

# COUNTY OF SACRAMENTO PAVEMENT CONDITION REPORT



## **PAVEMENT CONDITION REPORT** JANUARY 2019



#### **County of Sacramento**

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#### **Executive Summary**

The County of Sacramento (County) owns and maintains about 4,700 lane miles of roads in California. This large road network is a significant public asset valued at over \$5.5 billion. Residents, visitors, and businesses use this network to go to work, to take their children to school, to go shopping, or to simply play and recreate. It is a significant contributor to the economic vitality of the region, and therefore one of the most critical assets owned and maintained by the County.

The Pavement Condition Index (PCI) is used to determine the health or condition of the roads. The higher the number, the better the road condition. On a scale from 0 to 100, 0 indicates a "Very Poor" condition (e.g., a pothole riddled road) and 100 indicates an "Excellent" condition (e.g., a newly paved road). The County's road network currently has an average PCI of 50, which is considered to be in "Fair" condition. Overall, more than 50 percent of the network is in good or fair condition (PCI more than 50), while 9.1 percent is in very poor condition (PCI less than 25). The current unfunded backlog is estimated to be approximately \$783.8 million.

The County accomplishes pavement maintenance through contracts and by utilizing Department of Transportation staff. A combination of federal, state, and local funding sources are available to repair pavement and pave roadways.

Four funding scenarios were performed to determine potential outcomes for the County. The existing funding is expected to range from \$30 million to \$35 million per year depending on the sources. At \$30 million per year, the PCI will rapidly deteriorate to 36 by 2028 and to 34 by 2038. At \$35 million per year, the PCI will decrease to 38 over the next ten years and then essentially remain at that level. To maintain the current PCI at 50, about \$50.5 million per year is required. The addition of SB1 funding is insufficient to bring the County's road network to a state of good repair.

The analyses also indicate the County needs approximately \$88 million annually for pavement maintenance in order to improve the average PCI to 70 within 15 years. By doing so, roads can be maintained in good condition with ongoing preventive maintenance.

Sacramento needs at least \$88 million per year to improve the PCI to 70.

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#### Background

With about 4,700 lane miles of roads, the County of Sacramento (County) owns and maintains the eighth largest county road network in California. Only the counties of Los Angeles, San Diego, Fresno, Kern, Tulare, San Bernardino, and Imperial have larger road systems in California. To truly understand the magnitude of this network, consider driving every lane of every road. We would almost be in Dublin, Ireland, by the time we were done.

This large road network is a significant public asset valued at over \$5.5 billion. Residents, visitors, and businesses all utilize this asset to go to work, to take their children to school, to go shopping, or to simply play and recreate. The road network contributes significantly to the economic vitality of the region; and it is, therefore, one of the most critical assets owned and maintained by the County.

With this in mind, the Department of Transportation (Department) is committed to cost-effective maintenance strategies to meet our mission and vision to "continuously improve, operate, and maintain a safe and efficient transportation system that better serves our citizens and commerce." To achieve this, the Department has utilized a pavement management program (PMP) for many years. A PMP is a planning tool that answers questions such as:

- What are the characteristics of the County's road network?
- What are the existing pavement conditions?
- What maintenance and rehabilitation strategies are employed to improve roads?
- Is the current funding adequate?
- What is the most cost-effective way to implement a multi-year capital improvement program?
- What are the impacts of additional funding?

This report summarizes some of the key information about the County's road network and answers the above questions.

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#### **Pavement Condition**

The Pavement Condition Index (PCI) is the standard used to determine the health or condition of the roads. The PCI is a scale from 0 to 100: 0 represents a pothole-riddled road and 100 is a newly surfaced road. A PCI score of 70 to 100 is considered "Excellent/Good"; 50 to 69 is "Fair"; 25 to 49 is "Poor"; and 0 to 24 is "Very Poor." The PCI may be considered similar to a "grade" for each road section. The photographs on the right side illustrate a range of County roads in different conditions.

Sacramento County's roads currently have an average PCI of 50, which is at the low end of the "Fair" ranking. For comparison, Figure 1 indicates that the Sacramento County PCI average is near the bottom when compared to other Californian counties and cities.<sup>1</sup> The 2018 statewide average is 65.

The pavement network is composed of different classifications including arterials, collectors, and residential roads. Arterial roads are characterized by higher speeds; more truck, bus, and automobile traffic; and typically four or more lanes. Residential roads are typically two lanes, have lower speeds, and less traffic. Collector roads are inbetween, and their function is to "collect" traffic from residentials and funnel them to arterials.



#### Figure 1. PCI Comparison with Other Cities and Counties

1 PCI data are from 2018 California Statewide Local Streets and Roads Needs Assessment, October 2018, with exception of the City of Sacramento (2017), Elk Grove (2017), Lake County (2018), Mendocino County (2017), and West Sacramento (2018).



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As shown in Figure 2, the County has significantly more residential roads (61 percent) than any other classification. Residential roads have a slightly lower average PCI (48) than arterial or collector roads (54). This is typical of many counties because funding tends to be prioritized for roads with higher traffic volumes.

There are significant financial implications to the PCI because pavements deteriorate over time. The deterioration is slow at first but accelerates when the PCI drops below 70 (see Figure 3). As the pavement deteriorates, the repair cost increases rapidly. If there is inadequate funding to maintain roads in their current condition, then the unfunded backlog will grow rapidly in the future.

The unfunded backlog consists of needed pavement repairs that cannot be performed due to lack of funding. This includes preventive maintenance (slurry and chip seals), rehabilitation (overlays), and reconstruction activities. Deferring maintenance to future years will result in higher

PCI=100



#### Figure 2. Sacramento County Pavement Network Breakdown

costs. Roads that need to be overlaid now, which might cost \$5 per square yard (SY), will require reconstruction later at a cost of up to \$54 per SY. The County's current unfunded backlog is approximately \$783.8 million. Approximately \$130.0 million (17 percent) of the total unfunded backlog is earmarked for preventive maintenance, and the majority (83 percent) is allocated for the rehabilitation and reconstruction treatments.



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#### **Pavement Condition by Supervisorial Districts**

The average pavement condition for the County's road network is 50. This PCI value is fairly consistent for each supervisorial district (see Figure 4). The highest PCI (57) is in District 1, and the lowest PCI (48) is in District 4.



Pavement age is just one factor in today's pavement condition. Traffic levels, the underlying subgrade soils, drainage flows, and past maintenance practices are also contributing factors. Therefore, it should not be surprising that the average PCI for each district are not identical. Although the PCIs are similar, Figure 5 shows that there are significant variations in the percentage of roads in each condition category. Consequently, it is not always possible to implement a "one size fits all" approach to maintenance. Each supervisorial district will have different funding and maintenance needs. For example, District 2 may require more preventive maintenance than the other districts.



Figure 5. Breakdown of Pavement Condition Categories for Each Supervisorial District

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#### **Maintenance Strategies**

The pavement condition is affected by the funding level as well as the type and timing of maintenance strategies. Historically, the Department has implemented a variety of maintenance treatments to repair roads. The County paves residential roads by geographic area for economic efficiency. These geographic areas are commonly referred to as "neighborhoods" and are bounded by arterial or collector roads that are not part of the residential area. There are currently about 500 designated residential neighborhoods within the County. The pavement treatment selected for residential, arterial, or collector roadways is primarily based on the PCI. Treatments include slurry, chip, or cape seals when the roadways are in fair and good condition; overlays when the roadways are in poor condition; and reconstruction (full depth reclamation) when roadways are in very poor condition. Recycling techniques are employed when appropriate, which reduces construction costs by as much as 20 to 30 percent over conventional methods.

As shown previously in Figure 3, repair costs increase as the road condition deteriorates. For

Reconstructing 1 failed road is equivalent to preserving 11 good roads.

example, roads in good condition only require seals at an average cost of \$5 per square yard. In contrast, roads in very poor condition require reconstruction at costs of as much as \$54 per square yard, which is almost 11 times more expensive. Put another way, the cost of reconstructing 1 failed road is equivalent to the cost of preserving 11 good roads.

Maintaining roads is, in many ways, similar to maintaining a car. For example, performing inexpensive oil changes are more cost effective in the long run than doing nothing and replacing the car engine when it fails. This is why an aggressive preventive maintenance policy is important.



#### **Historical Funding and Pavement Maintenance**

The County accomplishes pavement maintenance through contracts and by utilizing Department staff. Two or three paving contracts are let each year in the total amount of about \$10 million. These contracts use a variety of funding sources including federal, state, and local sources (see below). The Department spends about \$12.3 million annually filling potholes, repairing pavement, and paving roadways.

#### **Funding Sources**

Funding for pavement maintenance and other road-related expenses typically comes from dedicated sources including the state gas tax and voter-approved increases in the sales tax. In addition to maintenance, this funding pays for operational needs; emergency repairs; complying with regulatory requirements; and maintaining, replacing, and modernizing aging infrastructure and equipment. These funding sources are described below.

#### Gas Tax (Highway Users Tax Account or HUTA)

California has a per-gallon excise tax on gasoline and diesel that is distributed to cities and counties using a formula based on population and mileage. The gas tax is restricted to specific transportation uses for public roads and associated facilities.

The gas tax has historically been the County's largest source of transportation funding. Until the recent action by the state legislature, the base excise tax of 18 cents per gallon had not been raised for over 20 years, so its purchasing power had eroded by about half since 1994.

Forecasts of future gas tax revenues are challenging because they are highly dependent on oil prices and demand. Overall, the long-term expectation is that the gas tax will be a declining revenue source as more fuel-efficient and alternative-fuel vehicles comprise a larger portion of the vehicle fleet. Other sources of funding have increasingly bridged the gap. The gas tax was historically the largest source of funding for pavement maintenance. But it has lost about half of its purchasing power since 1994 and is expected to be a declining revenue source in the long term.

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#### Measure A Maintenance

Sacramento County has a voter-approved, half-cent sales tax to fund transportation improvements such as transit and road maintenance. However, revenues are dependent on the strength of the economy as evidenced by the dramatic decline during the recession in 2009-2012. Since then, sales tax revenue has shown steady but modest increases. Barring any future economic downturns, Measure A revenues are expected to grow by about 3 percent annually through 2021.

#### Road Maintenance and Rehabilitation Account (RMRA) or SB1

In April 2017, the Governor signed the Road Repair and Accountability Act (RMRA): a state transportation funding package that increased the gas tax, diesel tax, and vehicle registration fees. The new measure will also index the gas tax to inflation; therefore, its purchasing power will not be eroded as occurred with HUTA.

RMRA is also commonly known as SB1 (Senate Bill 1) funding.

Funding is split equally among the state and cities and counties through the Road Maintenance and Rehabilitation Account (RMRA or SB1). The County is expected to receive approximately \$25 million a year.

SB1 funding is expected to provide about \$25 million a year to Sacramento County.

#### Federal Funding

Federal funding is generally available through the Regional Surface Transportation Program (RSTP), the most flexible source of federal transportation funding. RSTP is allocated using a population-based formula to the region and distributed on a competitive grant application basis by the Sacramento Area Council of Governments (SACOG).

SACOG's guidelines include funding for "Fix it First" projects, but maintenance projects must compete with other capital transportation projects and include "complete street"<sup>2</sup> components in any request for roadway rehabilitation. Most urban County roads include these components already. As a result, federal funding for rehabilitation can only be used for roads that currently lack sidewalks or bicycle lanes. In most cases, this requires acquiring right-of-way or relocation of utility lines, and these efforts take longer to design and construct and are usually three or four times costlier than pavement maintenance alone.

The County will continue to pursue complete streets projects in the future; however, it is not possible to predict how much funding may be granted by SACOG for pavement maintenance. In the last two-year funding cycle, the County received \$15 million; but only \$3 million was received this funding cycle. This unpredictability is why a high-low range in funding was analyzed in the following sections.

<sup>2</sup> Complete Streets ensure that the entire roadway is designed and constructed with all users in mind including bicyclists, public transportation vehicles and riders, and pedestrians of all ages and abilities.

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The current unfunded backlog is estimated to be approximately

\$784 million.

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#### Sacramento County Tomorrow

Given the current County road conditions, the Department faces significant challenges in the future even with new SB1 funding. The pavement condition is at the threshold between "Fair" and "Poor" and is expected to continue to deteriorate very quickly. The current unfunded backlog is estimated to be approximately \$783.8 million. The unfunded backlog for each supervisorial district is shown in Figure 6; within each district, the relative amount of each treatment needed is also shown. The unfunded backlog is roughly correlated with the size of the road network in each supervisorial district. For example, District 3 has the most pavement area and the highest unfunded backlog.







#### **Funding Scenarios**

Four funding scenarios were performed to determine potential outcomes for the County. They were:

- Scenario 1A: Current Funding Level (low) average \$30.0 million per year
- Scenario 1B: Current Funding Level (high) average \$35.0 million per year
- Scenario 2: Funding to Maintain PCI of 50 average \$50.5 million per year
- Scenario 3: Improve PCI to 70 within 15 years and maintain at that level \$87.9 million per year for the first 15 years, and \$61.2 million per year thereafter.

Table 1 shows the estimated funding sources for Scenarios 1A and 1B.

	Funding (\$M)/Year		
Sources	Low High		
SB1	\$23.5	\$23.5	
Capital Improvement Program (CIP)	\$2.0	\$5.0	
Force Account	\$1.5	\$2.0	
SACOG	\$3.0	\$4.5	
Totals	\$30.0	\$35.0	

#### Table 1. Estimated Sources of Pavement Funding

Table 2 summarizes each funding scenario and resulting PCI and unfunded backlog.

#### Table 2. Summary of Funding Scenarios and Results

	Annual	2028		2038	
Scenario Fund	Funding (\$M)	PCI	Unfunded Backlog (\$M)	PCI	Unfunded Backlog (\$M)
1A	\$30.0	36	\$1,364	34	\$1,816
1B	\$35.0	38	\$1,298	37	\$1,671
2	\$50.5	50	\$977	50	\$1,198
3	\$87.9*	63	\$626	70	\$442

\* In Scenario 3, \$87.9 million is required to improve the PCI to 70 in the first 15 years; \$61.2 million per year is needed during the subsequent 5 years to maintain the PCI at 70.

Each funding scenario is described in further detail on the following pages.



#### Scenario 1A: Current Funding Levels (Low: \$30M per Year)

This scenario assumes the low estimate for pavement funding as summarized in Table 1. Table 3 summarizes the total funding by district for the next 20 years.

Given the funding level shown in Table 3, Figure 7 predicts the following to occur by 2038:

- 1. The PCI will deteriorate to 36 by 2028 and to 34 by 2038.
- 2. The current unfunded backlog (\$783.8 million) will more than double to \$1.8 billion by 2038.
- 3. About 54 percent of the road network will be in poor or very poor condition.

# Table 3. Total Funding Available forEach Supervisorial District

District	Total Funding for 20 Years (\$M)		
1	\$30		
2	\$102		
3	\$258		
4	\$120		
5	\$90		
Countywide	\$600		



#### Existing Funding: \$30.0 M/Year



#### Scenario 1B: Current Funding Levels (High: \$35M per Year)

This scenario assumes the high estimate for pavement funding as summarized in Table 1. Table 4 summarizes the total funding by district for the next 20 years.

Given the funding levels shown in Table 4, Figure 8 predicts the following to occur by 2038:

- 1. The PCI will deteriorate to 37 in 2030 and then essentially remain at that level.
- 2. The current unfunded backlog (\$783.8 million) will more than double to \$1.7 billion by 2038.
- 3. About 50 percent of the road network will be in poor or very poor condition.

# Table 4.Total Funding Available forEach Supervisorial District

District	Total Funding for 20 Years (\$M)		
1	\$35		
2	\$119		
3	\$301		
4	\$140		
5	\$105		
Countywide	\$700		



#### Existing Funding: \$35.0 M/Year

Figure 8. Projected PCI and Unfunded Backlog with Current Funding Levels (High)

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#### Scenario 2: Maintain PCI = 50

In order to maintain the current County PCI at 50, about \$1.0 billion is required over the next 20 years. This equates to \$50.5 million annually. Note that the unfunded backlog will increase to \$1.2 billion (see Figure 9) due to the effects of inflation and deferring maintenance.



#### Required Funding: \$50.5 M/Year

## Figure 9. Projected PCI and Unfunded Backlog for Scenario 2

There is still a significant funding shortfall just to maintain the existing road condition despite the use of recycling technologies and pavement preservation strategies. An additional \$15.5 million per year is still needed beyond Scenario 1B (high funding level) despite SB1 funding. Figure 10 illustrates the different funding sources and the resulting shortfall.



Shortfall for Scenario 2

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#### Scenario 3: Improve Conditions (PCI = 70)

To improve the network condition to a PCI of 70 within 15 years and maintain it at the same level thereafter, the required funding is \$87.9 million per year for the first 15 years and \$61.2 million per year for the last 5 years. The unfunded backlog will decrease to less than \$500 million by 2038 (see Figure 11).



Figure 11. Projected PCI and Unfunded Backlog for Scenario 3

Figures 12 and 13 on the following pages show the impacts on the road network condition for each scenario. Currently, over half of the network is in good or fair condition, but 9.1 percent in very poor condition. Given existing funding levels (Scenario 1A or 1B), a little over half of the network will be in poor to very poor condition by 2038.

The other two funding scenarios result in marked improvements. In Scenario 2, two-thirds will be in good or fair condition; and for Scenario 3, over 90 percent will be in good or fair condition.

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2038 Condition (S1B: Existing Fund \$35M/Year)

2038 Condition (S1A: Existing Fund \$30M/Year)



2038 Condition (S2: Maintain PCI at 50)



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Figure 13. Impacts of Funding Scenarios on Pavement Network Condition by 2038

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Scenario 2 - Maintain PCI at 50









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#### Conclusions

The County of Sacramento has a substantial investment of over \$5.5 billion in the road network. Overall, the road network is at the threshold between "Fair" and "Poor" condition with a network PCI of 50.

The analyses indicate the County needs approximately \$88 million annually for pavement maintenance in order to improve the average PCI to 70 within 15 years. By doing so, roads can be maintained in good condition with ongoing preventive maintenance. There is insufficient funding to bring the County's road network to a state of good repair even with SB1. While the Department will continue to utilize newer, cost-effective technologies, it will be difficult to bridge the gap between the \$88 million per year that is needed and the \$30 million per year available. Consequently, it will become increasingly more challenging to meet the County's mission and vision to "continuously improve, operate and maintain a safe and efficient transportation system that better serves our citizens and commerce."

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Sacramento needs at least \$88 million per year to improve the PCI to 70.



**Appendix A** 

# Pavement Condition Index Maps

by Supervisorial District



February 26, 2019





#### Pavement Condition Index County Supervisorial District 1 (Map B)

EL CAMINO AVE EASTERN AVI ARDEN WAY FOLSOME S WATT AVE ELDER CREEK RD FLORIN RD B 0.5 2 0 Miles

February 26, 2019



County Supervisorial District 2

January 2019



County Supervisorial District 3

January 2019

# OAK AVE AVE FILBERT 0 0.5 1 2 Miles

February 26, 2019



County Supervisorial District 4





#### Attachment 1 February 26, 2019







Pavement Condition Index County Supervisorial District 5 (Map C) Attachment 1 February 26, 2019



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JANUARY 2019





#### **COUNTY OF SACRAMENTO**



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