



# TOWN OF APPLE VALLEY

## TOWN COUNCIL STAFF REPORT

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**To:** Honorable Mayor and Town Council **Date:** January 24, 2017

**From:** Brad Miller, Town Engineer **Item No:** 11  
Engineering Department

**Subject:** PAVEMENT MANAGEMENT SYSTEM REPORT

**T.M. Approval:** \_\_\_\_\_ **Budgeted Item:**  Yes  No  N/A

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### RECOMMENDED ACTION:

Receive and file.

### SUMMARY:

Per Council's request, this report explains the Town's method of selecting streets and the type of street repair to be performed each year on the Town's street system. The primary challenge is that there are limited street maintenance funds to cover the Town's 400 plus miles of paved roads.

### BACKGROUND:

A Pavement Management System (PMS) is a planning tool used to aid pavement management decisions and the Town is required to utilize such a system in order to be eligible for Measure I funding. PMS software programs model future pavement deterioration due to traffic and weather and recommend maintenance and repairs to the road's pavement surface based on the type and age of the pavement and various measures of existing pavement quality.

Recommendations are biased towards preventative maintenance, rather than allowing a road to deteriorate until it needs extensive reconstruction.

Typical tasks performed by PMS include:

1. Inventory pavement conditions, identifying good, fair and poor pavements.
2. Assign importance ratings for road segments, based on traffic volumes, road functional class and cost/benefit for the overall community.

3. Schedule maintenance of good roads to keep them in good condition.
4. Schedule repairs of poor and fair pavements as available funding allows.

Research has shown that it is far less expensive over time to keep a road in good condition than it is to repair it once it has deteriorated. This is why PMS place the priority on preventive maintenance of roads that are still in good condition, rather than reconstructing roads in poor condition. In terms of lifetime cost and long-term pavement conditions, this results in better overall system performance.

Recently, Town Engineering staff performed an update survey on all Town maintained streets using a visual inspection method to assess and inventory various road conditions such as transverse and longitudinal cracking, "alligator" type cracking, pot hole repair frequency and ride-quality. Average Daily Traffic (ADT) data was utilized by incorporating the information obtained through the city's traffic counts database for major arterials, collectors and various residential roads. For the remaining minor residential roads, not included in the vehicle count database, a traffic count was estimated based on the number of houses on each street.

The condition rating, improvement type, cost and priority for each street are determined by inputting the condition survey into the pavement management software program for each road segment. The program not only determines the Pavement Condition Index (PCI) for each street section, but also a suggested repair and cost estimate is determined. Updated unit repair costs were developed based on recent construction bids and projections of future construction conditions for each segment of the Town's 400 plus centerline-mile street system.

The PMS gives a snapshot of current pavement conditions and the current cost to bring all segments up to standard. Using the updated PMS data, it is estimated that the funding needs for our entire network is \$49.1 million.

Based on the PMS recommendation, the Town should try to allocate at least \$2M annually towards a five-year cyclical Micro-surfacing program and an additional \$1M annually to provide for reconstructions, overlays and other needed asphalt repairs above and beyond the micro-surface program.

### Treatment Types and Estimated Costs

**Slurry Seal:** the slurry seal option allows for a cost effective treatment to seal the surface and restore skid resistance of local street segments, which do not carry high traffic loads. This treatment is not used on streets which require strengthening or reconstruction. Typical slurry seal cost includes street cleaning, removal of vegetation, minor base repairs and the application of an emulsified asphalt aggregate mixture to the entire paved surface. Associated costs include the replacement of striping and pavement markings and other work needed to return the street to normal operation. Expectant life of a slurry seal is three (3) to five (5) years.

**Micro-surface:** Micro-surfacing is a process similar to a slurry seal. A mixture of asphalt emulsion and aggregate (crushed stone, gravel and sand) is applied to the road. However, unlike a slurry seal, micro-surfacing uses emulsion that is modified with

polymers and other ingredients so it cures more quickly. The service life is seven (7) or more years.

Chip Seal: Chip seals are constructed by evenly distributing a thin base of hot bitumen or asphalt onto an existing pavement and then embedding finely graded aggregate into it. The aggregate is evenly distributed over the seal spray, then rolled into a smooth pavement surface. A chip-seal-surfaced pavement can optionally be sealed with a top layer, which is referred to as a fog seal or enrichment. Chip sealing is the most economical method of street resurfacing. It is a commonly used process by municipalities across the nation. Chip sealing is comparable to other resurfacing methods in durability and effectiveness, but costs far less, (15-25% of the cost of pavement overlays). Chip seals are economical surface treatments designed to protect and prolong the life of roadway pavement.

Overlay: Thin asphalt overlays are used on all types of roadways for functional improvements. Functional improvements are those improvements that enhance the smoothness, friction, and/or profile of the roadway while adding little or no additional load-carrying capacity. These are particularly suitable for high-volume roads in urban areas where longer life and relatively low-noise surfaces are desired. Recently the Town constructed a hot-mix overlay on Apple Valley Road between Bear Valley Road and Town Center Drive.

Reconstruct: Typical street reconstruction costs include removal of the existing pavement and base structural section and replacement with a new structural section, which will meet a twenty-year design life. Ramona Road from Navajo Road to Central Road was recently reconstructed.

**FISCAL IMPACT:**

None.