

## **Pavement Management System Prioritization Policy – 2009**

### **Background**

There are currently 876 lane miles (5,280 feet by 11 feet wide = one lane mile) of road to maintain in the City of West Jordan. In years past, visual inspections and a “worst road first” methodology were used to prioritize which roads received treatments (usually a 2” thin overlay or a 3” thick overlay). This caused inexpensive treatments like slurry sealing, chip sealing, and crack sealing to be underfunded or not used on the roads that were in good or fair condition. Allowing the good or fair roads to degrade into a “fair” or “poor” condition is far more expensive to maintain long term for the City. Therefore, a more scientific approach is under way to use limited funding in a “right treatment at the right time” approach.

### **Pavement Management**

Several components are necessary for a pavement management system to work correctly. First, an agency must know how many miles of streets need maintenance, what condition each road is in, what treatment to apply for each condition, and how much of each treatment can be applied under existing budget constraints. Computer databases have been created to help manage the inventory of roads, their existing condition (based upon accurate inspections), and the best treatment to apply within a given budget. The City uses for Cartegraph PavementView Plus for its pavement management database.

Each year City staff inspects all of the arterial and collector streets (9000 South is an example of an arterial road, and 3200 West is a collector). Subdivision streets are inspected every third year. Surveys are conducted in the late summer to early fall when temperatures decline and roadway cracking is easily visible. Inspection reports are then compiled into the computer program, and budgets are also entered into the system. Scenarios are run allowing the program to give a maximum coverage to City streets in a “best road first” approach. Some money is also reserved every year to reconstruct roads in the “worst” category. By performing preventative maintenance on roads in the good to fair categories with inexpensive treatments, in the long term, more money will be available to maintain the remainder of the roadway system.

### **Pothole Filling**

Potholes occur in roads due to water freezing and thawing under the pavement causing the pavement to heave and break apart. Potholes are considered an emergency condition, and pothole filling is a temporary repair to remedy the situation until patching can be done. For more information on pothole repairs, see the City’s “Potholes – Frequently Asked Questions” Web page.

### **Patching and Crack Sealing**

These maintenance strategies address specific distresses in the roadway surface. For crack sealing, a thick bituminous material is injected into cracks that are ¼-inch wide to prevent water from infiltrating below the pavement. Patching for permanent pothole repair or utility cuts is completed with full quality control, squared off-full depth pavement cuts, and at the proper temperature. These types of repairs are generally followed by a roadway surface treatment (slurry or chip seal) within four years to provide a

cost-effective program of roadway preservation. Patching and Crack sealing are funded through annual Public Works operations budgets.

**Slurry Seal and Chip Seal Surface Treatments**

Slurry seal and chip seals are applied to the entire pavement surface to prevent oxidation (caused by the sun’s UV light) and moisture infiltration into the pore spaces of the pavement. Slurry seals are applied to roads that are in good condition, and chip seals are applied to streets that have at least a fair condition. Both treatments extend the pavement life by several years and improve long-term performance. Slurry and chip sealing are funded through the Capital Improvement Pavement Maintenance Program.

**Pavement Overlay**

Asphalt overlay projects are used to add strength to existing streets and are generally applied to pavements that have a poor condition rating. In accordance with the law, ADA ramps are installed or revised in conjunction with all overlay projects for the elimination of public way barriers. Depending on several variables, overlays last approximately 5 to 10 years, and further surface treatments can still be applied during that time. Pavement Overlays are funded through the Capital Improvement Pavement Maintenance Program.

**Pavement Reconstruction**

Pavements that have exceeded their functional (design) life are programmed for reconstruction through the Capital Improvement Pavement Maintenance Program. As with pavement overlays, ADA ramps are installed or rebuilt to comply with current standards. Moreover, damaged curb and other drainage issues along the roadway can be corrected to reduce the future damage to the road surface due to water infiltration and Utah winter cycles.

<b>Flexible Pavement Rating and Evaluation Guide</b>		
		
PCI = 100-86 (Excellent)	PCI = 85-71 (Very Good)	PCI = 70-56 (Good)
Requires no maintenance	Requires crack seal (\$0.01 SF maintenance cost )	Chip or slurry seal treatment (\$0.30 SF maintenance cost)

		
PCI = 55-41 (Fair)	PCI = 40- 26(Poor)	PCI = 25-11 (Very Poor)
Requires dig outs and thin overlay (\$1.50 SF rehabilitation cost)	Requires dig outs and thick overlay (\$2.50 rehabilitation cost)	Pavement and base reconstruction (\$6.00 SF reconstruction cost)

### Example – Best roads first approach

The work done in the 2009 season is a good example of just how much work can be accomplished with this best first approach. Below is the list of projects completed or under way for a total budget of \$3,985,114. This work covered 226.6 lane miles, or roughly ¼ of all City streets (14 lane miles reserved for next year on 9000 South included).

1. Crack Sealing – City wide locations as required (50 or more lane miles)
  - a. Up to \$100,000 (Public Works \$30,000 – department supplies, and \$70,000 from Pavement Rehabilitation)
2. Slurry Sealing – District 4 – South of 7800 South and West of 4800 West (125 lane miles)
  - a. Budget – approximately \$500,000
3. Chip Sealing with Salt Lake County (15 lane miles)
  - a. 4800 West from 6200 South to New Bingham Highway
  - b. 6200 South (south half) from near Bangerter Highway to 5600 West
  - c. Budget: \$235,114.00 plus additional for 4800 ??? West?? and 7000 South (amount pending Salt Lake County response)
4. Pavement Reconstruction – patch and repair plus milling and 2- to 3-inch overlay
  - a. Grizzly Way – 7000 South to overpass near West Hills Middle School (8200 South) 3-inch overlay (5 lane miles)
    - i. Budget: \$600,000
  - b. 7000 South – Redwood Road to Bangerter Highway – 3-inch overlay (10 lane miles)
    - i. Budget: \$1,000,000
  - c. 7800 South – 5600 West to 6700 West – cost of asphalt reconstruction and shoulder widening project (3.6 lane miles) 3-inch overlay
    - i. Budget: \$350,000
  - d. Miscellaneous subdivision streets - 2-inch overlays (4 lane miles)
    - i. Budget: \$200,000

- e. 9000 South – reserve any leftover funds for overlay next year – Master Planned waterline project needed first from 2700 West to 2200 West (14 lane miles)
  - i. Budget: \$1,000,000

In this example, if all the money were used for only overlay work, then only an additional 15.5 lane miles could have been maintained with overlay work, versus the 197.6 lane miles that was accomplished with the same money.

### **Policy**

While no system is perfect, and some streets in the same neighborhood may be skipped over in any given year due to the need for different treatments, staff is trying to reach as many streets as possible in each geographic area of the City within the given budget. Our desire is that no problem goes unnoticed, and that all potholes are repaired as soon as possible. Every road should be inspected no later than every third year. The goal is to manage the roadway network up to a “fair to good” condition within the budget constraints adopted by the City Council and management.