DATE ISSUED: June 9, 2006 REPORT NO: 06-071

ATTENTION: Public Safety & Neighborhood Services Committee
Agenda of June 14, 2006

THE CITY OF SAN DIEGO
REPORT TO THE CITY COUNCIL

SUBJECT: Condition of City Street Network

REQUESTED ACTION: THIS IS AN INFORMATION ITEM ONLY. NO ACTION IS REQUIRED ON THE PART OF THE COMMITTEE OR THE CITY COUNCIL

1. BACKGROUND

The Public Safety and Neighborhood Services Committee requested Street Division to present a report on the condition of the city's streets. This report will detail the following areas:

1. Background
2. Overview of City Street Network
3. Condition of City Streets
4. Types of Street Maintenance Activities
5. Selection Criteria for Street Maintenance
6. Historical and Current Funding Levels
7. Future Projections for Street Maintenance
8. Conclusion

2. OVERVIEW OF CITY STREET NETWORK

The City of San Diego's current street network consists of approximately 2735 miles of streets. This includes: 2574 miles of asphalt streets; 111 miles of concrete streets and; 50 miles of unimproved streets. In addition, there are approximately 194 miles of concrete alleys, 27 miles of asphalt alleys and 37 miles of unimproved alleys.

In 2001 and 2003, Street Division retained a specialized pavement engineering consultant, Stantec Consulting, to perform a citywide condition assessment of asphalt streets. The average cost for each survey was $250,000. The methodology used by the consultant was to assess the condition of all commercial streets and residential streets with an average daily traffic (ADT) count greater than 2,500. Although the entire network was not surveyed, information from the streets surveyed was extrapolated to those not surveyed. The result is an accurate overall condition assessment of the entire network of asphalt streets. A similar survey is planned for Fiscal Year 2007. The cost for the next condition assessment study is estimated at $450,000.

3. CONDITION OF CITY STREETS

The following information represents data collected from the most recent information from the 2003 street condition assessment survey. Streets were placed in one of three categories: acceptable, fair or poor.

Acceptable - A street in the acceptable condition category has little or no cracking, or potholes, or other distresses, has excellent drivability, and does not need maintenance. A street in acceptable condition has an OCI rating between 70 and 100.

Fair - A street in the fair condition category has moderate cracking, some minor potholes, has adequate drivability, and is typically in need of remedial repairs and a slurry seal, or a minor asphalt overlay. A street in fair condition has an OCI rating between 40 and 69.

Poor - A street in the poor condition category has severe cracking, numerous areas of failed pavement with possible sub base failure, poor drainage characteristics, exhibits a rough ride and qualifies for a comprehensive asphalt overlay or a total reconstruction. A street in poor condition has an OCI rating between 0 and 39.

The most recent data from the 2003 survey revealed that 40% of the streets are in acceptable condition, 42% fair and 18% are in poor condition. Figure 2 compares the percentage of each condition category of the 2003 survey with a previous similar survey in 2001.

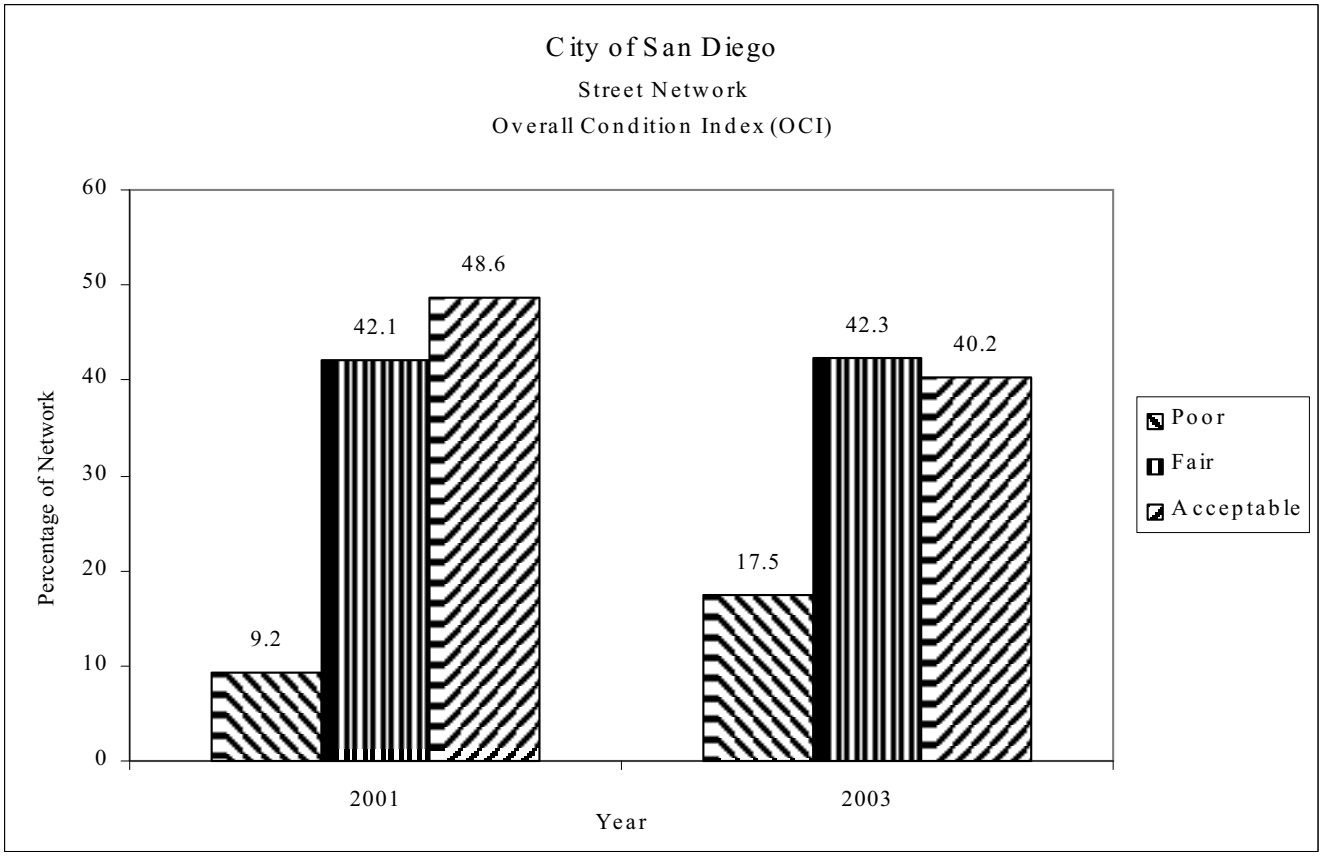

Figure 2

The industry accepted network would consist of 75% acceptable, 20% fair, and 5% poor. To obtain this network, based on the survey performed in 2003, 711 miles of streets need to be overlayed and 989 miles of streets need to be slurry sealed.

4. TYPES OF STREET MAINTENANCE ACTIVITIES

Overlay - Asphalt Overlay is the placement of a new layer of asphalt at a thickness of 1-3 inches over a deteriorated street surface. Overlaying also includes the repair of isolated asphalt failures, and grinding at the gutter line to retain proper drainage characteristics. The majority of the overlay program is contracted out to private paving companies.

Slurry Seal - Slurry Sealing is the application of a seal coat which consists of sand, emulsion, and water applied in a thin layer up to 1/4 inch thick on pavement in relatively good condition. Slurry seal coating is used to preserve the condition of sound asphalt pavements. As part of this process, crack sealing and minor surface repairs are typically completed prior to sealing. Since 1998, Street Division has utilized a rubberized slurry seal. This material incorporates rubber from recycled tires, retains a darker finish longer and is a more resilient coating product. Since beginning the rubberized slurry seal program, rubber from 429,000 tires has been used. City staff is currently working with the California Integrated Waste Management Board to have rubberized slurry seal approved as a recycled product. With this approval, special grants will be available for future projects. All slurry seal projects are contracted out to private paving contractors.

Concrete Pavement – Repairs to concrete streets range from patching with asphalt to removal and replacement of isolated concrete panels, to complete reconstruction of the entire roadway. All concrete repairs are performed by city forces.

A 2001 condition assessment survey of the concrete streets was performed by city pavement specialists. Based on that survey, most of the 111 miles of concrete streets needed isolated panel replacement of 120,000 square feet or 0.6 miles of pavement. Additionally, there were approximately 10 miles of concrete streets in need of complete reconstruction.

5. SELECTION CRITERIA FOR STREET MAINTENANCE

Current methods of maintenance utilized within the City's Street Resurfacing Program include asphalt overlays and slurry seal surface treatments. Streets are selected for overlay or slurry sealing through a variety of methods. The primary selection tool used is the Pavement Management System (PMS). This system stores current and historical condition data. This data includes the frequency and severity of various pavement distresses such as potholes and cracking, as well as ride condition. The PMS predicts the future condition of streets under different types of maintenance practices. The PMS then determines the best method to maintain each section of street and analyzes the entire city street system to find the most cost effective maintenance plan given specific budget constraints.

Figure 1 is a typical street deterioration curve from PMS. This deterioration curve illustrates that in the first 75% of service life, or approximately 16 years, the serviceability is reduced by 40%. During the next 25% of service life, or approximately 5 years, a street will lose its final 60% of the serviceability.

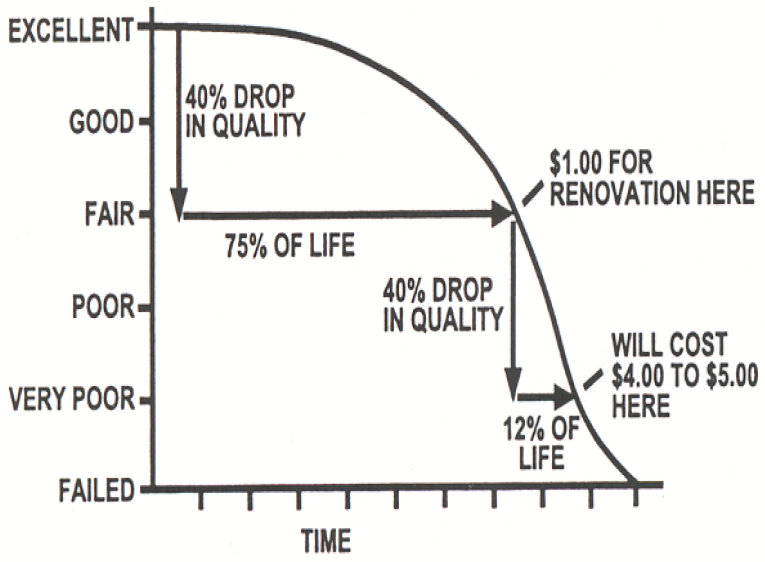

Figure 1. Typical pavement condition life cycle.

This illustrates that the most cost effective way to extend a street's service life is to perform maintenance before it reaches the critical deterioration drop-off point, as referred to on the chart as the "$1.00 FOR RENOVATION HERE."

The industry accepted roadway maintenance program, practiced by the California Department of Transportation and other major cities, is to keep 75% of the roadway system in acceptable condition at all times. The Street Division rates and monitors the condition of streets using an Overall Condition Index (OCI) indicator. Streets within the City of San Diego with an OCI rating of 70 or greater are considered in acceptable condition. The OCI rating is based on a scale from 0 to 100, which is determined using road attribute condition factors. These factors include: type of street, age, oxidation, rate of deterioration, average daily vehicle trips, types and size of cracks, number of potholes, previous maintenance, and quality of ride.

In addition to the priorities from PMS, input from Street Division staff, other city staff, citizens, community groups and council offices contribute to prioritizing the streets under consideration for resurfacing. The recommended sites are then evaluated in the field to determine the existing condition of the street surface. Combined with the supporting historical maintenance records, traffic usage of the street, and a utility conflict check, the appropriate final repair recommendation is made.

6. HISTORICAL AND CURRENT FUNDING LEVELS

Table 1 shows the history of the actual budget for the resurfacing (overlay and slurry seal) program. Figures for Fiscal Year 2007 are estimated. Since 2002, the funding levels for both the street overlay and slurry seal have been significantly reduced. Two commodities commonly used on resurfacing projects are paving grade oil and aggregate. As the price of these two products continue to escalate, the cost to maintain and repair the streets increases. Since 2002 the average annual increase in these material costs was 15%. The reduced budget combined with material price increases have significantly reduced the amount of street miles maintained.

Table 1

Fiscal Year	Overlay		Slurry Seal		Total Street Resurfacing	
	Funds	Miles	Funds	Miles	Funds	Miles
2000	$4,100,000	34.95	$4,245,700	82.58	$8,345,700	117.53
2001	$11,737,274	102.84	$4,703,532	90.36	$16,440,806	193.20
2002	$4,950,063	27.72	$2,758,509	123.65	$7,708,572	151.37
2003	$3,273,750	21.82	$1,700,647	71.90	$4,974,397	93.72
2004	$0	0.00	$710,081	27.00	$710,081	27.00
2005	$1,399,327	6.97	$770,300	19.50	$2,169,627	26.47
2006	$1,421,895	4.49	$770,000	20.00	$2,191,895	24.49
2007*	$8,208,222	21.04	$4,790,000	79.50	$12,998,222	100.54
Total	$35,090,531	219.83	$20,448,769	514.49	$55,539,300	734.32

Note: Funds and miles for Fiscal Year 2007 are proposed.

7. FUTURE PROJECTIONS FOR STREET MAINTENANCE

When comparing the data of the 2001 and 2003 survey, it is estimated that approximately 8% (206 miles or 103 each year) of the network has deteriorated from fair condition to poor condition and approximately 8% (206 miles or 103 each year) of the network has deteriorated from acceptable to fair.

Total street resurfacing funding decreased significantly after 2003. Is it anticipated that deterioration has accelerated since 2003, as compared to the rate of deterioration from 2001 to 2003. The degree of deterioration will be known following the planned survey during Fiscal Year 2007. As a conservative estimate, if a similar rate of deterioration is projected between 2003 and 2006, the percentages of streets in the acceptable, fair and poor categories are 28%, 43% and 29% respectively. Based on these percentages, the funding level required to maintain the network at its estimated current level needs to be sufficient to overlay 103 miles and 103 miles of slurry seal (see Table 2). A more accurate representation of the maintenance requirements of the city's street network will be obtained in Fiscal Year 2007 survey.

Table 2 provides annual funding alternatives for two maintenance plans. The first plan (Alternate 1) proposes to keep up with future network deterioration by overlaying 103 miles and slurry sealing 103 miles. This plan will also repair the 120,000 square feet or .6 miles of isolated concrete panels in need of repair.

The second plan (Alternate 2) proposes to eliminate the backlog within 5 years by overlaying 204 miles, slurry sealing 260 miles each year and reconstructing 1.5 miles of concrete streets. Alternative 2A identifies the annual maintenance miles and funding required to maintain the industry accepted network after the backlog is eliminated. This network will have 75% of the streets in acceptable condition, without any deferred maintenance, by overlaying 74 miles of asphalt pavement, slurry sealing 158 miles of asphalt pavement, and repairing 0.5 miles of concrete pavement.

By comparing maintenance budgets for the alternatives, it is noted that a street network in acceptable condition is less costly to maintain than the current network.

Table 2

Method	Cost per Mile	Alternative 1 Current Network		Alternative 2 Next 5 Years for Industry Accepted Network		Alternative 2A Industry Accepted Network - Maintain once achieved	
		Miles	Annual Budget	Miles	Annual Budget	Miles	Annual Budget
Overlay	$383,000	103	$39,449,000	204	$78,132,000	74	$28,342,000
Slurry Seal	$49,000	103	$5,047,000	260	$12,740,000	158	$7,742,000
Concrete	$4,200,000	0.6	$2,386,000	1.5	$6,300,000	0.5	$2,100,000
		Total	$46,882,000		$97,172,000		$38,184,000

With the cost per mile of overlay rising, the benefit to investigating alternative methods is becoming more appealing. City pavement specialists have been studying various surface treatments that can be applied to streets in fair and poor condition that improve its OCI to the acceptable range. Two of these surface treatments are a Cape Seal and a Type III Slurry Seal. In the future, as funds are available, these various "alternative" methods will be incorporated in overlay projects for further studying. If favorable, these methods will provide budgetary relief to the City's Street Resurfacing Program.

8. CONCLUSION

The longer street maintenance is deferred, the more costly the repairs will be when maintenance is performed. In the current fiscal year, $1,421,895 and $770,000 was allocated for overlay and slurry sealing respectively. The Mayor's proposed Fiscal Year 2007 allocates $8,208,222 and $4,790,000 for overlay and slurry sealing respectively.

The City's network of improved streets is one of the largest publicly held assets. If the same network were to be constructed today, the initial capitalization cost is estimated at $6.7 billion dollars. With such a significant amount of money invested in the street network, preventative maintenance is the key to its longevity and serviceability.

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