



Agenda Date: 02/11/2014
Agenda Item: 7.1

STAFF REPORT

Date: Tuesday, February 11, 2014
To: Bryan H. Montgomery, City Manager
From: Kevin Rohani, Public Works Director/City Engineer

Approved and Forwarded to City Council:


Bryan H. Montgomery, City Manager

SUBJECT: WORKSESSION - Street Maintenance and Resurfacing Program

Background and Analysis

The City of Oakley has under its jurisdiction approximately 131 miles of public streets that are maintained by the Public Works Department. Streets are amongst the highest valued assets that a community has and are directly related to the quality of life experienced by the residents and visitors to the City of Oakley.

The Governmental Accounting Standards Board (GASB) is the independent organization that establishes and improves standards of accounting and financial reporting for U.S. state and local governments. The GASB mandates that municipalities inventory their assets and identify by quality and condition, which includes all the streets owned by the municipality. The municipalities in the Bay Area use the Pavement Management System (PMS) software program that is produced and distributed by the Metropolitan Transportation Commission (MTC) to meet the GASB standard and to evaluate their roadway systems and condition.

The purpose of PMS is to assign a value, known as the Pavement Condition Index (PCI) representing the current condition of each street segment so that street maintenance and reconstruction can be prioritized. Also, from the GASB asset management view, it becomes a method to value streets at any given time. The City of Oakley uses the PMS program which enables Staff to update the PCI of all City streets annually and plan for street maintenance and resurfacing projects based on data and facts.

When streets are designed and constructed, the typical estimated life of a new street is 20-25 years *with* a preventive maintenance program. However, the life cycle of a street can be greatly affected by a number of factors, including;

- Deferred preventative maintenance
- Volume and type of traffic (especially heavy truck traffic)
- Construction materials and techniques
- Condition of the sub-grade
- Environment (i.e. temperature differential)
- Water intrusion from rain and landscaping

- Frequency of trench cuts in the roadway

Each of the above factors can contribute to the premature deterioration of street surfaces by impacting the street section's structural integrity and leading to structural failures. Once a street has failed, the only effective remedy is a complete reconstruction. In addition to the significant financial costs, there are other factors that are considered when evaluating pavement maintenance or rehabilitation, including the potential disturbances to residents and businesses as well as overall traffic flow, particularly during high demand periods.

The PCI categories for streets are established in the PMS program. A brand new street would have a PCI of 100. The PCI values are broken down into four (4) categories:

- **Condition I** - Good (PCI - 70 to 100) has little or no distress, with the possible exception of utility patching in good condition, or signs of light cracking that may be slightly weathered.
- **Condition II** - At Risk (PCI - 50 to 69) has severe weathering, moderate levels of distress, limited patching, and non-load-related cracking.
- **Condition III** - Poor (PCI - 26 to 49) has moderate to severe levels of distress including load-related types of cracking, such as alligator cracking.
- **Condition IV** - Failed (PCI - 0 to 25) has severe levels of distress, large quantities of distortion or alligator cracking, and pavement failures past possible rehabilitation activities.

The last PMS report that was done in 2012 showed the overall condition of Oakley's streets that are generally in the Classification I and II range with a PCI value of 77.

As a comparison, the PCI from our neighboring cities are:

- 88 - Brentwood
- 68 - Antioch
- 67 - Pittsburg
- 63 - Pleasant Hill
- 61 - Martinez

There are three major categories of streets in the City of Oakley: Arterials, Collectors, and Residential. Arterial street repair and resurfacing are often eligible for Federal and/or State grant funding, while Collector and Residential streets are not, meaning they are typically paid for with City funds.

Approximately 22% of the City's streets are classified as Arterials, such as Empire Avenue and Laurel Road. Approximately 18% of the City's streets are classified as Collectors, such as West Cypress Road and Carpenter Road. The remaining 60% are classified as Residential, such as Ashwood Drive and Fetzer Court.

Pavements begin to gently deteriorate right after construction, and then rapidly deteriorate after they pass a certain point. It is important that preventive maintenance be performed before pavements begin to rapidly deteriorate; otherwise, very expensive corrective maintenance is required to bring the pavement to acceptable levels. The quality of new street pavement drops approximately 40% during the first 15 years (good to fair) of its life cycle, and then drops another 40% during the next 5 years (fair to poor) of the life cycle.

The maintenance treatment that is performed when the pavement condition is between good and fair condition is called "preventive maintenance." Maintenance which is performed when the pavement condition is below fair condition level is called "corrective treatment" or "rehabilitation." Usually corrective maintenance costs are more than four times that of preventive maintenance costs.

The performance of a pavement is affected by the type and quality of the maintenance it receives, as well as when the maintenance is performed. Timely preventive maintenance can slow the rate of deterioration of pavement. Delays in maintenance and deferred maintenance can increase the severity of defects. Preventive pavement maintenance should be applied before a significant amount of distress occurs. For example, once a substantial crack occurs on the pavement surface it is easier for water to infiltrate into the layer of pavement and weaken the subgrade structure. Applying a crack sealant as a preventative measure will impede water from entering the crack, and therefore slow the deterioration process.

The more aggressive a pavement maintenance program can be, the greater the ability to extend a street's life cycle; therefore, maintaining a higher overall pavement condition index will result in a lower cost for pavement maintenance.

In order to maximize the use of City pavement funding resources, staff has investigated several options for street resurfacing in recent years. One of the methods that have been successful is the use of a Rubberized Asphalt Concrete (RAC) Cape Seal process as an alternative to the more conventional Asphalt Concrete (AC) overlay. The base material of RAC Cape Seal process is made from recycled rubber, which consists of ground or granulated rubber particles derived from auto, light truck, or other sources of tires that use a high content of natural rubber.

The RAC Cape Seal process is the application of a rubber chip seal, followed by an application of a slurry seal for the final surfacing. This will result in a thin pavement surfacing that provides improved resistance to reflective cracking and a better overall vehicular ride. This strategy also provides significant cost savings when compared to conventional AC overlay strategies. This application has a life expectancy of approximately five to ten years.

Another resurfacing strategy that staff is exploring is the use of a Thin Hot Mix Asphalt overlay. This process involves the application of a thin layer (typically not exceeding 1.5 inches) of special mix asphalt over a road base that has been repaired

and crack sealed. This approach is an alternative to the Cape Seal process that Staff will evaluate for its long term performance. This application has a life expectancy of approximately three to seven years.

The PCI for the City of Oakley has continued to decline from its peak of 86 in 2005 to the level of 77 in 2012. This is primarily due to the fact that around 2005, a lot of new development took place in the community and that new development installed brand new roads, thus raising the level of PCI. However, as stated above, the new pavement will deteriorate over time, resulting in a lower PCI (as has been the case since 2005)

Currently, the City of Oakley allocates \$300,000 per year for street repair and resurfacing maintenance projects. At this funding allocation, the PCI for the City of Oakley will drop to 69 by 2017 with an increasing level of deferred maintenance.

It is important to point out that the City of Oakley allocates additional funding for various major roadway construction projects that widen and improve the older streets in the community. The funding for these projects are in addition to the \$300,000 per year for general street resurfacing projects.

In order to keep the PCI level at 77, it will require funding allocations of over \$2.5 million per year in 2014 and increasing to over \$4 million per year by 2017.

This level of funding allocations for street repair and resurfacing is not practical in the City of Oakley with the limited funding that is available for all City services. Staff believes that a PCI level of 72 can be attained and sustained in the long term for our community. This PCI level puts the overall condition of City streets in the "Good" category (Condition I), which is far better than many of the neighboring municipalities and will improve and keep the quality of life and infrastructure in Oakley.

To attain a PCI level of 72, it will require funding allocations of about \$1million per year for dedicated street repair and resurfacing projects Citywide. This would be Staff recommendations for the FY 2014-15 budget and gradually increasing in subsequent years to keep up with inflating construction costs.

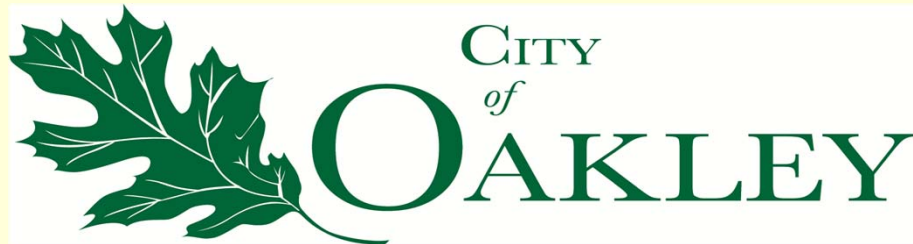
Staff will continue to diligently pursue the most effective and economical street resurfacing methods within the authorized funding to ensure the City streets are kept operational and in the best. In this process we will collaborate and coordinate with colleagues from Bay Area municipalities and industry experts to ensure the City of Oakley gets the best street maintenance and resurfacing product and service.

Fiscal Impact

This report is for information and no direct fiscal impact is required at this time.

Recommendation

The City Council accept and discuss the Staff Report and provide input and direction.



Pavement Management **Program**

February 11, 2014

What Is A Pavement Management Program?

- A tool to assist Cities make cost-effective decisions about streets
- Answers 4 main questions:
 - What does City of Oakley have in the street network?
 - What condition is it in?
 - What repairs are needed and when?
 - How much money is required to maintain or improve streets cost-effectively?
- City of Oakley uses Metropolitan Transportation Commission's (MTC's) StreetSaver® software

MTC's Requirements

- Maintain a PMP to be eligible for funding
- MTC has biennial PMP certification
- MTC provides grants to assist cities to maintain PMP – usually every 2-3 years
- Used to determine City's funding allocation

General Information

- City of Oakley has 131 miles of streets
- **Estimated \$220 million in value**

Functional Class	Total Miles
Arterial	28.8
Collector	23.6
Residential/Local	78.6
Total	131.0

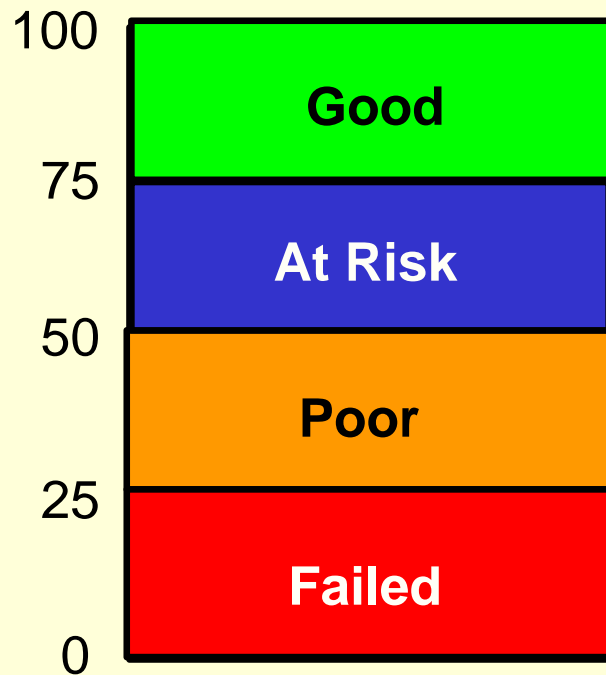
Limited state/federal funds available

Only city funds available
Exception Major Collectors

PCI Descriptions

PCI Range	Condition	Description
70 – 100	(1) Good	Little or No distress, with the exception of utility patches in good condition, or minor to moderate hairline cracks; Typically lightly weathered.
50 - 69	(2) At Risk	Light to moderate weathering, light load-related base failure, moderate linear cracking
25 - 49	(3) Poor	Moderate to severe weathering, light to moderate levels of base failure, moderate to heavy linear cracking.
0 - 25	(3) Failed	Extensive weathering, moderate to heavy base failure, failed patches, extensive network of moderate to heavy linear cracking.

How is Condition Measured?

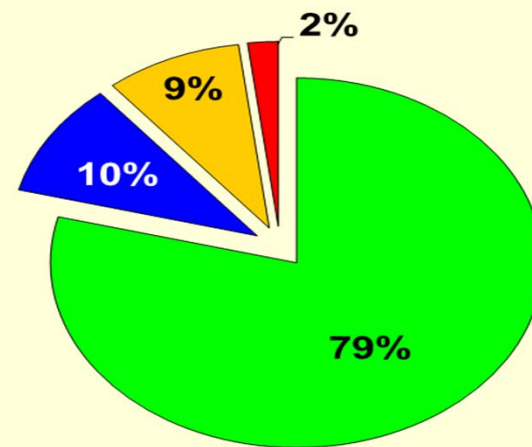


**Oakley PCI
is at 77 in 2012**

2012 City of Oakley PCI

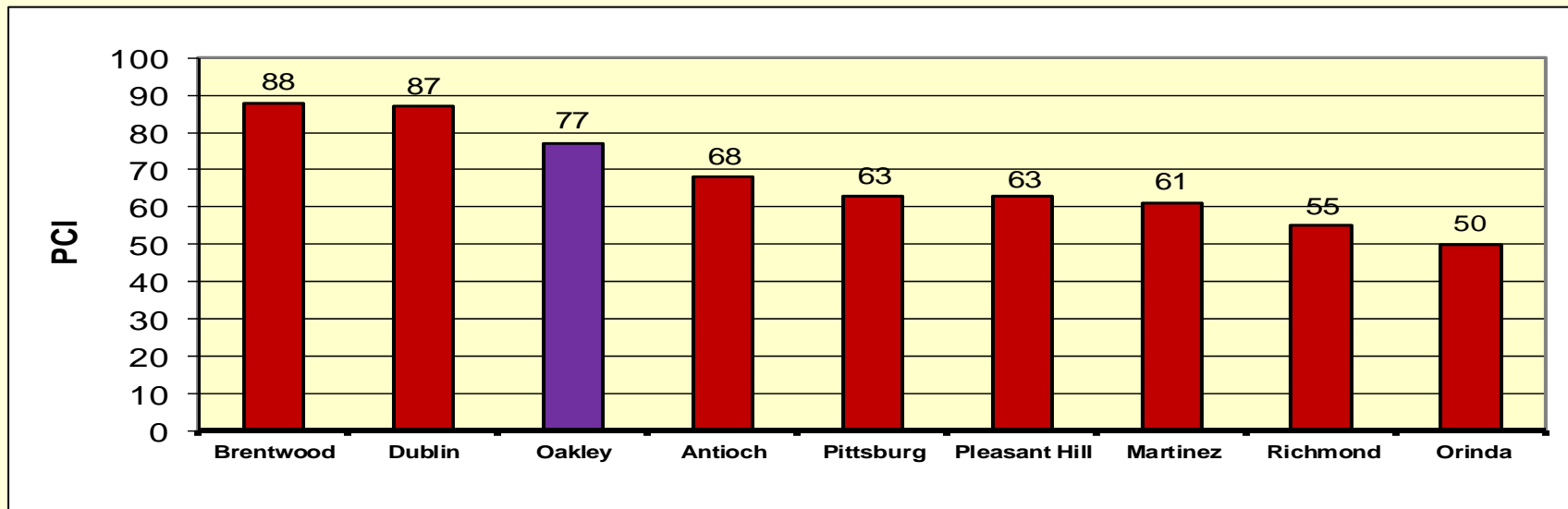
Average PCI = 77

- Good (70-100)
- At Risk (50-69)
- Poor (25-49)
- Failed (0-24)



* % of pavement area

How Do Other Cities Compare?



PCI = 100



PCI = 77



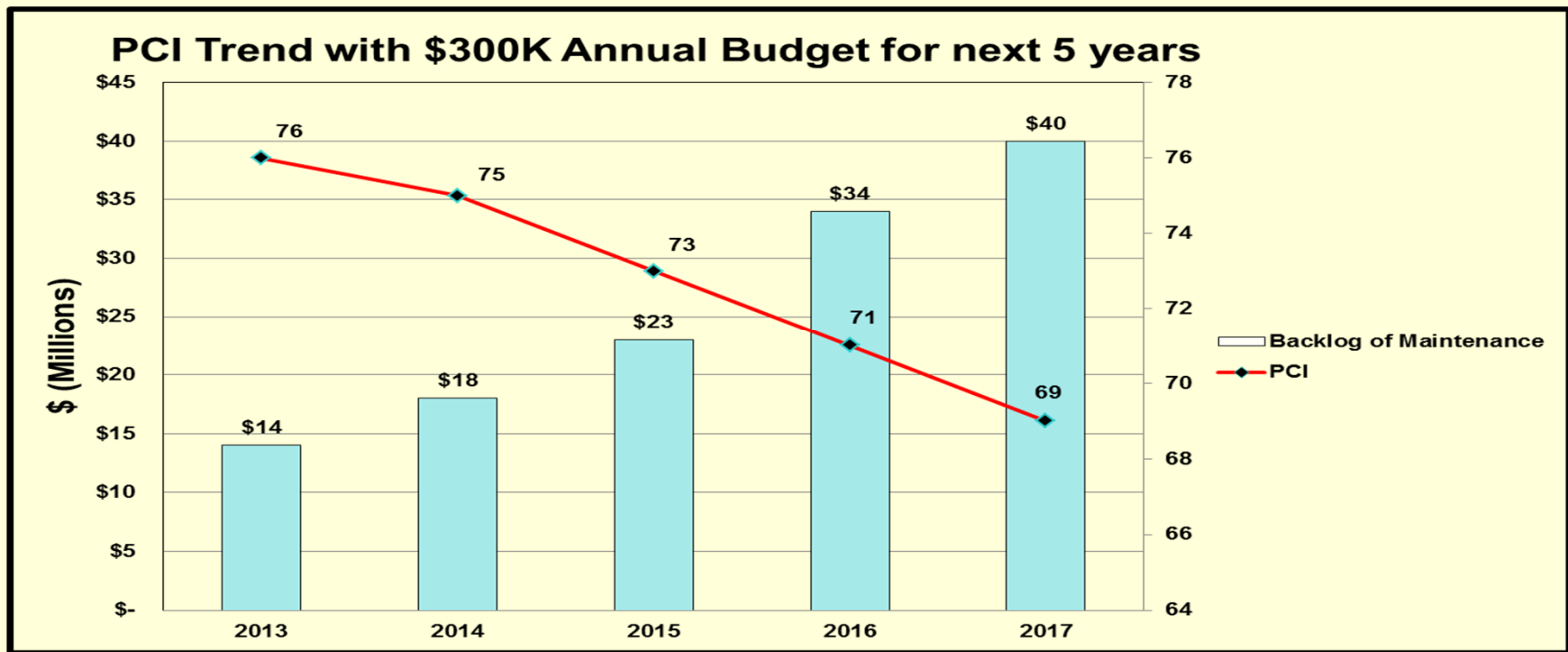
PCI = 37



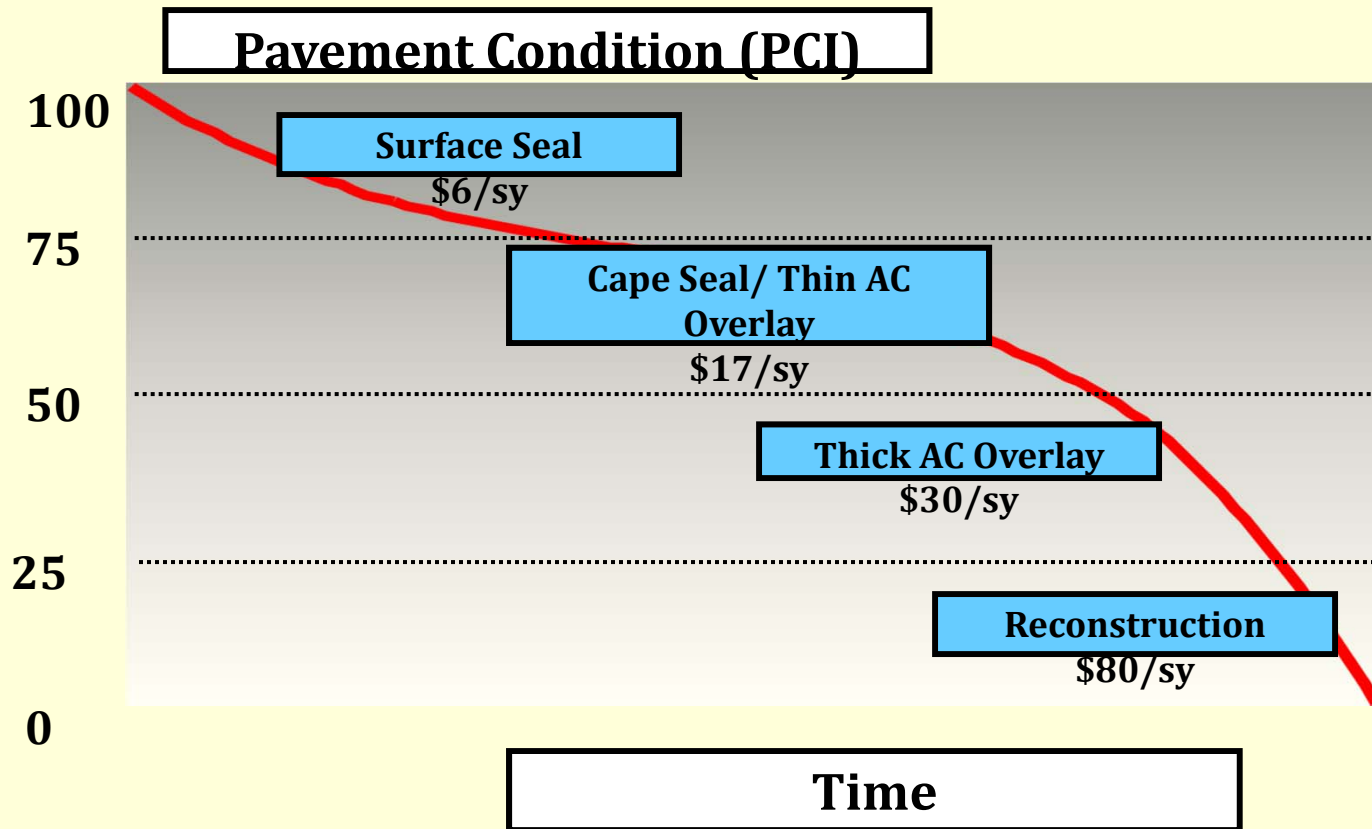
PCI = 10



PCI Trend



Pay Now or Pay More Later



Potential Funding Sources

- Local Transportation Sales Tax Measures
- Devote More Local Sales Tax/Revenues to Road Maintenance
- Establish Citywide Assessment Districts
- Truck Route Permit Fee
- Residential Garbage Collection Fee
- Development Road Impact Fee
- Pursue Federal and State grant funding programs for Arterial Streets
- “Taxes” (parcel, utility, sales, etc.)

Conclusions & Recommendations

- City has a street network in good condition that needs to be maintained to protect its investment in the roadway infrastructure.
- Follow PMP recommendations to stay certified with MTC
- Maintain current preventive maintenance strategy

Conclusions & Recommendations

- Continue to pursue rehabilitation alternatives (i.e. AC overlays and Rubberized Cape Seals)
- Aim to increase the pavement budget to maintain the current PCI
- Explore different funding alternatives and their financial impacts



Questions?