

Pavement Condition Report

August 2022

2022 UPDATE



City Pavement Condition Team

Ryan Moore, Director of Public Works Jose Sanchez, Streets Manager Lucinda Willcox, Program Manager Gregory Smith, Senior Engineer

In consultation with

Margot Yapp, NCE Mei-Hui Lee, NCE Sharlan Montgomery Dunn, NCE Mahdi Saghafi, NCE Jose Medina, NCE Ken Huisman, Märker Geospatial

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1. Sacramento Today

With over 3,000 lane-miles of streets, the City of Sacramento (City) owns and maintains the fifth largest city street network in California. Only the cities of Los Angeles, San Diego, San Jose, and Fresno have larger street systems in the state.

Within the region, Sacramento has the highest population density and serves as the regional hub, so its streets carry a correspondingly higher traffic volume than most other cities in the region.

This large street network is a significant public asset, valued at over \$2.6 billion, and is used by hundreds of thousands of automobiles, buses, trucks, bikes, and pedestrians daily.

The City's Public Works Department (Department) is responsible for maintenance, operations, and repair of the City's streets. The Department has utilized a pavement management program (PMP) for many years. A PMP is a decision-support tool that answers questions such as:

- What does the City's street network consist of?
- What is the existing condition of the City's streets?
- What maintenance and rehabilitation strategies are deployed to improve street conditions?
- How much funding is needed?
- What is the most cost-effective way to implement a multi-year resurfacing program based on different levels of funding?

This report summarizes some of the key information on the City's street network and discusses the funding needed to bring the street network to a state of good repair, as well as the implications of different funding levels. This report only examines pavement conditions; it does not discuss the condition or needs related to other elements of the transportation network (bike lanes, sidewalks, striping, signage, traffic control equipment, medians, landscaping, or street trees), day-to-day operations, or emergency repairs.



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2. Pavement Condition

In order to quantify the health, or condition of the City's streets, a standard called the Pavement Condition Index (PCI) is used. The PCI is a scale from 0 to 100, with 100 being a newly surfaced street and zero a failed street. 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 street section. Generally, it is desirable to achieve at least a citywide average PCI of 75 because pavements in this condition can be maintained more cost-effectively. Figure 1 illustrates a range of streets in different condition.

A portion of the street network is surveyed every year using the ASTM D6433-20 pavement distress protocols, which are nationally accepted and used by many cities and counties in the United States, as well as internationally. The arterials are inspected biennially and approximately one-fourth of the residentials are inspected every year. This provides a regular up-to-date snapshot for planning purposes.

In 2022, Sacramento's streets had a citywide average PCI of 59, which is considered to be in "Fair" condition. For comparison, Figure 2 indicates that the condition of the City's network is in the lower range compared to other large agencies in California. Also, as shown in Figure 3, the City is in the bottom third compared to the other agencies in the Sacramento Area Council of Governments (SACOG). For reference, the 2020 statewide average PCI was 66^{1} .



Pavement Condition Index

NOTE: City PCIs denoted by an \ast are from 2020-2021 PMP updates. All others are from the 2020 Statewide Local Roads and Streets Needs Assessment.

Figure 2. PCI Comparison with Other Large Agencies in California





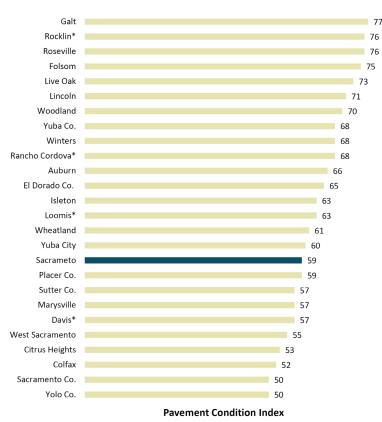


Figure 1. Streets with Varying PCIs

¹ "California Statewide Local Streets and Roads Needs Assessment 2020 Update," Nichols Consulting Engineers, Chtd., CA, 2021.

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NOTE: City PCIs denoted by an * are from 2020-2021 PMP updates. All others are from the 2020 Statewide Local Roads and Streets Needs Assessment.

Figure 3. PCI Comparison with other SACOG Agencies

The street network is composed of different classifications, such as arterials, collectors, and residential streets. Arterials are characterized by higher speeds, more truck, bus, and automobile traffic and typically have at least 4 lanes. Residential streets typically have 2 lanes and have much lower speeds and traffic. Collectors are in-between – their function is to "collect" traffic from residential streets and funnel them to arterials. Like most cities, Sacramento has significantly more residential streets (63.5 percent) than any other classification. As shown in Figure 4, on average, arterials in Sacramento have a slightly higher PCI (63) than collectors (62) and residential streets (57). This indicates that most of the recent pavement work was performed on arterials rather than collectors or residential streets.

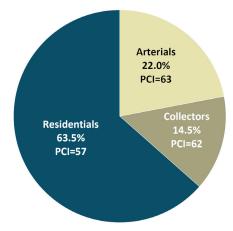


Figure 4. Network Condition Breakdown by Functional Class

2.1 Pavement Condition by Council District

The street network is almost evenly divided among 8 council districts, but the roads are not necessarily in the same condition across districts. Figure 5 indicates that District 1 has the highest PCI (67), and District 2 has the lowest PCI (52), with the remaining districts in the high 50s to low 60s. The streets in District 1 are newer than those in most other districts, so the overall PCI is higher. In addition, deferred maintenance on older streets results in faster deterioration and hence, a lower PCI. There are no council districts with an average PCI that is good condition, and conditions are expected to continue to decline.

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. Consequently, it is not always possible to implement a "one size fits all" approach to maintenance. Therefore, it should not be surprising that the PCIs for each district are not identical. Figure 6 shows the percentage of streets in each condition category for each council district.

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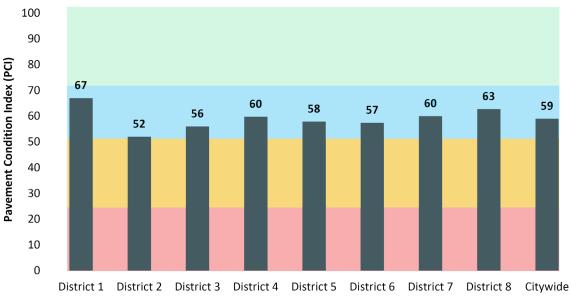


Figure 5. PCI by Council District

Appendix A, included at the end of this report, contains maps of each council district and the condition of the individual streets in those districts, as well as the unfunded backlog.

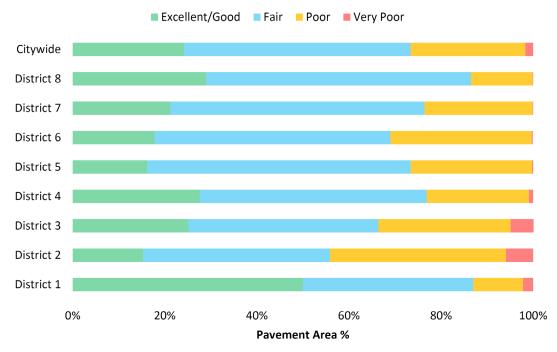


Figure 6. Pavement Condition Breakdown by Council District

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2.2 Pavement Condition by Disadvantaged Areas

The City has recently adopted policies and criteria to address equity and potential historic disinvestments and harm to vulnerable communities and communities of color. In an effort to better consider issues of equity when making decisions about transportation infrastructure and resources, the City has used CalEnviroScreen 4.0 to identify disadvantaged areas (see Figure 7) based on environmental, public health, and socioeconomic conditions. CalEnviroScreen is a tool developed by the California Environmental Protection Agency which analyzes public data to identify cumulative pollution burdens, socioeconomic factors, and vulnerabilities faced by individual census tracts. It is generally used by state agencies in making funding decisions to address equity considerations.

City of Sacramento

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Disadvantaged Areas

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Figure 7. Disadvantaged Areas in the City of Sacramento (CalEnviroScreen 4.0)

As shown in Figure 8, the streets within these disadvantaged areas represent approximately onethird of the City's network and have an average PCI of 56. The remaining two-thirds of the network has an average PCI of 60. This PCI difference can be attributed to communities that have recently been developed in the non-disadvantaged areas (e.g., Natomas, McKinley Village), with higher PCIs due to newer streets. While there may be some inequities at the individual neighborhood level, overall the disadvantaged communities do no exhibit a significantly different average PCI than the nondisadvantaged communities. It should be noted, however, that levels of investment throughout the city are inadequate and that pavement will continue to deteriorate at a higher rate in areas with lower PCIs.

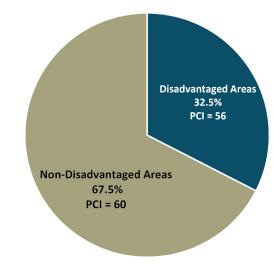


Figure 8. Network Condition Breakdown by Disadvantaged Area

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3. Maintenance Strategies

The street condition is affected by the type and timing of maintenance strategies. Historically, the Department has implemented a variety of maintenance treatments to repair streets. These techniques include a combination of relatively inexpensive pavement preservation treatments such as slurry seals on streets in good condition to significantly more expensive overlays and reconstruction for streets in fair and poor condition. Some of the treatments that have been applied include rubberized asphalt overlays and seals, recycled asphalt pavements, and bonded wearing courses.

Pavements do not deteriorate linearly over time. Deterioration is slow at first, but then accelerates when the PCI drops below 70. As the pavement deteriorates, the cost of repair increases rapidly. If

there is inadequate funding to conduct preventative maintenance, the cost to repair streets increases rapidly.

Figure 9 summarizes the general costs of repair for streets in different conditions. For example, streets that are in good condition require seals at a cost of \$4.50 to \$10.00 per square yard (sy). In contrast, streets that are in very poor condition will require reconstruction at costs from \$88.00 to \$117.00/sy, which can be as much as 26 times more expensive. Or to put it another way, the cost of reconstructing 1 failed street is equivalent to the cost of preserving 26 good streets.

Reconstructing one failed street is equivalent to preserving 26 good streets!

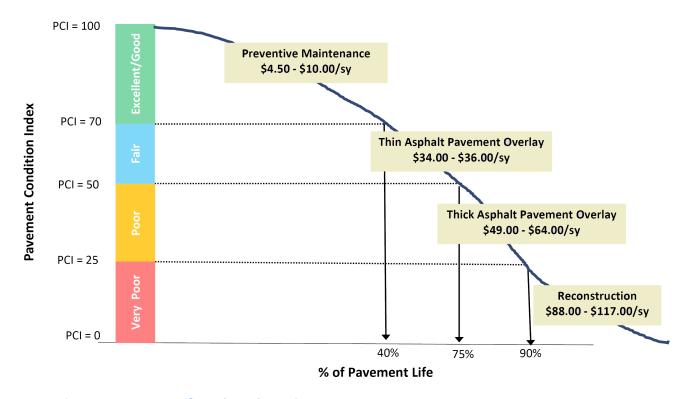


Figure 9. Pavement Life Cycle and Repair Costs

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4. Historical Pavement Maintenance

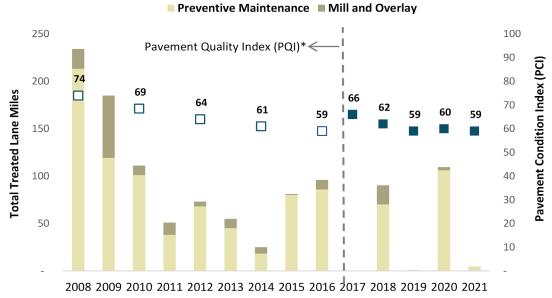
When sufficient funding is available, it is possible for any city to maintain streets at an acceptable level. However, Figure 10 illustrates two trends that have occurred in Sacramento since 2008:

- 1. Less Streets Are Being Repaired: Between 2008 and 2010, almost 180 lane-miles of streets were maintained or repaired each year. Much of this was the result of a one-time infusion of funds through the American Recovery and Reinvestment Act (ARRA). Since 2011, as federal funding allocated by the region for pavement rehabilitation declined, the treated mileage has dropped to an average of 50 lane-miles per year less than one-third of the previous level-of-effort.
- 2. Pavement Condition is Declining: The result is a downward trend in pavement condition as illustrated by the Pavement Quality Index (PQI) and later the Pavement Condition Index (PCI). Note that there was no resurfacing program in 2017 (due to lack of funding) or in 2019 (contracts were rejected due to high bids). In 2020, a total of

110 lane-miles were maintained or rehabilitated, but in 2021, only 4.25 lanes-miles were treated. Most of the projects planned for 2021 were delayed due to staff shortages, UPRR design challenges and federal 10A audits.

There are several reasons for the decreasing number of streets treated:

- The City's funding levels reached a high of \$14.3 million in 2009 (primarily ARRA) and then dropped sharply to \$5.3 million in 2010. Funding did not improve significantly until 2019, when Senate Bill 1 (SB1) was passed (see Section 6).
- The cost of complying with regulatory requirements has increased e.g., Americans with Disabilities Act [ADA] compliance.
- Construction costs have increased since 2012.
- Operational costs have also increased. The City relies on transportation funding to address emergency repairs (e.g., fill potholes). As the pavement deteriorates, the need for emergency repairs increases. On average, the City fills 15,000 potholes per year.



^{*} PQI was used as a condition measure from 2008 to 2016. In 2017, the City switched to the more widely used PCI.

Figure 10. Historical PQI/PCI and Total Treated Lane Miles

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5. American with Disabilities Act Requirements

Maintaining the City's pavement assets also requires a "complete streets" approach to enable safe access for users of different ages and abilities, regardless of the mode of transportation. This approach affects all aspects of street maintenance, such as restriping for bike lanes, traffic signals, or modifications to reduce speeds. A key component of this is the ADA, which requires public entities to ensure that persons with disabilities have access to pedestrian routes within the public right-of-way.

In July 2013, a joint technical guidance was published by the U.S. Department of Justice and the U.S. Department of Transportation to clarify which road maintenance activities would trigger the need to upgrade affected curb ramps to current standards. Essentially, any street maintenance defined as an "alteration" triggers the requirement to upgrade ADA curb ramps.

Almost all of the pavement treatments utilized by the Department are considered "alterations;" this affects an estimated 25,400 curb ramps and accelerated the schedule to upgrade non-compliant ramps. The upgrading/replacement of curb ramps represents a significant opportunity for the City to improve ADA access during the completion of pavement rehabilitation and maintenance activities, but the costs for these ramp upgrades need to be planned and accounted for in the City's paving costs. As an older city, most of Sacramento's streets were built prior to current ADA standards. It is estimated that upgrading curb ramps adds as much as 37 percent to street paving costs. The City has committed at least 20 percent of its annual transportation funds for ADA compliance.

Figure 11 shows examples of non-existent (top), non-compliant (middle) and compliant (bottom) curb ramps.

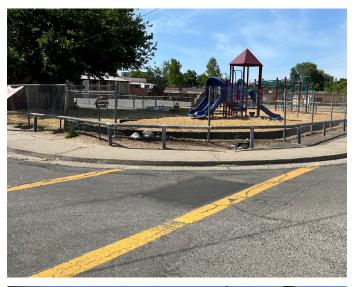






Figure 11. Example Curb Ramps

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6. Funding and Expenditures

Funding for pavement maintenance typically comes from dedicated sources, including the state gas taxes and voter-approved, dedicated countywide transportation sales tax. These funds are used for all transportation-related expenses, not just pavement maintenance. These expenses are used to meet operational needs; perform emergency repairs; meet regulatory requirements; and maintain, replace, and modernize aging infrastructure and equipment.

6.1 Funding Sources

As shown in Figure 12, the City's funding for pavement repairs has come from a combination of federal, state, and local sources. Each source is briefly described in the following subsections.

6.1.1 Federal Funding

Federal funding for road rehabilitation was historically available through the Regional Surface Transportation Program (RSTP), the largest and most flexible source of federal transportation funding. Regional shares of RSTP funding are allocated to SACOG agencies using a population-based formula.

Prior to 2002, Sacramento received a proportionate share of RSTP funding to use on priority pavement rehabilitation projects. In 2002, SACOG revised its program to require members to compete for regional funding. Since then, funding for roadway rehabilitation has declined substantially, and additional sources of state funding were generally one-time funds.

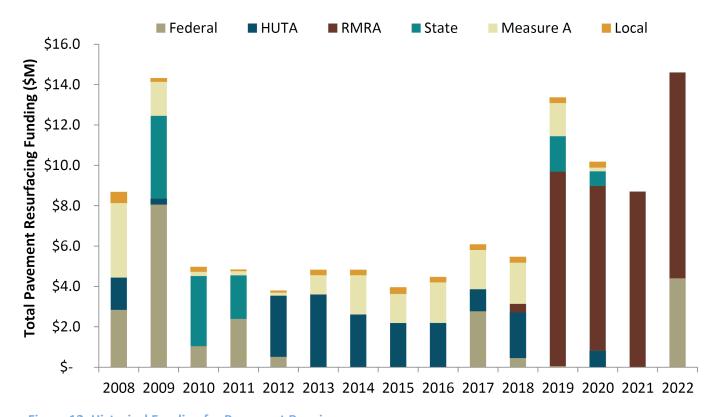


Figure 12. Historical Funding for Pavement Repairs

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With the Great Recession, the federal government provided one-time federal stimulus funding to the region, known as the American Recovery and Reinvestment Act (ARRA), leading to a spike in funding in 2009.

Since that time, federal funding for pavement rehabilitation from RSTP (allocated by SACOG) has been limited and unpredictable. In addition, SACOG's total funding for pavement rehabilitation declined, particularly for its larger member agencies. This corresponded with declines in gas tax, resulting in an overall lack of available funds for pavement maintenance at a critical time.

In general, the City of Sacramento receives a lower amount of federal funding per capita than other agencies in the region. Note that Federal funding in 2022 was for a project that was programmed in previous years.

In November 2021, the Infrastructure Investment and Jobs Act (IIJA) was signed. The passage of this act resulted in roughly \$1.2 trillion in transportation and infrastructure funding nationwide. Of this, approximately \$110 billion is expected to go towards roads and bridges. While some of this funding is already available, new programs for funding distribution are still in development. It is expected that the majority of funding opportunities will be available in late 2022/early 2023. SACOG estimates a 10 to 20% increase in available funding.

6.1.2 Highway Users Tax Account

The Highway Users Tax Account (HUTA) is a pergallon state excise tax on gasoline and diesel. These funds are 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 was historically the City's single largest source of transportation funding. The base excise tax of 18 cents per gallon was not raised until 2017, so its purchasing power had eroded by half in the previous decades.

Forecasts of future gas tax revenues are challenging, as they are highly dependent on oil prices and demand. Overall, the long-term expectation is that this will be a declining revenue source as more fuel-efficient and alternative-fuel vehicles comprise a larger portion of the vehicle fleet. In the short-term, gas-tax revenues should increase slightly as the result of population growth and adjustments that are indexed to inflation.

6.1.3 Road Maintenance and Rehabilitation Account

In April 2017, the Governor signed Senate Bill 1 (SB1), also known as the Road Repair and Accountability Act, a state transportation funding package that increases the gas tax, diesel tax, and vehicle registration fees. The new measure is indexed to inflation so that its purchasing power will not be eroded as occurred with HUTA.

Half of the funding is allocated to cities and counties through the Road Maintenance and Rehabilitation Account (RMRA); the City began receiving revenues in 2018 and is expected to receive as much as \$11.7 million for Fiscal Year (FY) 2022-23. This program also encourages inclusion of other improvements such as safety improvements, technology upgrades, and improvements to support efforts for cleaner transportation options. These are all important priorities, but their inclusion reduces the amount of funding remaining for pavement rehabilitation.

RMRA is expected to provide \$11.7 million per year to the City

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6.1.4 Measure A (Countywide Transportation Sales Tax)

Sacramento County has a voter-approved half-cent sales tax to fund transportation improvements such as transit and street maintenance. Sales tax revenues are dependent on the strength of the economy, as evidenced by the dramatic decline during the recession in 2009 to 2012. Since then, sales taxes have shown steady but modest increases. Measure A revenues are expected to grow by about 4.5 percent annually through 2025, although any recession would reduce these projections.

6.2 Operating and Capital Expenditures

The City's operating expenses include ongoing operations to maintain a transportation system used by hundreds of thousands of automobiles, trucks, cyclists, buses, and pedestrians daily. It includes labor, supplies, materials, equipment, and vehicles.

The Department is tasked with planning, building, and maintaining transportation infrastructure (including roads, bridges, sidewalks, bikeways, streetlights, traffic signals, traffic-control devices, street signs, and markings) and providing for safety and accessibility, with over 250 employees assigned to these tasks. The costs of providing these services are fully offset with transportation funds and reimbursements from other sources.

Historically, about 70 percent of transportation funding has been needed to maintain ongoing operations, emergency repairs, and day-to-day upgrades.

Investments in infrastructure or facilities that exceed \$20,000 are included in the City's Capital Improvement Program (CIP). The CIP consists of individual projects, each with its own budget established by funding type. Typically, the largest capital expenses are major transportation projects, most of which have federal funding.

6.3 Comparison with Similar Agencies

When compared to its peers, the City is at the bottom of the list in terms of pavement funding. Figure 13 examines the funding available as well as the sources of funding for other large cities in California. Much of this information was compiled from the California Statewide Local Streets and Roads Needs Assessment 2020 Update as well as individual city websites. Although many of these cities have unique characteristics that dictate different levels of funding (e.g., composite pavements, which are more expensive to construct), one trend is clear. The top 3 cities (San Francisco, San Jose, and Oakland) rely heavily on local funding; more than 40 percent of their budgets come primarily from sales and parcel taxes. For example, Oakland passed a parcel tax (Measure KK) in 2018, which resulted in a bond measure totaling \$350 million for street maintenance. San Francisco also receives money from the General Fund.

Note that the data include funding for pavement repairs only (i.e. seals, overlays, and reconstruction). Operational expenses are not included.

Sacramento is at the bottom of the list for pavement funding compared to its peers

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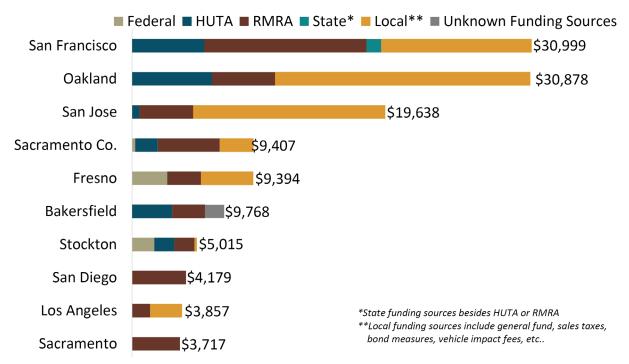


Figure 13. Comparison of Paving Funding with Other Large Cities

6.4 Funding Summary

The City's primary funding source to address street maintenance has been the state gas tax (HUTA), which was not indexed to inflation. By 2017, the amount of gas tax generated statewide had about half the spending power as it had in decades earlier, resulting in gradual reduction in pavement maintenance. Many counties and jurisdictions implemented local funding measures to help offset some of this loss in spending power. In 2017, the state increased the statewide gas tax for the first time in 25 years in response to the decreasing pavement conditions on state highways and local streets throughout the state.

With a roadway network developed over the last 150 years, the City of Sacramento has some of the oldest roads in the state. Decades of inadequate investment in pavement maintenance have resulted in thousands of miles of needed roadway rehabilitation, and pavement conditions that are on a steep decline. The additional funding from

the gas tax increase will help alter the trajectory of the deteriorating PCI in communities with newer streets. Unfortunately, for older and less wealthy communities such as Sacramento, conditions have declined to a level that requires more annual funding than currently available from the increased gas tax revenues or other local, state, and federal sources. For example, the City's current unfunded backlog is approximately \$298 million, about 32% higher than it was just 2 years earlier.

The City needs 5 times the amount of funding that it currently receives to arrest the steep decline in pavement condition. This would require an unprecedented, significant and/or new local or regional funding approach.

Sacramento needs 5 times the amount of funding it currently receives to arrest the steep decline in pavement condition

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7. Sacramento Tomorrow

The City faces significant challenges in the future for providing adequate roadway conditions, even with RMRA funding. The pavement is in "Fair" condition, and without sufficient resources, it anticipated to continue to decline. Three alternate funding scenarios were performed to determine potential outcomes.

7.1 Scenario 1: Current Funding Levels

Assuming \$11.7 million annually in RMRA funding, the City will receive a total of \$117.0 million over the next 10 years. Given this funding level, Figure 14 indicates that the following is predicted to occur by 2031:

- 1. The PCI will deteriorate to 42.
- 2. The current unfunded backlog (\$298 million) will more than triple to \$1 billion.
- 3. Approximately 65 percent of the street network will be in "Poor" or "Very Poor" condition.

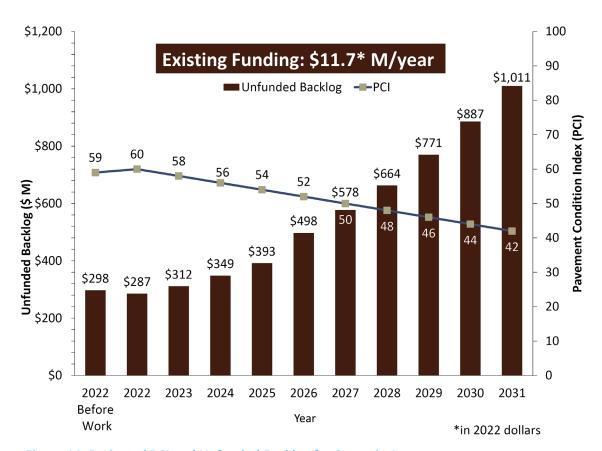


Figure 14. Projected PCI and Unfunded Backlog for Scenario 1

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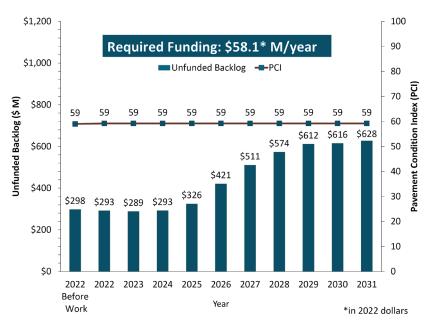


Figure 15. Projected PCI and Unfunded Backlog for Scenario 2

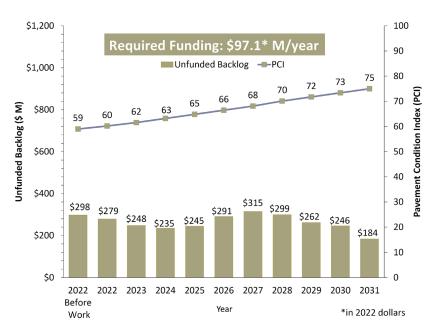


Figure 16. Projected PCI and Unfunded Backlog for Scenario 3

7.2 Scenario 2: Maintain Current Conditions (PCI = 59)

In order to maintain current conditions (i.e., PCI at 59), at least \$581 million will be required over the next 10 years, with \$254 million for residential streets and \$326 million for arterials and collectors. This equates to \$58.1 million per year, which is \$46.4 million more than the amount currently available. Even with this level of investment, the unfunded backlog would increase to over \$628 million by 2031 (Figure 15). This situation exists because the road conditions (low average PCI) are expensive to restore to a state of good repair.

7.3 Scenario 3: Improve Condition to a State of Good Repair (PCI = 75)

To improve the network condition to a state of good repair within 10 years would require \$971 million over the next 10 years: \$520 million for residential streets and \$451 million for arterials and collectors. The unfunded backlog would decrease from \$298 million to \$184 million by 2031 (Figure 16).

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7.4 Projected Pavement Condition

Finally, Figure 17 shows the impacts of each scenario on the street network by condition. Currently, 73 percent of the network is in "Excellent/Good" or "Fair" condition, with the remaining 27 percent in "Poor" to "Very Poor" condition. Under the current funding levels (Scenario 1), it is predicted that streets in "Poor" to "Very Poor" condition will more than double to 65 percent by 2031.

The other two funding scenarios illustrate marked improvements; Scenario 2 results in 57 percent of the pavement network in "Excellent/Good" condition, while Scenario 3 results in 81 percent in "Excellent/Good" condition by 2031.

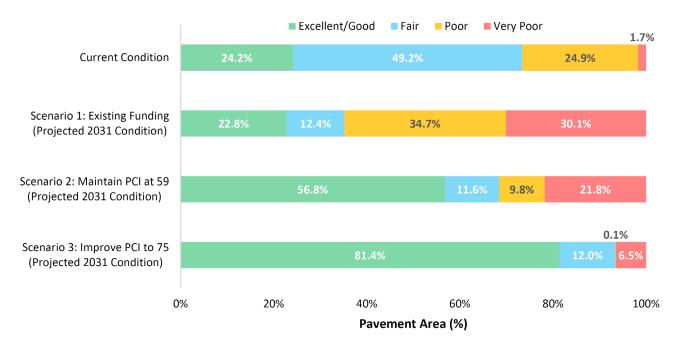


Figure 17. Comparison of Network Condition by Scenario

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8. Conclusions

To summarize, the City has a substantial asset of over \$2.6 billion in the pavement network (this does not include sidewalks, signals, landscapes, storm drains, etc.) Overall, the street network is in "Fair" condition with a network PCI of 59. Approximately 73 percent of the streets currently fall into the "Excellent/Good" and "Fair" condition categories.

In the last major Pavement Condition Report (August 2020), a network PCI of 60 was reported. Since then, the network PCI has deteriorated slightly to 59. However, keeping the PCI at 59 will require \$581 million over the next 10 years. New revenue sources will be needed to prevent significant deterioration and reduce the unfunded backlog.

The analyses indicate that the City needs approximately \$97.1 million annually for pavement maintenance in order to improve the PCI of all streets to an average of 75. If that could be achieved, many streets could then be maintained in "Good" condition with ongoing preventive maintenance.

Sacramento needs at least \$97.1 million per year to improve the network PCI to 75

The City's projected funding level (average of \$11.7 million/year) will result in a decrease of the network PCI to 42 over the next 10 years and the unfunded backlog will triple to \$1 billion by 2031. At this time, there are no identified funding strategies that will significantly arrest this decline.

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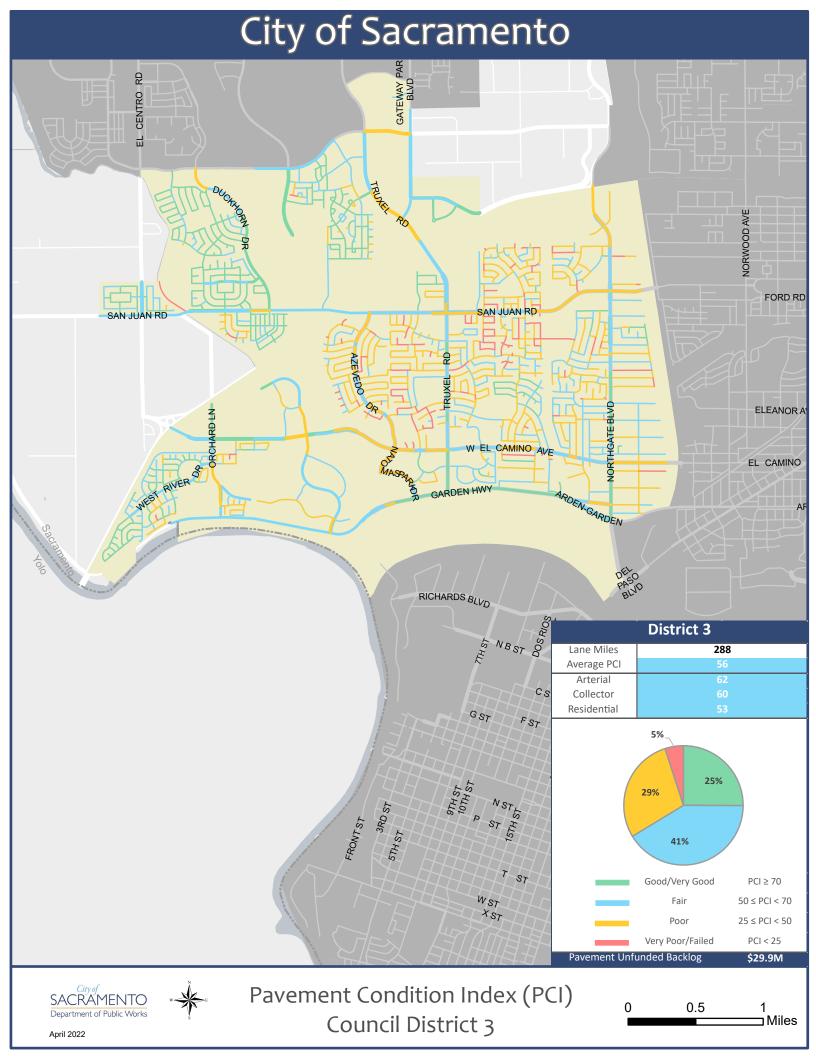


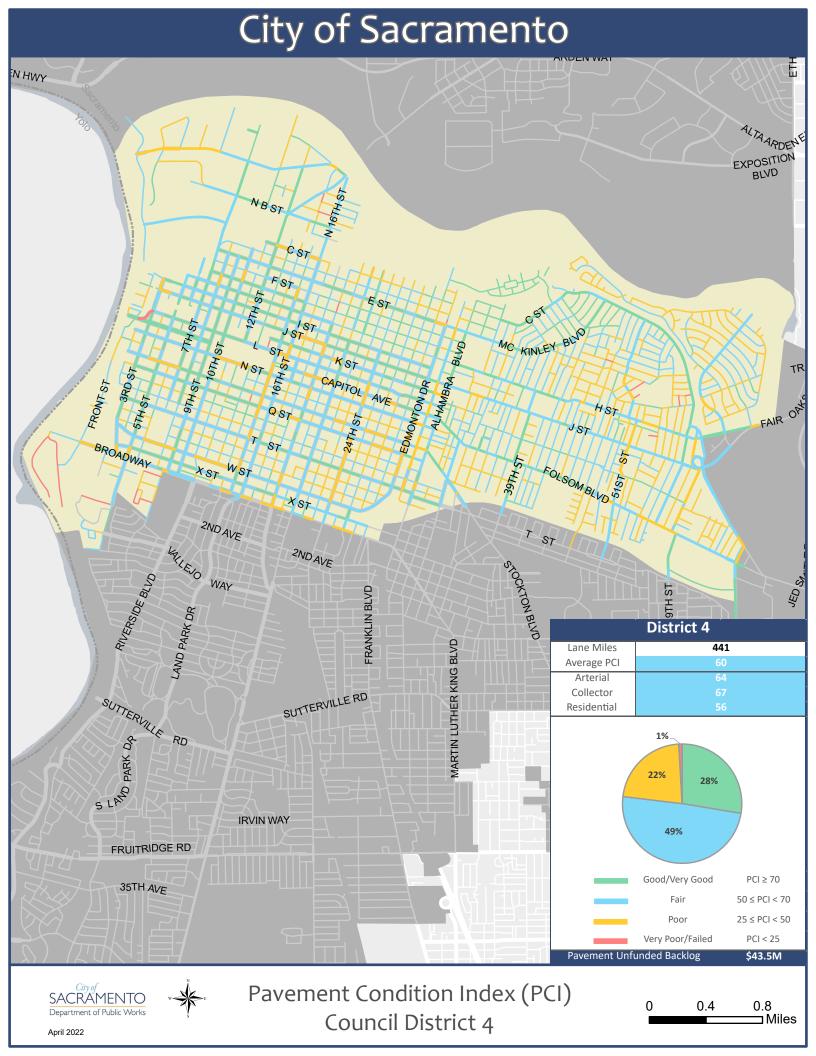
Appendix A

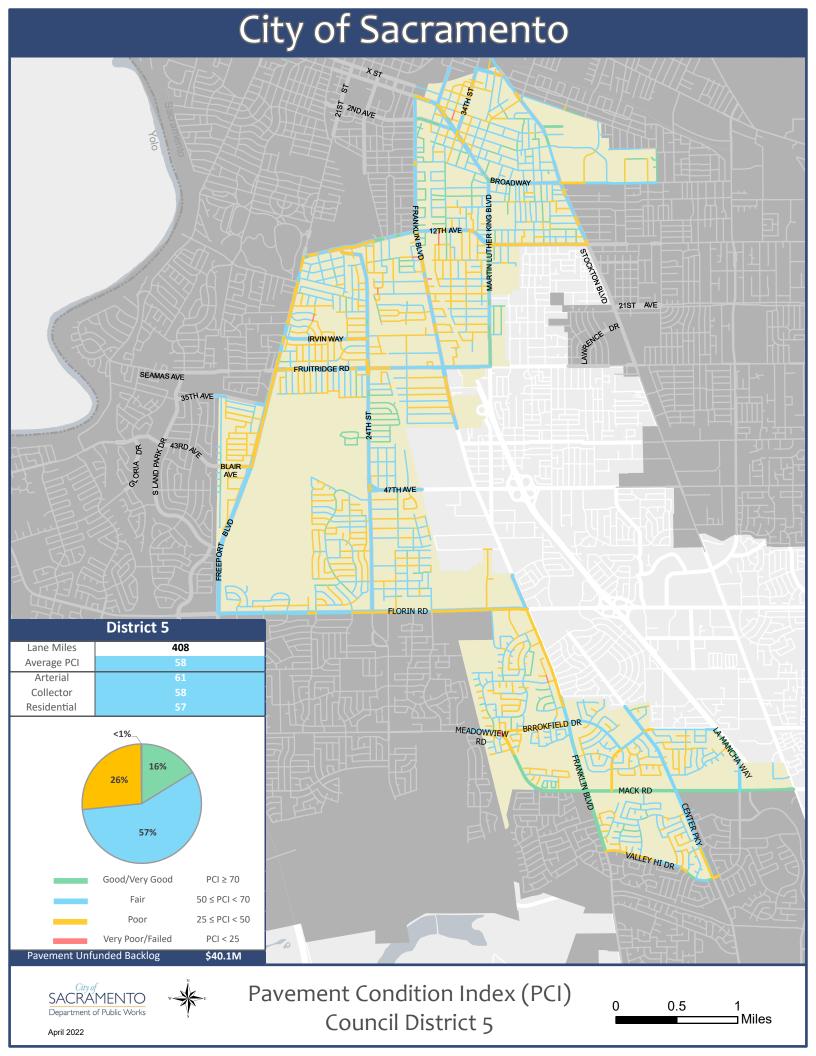
PCI Maps for Council Districts

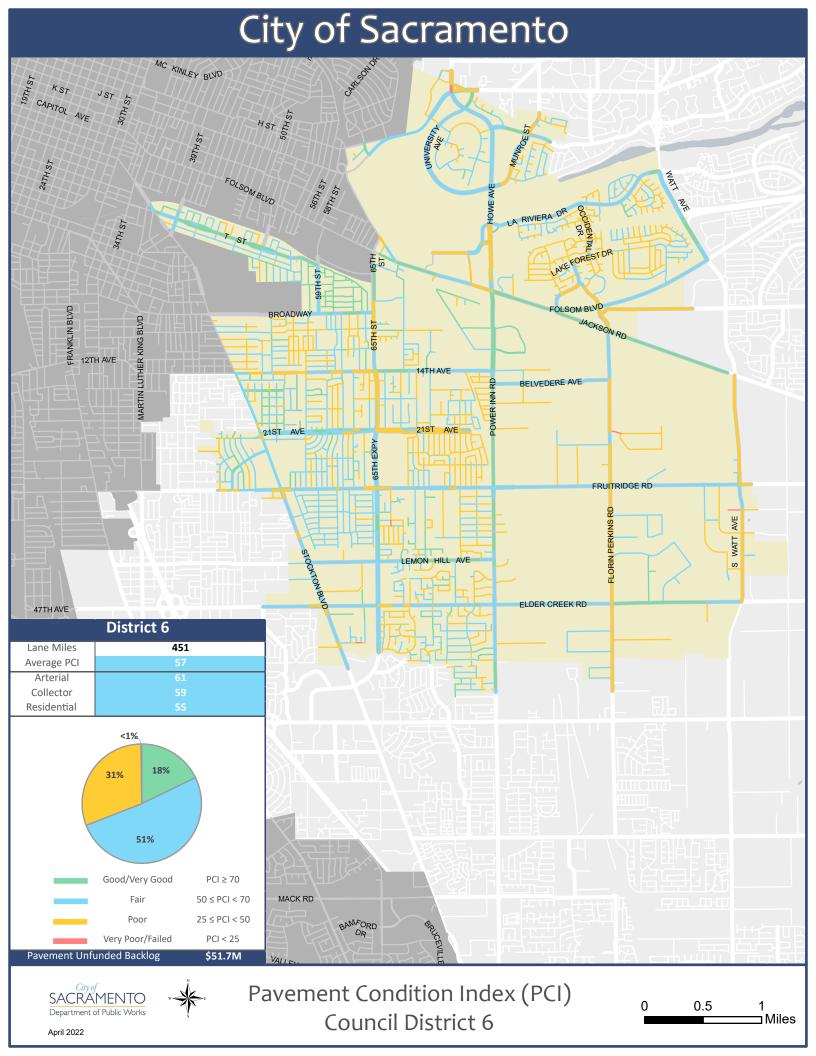
City of Sacramento ELKHORN BLVD **DEL PASO RD** District 1 331 Lane Miles Average PCI Arterial Collector MYOTIS DR Residential SAN JUAN RD SAN JUAN RD 2% 11% 50% 37% W EL CAMINO AVE WEST RIVER DR GARDEN HWY Good/Very Good PCI ≥ 70 Fair 50 ≤ PCI < 70 25 ≤ PCI < 50 Poor Very Poor/Failed PCI < 25 Pavement Unfunded Backlog \$16.8M Pavement Condition Index (PCI) SACRAMENTO 0.5 Department of Public Works Council District 1 Miles April 2022

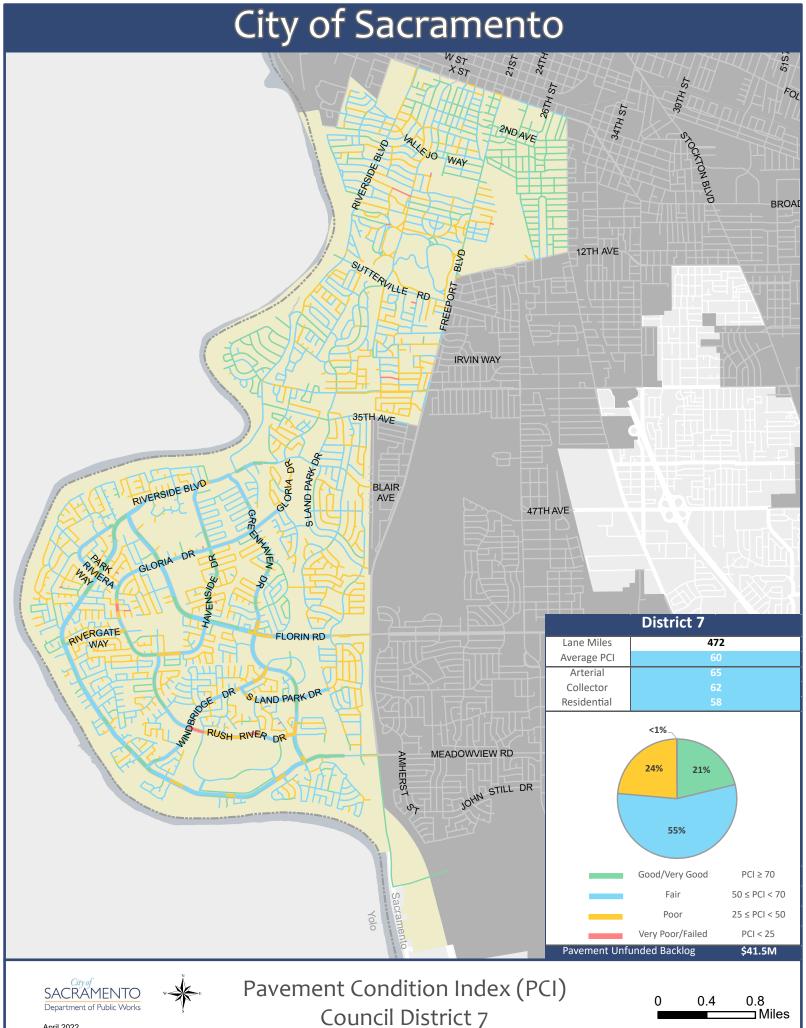
City of Sacramento MAIN AVE AUBURN BLVD SOUTH AVE SILVER ARCADE BLVO ELEANOR AVE EL CAMINO AVE District 2 ARDEN-GARDEN ARDEN WAY 430 Lane Miles Average PCI Arterial Collector Residential EXPOSITION BLVD 6% 15% 38% 41% Good/Very Good $PCI \ge 70$ Fair 50 ≤ PCI < 70 Poor 25 ≤ PCI < 50 PCI < 25 Very Poor/Failed Pavement Unfunded Backlog \$51.8M Pavement Condition Index (PCI) SACRAMENTO 0.95 0.47 Department of Public Works Council District 2 ⊐ Miles April 2022













City of Sacramento FLORIN RD BROOKFIELDOP MEADOWVIEW RD MACK RD VALLEY HI DR COSUMNES RIVER BLVD ALPINE FROST DR DELTA SHORES CIR EHRHARDT AVE COSUMNES RIVER BLVD CALVINE District 8 JACINTO RD 327 Lane Miles Average PCI Arterial Collector Residential SHELDON RD <1% 13% 29% 58% Good/Very Good PCI ≥ 70 Fair 50 ≤ PCI < 70 Poor 25 ≤ PCI < 50 PCI < 25 Very Poor/Failed Pavement Unfunded Backlog \$22.9M Pavement Condition Index (PCI) SACRAMENTO 0.47 0.95 Department of Public Works Council District 8 ⊐Miles April 2022

