and/or funding sources s for residential vs arterial street preservation?		
1	Most preservation activities are funded by the Road Operations Budget however some projects may receive additional funds from various grant opportunities.	Jul 26, 2012 5:46 PM
2	Yes, BUT street maintenace is about as sexy as a rotten pumpkin. Projects that improve traffic or new pavement typically the the bulk of that scare money.	Jul 26, 2012 7:54 AM
3	Residential streets are funded out of the general funds. Arterial streets are funded with both general funds with match funds from the general fund.	Jul 23, 2012 10:35 AM
4	We split the Motor Vehicle revenues between the residential and arterial funds, but it is not nearly enough. We have to subsidize it with general fund dollars.	Jul 23, 2012 8:16 AM
5	It is the council's perception that the arterials will be taken care of with grants (obviously very optomistic) and that the residential will need to be funded locally.	Jul 17, 2012 1:08 PM
6	CAPP funds can only be used on minor collectors and above, county funds fund the majority of our annual sealcoat program, we use our Fed STP funds for overlays/inlays	Jul 16, 2012 9:27 AM
7	We think we'll have different PCI targets for different classifications of roads.	Jul 14, 2012 7:02 AM
8	Starting in 2012	Jul 11, 2012 10:51 AM
9	Arterial street preservation has been funded as part of capital improvement projects in several instances over the past 10 years. For the past 5 years there has been no purely maintenance funding dedicated to street maintenance - either arterial or residential streets - beyond pot-hole repair and minor patching, signage and striping.	Jul 10, 2012 9:36 AM
10	County Arterial Preservation Program (CAPP) funding through CRAB	Jul 2, 2012 2:07 PM
11	No separate funding for Local Access roads	Jul 2, 2012 7:55 AM
12	Not currently but this may be considered in the future. Currently budgets are broken into that used by Road Maintenance for prelevel / chip seal and that used for contract overlay work.	Jun 29, 2012 11:04 AM
13	The city goal is to develop such program	Jun 29, 2012 9:30 AM

Q14. What are your funding sources for this program and the percentage from each source?		
1	County Road Fund = approximately 67 million for (2012) Preservation = approximately 8.9 million from Road Ops (13.3%) Preservation = approximately 3.0 million from Construction (4.5%)	Jul 26, 2012 5:46 PM
2	100% General fund	Jul 26, 2012 1:00 PM
3	Usually: 100% General Fund. Sometimes 75 GF - 25 ASF	Jul 26, 2012 7:54 AM
4	CAPP funds annually support $500,000 in chip sealing FFC 08 roads. The balance of annual chip sealing is paid for with County Road Funds.	Jul 24, 2012 10:23 AM
5	N/A	Jul 24, 2012 9:11 AM
6	TBD-Transportation Benefit District	Jul 24, 2012 8:58 AM
7	2/10 sales tax - 45% MVFT - 30% General Fund - 25%	Jul 24, 2012 6:57 AM
8	The program is funded through the gas tax revenue, real estate excise tax and the general fund.	Jul 23, 2012 4:24 PM
9	General Fund and occaisonal Grant funds.	Jul 23, 2012 12:29 PM
10	10%	Jul 23, 2012 11:29 AM
11	CAPP - 10% MVFT - 45% Local - 45%	Jul 23, 2012 11:04 AM
12	Residential Streets - 100% Arterial Streets - 86.5% and 13.5% match (general funds)	Jul 23, 2012 10:35 AM
13	Property tax 0.5 MVFT 0.35 CAPP 0.15	Jul 23, 2012 10:07 AM
14	no funding sources	Jul 23, 2012 8:38 AM
15	Residential Streets gets 67% of the Motor Vehicle fund and arterial streets get 33%	Jul 23, 2012 8:16 AM
16	State and Local, funding percentage varies	Jul 23, 2012 7:19 AM
17	General Fund Gas Tax	Jul 20, 2012 3:18 PM
18	Annual Gas Tax Revenue is the only current source of funding. A percentage of property tax revenue was historically allocated to the Streets O&M fund, but that funding source was cut in 2010 due to budget shortfalls in the General Fund.	Jul 17, 2012 3:58 PM
19	REET 73% State Fuel Tax 27%	Jul 16, 2012 6:53 PM
20	Arterial is funded by WSDOT. Residental is in house with funds taken out our Street fund. I dont have the percentage.	Jul 16, 2012 10:33 AM
21	approximately 33% CAPP, 67% county funds for sealcoat. 100% Fed STP funds on HMA overlays/inlays	Jul 16, 2012 9:27 AM
22	Gas tax 30 % Property tax 50% Forest Revenues 20%	Jul 16, 2012 8:11 AM

Q14. What are your funding sources for this program and the percentage from each source?		
23	Gas tax - 33% Local voted utility tax - 15% Business street utility charge - 10% Real Estate Excise Tax - 10% General Fund - 32%	Jul 14, 2012 7:02 AM
24	Gas Tax 28%, Property Tax 67%, REET2 5%	Jul 13, 2012 3:01 PM
25	General fund.	Jul 13, 2012 1:40 PM
26	Motor Fuel tax 62,000 Capital Fund 200,000 General Fund 90,000	Jul 13, 2012 1:23 PM
27	Gas Tax - 60% Real Estate Excise Tax - 23% General Fund - 17%	Jul 13, 2012 11:38 AM
28	Utility and gas taxes.	Jul 12, 2012 11:52 AM
29	Started TBD car tab fee in 2011, startup residential program in 2012	Jul 11, 2012 10:51 AM
30	Funding assumptions for this program are: Annual Grants: $750,000 (25%) Operating Budget: $250,000 (8%) Capital Facilities Plan - Gas Tax: $275,000 (9%) CIP Fund: $1,205,000 (40%) Transportation Benefit District: $545,000 (18%)	Jul 10, 2012 7:53 PM
31	Gas Tax - Arterial Preservation (CAPP) 21% County Road Budget 81%	Jul 10, 2012 12:58 PM
32	Arterial Program is funded from vehicle fuel tax 80% and Business license fee 20%. Overlay Program is funded from Business Licensing fees 100%	Jul 10, 2012 10:57 AM
33	TIB, WSDOT, USDOT for capital projects. Local funding for street maintenance has been cut back to just striping, signage, pot-hole repair and minor patching. Street maintenance is the single most underfunded aspect of the City's public works programs.	Jul 10, 2012 9:36 AM
34	Gas tax, REET.	Jul 9, 2012 10:29 AM
35	Road Fund budget (Gas Tax, Property Tax) - 80% CAPP - 20%	Jul 9, 2012 8:53 AM
36	County Road Fund 98% Miscellaneous grants	Jul 6, 2012 9:15 AM
37	REET and Gas Tax 2012 Revenue Budget (Actual Revenue Is Less): REET 1 = $52,894 = 10.4% REET 2 = $158,681 = 31.2% MVFT = $297,000 = 58.4% TOTAL = $508,574 2012 Expenditure Budget: Surface Treatments (seals) 45% (CIP Chip Seal Program $179,000) Overlays 55% (CIP Overlay Program $250,000) Street Striping = $21,500	Jul 5, 2012 11:50 AM
38	Arterial Street Fund for classified streets General Fund - Streets Transportation Benefit District - all streets	Jul 3, 2012 12:19 PM
39	Road Levy is thye primary source of asphalt preservation (100%)	Jul 2, 2012 2:07 PM
40	The program is funded entirely by the City's Capital Improvement Program.	Jul 2, 2012 12:28 PM
41	Arterial paving programs are an amalgam of funds, but rely most heavily on the 9-yr Bridging the Gap transportation levy approved by voters in 2006. Non-arterial programs are mainly funded by gas tax and general fund. The Bridging the Gap transportation levy will allow SDOT to average around 20-25 lane-miles of arterial paving per year over the life of the levy, However, Seattle has a	Jul 2, 2012 10:18 AM

Q14. What are your funding sources for this program and the percentage from each source?		
	significant backlog of deferred arterial street maintenance, approximately 400 lane-miles as identified in the 2010 pavement condition suvey. As of 2012, SDOT has two small spot non-arterial paving programs that allow paving crews rehabilitate about 0.5 to 1.0 lane-miles of asphalt and concrete per year across the 2,412 lane-mile non-arterial system. Chip seal funds have dwindled to the point where it is difficult to run a program. Overall, the amount of non-arterial paving accomplished is negligible in scale to the system, but it does allow SDOT to address a few critical non-arterial locations used by buses and industry, or around hospitals and other locations with heavy pedestrian traffic crossing the street. http://www.seattle.gov/transportation/pavementmanagement.htm	
42	CAPP - County Arterial Preservation Program, percent varies by county.	Jul 2, 2012 7:55 AM
43	Fuel and Sales Tax (approximately 19% of 9.1 million projected revenues in 2013), 1.83 million to resurfacing program for 2013 TBD funding (0.2% sales tax levy, approximately 1/3 goes to annual resurfacing program, 1.5 million in 2013)	Jun 29, 2012 2:37 PM
44	Program is funded through our Capital Improvement Program ($2.3M this year). Additional $400K of maintenance budget is used to peform from in-house repairs to prepare streests for overlay and slurry seal.	Jun 29, 2012 1:26 PM
45	County Road Fund (CRF): 5.45% of property tax dollars $600,000-$650,000 from CRAB's distribution of County Arterial Preservation Program (CAPP) funds (usually about 12% of pavement management budget). CRAB's County Arterial Preservation Program (CAPP): usually between $600,000-$650,000 (In 2012 CAPP funds represented 12.4% of total funds used for pavement preservation / rehabilitation) Other miscellaneous funds	Jun 29, 2012 11:04 AM
46	REET, Steet Fund	Jun 29, 2012 9:37 AM
47	General Fund 100%	Jun 29, 2012 9:30 AM

Q15. What types of pavement management (preservation) techniques does your agency use and where?		
1	Other = Pulverize and Base Stabilization activities	Jul 26, 2012 5:46 PM
2	53% of our network is concrete; so we do a lot of that.	Jul 26, 2012 7:54 AM
3	the city is in the beginning stages of identifying major areas in need of chip sealing and crack sealing work for preservation purposes. Some work will be done in the summer of 2012.	Jul 17, 2012 3:58 PM
4	We would prefer Hot-Mix asphalt but no projects have been performed to date.	Jul 17, 2012 1:08 PM
5	1. Arterial chip seal project planned for 2013 2. Aretial slurry seal planned for 2014 3. Fog seal done in conjunction with chip seal 4. CIR done on selected blocks having excessive alligator/block cracking	Jul 16, 2012 6:53 PM
6	EZ Street cold patch for filling pot holes.	Jul 16, 2012 10:33 AM
7	Other - pavement patching and preleveling prior to sealcoating	Jul 16, 2012 9:27 AM
8	We also do preleveling, blade patching and digouts.	Jul 16, 2012 8:11 AM
9	Intend to implement more techniques as program develops.	Jul 14, 2012 7:02 AM
10	Overlays have been used in the past, but are not currnetly used becasue of insufficient funding.	Jul 13, 2012 3:04 PM
11	We no longer have the funding to chip seal roads. We are strictly in a stop-gap maintenace mode.	Jul 13, 2012 3:01 PM
12	The City will consider chip seal, slurry seal and fog seal for its collectors and residential streets.	Jul 13, 2012 1:40 PM
13	Residential Program started in 2012	Jul 11, 2012 10:51 AM
14	For the roads that are on the Chip Seal list for the current year. We Pre Level with Hot Mix Asphalt any deficiencies and Crack Seal the Longitudinal and Transverse cracks. The remaining roads are monitored annually and deficiencies are repaired.	Jul 10, 2012 12:58 PM
15	A significant portion of arterial street miles in the City are part of SR-20, a WSDOT maintenance responsibility.	Jul 10, 2012 9:36 AM
16	We believe we have failed at pavement preservation (for many streets, but not all) if we have to grind and overlay, or rebuild. Our goal is to chip seal pavements before they deteriorate to the point of needing to be ground out and overlaid or rebuilt. In our opinion, for most streets, grinding and overlaying isn't really pavement preservation, it is pavement replacement due to allowing it to fail.	Jul 9, 2012 10:29 AM
17	Full depth reclamation	Jul 6, 2012 9:15 AM
18	Sandwich Seal (Double Chip Seal) when asphalt matt is thin and there is extensive cracking and fatigue, in lieu of an overlay when $ are not available. Double Chip Seal is also used on unpaved gravel roads as well.	Jul 5, 2012 11:50 AM

Q15. What types of pavement management (preservation) techniques does your agency use and where?		
19	Seattle has a large inventory of rigid portland cement concrete pavements (PCCP) and employs some maintenace treatments on those not listed such as diamond grinding and select panel replacement.	Jul 2, 2012 10:18 AM
20	until this year we have not used any of these techniques. I am the new manager for streets and we will be crack sealing, chip sealing this summer.	Jul 2, 2012 6:48 AM
21	Possibly may do microsurfacing on collectors in upcoming years.	Jun 29, 2012 1:26 PM
22	Chip seals are typically limited to rural areas	Jun 29, 2012 11:04 AM
23	We have started using Warm Mix Asphalt as well for overlay and gravel road upgrades	Jun 22, 2012 1:44 PM

Q16. How much (%) is spent on:		
1	Concrete up to half of street maintenance budget	Jul 26, 2012 7:54 AM
2	We also do digout work as necessary.	Jul 23, 2012 4:24 PM
3	More is needed, but there is not the funds to provide for it. We try to keep vehicles from suffering damage while our preservation efforts diminish every year due lack of funding. Many of our streets (20%) are to far below the current targeted rate and are not eligible for any funding.	Jul 23, 2012 8:16 AM
4	Surface Treatments: Chip seal and crack filling Overlays: 2" HMA overlay without milling Partial Depth: full width grind and 2" HMA overlay Full Depth: permanent patching as well as pvmt repairs as part of overlays	Jul 16, 2012 6:53 PM
5	On a percentage basis full-depth repairs predominate because they are so expensive. Full depth repairs are generally associated with the larger, grant-funded capital projects that have been the mainstay of the street maintenance program in recent years.	Jul 10, 2012 9:36 AM
6	We do partial or full depth repairs on the worst spots, crack seal and then follow the same year or within 8 months, with a chip seal. On the more deteriorated or stressed streets, we double chip seal (first layer is 1/2 inch rock, followed by 3/8 inch rock and then a final light oil top coat).	Jul 9, 2012 10:29 AM
7	Street Striping and Pavement Marking Maintenance = $21,500	Jul 5, 2012 11:50 AM
8	Estimated.	Jul 2, 2012 10:18 AM
9	Preventitive maintenance costs not included in program costs shown in previous responses. Annual chip seal budget is $300k and annual crack seal budget is $250k and are paid seperate from preservation funding out of operational funds. Same for ACP patch work and sidewalk repair/replacement.	Jun 29, 2012 2:37 PM
10	estimated and varies from year to year, however most overlay focus is on Arterials right now.	Jun 29, 2012 1:26 PM