Council Meeting Date: March 17, 2003 **Agenda Item: 5(b)**

CITY COUNCIL AGENDA ITEM
CITY OF SHORELINE, WASHINGTON

AGENDA TITLE:	Pavement Management System
DEPARTMENT:	Public Works
PRESENTED BY:	Paul S. Haines, Public Works Director

PROBLEM/ISSUE STATEMENT

The purpose of this staff report is to inform the Council on the pavement condition ratings of City of Shoreline streets in 1999 and 2002, and to provide projected pavement condition ratings as a result of budget reductions due to I-776.

RECOMMENDATION

No action is required. This staff report provides updated information to the Council on the pavement condition ratings of City of Shoreline streets.

Approved By: City Manager ____ City Attorney ____

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INTRODUCTION

The purpose of this staff report is to inform the Council of the Pavement Management System Study regarding the Overlay Program and its condition ratings of our City streets. The Pavement Management Study is designed to determine an optimal pavement maintenance and rehabilitation program.

BACKGROUND

The City of Shoreline has 162.3 center lane miles of paved surfaces with an estimated replacement value of $380 million. From the time of the City's incorporation until 1999, street overlays were done according to King County criteria and county-wide pavement management ratings. The Shoreline area (Pre-Incorporation) received an average of 3.77 lane miles of overlay each year. This pavement management plan allowed roads to deteriorate at a steady rate with a steadily increasing deferred maintenance cost.

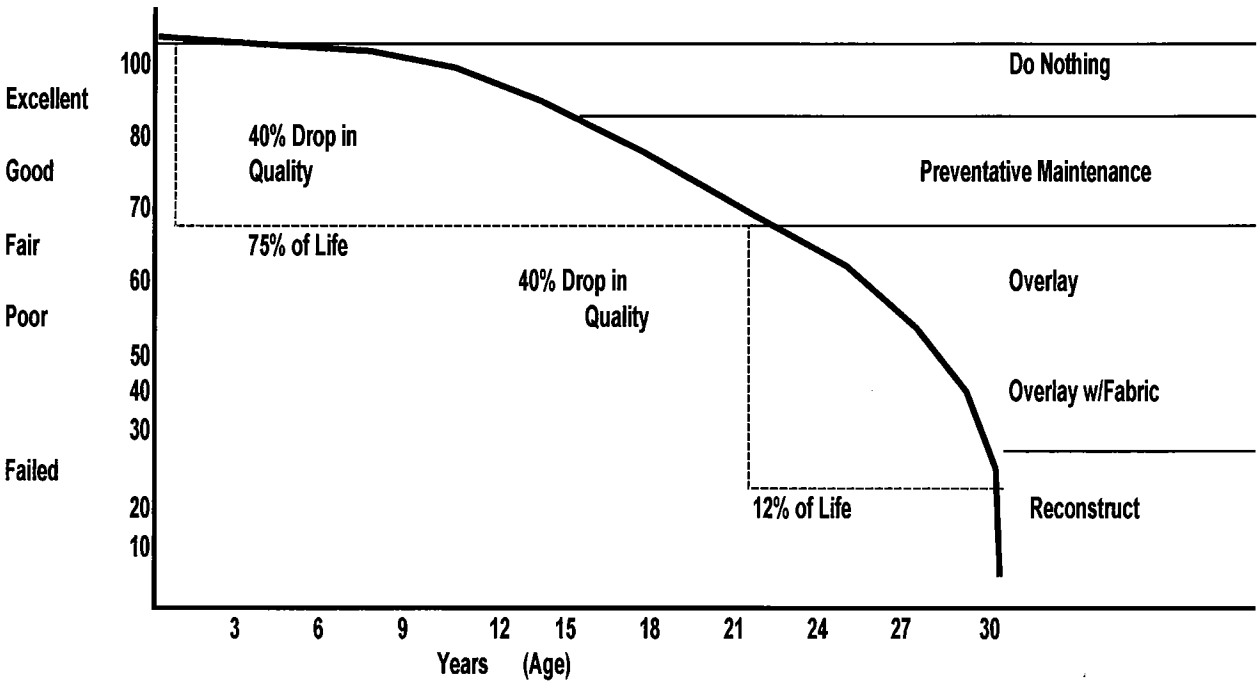
On February 1, 1999, Public Works staff introduced the use and concept of Pavement Management systems. Included was an analysis of our own pavement network utilizing Measurement Research Corporation's (MRC) distress survey data. This survey data identified the severity of different types of cracking, the amount of loose rock, rutting, potholes and asphalt failures. The City's pavement condition was rated using a scale from 0-100 with 0 being the worst condition and 100 being the best. Staff presented a long-term strategy to optimize available funds, improve the overall condition of our pavement network and get more work done with limited funds. Council concurred that it would be necessary to increase the overlay budget of $400,000 adopted during the 1999 budget process to $590,000 to bring road conditions to an appropriately maintained service level.

DISCUSSION

History:

As part of the 2000 Pavement and Rehabilitation Plan, staff reviewed a series of pavement treatment options that could be applied over the life of the pavement to maximize the use of limited funds and extend the life of the pavement.

The 1999 Inventory/Condition assessment done by MRC showed the City's overall weighted average score of our pavement network system to be 75.9, fair to good condition. However, the report also showed a high percentage (29%) of pavement sections that had condition ratings below 65. Historically, these street sections fail 6 times faster than those rated above 65. The Pavement Performance Curve shown below illustrates this point.



These figures define the various terminology associated with applying these curves to the variables which define the pavement performance we wish to model. These terms are used extensively in defining the various information associated with the construction, maintenance and repair of pavements. Some of these are:

Score	The pavement surface condition rating, 0 to 100, with 100 = Best
LMY	Last maintenance, rehabilitation or re-construction year
Expected Life	The expected life to the "Must Repair" score (40 for this analysis)
Age	Age of the pavement measured from the "LMY" at the must repair score

The analysis of the condition of pavement surface within Shoreline included a few application alternatives. One application alternative depicted the "Status Quo" option (reactive rather than planned maintenance) reflecting the City's prior maintenance practices and funding levels of $400,000 annually. The continuation of this program would have created a decline in pavement conditions and a dramatic increase of deferred maintenance with a need for large capital investments occurring in the long term. The optimum program recommended by MRC required an annual expenditure of $860,000 to improve the condition of City streets. The maintenance programs that staff recommended and Council approved was a Mix Method pavement program. This maintenance strategy proposed overlays on streets with a condition rating below 65 to rehabilitate these streets. It also proposed using seal coats on streets with condition ratings above 75 to provide preventative maintenance and keep these streets in good condition. This maintenance strategy was employed to maintain the existing pavement condition and deferred maintenance costs. This strategy required an increase in the overlay budget that was approved by the Council in the 1999 budget process and again in the 2000 budget process. The total Pavement Maintenance and Rehabilitation budget approved by the Council in 2001 and 2002 was $700,000.

Current:

The primary objective of the Pavement Management System is to provide a comprehensive long-term maintenance and rehabilitation plan for maintaining City streets. The data gathered and analysis done provides the City with the ability to evaluate it's current Maintenance, Repair and Rehabilitation (MR&R) operations and to allow for future guidance in possible modifications to existing funding levels and repair strategies.

In 1999, the City's overall weighted-average pavement rating was 75.9 with a 10 -year deferred maintenance cost of $7.3 million (In 2002 dollars). The deferred maintenance cost is the dollar expenditure required to bring all street ratings to 100 at the end of the 10-year maintenance strategy. The following graph and MR&R option table shows the City's options in 1999. As stated above, Staff recommended use of option 2 and Council concurred.

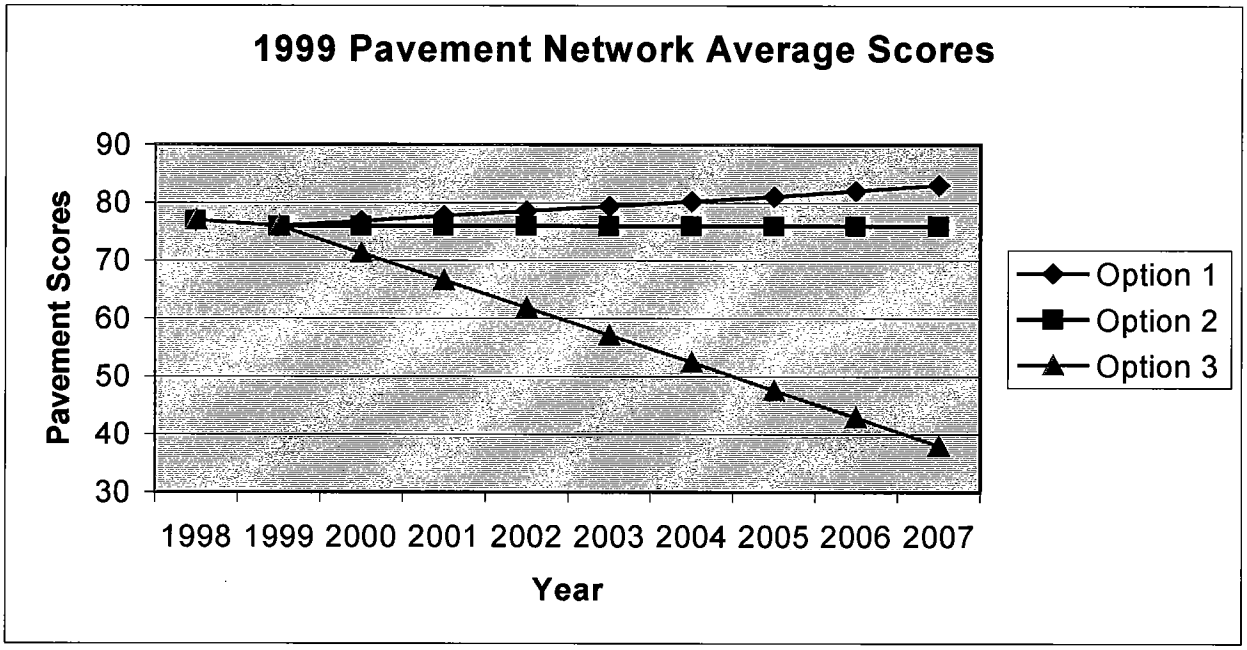
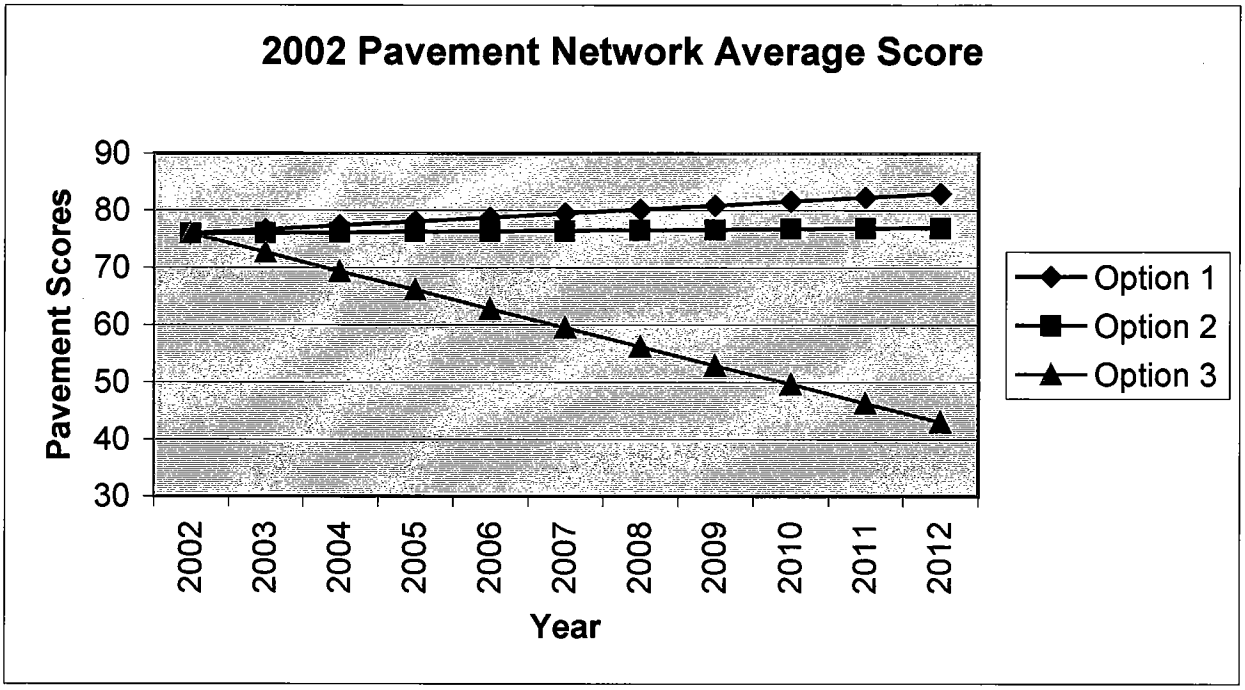


Table 1 - 1999 Alternative Annual Maintenance & Rehabilitation Budget Levels in $1,000

MR&R Strategy	Description of Analysis	Average Annual Budget	Pavement Scores		10 Year Deferred $ X 1000
			Beg.	End	
Option 1	Recommended Optimized Budget	$860	76	83	$5,525
Option 2	Preventative Maintenance	$680	76	76	$7,298
Option 3	Do Nothing	$0	76	38	$23,155

The City's Pavement Condition Ratings were updated in 2002, again by contract to Measurement Research Corporation. The predicted condition of the City's pavement

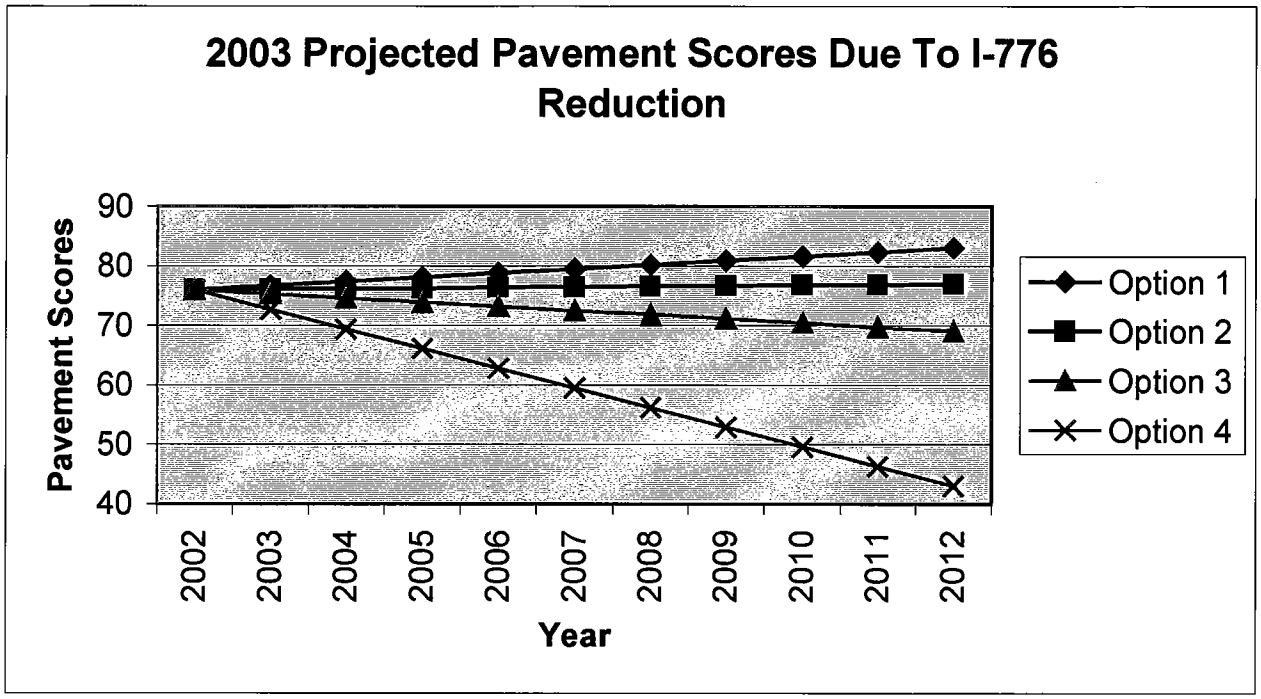
network was again analyzed over a 10-year period to determine the long-term effects of the alternative uniform budget levels. The results of this inventory showed a no net loss in pavement condition ratings and a slight decrease in the deferred maintenance, proving that the strategies outlined by MRC and recommended by staff were valid. The following graph and MR&R option table shows the City's options in 2002. Again, the preferred option is option 2.



2002 Alternative Annual Maintenance & Rehabilitation Budget Levels

MR&R Strategy	Description of Analysis	Average Annual Budget	Pavement Scores		10 Year Deferred $ X 1000
			Beg.	End	
Option 1	Recommended Optimized Budget	$860	76	83	$5,983
Option 2	Preventative Maintenance	$700	76	77	$7,497
Option 3	Do Nothing	$0	76	38	$23,188

With the 30% reduction in the 2003 Overlay budget, from $700,000 to $500,00, due to the impacts of I-776, the City can expect a reduction in the overall condition of its streets over the next ten years. The prediction model used in 1999 and 2002 was extended to show this reduction in budget. This, of course, could change depending upon the outcome of the legal challenge to I-776. I-776 was declared unconstitutional in a superior court ruling. King County is now collecting the fees and holding them until the Supreme Court hears the case. The following graph and MR&R option table shows the City's options to include the reduction in preventative maintenance or option 3.



2003 Alternative Annual Maintenance & Rehabilitation Budget Levels

MR&R Strategy	Description of Analysis	Average Annual Budget	Pavement Scores		10 Year Deferred $ X 1000
			Beg.	End	
Option 1	Recommended Optimized Budget	$860	76	83	$5,983
Option 2	Preventative Maintenance	$700	76	77	$7,497
Option 3	2003 Approved Budget	$500	76	69	$12,225
Option 4	Do Nothing	$0	76	38	$23,188

Summary

The City's Pavement Management System has been proven to be an effective tool for planning and prioritizing street maintenance, repair and rehabilitation work. It has also proven to be an accurate forecasting tool given an approved budget. The Pavement Management System has shown that an annual budget of $700,000 for street rehabilitation and preventative maintenance in the form of overlay and surface seals has effectively maintained the street network in good condition and stopped the continued deterioration of the network.

If the Supreme Court upholds the I-776 initiative, the City will need to find replacement revenues. With the 30% reduction in the City's overlay program due to I-776, the City will no longer be able to preserve the street network in its present condition. The overall average condition rating will decrease and the deferred maintenance costs will increase over time. At the $500,000 level, the City's street network can not be sustained in an acceptable condition.

RECOMMENDATION

No action is required. This staff report provides updated information to the Council on the pavement condition ratings of City of Shoreline streets.