
The City of SAN DIEGO
SAN DIEGO AT WORK

# Pavement Management Plan

January 2024

City of San Diego Transportation Department

# Acknowledgements

This plan draws upon the expertise and input of various Transportation Department and City staff, and consultants who have collectively worked to develop a comprehensive plan to ensure the continued health and functionality of San Diego's street network.

The Transportation Department thanks the following Departments for the coordination and collaboration required to develop this Pavement Management Plan:

- City Attorney's Office
- Communications Department
- Department of Finance
- Department of Race and Equity
- Development Services Department
- Engineering & Capital Projects Department
- General Services
- Performance and Analytics Department
- Purchasing & Contracting



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# Executive Summary

## Purpose

**This Pavement Management Plan (PMP) outlines the City of San Diego (City) Transportation Department's (Department) pavement funding needs, street selection process, and the planned resurfacing work over the next five years.** While the Department is responsible for other transportation asset maintenance and improvements, this plan is intended to only focus on pavement conditions and related street improvements.

The PMP relies on the most recent pavement condition assessment (FY23) conducted by the Department to create a comprehensive, data-driven strategy that answers key pavement management questions, including:

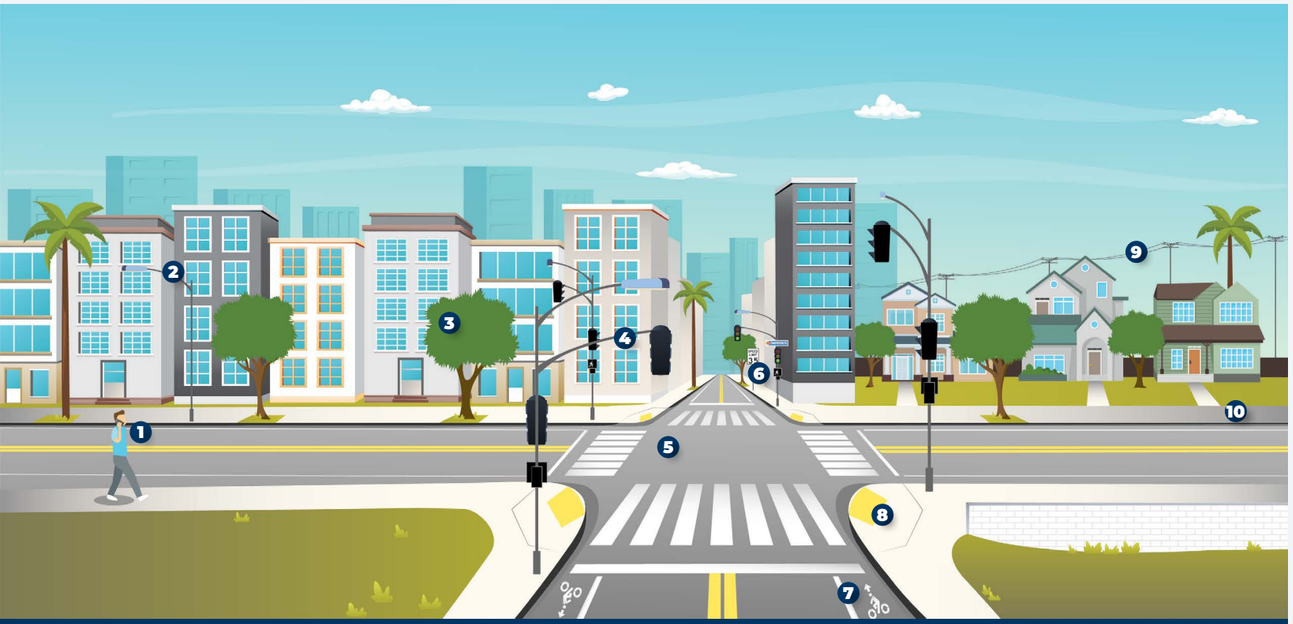
- **Current Street Conditions:** What is the current condition of the City's street network? How does this compare to similar municipalities?
- **Maintenance and Repair Strategies:** What maintenance and rehabilitation strategies are utilized by the City and similar municipalities to improve street conditions?
- **Prioritization and Inclusion of Equity In Street Selection Process:** What is the best way to prioritize streets for pavement repair and maintenance? How equity is incorporated in that selection?
- **Funding Needs:** What current funding sources are in place and how much funding is needed to improve the City's street network?
- **Funding Strategy:** What is the most cost-effective way to implement a multi-year resurfacing program based on different levels of funding?
- **Optimal Operations:** Are there any options to optimize repair and maintenance operations?
- **Feasibility of In-House Paving Program:** What is the cost and feasibility of implementing a City in-house paving program?

**This Pavement Management Plan (PMP) has been developed by the City of San Diego's Transportation Department to summarize the current citywide street condition and to identify strategic investment needs that will ensure the network is efficiently maintained. It is the first plan of its kind for the City, as the Department aims to proactively identify funding needs and provide a reliable transportation network for its residents.**

**This 5-Year Plan is intended to inform the public and stakeholders on the streets selected and the necessary funding to implement improvements.**

## San Diego At Work: Transportation Department Responsibilities and Services

The Transportation Department is responsible for a multitude of transportation-related services that promote the efficient movement of people and goods across the City. **The Department comprises a dedicated team of nearly 500 professionals including engineers, planners, equipment operators, electricians, technicians, field crews, and management staff to service the City's extensive public right of way**. The Department oversees and performs the maintenance and rehabilitation of the City's streets, sidewalks, street lights, traffic signals, street signs, curb ramps, trees, and bike lanes; management of the Utilities Undergrounding Program; and coordination of work in the public right of way (Figure A). Teams of Department engineers handle project planning, mark outs, implementation, and contract initiation for Capital Improvement Program (CIP) projects involving installation of new infrastructure and replacement of existing infrastructure.



1. **10,000** Calls to Dispatch
2. **60,000** Street and Park Lights
3. **250,000** Trees Along City Streets
4. **1,650** Traffic Signals
5. **6,600** Lane Miles of Streets/Pavement
6. **50,000** Street Signs
7. **1,117** Miles of Bike Lanes
8. **50,000** Curb Ramps
9. **1,100** Miles of Overhead Lines Remaining to Underground
10. **4,550** Miles of Sidewalks

***Figure A.*** *Transportation Department Assets*

The criticality of the Department's services is demonstrated through the sheer number of service requests received by the City on a daily basis. The City's Get It Done app allows the public to report a variety of maintenance and related needs. The Department manages the single-most requested services citywide, responding to a diverse range of issues that impact the right of way. In FY23 alone, more than 10,000 Public Works Dispatch calls and 408,000 Get It Done requests were submitted citywide. Nearly 136,000, or 33%, of the requests were handled by the Department with 23% of these requests related to street maintenance and rehabilitation needs.





The Department recently launched the San Diego At Work program, which seeks to educate residents, businesses, and industry about the services the Department provides. The mission of the San Diego At Work program is to:

- **Improve** our streets, sidewalks, alleys, and bike paths through proactive maintenance and attention
- **Serve** the public through excellent customer service and responsiveness
- **Protect** our street and street network from degradation
- **Safeguard** the public right-of-way through safe[1] street design and maintenance
- **Positively Impact** the way San Diegans live and work through a world-class transportation infrastructure network

San Diego At Work is dedicated to ensuring safe and efficient travel for all pedestrians, cyclists, and drivers on San Diego's streets, alleys, and bike paths. This integrated team synergizes diverse expertise to plan, design, and execute pavement maintenance and rehabilitation projects throughout the City, and to respond to resident needs on a daily basis.

## Pavement Management In the City of San Diego

**There are 110 team members within the Department who are dedicated to maintaining and improving the City's pavement condition**, comprising nine teams that perform pothole repair, mill and paves, and trench restoration. These teams responded to over 31,000 Get It Done requests for pothole repair and pavement maintenance, in addition to proactive project planning, in FY23.

The Pothole Repair Team consists of nine crews dedicated to responding to Get It Done requests for pothole repair. In FY23 this team addressed over 50,000 potholes, with an average of five working days to repair a pothole after being reported. On average in FY23 the backlog of Get It Done requests for the pothole team was 100-200 potholes.

There are two Mill and Pave Teams that respond to Get It Done requests for spot mill and pave and also perform proactive mill and pave on larger street segments via the Hot Roads Program. The Hot Roads Program identifies street segments with high number of pothole repair requests that aren't being repaired via upcoming maintenance and rehabilitation projects and performs mill and pave on these segments using in-house crews. In FY23 the Mill and Pave Team performed 4.4 miles of mill and pave. On average in FY23 the daily backlog of Get It Done Requests for the two mill and pave teams was 905 locations.

There are four trench restoration teams that perform temporary and permanent trench restoration for the City's utility work in the public right of way. The three teams consist of one team dedicated to temporary repairs for water projects, one team dedicated to temporary repairs for sewer projects, and one team dedicated to permanent mill and paves and one team dedicated to concrete trench repairs for these projects. In FY23, the water team completed 680 trench repairs, the sewer team completed 139 trench repairs, and the Mill and Pave Team completed over 50,000 square feet of mill and paves. On average in FY23, the daily backlog of trench restoration requests was 381 locations.

**Equity Factors have been included in the street selection process starting in FY24. See Section 1.1 and 1.3 for more information**

[1]All references to safe and safety are intended to convey that mobility facilities are safe when used as intended and by persons exercising due care.

There are two engineering teams in the Department that are dedicated to pavement management. The Street Asset Management Team is responsible for producing slurry seal contracts, managing crack seal projects, conducting condition assessments, and managing asset inventory through GIS and OpenGov Cartegraph Asset Management software (Cartegraph), an asset management platform that enables the Department to develop pavement management strategies and recommendations. The Construction Operations section is responsible for oversight of slurry seal work performed by contractors as well as oversight of pavement management work performed by in-house crews. The planners, contract managers, inspectors, and other personnel from Construction Operations team conduct inspection of in-house construction operations for transportation assets. This group is charged with ensuring that the installed improvements are consistent with design standards, construction drawings, and specifications for specific street improvements.

Pavement Management functions are coordinated between Divisions within the Department and are also coordinated with other City Depatments to design projects, perform right-of-way maintenance and improvements, and inspect construction to provide a functional and viable transportation network throughout the City (Figure B). The Department coordinates with other asset managing departments such as Stormwater and Public Utilities Departments as these departments are responsible for the planning of utility improvement projects that could impact the pavement condition during construction. The Department coordinates with Engineering and Capital Projects (ECP) for planning, design and construction oversight of pavement rehabilitation projects such as asphalt overlay and reconstruction, as well as paving for other City infrastructure projects. Sustainability and Mobility (SuMo) provides data for bike lanes that the Department uses for project striping modifications. Development Services Department manages private projects that involve paving and coordination with the Department. Through a combined effort, all of these departments support an effort to provide a functional and viable transportation network throughout the City.

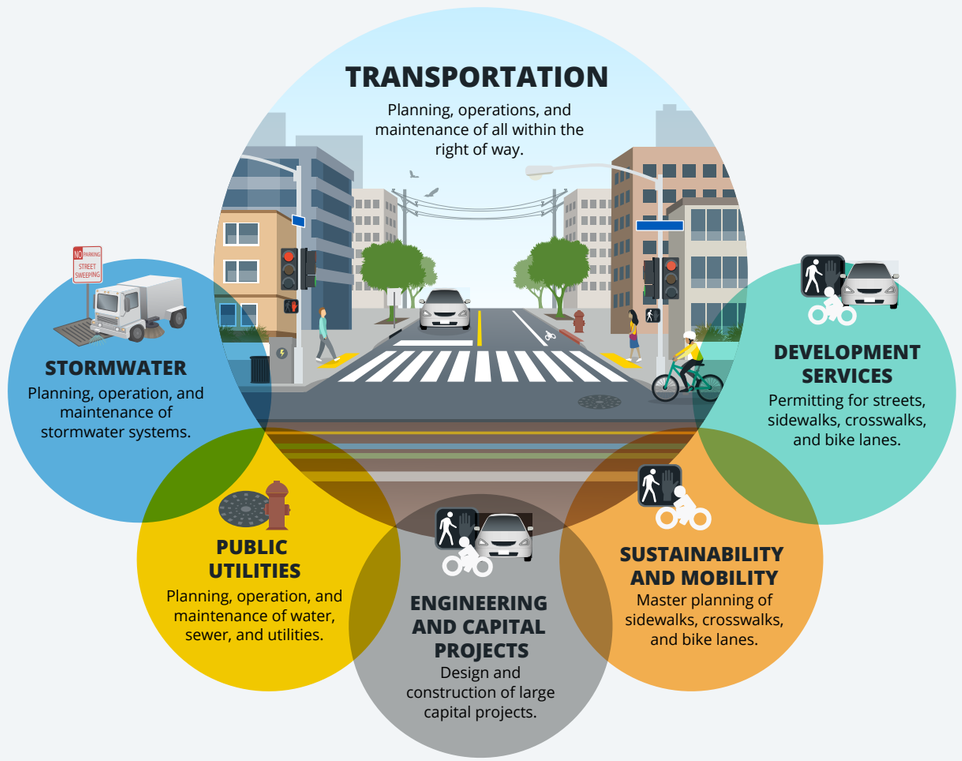



***Figure B.*** *Transportation and Coordinating Department Responsibilities*





## Street Network Inventory

**San Diego is the second largest city and has the second largest street network in California**, covering over 325 square miles of land and housing over 1.37 million (M) residents. The Department maintains, operates, and repairs over 6,600 lane miles of street network including paved streets, alleys, and unimproved streets, in addition to a multitude of other transportation related assets. These streets are costly to improve as they require upgrades other than paving, such as sidewalks and/or utility installation. The City's various street classifications are shown in Figure C which also indicates how the street network can be broken down by each street class type.

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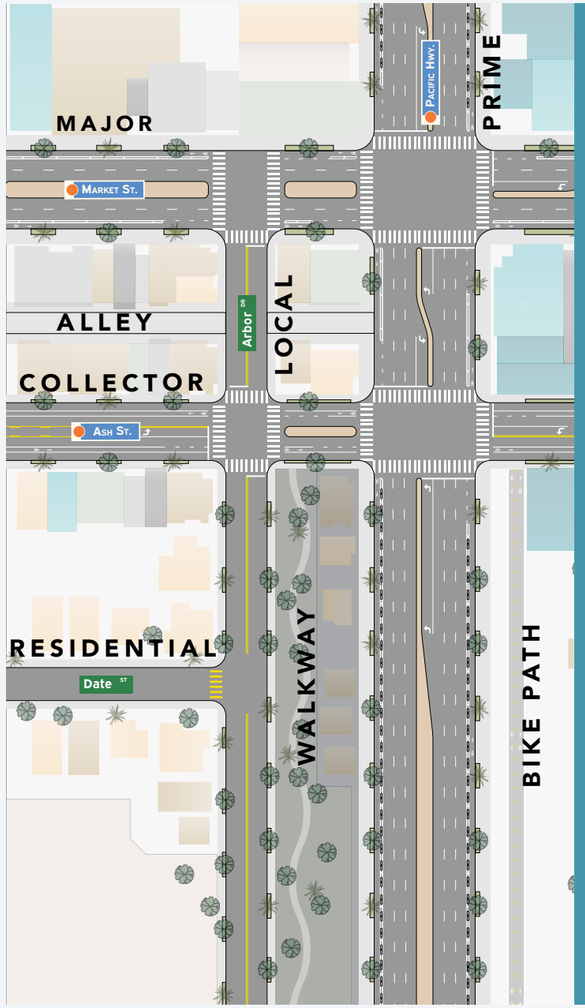



***Figure C****. City of San Diego Street Classifications*

**6%** **PRIME:** A street that provides a network connecting vehicles and transit to other primary arterials and the freeway system. This street type typically has a raised center median, bicycle lanes, street trees, traffic safety street lighting, sidewalks, and no access from the abutting property.

**15%** **MAJOR STREET:** A street that provides a network connecting vehicles and transit to other major streets and primary arterials and the freeway system and secondarily provides access to abutting commercial and industrial property. This street type typically has a raised center median, street trees, traffic safety street lighting, and sidewalks.

**12%** **COLLECTOR:** A street that provides movement between local/collector streets and streets of higher classification and secondarily provides access to abutting property. This street type typically has on-street parking, street trees, traffic safety, street lighting, and sidewalks.

**5%** **LOCAL STREET:** A street that provides direct access to an abutting property. This street type typically has on-street parking, street trees, traffic safety lighting, and sidewalks.

**52%** **RESIDENTIAL:** Category of street serving housing areas or neighborhoods where the primary purpose is to provide access to residences.

*% = Street Classification Percentage within City's Street Network. Other street types in the City's network are not shown, and include: Bike Paths, Unpaved Streets, and Walkways (10%).*

## Unimproved Streets and Alleys

As part of the street network described above, the Department is also responsible for approximately 62 miles of unimproved alleys and streets, which are street segments that are part of the City's street network but were not originally built to City Construction Standards. These streets typically lack one or more of the following pavement construction requirements explained below.

**Materials Specifications:** Detailed specifications for the types and quality of materials to be used in pavement construction, including asphalt mixtures, aggregates, and any additives.

**Design Standards:** Guidelines for the design of pavements, including thickness requirements, slope considerations, and load-bearing capacity based on the anticipated traffic.

**Construction Methods:** Standard procedures for the construction process, such as excavation, grading, subbase preparation, and application of asphalt or other pavement materials.

**Environmental Compliance:** Adherence to environmental regulations, which may include erosion control measures, and consideration for water runoff.

**Accessibility Standards:** Compliance with accessibility standards to ensure that pavements are designed and constructed with consideration for individuals with disabilities.

**Safety Measures:** Implementation of safety measures the general public, including signage, traffic control, and protective barriers.

Of the 62 miles of unimproved streets, 45 miles are paved, although not to City standards, and 17 miles are unpaved. Unimproved Streets mostly fall under the "Residential", "Local" and "Alley" classifications, as defined in Figure C.

In 2021, City Council Policy 200-01 was updated to allow City funds to be used to improve unimproved streets and alleys. Prior to this update, unimproved roads were not prioritized as part of the annual paving prioritization process since these projects typically require extensive work in addition to paving (e.g. grading, utility installation, sidewalk installation, etc.) and there has been no dedicated funding source. The Department will begin requesting dedicated funding for improvement of unimproved streets starting in the FY25 budget development process.

## Pavement Maintenance Repair Types

The Department deploys a variety of pavement maintenance and rehabilitation treatment methods to appropriately address the degradation of a damaged street. Pavement degradation is a gradual process influenced by various factors such as weather, traffic loads, and environmental conditions. Over time, the asphalt binder in pavement can oxidize due to exposure to sunlight, leading to surface cracking and loss of flexibility. Additionally, heavy vehicle loads and repeated traffic impact can cause the development of fatigue cracks and ruts. As the pavement ages, the surface may experience further distress in the form of potholes, roughness, and loss of skid resistance.

**Proactive management allows the Department to apply the right treatment at the right time for the best use of funds.**





To address these issues and extend the pavement's lifespan, a systematic approach to maintenance is crucial. Preventive measures like cape seal, scrub seal, and slurry seal are employed once the street is between five and 10 years old to seal cracks, restore surface texture, and protect against further deterioration. As the pavement continues to age (at roughly 20-25 years old) and undergoes further use, more extensive interventions such as asphalt concrete overlay may be required as part of standard maintenance and repair. At the end of the pavement life cycle (approximately 30 years for asphalt and 50 years for concrete), complete reconstruction may become necessary to ensure the structural integrity and safety of the street network. The choice of specific treatment to a given street segment depends on the severity of deterioration and the desired level of pavement performance (Figure D). Proactive management of minor cracks and damage through crack sealing, mill and pave efforts, and surface seals are much less expensive treatment methods and can prolong the life of the street by up to eight years before major, more costly repairs are needed. If the damage to the street is not proactively maintained, pothole repairs, overlay, and reconstruction are required to reestablish street integrity. The following maintenance and rehabilitation activities and performed by in-house Department crews and independent contractors to ensure that the right repair method is being done at the right time:

- **Crack seals** are the application of an adhesive material to the pavement surface that minimizes moisture infiltration and slows the spread of cracking.
- **Slurry seals** consist of a mixture of water, asphalt emulsion, aggregate, and polymer additives. Slurry seals serve a similar purpose as crack sealing, but on a wider scale where sealing individual cracks is not economical. ($220K/per mile)
- **Scrub seal** are very similar to slurry seals, but involve an application of rejuvenating emulsion followed by a scrub broom, layer of aggregate, and a final flush coat (typically a fog seal). ($350K/per mile)
- **Cape seal** order of operations is application of rejuvenating emulsion, followed by scrub broom, layer of aggregates, and then the application of a slurry seal (which replaces the flush coat). A cape seal is a scrub seal with a slurry seal placed over it. ($300K/per mile)
- **Mill and Pave** treatments provide rehabilitation of the structural integrity of the street after damage has occurred, typically as a result of trench cuts for water, sewer, stormwater, or dry utility work has impacted the street surface. Mill and paves can be performed on streets that require overlay but are done on shorter stretches.
- **Pothole** repairs are performed by Department crews to provide spot treatments to moderate to severely damaged sections of street. Department crews repair potholes that are reported via the Get It Done app.
- **Asphalt overlays** rehabilitate pavement surfaces with moderate to severe distress, improving ride quality, and restoring street asset integrity. ($1.7M/per mile)
- **Full-depth reclamation** grinds and recycles the existing pavement structure to provide a cost-effective rehabilitation treatment for significantly distressed pavements. This treatment method remediates and improves the failed base material.
- **Reconstruction** replaces the entire pavement structure and base material with new materials and is used for significant distress or design changes. This rehabilitation method can be applied to both asphalt and concrete streets.

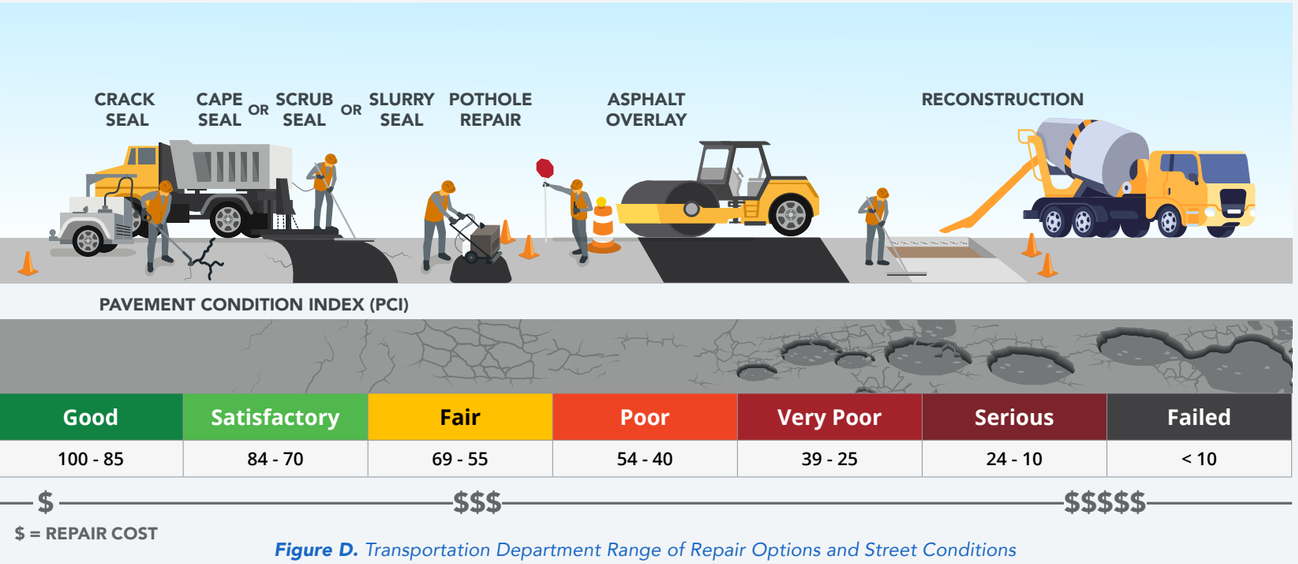



***Figure D.*** *Transportation Department Range of Repair Options and Street Conditions*

Limited Department crew capacity, funding, and other factors have led to a reactive approach to address needed pavement repairs in the City. The two Mill and Pave Teams have had an average daily backlog of 905 location in FY23. The Department's nine Pothole Repair Teams only have capacity to repair high priority damaged sections of street until more permanent repairs can be made. Deferred maintenance in previous years caused by insufficient funding and resources, led to a need for the Pothole Repair Teams to address over 50,000 potholes citywide in FY23 and the average backlog was 100-200 potholes. The City crews must frequently divert efforts from on-going projects in order to address emergency and resident requests that result in frequent, temporary solutions until more permanent solutions can be funded. Moving forward, it is recommended the City move toward a proactive maintenance approach that protects street conditions and avoids streets degrading to the point of needing costly pothole repairs and reconstruction.

**Limited funding for proactive rehabilitation and maintenance has contributed to a large volume of requests for reactive repairs like pothole patching and spot mill and paves. In FY23, the Pothole Repair Teams patched over 50,000 potholes, but backlog still remains.**

## Pavement Condition Scoring and Assessment

The Pavement Condition Index (PCI) method is the industry standard and most widely used method for assessing and reporting street pavement conditions. It is an objective and repeatable assessment of the structural integrity and operational condition of street pavements. The PCI scoring scale ranges from 0 (worst) to 100 (best) and provides a common language for pavement practitioners to describe and communicate pavement conditions to both technical and non-technical individuals alike (Figure E). The scale includes seven condition categories:





- **Good (PCI 85-100):** Street displays minimal to low distress and only requires preventative maintenance.
- **Satisfactory (PCI 70-84):** Street displays scattered cracking and only requires routine maintenance.
- **Fair (PCI 55-69):** Street displays signs of low to medium distress and requires minor maintenance up to major rehabilitation.
- **Poor (PCI 40-54):** Street displays medium distress. Near-term maintenance and rehabilitation or reconstruction may be required. Costs to maintain these streets are higher.
- **Very Poor (PCI 25-39):** Street displays high distress and requires considerable levels of maintenance and/or major rehabilitation and reconstruction.
- **Serious (PCI 10-24):** Street is very highly distressed, contains various potholes, and requires considerable levels of maintenanc and/or major rehabilitation and reconstruction.
- **Failed (PCI <10):** Street is extremely distressed and requires full reconstruction, which requires the highest investment.


| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |

71 (2016) — 63 (2023)

***Figure E****. City of San Diego 2023 PCI Score*

The City performed street condition assessments in 2011, 2016, and most recently in 2023. Figure F shows the average overall street network PCIs determined through each of these assessments. The industry standard for performing street condition assessments is typically every 4 years; however, the City has not had enough funding to perform assessments at this frequency. Since the 2016 street condition assessment was performed, the overall network PCI has deteriorated by eight points. Starting in February 2023 through August 2023, a comprehensive pavement condition survey was conducted using an automated collection system for City-managed street and pavement assets. Condition data was collected along one lane for alleys, one lane for local and residential streets, and two lane in each direction for major, prime and collector streets. As part of this effort, each street segment was assigned a PCI score. **The City's overall network PCI score was 63** at the time of the survey, which falls into the "Fair" category of the ASTM scoring scale.

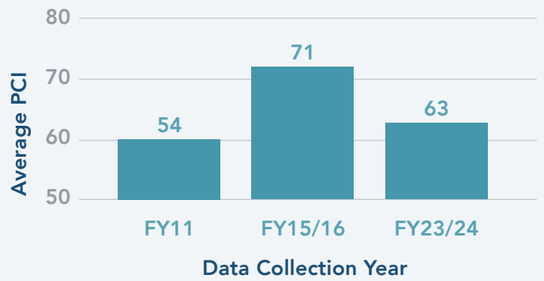



***Figure F**. City of San Diego Street Network PCI Over Time*

A PCI score of 63 suggests a street that is in a middling condition with signs of low to medium distress. Streets in this condition may be as generally satisfactory but with room for improvement to enhance comfort. In your neighborhood, this would likely translate to a street surface that is relatively smooth with occasional minor cracks or surface distress. The ride quality may be acceptable, but there would be noticeable signs of wear and aging. An example street segment with a PCI score of 63 in shown in Figure E.

Some notable highlights from the 2023 street condition data include:

**1.** The PCI score of City's street network has decreased since the last assessment conducted in 2016 due to deferred maintenance resulting from a lack of consistent funding for the Department. 34% of the City's street network has been identified as "Poor", "Very Poor", "Serious" and "Failed" conditions.

**2.** The City's major, prime, and alley streets are now in the lowest condition, demonstrating that majors and primes are the most heavily traveled streets, and will be the most expensive to repair.

**3.** The City's major, prime, and alleys are in the worst condition compared to other street classifications. Major and primes are typically the largest streets and will be the most costly to repair.

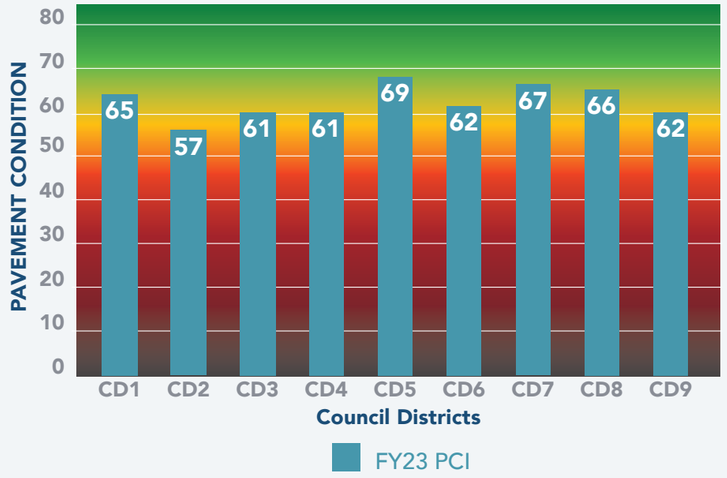



***Figure G**. Average Area Weighted PCI by Council District*

**4.** The average PCI within the nine City Council Districts range between 57-69 and are considered "Fair" condition (Figure G), indicating that street conditions are relatively consistent throughout the City.





**5.** The City's overall PCI score ranked eighth out of 13 agencies/municipalities benchmarked as part of this plan, which indicates that the City has room for improvement since the typical municipal agency PCI goal is 70. The benchmarked municipalities included large population hubs such as the County and City of Los Angeles, and local agencies such as the County of San Diego.

**The 2023 condition assessment will be used to assess and prioritize pavement maintenance and rehabilitation projects for the next five years. Results of the condition assessment and planned pavement maintenance projects can be viewed at streets.sandiego.gov.**

The City's PCI and other asset information for the street network is housed in OpenGov Cartegraph Asset Management software (Cartegraph), an asset management platform that enables the Department to develop pavement management strategies and recommendations. **Pavement strategies and recommendations for street asset management include maintenance (i.e., activities that preserve pavement condition such as crack sealing, slurry and scrub seals, and cape seals) and rehabilitation (i.e., activities that resurface or reconstruct streets such as overlay, full-depth reclamation, and reconstruction)**. In Cartegraph's Maintenance and Rehabilitation (M&R) prioritization process for streets of rehabilitation efforts and which treatment will be recommended. In addition to PCI, "tiebreaker" criteria include street classification, street use and proximity to freeway on/offramps, schools, and shopping centers, and also considers if a street is part of the National Highway System. **Beginning in 2023, the City is also incorporating Equity Factors to the existing street selection tiebreaker criteria,** which would consider the streets location in a location within a census tract that is deemed eligible for Community Development Block Grant (CDBG) funds, in a Promise Zone, or located in a Community of Concern identified per the Climate Equity Index (very low, low, or moderate access to opportunity) as part of the prioritization score.

Beginning in FY24, the Cartegraph management system allows for coordination with ongoing construction projects to minimize disruptions and optimize resource allocation. This enables the Department to consider bundling repair efforts with other City projects to maximize cost efficiency and resource optimization. Cartegraph identifies the appropriate pavement maintenance and rehabilitation activity based on the street segment PCI, and the scoring criteria is then applied to identify the specific streets selected for treatment.

## Change from Overall Condition Index to Pavement Condition Index

The City has historically reported pavement conditions in terms of the Overall Condition Index (OCI). The OCI combined two indexes: the PCI and the Ride Condition Index (RCI). The PCI was developed in the 1970s by the US Army Corps of Engineers and is based on ASTM (formerly American Society for Testing and Materials) D6433, Standard Practice for Streets and Parking Lots Pavement Condition Surveys. The RCI is based on the International Roughness Index (IRI), as defined in ASTM E1926. PCI scoring is solely based on pavement distress. Updating to PCI scoring from the previous OCI methodology affords the Department a standardized and forward-looking approach. Conversion to PCI scoring standardizes pavement assessments based on pavement condition distress alone and allows for common communication among pavement professionals and public stakeholders. For the purposes of this PMP, previous City pavement surveys collected using OCI were converted to PCI to allow for direct comparison.

## Benchmarking PCI Scores

PCI benchmarking was conducted against 13 cities throughout the United States (Figure H). It should be noted that the benchmarked cities vary in population density or street network size. The benchmarked cities had an average PCI score of 64.3 and median PCI of 65. The City's 2023 network PCI score of 63 ranks below both the average and the median of the 13 cities evaluated. Five of the 13 benchmarked cities currently have average street network PCI greater than or equal to the City's PCI target of 70.

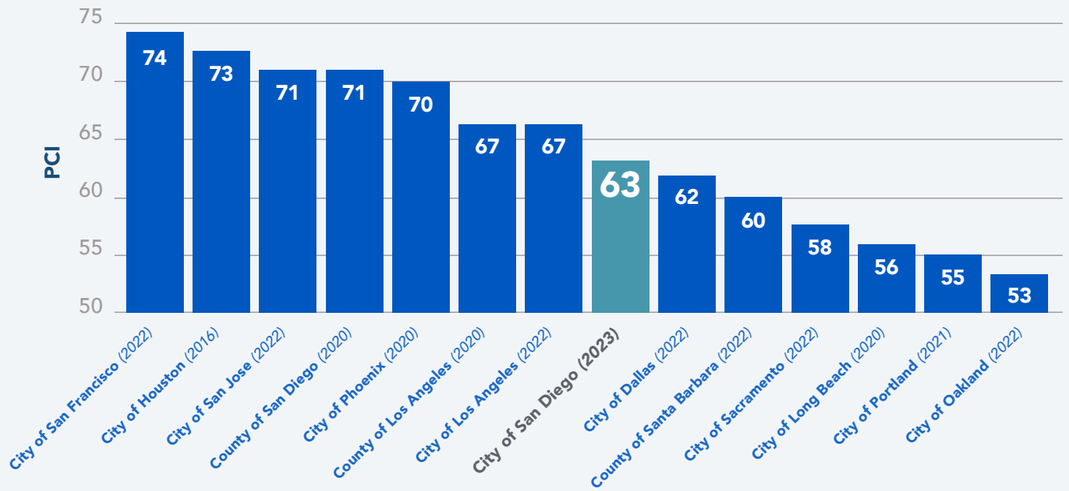



***Figure H.*** *PCI Values Summary of Benchmarked Municipalities*

**Parentheses indicate latest available data source.*

## History of Pavement Management Funding

To evaluate and improve upon previous pavement management strategies, the PMP examines the historical funding trends, funding sources, and pavement maintenance and rehabilitation activities in order to optimize pavement management within the City. Since FY13, budgeted funding for street maintenance and rehabilitation has averaged $46.4M annually with an average of $19.8M and $26.6M allocated for maintenance (based on available data FY13-FY23) and rehabilitation, respectively (Figure I). While funding in FY24 was the highest since FY13 and over three times the average annual allocation, this amount is still not enough to proactively maintain the network. The annual budgeted amounts do not represent the budget ask from the Department, which has consistently requested funding to maintain a PCI of 70. However due to competing needs throughout the City, Department allocations have remained lower than the request and have not been adequate to fully support needed maintenance and rehabilitation. Consequently, the City street network condition has declined with time.

**Historic City street maintenance and rehabilitation funding has generally been inconsistent to meet street network needs. A dedicated funding source is needed to support street network needs.**





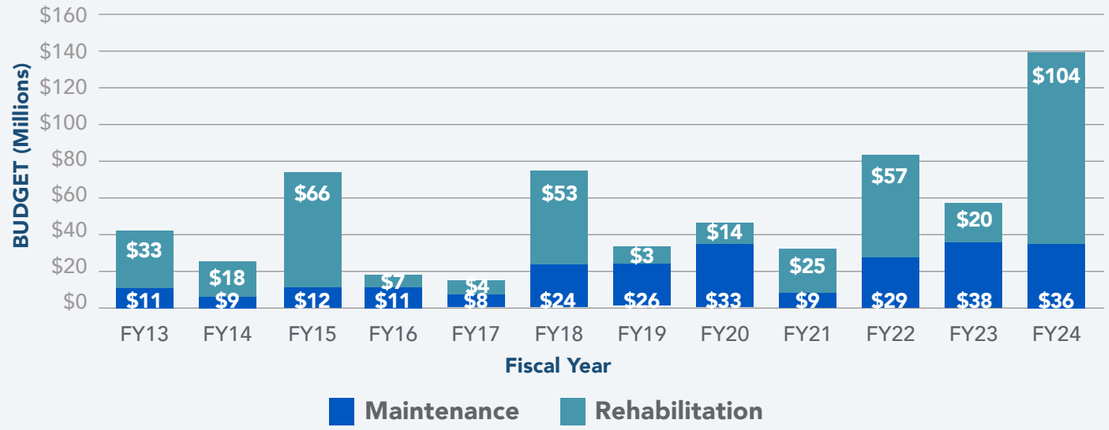



***Figure I.*** *Budgeted Funding Amounts for Pavement Maintenance and Rehabilitation FY11- FY24*
*Financing was received in FY15, FY18, FY22, and FY24 and was meant to support the program over multiple fiscal years.*

The funding for maintenance and rehabilitation activities comes from various sources, including Gas Tax, TransNet, Road Maintenance and Rehabilitation Account (RMRA), Street Damage Fee, and Debt Financing. Investing in proactive maintenance and financing repairs can extend the lifetime of existing pavement assets and reduce long-term costs. An analysis of the City's maintenance and rehabilitation costs determined that the streets in "good" condition (PCI of 70 or higher), on average cost less to repair per mile as opposed to streets with worse PCI. The average cost to repair a street segment with a PCI of 70 or higher is $220k per mile to maintain, while a street segment with a PCI between 60 and 35 costs $1.7M per mile to rehabilitate based on recent bid price information and Department analyses.

The consideration of historical funding levels and street condition based on the PCI provides important context for developing future funding scenarios. In FY24, the City allocated $33.7M for maintenance and $104.3M for rehabilitation, but future projections based on 2023 PCI data highlight the need for additional funding to meet the City's street network needs and objectives. Not receiving adequate funding will lead to deferred maintenance, which results in rapidly escalating repair costs, and reduces overall quality of life for residents and visitors due to deteriorating street conditions negatively impacting street conditions as well as reduces overall quality of life for residents and visitors.

## Funding Needs and Recommended Pavement Management Strategy

The City maintains the second largest network of streets and alleys in the State of California, and this network is currently in "Fair" condition. In the last major pavement condition assessment in 2016, the City's street network was reported to have a PCI of 71. Since then, the overall PCI has deteriorated by eight points. It is expected that maintaining current funding level projections will further reduce the average City street network PCI score to 45 or "Poor" condition by the end of FY34 (Figure J).

A financial analysis was conducted using multiple street selection approaches in Cartegraph to assess cost-effective and operationally viable options to achieve an average PCI 70 score. The funding scenario options evaluated by the Department include street selection approaches based on best value (funding streets at optimum PCI conditions to maximize cost-efficiency of treatment type), worst streets first (funding streets in the worst condition first, ahead of funding streets in better condition with lower cost treatment methods), and most people impacted (funding streets with high Average Daily Traffic (ADT) volume first, ahead of funding streets with lower ADT) assumptions.

Department analyses determined that in order to achieve and maintain an average street network PCI of 70 or higher, an average of $188M/yr applied at a best value 10-Year approach is needed. In this 10-Year scenario, PCI 70 is achieved in year eight and then maintained for years nine and 10.

Analyses determined that in order to maintain an average network condition of PCI of 70 or higher in 10 years, an annual average of $188M/year is needed (hereafter Best Value Approach PCI 70 10-Year Implementation Scenario; Figure J). The total investment to reach a PCI of 70 in eight years is approximately $1.7 billon (B). The final two years of this scenario include >99% of funding directed to maintenance activities to maintain PCI 70 once achieved. The total investment for the Best Value Approach PCI 70 10-Year Implementation Scenario is $1.9B. In contrast, the City's overall road network PCI will continue to degrade over the next 10 years to a PCI score of 45 ("Poor") if projected funding levels based on known sources remain the same. Dedicated and consistent annual year-over-year investment is the only possible option to improve and preserve San Diego's street assets and reduce long-term costs. Ramp-up of City forces is needed to accomplish the ~760 annual average lane miles target associated with this implementation scenario.

The PMP has been produced in close consultation with City staff and pavement management experts. This plan also provides a response to concerns identified within the "Response to Grand Jury Report 'When Will My Street Be Paved? City of San Diego's Street Paving Challenges'" developed by The Office of the Independent Budget Analyst. With the development of this PMP, the Department is actively taking major strides in strategically prioritizing future pavement maintenance and rehabilitation activities by evaluating the condition of all street segments in the street network, determining funding needs to maintain a network PCI of 70, and evaluating potential options for operational efficiencies, such as performing some paving work in-house and working with other municipalities in the region to establish common Reclaimed Asphalt Pavement (RAP) standards to improve material and supply availability.

**A total investment of $1.9 billion over 10 years is needed to reach the City's street network goal of PCI 70 or higher. Dedicated year-over-year annual investments are required to improve and preserve San Diego's street assets and reduce long-term maintenance and rehabilitation costs.**





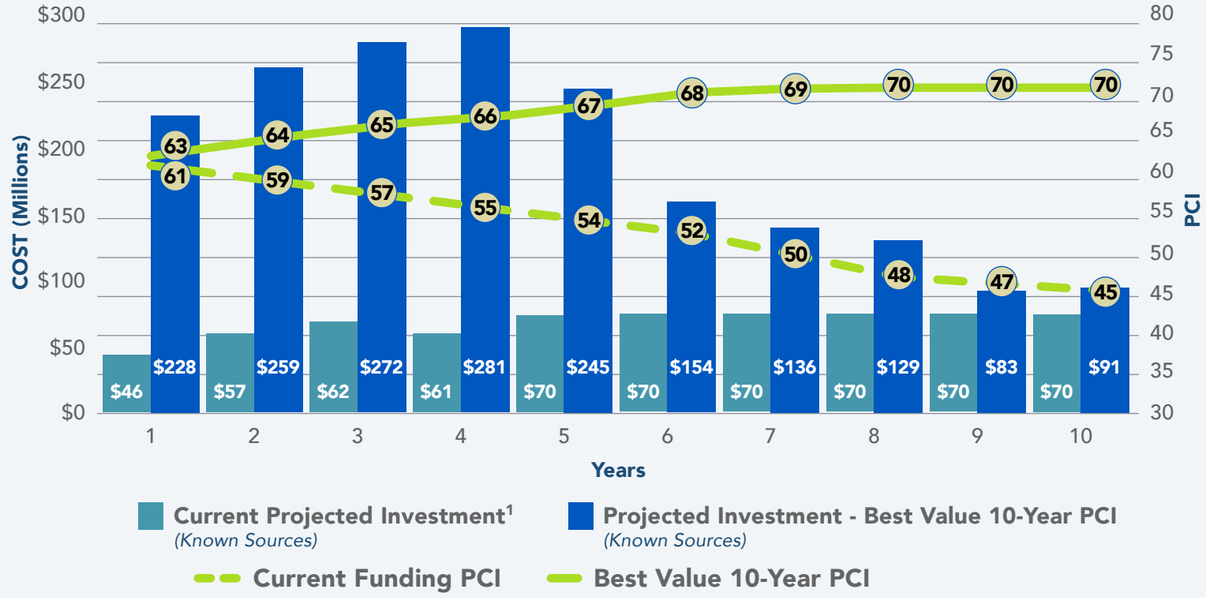



***Figure J.*** *Current Investment Comparison to Recommended Funding Scenario Investment*

*[1] Current investment includes projected Road Maintenance and Rehabilitation Account, TransNet, Gas Tax, Street Damage Fee, based on historic funding amounts. The current investment scenario assumes the funding in year five will carry forward through year 10.*

Figure J demonstrates that the City's overall street network PCI will continue to degrade over the next 10 years if funding levels remain consistent with historic projections. The current investment amounts were determined based on projections of historic funding. This figure also shows that if investment in pavement repairs is made according to the Best Value 10-Year PCI 70 Investment strategy, the City's overall network street PCI will improve to 70 in Year 8 and will be maintained through Year 10. This funding scenario represents the most efficient use of funds to achieve a PCI of 70 over the 10 year period, which occurs at Year 8.

## Benchmarking Municipal Funding Sources

Comparable municipal agencies that have achieved an average street network PCI score greater than 70 were benchmarked as part of this PMP. In general, the benchmarked agencies typically have guaranteed funding sources to support street maintenance and rehabilitation activity implementation. Most agencies, whether they had achieved a PCI of 70 or not, rely on tax revenue. Examination of agency-specific funding provides insight to various funding sources applied to transportation network maintenance and repair activities throughout the state.

Evaluation of street maintenance program funding sources indicates trends for the benchmarked municipalities. **Long Beach** relies on local sales tax revenue through local proposition 'Measure A' funds, gasoline taxes, and state and federal government contributions. **Los Angeles County** utilizes funding from the county general fund, a dedicated gasoline tax fund, and funds from local Proposition A, emphasizing local transit and transportation. **Sacramento** accesses multiple funding channels, including state RMRA and Highway Users Tax Account (HUTA) funds, alongside federal, state, and local sources, complemented by local sales tax revenue through Measure A. **San Jose** utilizes general fund but also considers potential gas tax revenue from local or state contributions. Each municipality combines various revenue sources to support essential street maintenance programs. The variety

in funding sources is emblematic of each municipality's commitment to balancing financial sustainability and the long-term health of its street networks. By effectively leveraging these diverse financial channels, cities can execute pavement management plans that enhance street quality and contribute to the overall well-being of their communities, fostering safer transportation, and economic stability.

## Ramping Up City Efforts - In-House Paving Assessment

Analyzing the City's historical funding and staff capacity, it is clear that the City would be required to significantly increase funding and staffing to effectively execute the optimal funding scenario to reach and maintain a PCI of 70. Regional coordination amongst agencies and the industry will also be needed to ensure an adequate number of contractors and materials are available.

As part of the Department's effort to evolve and optimize pavement maintenance and rehabilitation projects, this PMP also includes a feasibility assessment that evaluates the potential benefits of performing paving projects in-house utilizing City equipment and personnel in tandem with a City maintained asphalt materials plant. The Department has the capability to perform pavement maintenance and rehabilitation projects in-house if provided the adequate resources, including staff, training, equipment, and materials. An evaluation of the resource needs to enable the Department to perform paving operations in-house is discussed in Section 4.4, and the full assessment is provided in Appendix B.

This strategy was considered as means of combating current challenges related to paving, which include the following:

- **Rising Contractor Costs:** Costs for outsourced maintenance and rehabilitation projects have been increasing at a substantial rate. Since 2019, costs for slurry projects have increased by over 47%, reducing the Department's capacity to address repair with annual budget allocations.
- **Limited Contractor Availability:** The City has limited options when it comes to selecting paving contractors, with 20 of the past 27 slurry seal projects being split between two local contractors. The City awards projects to the lowest responsible and reliable bidder consistent with the law. City staff cite the shortage of highly specialized and certified labor as a reason for the lack of additional contractors vying for City paving contracts.
- **Limited Material Availability:** Regional suppliers have raised concerns that they do not have enough raw materials to address the County of San Diego's paving needs. Suppliers have noted inconsistent standards related to Reclaimed Asphalt Pavement (RAP) requirements of other municipalities in the region.

It was determined that the Department would need to secure additional space for equipment storage and a new pavement plant capable of manufacturing asphalt for City projects. The estimated cost for acquiring these facilities is approximately $300M. Additionally, the Department must invest in equipment, with an upfront cost of around $314M for overlay crews. Personnel requirements for these crews have also been detailed, and equate to a total of approximately 862 FTEs, including engineering and planning staff, safety and inspection teams, and field crews.





## Current Department Initiatives

Despite facing funding challenges, the Department maximizes the use of their limited resources to address and prevent as many pavement issues as possible. The Department prepares streets for winter storms by repairing potholes before rainwater accelerates the degradation of the damaged street. The implementation of the Hot Roads Initiative, which strategically identifies and addresses street segments with the highest pothole counts, showcases the Department's commitment to efficient maintenance practices. Additionally, the Department is applying more cost-efficient new pavement maintenance treatments such crack seal, cape seal, and scrub seal. Applications including crack seal, cape seal, and scrub seal are being tested throughout the City to demonstrate the viability of these less costly techniques, that extend the longevity of the network. Furthermore, despite financial constraints, the City has allocated $104M in rehabilitation projects in FY24, the most significant investment in pavement repair in over 15 years.

The City of SAN DIEGO
SAN DIEGO AT WORK

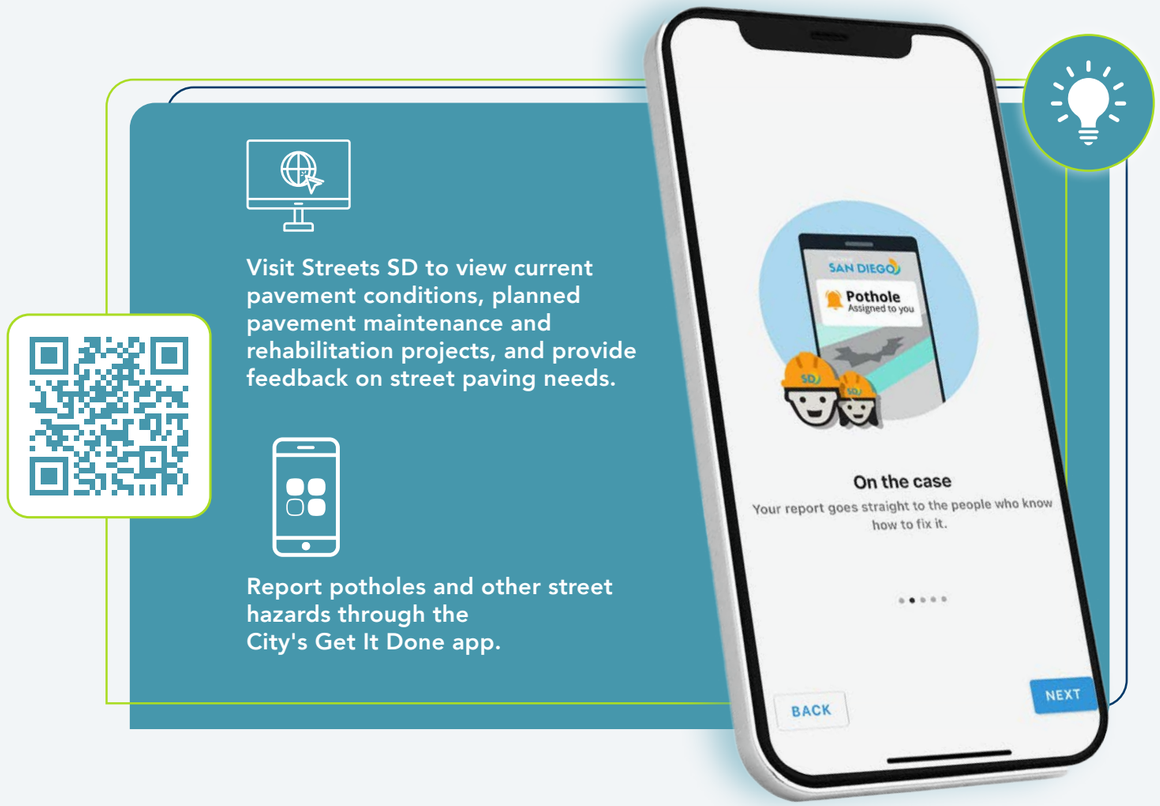
- **Repaired over 50,000 potholes,** performed 4.4 miles of mill and pave, and addressed over 800 trench repairs in FY23 using Department crews
- Implemented **"Hot Roads" initiative** to prioritize street segments with the highest amount of potholes
- Applied more cost efficient pavement maintenance treatments (cape, scrub, and crack seals) to streets that will typically receive more costly overlay treatments

### Five-Year Paving Plan

The development of this PMP is the first of its kind for the Department. As part of this PMP, the Department has proposed a five-year pavement plan that can be found on the City's website at streets.sandiego.gov. This plan provides a description of the streets that could be targeted for improvements in the next five fiscal years, assuming that the Department will be provided the necessary funding to successfully execute this plan. This plan will be updated on an annual basis once funding is known for any given fiscal year.

## Resources Available to Residents

The Department is committed to ensuring transparency and accessibility of information for residents regarding the City's street infrastructure. To provide real-time insights, the Department has established a user-friendly website, https://streets.sandiego.gov where residents can access detailed information about the current condition of each street segment in the City. This online platform also features updates on ongoing and planned maintenance and rehabilitation projects, empowering residents to stay informed about the City's efforts to enhance street quality. Moreover, the Department encourages residents to actively participate in the maintenance process through the Get It Done app. Residents can also view current street conditions in their Council District by going to Appendix A of this PMP. Residents can quickly and efficiently report potholes directly through the Get It Done app. To further address infrastructure needs, the Department has proactively sought additional funding by submitting budget requests with the aim of expanding investments to align with this PMP and to achieve a targeted total network PCI of 70.








# City of San Diego Pavement Management Plan

**1 INTRODUCTION**

The City conducted a 2023 Pavement Condition Assessment of its over 6,600 lane miles street network.

**2 2023 PAVEMENT CONDITION ASSESSMENT**

Through advanced technology to perform the assessment, it was determined that the PCI is 63.

**3 FUNDING NEEDS**

The City evaluated various funding scenario using data informed decision making tools and determined which funding scenario was optimal.

**4 PAVEMENT MANAGEMENT PLAN IMPLEMENTATION & CONSIDERATIONS**

A plan has been developed to outline the City's needs to successfully bring the overall network to a PCI of 70 to set an equal standard.

**5 CONCLUSION**

The City requires $188M in average annual funding for the next 10 years to obtain a PCI of 70. While the City is looking into options to ramp up efforts and prevent challenges, the City's five-year plan can be monitored online.

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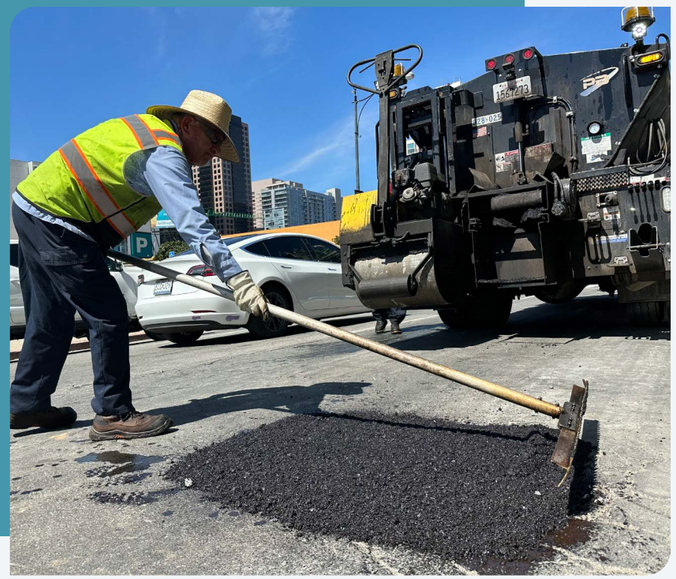
# 1. Introduction



The Transportation Department (Department) is responsible for a multitude of transportation-related services that promote the efficient movement of people and goods across the City. The Department consists of a dedicated team of nearly 500 professionals including engineers, planners, equipment operators, electricians, technicians, field crews, and management staff to service the City's extensive public right of way. Of the 500 professionals, 110 full time employees are dedicated to pavement management. This integrated team synergizes diverse expertise to plan, design, and execute pavement maintenance and rehabilitation projects throughout the City, and to respond to resident needs on a daily basis.

The Department oversees and performs the maintenance and rehabilitation of the City's streets, including pothole repair and mill and pave activities; sidewalks and bike lane maintenance; traffic and transportation system engineering; management of the Utilities Undergrounding Program; and coordination of work in the public right of way. These Department functions are coordinated both internally and with other City Departments to efficiently design projects, perform right of way maintenance and improvements, and inspect project construction to provide a functional and viable transportation network throughout the City.

**San Diego at Work! The Department is comprised of a dedicated team of nearly 500 professionals that service the City's extensive public right of way. Over 100 Department employees are dedicated full time to pavement management. These staff plan, design, and execute pavement projects daily, throughout the City.**

- Department crews address needed pavement repairs, including requests that are sent in from residents through the Get It Done app
- The Mill and Pave Team responds daily to pavement repairs and other street damage
- The Pothole Repair Team repairs extremely damaged sections of street to improve the rideability for the public until more permanent repairs can be made
- In FY23, the Department received nearly 136,000 Get It Done requests, which is 33% of the City's total requests

There are nine in house teams that perform pothole repair, mill and paves, trench restoration, and planning, design, and construction oversight. In FY23, these teams responded to over 31,000 Get It Done requests for pothole repair and pavement maintenance, in addition to proactive project planning and services for other Departments.

Mill and Pave treatments provide rehabilitation of the structural integrity of the street after damage has occurred, typically as a result of trench cuts for water, sewer, stormwater, or dry utility work has impacted the street surface. There are two Mill and Pave Teams that respond to Get It Done requests for spot mill and pave and also perform proactive mill and pave on larger street segments via the Hot Roads Program. The Hot Roads Program identifies street segments with a high number of pothole repair requests that aren't being repaired via upcoming maintenance rehabilitation projects and performs mill and pave on these street segments using in house crews. In FY23 the Mill and Pave Team performed 4.4 miles of mill and pave.

Pothole repairs are performed by Department crews to provide spot treatments to moderate to severely damaged sections of street. There are nine Pothole Repair crews dedicated to responding to Get It Done requests for pothole repair. In FY23, these teams addressed over 50,000 potholes, with an average five days response time. There are three trench restoration teams that perform temporary and permanent trench restoration for the City's utility work in the public right of way. The three teams consist of one team dedicated to temporary repairs for water projects, one team dedicated to temporary repairs for sewer projects, and one team dedicated to permanent mill and paves and one team dedicated to concrete trench restoration for these projects. In FY23, the water team completed 680 trench repairs, the sewer team completed 139 trench repairs, and the Mill and Pave Team completed over 50,000 square feet of mill and paves.





Two Department engineering teams are dedicated to pavement management. The Street Asset Management team is responsible for producing slurry seal contracts, managing crack seal projects, conducting condition assessments, and managing asset inventory through GIS and Cartegraph. The team also coordinates with the Engineering and Capital Projects (ECP) Department to produce overlay group jobs and contracts. The Construction Operations team includes planners, contract managers, inspectors, and other personnel whom conduct inspection of in-house construction operations for transportation assets. This team is charged with ensuring that installed improvements are consistent with City design standards, construction drawings, and specifications for specific street improvements.

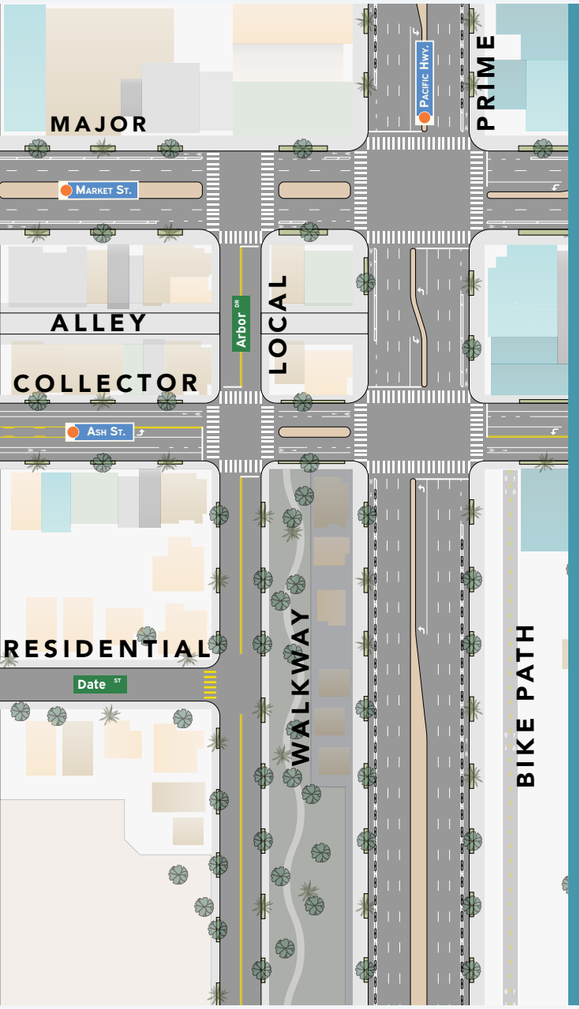
The criticality of the Department's services is demonstrated through the sheer number of service requests received by the City on a daily basis. The City's Get It Done app allows the public to report a variety of maintenance and related needs. In FY23, the Department received 136,000 Get It Done requests. The Department provides the single-most requested services citywide, responding to a diverse range of issues that impact the right of way.

## 1.1 Street Network Overview

**The City maintains over 6,600 lane miles of streets and alleys, making it the second largest network of streets and alleys in California.** Only the City of Los Angeles is responsible for a larger system. This street network provides comprehensive mobility options for vehicles, cyclists, pedestrians, and other forms of transit for the City's population of 1.37M residents. The City serves as the largest metropolitan hub in San Diego County. This extensive network of streets and alleys expands throughout the City's 372 square miles of land area and is crucial to the movement of people and goods throughout the region.

The Department manages and is responsible for the maintenance, repair, and restoration of the street network through both in-house and outsourced maintenance operations. As displayed in Figure 1-1 on the following page, the Department categorizes streets within the street network according to the following classifications: Prime Arterials, Major Streets, Collector Streets, Local Streets, and Residential Streets. Prime arterials and major streets convey the highest volumes of traffic throughout the City, serving as conduits for travel, tourism, and daily commutes. Collector streets facilitate the distribution of traffic, preventing congestion on primary routes and enabling smooth access to local streets. Local streets, in turn, provide the essential infrastructure for residents, allowing them to access their homes, schools, and local businesses. Alleys support critical services such as residential parking, waste removal, and utility maintenance, ensuring the cleanliness and utility of neighborhoods.

**The City's network of over 6,600 lane miles of streets and alleys is expansive, making it the 2nd largest network in the State.**




6% **PRIME:** A street that provides a network connecting vehicles and transit to other primary arterials and the freeway system. This street type typically has a raised center median, bicycle lanes, street trees, traffic safety street lighting, sidewalks, and no access from the abutting property.

15% **MAJOR STREET:** A street that provides a network connecting vehicles and transit to other major streets and primary arterials and the freeway system and secondarily provides access to abutting commercial and industrial property. This street type typically has a raised center median, street trees, traffic safety street lighting, and sidewalks.

12% **COLLECTOR:** A street that provides movement between local/collector streets and streets of higher classification and secondarily provides access to abutting property. This street type typically has on-street parking, street trees, traffic safety, street lighting, and sidewalks.

5% **LOCAL STREET:** A street that provides direct access to an abutting property. This street type typically has on-street parking, street trees, traffic safety lighting, and sidewalks.

52% **RESIDENTIAL:** Category of street serving housing areas or neighborhoods where the primary purpose is to provide access to residences.

*% = Street Classification Percentage within City's Street Network. Other street types in the City's network are not shown, and include: Bike Paths, Unpaved Streets, and Walkways (10%).*

***Figure 1-1.*** *City of San Diego Street Classifications*






## Unimproved Streets

As part of the street network described above, the network also includes approximately 62 miles of unimproved alleys and streets, which are street segments that are part of the City's street network but were not originally built to City Construction Standards. These streets typically lack one or more of the following pavement construction requirements explained below.

**The City's street network includes approximately 62 miles of unimproved alleys and streets. A unique process is used to prioritize unimproved alleys and streets for improvement, separate from the pavement prioritization process.**

**Materials Specifications:** Detailed specifications for the types and quality of materials to be used in pavement construction, including asphalt mixtures, aggregates, and any additives.

**Design Standards:** Guidelines for the design of pavements, including thickness requirements, slope considerations, and load-bearing capacity based on the anticipated traffic.

**Construction Methods:** Standard procedures for the construction process, such as excavation, grading, subbase preparation, and application of asphalt or other pavement materials.

**Environmental Compliance:** Adherence to environmental regulations, which may include erosion control measures, and consideration for water runoff.

**Accessibility Standards:** Compliance with accessibility standards to ensure that pavements are designed and constructed with consideration for individuals with disabilities.

**Safety Measures:** Implementation of safety measures the general public, including signage, traffic control, and protective barriers.

Of the 62 miles of unimproved streets, 45 miles fall under the "unimproved street" category, (Table 1-1). which is defined as a segment that is paved with less than 2 inches of hot mix asphalt, is not graded or paved for drainage, is unpaved, or lacks a sufficient underlying base. The remaining 17 miles fall under the "Unimproved Alley" category, which is defined as a segment that is no wider than 25 feet, paved with less than 2 inches of hot mix asphalt, is not graded or paved for drainage, and lacks a sufficient underlying base. Of the 62 miles of unimproved streets, 45 miles are paved, although not to City standards, and 17 miles are unpaved. Unimproved Streets mostly fall under the "Residential", "Local", and "Alley" classifications, as defined in Figure 1-1.

**Table 1-1. Summary of Council District Unimproved Street Mileage**

| Council District | Unimproved Streets/Alleys |
|---|---|
| 1 | 5.0 |
| 2 | 10.5 |
| 3 | 7.8 |
| 4 | 14.6 |
| 5 | 2.2 |
| 6 | 1.0 |
| 7 | 0.6 |
| 8 | 13.6 |
| 9 | 6.4 |
| **Total** | **62** |

***Figure 1-2.*** *Unimproved Streets Examples*

In 2021, City Council Policy 200-01 was updated to allow City funds to be used to improve unimproved streets and alleys. Prior to this update, City Council adopted Resolution No. 107424 had excluded City forces from improving unimproved streets and alleys. The Department historically has not considered improving unimproved streets and alleys as part of the annual paving prioritization process since these projects typically require extensive work in addition to paving (e.g. grading, utility installation, sidewalk installation, etc.).

The Department is requesting dedicated funding for improvement of unimproved streets starting in FY25. A unique prioritization process has been developed in FY24 to prioritize unimproved streets for funding that considers pavement condition, number of people impacted, safety, impacted services, including street sweeping and trash collection, and proximity to location within a census tract that is deemed eligible for CDBG funds, in a Promise Zone, or located in a Community of Concern identified per the Climate Equity Index (very low, low, or moderate access to opportunity). Refer to Section 1.3 for more discussion on the unimproved street prioritization process and Section 3.4 for more information on funding needs.

### Repair Miles vs. Lane Miles

The Department has historically used repair miles to report out on the number of miles repaired via maintenance and rehabilitation projects. As part of the 2023 Pavement Condition Assessment, data was captured to allow the Department to begin reporting out improved mileage and targeted mileage in lane miles, which is much more accurate than repair miles and consistent with industry standards. For the purpose of this PMP, any mileage numbers that refer to historic mileage are reported in repair miles, and any mileage numbers that refer to future mileage goals are reported in lane miles. Moving forward, the Department will use lane miles instead of repair miles when reporting improved mileage and targeted mileage. More information on the difference between repair and lane miles is below.

**Repair miles:** Repair miles were calculated as the total length of the street if a street was less than 50 feet wide. If a street was equal to or more than 50 feet wide, then the length was doubled. For the purpose of this PMP, repair miles are used to quantify historic repair activity that has been performed on streets, as this methodology is what was used in previous years.

**Lane miles:** Lane miles are calculated as the total length of individual lanes within a street. For the purpose of this PMP, lane miles will be used to quantify future and proposed repair activities that are planned for streets.

## 1.2 Pavement Maintenance and Repair Methods

Various maintenance and repair methods are applied as street infrastructure ages and degrades. Pavement degradation is a gradual process influenced by various factors such as weather, traffic loads, and environmental conditions. Over time, the asphalt binder in pavement can oxidize due to exposure to sunlight, leading to surface cracking and loss of flexibility. Additionally, heavy vehicle loads and repeated traffic impact can cause the development of fatigue cracks and ruts. As the pavement ages, the surface may experience further distress in the form of potholes, roughness, and loss of skid resistance. To address these issues and extend the pavement lifespan, a systematic approach to maintenance is crucial.

Selection of the most appropriate pavement maintenance and rehabilitation activity depends on the condition and the functional classification of the pavement. Preventive maintenance treatments, such as crack sealing and slurry seals, are used to keep good pavements in good condition and slow street deterioration. Rehabilitation activities, such as an overlay or reconstruction, consist of significant structural improvements to the pavement and reset or extend the service life of an existing pavement. This section describes the types of pavement maintenance and rehabilitation activities used by the City. Maintenance activities cost less to implement, in comparison to rehabilitation costs.

**Crack Seal:** Crack sealing is one of the more commonly performed pavement preventive maintenance activities. One objective of crack sealing is to reduce the amount of moisture that can infiltrate the asphalt surface, thereby reducing moisture-related distresses, such as stripping, pumping of fines, and increased fatigue cracking. Crack sealing is performed to extend the service life of the existing pavement or as a surface preparation treatment conducted prior to the construction of an overlay to extend the service life of the overlay.

**Slurry Seal:** Slurry seal is a preventive maintenance treatment that involves the application of a thin layer of slurry mixture on the existing pavement surface. This mixture usually consists of asphalt emulsion, fine aggregates, mineral fillers, and water. Slurry seal helps to seal minor cracks, restore surface friction, and protect the underlying pavement from aging and weathering. It is an effective and cost-efficient treatment for extending the life of streets with relatively minor surface distress. ($220K/per mile)

**Cape Seal:** A cape seal combines the benefits of a chip seal and a slurry seal. It begins with the application of a chip seal, which involves the placement of a layer of asphalt emulsion followed by the application of aggregate chips. This is then overlaid with a slurry seal. The chip seal provides enhanced crack sealing and waterproofing, while the slurry seal adds an additional protective layer and restores the surface appearance. Cape seal treatments are commonly used on streets with moderate surface distress, but that are not exhibiting structural distresses. ($300K/per mile)

**Scrub Seal:** Scrub seals are very similar to chip seals described above with the addition of a series of brooms that follow the application of the asphalt emulsion. These brooms, referred to as “scrub brooms’, work the emulsion into the surface cracks which helps ensure the surface is completely sealed. Scrub seals are an excellent option for streets with minor cracking or other non-load related distress. ($350K/per mile)

**Mill and Pave:** This type of treatments provides restoration of the structural integrity of the street after damage has occurred. The City currently has two Mill and Pave Teams in-house, and is seeking to add a third team for FY25.

**Pothole Repair:** Pothole repair activities provide spot treatments to severely damaged streets that are degrading but cannot be addressed by overlay or reconstruction efforts in the near term. The Department repairs potholes that are reported through the Get It Done app.

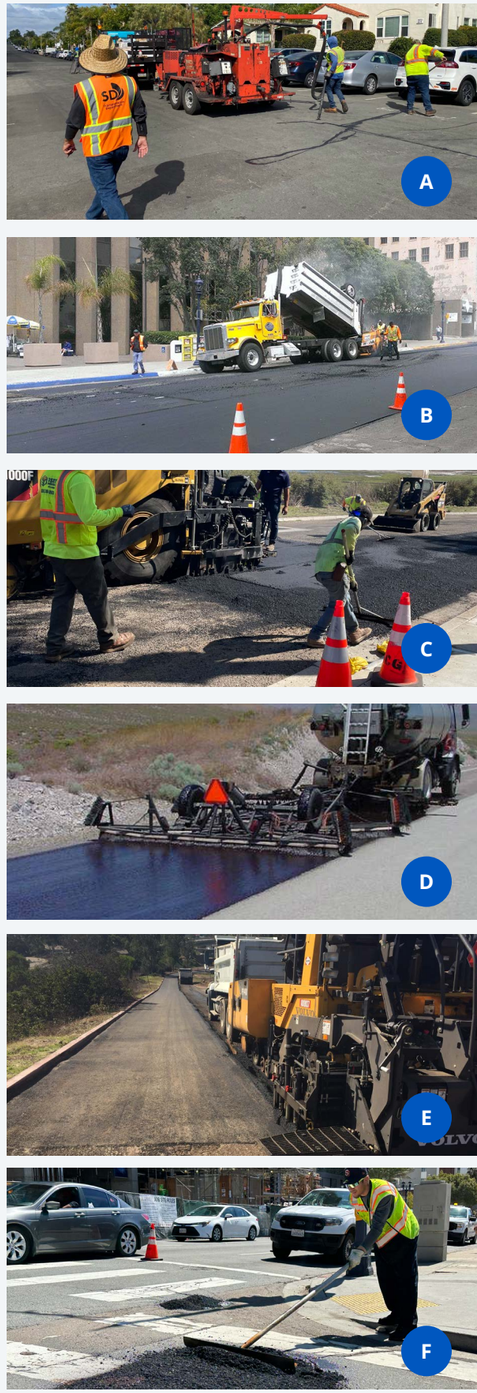



***Figure 1-3.*** *Pavement Repair Method Examples: **A**) Crack Seal **B**) Slurry Seal; **C**) Cape Seal; **D**) Scrub Seal; **E**) Mill and Pave; **F**) Pothole Repair*






***Figure 1-4. A**) Asphalt Overlay; **B**) Full-Depth Reclamation; **C**) Reconstruction; **D**) Concrete Street Repair; and **E**) Unimproved Street Repair*

**Asphalt Overlay:** An asphalt overlay, also known as resurfacing, involves the placement of a new layer of asphalt pavement over the existing pavement surface or the removal and replacement of a portion of the asphalt surface. This treatment is commonly used on streets that require more than just minor maintenance but do not require full reconstruction. Asphalt overlays can be combined with full- or partial-depth patching to repair localized structural distresses, such as fatigue cracking and potholes. ($1.7M/per mile)

**Full-Depth Reclamation:** Full-depth reclamation (FDR) is a cost-effective treatment that recycles existing materials for use in the new pavement structure. The process involves the grinding and pulverizing of the existing pavement and part of the granular base. This material is then mixed with a stabilizing agent and compacted to provide a stronger base for the new pavement layer. This treatment is suitable for streets where overlays will no longer be effective and sufficient base material is available.

**Reconstruction:** Reconstruction refers to the complete removal and replacement of the existing pavement structure. It is typically undertaken when the existing pavement has significant distress, such as deep cracks, potholes, or other structural distress. During reconstruction, all layers of the pavement structure, including the base and subbase, are excavated and replaced with new materials. This major activity is necessary when the existing pavement is beyond repair or when significant changes in street design or capacity are required.

**Concrete Street Repair:** Concrete streets are constructed using a mixture of cement, aggregates, water, and other additives. Unlike asphalt pavement, which is flexible, concrete pavement is rigid and has high load-bearing capacity. Concrete streets are known for their durability, strength, and resistance to heavy traffic loads. They are commonly used on highways, major arterials, and intersections where a long service life and high structural integrity are required, on streets with steep slopes, and in areas with a high water table. Typical concrete street maintenance activities include localized patching, for minor distresses, and panel replacement, for more significant distresses.

**Unimproved Street Repair:** Unimproved streets and alleys refer to streets that lack conventional pavement surfaces, such as asphalt or concrete. These streets may be made of gravel, dirt, or other natural materials. Although unimproved streets may be less smooth and have limited dust control, they can still provide access to properties and serve as transportation routes. Maintenance activities for unimproved streets often involve grading, adding gravel, and addressing erosion or drainage issues.





The choice of specific treatment to a given street segment depends on the severity of deterioration and the desired level of pavement performance. Proactive management of minor cracks and damage through crack sealing, mill and pave efforts, and surface seals are much less expensive treatment methods and can prolong the life of the street by up to eight years before major, more costly repairs are needed. If the damage to the street is not proactively maintained, pothole repairs, overlay, and reconstruction will be required to reestablish street integrity (Figure 1-5).

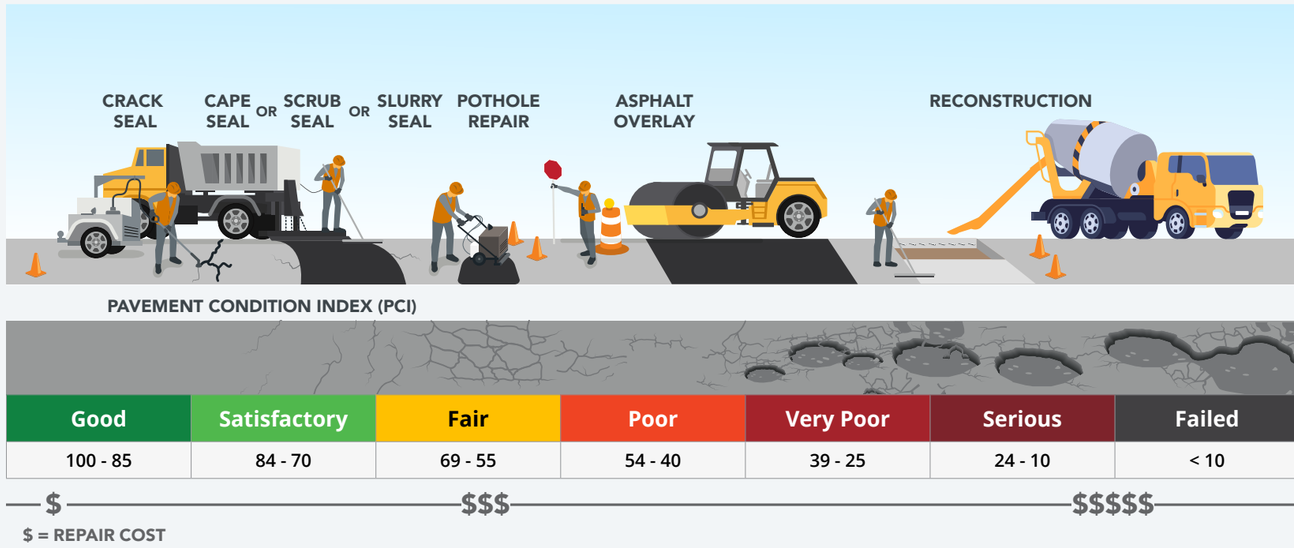



***Figure 1-5.** Transportation Department Range of Repair Options and Street Conditions*

## 1.3 Street Selection Process

The City uses the Cartegraph asset management system for developing recommendations for street maintenance and rehabilitation based on the results of periodic condition assessments. The City's previous condition assessments have occurred at inconsistent intervals beginning in 2011, 2016, and most recently in 2023. Moving forward, the City is using the 2023 condition information to make well-informed street selection decisions based on industry standards. Further, the City is striving to improve the process by aiming to conduct condition assessments every four years, and to create a rolling 5-Year Paving Plan beginning this fiscal year (FY24). The results of the pavement condition assessment and rolling 5-Year Paving Plan will be displayed for public viewing in Streets SD [https://streets.sandiego.gov].

**Starting in FY24, the City will begin using an equitable community investment factor when selecting streets for maintenance and rehabilitation.**

## Scenario Decision Process

1. **IDENTIFY GOAL (PCI OR BUDGET)**
2. **USE CONDITION ASSESSMENT PCI**
3. **USE CRITICALITY MATRIX**
4. **IDENTIFY HIGHEST RANKED STREET**

In Cartegraph's prioritization process for streets, a well-defined set of criteria is used to determine which streets are most in need of rehabilitation efforts. The Department uses a criticality matrix to help prioritize streets with higher Average Daily Traffic (ADT), streets located in high use areas such as schools and shopping centers, streets that are part of the national highway system, and streets located within a census tract that is deemed eligible for Community Development Block Grant (CDBG) funds, in a Promise Zone, or located in a Community of Concern identified per the Climate Equity Index (very low, low, or moderate access to opportunity). In the event of a scoring tie based on deferred unit cost and condition, the criticality matrix is used to prioritize streets segments with the highest point values based on the criticality criteria (Table 1-1). Maintenance history is also factored in to track any past maintenance or repair work to ensure proper eligibility in planning. This prioritization criteria emphasize a best-value approach, strategically focusing on projects that deliver the highest improvement for the lowest costs, ensuring an efficient and cost-effective enhancement of the City's street network.

Table 1-2. Cartegraph Criticality Calculation

| Functional Classification | Functional Classification Points | High Use Area (Freeway On/Off Ramps, Schools, Shopping Centers) | National Highway System | Equitable Community Investment (New for FY24) | Maximum Criticality Points |
|---|---|---|---|---|---|
| Unpaved | 0 | 0 or 1 | 0 or 0.5 | 0 or 0.5 | 2.5 |
| Walkway | 0.5 | 0 or 1 | 0 or 0.5 | 0 or 0.5 | 3 |
| Bike Path | 1 | 0 or 1 | 0 or 0.5 | 0 or 0.5 | 3.5 |
| Alley | 1 | 0 or 1 | 0 or 0.5 | 0 or 0.5 | 3.5 |
| Local | 2 | 0 or 1 | 0 or 0.5 | 0 or 0.5 | 4.5 |
| Residential | 2 | 0 or 1 | 0 or 0.5 | 0 or 0.5 | 4.5 |
| Collector | 3 | 0 or 1 | 0 or 0.5 | 0 or 0.5 | 5.5 |
| Major | 4 | 0 or 1 | 0 or 0.5 | 0 or 0.5 | 6.5 |
| Prime | 5 | 0 or 1 | 0 or 0.5 | 0 or 0.5 | 7.5 |

**Once the streets and their associated maintenance and rehabilitation treatments are selected, the Department's engineering teams begin bundling the street segments into projects based on location.** At this time, conflict checking is performed to review if the street may already be trenched as part of another City or private utility project. If a conflict is detected, the street is removed from the paving project list. The streets selected for paving are added to Streets SD prior to conflict checking, but are subject to change based on the results of the conflict check and the City Council approval process described below.

Once the street list is finalized and projects are determined, the Department goes to City Council for approval to execute and award the project to a contractor. After this approval is received, the Department begins the design phase of the project. The design phase involves engineers surveying the selected streets and marking out the extents of paving as well as the extents of any spot repair. This information is then compiled into a bid list that is used during the project advertisement phase. The engineering teams then work with the ECP Department and Purchasing & Contracting Department to advertise the project for contractors to bid on.





It is important to note that the Department's engineers are responsible for determining the list of street segments for all paving projects, but currently only perform the design and contract initiation process for maintenance projects. The Department provides the ECP Department with a street list to use for planning of rehabilitation projects.

**The City is making well- informed decisions regarding street selection that are consistent with industry standards. This PMP provides the background information for how the 5-year plan is developed. The 5-year plan will be updated annually and displayed on Streets SD.**

## Inclusion of Equity in Street Selection

In FY24 the Department worked closely with the City's Department of Race and Equity to incorporate Equity Factors into the street selection process. Equity Factors are a strategic approach used for the purpose of applying an equity lens[3] to the City operations at the departmental and organizational levels. Informed by the consistent and pervasive force of structural racism, Equity Factors appropriately frame policy, practice, and budget decisions with the goal of addressing racial disparities to produce equitable outcomes. Equity Factors provide an effective means to explore how equity currently operates within the context of each department's operations, and at a comprehensive citywide level to address the impact in the following areas:

- **Equity in Access:** Includes enhancing access to City services or programs like trash and recycling collection, parks and recreational programs, library services, and keeping our communities safe.
- **Equity in Infrastructure:** Includes addressing disparities in our infrastructure, which includes fixing broken streets and sidewalks, repairing miles of levees, fixing broken pipes, and cleaning our drainage channels. Equity in action includes providing miles of street sweeping annually and ensuring our watersheds and pump stations are working properly.
- **Equity in Communities of Concern:** Includes addressing disparities in Communities of Concern to improve the harmful impact of environmental injustice through a Climate Equity Fund that targets Council Districts to prevent enduring underinvestment.
- **Equity in Processes:** Includes ensuring our processes like budget decisions and policies are being guided by an inclusive equity lens.

Equity Factors are never in competition with each other, they co-exist and need to be consciously considered as parts of a whole. The introduction of Equity Factors as a strategic approach to equity is provided in this PMP notably in the context of the "Equity in Infrastructure" factor as part of the street selection process for paving and improvement of unimproved streets and alleys. Applying an equity lens allows for analyzing the City's streets and communities through identified disparities and increases means to determine equity as both an outcome to aim for, and into a practice for how departments can collaborate, operate, and serve.

[3]Definitions of equity, equity lens, and equality are as follows

- Equity is defined as what occurs when we eliminate institutional racism and systemic disparities, providing everyone with equitable access to opportunity and resources to thrive, no matter where they live or how they identify.
- An Equity Lens is a set of specific questions we ask to critically and thoughtfully analyze policies, programs, practices, and budget decisions to achieve equitable outcomes.
- Equality is defined as each individual, family, neighborhood, or community being given the same resources and opportunities without recognition that each person has different circumstances.

## Coordination with Engineering and Capital Projects

**As part of the street selection process, the Department coordinates with the ECP Department to plan rehabilitation projects based on the recommended Cartegraph street selections.** The Department uploads the street selections from Cartegraph along with the priority and recommended year of rehabilitation into the City's Enterprise Asset Management (EAM) system. The City's EAM system is where ECP can identify conflicts and recommend bundling of the paving with other City assets when necessary. ECP provides the scope of work for reach paving project to the Department for final approval priori to initiation and implementation. This process ensures that project conflicts are minimized and that City street preservation ordinance is being followed. The streets identified for maintenance activities remain under the oversight of the Department, however, the streets identified for rehabilitation activities are provided to ECP, and ECP is responsible for delivering those projects.

All projects trenching on City streets are subject to compliance with the City's Street Preservation Ordinance (SPO; amended 2023), which requires them to perform a mill & pave of the trenched area plus the area of influence. The recent Street Preservation Ordinance amendments emphasize complete and timely repairs, enhance street safety through the implementation of higher quality resurfacing after trenching and stricter time limits for temporary asphalt patches, which have historically led to uneven streets. In addition to promoting safety, the updated guidelines seek to improve coordination among projects within the right of way, minimizing repeated work on the same street to mitigate community impacts. Notable changes include the introduction of restoration requirements for concrete streets and alleys, reducing moratoriums on asphalt overlay and slurry seal, requiring most trenching and restoration work to be completed within 180 days, and adjusting the street damage fee to ensure that the entity responsible for excavating bears the full cost of damages by paying the Street Damage Fund (SDF), not the public. These changes not only increase the longevity of streets but also address costs upfront, preventing repairs from evolving into an unfunded burden on taxpayers.

Per the updated SPO, projects trenching the street may not always pave the street from curb to curb. When conflicts are detected with the Department's street list and other City utility projects that may be trenching the street, ECP uses the following methodology to determine which projects will receive funding from the Transportation Department to pave the full width of the street. These funds are known as delta funds.

- Pave the full width of the street if the street is on the Department's five-year paving plan.
- For segments not within the Department's 5-Year Paving Plan, request approval from the Transportation Department that full width paving is needed if the PCI is less than 50.

On average, $8 million annually of the Department's CIP funding will be needed to fund these activities.

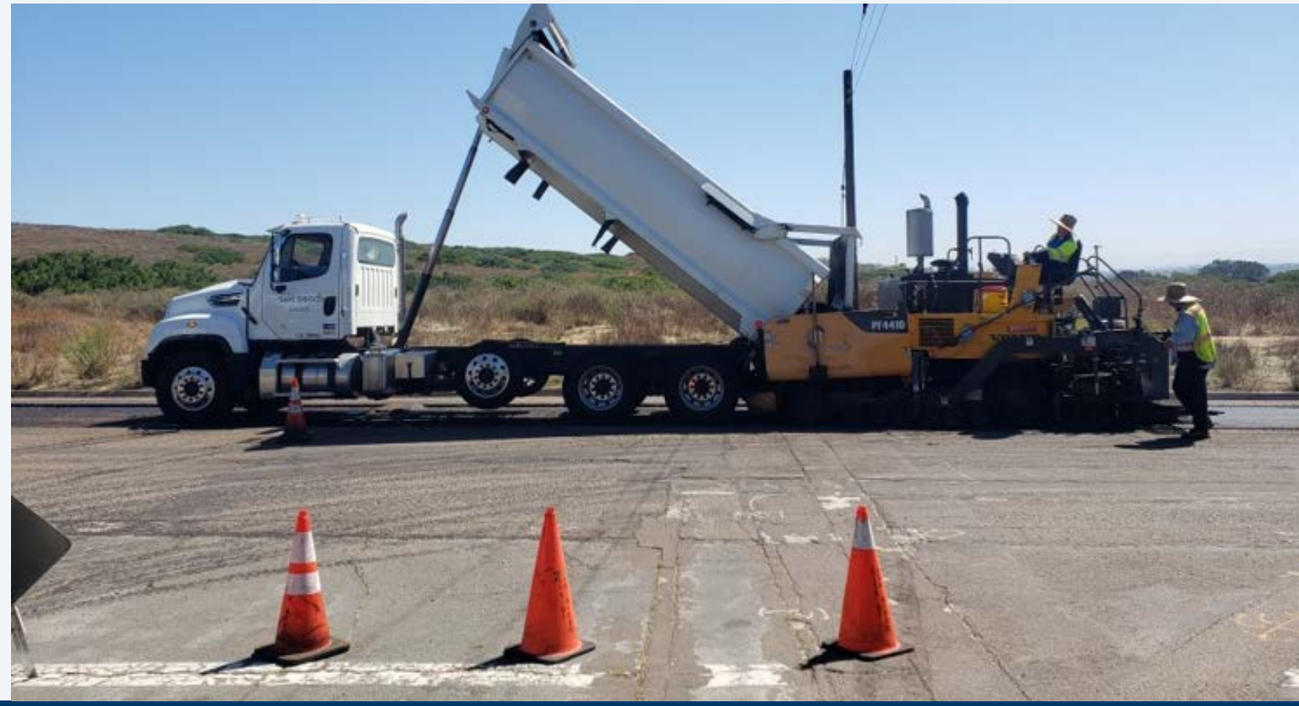
## Unimproved Streets Selection Process

**The City has recently introduced equity into the unimproved street selection process.**

Unimproved streets are currently not included in the annual prioritization of pavement maintenance and rehabilitation activities as the projects are often more complex and do not consist solely of funding. However, the Department has developed a prioritization process to rank unimproved street projects and will begin requesting budget for these projects in FY25. The proposed prioritization criteria consist of the following:

- Number of residents served by street/alleyway
- Safety considerations such as whether or not a street is in a high flooding area (based on Federal Emergency Management Agency (FEMA) 100YR Floodplain mapping)
- Unimproved street limits other services from being provided to residents (e.g. trash pickup, street sweeping, sidewalk accessibility/walkability, etc.)
- Locations within a census tract that is deemed eligible for Community Development Block Grant (CDBG) funds, in a Promise Zone, or located in a Community of Concern identified per the Climate Equity Index (very low, low, or moderate access to opportunity), per Council Policy 800-14.

While structures and systemic policies have impacted disparities within communities in both measurable and less quantifiable ways, allocating dedicated funding to prioritize unimproved streets is activating the Equity in Communities of Concern factor, which includes addressing disparities to prevent enduring underinvestment. Council District 4 and 8 have the highest number of miles that fall under the Unimproved Streets/Alleys category; therefore, an intentional investment recognizes an equitable investment in location within a census tract that is deemed eligible for CDBG funds, in a Promise Zone, or located in a Community of Concern identified per the Climate Equity Index (very low, low, or moderate access to opportunity).



## 1.4 Street Repair History

The City has historically inconsistently invested in pavement management. Annual Department budget requests have reflected needed funding for known repairs but competing needs throughout the City resulted in reduced budgets for pavement management. Over the last 13 years, the City has invested over $494M into pavement maintenance and rehabilitation activities. This has resulted in the completion of about 984 miles of AC overlay, 2,195 miles of slurry seal, and 17 miles of concrete reconstruction (Figure 1-6).

The funding allocated to pavement maintenance and rehabilitation activities since 2011 has resulted in an annual average of 122 miles repaired, which is significantly less than what is needed to achieve and maintain an overall street network PCI of 70. Inconsistent investment in pavement, especially since 2016 has resulted in a decrease in PCI from 71 to 63 over the past seven years.

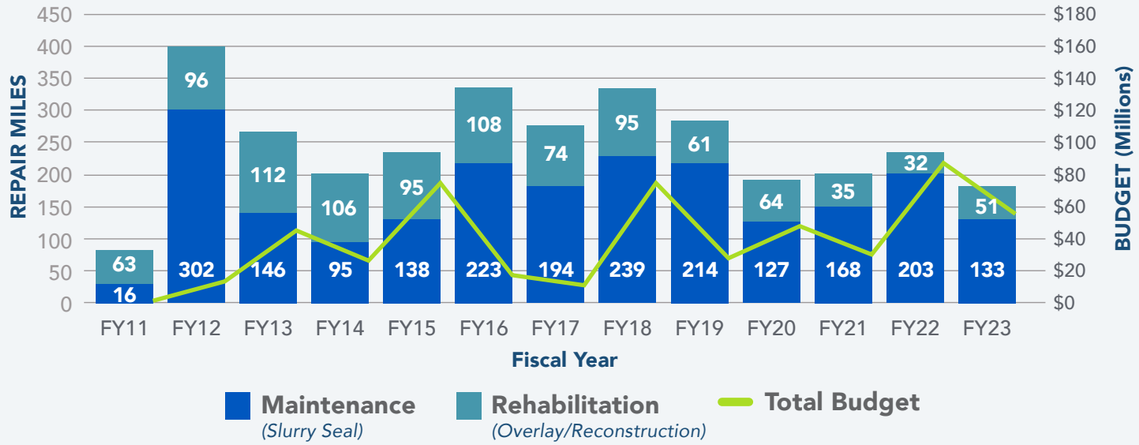



***Figure 1-6.*** *Annual Repair Miles of Repaired Street (FY11-FY23)*

# 2. 2023 Pavement Condition Assessment


The 2023 pavement condition assessment was conducted to understand the current condition of the pavement network to help the Department make informed decisions about pavement maintenance and rehabilitation project planning, given the previous assessment was performed in 2016 and had become outdated. Moving forward, the Department will request budget for pavement condition assessments every four years, which will help the Department make better-informed, data-driven decisions. In addition, the Department has updated assessment methodology to be consistent with industry standards to score pavement by PCI rather than a blended overall condition index (OCI). More information on the PCI method is presented in section 2.2.

**The Department just completed a condition assessment for the first time in seven years. This data is extremely valuable because it will help the Department make informed decisions. Moving forward, it is recommended that an assessment be conducted every four years.**

**This PMP defines the City's intention to achieve an overall network PCI of 70 over the next 10 years based on four strategic factors:**

1. Increased Assessment Frequency: Street condition assessments will be performed every four years, which will help the City make better informed decisions about the pavement management strategy.
2. Methodology Changes: State-of-the-art data collection & conversion of condition index from OCI to PCI helps rank the City's network condition and benchmark other agencies.
3. Data-Driven Decision-making: Updated technology to evaluate street conditions which provide more accurate assessments and to identify realistic deterioration rates.
4. Clear and Transparent Communications: Improved data and strategic condition-based decision-making allows the Department to identify funding that is needed to meet maintenance and repair, community, and City priorities.

## 2.1 2023 Data Collection Methodology

Beginning in February 2023, pavement condition data was collected using an automated ARAN (Automatic Street Analyzer). The ARAN is equipped with Laser Crack Measuring System (LCMS) technology. The LCMS system is the highest resolution 3D pavement scanning technology available. The 3D cameras can detect one-millimeter-wide cracks and full-lane-width rutting on the pavement surface at posted speeds.


***Figure 2-1.*** *Data Collection Vehicle*

The 3D cameras are coupled with downward-facing lasers that provide constant and consistent illumination of the pavement surface regardless of ambient lighting conditions. The impacts of shadows from trees, buildings, or simply overcast sky conditions are eliminated by the laser illumination.

The pavement condition survey consists of driving the ARAN along every street managed by the Transportation Department. For prime, major, and collector streets, two-pass data collection is performed, whereby the ARAN system drives in both directions in the outermost lanes. The outermost lanes are typically subject to heavier truck loading, and they tend to exhibit more pavement distress. For local streets, single-pass data collection is performed.

**City condition assessment data was collected using state-of-the-art equipment and in conformance with industry standards, providing increased data accuracy and decision-making confidence.**





For local and residential streets and alleys, data collection is performed on one lane.

Pavement surface distresses captured with the ARAN, including longitudinal and transverse cracking, fatigue cracking, block cracking, rutting, raveling, patching, and others, are extracted from the 3D imagery using a combination of automated and manual techniques. These distresses are then used to calculate PCI values for each street segment.

The 2023 pavement condition survey is the first time that LCMS technology was deployed for assessing pavement conditions of the City's street network. The survey results provide a comprehensive baseline condition assessment for the City moving forward.

## 2.2 2023 Pavement Condition Index (PCI) Scoring

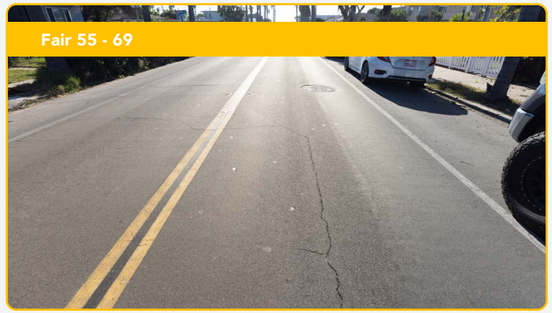
The PCI scoring method is the industry standard and most widely used method for assessing and reporting street pavement conditions. It is an objective and repeatable assessment of the structural integrity and operational condition of street pavements. **The PCI scoring scale ranges from 0 (worst) to 100 (best) and provides a common language for pavement practitioners to describe and communicate pavement conditions to both technical and non-technical individuals alike.** The scale includes seven condition categories:

- **Good (PCI 85-100):** Street displays minimal to low distress and only requires preventative maintenance.
- **Satisfactory (PCI 70-84):** Street displays scattered cracking and only requires routine maintenance.
- **Fair (PCI 55-69):** Street displays signs of low to medium distress and requires minor maintenance up to major rehabilitation.
- **Poor (PCI 40-54):** Street displays medium distress. Near-term maintenance and rehabilitation or reconstruction may be required. Costs to maintain these streets are higher.
- **Very Poor (PCI 25-39):** Street displays high distress and requires considerable levels of maintenance and/or major rehabilitation and reconstruction.
- **Serious (PCI 10-24):** Street is very highly distressed, contains various potholes, and requires considerable levels of maintenance and/or major rehabilitation and reconstruction.
- **Failed (PCI <10):** Street is extremely distressed and requires full reconstruction, which requires the highest investment.

The PCI describes pavement condition on a scale ranging from 0 to 100, with 0 indicating a failed pavement and 100 indicating a pavement in excellent condition. The PCI is calculated by:

1. Identifying and recording observed pavement distresses (e.g., rutting, potholes, cracking, etc.) along a segment of street
2. Assessing the severity (i.e., low, medium, or high) of each distress
3. Measuring the quantity of each distress

**These observations are then used to calculate the PCI value for each street segment.**







| Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|
| 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |

***Figure 2-2.*** *Example Street Conditions and PCI Scores*

For pavement practitioners, PCI values are used to identify the level of maintenance or rehabilitation required by a segment of street pavement. Higher PCI values indicate that less expensive treatment types, like crack sealing or slurry seal are needed, while lower PCI values indicate that more expensive treatments such as overlay or reconstruction are required to maintain the street's integrity. PCI values are also used to track pavement condition over time and forecast future pavement conditions. For non-pavement practitioners, PCI values provide a convenient way of reporting overall pavement conditions and tracking progress towards reaching agency goals.

**The City's use of PCI scoring allows for industry standard evaluation of street conditions and easier comparisons of City conditions to other agencies.**

Updating to PCI scoring from the previous OCI methodology affords the Department a standardized and forward-looking approach. The previous OCI methods included a roughness index component, which aim to assess the rideability of the street, in addition to the pavement distress. PCI scoring is solely based on pavement distress. Conversion to PCI scoring standardizes pavement assessments based on pavement condition distress and allows for common communication among pavement professionals and public stakeholders. For the purposes of this PMP, previous City pavement surveys collected using OCI were converted to PCI to allow for direct comparison.

Measuring street conditions using PCI is the industry standard and allows for easier comparisons and communications when reporting and messaging street conditions.





## 2.2.1 Current Street Network Condition

The City's street network is currently in a "Fair" condition with a weighted average PCI of 63. Streets with a PCI of 63 exhibit weathering and moderate cracking. Without proper investments, the street network will continue to degrade, showing more apparent deterioration, and requiring more costly solutions.

| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |

71 (2016) — 63 (2023)

***Figure 2-3****. City of San Diego 2023 PCI Score*

While a PCI of 63 is considered Fair condition, the City's network is at risk for dropping to the "Poor" and lower categories which require significantly higher investments to raise the PCI back up. There are still a significant number of streets that can benefit from preventative maintenance, however the number of streets requiring major rehabilitation has grown significantly since the last assessment. Based on the current assessment nearly 34% of the City's street network has a PCI of 54 (Poor) or lower while only 20% has a PCI of 85 (Good) or higher. It is important to note that these PCIs were obtained from data that included paved unimproved streets, excluded unpaved unimproved streets, and are weighted based on street area. While the data shows that the City's overall street network is in decent condition, without the necessary investments to maintain and improve the network, the City's PCI can rapidly decrease and become more costly to improve.

Street condition PCI scores vary for the City's six major street classifications that include Prime, Major, Collector, Local, Residential, and Alleys (Figure 2-4). When broken down by street type, the PCIs of each range from 48 to 70 with alleys (PCI=48) ranking the worst street type followed by major (PCI=61) and prime (PCI=62) streets. Local streets were ranked the highest. Prime and Major streets make up 21% of the classified street network which equates to one fifth. These two street classifications are most frequently traveled and are larger which will be more expensive to maintain, proving that the condition of these street classifications are essential to a functional transportation network. Table 2.1 describes PCI scores by street classification, while Figure 2-4 provides the 2023 PCI scores by street classification.

**Table 2-1. PCI Scores by Street Classification**

| Street Classification | PCI |
|---|---|
| Prime | 62 |
| Major | 61 |
| Collector | 67 |
| Local | 70 |
| Residential | 67 |
| Alley | 48 |

**Based on the 2023 Pavement Condition Index, the weighted average PCI for the City of San Diego's street network is reported as Fair (63).**

**Fair 63**

# Key Findings of the 2023 Condition Assessment:

- A large percentage of most frequently traveled street classes (Prime and Major) in the City's street network are in Fair condition and are in need of maintenance treatments to prevent degradation into worse conditions.
- The PCI score of City's street network has decreased since the last assessment conducted in 2016 due to deferred maintenance resulting from a lack of consistent funding for the Department. 34% of the City's street network has been identified as "Poor", "Very Poor", "Serious" and "Failed" conditions.
- The PCIs between Council Districts ranged from a PCI of 57 (Council District 2) to 69 (Council District 5). All Council Districts fall within the "Fair" category but some, such as CD 2 are at a higher risk of entering the "Poor" category.

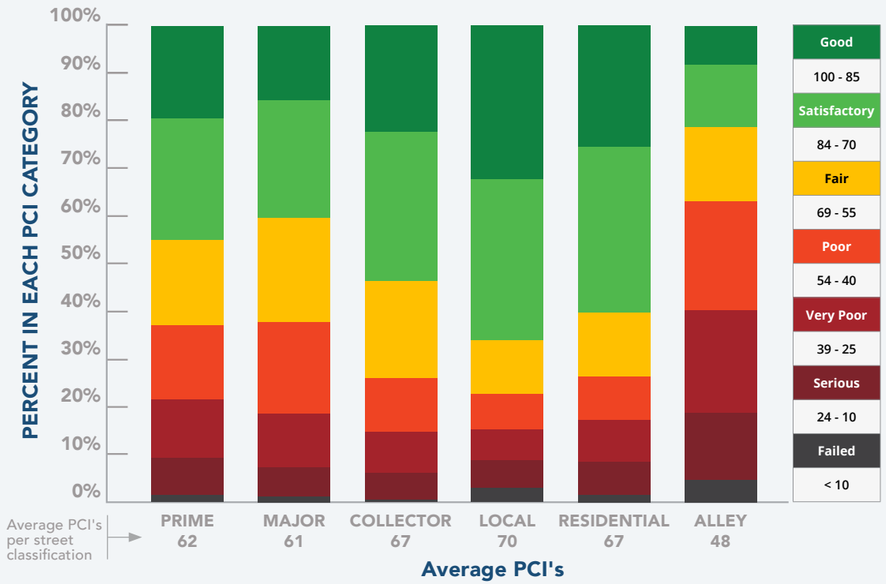



***Figure 2-4.*** *2023 PCI by Street Classifications*

The 2023 assessment demonstrates that there is not significant disparity in street conditions between Council Districts (CD) which ranged from a PCI of 57 (CD 2) to 69 (CD 5) and all remain within the Fair category (Figure 2-5).

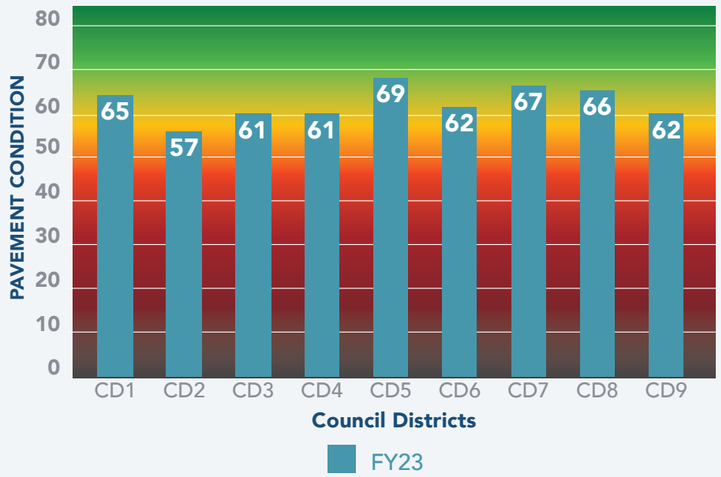



***Figure 2-5.*** *Average Area Weighted PCI by Council District*

## 2.2.2 PCI Benchmarking

Benchmarking of the City's historic PCI values was conducted to understand the previous decisions made in maintaining streets and to pinpoint potential patterns that may inform future pavement management strategies.

The historic pavement condition analysis revolves around a comprehensive examination of the PCI values gathered from assessments conducted in 2011 and 2016. The central objective of this effort is to accurately monitor changes in the condition of the City's pavement infrastructure over this next four year interval and to detect any significant trends that may arise.

## Historical PCI Assessment Methodology

In 2011, the City's pavement condition assessment data was collected by Mission Geographic. In 2013 Mission Geographic was acquired by Cartegraph who would go on to complete the 2016 survey. Both surveys involved a semi-automated approach where a moving vehicle equipped with video equipment and a laser profiler, covered over 97% of the street network. These surveys produced an Overall Condition Index (OCI) comprised of a Pavement Condition Index (PCI) and Ride Condition Index (RCI), with PCI contributing 60% and RCI 40% to the final score (Figure 2-6).

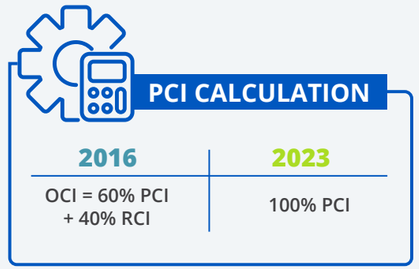



***Figure 2-6.*** *Comparison of the PCI Calculation (2016 vs. 2023)*

## Historic PCI Data

The City maintains a database of pavement inspection data in its Cartegraph system comprised of data from 2011, 2016, and the 2023 condition assessment. In order to compare the data across assessments, the 2011 and 2016 data, which was previously displayed in OCI, was converted to PCI by taking the recorded PCI scores at face value. The results of this showed that in 2011 the City's overall PCI was 54 and in 2016 it had increased to 71. The chart in Figure 2-7 shows the PCIs in comparison to each other.

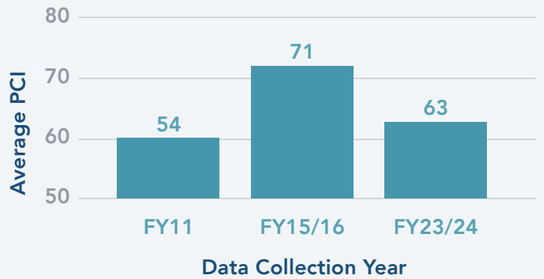
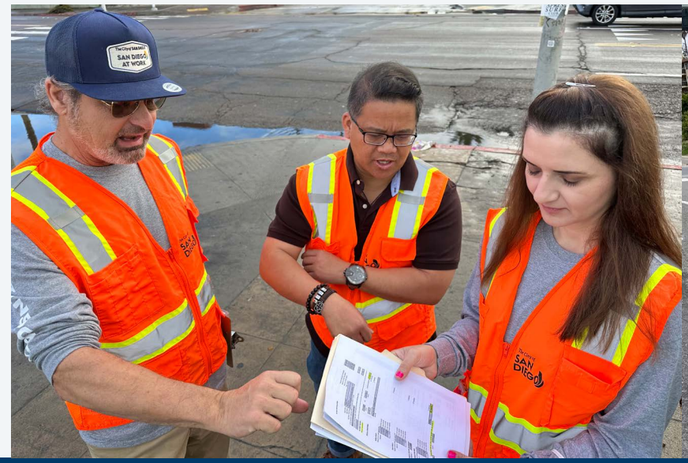
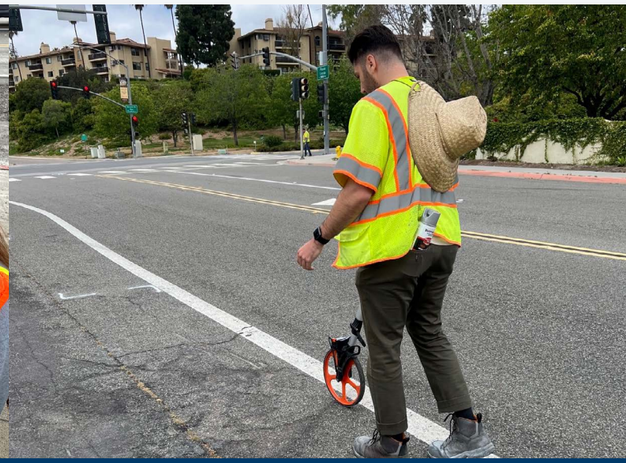



***Figure 2-7****. City of San Diego Street Network PCI Over Time*

The PCI in 2023 has decreased since the 2016 assessment due to inconsistent funding.





To track the historical conditions of pavement segments within the City, an analysis has been performed to compare the findings of the City's previous condition assessments conducted in 2011 and 2016. A breakdown of historical PCI scores by CD is provided in Figure 2-8. Council Districts displayed PCIs between 49-61 in 2011, 65-75 in 2016, and 57-69 in 2023. Further review of the data shows that there was a "spike" in street conditions during the 2016 condition assessment dataset, which has been the only dataset that recorded a Council District reaching the "Satisfactory" PCI category. The City has established a goal of bringing the overall street network to a PCI of 70 which is the beginning score of the "Satisfactory" PCI category. The PCI scores for each of the Council Districts have decreased since the 2016 condition assessment. In addition to the Council Districts boundaries updating in 2023, various factors can contribute to the PCI degrading over time, including deferred maintenance due to not enough investments to improve the overall average network condition.

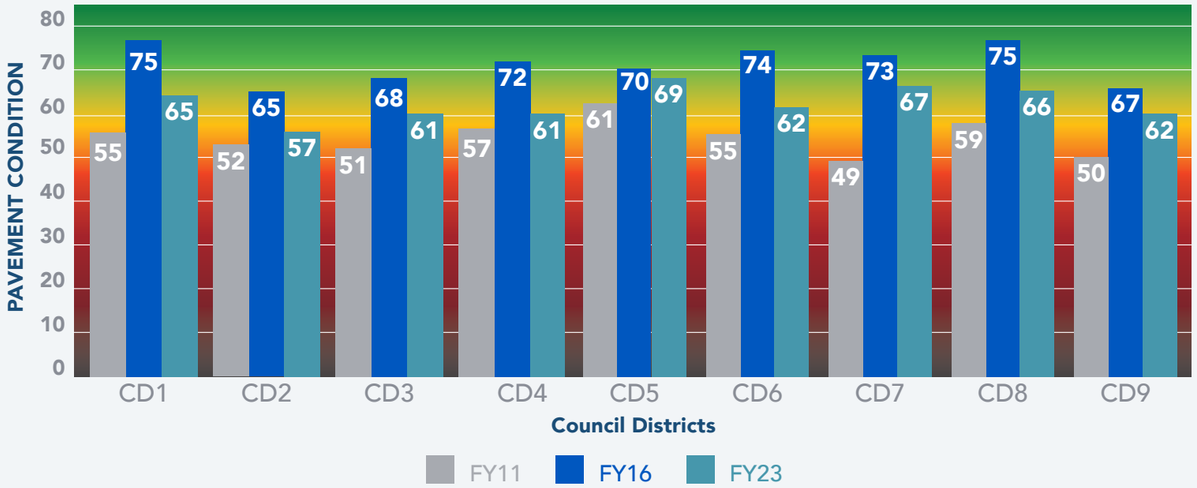



***Figure 2-8.*** *Average Area Weighted PCI by Council District*
*Note: The City of San Diego updated its Council District boundaries in 2023*

Further review of the data uncovered some segments that saw a PCI "spike" in 2016. This suggests that while there were improvements made after the 2011 assessment that brought the overall network PCI score up, these improvements may have acted as temporary solutions that improved the PCI in the short term. With this insight, the City is focused on improving the network PCI in a way that provides long-lasting results through informed decision making.

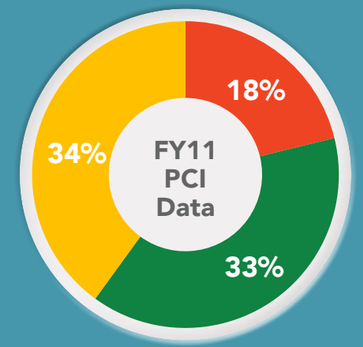
## PCI Comparison- 2011 to 2023 Data

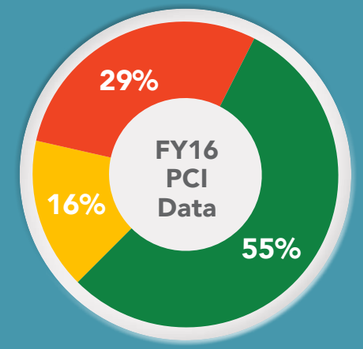
In the 2011 assessment, the average PCI for the City's street network was 54. The City analyzed approximately 2,800 miles of streets, including 2,659 miles of asphalt streets, 115 miles of concrete streets, 203 miles of paved alleys, and 37 miles of unpaved alleys throughout the assessment.

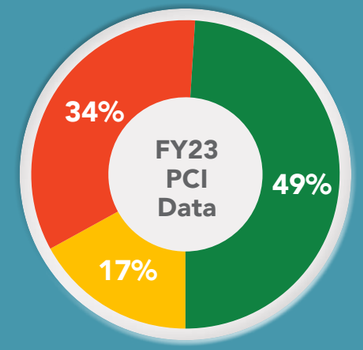
## PCI Comparison- 2016 to 2023 Data

The 2016 assessment offers a contrast of PCI values as compared to the 2011 assessment. The average PCI score for the City's street network was 71 in 2016. The City analyzed approximately 2,900 miles of streets, including 2,668 miles of asphalt, 120 miles of concrete, and 204 miles of paved alleys.

2. Pavement Condition Assessment




**"Good"** PCI (70-100)
**"Fair"** PCI (55-69)
**"Poor"** PCI (0-54)

## PCI Benchmarking: How Does City of San Diego Compare?

To better understand how the City's street network compares to other agencies across the United States, the City was compared to 13 other agencies (Figure 2-9). These agencies were chosen based on proximity, relative size of street network and population, or were common reference agencies. PCI, funding sources, maintenance trends, and annual mileage of street repairs were analyzed to compare to the City. It should be noted that the benchmarked cities vary in population density and street network size. The 14 cities' average PCI is 64.3; the median is 65. The City's 2023 network PCI of 63 ranks below both the average and the median of the 14 cities evaluated in addition to the average PCI for the State of California (PCI=65). Five of the 14 benchmarked cities currently have an average street network PCI greater than or equal to the City's PCI target of 70.

**The California statewide average PCI is 65 or "Fair" (2022 data).**

Common themes discovered during benchmarking were that most of the cities used similar repair activities, had long term pavement management goals, and used multiple funding sources to fund their street maintenance and rehabilitation efforts. One notable City benchmarked is the City of San Jose, which has a PCI of 70 and a street network size of 1,940 miles, just over half the size of San Diego's network; yet has invested nearly double of what the City budgeted for FY23. With a similar 10 year strategy as San Jose and sufficient funding, the City aims to obtain a PCI of 70.

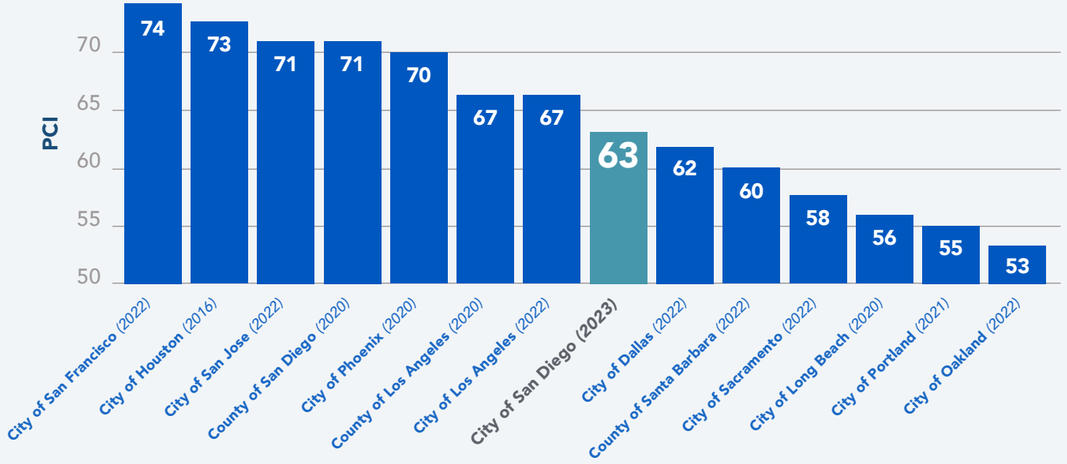



***Figure 2-9.*** *PCI Values Summary of Benchmarked Municipalities*
**Parentheses indicate latest available data source.*

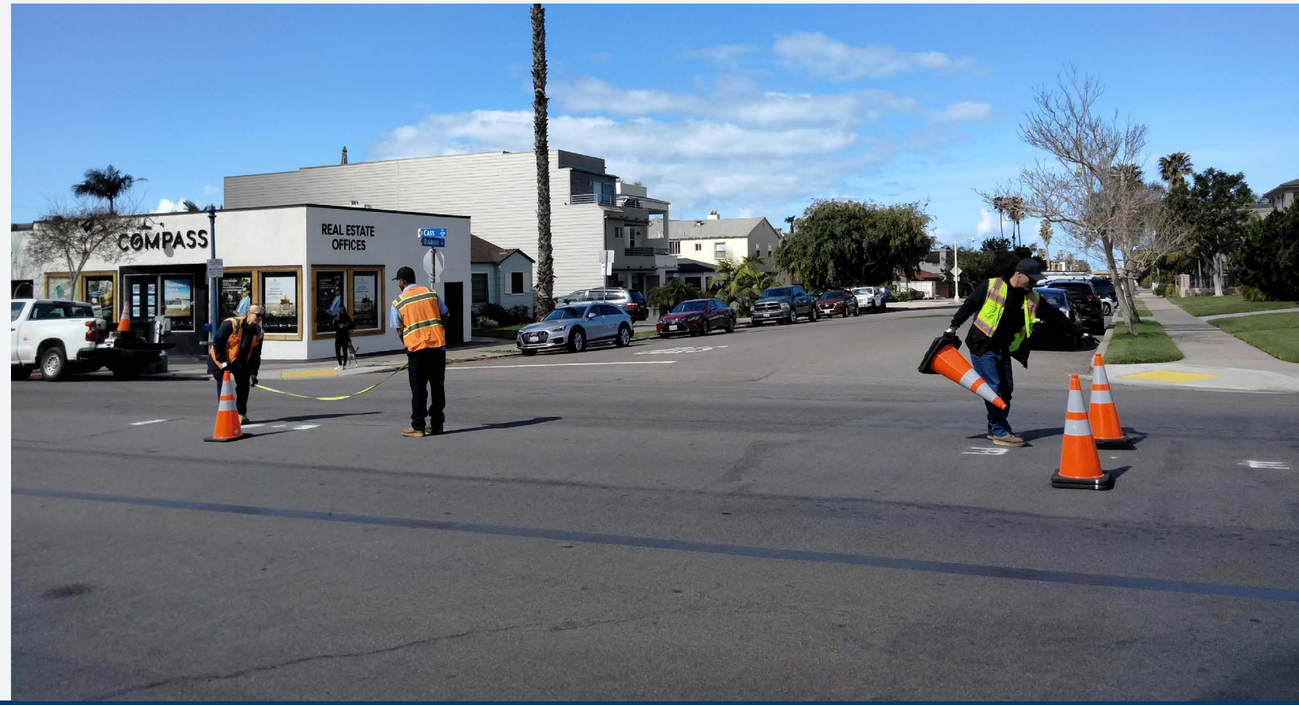




Four main factors were evaluated to benchmark the City against other agencies: pavement condition (PCI), funding sources, maintenance trends, and annual mileage of street repairs conducted. From the benchmarking effort, it is clear that agencies can achieve a street network PCI of 70 or higher. Key observations from San Jose and San Francisco are:

- The City of San Jose has chosen to focus on prioritizing larger Average Daily Traffic (ADT) streets. In 2010, the City established a 10-year strategy to obtain a PCI of 70.
- The City of San Jose currently invests two times more per mile of street network than the City of San Diego. In FY23, 236 miles of major and local streets were repaired/maintained.
- Diverse funding sources allow for greater flexibility in funding improvements. Several municipalities, including the City of San Jose, include or are considering implementing a gas tax to produce revenue to fund improvements.
- The City of San Francisco has a focus to prioritize best streets first and has committed to dedicating large and increasing investments to maintain a network PCI over 70.
- In FY24, the City of San Francisco budgeted six times more per mile than the City of San Diego.

Consistent and large investments in street maintenance and rehabilitation has allowed cities like San Francisco and San Jose to maintain an overall network PCI of 70.



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# 3. Funding Needs

Funding for City street maintenance and rehabilitation has historically been inconsistent, and generally not sufficient to support street network needs. Funding in recent fiscal years has increased but is still not enough. Limited annual funding defers maintenance activities that preserve street conditions, leading to the need for costlier fixes later. Inconsistent and insufficient funding also impacts Department staffing by reducing potential for project planning and implementation efficiencies. Based on these and other factors including inflation and comparison of CIP outlook prepared for FY21-25 versus FY24-28, the Department annual funding needs are estimated to have increased four to five times since 2020.

Moving forward, the Department seeks to apply a proactive strategic street network improvement and maintenance approach to maximize level of service, personnel efficiency, and cost-efficiency. This measured approach requires consistent, adequate funding over the next five-years in excess of $200M/yr to simultaneously repair degraded streets and maintain streets in good condition. The Department performed detailed analyses using updated 2023 PCI data and Cartegraph to evaluate funding options and associated outcomes to reach an average citywide pavement condition index of 70. Given the current street network condition Fair PCI score status, it is imperative the City invest now to prevent further degradation and make improvements to maintain the transportation network used daily by hundreds of thousands of pedestrians, cyclists, and drivers.

**For the past decade, San Diego's street maintenance and rehabilitation funding has been insufficient to maintain a PCI of 70 and deferred maintenance has degraded the City's street network. Increased funding now is vital to protect and improve street conditions to ensure all San Diegan's can safely and effectively get where they need to go.**

## 3.1 Historic Program Funding and Funding Sources

City pavement maintenance and repair funding is generally derived from a suite of federal, state, and local dedicated sources. These diverse sources are applied to various maintenance and repair activities based on street type, funding source, and transportation project type. Funding is generally allocated between maintenance (historically referred to as operations and maintenance) and rehabilitation (historically referred to as Capital Improvement Project or CIP) project types.

**The average City annual investments for maintenance ($19.8M) and rehabilitation ($26.6M) applied since FY13 has not been adequate to maintain a pavement condition index of 70.**

Since FY13, budgeted funding for street maintenance and rehabilitation has averaged $46.4M annually with an average of $19.8M and $26.6M allocated for maintenance (based on available data FY13-FY23) and rehabilitation, respectively (Figure 3-1). While funding in FY24 was the highest since FY13 and over three times the average annual allocation, this amount is still not enough to proactively maintain the network. The annual budgeted amounts do not represent the budget ask from the Department, which has consistently requested funding to maintain a PCI of 70. However due to competing needs throughout the City, Department allocations have remained lower than the request and have not been adequate to fully support needed maintenance and rehabilitation. Consequently, the City street network condition has declined with time.

The funding for maintenance and rehabilitation activities comes from various sources, including Gas Tax, TransNet, Road Maintenance and Rehabilitation Account (RMRA), Street Damage Fee, Debt Financing, and Infrastructure funds. These funding sources, combined with periodic bond financing and borrowing result in variable amounts of budgeted rehabilitation activity funding.

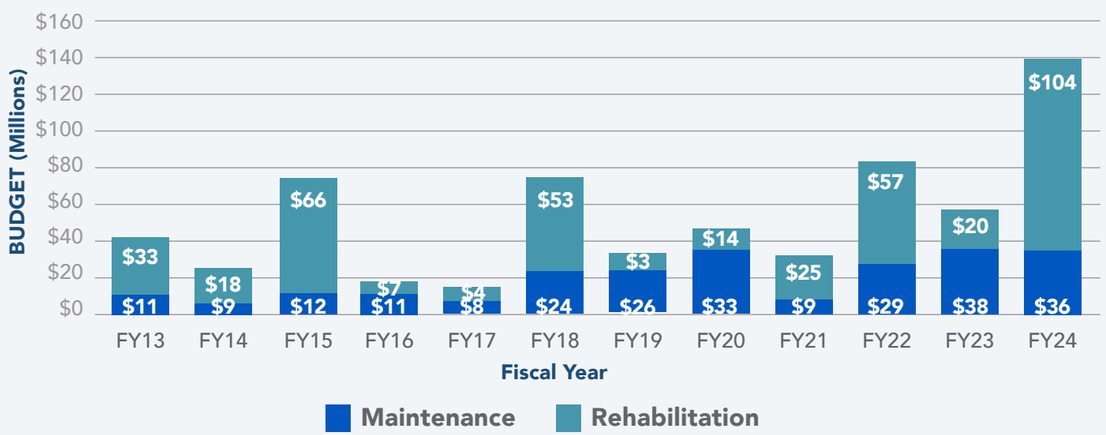



***Figure 3-1.*** *Budgeted Funding Amounts for Pavement Maintenance and Rehabilitation FY13- FY24*
*Financing was received in FY15, FY18, FY22, and FY24 and was meant to support the program over multiple fiscal years.*





## Transportation Infrastructure Funding Sources

**RMRA** - Senate Bill (SB) 1 (2017) created the Street Maintenance and Rehabilitation Program (RMRP) to address deferred maintenance on the State Highway System and the local street and street system. The Road Maintenance and Rehabilitation Account (RMRA) is the mechanism used by the City for the deposit of various funds for the program and is used for basic street maintenance, rehabilitation, and critical safety projects on the local streets and streets system.

**TransNet** - Local, ½ cent gasoline sales tax originally approved by San Diego County voters in 1987 and extended to 2048 in November 2004. TransNet is dedicated to specific transportation improvement projects and is administered by the San Diego Association of Governments (SANDAG).

**Gas Tax** - State gasoline tax, originally approved in 1923, generated through an ~$0.58 excise tax on the sale of gasoline to improve the state's streets, traffic safety, and public transit systems.

**Street Damage Fee** - Local City funding source derived from the Street Preservation Ordinance adopted in 2013. Fee applied to entities performing excavation in the City right of way to recover maintenance and additional rehabilitation costs incurred by the City.

**Infrastructure Fund** - The Infrastructure Fund was established by the City Charter, Article VII, Section 77.1 to be a dedicated source of revenue to fund General Fund infrastructure costs.

**Debt Financing** - Bond financing used to support General Fund asset street improvements through the issuance of Lease Revenue Bonds. The Commercial Paper Notes program is used as an interim source until Lease Revenue Bonds are issued to pay off the notes.

Current (FY24) and projected (FY25) maintenance activity funding is primarily RMRA funds (Figure 3-2). Rehabilitation activity funding for the same period includes a combination of TransNet, Gas Tax, and Street Damage Fee sources. The Department also actively looks to identify and secure grant funding for projects that meet grant funding agency criteria.

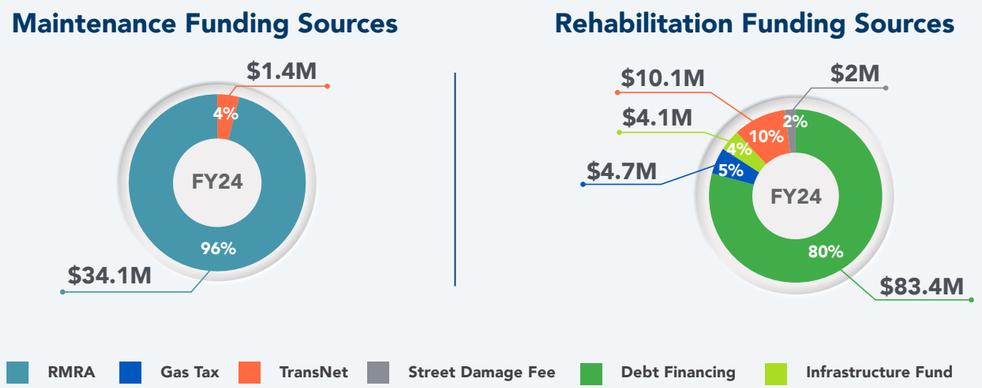



***Figure 3-2.*** *Street Resurfacing Program Funding Sources*

## 3.2 Benchmarking Municipal Funding Sources

Comparable municipal agencies that have achieved an average street network PCI 70 or above were benchmarked as part of this PMP. In general, the benchmarked agencies typically have guaranteed funding sources to support street maintenance and rehabilitation activity implementation. Most agencies, whether they had achieved a PCI of 70 or not, rely on tax revenue. Examination of agency-specific funding provides insight to various funding sources applied to transportation network maintenance and repair activities throughout the state.

Evaluation of street maintenance program funding sources indicates trends for the benchmarked municipalities. **Long Beach** relies on local sales tax revenue through local proposition 'Measure A' funds, gasoline taxes, and state and federal government contributions. **Los Angeles County** utilizes funding from the county general fund, a dedicated gasoline tax fund, and funds from local Proposition A, emphasizing local transit and transportation. **Sacramento** accesses multiple funding channels, including state RMRA and Gasoline Tax funds, alongside federal, state, and local sources, complemented by local sales tax revenue through Measure A. **San Jose** utilizes general fund but also considers potential gas tax revenue from local or state contributions. Each municipality combines various revenue sources to support essential street maintenance programs.

The variety in funding sources is emblematic of each municipality's commitment to balancing financial sustainability and the long-term health of its street networks. By effectively leveraging these diverse financial channels, cities can execute pavement management plans that enhance street quality and contribute to the overall well-being of their communities, fostering safer transportation and economic stability.

## 3.3 Funding Scenario Overview

The Department examined a diverse suite of future funding scenario options to address deteriorating City street infrastructure using the Cartegraph asset management system. Cartegraph allows for user-defined funding and prioritization criteria to set the basis for long-term funding scenarios. Cartegraph can then generate information on annual funding need, maintenance and rehabilitation repair mileage, ending PCI score, and other key attributes that allow the Department to evaluate the relative financial and infrastructure impact of each scenario.

The funding scenario options evaluated by the Department include street selection approaches based on best value (funding streets at optimum PCI conditions to maximize cost-efficiency of treatment type), worst streets first (funding streets in the worst condition first, ahead of funding streets in better condition with lower cost treatment methods), and most people impacted (funding streets with high Average Daily Traffic (ADT) volume first, ahead of funding streets with lower ADT) assumptions. The Department's comprehensive assessment approach appraised the short- and long-terms costs, street network improvement impact and timing, and operations considerations for each of the various evaluated funding scenario options.

**Table 3-1. Cartegraph Activity Cost Assumptions**

| Activity | Cost (per square foot) |
|---|---|
| AC - Surface Treatment (RPMS) | $1.18 |
| AC - Cape Seal (new) | $1.65 |
| AC - Scrub Seal (new) | $1.84 |
| AC - AC Overlay | $8.82 |
| AC - Reconstruct - Full | $34.00 |
| PCC - Reconstruct - Full | $50.00 |

Cartegraph-generated funding scenarios include a suite of unit rate and cost assumptions used to develop cost per unit area estimates for maintenance and rehabilitation activities and annual funding need projections (Table 3-1). Cost and unit rates assumptions were based both on recent bid documents for maintenance and rehabilitation activities projects in both the City and from the City of Santee (Santee). For some activity types, only Santee bid documents were available. City costs for these activities were scaled based on the ratios between rates for activities in use with Santee. A 3% inflation rate is applied year-over-year in Cartegraph to generate the scenarios.





### Street Selection Approach Option Summary

| Street Selection Approach | Pros | Cons |
|---|---|---|
| Best Value (Recommended Approach) | ▶ Prioritizes streets before treatment cost increases<br>▶ Lowest investment for highest PCI | ▶ Streets in better condition are often selected first and are not perceived as the streets that need it first |
| Worst Streets First | ▶ Prioritizes streets in worst condition that are perceived as the streets that need maintenance and rehabilitation the most | ▶ Most expensive streets addressed first, leaving limited/no funding for rest of street network<br>▶ Small percentage of street network improved |
| Most People Impacted (ADT) | ▶ Prioritizes more frequently traveled streets | ▶ More frequently traveled streets are in worse condition and are more expensive to maintain<br>▶ Smaller percentage of street network improved |

The best value, worst streets first, and most people impacted approach scenario analyses included both 5- and 10-year implementation timelines. Additionally, scenario options included fixed annual investment ($100M, $200M, $300M, and $400M per year) and variable annual investment targeted at achievement of a street network average of 70 PCI citywide in 5- or 10-years were also considered (Table 3-2).

**Table 3-2. Funding Scenario/Implementation Year Options Evaluated For Each Street Selection Approach**

| Scenario[1] | Years |
|---|---|
| $100M Annual Investment | 5 |
| | 10 |
| $200M Annual Investment | 5 |
| | 10 |
| $300M Annual Investment | 5 |
| | 10 |
| $400M Annual Investment | 5 |
| | 10 |
| Network PCI of 70 | 5 |
| | 10 |

[1]Indicated annual investment amounts are total annual amount and include dedicated funding sources (e.g. RMRA, Gas Tax, TransNet, etc.).

**A diversity of street selection options are available to address San Diego's street needs. The Department selected to evaluate scenarios based on best value, worst streets first, and most people impacted approaches at fixed annual investments ($100M, $200M, $300M, and $400M per year) as well as variable annual investments to target a PCI 70 score citywide in 5- or 10-years.**

## 3.3.1 Current Funding Scenario

In FY24, the City allocated $35.6M and $104.3M for street maintenance and rehabilitation, respectively. Latest five-year outlook projections indicate much lower dedicated funding source allocations for FY25-FY29. Average annual dedicated allocations in these years are $43.1M for maintenance and $16.1M for rehabilitation project types. These dedicated funding amounts are projections from RMRA, Gas Tax Fund, TransNet Fund, and Street Damage Fee funding sources.

**Current known funding is not sufficient for the Department to adequately operate, maintain, and protect the City's street infrastructure assets.**

Additionally in FY30 – FY34, fixed annual allocations for maintenance ($45.1M) and rehabilitation ($24.7M) are assumed for RMRA, Gas Tax Fund, TransNet Fund, and Street Damage Fee funding sources given uncertainty in projections beyond FY29. This projected funding pattern is predicted to lower the City average street network PCI to 45 (Poor) by the end of FY34 (Figure 3-3). Given projected maintenance and rehabilitation needs for City local and arterial street networks based on the 2023 PCI measurements, historic, current, and projected program funding levels are not adequate to meet the City's key objectives to acheive an average street network PCI score of 70 by FY34. **Funding at current projected amounts is predicted to lower the City average street network PCI score to 54 (Poor) in the next five years when projected RMRA, Gas Tax Fund, TransNet Fund, and Street Damage Fee funding sources are more certain (FY29) and to 45 (Poor) by FY34.**

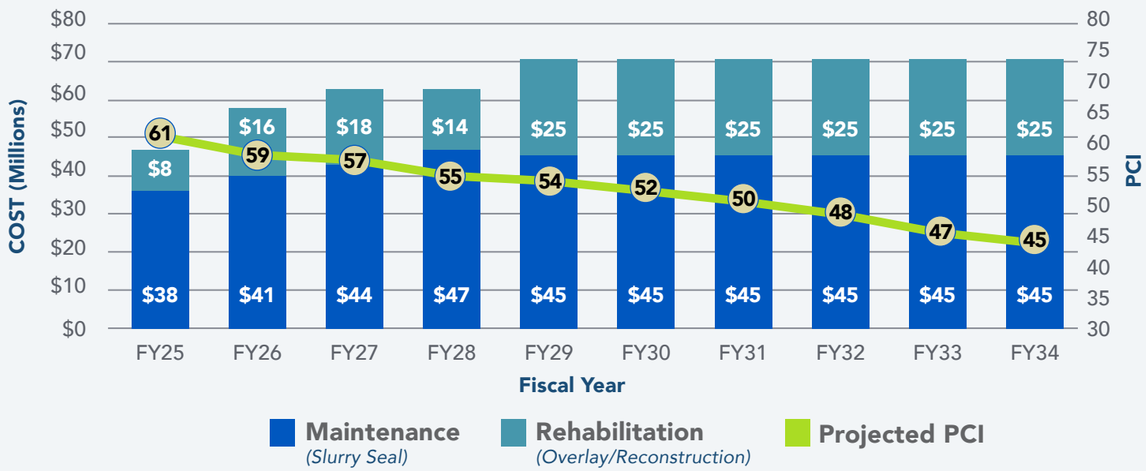



***Figure 3-3.*** *Current Funding Scenario and Projected Funding Based On Current Allocation*



## 3.3.2 Future Funding Scenario Assessment

Scenario analyses for best value, worst streets first, and most people impacted approaches using incremental fixed annual $100M investments ($100M to $400M per year) and variable annual investments were used to provide insight to the costs and benefits of future funding options. A primary goal to achieve of an average PCI 70 score for the City's street network over a 5- to 10-year implementation period guided evaluation of the assessed scenarios.

**Worst first approach scenarios did not achieve the PCI 70 target, with high ($300M-$400M) fixed annual investments for 5 or even 10 years (Table 3-3)**. The worst first approach defers maintenance on streets in good or satisfactory condition and ultimately the citywide average PCI drops to low- end Fair condition at best under fixed annual investment levels. The worst streets first approach with variable annual investment could achieve PCI 70 in 5-years but requires a $1.3B average annual and ~$6.7B total investment compared to the best value scenario (Table 3-4).

Similarly, **the most people impacted approach evaluated at fixed investments ($100M-$400M/yr) is not sufficient to overcome the cost of deferred maintenance and PCI decreases over time**. The most people impacted approach can achieve PCI of 70 in 8 years with high variable annual ($600M) and total ($3.8B) investments (Table 3-5).

**The best value approach implementation scenarios at higher fixed annual investment levels provide the best opportunities for achievement of PCI 70 within 5- to 10-year timeframes. The $300M/yr scenario allows for PCI 70 to be reached in 4 years with a total investment of $1.2B**. The average annual repair mileage improved in the first four years to achieve PCI 70 is 557 miles at this level of investment (Table 3-6).

**The $400M/yr 10-Year scenario allows for PCI 73 to be reached in 2 years with a total investment of $800M (Table 3-6)**. This scenario and level of investment repairs over 2,000 miles of street in the first two years. The $100M/yr and $200M/yr fixed annual investment scenarios that do not provide sufficient funding to mitigate previous deferred maintenance and do not achieve the PCI 70 goal due to ongoing deferred maintenance.

**Table 3-3. Worst First/Most People Impacted Approach Fixed Funding Scenario Outcomes**

| Annual Funding Amount | Duration | Worst First Projected PCI | Most People Impacted Projected PCI |
|---|---|---|---|
| $100M | 5 | 50 | 49 |
| | 10 | 33 | 36 |
| $200M | 5 | 51 | 54 |
| | 10 | 37 | 44 |
| $300M | 5 | 52 | 58 |
| | 10 | 40 | 50 |
| $400M | 5 | 54 | 60 |
| | 10 | 43 | 56 |

**Table 3-4. Worst First Street Selection Approach Variable Funding Scenario Outcomes**

| Duration | Average Annual Investment | Total Investment to PCI 70 |
|---|---|---|
| 5 | $1.3B | $6.7B |
| 10* | $1.3B | $10.2B |

*PCI of 70 is achieved in 8 years

**Table 3-5. Most People Impacted Street Selection Approach Variable Funding Scenario Outcomes**

| Duration | Average Annual Investment | Total Investment to PCI 70 |
|---|---|---|
| 5 | $600M | $3.0B |
| 10* | $478M | $3.8B |

*PCI of 70 is achieved in 8 years

Applying the best value approach with variable annual funding within 5-Year and 10-Year scenarios can achieve 70 PCI in 5 to 8 years, depending on the level and consistency of initial investments (Table 3-6). **The 5-Year scenario achieves PCI 70 in the fifth year, with an average annual investment of $277M and $1.4B total investment**. Average annual repair mileage for this scenario is 470 miles. **The 10-Year scenario achieves and maintains PCI 70 with an annual average of $188M/year and total investment of $1.9B. For this scenario, PCI 70 is achieved in year eight with a total investment of $1.7B.** Average annual lane mileage for this scenario is 760 miles.

Large, consistent annual investment scenarios of $300M/yr and $400M/yr achieve PCI 70 faster, with smaller total investment. However, these large annual investments present operational capacity challenges and present unrealistic annual repair mileage targets. Reduced annual investments $188M-$277M average annual investment over the 5- or 10-Year period can achieve PCI 70 over time. Repair mileage targets for these scenarios will require ramp-up of City forces to meet operational maintenance and rehabilitation activity needs, but are more operationally feasible compared to the $300M and $400M annual investment scenarios.

**Table 3-6. Summary of Best Value Street Selection Approach Scenarios That Achieve PCI of 70**

| Scenario (Best Value) | Years to Achieve PCI 70 | Average Annual Investment for PCI 70 | Total Investment for PCI 70 | Average Annual Lane Mileage for PCI 70 | Key Details |
|---|---|---|---|---|---|
| $400M/Year Annual Investment | 2 | $400M | $800M | 1023 | Shortest time to PCI 70<br><br>Lowest investment to PCI 70<br><br>Potential personnel and resource limitations to achieve annual mileage needs |
| $300M/Year Annual Investment | 4 | $300M | $1.2B | 875 | PCI of 70 achieved in 4 years<br><br>Average annual mileage requires ramp-up of City forces and contractor resources |
| 70 PCI Over 5 Years | 5 | $277M | $1.4B | 887 | PCI of 70 achieved in five-years<br><br>Average annual mileage requires ramp-up of City forces and contractor resources |
| 70 PCI Over 10 Years | 8 | $188M | $1.7B | 760 | Lowest average annual investment<br><br>10-Year Cartegraph asset management scenario achieves PCI 70 in year eight<br><br>Average annual mileage requires ramp up of City forces and contractor resources |

**Significant annual funding (>$180M/yr), applied to a best value investment approach is needed to cost-effectively achieve the City's street network condition goal of PCI 70. Annual investments of $300M/yr and $400M/yr can rapidly improve the overall street network but were determined to be unrealistic in the current economic climate and existing resources limit the operational capacity to implement commensurate maintenance and rehabilitation projects.**





## 3.4 Recommended Funding Strategy

The recommended funding strategy is the Best Value Approach to achieve a PCI of 70 over 10 years. This scenario requires $188M average annual and $1.9B total investment. In this scenario, PCI 70 is achieved in year eight with a total investment of $1.7B. The approach provides operational feasibility with ramp-up of City forces to accomplish the ~760 lane miles/yr of street repair, while also steadily increasing the PCI annually by one point (figure 3-4). The proposed FY25 Department budget includes $60M for street maintenance and $168M for rehabilitation activities. Remaining funding needs to achieve PCI 70 (FY26- FY33) require $188M average annual and $1.9B total investment. The recommended funding scenario represents the most efficient use of funds to achieve a PCI of 70 based on available information. If additional funding is available in years 6 through 10, the Department will perform analyses to assess and apply rehabilitation activities in order to cost-effectively address street needs.

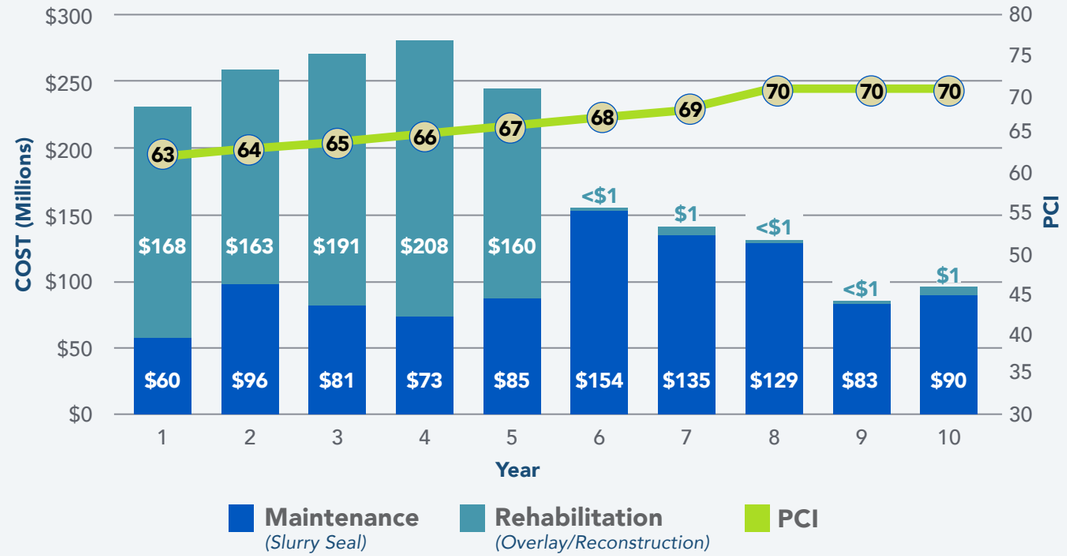



***Figure 3-4.*** *Recommended Funding Scenario- Best Value 10-Year PCI 70*

**The recommended funding strategy is the Best Value Approach PCI 70 10-Year Implementation scenario. This approach achieves PCI 70 in 8 years with $188M average annual investment and $1.9B total investment. Ramp-up of City forces is needed to accomplish the 760 annual average lane miles target.**

The Best Value Approach PCI 70 10-Year Implementation scenario funding (Table 3-7) maintenance investment is <$100M for the first five years. In the latter five-year period, maintenance investment ramps up for years 6-8 and then lessens in the final two years of the scenario.

**Table 3-7. Funding Summary - Best Value Approach PCI 70 10-Year Implementation Scenario**

| Year | Maintenance Funding Need | Rehabilitation Funding Need | Total Investment Need | Projected Funding Gap* | Lane Miles Addressed Target |
|---|---|---|---|---|---|
| 1 | $60M | $168M | $228M | $182M | 608 |
| 2 | $96M | 163M | $259M | $201M | 816 |
| 3 | $81M | $191M | $272M | $211M | 705 |
| 4 | $73M | $208M | $281M | $219M | 643 |
| 5 | $85M | $160M | $245M | $175M | 692 |
| 6 | $154M | $- | $154M | $84M | 1098 |
| 7 | $135M | $1M | $136M | $65M | 952 |
| 8 | $129M | $- | $129M | $59M | 904 |
| 9 | $83M | $- | $83M | $14M | 571 |
| 10 | $90M | $1M | $91M | $21M | 615 |
| **Total** | **$986M** | **$891M** | **$1.9B** | **$1.2B** | **7,603** |

**The Projected Funding Gap was updated in February 2024 to reflect a funding gap of $1.2B. The previously reported funding gap of $1.1B was incorrectly calculated in Years 6-10*

This recommended approach is an ideal funding scenario intended to provide the City an understanding of the funding amount needed to achieve a PCI of 70 over the next 10 years. The recommended 10-Year scenario achieves PCI 70 in year eight. It does not consider paving that will occur as part of private projects or as part of other City Department projects. This assessment is based on known and/or assumed funding amounts and is subject to change. As additional funding amount information becomes available, the Department will update the scenario to re-assess funding needs to achieve a PCI of 70 within the next 10 years.

## Unimproved Streets and Alleys Funding

The Department is requesting a separate dedicated funding for improvement of unimproved roads starting in FY25. A unique prioritization process has been developed in FY24 to prioritize unimproved roads for funding that considers pavement condition, number of people impacted, safety, impacted serviced, including street sweeping and trash collection, and proximity to location within a census tract that is deemed eligible for CDBG funds, in a Promise Zone, or located in a Community of Concern identified per the Climate Equity Index (very low, low, or moderate access to opportunity). Given the significant costs associated with rehabilitation for unimproved roads but also recognizing the importance of providing equitable services City-wide, one strategy is to fund improvement of two unpaved unimproved streets and alleys per year at approximately $4.3M annually, which results in all 17 miles of unpaved unimproved streets and alleys being improved within 85 years. Other funding options to improve the 17 miles of unpaved unimproved streets and alleys are presented in Table 3-8.

**Table 3-8. Unpaved Unimproved Streets and Alleys Scenarios**

| Scenario | FY25 Investment | Costs Through FY29 | Total Cost[1] | Years to Complete |
|---|---|---|---|---|
| 0.1 Miles/Year | $2.2M | $11.4M | $10.9B | 170 |
| 0.2 Miles/Year | $4.3M | $22.9M | $1.12B | 85 |
| 0.3 Miles/Year | $6.5M | $34.3M | $928M | 57 |
| 0.4 Miles/Year | $8.6M | $45.7M | $716M | 43 |
| 0.5 Miles/Year | $10.8M | $57.2M | $617M | 34 |

[1] Total cost assumes 3% annual inflation





## 3.5 Consequences of Underfunding

The consequences of underfunding are severe. 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 (Figure 3-5)**.

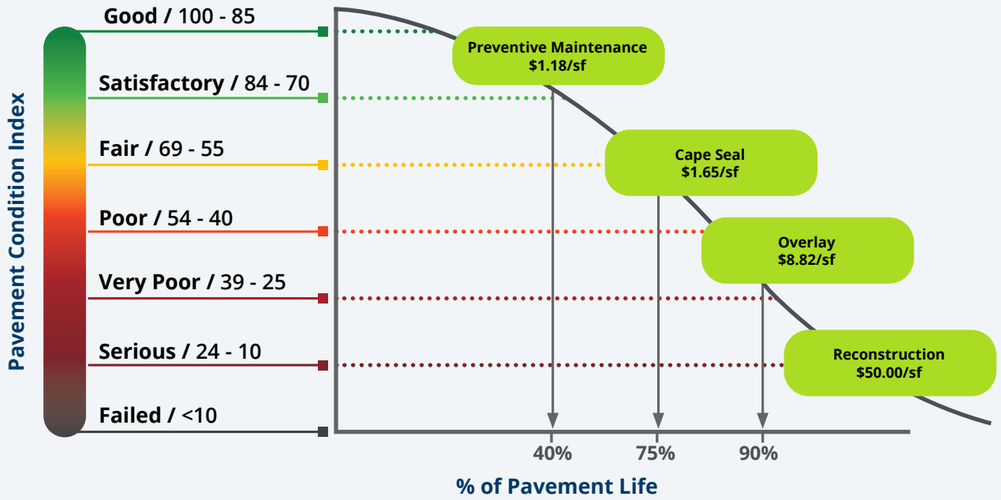



***Figure 3-5.*** *Cost Ranges For Street Repairs Appropriate For Various PCI Categories*

Investment in proactive maintenance and/or repair of streets in good condition can extend street asset lifetime and reduce long-term costs. **Streets that are proactively maintained and/or repaired while in good condition will generally have an extended lifetime and will cost less over their lifetime than those left to deteriorate to a poor condition.** Also, deferred maintenance leads to ancillary issues associated with deteriorated conditions. Degraded conditions and cracks can lead to increased City liabilities over time.

**Sufficient funding applied proactively extends City street asset lifecycles and reduces long-term costs. Inadequate funding leaves streets to deteriorate leading to long-term deferred maintenance costs and increasing City liabilities.**

The importance of proactive pavement management funding cannot be overstated. Tactical street maintenance, repairs, and other street enhancements create safer streets and more enjoyable and equitable conditions for drivers, bicyclists, and pedestrians. Finally, underfunding leads to long-term deferred maintenance costs that impact current and future City residents for decades to come.

## 3.6 Complementary Funding and Partnership Opportunities

A central pillar to the effective execution of the PMP lies in securing adequate funding. A well-maintained street network is vital for the prosperity and mobility of the City. To increase funding for street network improvements, various funding augmentation and partnership opportunities are available to support City goals to achieve a PCI 70 target.

**Complementary funding and partnerships present options to augment street maintenance and repair budgets and reduce City costs.**

**New Revenue Stream Creation**. New revenue may be generated by voter-approval of a ballot initiative to formally increase and/or provide dedicated funding for pavement maintenance and rehabilitation. Outreach to inform and educate the public of the importance of this need is critical to the potential successful of this approach.

**Coordinate with other City Departments to combine projects**. The Department should continue to coordinate with the ECP to identify cost savings for paving streets in the 5-year priority list via other City Department utility improvement projects. These projects will be required to pave a larger influence area as part of the updated Street Preservation Ordinance, and it is anticipated the cost of paving the remaining delta will be less costly to the Department.

**Additional Grant Funding**. Recent grant funding pursuit coordination efforts within the office of the City Chief Operating Officer support future infrastructure improvement program efforts to obtain federal, state, or local grants to fund pavement repairs. Examples include projects supporting Active Transportation that promote street diets and traffic calming, which in turn support concurrent maintenance and pavement repair activities.

**Public-Private Partnerships (PPPs)**. Public-private partnerships provide opportunities for directed private entity investments for street maintenance and rehabilitation in exchange for long-term benefits such as revenue generated from advertising or other income-generating activities.

**Collaborate with SANDAG, CALTRANS, or adjacent Cities**. Collaborative project efforts with state, regional, and/or local transportation agency partners may allow the City to coordinate efforts and leverage additional funding sources and/or cooperative bargaining for street maintenance and repair activities or materials.

# 4. Pavement Management Plan Implementation & Considerations

The Department has identified a strategy to achieve an overall street network PCI of 70 by 2034, which will require significant, consistent annual investments over the next decade, and a commitment from the City to dedicate funding and resources to pavement maintenance and rehabilitation. Implementation of this plan will require a ramp-up in City forces, collaboration with local contractors and suppliers, and proactive planning to ensure these goals are met on an annual basis. The following section discusses the necessary steps to execute this PMP, and identifies the challenges to implementation, what is needed to prepare for additional funding, and potential options to realize efficiencies. This section also summarizes an evaluation of the Department's capacity to conduct pavement maintenance and rehabilitation efforts in-house, identifying the funding and resource needs that would be required to reduce reliance on contractors.

**This plan provides a clear strategy to improve the street network PCI to 70 over the next 10 years. More funding and repair mileage is needed than ever before and the City will require significant ramp-up of staffing to implement.**

## 4.1 Five-Year Paving Plan

The Department has developed the 5-Year Paving Plan (FY25 - FY29) using the results of this PMP. Streets were selected using the best value street selection approach to reach a PCI of 70 by year FY34. The Department has posted their five-year plan on Streets SD. Streets selected for paving are subject to change once known funding amounts for the five-year period are determined. As a result, the five-year plan will be updated annually once budget for the following fiscal year is known.

Over the next five years, the projects outlined in the five-year paving plan may face delays or cancellations due to a variety of factors, necessitating frequent updates and revisions to the plan. One significant reason for the cancellation of projects is the lack of full funding for a plan year. Projects require substantial investment, and if the anticipated funding is not fully secured, it could lead to the cancellation of scheduled work.

Another reason for project cancellation is the occurrence of conflicts with other projects impacting the same street segments. In densely populated and active urban areas like San Diego, it's common for multiple infrastructure projects to be planned concurrently. If a street is scheduled for excavation for utility work, or is part of a broader urban development project, it may render pavement works on that street redundant or unfeasible, leading to their cancellation.

**Five-Year Paving Plan – What Can be Done**

**Several key factors need to be considered including resources needed to plan, design, and implement street improvement projects and contractor and supplier abilities to address the increased number of projects.**

Moreover, projects may be delayed due to factors such as inclement weather, contracting delays, and supply chain issues. Weather conditions, especially during San Diego's rainy and winter seasons, can significantly impact the feasibility and timing of pavement works. Delays in the contracting process, which can include bidding, negotiations, and finalizing contracts, also contribute to project postponements. Additionally, supply chain issues can lead to delays in receiving necessary materials for projects. These supply chain challenges can be caused by trade disruptions, logistical bottlenecks, or scarcity of raw materials, all of which directly impact the timeline of pavement works. Together, these factors necessitate a flexible and adaptive approach to planning and executing pavement projects over the next five years.

## 4.2 Preparing for Additional Funding

Implementing the mileage goals needed to achieve a PCI of 70 will require significant ramp-up of City forces, contractors, and material suppliers to implement. Should the Department receive full funding for its pavement maintenance and rehabilitation needs, the Department would still face several key challenges for successful implementation. Both contractor and City capacity act as limiting factors. Several key factors need to be considered including resources needed to plan, design, and implement street improvement projects and contractor and supplier abilities to address the increased number of projects.





The repair mileage projections to meet a PCI of 70 in 10 years are nearly double the City's average for the past 10 years.

The following challenges are anticipated:

- Not enough contractors and subcontractors bidding on projects - The Department is working the Purchasing & Contracting Department to review our contract requirements and is hosting more industry workshops
- Lack of staffing resources to plan and design projects - Limited resources delay the implementation of projects.
- Shortage of aggregate and asphalt materials - Limited supplies in the region make it challenging for projects to be delivered in a timely manner.

**Preparing for More Funding:**

- Regional Contractor Capabilities and Capacity: Communicate the five-year Paving Plan to contractors early, so they can plan ahead and build up equipment and staffing resources
- Resources to Plan and Design: Budget requests for additional in-house staffing and resources that will enable the Department to manage double the mileage that the Department has historically completed
- Materials: Coordinate with suppliers in the region to ensure that materials will be readily available for paving projects when needed and identify redundancy

### *4.2.1 Regional Contractor Availability*

The availability of contractors to implement pavement projects at the scale projected in this PMP is a potential implementation challenge. The first challenge is the limited availability and capacity of local contractors. With a shortage of contractors in the local area and an increase in projects to complete the City's goals, the City must evaluate other options for maintenance repair projects. Recent bid results for overlay and slurry seal projects were reviewed to evaluate trends in bidding that may inform contractor availability. This review showed that only two to three contractors are bidding on slurry seal projects, and three to seven on asphalt overlay projects, highlighting a shortage that complicates efforts to achieve efficient pavement maintenance within city limits. Bonding capacity and bonding requirements may also impact local contractors' availability to bid on projects, as there are typically caps to the value of bonds. Other contract requirements such as insurance requirements, Small Local Business Enterprises/Emerging Local Business Enterprises (SLBE/ELBEs) may also dicourage potential contractors from bidding, further reducing the number of available contractors.

In general, the Southern California region is currently facing a skilled labor shortage in the field of road maintenance, particularly for projects involving slurry seal, scrub seal, and cape seal. These specific techniques are essential for preserving and extending the life of streets, but the scarcity of trained professionals capable of executing these tasks is causing delays and challenges. The shortage is impacting the ability to maintain roads at

an optimal level, leading to potential increases in repair costs and disruptions in maintenance schedules.

**In order to mitigate challenges associated with contractor availability, the City is taking several steps to increase regional capacity.** These measures include holding industry workshops with local contractors to improve the procurement and contract process. The Department is working to potentially re-evaluate the sizes of contracts for pavement maintenance and rehabilitation projects in order to attract and increase bidders.

Contractor availability is a region-wide issue, and the Department is working with the City's Purchasing and Contracts Department in order increase contractor availability and increase potential viable bidders.

Department staff are also exploring the feasibility of expanding in-house pavement maintenance and rehabilitation efforts in order to increase regional capacity. The results of evaluation are presented in Section 4.4 and Appendix B.

## 4.2.2 Resources to Implement Paving Projects

Planning, design, implementation, and oversight are critical in the success of pavement repair projects. Insufficient resources to plan for and properly design pavement maintenance and rehabilitation will delay project implementation if plans and contract documents cannot be prepared in a timely manner to procure contractors to perform the work. Furthermore, a lack of planning, design, implementation and oversight resources could lead to costly change orders in the field if site conditions are not identified and planned for proactively. Adequate planning, design, implementation and oversight resources are needed for the Department to ramp-up in preparation for the infusion of funding to the pavement management program. It is estimated that the City would need to add at least 40 engineers to support planning, design, and construction oversight to meet the Department's PMP mileage goals.

The following Departments will require additional needs to ramp-up their programs:

- Transportation – more engineering staff for planning & oversight; more administrative staff to support administrative tasks such as invoice payment
- Engineering & Capital Projects – more engineering staff for planning & oversight
- Purchasing & Contracting – more staff to support additional contracts

Infusion of funding into the pavement management program would also necessitate a substantial ramp-up of resources across various supporting departments within the City. This increase in resources is not limited to the direct workforce handling pavement projects but extends to other crucial departments that will play a supportive role in ensuring the program's success.

Departments like Finance, Human Resources (HR), Personnel, and others involved in the administrative aspects of increased hiring, processing a higher volume of mayoral and council actions, purchase requisitions, and invoice payments will need to expand their staff. The additional workload generated by the pavement management program, such as financial management, procurement processes, and employee administration, will require more personnel to handle these tasks efficiently.





However, the expansion isn't just about increasing the number of staff. These departments will also need to consider additional resources such as equipment and office space to accommodate the increased workforce. This includes investing in computers, software, office furniture, and possibly expanding existing office spaces or acquiring new ones to ensure that the additional staff can work effectively.

## 4.2.3 Pavement Materials

The Department encounters various challenges in securing materials for asphalt maintenance and rehabilitation projects. Asphalt pricing and availability are particularly challenging materials considerations. **Asphalt prices can be influenced by factors such as changes in oil prices, market demand, and geopolitical events, making it challenging for the Department to plan and manage project budgets effectively.** Additionally, supply chain disruptions, which can arise from various issues like transportation delays , may impact the timely delivery of asphalt materials, potentially causing delays in scheduled projects. Finally, asphalt and concrete materials are subject to temperature and curing timing limits. Asphalt is produced in local production plants and delivered via truckload such that it arrives at the project site with a temperature of up to 300 degrees Fahrenheit (°F). Asphalt must then be placed and compacted while it is still hot enough to work. Depending on several factors, the acceptable mix temperature can be as high as 290 °F, or it may be as low as 185 °F. If too much heat is lost prior to compaction, the pavement will be weaker and rougher, and it will not have the aesthetic appeal that it should. Similarly, concrete pouring is often targeted for less than 90 minutes after batching. Accordingly, availability of acceptable source material for City pavement projects is limited to the capacity of local plants able to meet these working requirements. Potential options to address this issue are evaluated as part of the Department's in-house paving assessment (Appendix B).

Each material required for pavement projects has its own set of potential issues that need to be addressed:

- **Emulsions:** Fortunately, there are no significant concerns with the supply of emulsions, which are essential for certain types of pavement treatments.
- **Aggregates (Type 1-3 rock):** There are currently known shortages of aggregates in the region. Aggregates are a fundamental component for most pavement projects, and a shortage can significantly impede the ability to complete projects on time and within budget.


- **Asphalt:** While not a large issue currently, there is an anticipation that asphalt could become a problem. This foresight requires proactive measures to ensure a steady supply as the demand increases with the ramp-up of pavement projects.
- **Stockpiles:** The current lack of sufficient stockpile locations for the required mileage is a significant concern. Contractors may have to share stockpile spaces, which could lead to logistical complications and potential delays in material availability.
- **Plant Capacity:** The region doesn't have enough plants to meet the expected demand. This limitation can lead to bottlenecks in material production, affecting the timely supply of essential pavement materials.

To address these challenges, several options could be considered:

- **Evaluating More Recycled Materials:** Particularly for aggregates, exploring the use of recycled materials can alleviate some of the supply pressure. Working with local agencies to increase the supply of recycled aggregates can be a sustainable and cost-effective solution.

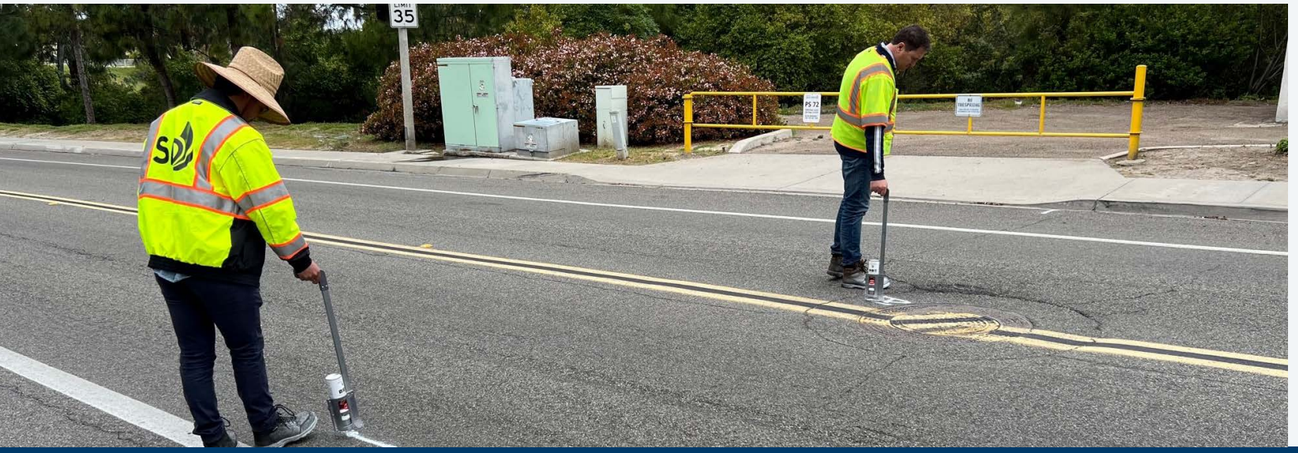
- **Identifying Additional Stockpile Locations:** Expanding the number of stockpile locations throughout the city can mitigate the issue of insufficient storage spaces. This would involve identifying potential new sites and ensuring they are strategically located to serve various project sites efficiently.

- **Investing in Plant Expansion:** Encouraging investment in the expansion of existing plants or the establishment of new ones could be a long-term solution to increase production capacity in the region.

- **Diversifying Suppliers:** Relying on a broader base of suppliers can reduce the risk of material shortages. This might involve sourcing materials from outside the region.

Another challenge is the competition for resources within the construction industry. As urban development and infrastructure projects increase, there is a higher demand for construction materials, including asphalt. **This heightened demand can result in increased competition among municipalities and private entities for access to quality asphalt materials**. The Department may face challenges in securing a reliable and sufficient supply to meet the demands of its pavement rehabilitation and maintenance projects. To address these challenges, the Department may need to implement proactive strategies such as diversifying suppliers, establishing long-term contracts, constructing a City-owned asphalt plant, and/or closely monitoring market trends to navigate potential disruptions in the asphalt supply chain.

To proactively address potential challenges arising from material shortages, the Department is undertaking strategic measures to enhance material availability. At a regional scale, collaborative efforts are underway with neighboring municipalities and asphalt suppliers to formulate standardized asphalt mix specifications, with a particular emphasis on RAP. The focus is on promoting the utilization of recycled hot mix asphalt sourced from centralized RAP processing facilities, where asphalt pavements undergo crushing, screening, and stockpiling for subsequent incorporation into asphalt concrete production, cold mix formulations, or utilization as granular or stabilized base material. The establishment of uniform RAP requirements across the region aims to streamline production processes for suppliers, enabling them to generate a singular asphalt mix applicable to all municipalities within the region. This harmonization prevents resource fragmentation, optimizing efficiency and resource utilization in asphalt mix production. As part of the in-house pavement assessment, the Department is








also evaluating the feasibility of purchasing or constructing a City-owned asphalt plant that would strictly service City projects. This is a strategy that has been adopted by the City of St. Paul, Minnesota, and the City of Los Angeles Streets Division, with varying degrees of success, with the main challenges being associated with added facility maintenance and staffing costs.

### 4.2.4 Weather Considerations

The Department will need to re-evaluate the timing, planning, and scheduling of projects, particularly during the rainy and winter seasons. This is necessitated by the unique challenges posed by these seasons, such as increased rainfall and potential storm events, which can significantly impact the feasibility and effectiveness of pavement works like slurry sealing, scrub sealing, and cape sealing. Effective scheduling during these periods is essential to avoid weather-related delays and ensure the durability of the pavement works. Additionally, careful planning is required to minimize disruptions to traffic and local communities. The re-evaluation aims to optimize resource allocation, ensure the safety of workers and the public, and maintain the integrity of the City's road infrastructure despite the adversities of the wetter months.

## 4.3 Options for Efficiencies

The Department can explore several potential options to enhance efficiencies in pavement maintenance and rehabilitation projects:

- **Advanced Planning and Scheduling:** Implementing a proactive approach to project planning and scheduling can contribute significantly to efficiency. The Department is seeking to conduct a comprehensive pavement condition assessment for its street network once every four years, while also creating a rolling five-year pavement maintenance and rehabilitation plan. By anticipating maintenance needs and coordinating projects well in advance, the Department can streamline the procurement of materials, labor, and equipment, reducing the risk of delays and ensuring smoother project execution.

- **Bulk Material Purchasing and Strategic Stockpiling:** Should the Department opt to expand in-house operations, negotiating bulk purchasing agreements with asphalt suppliers can lead to cost savings. Additionally, strategically stockpiling essential materials, such when prices are favorable, can provide a buffer against market fluctuations. This approach helps the Department maintain a stable supply of materials and potentially reduce overall project costs.

- **Training and Skill Development:** Investing in training programs for Department staff and contractors can enhance skills and knowledge related to the latest asphalt technologies and best practices. Well-trained personnel are better equipped to manage projects efficiently and address challenges effectively.

- **Project Bundling:** Bundling pavement maintenance and rehabilitation projects with other public works initiatives in the City offers cost savings through economies of scale, resource allocation optimization, and reduced overall project expenditures. Coordinating pavement rehabilitation with other public works project like sewer, water, drainage and other utility projects streamlines construction timelines, minimizing community disruption through consolidated construction activities. This integrated approach facilitates a comprehensive and sustainable urban development, concurrently addressing diverse infrastructure needs for long-term resilience. This strategy may also address the regional contractor challenges addressed in 4.3.1, where new specialty contractors may be more inclined to team with larger, more capable general contractors that can better meet insurance, bonding and DBE requirements.

- **In-House Paving:** The Department has the capability to perform pavement maintenance and rehabilitation projects in-house if provided the adequate resources, including staff, training, equipment, and materials. An evaluation of the resource needs to enable the Department to perform paving operations in-house is discussed in Section 4.4, and the full assessment is provided in Appendix B.

By combining these strategies the Department can develop a holistic approach to improving the efficiency of asphalt rehabilitation and maintenance projects, ensuring the longevity and resilience of the city's transportation infrastructure.

## 4.4 In-House Paving Assessment

The Department is currently grappling with the challenge of rising contractor costs, coupled with limitations in contractor and material availability, and a shortage of existing staff and equipment needed to meet annual pavement and rehabilitation goals. The exploration of alternative solutions was explored due to escalating costs, a scarcity of paving contractors in the region, and concerns about managing growing work volumes. Various options are under consideration, ranging from a fully in-house approach, including the operation of a city-owned asphalt plant, to a phased transition, each presenting distinct benefits and challenges.

Benchmarking with other municipalities, particularly Los Angeles and St. Paul, MN, showcases successful models of in-house operations and asphalt plant ownership. It's noteworthy that the implementation of cape seal and scrub seal treatments remains unexplored among the surveyed cities. Ongoing challenges, particularly in recruiting and retaining skilled labor, underscore the complexities involved in transitioning to in-house pavement repair and maintenance. The ultimate decision-making process must carefully balance the pursuit of control, cost-effectiveness, and efficiency against the significant upfront investments and ongoing challenges associated with in-house operations.

**The prospect of transitioning paving operations in-house for the Department could achieve cost savings only for AC overlay projects, with an estimated per-mile cost reduction of approximately 9%. However, this shift requires a substantial initial investment totaling approximately $302M**. This financial commitment encompasses acquiring specialized equipment, establishing a new operations yard, and constructing a new asphalt plant to meet the Department's asphalt production needs.

An analysis of in-house costs versus contractor costs for slurry seal, cape seal, and scrub seal indicated that the Department would not achieve any cost savings for these treatment types if performed in-house, with costs being nearly 59% higher than when executed by a contractor.

It is crucial to recognize that beyond the initial capital investment, significant recurring costs are associated with sustaining in-house operations. These include administrative personnel, equipment maintenance, and ongoing maintenance of the newly established operations yard, all contributing to operational expenditures. Careful financial planning and a proactive approach to addressing challenges, such as finding suitable sites, securing permits, and attracting skilled personnel, will be essential in ensuring the long-term success and sustainability of the in-house paving initiative.

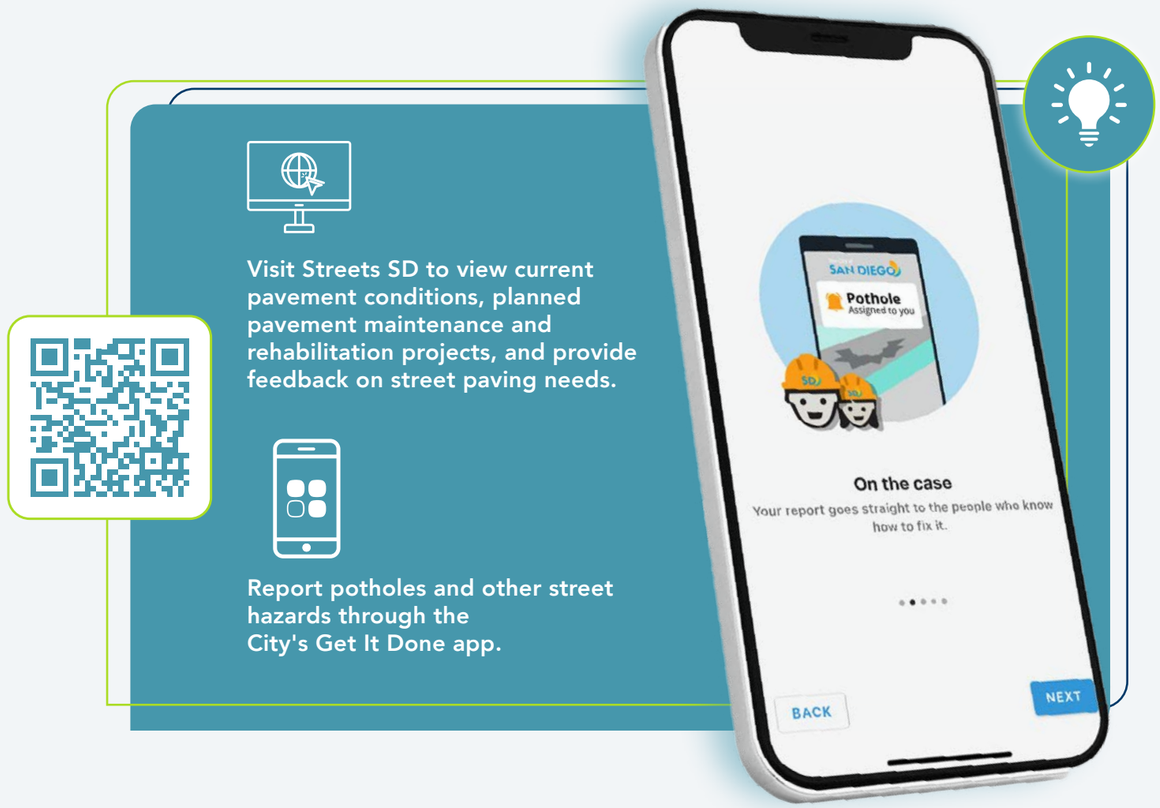
**It is recommended that the Transportation Department expand its capacity by adding two additional mill and overlay teams, enabling the performance of a total of 20 miles of proactive mill and overlay work**. This approach offers a cost-effective alternative to contractor services while aligning with benchmarks set by comparable jurisdictions, such as Dallas and Fort Worth, which achieve approximately 25 miles of in-house mill and overlay. However, considering the limited operational space at the Chollas Yard, it is anticipated that only one additional mill and overlay team can be accommodated, highlighting the need for a new yard to facilitate further expansion. This strategic move is particularly advantageous for addressing "Hot Roads," high-visibility areas requiring immediate attention due to numerous potholes and pavement issues. Establishing dedicated teams to handle these urgent concerns ensures a swift and effective response, enhancing the Department's ability to promptly address critical pavement issues and maintain public satisfaction with the quality of street infrastructure in the City.



# 5. Conclusion

In summary, the City has an extensive street network consisting of over 6,600 lane miles of streets and alleys, making it the second largest network of streets and alleys in the State of California. Overall, the street network is in "Fair" condition with a network PCI of 63, where 34% of streets currently fall into the "Poor", "Very Poor", "Serious" and "Failed" categories. In the last major pavement condition assessment in 2016, the City's street network was reported to have a PCI of 71. Since then, the overall PCI has deteriorated by eight points. Due to the lack of resources and funding, City staff have been challenged with managing pavement from a proactive stance and have slipped into a reactive process. From dedicated resources, the City's street network would drop to a PCI of 54 by FY29, despite the City investing $296M into pavement management repairs and rehabilitation efforts. Through various financial analyses, the City recommends implementing a 10-year funding strategy in which the City's overall street network achieves a "Fair" condition (PCI of 70 or higher) by investing a total of **$1.9 billion** for the 10-year period. In this scenario PCI 70 is achieved in year eight and then maintained for years nine and 10. While this strategy requires a higher average annual investment compared to previous years, it provides more of a realistic timeline for the City to ramp up resources and secure the necessary funding for successful implementation.

Investing in the City's street network provides safe and efficient travel for bicyclists, pedestrians, and motorists, when used with due care. While the City is searching for different avenues to shift towards a proactive approach, such as assessing the feasibility of implementing an in-house paving team, the public is encouraged to do their part as well. This can be done by reporting potholes and other street hazards through the City's Get It Done app. This multi-faceted approach demonstrates the City's commit ment to engaging residents, fostering collaboration, and pursuing adequate funding to elevate the overall quality of San Diego's street network. San Diego is at work and invites you to join in helping keep San Diego streets safe for all.




# Appendix

## A – Council District Maps

*Condition tables in Council District Maps 1-9 were updated in February 2024*

## B – In-House Paving Assessment

## C – Five-Year Plan Street List

## D – References

The City of SAN DIEGO
SAN DIEGO AT WORK

## ROAD NETWORK INVENTORY IN COUNCIL DISTRICTS CITYWIDE

The 6,613 lane miles of roadway in the City are at an average network Pavement Condition Index of Fair (63 out of 100).

**Total Lane Miles in Citywide Districts**

**6,613**

| Prime Roads (%) | Major Roads (%) |
|---|---|
| 6% | 15% |
| **Collector Roads (%)** | **Local Roads (%)** |
| 12% | 5% |
| **Residential Roads (%)** | **Alley (%)** |
| 52% | 8% |

**Unimproved Roads (%)**

**0.12%**

Other roadway types part of the City's network not shown include: Bike Paths and walkways

## PAVEMENT CONDITION IN COUNCIL DISTRICTS CITYWIDE

Significant annual >$250M/yr funding for the first five years of a 10-year stategy, applied to a best value investment approach is needed to cost-effectively achieve the City's goal of a roadway network condition PCI score of 70. This approach strategy 'front-loads' rehabilitation investments ($178M/yr average in the first five years) with additional $79M/yr average investment for maintenance and then converts to primarily maintenance-focused investment ($118M/yr average in the last 5 years). This selected budget strategy for tactical street maintenance, repairs, and other street enhancements creates safer streets, when used with due care, and more enjoyable and equitable conditions for drivers, bicyclists, and pedestrians.

## HISTORY OF PAVEMENT MANAGEMENT IN COUNCIL DISTRICT 1

| PCI in 2016 | Total Repair Miles Since 2016 |
|---|---|
| 71 | 2021 |

**Total Overlay Repair Miles Since 2016**

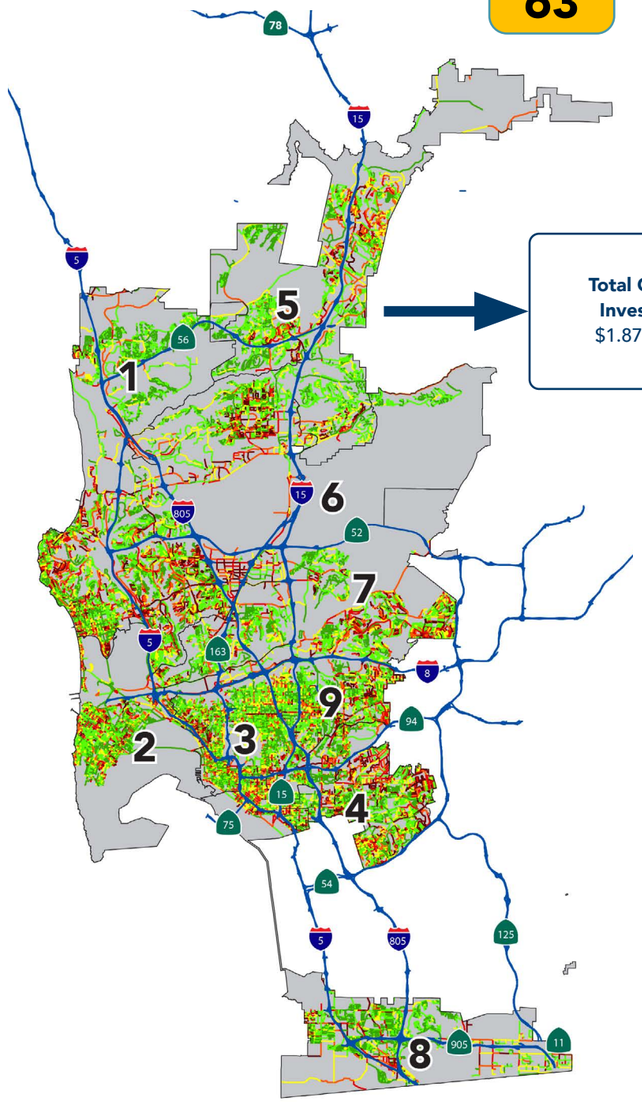
**521**

**Total Slurry Seal Repair Miles Since 2016**

**1500**

### FY24 Conditions

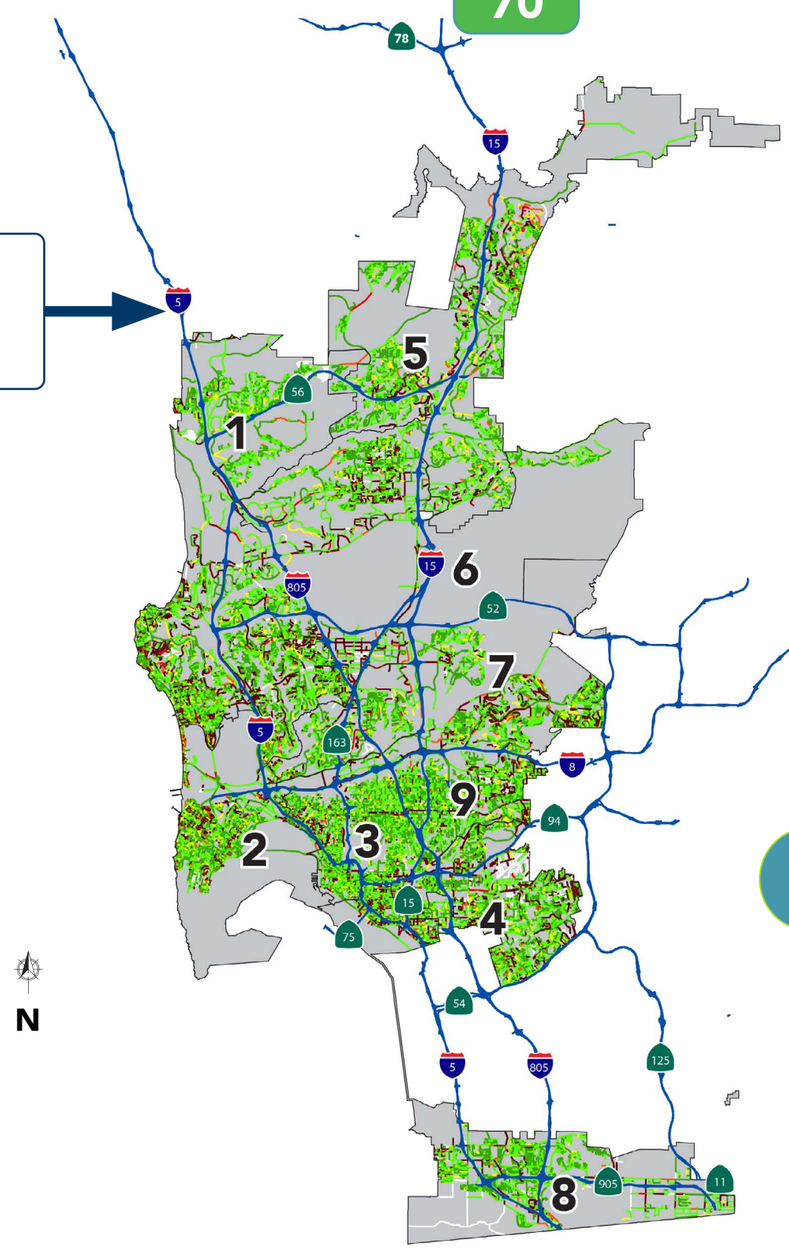
Average Pavement Condition Index: **63**




**Total Citywide Investment:**
$1.877 Billion

### FY34 Conditions (Pending Funding)

Average Pavement Condition Index: **70**




N

| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |
| FY24 Condition | 20% | 32% | 17% | 12% | 10% | 6.7% | 2.0% |

| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |
| FY34 Condition (Pending Funding) | 48% | 32% | 1.9% | 0.2% | 0.2% | 0.1% | 18% |

**Current projected street maintenance and rehabilitation funding allocations will lower the City average roadway network PCI to 45 (Poor) by the end of FY 2034**. In FY 2024, the City allocated $35.6M and $104.3M for roadway maintenance and rehabilitation, respectively. Latest five-year outlook projections indicate much lower allocations for FY 2025-FY 2029, based on known funding sources. **Projected program funding levels are not adequate to meet the City's key objectives to achieve an average roadway network PCI score of 70 by FY34.**

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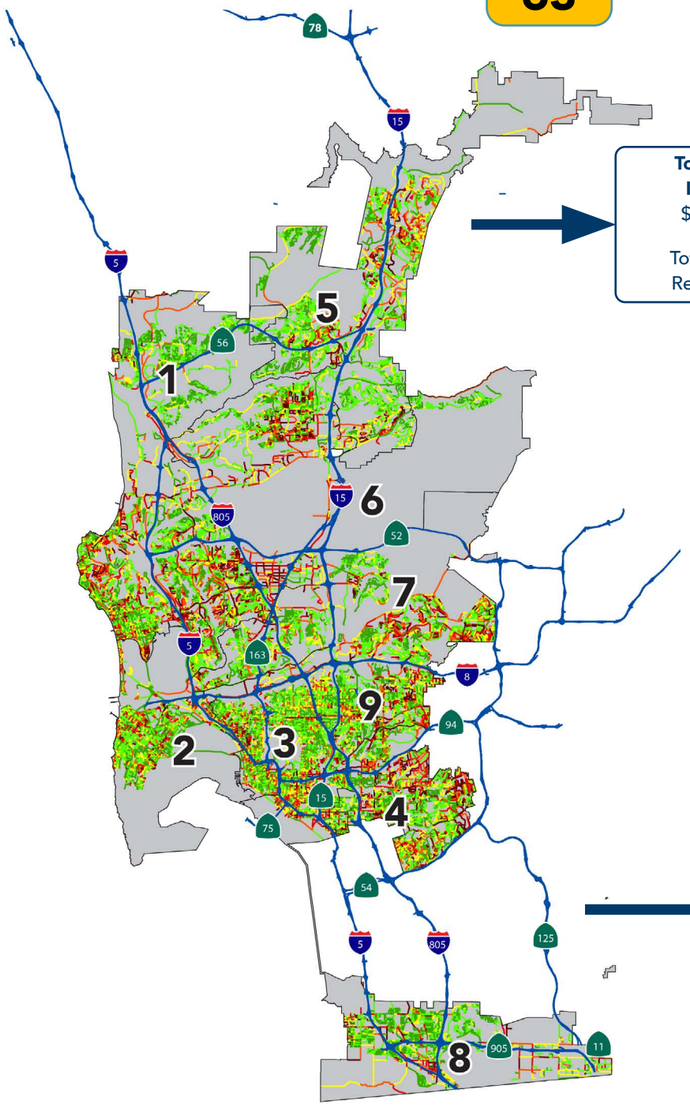
## FY24 Conditions

Average Pavement Condition Index
**63**

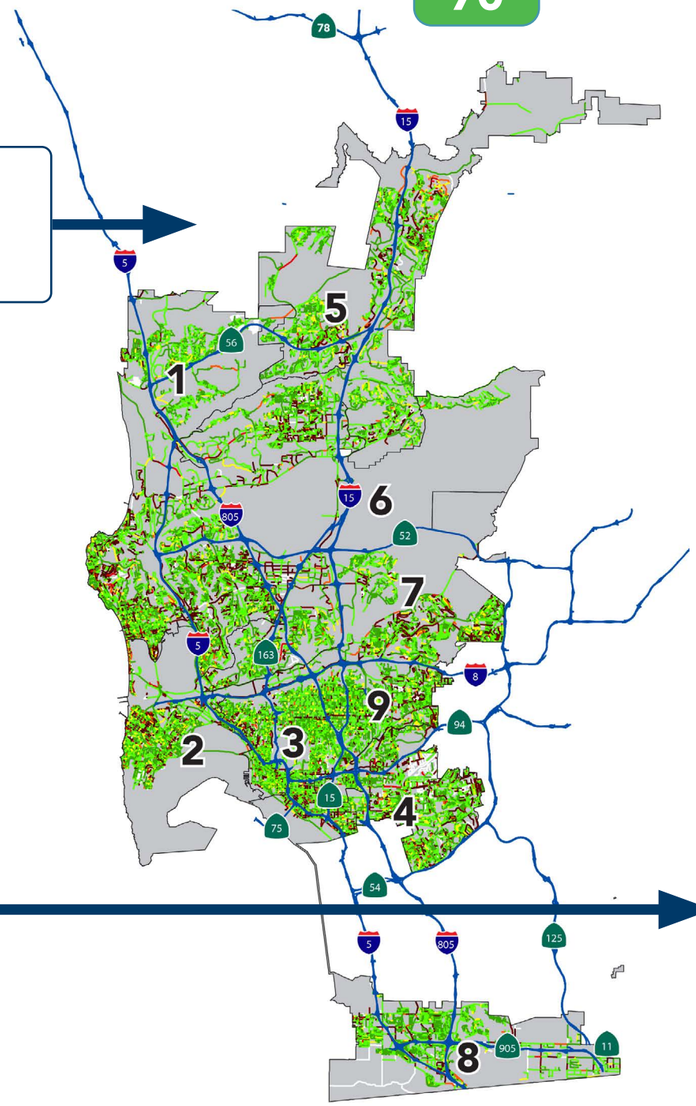



**Total Citywide Investment:**
$1.877 Billion

Total Lane Miles Repaired: 7,603

## FY34 Conditions (Pending Funding)

Average Pavement Condition Index
**70**

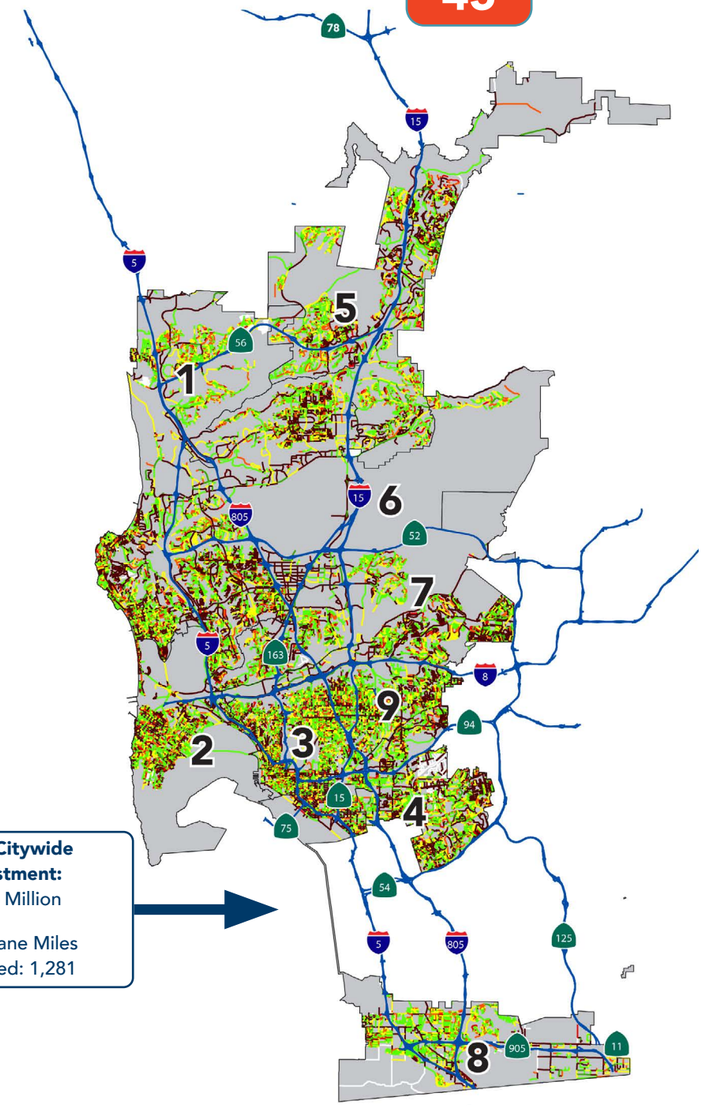



**Total Citywide Investment:**
$645 Million

Total Lane Miles Reapired: 1,281

## FY34 Conditions (Current Funding)

Average Pavement Condition Index
**45**




N

| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |
| FY24 Condition | 20% | 32% | 17% | 12% | 10% | 6.7% | 2.0% |
| FY34 Condition: Pending Funding ($1.9B Total Over 10 Years) | 48% | 32% | 1.9% | **0.2%** | 0.2% | 0.1% | 18% |
| FY34 Condition: Current Funding ($646M Total Over 10 Years) | **5.5%** | 29% | 19% | 8.3% | 4.1% | 3.9% | **30%** |

If the Department were to obtain the requested funding over the next ten years, 80% of the City's street network would fall within a PCI of 70 or greater compared to the 52% that currently falls within this same range.

If the Department were to maintain the current projected investments for the next ten years, 30% of the City's street network would fall into the Failed category (PCI <10) compared to the 2% that currently falls within this same range. Streets that fall within the Failed category require significant investments to rehabilitate.

# COUNCIL DISTRICT 1: PAVEMENT CONDITION AND FUNDING NEEDS

## ROAD NETWORK INVENTORY IN COUNCIL DISTRICT 1

Council District 1, located in northern San Diego, encompasses prominent neighborhoods such as Carmel Valley, La Jolla, and University City.

**Total Lane Miles in District**

**853**

**Percentage (%) of City's Road Network**

**13%**

| Prime Roads (%) | Major Roads (%) |
|---|---|
| 9% | 19% |
| **Collector Roads (%)** | **Local Roads (%)** |
| 5% | 4% |
| **Residential Roads (%)** | **Alley (%)** |
| 47% | 11% |

**Unimproved Roads (%)**

**0.08%**

**Other roadway types part of the City's network not shown include: bike paths and walkways**

## PAVEMENT CONDITION IN COUNCIL DISTRICT 1

Recent Pavement Condition Index (PCI) street condition data collected by the Transportation Department indicates **the average PCI score in District 1 is Fair (65 out of 100)**. In Council District 1 Local streets have the highest PCI scores with 76 while Major streets have the lowest average PCI with 65.

## HISTORY OF PAVEMENT MANAGEMENT IN COUNCIL DISTRICT 1

| PCI in 2016 | Total Repair Miles Since 2016 |
|---|---|
| 75 | 262 |

**Total Overlay Repair Miles Since 2016**

**61**

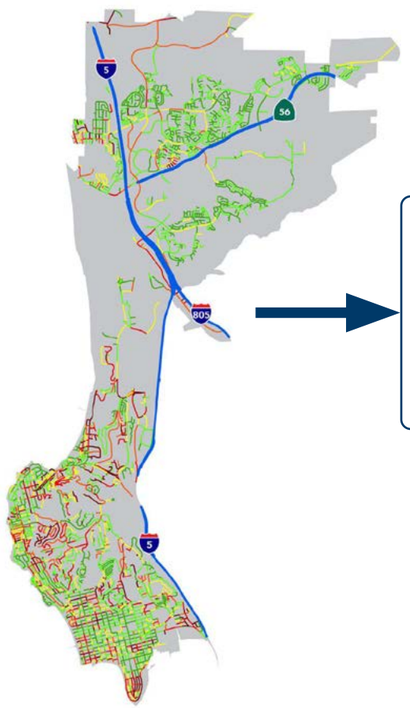
**Total Slurry Seal Repair Miles Since 2016**

**201**

### FY24 Conditions

**Average Pavement Condition Index**

**65**



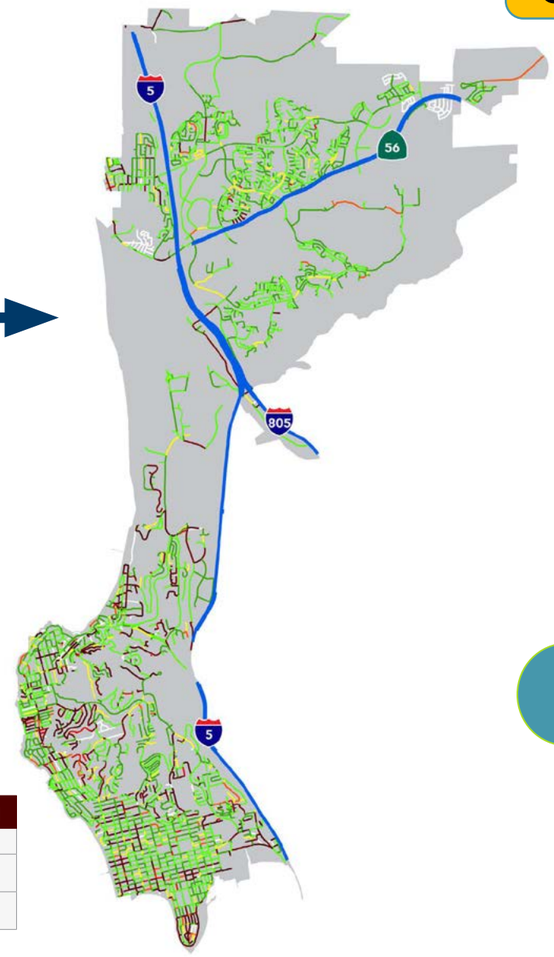
**Total Council District 1 Investment:**
$243 Million

**Total Citywide Investment:**
$1.877 Billion

### FY34 Conditions (Pending Funding)

**Average Pavement Condition Index**

**69**



N

| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |
| FY24 Condition | 26% | 28% | 14% | 12% | 12% | 7% | 1% |
| FY34 Condition (Pending Funding) | 40% | 35% | 6% | 3% | 1% | 7% | 8% |

## 10 Year Investment Need in Council District 1

**MAINTENANCE (SLURRY SEAL)**

>425
Total 10 Year Lane Miles

$12.3M
of Average Annual Investment

$123M
of Total 10 Year Investment

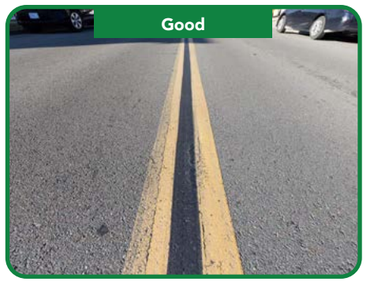
**REHABILITATION (OVERLAY/RECONSTRUCTION)**

>67
Total 10 Year Lane Miles

$12.0M
of Average Annual Investment

$120M
of Total 10 Year Investment

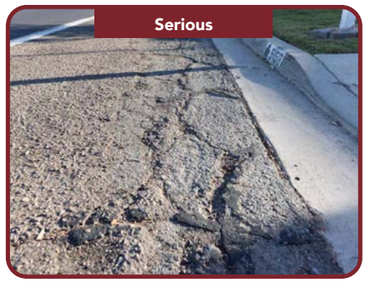
**Current projected street maintenance and rehabilitation funding allocations will lower the City average roadway network PCI to 45 (Poor) by the end of FY 2034**. In FY 2024, the City allocated $35.6M and $104.3M for roadway maintenance and rehabilitation, respectively. Latest five-year outlook projections indicate much lower allocations for FY 2025-FY 2029, based on known funding sources. **Projected program funding levels are not adequate** to meet the City's key objectives to achieve an average roadway network PCI score of 70 by 2034.



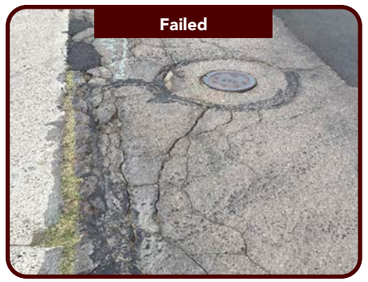

**Crown Point Dr**


**La Jolla Mesa Dr**


**Fanuel St**




**Soledad Rd**




**Soledad Rd**

# COUNCIL DISTRICT 2: PAVEMENT CONDITION AND FUNDING NEEDS

## ROAD NETWORK INVENTORY IN COUNCIL DISTRICT 2

Council District 2 in San Diego covers several neighborhoods, including Mission Beach, Pacific Beach, Ocean Beach, Point Loma, and the historic Midway community. The transportation infrastructure in District 2 is diverse and vital to the city's mobility. Council District 2 is well-connected to the rest of San Diego through a network of major roads and highways.

**Total Lane Miles in District**

**920**

**Percentage (%) of City's Road Network**

**14%**

| Prime Roads (%) | Major Roads (%) |
|---|---|
| 9% | 12% |

| Collector Roads (%) | Local Roads (%) |
|---|---|
| 7% | 5% |

| Residential Roads (%) | Alley (%) |
|---|---|
| 52% | 11% |

**Unimproved Roads (%)**

**0.05%**

**Other roadway types part of the City's network not shown include: bike paths and walkways**

## PAVEMENT CONDITION IN COUNCIL DISTRICT 2

Recent Pavement Condition Index (PCI) street condition data collected by the Transportation Department indicates **the average PCI score in District 2 is Fair (57 out of 100)**. In Council District 2 Local streets have the highest PCI scores with 74 while Prime, Major and Alleys have the lowest average PCI scores of 64.

## HISTORY OF PAVEMENT MANAGEMENT IN COUNCIL DISTRICT 2

| PCI in 2016 | Total Repair Miles Since 2016 |
|---|---|
| 65 | 236 |

**Total Overlay Repair Miles Since 2016**

**98**

**Total Slurry Seal Repair Miles Since 2016**

**138**

### FY24 Conditions

**Average Pavement Condition Index**

**57**


**Total Council District 2 Investment:**
$238 Million

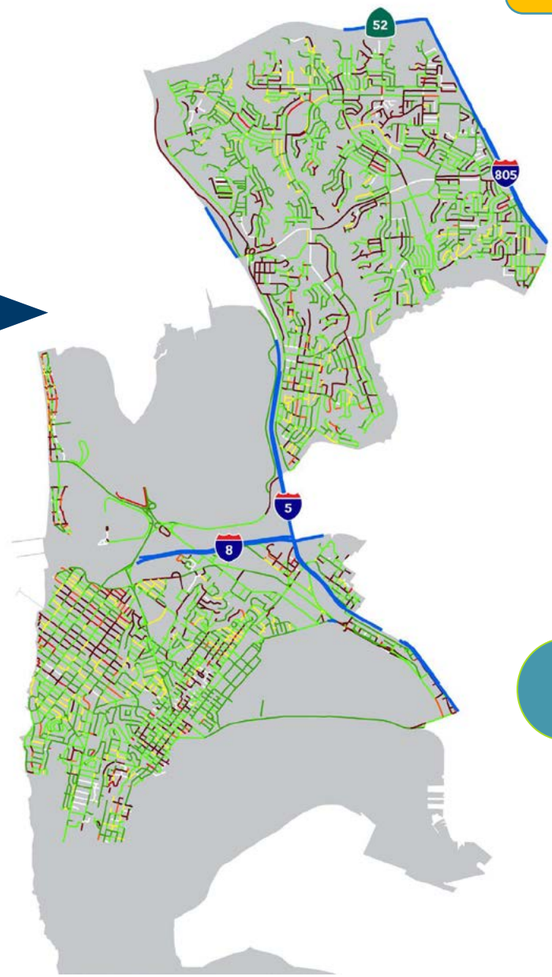
**Total Citywide Investment:**
$1.877 Billion

N

### FY34 Conditions (Pending Funding)

**Average Pavement Condition Index**

**64**




| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |
| FY24 Condition | 22% | 27% | 14% | 14% | 12% | 8% | 3% |
| FY34 Condition (Pending Funding) | 40% | 30% | 7% | 2% | 1% | 8% | 12% |

## 10 Year Investment Need in Council District 2

**MAINTENANCE (SLURRY SEAL)**

>417
Total 10 Year Lane Miles

$11.9M
of Average Annual Investment

$119M
of Total 10 Year Investment

**REHABILITATION (OVERLAY/RECONSTRUCTION)**

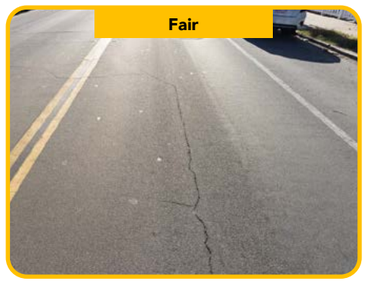
>67
Total 10 Year Lane Miles

$11.8M
of Average Annual Investment

$118M
of Total 10 Year Investment

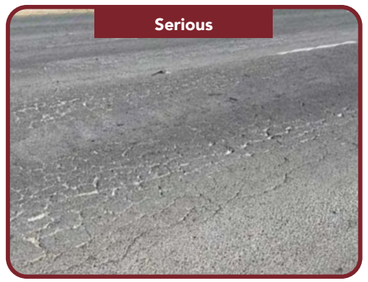
**Current projected street maintenance and rehabilitation funding allocations will lower the City average roadway network PCI to 45 (Poor) by the end of FY 2034**. In FY 2024, the City allocated $35.6M and $104.3M for roadway maintenance and rehabilitation, respectively. Latest five-year outlook projections indicate much lower allocations for FY 2025-FY 2029, based on known funding sources. **Projected program funding levels are not adequate** to meet the City's key objectives to achieve an average roadway network PCI score of 70 by 2034.


**North Harbor Dr**

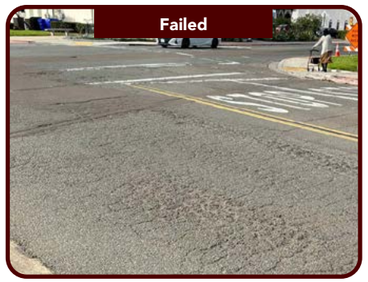



**Sunset Cliffs Blvd**


**Moraga Ave**




**Clairemont Dr**




**Field St**

# COUNCIL DISTRICT 3: PAVEMENT CONDITION AND FUNDING NEEDS

## ROAD NETWORK INVENTORY IN COUNCIL DISTRICT 3

Council District 3, situated at the city's center, features neighborhoods such as Balboa Park, Downtown, and Hillcrest.

**Total Lane Miles in District**

580

**Percentage (%) of City's Road Network**

9%

| Prime Roads (%) | Major Roads (%) |
|---|---|
| 1% | 9% |
| **Collector Roads (%)** | **Local Roads (%)** |
| 31% | 2% |
| **Residential Roads (%)** | **Alley (%)** |
| 39% | 16% |

**Unimproved Roads (%)**

0.03%

**Other roadway types part of the City's network not shown include: bike paths and walkways**

## PAVEMENT CONDITION IN COUNCIL DISTRICT 3

Recent Pavement Condition Index (PCI) street condition data collected by the Transportation Department indicates **the average PCI score in District 3 is Fair (61 out of 100)**. In Council District 3 Collector streets have the highest PCI scores with 72 while Local streets have the lowest average PCI of 59.

## HISTORY OF PAVEMENT MANAGEMENT IN COUNCIL DISTRICT 3

| PCI in 2016 | Total Repair Miles Since 2016 |
|---|---|
| 68 | 214 |

**Total Overlay Repair Miles Since 2016**

71

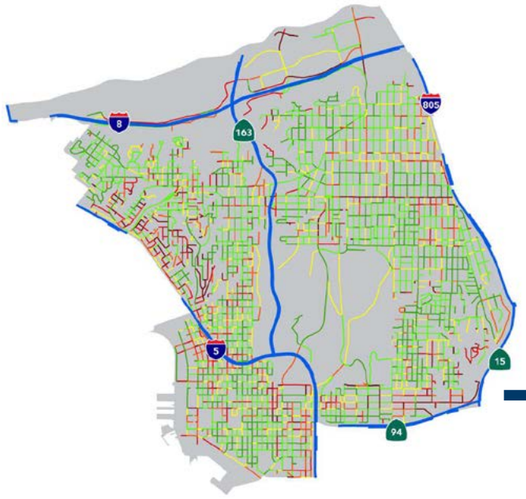
**Total Slurry Seal Repair Miles Since 2016**

142

**FY24 Conditions**

**Average Pavement Condition Index**

61




**Total Council District 3 Investment:**
$170 Million

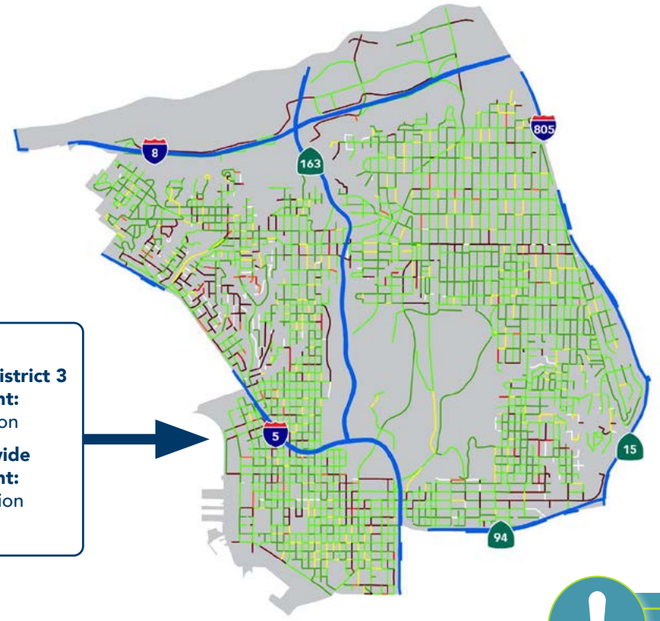
**Total Citywide Investment:**
$1.877 Billion

N

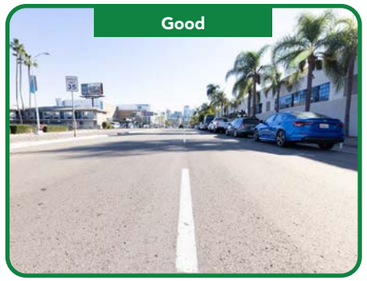
**FY34 Conditions (Pending Funding)**

**Average Pavement Condition Index**

73




| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |
| FY24 Condition | 21% | 30% | 15% | 13% | 12% | 8% | 1% |
| FY34 Condition (Pending Funding) | 38% | 40% | 8% | 1% | 1% | 5% | 6% |




Pacific Highway


El Cajon Blvd


El Cajon Blvd


University Ave


University Ave

## 10 Year Investment Need in Council District 3

**MAINTENANCE (SLURRY SEAL)**

>400
Total 10 Year Lane Miles

$9.9M
of Average Annual Investment

$99M
of Total 10 Year Investment

**REHABILITATION (OVERLAY/RECONSTRUCTION)**

>48
Total 10 Year Lane Miles

$7.1M
of Average Annual Investment

$71M
of Total 10 Year Investment

**Current projected street maintenance and rehabilitation funding allocations will lower the City average roadway network PCI to 45 (Poor) by the end of FY 2034.** In FY 2024, the City allocated $35.6M and $104.3M for roadway maintenance and rehabilitation, respectively. Latest five-year outlook projections indicate much lower allocations for FY 2025-FY 2029, based on known funding sources. **Projected program funding levels are not adequate** to meet the City's key objectives to achieve an average roadway network PCI score of 70 by 2034.

# COUNCIL DISTRICT 4: PAVEMENT CONDITION AND FUNDING NEEDS

## ROAD NETWORK INVENTORY IN COUNCIL DISTRICT 4

Council District 4 encompasses neighborhoods like Encanto, Paradise Hills, and Oak Park, reflecting cultural diversity and community strength.

**Total Lane Miles in District**

**603**

**Percentage (%) of City's Road Network**

**9%**

| Prime Roads (%) | Major Roads (%) |
|---|---|
| 0% | 6% |
| **Collector Roads (%)** | **Local Roads (%)** |
| 25% | 2% |
| **Residential Roads (%)** | **Alley (%)** |
| 63% | 3% |

**Unimproved Roads (%)**

**0.14%**

**Other roadway types part of the City's network not shown include: bike paths and walkways**

## PAVEMENT CONDITION IN COUNCIL DISTRICT 4

Recent Pavement Condition Index (PCI) street condition data collected by the Transportation Department indicates **the average PCI score in District 4 is Fair (61 out of 100)**. In Council District 4 Residential streets have the highest PCI scores with 65 while Major streets have the lowest average PCI with 56.

## HISTORY OF PAVEMENT MANAGEMENT IN COUNCIL DISTRICT 4

| PCI in 2016 | Total Repair Miles Since 2016 |
|---|---|
| 72 | 179 |

**Total Overlay Repair Miles Since 2016**

**47**

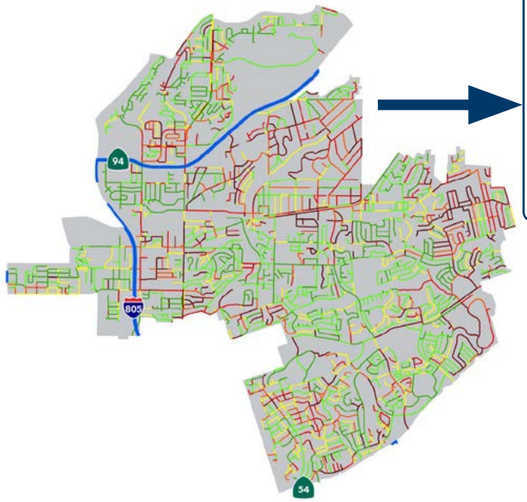
**Total Slurry Seal Repair Miles Since 2016**

**132**

### FY24 Conditions

**Average Pavement Condition Index**

**61**



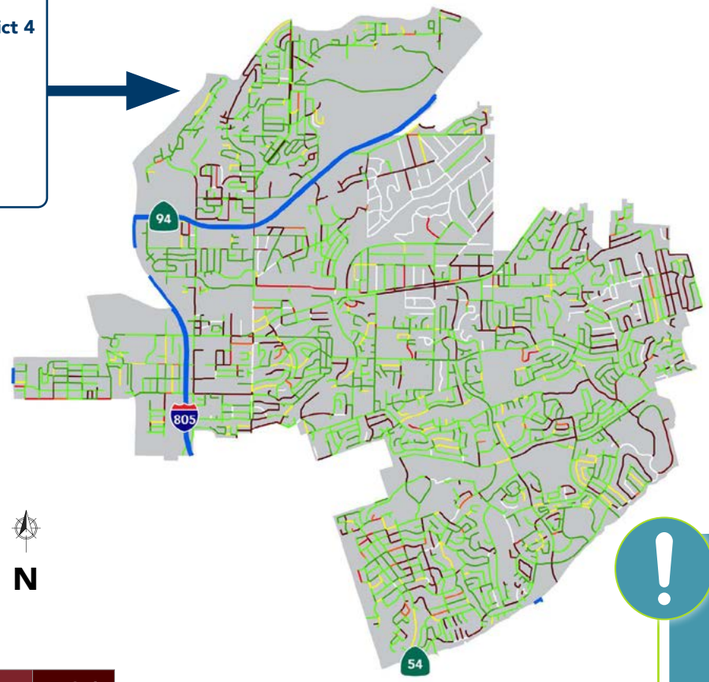

**Total Council District 4 Investment:**
$144 Million

**Total Citywide Investment:**
$1.877 Billion

### FY34 Conditions (Pending Funding)

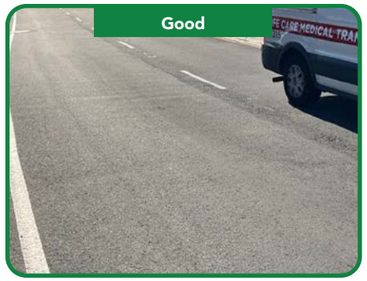
**Average Pavement Condition Index**

**67**




N

| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |
| FY24 Condition | 22% | 26% | 14% | 11% | 12% | 11% | 3% |
| FY34 Condition (Pending Funding) | 37% | 35% | 6% | 2% | 1% | 9% | 11% |




Market St


Euclid Ave


Main St


Jamacha Rd


Euclid Ave

## 10 Year Investment Need in Council District 4

**MAINTENANCE**
**(SLURRY SEAL)**

>282
Total 10 Year Lane Miles

$8.0M
of Average Annual Investment

$80M
of Total 10 Year Investment

**REHABILITATION**
**(OVERLAY/RECONSTRUCTION)**

>38
Total 10 Year Lane Miles

$6.4M
of Average Annual Investment

$64M
of Total 10 Year Investment

**Current projected street maintenance and rehabilitation funding allocations will lower the City average roadway network PCI to 45 (Poor) by the end of FY 2034.** In FY 2024, the City allocated $35.6M and $104.3M for roadway maintenance and rehabilitation, respectively. Latest five-year outlook projections indicate much lower allocations for FY 2025-FY 2029, based on known funding sources. **Projected program funding levels are not adequate** to meet the City's key objectives to achieve an average roadway network PCI score of 70 by 2034.

# COUNCIL DISTRICT 5: PAVEMENT CONDITION AND FUNDING NEEDS

## ROAD NETWORK INVENTORY IN COUNCIL DISTRICT 5

Located in the northeastern part of San Diego, Council District 5 features neighborhoods like Scripps Ranch and Rancho Bernardo, where suburban tranquility aligns with accessibility.

**Total Lane Miles in District**

**884**

**Percentage (%) of City's Road Network**

**13%**

| Prime Roads (%) | Major Roads (%) |
|---|---|
| 8% | 19% |

| Collector Roads (%) | Local Roads (%) |
|---|---|
| 5% | 3% |

| Residential Roads (%) | Alley (%) |
|---|---|
| 61% | 0% |

**Unimproved Roads (%)**

**< 0.01%**

**Other roadway types part of the City's network not shown include: bike paths and walkways**

## PAVEMENT CONDITION IN COUNCIL DISTRICT 5

Recent Pavement Condition Index (PCI) street condition data collected by the Transportation Department indicates **the average PCI score in District 5 is Fair (69 out of 100)**. In Council District 5 Local streets have the highest PCI scores with 79 while Prime streets have the lowest average PCI with 63.

## HISTORY OF PAVEMENT MANAGEMENT IN COUNCIL DISTRICT 5

| PCI in 2016 | Total Repair Miles Since 2016 |
|---|---|
| 70 | 299 |

**Total Overlay Repair Miles Since 2016**

**56**

**Total Slurry Seal Repair Miles Since 2016**

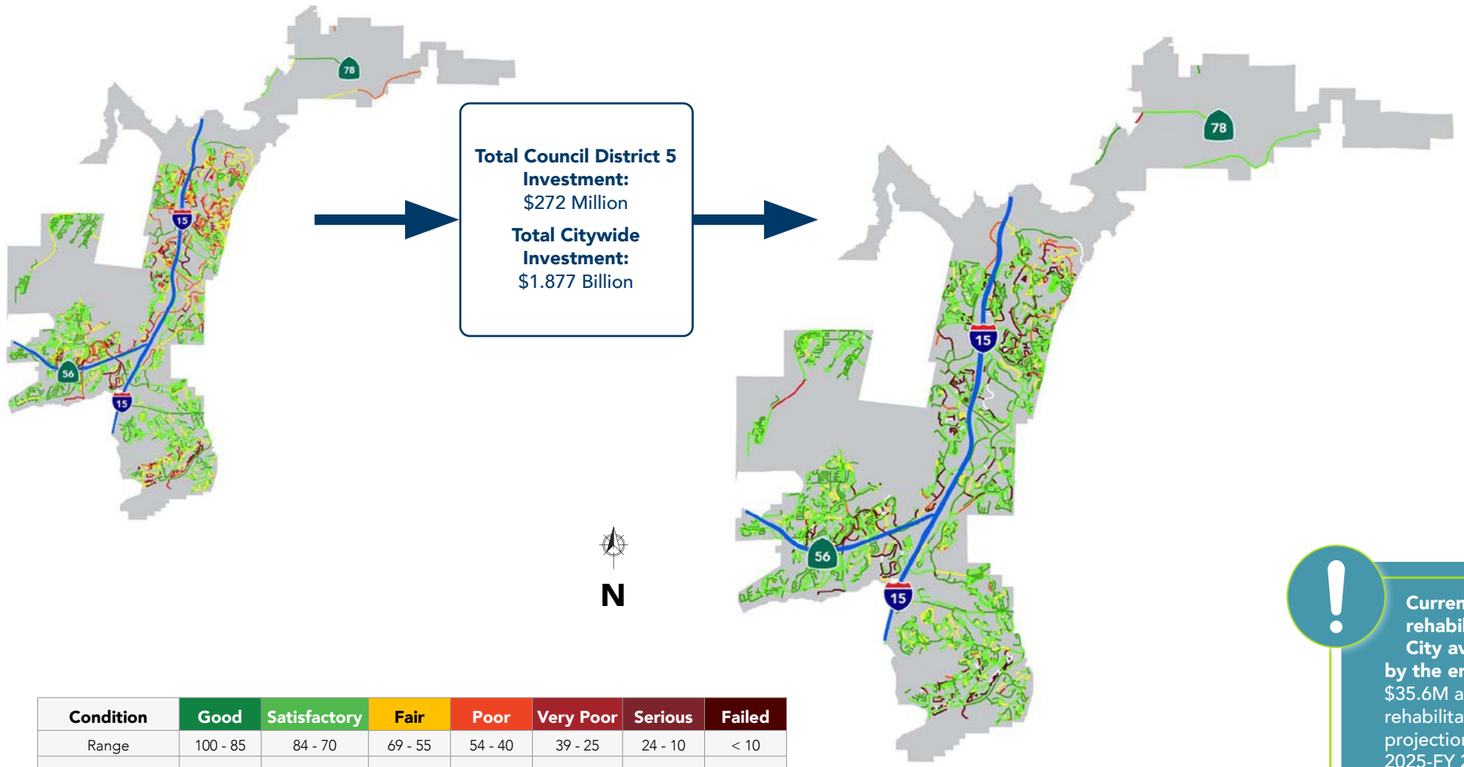
**243**

### FY24 Conditions

Average Pavement Condition Index: **69**

### FY34 Conditions (Pending Funding)

Average Pavement Condition Index: **74**




**Total Council District 5 Investment:**
$272 Million

**Total Citywide Investment:**
$1.877 Billion

| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |
| FY24 Condition | 25% | 37% | 17% | 10% | 6% | 4% | 1% |
| FY34 Condition (Pending Funding) | 43% | 35% | 8% | 3% | 0% | 5% | 5% |

## 10 Year Investment Need in Council District 5

**MAINTENANCE (SLURRY SEAL)**

>499
Total 10 Year Lane Miles

$14.6M
of Average Annual Investment

$146M
of Total 10 Year Investment

**REHABILITATION (OVERLAY/RECONSTRUCTION)**

>69
Total 10 Year Lane Miles

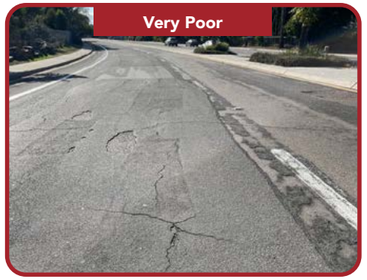
$12.6M
of Average Annual Investment

$126M
of Total 10 Year Investment

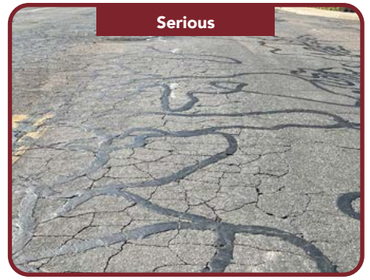
**Current projected street maintenance and rehabilitation funding allocations will lower the City average roadway network PCI to 45 (Poor) by the end of FY 2034.** In FY 2024, the City allocated $35.6M and $104.3M for roadway maintenance and rehabilitation, respectively. Latest five-year outlook projections indicate much lower allocations for FY 2025-FY 2029, based on known funding sources. **Projected program funding levels are not adequate** to meet the City's key objectives to achieve an average roadway network PCI score of 70 by 2034.

Scripps Poway Pkwy

Spring Canyon Rd



Carmel Mtn Rd



Scripps Trail

Rancho Peñasquitos Blvd

# COUNCIL DISTRICT 6: PAVEMENT CONDITION AND FUNDING NEEDS

## ROAD NETWORK INVENTORY IN COUNCIL DISTRICT 6

Encompassing a range of neighborhoods, including Mira Mesa, Kearny Mesa, and Sorrento Valley, Council District 6 is known for its thriving business communities and residential areas.

**Total Lane Miles in District**

**828**

**Percentage (%) of City's Road Network**

**13%**

| Prime Roads (%) | Major Roads (%) |
|---|---|
| 9% | 25% |
| **Collector Roads (%)** | **Local Roads (%)** |
| 7% | 6% |
| **Residential Roads (%)** | **Alley (%)** |
| 52% | 0% |

**Unimproved Roads (%)**

**0.07%**

**Other roadway types part of the City's network not shown include: bike paths and walkways**

## PAVEMENT CONDITION IN COUNCIL DISTRICT 6

Recent Pavement Condition Index (PCI) street condition data collected by the Transportation Department indicates **the average PCI score in District 6 is fair (62 out of 100)**. In Council District 6 Local streets have the highest PCI scores with 70 while Major and Prime streets have the lowest average PCI of 60.

## HISTORY OF PAVEMENT MANAGEMENT IN COUNCIL DISTRICT 6

| PCI in 2016 | Total Repair Miles Since 2016 |
|---|---|
| 74 | 211 |

**Total Overlay Repair Miles Since 2016**

**30**

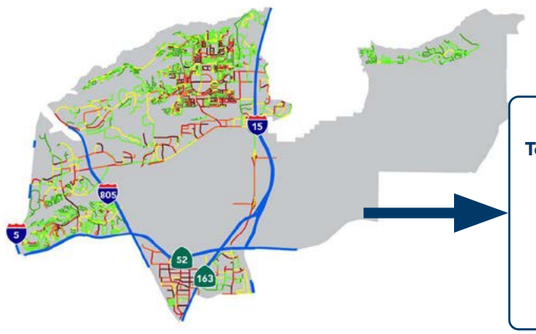
**Total Slurry Seal Repair Miles Since 2016**

**181**

**FY24 Conditions**

**Average Pavement Condition Index**

**62**



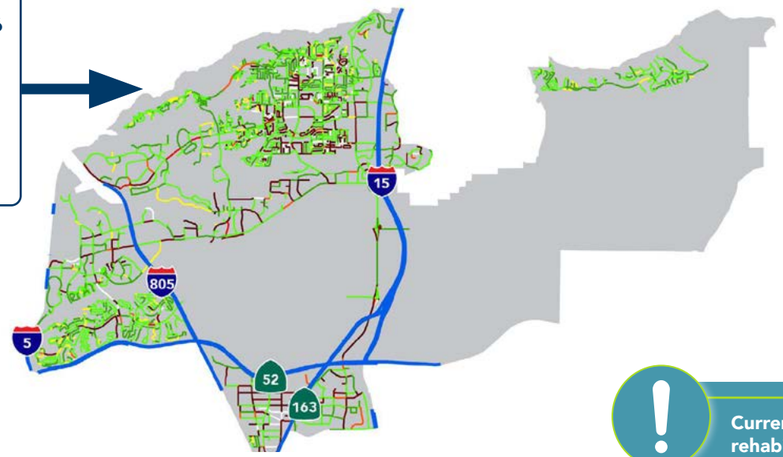

**Total Council District 6 Investment:**
$256 Million

**Total Citywide Investment:**
$1.877 Billion

**FY34 Conditions (Pending Funding)**

**Average Pavement Condition Index**

**68**




N

| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |
| FY24 Condition | 19% | 32% | 16% | 12% | 10% | 8% | 3% |
| FY34 Condition (Pending Funding) | 35% | 39% | 6% | 2% | 0% | 9% | 9% |

## 10 Year Investment Need in Council District 6

**MAINTENANCE (SLURRY SEAL)**

>420
Total 10 Year Lane Miles

$12.4M
of Average Annual Investment

$124M
of Total 10 Year Investment

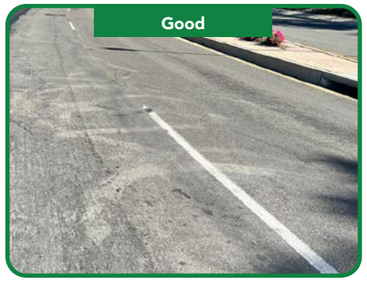
**REHABILITATION (OVERLAY/RECONSTRUCTION)**

>74
Total 10 Year Lane Miles

$13.2M
of Average Annual Investment

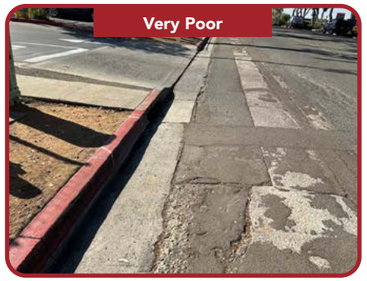
$132M
of Total 10 Year Investment

**Current projected street maintenance and rehabilitation funding allocations will lower the City average roadway network PCI to 45 (Poor) by the end of FY 2034.** In FY 2024, the City allocated $35.6M and $104.3M for roadway maintenance and rehabilitation, respectively. Latest five-year outlook projections indicate much lower allocations for FY 2025-FY 2029, based on known funding sources. **Projected program funding levels are not adequate** to meet the City's key objectives to achieve an average roadway network PCI score of 70 by 2034.

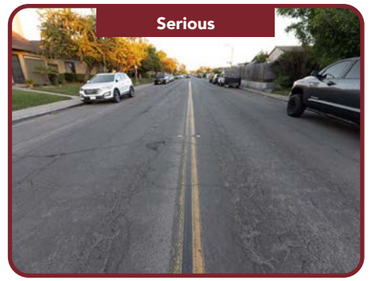



Scripps Ranch Blvd

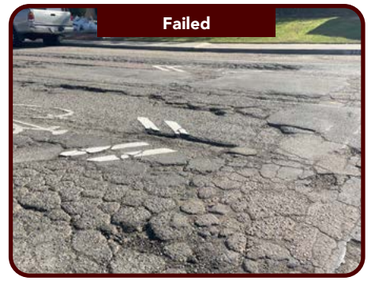

Mira Mesa Blvd




Convoy Ct




Flanders Dr




Gold Coast Dr

# COUNCIL DISTRICT 7: PAVEMENT CONDITION AND FUNDING NEEDS

## ROAD NETWORK INVENTORY IN COUNCIL DISTRICT 7

Council District 7 includes communities like Linda Vista and Serra Mesa, offering a balance between residential comfort and access to essential amenities.

**Total Lane Miles in District**

**784**

**Percentage (%) of City's Road Network**

**12%**

| Prime Roads (%) | Major Roads (%) |
|---|---|
| 7% | 15% |
| **Collector Roads (%)** | **Local Roads (%)** |
| 6% | 4% |
| **Residential Roads (%)** | **Alley (%)** |
| 61% | 5% |

**Unimproved Roads (%)**

**< 0.01%**

**Other roadway types part of the City's network not shown include: bike paths and walkways**

## PAVEMENT CONDITION IN COUNCIL DISTRICT 7

Recent Pavement Condition Index (PCI) street condition data collected by the Transportation Department indicates **the average PCI score in District 7 is fair (67 out of 100)**. In Council District 7 Local streets have the highest PCI scores with 75 while Prime streets have the lowest average PCI of 59.

## HISTORY OF PAVEMENT MANAGEMENT IN COUNCIL DISTRICT 7

| PCI in 2016 | Total Repair Miles Since 2016 |
|---|---|
| 73 | 204 |

**Total Overlay Repair Miles Since 2016**

**50**

**Total Slurry Seal Repair Miles Since 2016**

**155**

**FY24 Conditions**

**Average Pavement Condition Index**

**67**

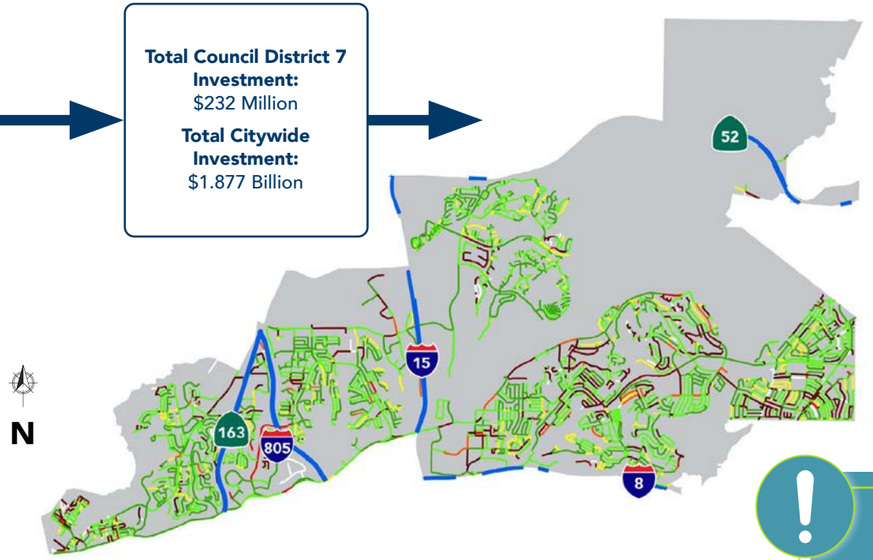

**Total Council District 7 Investment:**
$232 Million

**Total Citywide Investment:**
$1.877 Billion

**FY34 Conditions (Pending Funding)**

**Average Pavement Condition Index**

**70**




| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |
| FY24 Condition | 20% | 35% | 16% | 12% | 10% | 6% | 2% |
| FY34 Condition (Pending Funding) | 43% | 31% | 8% | 3% | 0% | 8% | 7% |

## 10 Year Investment Need in Council District 7

**MAINTENANCE (SLURRY SEAL)**

>407
Total 10 Year Lane Miles

$11.7M
of Average Annual Investment

$117M
of Total 10 Year Investment

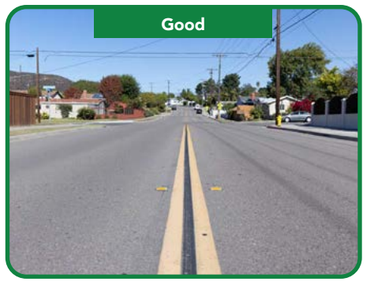
**REHABILITATION (OVERLAY/RECONSTRUCTION)**

>66
Total 10 Year Lane Miles

$11.5M
of Average Annual Investment

$115M
of Total 10 Year Investment

**Current projected street maintenance and rehabilitation funding allocations will lower the City average roadway network PCI to 45 (Poor) by the end of FY 2034.** In FY 2024, the City allocated $35.6M and $104.3M for roadway maintenance and rehabilitation, respectively. Latest five-year outlook projections indicate much lower allocations for FY 2025-FY 2029, based on known funding sources. **Projected program funding levels are not adequate** to meet the City's key objectives to achieve an average roadway network PCI score of 70 by 2034.




Boulder Lake Ave


Twain Ave


Mission Gorge Rd


Morena Blvd


Cowles Mtn Blvd

# COUNCIL DISTRICT 8: PAVEMENT CONDITION AND FUNDING NEEDS

## ROAD NETWORK INVENTORY IN COUNCIL DISTRICT 8

Situated in the southern precincts of San Diego, Council District 8 includes neighborhoods such as Barrio Logan and Logan Heights, characterized by rich cultural legacies.

**Total Lane Miles in District**

**611**

**Percentage (%) of City's Road Network**

**9%**

| Prime Roads (%) | Major Roads (%) |
|---|---|
| 7% | 18% |
| **Collector Roads (%)** | **Local Roads (%)** |
| 9% | 9% |
| **Residential Roads (%)** | **Alley (%)** |
| 48% | 8% |

**Unimproved Roads (%)**

**0.81%**

**Other roadway types part of the City's network not shown include: bike paths and walkways**

## PAVEMENT CONDITION IN COUNCIL DISTRICT 8

Recent Pavement Condition Index (PCI) street condition data collected by the Transportation Department indicates **the average PCI score in District 8 is Fair (66 out of 100)**. In Council District 8 Local streets have the highest PCI scores with 76 while Prime and Major streets have the lowest average PCI of 62.

## HISTORY OF PAVEMENT MANAGEMENT IN COUNCIL DISTRICT 8

| PCI in 2016 | Total Repair Miles Since 2016 |
|---|---|
| 75 | 209 |

**Total Overlay Repair Miles Since 2016**

**47**

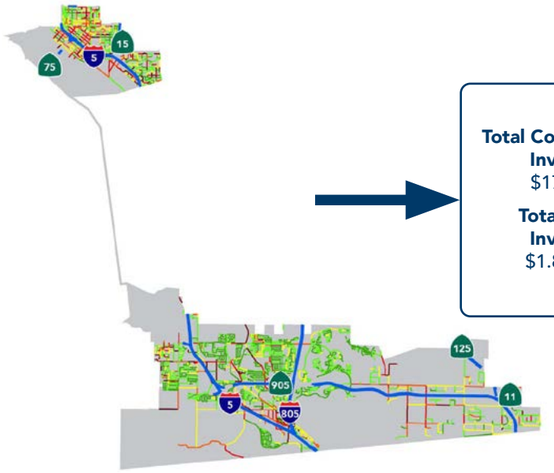
**Total Slurry Seal Repair Miles Since 2016**

**162**

### FY24 Conditions

**Average Pavement Condition Index**

**66**



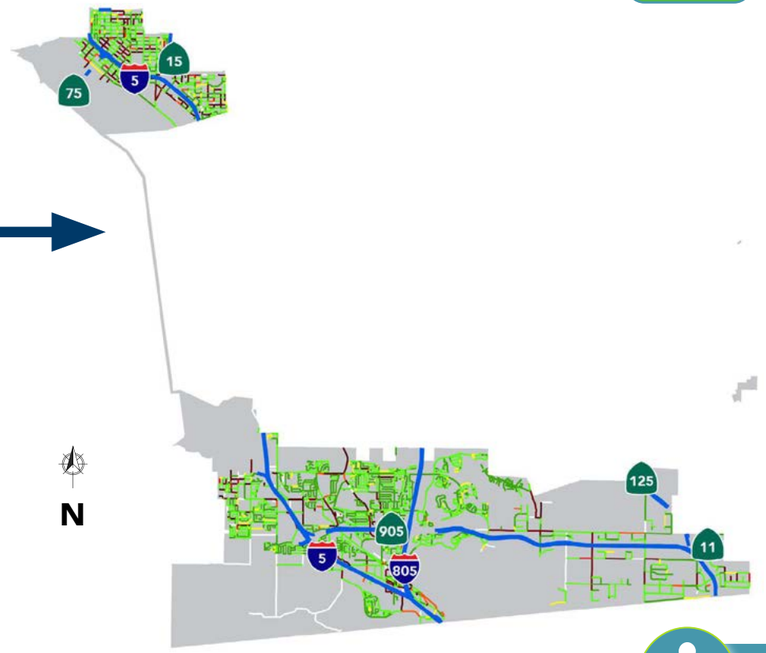

**Total Council District 8 Investment:**
$172 Million

**Total Citywide Investment:**
$1.877 Billion

### FY34 Conditions (Pending Funding)

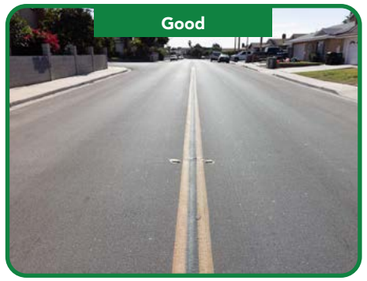
**Average Pavement Condition Index**

**74**

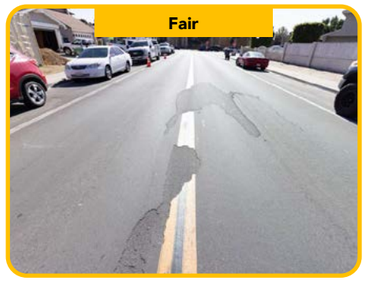



N

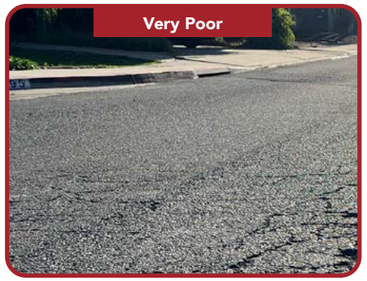
| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |
| FY24 Condition | 27% | 26% | 18% | 12% | 10% | 6% | 1% |
| FY34 Condition (Pending Funding) | 41% | 37% | 5% | 2% | 1% | 7% | 6% |




Piccard Ave




Howard Ave




San Ysidro Blvd


Iris Ave


International Rd

## 10 Year Investment Need in Council District 8

**MAINTENANCE (SLURRY SEAL)**

>330
Total 10 Year Lane Miles

$9.2M
of Average Annual Investment

$92M
of Total 10 Year Investment

**REHABILITATION (OVERLAY/RECONSTRUCTION)**

>49
Total 10 Year Lane Miles

$8.1M
of Average Annual Investment

$81M
of Total 10 Year Investment

**Current projected street maintenance and rehabilitation funding allocations will lower the City average roadway network PCI to 45 (Poor) by the end of FY 2034.** In FY 2024, the City allocated $35.6M and $104.3M for roadway maintenance and rehabilitation, respectively. Latest five-year outlook projections indicate much lower allocations for FY 2025-FY 2029, based on known funding sources. **Projected program funding levels are not adequate** to meet the City's key objectives to achieve an average roadway network PCI score of 70 by 2034.

# COUNCIL DISTRICT 9: PAVEMENT CONDITION AND FUNDING NEEDS

## ROAD NETWORK INVENTORY IN COUNCIL DISTRICT 9

Council District 9 encompasses a diverse array of neighborhoods, including City Heights, Kensington, and College Area, known for their cultural diversity and vibrant communities.

**Total Lane Miles in District**

**550**

**Percentage (%) of City's Road Network**

**8%**

| Prime Roads (%) | Major Roads (%) |
|---|---|
| 1% | 9% |
| **Collector Roads (%)** | **Local Roads (%)** |
| 16% | 6% |
| **Residential Roads (%)** | **Alley (%)** |
| 49% | 19% |

**Unimproved Roads (%)**

**0.08%**

**Other roadway types part of the City's network not shown include: bike paths and walkways**

## PAVEMENT CONDITION IN COUNCIL DISTRICT 9

Recent Pavement Condition Index (PCI) street condition data collected by the Transportation Department indicates **the average PCI score in District 9 is Fair (61 out of 100)**. In Council District 9 Residential streets have the highest PCI scores with 68 while Local streets have the lowest average PCI with 57.

## HISTORY OF PAVEMENT MANAGEMENT IN COUNCIL DISTRICT 9

| PCI in 2016 | Total Repair Miles Since 2016 |
|---|---|
| 67 | 206 |

**Total Overlay Repair Miles Since 2016**

**60**

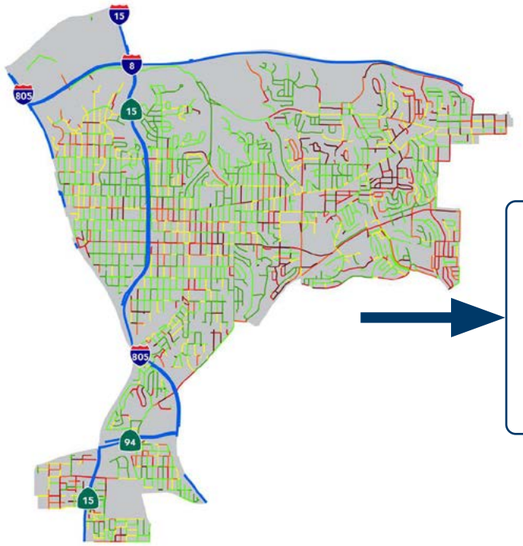
**Total Slurry Seal Repair Miles Since 2016**

**146**

### FY24 Conditions

**Average Pavement Condition Index**

**62**



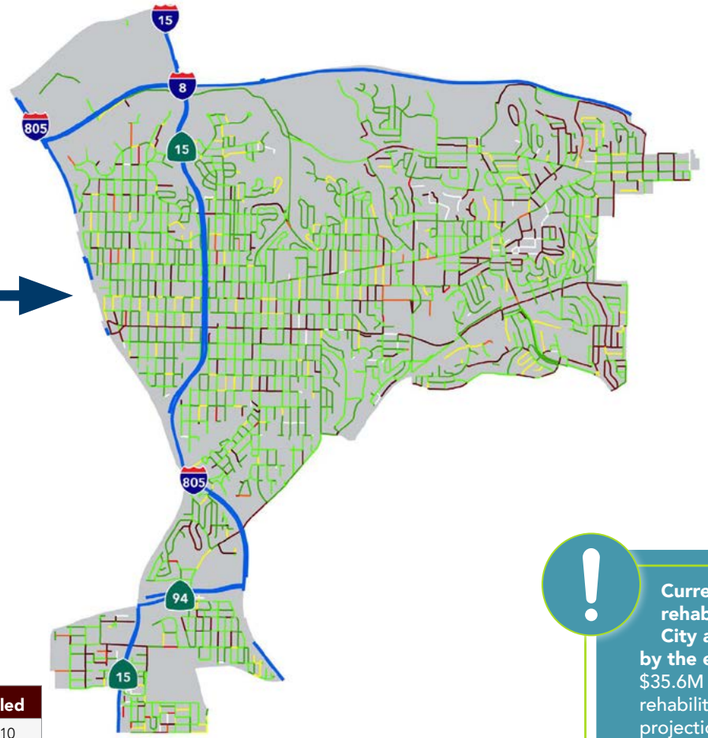
**Total Council District 9 Investment:**
$150 Million

**Total Citywide Investment:**
$1.877 Billion

### FY34 Conditions (Pending Funding)

**Average Pavement Condition Index**

**72**



N

| Condition | Good | Satisfactory | Fair | Poor | Very Poor | Serious | Failed |
|---|---|---|---|---|---|---|---|
| Range | 100 - 85 | 84 - 70 | 69 - 55 | 54 - 40 | 39 - 25 | 24 - 10 | < 10 |
| FY24 Condition | 20% | 29% | 15% | 12% | 14% | 9% | 1% |
| FY34 Condition (Pending Funding) | 40% | 35% | 7% | 1% | 1% | 8% | 9% |

## 10 Year Investment Need in Council District 9

**MAINTENANCE (SLURRY SEAL)**

>326
Total 10 Year Lane Miles

$8.6M
of Average Annual Investment

$86M
of Total 10 Year Investment

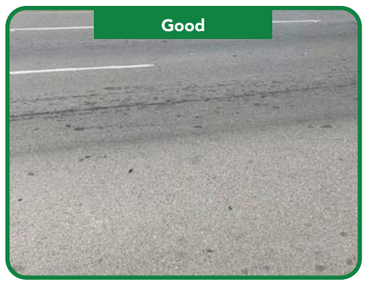
**REHABILITATION (OVERLAY/RECONSTRUCTION)**

>40
Total 10 Year Lane Miles

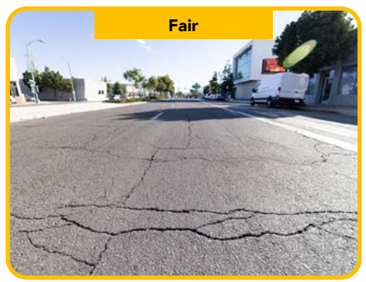
$6.4M
of Average Annual Investment

$64M
of Total 10 Year Investment

**Current projected street maintenance and rehabilitation funding allocations will lower the City average roadway network PCI to 45 (Poor) by the end of FY 2034.** In FY 2024, the City allocated $35.6M and $104.3M for roadway maintenance and rehabilitation, respectively. Latest five-year outlook projections indicate much lower allocations for FY 2025-FY 2029, based on known funding sources. **Projected program funding levels are not adequate** to meet the City's key objectives to achieve an average roadway network PCI score of 70 by 2034.

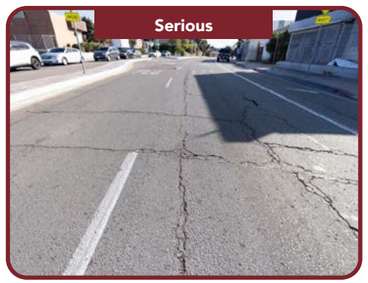



**El Cajon Blvd**




**El Cajon Blvd**


**University Ave**




**University Ave**


**Orchard Ave**

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# Appendix B – In-House Paving Assessment


## 1.0 Introduction

The City of San Diego's (City) Transportation Department (Department) faces the challenge of escalating contractor costs, with a notable increase in costs of nearly increase in costs between 47%-53% over the past five years. This surge in expenses has raised concerns about the sustainability of relying solely on local contractors for street maintenance programs. Concurrently, there are a limited number of skilled paving contractors within the San Diego region and increasing concerns that contractors alone cannot keep pace with the growing volume of work, intensifying the urgency of finding a viable solution. Consequently, the Department is actively exploring alternatives to enhance the efficiency and cost-effectiveness of its pavement management process. As part of this effort, the feasibility of transitioning to an in-house pavement maintenance and rehabilitation approach is being assessed.

## 1.1 Overview of Current Paving Challenges

The Department faces three main challenges with construction of pavement maintenance and rehabilitation projects. The first challenge is the limited availability and capacity of local contractors. With a shortage of contractors in the local area and an increase in projects to complete the Department's goals, the Department must evaluate other options for maintenance and rehabilitation projects. Recent experiences show that only two to three contractors are bidding on slurry seal projects, and three to seven on asphalt overlay projects, highlighting a shortage that complicates efforts to achieve efficient pavement maintenance within City limits. The second challenge is associated with rising contractor costs. Costs have increased for paving projects performed by contractors. A review of recent contractor bids shows that slurry seal project performed by contractors have experienced a cost increase of 47% between FY18-FY23, while costs for AC overlay projects increased by 53% between FY20-FY24. The third challenge is a shortage in aggregate and asphalt are anticipated in the upcoming years, and the Department must plan for these shortages. These three challenges highlight the need for the Department to consider other methods to achieve the planned mileage goals outlined in this Pavement Management Plan.

## 1.2 Options for In-House Paving

A range of strategic scenarios has been considered to enhance the Department's in-house paving options. These options address key factors such as project planning and scheduling, resource allocation, and sustainability. The subsequent exploration introduces the scope of work necessary for each option's delivery.

### Option 1A – Full In-House Operations with Asphalt Plant

This option involves the Department's internal workforce performing all slurry seal, cape seal, scrub seal, and asphalt overlay work, and operations of a City-owned and maintained asphalt plant. This option ensures maximum oversight over planning and execution but requires a significant resource investment, particularly with the inclusion of an asphalt plant within the internal operations for enhanced oversight over material production.

### Option 1B – Full In-House Operations without Asphalt Plant

This option considers the Department's internal workforce performing all slurry seal, cape seal, scrub seal, and asphalt overlay work but opting to purchase materials from regional suppliers instead of operating and maintaining an asphalt plant. This option balances oversight over planning and design, and resource efficiency by relying on external suppliers for materials.

### Option 2 – Partial Transition to In-House Paving

This option introduces a phased approach to in-house operations. It assesses the feasibility of partially performing slurry seal, cape seal, scrub seal, and/or asphalt overlay in-house, while still relying on contractors for the remaining paving operations. This option includes the steps needed for a gradual transition to more paving operations in-house.

### Option 3 – Maintain Current Operations

This option maintains the current operational model, relying on contractors for most pavement work, with Department crews supplementing for emergencies and minor projects. This option includes a continued reliance on external contractors for pavement maintenance, with limited involvement of the internal workforce.





## 1.3 Benchmarking with Other Municipalities

Examining strategies employed by various municipalities offers valuable insights into effective pavement maintenance practices.

**Los Angeles, CA:** The City of Los Angeles has the largest percentage of in-house paving work of any other municipality in the nation. With a street network that is equivalent to more than four times that of the City of San Diego (28,000 lane miles vs. 6,613 lane miles), the Los Angeles City Department of Public Works Bureau of Street Services (Streets LA) is slated to complete 1,249 lane miles of AC overlay and slurry seal for FY24. Streets LA owns and operates two asphalt plants that produce up to 600,000 tons of asphalt annually.

**St. Paul, MN:** The City of St. Paul has a street network of 1,874 lane miles and performs in-house paving of five to 10 miles per year. The City contracts out milling activities and performs paving using City crews for labor while sourcing materials from a City-owned asphalt plant that produces approximately 50,000 tons of asphalt per year. The City supplies surrounding municipalities with asphalt materials from its asphalt plant, although costs are above market price due to on-going deferred maintenance of the plant.

**Dallas, TX:** In addition to basic maintenance, Dallas' in-house paving activities include crack seal, onyx, asphalt restoration, full-depth repairs, AC overlay, and concrete partial recon. This approach reflects Dallas's commitment to efficiently tackling diverse pavement issues, emphasizing a dedication to enhancing street infrastructure longevity and quality through a variety of paving initiatives. **Dallas in-house crews perform about 25 miles of in-house mill and overlay each year.**

**Fort Worth, TX:** The City of Fort Worth has established in-house capabilities for mill and overlay, crack seal, chip seal, and full-depth repairs. Their commitment to full-depth repairs is noteworthy, achieving an annual milestone of approximately 1.5 miles. **Similar to Dallas, Fortworth in-house crews perform about 25 miles of in-house mill and overlay each year.**

**Fort Collins, CO:** The City adopts a versatile approach with two in-house crews specializing in mill and pave, as well as emergency patchwork. Additionally, both crews engage in crack seal activities during winter months.

**Prince George's County, MD:** The County focuses its in-house pavement maintenance and rehabilitation strategy on mill and paving operations. Their capabilities do not extend to slurry seal.

In reviewing the paving practices across various cities in the United States, only two Cities (Los Angeles and St. Paul, MN), distinguish themselves by having dedicated asphalt plants, which provide a degree of self-sufficiency in material production. Most cities, like Dallas and Fort Worth, maintain in-house mill and pave teams, with an annual average of 25 miles as a prevalent standard for pavement maintenance. While many cities focus on core mill and pave operations, only a select few venture into additional treatments such as crack seal, overlay, and slurry seal. However, none of the cities surveyed engage in the application of cape seal or scrub seal, suggesting that there are challenges in performing these activities in-house and these treatments are better suited to be performed by specialty contractors. .

## 1.4 Service Level Expectations for In-House Paving Operations

The Department has expressed specific service level expectations for its street network and aims to maintain a PCI score of 70 or better over the next 10 years. This goal is hindered by several factors, which include funding, workforce availability, and regional contractor capacity. By developing a workforce capable of meeting this performance goal, the Department would be able to reduce its dependence on external contracting entities. This strategic pursuit, coupled with enhancing overall service production to residents and street users, is grounded on the assumption that a well-trained, adequately equipped labor force would be poised to uphold and enhance

the City's street infrastructure. In order to achieve a PCI of 70, the Department must perform over 4,022 repair miles of AC overlay, cape seal, scrub seal, and slurry seal projects over the next 10 years, and is evaluating the feasibility of performing some or all of this mileage using City forces.

## 2.0 In-House Paving Cost Assessment

A cost assessment was performed to determine the costs of bringing all or a portion of paving operations in-house and compare that to the cost of local contractors. This assessment considers upfront costs and recurring costs associated with in-house paving operations.

Upfront costs include a new storage and operations yards, as well as a potential City-owned asphalt plant. Recurring costs include associated labor, material, and equipment costs.

The determination of in-house paving costs for the Department was a comprehensive process that involved collaboration with Department management, engineers, and field crew supervisors and superintendents. To determine personnel and equipment needs, in-depth interviews were conducted to gather insights into the number of full time equivalents (FTEs) and equipment needed for overlay and slurry seal projects. Recent large-scale mill and pave projects were used as the basis for FTEs, and project duration timelines for AC overlay projects.

However, the Department's in-house crews currently do not perform activities similar to slurry seal, so estimates were based on the crew makeup for contractors that perform the work for the City. Project duration timelines for slurry seal projects are based on the Department's best estimates based on current crews production for AC overlay projects and knowledge of slurry seal project steps.

The costs for labor were calculated using City load and overhead rates and included planned raises through FY26. Material quantities were derived from an examination of recent AC overlay (2022-2023) and slurry seal (2019-2023) projects, enabling the establishment of a "per mile" average quantity for essential line items such as asphalt, concrete, fabric, curb ramps, signage, striping, and more. Material prices for asphalt and concrete were determined using the Department's contracted price sheets with local suppliers for asphalt and concrete. Other materials costs were determined by using the most recent contractor costs in the aforementioned bids.

Furthermore, the determination of costs for a new operations yard involved a process that started with the calculation of square footage requirements for each existing FTE at the Chollas Operations Yard. This data was then multiplied by the number of new FTEs required to bring paving maintenance and rehabilitation activities in-house. The cost estimation for the new operations yard was derived by scaling recent development costs from a comparable project in the City of Santa Monica.

Similarly, asphalt plant costs were determined through scaling a recent project for LA Streets, the streets division of the City of Los Angeles. This scaling process involved dividing the Department's annual material needs by the annual production capacity of the LA plant, ensuring a comprehensive and accurate assessment of asphalt plant costs for the Department.

The Department's field crews currently do not perform any in-house activities similar to scrub and cape seal, making in-house labor hours, material, and equipment estimates challenging to assess. As a result, this assessment uses costs from recent Department and other local agency bids to determine a cost ratio with slurry seal projects, which require a similar material and skill set. Based on these bids, scrub seal material and personnel costs were assumed to be 59% more than slurry seal and cape seal costs were assumed to be 36% more than slurry seal.





## 2.1 Projected Workload

The Department has projected pavement maintenance and rehabilitation needs over the next 10 years using Cartegraph's Scenario Builder, which identifies, forecasts and prioritizes projects over multiple years. These projections serve as the basis for equipment, labor and material needs. The ten-year outlook allows for a comprehensive and forward-looking assessment, considering the dynamic nature of pavement maintenance requirements. Table 1 displays the projected overlay, cape seal, scrub seal, and slurry seal repair miles needed in order to achieve a PCI of 70. This assessment considers these numbers when assessing the cost and feasibility of bringing paving operations fully in-house.

**Table 1. Projected Maintenance Work for Next 10 Years (Repair Miles)**

| Treatment Type | FY25 | FY26 | FY27 | FY28 | FY29 | FY30 | FY31 | FY32 | FY33 | FY34 | Total | Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC Overlay (miles) | 105.3 | 97.4 | 107.7 | 117.8 | 86.8 | 0.2 | 0.4 | 0.1 | 0.1 | 0.3 | 516.1 | 51.6 |
| Cape Seal (miles) | - | - | - | - | 12.8 | 45.6 | 78.2 | 22.5 | - | - | 159.1 | 15.9 |
| Scrub Seal (miles) | 122.4 | 179.0 | 163.4 | 148.3 | 138.0 | 40.1 | 1.3 | 0.7 | 0.1 | - | 793.3 | 79.3 |
| Slurry Seal (RPMS) (miles) | 86.7 | 156.3 | 102.0 | 81.1 | 126.7 | 496.0 | 419.0 | 454.9 | 304.1 | 326.9 | 2,553.7 | 255.4 |
| **Grand Total** | **314.4** | **432.7** | **373.1** | **347.2** | **364.3** | **581.9** | **498.9** | **478.2** | **304.3** | **327.2** | **4,022.2** | **402.2** |

## 2.2 AC Overlay Costs

An AC overlay project typically follows a structured sequence of steps, starting with the planning and design phase led by engineers. This involves planning and conflict checking the street segments selected for paving, and markouts of the pavement for preparatory work (e.g. dig outs) and the limits of asphalt overlay.

Preparatory work follows the engineer's markouts and includes but is not limited to tasks such as the removal of existing striping (if needed), weed abatement to clear the project area, tree trimming/root pruning, and dig outs for addressing any pavement irregularities or damaged sections. In addition, curb ramp crews replace all curb ramps within the project area that are damaged or found be out of compliance with current City standards. Initially, a thorough assessment of the existing curb ramps must be conducted to identify any deficiencies or non-compliance with accessibility standards. Subsequently, the removal of the outdated or substandard ramps is executed, taking into account the necessary adjustments to align with the new asphalt overlay.

Once the preparatory work is complete, the next phase involves milling the existing pavement and paving the surface. This portion of work is performed by specialized field crews and overseen by an engineering team.

The final project phase includes the installation of striping and signage at the end of the project. This step includes marking streets with necessary traffic lines for vehicular and bicycle traffic, and installing signage to communicate important information to motorists, bicyclists, and pedestrians. The comprehensive approach from planning to installation ensures the successful execution of an AC overlay project, enhancing the street's longevity and overall safety.

This section outlines the methodology and assumptions to determine the cost of performing one mile of AC overlay in-house using Department forces.

The following describes the methodology used to establish material, labor, and equipment costs for one mile of AC overlay:

- **Labor Costs – Planning, Design, and Construction Oversight:** Transportation Department engineering staff provided a list of staff and hours needed to provide engineering support (planning, design, and construction inspections) for one mile of AC overlay repair.

- **Labor Costs – Mill and Pave:** Transportation Department crew supervisors provided a list of staff and hours needed for AC overlay based on the production of the Department's existing mill and pave team. The current mill and pave team, which consists of 15 FTEs, is capable of completing one mile in 26 working days. This work also includes all preparatory work such as weed abatement, removal of existing traffic striping, and dig outs to address pavement irregularities or damaged sections.

- **Labor Costs – Curb Ramp Installation:** Transportation Department crew supervisors provided a list of staff and hours needed for curb ramp installation based on the production of the Department's existing curb ramp installation team. The Department's current sidewalks repair crew is made up of 10 FTEs and is able to install up to two curb ramps per week. Based on four recent AC overlay projects (AC2110, AC2111, AC2301, AC2302), an average of 22 curb ramps are needed per mile of AC overlay repair. As such, the Department's current pacing of two curb ramps per five day work week was extrapolated to determine the level of effort needed to complete 22 curb ramps.

- **Labor Costs – Striping and Signage:** Transportation Department crew supervisors provided a list of staff and hours needed for striping and signage installation based on the production of the Department's existing striping and signage teams.

A summary of AC overlay personnel costs is presented in Table 2.

**Table 2. Cost of AC Overlay Personnel**

| Task | Classification | Number of Staff Per Mile | Hourly Rate (with FY26 Raises) | Hours Per Mile Per FTE | Total Cost ($/mile) |
|---|---|---|---|---|---|
| Planning, Design, Contract Initiation | Assistant Engineer-Civil | 1 | $150 | 16 | $2,400 |
| | Associate Engineer-Civil | 1 | $189 | 8 | $1,512 |
| | Senior Civil Engineer | 1 | $245 | 4 | $980 |
| **Planning Subtotal** | | **3** | **$583** | **28** | **$4,892** |
| Construction Oversight | Assistant Engineer-Civil | 1 | $150 | 160 | $24,000 |
| | Associate Engineer-Civil | 1 | $189 | 80 | $15,120 |
| | Senior Civil Engineer | 1 | $245 | 40 | $9,800 |
| **Construction Oversight Subtotal** | | **3** | **$583** | **280** | **$48,920** |
| Mill and Pave | Public Works Superintendent | 1 | $199 | 40 | $7,960 |
| | Equipment Operator 2 | 3 | $93 | 160 | $44,640 |
| | Equipment Operator 3 | 1 | $129 | 160 | $20,640 |
| | Heavy Truck Driver 2 | 7 | $93 | 160 | $104,160 |
| | Public Works Supervisor | 1 | $155 | 160 | $24,800 |
| | Utility Worker 1 | 1 | $74 | 160 | $11,840 |
| | Utility Worker 2 | 2 | $85 | 160 | $27,200 |
| **Mill and Pave Subtotal** | | **16** | **$827** | **1,000** | **$241,240** |
| Curb Ramp | Public Works Superintendent | 1 | $199 | 40 | $7,960 |
| | Cement Finisher | 4 | $120 | 440 | $211,200 |
| | Equipment Operator 2 | 1 | $115 | 440 | $50,600 |
| | Heavy Truck Driver 2 | 2 | $93 | 440 | $81,840 |
| | Public Works Supervisor | 1 | $155 | 440 | $68,200 |
| | Utility Worker 1 | 1 | $74 | 440 | $32,560 |
| | Utility Worker 2 | 1 | $85 | 440 | $37,400 |
| **Curb Ramp Subtotal** | | **11** | **$840** | **2,680** | **$489,760** |
| Field Crew Costs (Striping) | Traffic Striper Operator | 2 | $86 | 16 | $2,752 |
| | Utility Worker 1 | 4 | $74 | 16 | $4,736 |
| | Utility Worker 2 | 2 | $85 | 16 | $2,720 |
| **Striping Subtotal** | | **8** | **$245** | **48** | **$10,208** |
| **Project Subtotal** | | | | | **$795,020** |
| **Project Administration (5%)** | | | | | **$39,751** |
| **Total** | | **41** | **$3,079** | **4,036** | **$834,771** |

- **Materials:** Bids from four recent AC overlay projects (AC2110, AC2111, AC2301, AC2302) were reviewed to determine the average per mile material needs for AC overlay projects. Unit costs for these line items were established using the City's existing asphalt and concrete contract pricing schedule. Materials not included in existing in these existing contract agreements were determined based on average prices from the aforementioned bids.

- **Miscellaneous Costs:** The following project activities have not been evaluated individually but were applied as 5% of the combined personnel and material costs. This percentage is based on a ratio of the total cost of the items identified below over the total project cost. This calculation was done as the average of four recent AC overlay projects (AC2110, AC2111, AC2301, AC2302). Miscellaneous costs include the following:

- Traffic device replacement
- Survey monument preservation and replacement
- Traffic detector loop replacement and conduit stubs
- Traffic signal replacement
- Appurtenance replacement and grade adjustment

A summary of AC overlay material costs is presented in Table 3.

**Table 3. Cost of AC Overlay Materials**

| Material | Unit | Cost Per Unit Per Mile | Quantity Per Mile | Total Unit Rate ($/Mile) |
|---|---|---|---|---|
| Crushed Misc. Base | TON | $70 | 197 | $13,790 |
| Asphalt Concrete Base | TON | $220 | 191 | $42,020 |
| Asphalt Concrete (2") | TON | $93 | 2,151 | $200,043 |
| Asphalt Concrete (3") | TON | $86 | 956 | $82,216 |
| Pavement Fabric | SY | $3 | 8,829 | $26,487 |
| Curb Ramps | EA | $3,989 | 22 | $87,758 |
| Striping, Signage | LS | $6,072 | 1 | $6,072 |
| **Subtotal Cost for Materials Per Mile** | | | | **$458,386** |
| **Miscellaneous Costs (5%)** | | | | **$22,919** |
| **Total Cost for Materials Per Mile** | | | | **$481,305** |

Based on the combined material and personnel costs, miscellaneous costs for AC overlay are assumed to be approximately $62,670 per mile.

- **Equipment:** Transportation Department staff, including field crew supervisors, engineers, and Department management, provided an estimate of equipment needs for each team involved in AC overlay projects, based on the existing team's equipment usage and needs for similar projects. Equipment costs were determined by using the Department's existing equipment supplier contract price sheets. Prices for specialty equipment were determined by contacting regional and national suppliers. The Fleet Operations Division (Fleet), provided estimated lifecycles for equipment (assumed to be eight years in this analysis) and also provided feedback for electrification needs. In November of 2021, the State of California signed the Under2 Climate Coalition's ZEV Pledge for Public Fleets that sets goals to transition fleet composition where feasible to 100% ZEV by 2030 for buses and ATVs, 2035 for light-duty vehicles (LDVs) and 2040 for medium- and heavy-duty vehicles. As such, a 70% cost increase was added to the cost estimates for trucks, LDVs, medium- and heavy-duty were to account for electrification requirements. A summary of AC overlay equipment costs is presented in Table 4.





**Table 4. Cost of AC Overlay Equipment**

| Phase | Equipment | Gas Unit Cost | Electric Unit Cost | Quantity Per Crew | Cost Per Crew |
|---|---|---|---|---|---|
| Planning, Design, Contract Initiation | Crew Trucks (Ford F150) | $46,155 | $78,464 | 3 | $235,391 |
| **Planning Subtotal** | | | | **3** | **$235,391** |
| Construction Oversight | Crew Trucks (Ford F150) | $46,155 | $78,464 | 5 | $392,318 |
| **Construction Oversight Subtotal** | | | | **5** | **$392,318** |
| Mill and Pave | 4' Grinder | $16,276 | $27,669 | 1 | $27,669 |
| | 6' Grinder | $35,865 | $60,971 | 1 | $60,971 |
| | Backhoe | $204,176 | $347,099 | 1 | $347,099 |
| | Heavy Trucks (Ford F350) | $64,203 | $109,146 | 5 | $545,730 |
| | Lowboy | $89,900 | N/A | 1 | $89,900 |
| | Vibratory Roller | $76,225 | $129,583 | 1 | $129,583 |
| | Milling Machine | $820,667 | $1,395,134 | 1 | $1,395,134 |
| | 5th Wheel Heavy Tractor | $280,930 | $477,581 | 1 | $477,581 |
| | Hydraulic Detachable Gooseneck Trailer | $66,000 | N/A | 1 | $66,000 |
| | Volvo Paver | $510,399 | $867,678 | 2 | $1,735,356 |
| | Paver Trailer | $40,069 | N/A | 1 | $40,069 |
| | 10-Ton Steel Drum Roller | $173,481 | $294,917 | 1 | $294,917 |
| | 3-Ton Steel Drum Roller | $76,225 | $129,583 | 1 | $129,583 |
| | Bobcat | $100,317 | $170,539 | 1 | $170,539 |
| | Medium Trailer | $44,539 | N/A | 3 | $133,616 |
| | Street Sweeper | $396,162 | $673,476 | 2 | $1,346,952 |
| | Super 10 Dump Trucks | $253,480 | $430,916 | 7 | $3,016,412 |
| | Heavy Truck (F550) | $231,955 | $394,323 | 1 | $394,323 |
| | Tow-Behind Emulsion Tank | $31,850 | N/A | 1 | $31,850 |
| | Conex Box | $3,999 | N/A | 1 | $3,999 |
| | Crew Trucks (Ford F250) | $71,792 | $122,046 | 18 | $2,196,828 |
| **Mill and Pave Subtotal** | | | | **52** | **$12,634,110** |

| Phase | Equipment | Gas Unit Cost | Electric Unit Cost | Quantity Per Crew | Cost Per Crew |
|---|---|---|---|---|---|
| Curb Ramp | Ford F250 | $71,792 | $122,046 | 1 | $122,046 |
| | Ford F450 | $64,455 | $109,574 | 3 | $328,722 |
| | Ford F550 | $43,160 | $73,372 | 2 | $146,744 |
| | Dump Trucks | $272,692 | $463,576 | 3 | $1,390,728 |
| | Backhoe | $204,176 | $347,099 | 1 | $347,099 |
| | Bobcat | $77,922 | $132,467 | 1 | $132,467 |
| | Bobcat Trailer | $22,092 | N/A | 1 | $22,092 |
| **Curb Ramp Subtotal** | | | | **12** | **$2,489,898** |
| Striping | Chase Trucks (Ford F350) | $64,203 | $109,146 | 1 | $109,146 |
| | Crew Trucks (Ford F250) | $71,792 | $122,046 | 4 | $488,184 |
| | Sand Blaster | $19,806 | N/A | 1 | $19,806 |
| | Self Propelled Berm Machine | $10,460 | $17,782 | 1 | $17,782 |
| | Street Sweeper | $396,162 | $673,476 | 1 | $673,476 |
| | Striper | $584,570 | $993,769 | 1 | $993,769 |
| | Thermoplastic Applicator Truck | $238,110 | $404,786 | 1 | $404,786 |
| **Striping Subtotal** | | | | **10** | **$2,706,949** |
| **Total** | | | | **82** | **$18,458,669** |
| **Equipment Life Cycle** | | | | **8** | **Years** |
| **Total Mileage Completed Over Life Cycle** | | | | **80** | **Miles** |
| **Equipment Cost (Per Mile)** | | | | **$230,733** | **$/Mile** |

The per-mile costs for the AC overlay projects amount to $1,551,424, encompassing various components. The largest share of this expenditure is allocated to labor at $834,771. Material costs contribute as well, totaling $481,305, emphasizing the expenses associated with acquiring quality asphalt and related materials.

In order to determine the per-mile equipment costs for in-house AC overlay, Fleet suggested life-cycle estimate of eight years for all equipment. To arrive at the per-mile cost, it was assumed that the equipment could effectively operate for 80 miles over the assumed eight-year life cycle, with each crew covering 10 miles annually. The total equipment cost was then divided by 80, providing a per-mile equipment cost of $230,733. In addition, a capital renewal factor of 2% ($4,615) was added to account for maintenance and repair costs over the equipment's life span.

**Total Recurring AC Overlay Cost (per mile)** including personnel, material, equipment, administration, and capital renewal costs: $1,551,424





## 2.3 Slurry Seal Costs

Slurry seal projects follow a similar phasing as AC overlay projects. Engineers perform planning and design, preparatory work involves activities such as striping removal, mill and paves, and digouts, and striping and signage installation is required at the end of the project. The main differences are the application of slurry seal and that these projects do not require curb ramp upgrades or installation.

During a slurry seal project, a mixture of asphalt emulsion, fine aggregate, mineral filler, and water is applied to the existing pavement. The process begins with the thorough cleaning of the street surface, ensuring it is free from debris and contaminants. Next, the slurry seal mixture is spread evenly over the street using specialized equipment.

Once applied, the slurry seal serves multiple purposes. It seals cracks in the pavement, preventing the infiltration of water and protecting the underlying structure. It also provides a new, smooth surface, improving the skid resistance and aesthetics of the street. The mixture needs time to cure and set before the street is reopened to traffic. Slurry seal projects are commonly employed as a cost-effective preventive maintenance measure, helping to address minor surface distress and extend the overall life of the street infrastructure.

The following describes the methodology used to establish material, labor, and equipment costs:

- **Labor Costs – Planning, Design, and Construction Oversight:** Transportation Department engineering staff provided a list of staff and hours needed to provide engineering support (planning, design, and construction inspections) for one mile of slurry seal.

- **Labor Costs – Slurry Seal (Includes Preparatory Work):** Department crew supervisors and engineering staff that oversee slurry seal construction projects were interviewed and asked to provide an estimate of labor and staff needs, as well as an estimated annual pace for each crew. It is noted that the Department does not currently perform activities similar to slurry seal using in-house crews and estimated a pace for each crew was challenging. As a result, this assessment estimated the number of days one mile could be completed by a contractor using existing project working days and mileage, then scaled this number based on estimates of in-house performance. It was estimated that slurry seal projects performed by contractors would complete one mile in roughly 3.5 days (including preparatory work). Department staff noted that since slurry seal treatments are not currently performed by in-house crews, there would be a steep learning curve for existing and new staff, and work would be completed a slower rate than that of a contractor (roughly three times slower). Using this comparison to private contractors, it was assumed that in-house slurry seal crews can complete one mile in 10 days.

  This difference in timeline can be attributed to contractors' possession of specialized skill sets tuned through experience and training, enabling them to work with efficiency and speed. Additionally, contractors have a distinct advantage in their ability to bring staff on and off projects, optimizing workforce allocation and minimizing downtime. Their crews are often multifunctional, capable of seamlessly transitioning between various project tasks, whereas in-house crews may lack such versatility. Furthermore, contractors strategically leverage subcontractors for specific project components, allowing them to spread out their workload and focus on core competencies. In contrast, Department crews must internally manage all phases of the project, leading to a more sequential and time-consuming approach. In essence, contractors' specialized skills, flexible workforce management, multitasking capabilities, and strategic use of subcontractors collectively contribute to their superior efficiency in completing slurry seal projects within shorter timeframes compared to in-house crews.

- **Labor Costs – Striping and Signage:** Transportation Department crew supervisors provided a list of staff and hours needed for striping and signage installation based on the production of the Department's existing striping and signage teams.

Table 5. Cost of Slurry Seal Personnel

| Task | Classification | Number of Staff Per Crew | Loaded Hourly Rate (No Raise) | Hours Per Mile | Total Unit Cost ($/mile) |
|---|---|---|---|---|---|
| Planning, Design, Contract Initiation | Assistant Engineer-Civil | 4 | $135 | 12 | $7,200 |
| | Associate Engineer-Civil | 1 | $171 | 6 | $1,134 |
| | Senior Civil Engineer | 1 | $220 | 2 | $368 |
| **Planning Subtotal** | | **6** | **$526** | **19.5** | **$8,702** |
| Construction Oversight | Assistant Engineer-Civil | 1 | $135 | 80 | $12,000 |
| | Associate Engineer-Civil | 1 | $171 | 20 | $3,780 |
| | Senior Civil Engineer | 1 | $220 | 5 | $1,225 |
| **Construction Oversight Subtotal** | | **3** | **$526** | **105** | **$17,005** |
| Slurry Seal | Laborer | 3 | $61 | 80 | $16,320 |
| | Equipment Operator 3 | 3 | $116 | 80 | $30,960 |
| | Heavy Truck Driver 2 | 6 | $83 | 80 | $44,640 |
| | Public Works Superintendent | 1 | $179 | 40 | $7,960 |
| | Public Works Supervisor | 1 | $140 | 80 | $12,400 |
| | Utility Worker 2 | 10 | $77 | 80 | $68,000 |
| **Slurry Seal Subtotal** | | **24** | **$656** | **440** | **$180,280** |
| Signage | Utility Worker 1 | 1 | $67 | 16 | $1,184 |
| | Utility Worker 2 | 1 | $77 | 16 | $1,360 |
| | Public Works Supervisor | 1 | $140 | 16 | $2,480 |
| **Signage Subtotal** | | **3** | **$283** | **48** | **$5,024** |
| Field Crew Costs (Striping) | Traffic Striper Operator | 2 | $77 | 16 | $2,752 |
| | Utility Worker 1 | 4 | $67 | 16 | $4,736 |
| | Utility Worker 2 | 2 | $77 | 16 | $2,720 |
| **Striping Subtotal** | | **8** | **$221** | **48** | **$10,208** |
| **Project Subtotal** | | **44** | **$2,210.87** | **660.5** | **$221,219** |
| | **Administration (5%)** | | | | **$11,061** |
| | **Personnel Total** | | | | **$232,279** |

Based on the annual need to complete an average of 111 slurry seal miles per year over the next five years, it was determined that the department will need to staff and supply four slurry seal crews.

- **Materials:** Bids from 10 recent slurry seal projects (FY18-FY23) were reviewed to determine the average per mile material needs for these projects. Unit costs for these line items were established using the Department's existing asphalt contract pricing schedule, or recent bids. The material needs per mile and their costs are summarized in Table 6.





- **Miscellaneous Costs:** The following project needs have not been evaluated individually but were applied as 5% of the total project costs. This percentage is based on a ratio of the total cost of the items identified below over the total project cost. This calculation was done as the average of 10 recent slurry seal projects completed between FY18 and FY23:
  - Traffic device replacement
  - Survey monument preservation and replacement
  - Traffic detector loop replacement and conduit stubs
  - Traffic signal replacement
  - Appurtenance replacement and grade adjustment

Table 6. Cost of Slurry Seal Materials

| Material | Unit | Cost Per Unit Per Mile | Quantity Per Mile | Total Unit Rate ($/mile) |
|---|---|---|---|---|
| Pavement Fabric | TON | $39 | 21 | $830 |
| Crack Seal | LB | $5 | 1,521 | $7,604 |
| RPMS Polymer | SF | $0.37 | 169,724 | $62,798 |
| Crushed Base | TON | $11 | 14 | $154 |
| Striping, Signage | LS | $6,072.00 | 1 | $6,072 |
| **Subtotal Cost for Materials Per Mile** | | | | **$77,458** |
| **Miscellaneous Costs (5%)** | | | | **$3,873** |
| **Total Cost for Materials Per Mile** | | | | **$81,331** |

- **Equipment:** Department crew supervisors and engineering staff that oversee slurry seal projects provided an estimate of the equipment needed to perform all phases of a slurry seal project.Similar to the methodology applied for AC overlay equipment, a 70% cost increase was added to the cost estimates for trucks, LDVs, medium- and heavy-duty were to account for electrification requirements. The cost of equipment for each phase is summarized in Table 7.

Table 7. Cost of Slurry Seal Equipment

| Phase | Equipment | Gas Unit Cost | Electric Unit Cost | Quantity Per Crew | Cost Per Crew |
|---|---|---|---|---|---|
| Planning, Design, Contract Initiation | Crew Trucks (Ford F150) | $46,155 | $78,464 | 2 | $156,928 |
| **Planning Subtotal** | | | | **2** | **$156,928** |
| Construction Oversight | Crew Trucks (Ford F150) | $46,155 | $78,464 | 2 | $156,928 |
| **Construction Oversight Subtotal** | | | | **2** | **$156,928** |

| Phase | Equipment | Gas Unit Cost | Electric Unit Cost | Quantity Per Crew | Cost Per Crew |
|---|---|---|---|---|---|
| Prep-Work | 4' Grinder | $16,276 | $27,669 | 1 | $27,669 |
| | Backhoe | $204,176 | $347,099 | 1 | $347,099 |
| | Bobcat | $100,317 | $170,539 | 1 | $170,539 |
| | Crew Trucks (Ford F250) | $71,792 | $122,046 | 5 | $610,230 |
| | Heavy Truck (Ford F350) | $64,203 | $109,146 | 5 | $545,730 |
| | Street Sweeper | $396,162 | $673,476 | 1 | $673,476 |
| | Traffic Control Trucks (Ford F350) | $64,203 | $109,146 | 2 | $218,292 |
| | Trailer | $63,518 | N/A | 1 | $63,518 |
| | Two Ton Roller | $76,225 | $129,583 | 1 | $129,583 |
| **Prep-Work Subtotal** | | | | **18** | **$2,786,136** |
| Crack Seal | $64,203 | $109,146 | 1 | $109,146 | $109,146 |
| | $59,499 | $101,148 | 1 | $101,148 | $101,148 |
| | $64,203 | $109,146 | 1 | $109,146 | $109,146 |
| **Crack Seal Subtotal** | | | | **3** | **$319,440** |
| Slurry Seal | Heavy Trucks (Ford F350) | $64,203 | $109,146 | 3 | $327,438 |
| | Slurry Seal Machine | $300,000 | $510,000 | 1 | $510,000 |
| | Slurry Truck (Ford F350) | $64,203 | $109,146 | 1 | $109,146 |
| | Street Sweeper | $396,162 | $673,476 | 1 | $673,476 |
| | Traffic Control Trucks (Ford F350) | $64,203 | $109,146 | 5 | $545,730 |
| | Trailer | $63,518 | N/A | 1 | $63,518 |
| **Slurry Seal Subtotal** | | | | **12** | **$2,229,308** |
| Striping | Chase Truck (Ford F350) | $64,203 | $109,146 | 1 | $109,146 |
| | Crew Trucks (Ford F250) | $71,792 | $122,046 | 4 | $488,184 |
| | Sand Blaster | $19,806 | N/A | 1 | $19,806 |
| | Self-Propelled Berm Machine | $10,460 | $17,782 | 1 | $17,782 |
| | Street Sweeper | $396,162 | $673,476 | 1 | $673,476 |
| | Striper | $584,570 | $993,769 | 1 | $993,769 |
| | Thermoplastic Applicator Truck | $238,110 | $404,786 | 1 | $404,786 |
| **Striping Subtotal** | | | | **10** | **$2,706,949** |
| **Total** | | | | **47** | **$8,355,690** |
| **Equipment Life Cycle** | | | | **8** | **Years** |
| **Total Mileage Completed Over Life Cycle** | | | | **208** | **Miles** |
| **Equipment Cost (Per Mile)** | | | | **$40,172** | **$/Mile** |





The per-mile costs for the slurry seal project are delineated as follows, shedding light on the financial intricacies of performing this treatment type in-house. Labor costs for slurry seal were determined to be $232,279. Material costs contribute $81,331, reflecting the expenses associated with acquiring and applying the specialized slurry mixture.

In order to determine the per-mile equipment costs for in-house slurry seal, Fleet suggested life-cycle estimate of eight years for all equipment. To arrive at the per-mile cost, it was assumed that the equipment could effectively operate for 260 miles over the assumed eight-year life cycle, with each crew covering 26 miles annually. The total equipment cost was then divided by 208, providing a per-mile equipment cost of $40,172. In addition, a capital renewal factor of 2% ($803) was added to account for maintenance costs over the equipment's life span.

**Total Recurring Slurry Seal Cost** (per mile) including personnel, material, equipment, administration, and capital renewal costs: $350,713

## 2.4 Cape Seal Costs

A cape seal project is a comprehensive pavement preservation process that combines the application of a chip seal followed by a slurry seal. The project begins with the application of a chip seal, which involves spreading a layer of aggregate (usually small-sized gravel) over the existing asphalt surface. This is then rolled and compacted to create a durable and skid-resistant surface.

Following the chip seal, a slurry seal is applied over the newly treated surface. The slurry seal consists of a mixture of asphalt emulsion, fine aggregate, mineral filler, and water. This top layer serves to seal the chip seal, enhancing durability, providing a smoother surface, and offering additional protection against the elements. Cape seal projects are particularly effective in rejuvenating aging street surfaces, addressing minor distress, and improving overall street performance. This combined treatment provides an economical and efficient solution to extend the life of streets and enhance their functionality.

During the staff interviews that were conducted for this assessment, Department staff noted that they have never performed or done oversight of cape seal projects, so providing estimates of labor needs would be challenging. Recent bid results for City and local agencies were reviewed to determine a ratio of cape seal project costs compared to slurry seal project costs. As such, cape seal labor and material costs were estimated to be approximately 36% more than the in-house rate established for slurry seal ($351k per mile). This ratio was determined from recent City and local agency bid results for cape seal projects.

**Labor Costs and Material Costs** (assumed to be 36% more than slurry seal): $478,247

## 2.5 Scrub Seal Costs

A scrub seal project is a pavement maintenance process aimed at rejuvenating and protecting street surfaces. The project involves applying a polymer-modified emulsion to the existing pavement, followed by the mechanical scrubbing of the emulsion into the surface using specialized equipment. This process helps the emulsion penetrate the pavement, filling voids and cracks while also enhancing the bond between the existing street and the new surface treatment.

The scrub seal mixture typically consists of an emulsion, aggregate, and additional additives for improved performance. The scrubbing action ensures a thorough and uniform distribution of the treatment, promoting adhesion and durability. Once applied, the scrub seal provides a renewed surface that is resistant to water intrusion, protects against UV rays, and improves skid resistance. Scrub seal projects are often employed as a preventive maintenance measure to address surface distress, prolong the life of the pavement, and enhance overall street performance. This process is particularly beneficial for streets with moderate wear and surface degradation.

During the staff interviews that were conducted for this assessment, Department staff noted that they have never performed or done oversight of scrub seal projects, so providing labor estimates would be challenging. However, the Department's senior engineering staff were able to provide a list of equipment that would be needed to perform scrub seal projects in-house. Recent bid results for City and local agencies were reviewed to determine a ratio of scrub seal project costs compared to slurry seal project costs. As such, scrub seal costs were estimated to be approximately 59% more than the in-house rate established for slurry seal ($351k per mile).

**Labor Costs and Material Costs** (assumed to be 59% more than slurry seal): $557,955

## 2.6 Comparison of In-House vs. Contractors

The costs for in-house paving maintenance and rehabilitation projects developed in Sections 2.2 through Section 2.5 were compared to the typical treatment costs (per mile) that the Department expects to incur with contractors based on known costs from recent bids. Based strictly on personnel, equipment, and material costs, the shifting overlay to in-house crews would result in a savings of approximately 9%. However, due to anticipated steep learning curves, slurry seal, cape seal, and scrub seal are anticipated to cost 59% more than private contractors. This is consistent with other municipality benchmarking which shows only a few municipalities do slurry seal using in-house crews, and none do cape and scrub seal, indicating these are specialized treatments that may be best for specialized contractors to perform. **Given the unit cost to perform slurry, cape, and scrub seal using in-house crews is more than contractors, it is recommended that the City continue to rely on contractors for these pavement treatment types.**

Table 8. Comparison of In-House vs. Contractor Costs

| Activity | Total Cost Per Mile (Contractor) | Total Cost Per Mile (in-house[1]) | % Difference |
|---|---|---|---|
| Slurry Seal | $220,000 | $350,713 | -59% |
| AC Overlay | $1,700,000 | $1,551,424 | 9% |
| Cape Seal | $300,000 | $478,244 | -59% |
| Scrub Seal | $350,000 | $557,952 | -59% |

Although the total cost per mile for AC overlay is less than the cost per mile of recent contractor bids, it is noted that in-house crews efficiency is not as productive as contractors and performing overlay in-house may only be effective at lower mileages.

[1] Assumes that City and Department staff would perform planning, design, and construction oversight activities





## 2.7 Total FTE and Equipment Needs Over Next Ten Years

The annual needs (FTEs and Equipment) were calculated for each treatment type based on the projected annual workload identified in Section 2.1, Table 1. The total annual needs for each treatment type are summarized as follows:

**AC Overlay:** Based on an annual average workload of 56 miles, 260 total working days per year, and an estimated crew pace of approximately 26 working days per mile, it was determined that the Department would need to furnish six new AC overlay crews (180 new FTEs) and 12 new curb ramp crews (132 FTEs) with an additional $111M needed for equipment to perform AC overlay fully in-house. However, the Department does not recommend that the City immediately hire in-house crews to perform all AC overlay. Based on mileage fluctuation, benchmarking of other agencies, and current challenges with recruitment and retention of the job classifications that makeup these crews, it is recommended the City start with two in-house mill and pave teams to perform a total of 20 miles of overlay annually. It is recommended that the City initially fund one crew in FY25 and another in FY26 and after two years of production, the Department evaluates the efficiency of the teams and considers pursuing more in-house operations. The total crew and FTE need for two asphalt overlay teams (plus curb ramp teams) is 106 FTEs and the total equipment need is $36.9M. This recommended approach provides a balance between gaining cost efficiency with in-house crews while still relying on contractors to support the City in meeting their annual overlay mileage goals.

**Slurry Seal, Cape Seal, and Scrub Seal:** It is not recommended that the Department perform any of these treatments in-house, as in-house operations are not cost-competitive with external contractors. These treatments involve specialized skills and techniques, making them more efficiently handled by experienced professionals in the field. When benchmarking against industry practices, it was observed that no entities undertake the in-house execution of cape seal and scrub seal treatments, and the very few entities with in-house slurry seal team still rely on external contractors to complete annual goals. The current skill set of in-house crews is not tailored to these specialized treatments, and achieving competitiveness with contractors would necessitate a substantial investment in recruitment and extensive training for specialized job classes. Considering the financial and operational implications, outsourcing these treatments to established contractors remains a more practical and cost-effective approach for the Department.

## 2.8 General Upfront Costs

### Space Planning

To facilitate the shift to in-house paving maintenance and rehabilitation operations, the Department has identified the crucial need for a new operations yard, as the existing Chollas Operations Yard has reached its capacity limits. This section will delve into the size requirements, cost estimations, and the planning involved in establishing a new operations yard that will accommodate the expanded in-house paving crews.

Chollas Operations Yard (Figure 1) currently serves as the operations yard for multiple City Departments, including the Department's paving teams, and is at capacity and cannot accommodate additional paving teams required to partially move paving operations in-house. In order to keep teams that perform maintenance in the right of way at the same work location and streamline communication and operations, it is recommended that a new yard be purchased and developed that will include the entire Street Division team, the two new in-house paving teams, and new and existing Fleet Operations Division's employees that will maintain Street Division's equipment. The total estimate of FTEs at the yard is 487 FTEs.


**Figure 1.** *Chollas Operations Yard*

To determine the size requirements of the new yard, an analysis was conducted based on the proportional relationship between FTEs and square footage at the existing Chollas Operations Yard. With the Chollas Operations Yard spanning approximately 2,419,000 square feet and employing approximately 1,200 individuals, the calculation revealed that each new FTE would require approximately 2,000 square feet to accommodate office space, equipment storage and parking. Given the projection of 487 new FTEs to facilitate the in-house paving operations, it was determined that the new yard would need to span at least 982,102 square feet to ensure optimal functionality.

Cost estimation for a new yard included a two-step process, beginning with an examination of industrial land use listings in San Diego. The listings indicate a cost of $133,435 per acre for industrial land in the region, providing an initial benchmark for the analysis.

In the second step, the cost was further refined by referencing a recently completed Public Works Operations Facility in the City of Santa Monica, which shares similarities in purpose and function. This facility, spanning 14.7 acres (640,000 SF), incurred a total cost of $114M, which includes land development as well as the development of office space and other staff facilities, parking lots, maintenance bays, wash racks, fueling stations, and other facilities typically found in operations yards. This value does not factor in the cost to purchase an industrial lot, as explained above.

Another consideration in cost estimation is the application of a 50% contingency, as recommended by the California DoT cost estimation handbook. Contingency funds act as a financial buffer to mitigate unforeseen challenges or cost overruns during the project implementation phase. Given the scale and complexity of establishing a new operations yard, the inclusion of a contingency factor is prudent to ensure financial resilience throughout the project's lifecycle.





After these calculations and adjustments, the estimated cost for the new operations yard for the Department in the City of San Diego is projected to be approximately $265M. This estimate takes into account not only the cost of acquiring the land but also the expenses associated with developing the infrastructure and ensuring that the facility meets the operational needs and standards of the envisioned in-house paving operations. These costs are summarized in Table 9.

**Table 9. Upfront Cost Estimate for Purchasing New Operations Yard**

| | |
|---|---|
| Total Employees at Chollas | 1,200 |
| Chollas Yard (SF) | 2,419,964 |
| Chollas Yard SF/Employee | 2,017 |
| Total Employees (AC Overlay, Streets, and Fleet) | 487 |
| Desired Area for Industrial Land (ac) | 22.55 |
| Desired Area for Industrial Land (SF) | 982,102 |
| Current Rate of Industrial Land ($/ac)[2] | $133,435 |
| Estimated Cost for Industrial Land ($) | $3,008,421 |
| Current Rate for Operations Yard Development ($/SF)[3] | $179 |
| Estimated Cost for Industrial Land Development ($) | $175,799,004 |
| Contingency (50%) | $89,403,713 |
| Total Upfront Cost | $265,202,717 |

The establishment of a new operations yard is a pivotal component of this transformation, ensuring that the expanded in-house paving crews have the infrastructure necessary to meet the growing demands of the Department for AC overlay.

## Asphalt Plant

The Department is confronted with a significant challenge as it aims to streamline paving maintenance and rehabilitation activities. Should the Department receive the necessary funding to implement paving projects to reach the desired PCI goal of 70, the Department would may have to compliment the material availability from regional asphalt suppliers by producing asphalt in-house to meet the escalating demand efficiently. To realize this objective, the Department would need to acquire additional land and establish a new asphalt plant. The anticipated asphalt demand for AC overlay, slurry seal, cape seal and scrub seal projects over the next 10 years amounts to nearly 450,000 tons annually, with the overarching objective of achieving a Pavement Condition Index (PCI) of 70 in ten years. Currently dependent on external suppliers, internalizing asphalt production is envisioned not only as a cost-saving measure in the long term but also as a strategic initiative to enhance control over the quality and scheduling of asphalt production.

The estimated cost for this initiative is $34M, derived by scaling down the costs of the recently completed LA Streets asphalt plant (AP1), which incurred an expenditure of $31,073,000 and produces 700,000 tons of asphalt per year, plus applying a 50% contingency to the estimate. This substantial investment aligns with the City's broader vision for sustainable infrastructure management. This move could fortify the City's infrastructure resilience and also to establish a foundation for long-term efficiency and self-sufficiency in paving materials. These costs are summarized in Table 10.

[2] Averaged rates for the industrial land for sale in the region.

[3] The industrial land development rate for the project of a similar scope of work.

**Table 10. In-House Procurement Plant Costs**

| Aspect | Details |
|---|---|
| Project Baseline | Asphalt Plant #1 - LA Streets |
| Agency | City of Los Angeles, Department of Public Works, Bureau of Street Services |
| Plant Capacity | Up to 700,000 tons per year (400 tons per hour) |
| Materials Produced | Hot mix asphalt (HMA) and warm mix asphalt |
| Project Timeline | Completed in 2019 |
| Project Location | Los Angeles, California |
| LA Asphalt Footprint (Acres) | 2 Acres |
| SD Asphalt Plant Footprint Need (Acres) | 1.29 |
| Land Purchase Price (Assumed to be $133,435 Per Acre) | $171,675 |
| LA Asphalt Production Capacity (Tons) | 700,000 |
| SD Asphalt Production Needs (Tons) | 450,303 |
| Construction Cost (2019 Dollars) | $31,073,000 |
| Construction Cost (2023 Dollars) | $34,972,935 |
| $/Ton | $50 |
| Scale Factor | $22,669,425 |
| Contingency (50%) | $11,334,713 |
| Total Project Costs | $34,004,138 |
| Estimated Annual Maintenance Costs (5%)[4] | $1,700,207 |
| Estimated Capital Renewal Costs (2%) | $680,083 |
| Total Annual Costs | $2,380,290 |

## 3.0 Feasibility Assessment

The Transportation Department is currently confronted with a challenge in internalizing paving maintenance and rehabilitation services due to the strained capacity of the Chollas Operations Yard. The yard, which is shared with Stormwater Department, Public Utilities Department, and General Services Department/Fleet Operations Division, is grappling with capacity issues related to personnel, equipment, and material storage of existing operations. This limited space intensifies the pressure on resources, making it impractical to absorb the additional demands of expanding paving maintenance and rehabilitation operations in-house at the existing Chollas Operations Yard. The existing constraints highlight the urgent need for a new operations yard that can accommodate the expanded scope of activities, providing sufficient space and resources for the Department to manage its paving maintenance and rehabilitation responsibilities effectively. A total of 487 FTEs would be housed in the new yard, which would include two new AC overlay crews, as well as move the existing Streets Division and Fleet Operations Division staff, in-house.

The City would need to navigate through the process of obtaining necessary permits and approvals for land development and construction. Securing funding for such a significant investment requires careful financial planning and potentially involves collaboration with external stakeholders or securing grants to mitigate the financial burden. Overall, finding and constructing a new operations yard demands a strategic, multifaceted approach to navigate through logistical, regulatory, and financial hurdles for the successful realization of the in-house paving operations initiative.

[4]Based on annual allocations made for plant maintenance by LA Streets.



Appendix B – In-House Paving Assessment

In addition, the new operations yard would have to be compliant with the 2022 Climate Action Plan, which establishes a community-wide goal of net zero by 2035, committing to an accelerated trajectory for greenhouse gas reductions. The cost comparison between building an operations yard for a completely electric fleet versus a traditional gas fleet can vary based on various factors, including location, size of the fleet, existing infrastructure, and local regulations. Generally, the main differences in cost would stem from the need for charging and maintenance infrastructure for an electric fleet, which can be substantial.

Transportation Department staff have also noted that they have experienced difficulties in hiring qualified and trained staff to fill existing vacancies for many of the job classifications that make up the in-house paving teams. This would indicate that should some AC overlay projects move in-house, the Department would have difficulty in immediately filling the 106 FTE positions. **Department staff have also noted that current salaries and wages for field crews (such as equipment operators) would have to be increased by 30% in order to remain competitive with other Southern California Agencies and contractors.**

The Department could face considerable challenges in executing slurry seal, cape seal, and scrub seal projects with in-house crews due to the specialized nature of these pavement maintenance techniques. The application of these seals demands extensive training and skilled labor, posing difficulties in recruitment as the Department competes with private contractors for qualified personnel. Private contractors often possess established expertise and experience in these precise methodologies, making it challenging for the Department to assemble a workforce with comparable proficiency. Additionally, the training and retention of skilled labor in-house may necessitate significant investment and time, potentially impacting the efficiency and timely completion of pavement maintenance projects. The competitive labor market for such specialized skills poses a notable obstacle for the Department in seamlessly integrating these practices into its in-house operations. **Because of this and the higher costs for in-house crews to perform the slurry seal, cape seal, and scrub seal projects, it is recommended that the City continues to rely on contractors to perform this work.**

In contemplating the acquisition and development of an asphalt plant for in-house operations, the Department faces multifaceted challenges. The potential advantages of enhanced control over material quality and production schedules must be weighed against the considerable demands inherent in managing such a facility. Ongoing operational expenses, including the costs of maintenance, utilities, and skilled personnel, represent a significant financial commitment. Moreover, compliance with stringent environmental regulations introduces a layer of complexity, necessitating continuous monitoring and adherence to evolving standards. Compounding the challenge is the current absence of feasible locations for an in-house plant, raising questions about the practicality and viability of such an ambitious undertaking at the present time. Because of the complexities with purchasing and operating an asphalt plant, as well as supply shortages in asphalt and aggregate, it is not recommended that the City purchase an asphalt plant at this time. When benchmarking asphalt plants throughout the nation, it was noted that only two municipalities currently own and operate an asphalt plant.

While the Department faces challenges with space constraints and recruitment, retention, and training of a specialized workforce needed to fully bring pavement operations in-house, **it is recommended the Department add two additional mill and pave teams to perform a total of 20 miles of proactive mill and pave work at a lower cost than contractors and remain consistent with other benchmarked jurisdictions.** The 20-mile total would put the Department's in-house output in line with Dallas and Fort Worth, which complete approximately 25 miles of mill and pave in-house. However, the Department is currently experiencing significant vacancies in critical job classifications required to implement in-house paving. Furthermore, there is limited to no capacity at the Chollas Operations Yard for additional FTEs. Recognizing these limitations, the City is at a critical junction where further expansion necessitates the acquisition of a new operations yard and an increase in compensation for job classifications that make up the in-house teams, such as equipment operators.

# 4.0 Pathway for In-House Implementation

Based on the in-house paving needs for FTEs, equipment, and space planning identified in Section 2, the Department must complete the following in order to bring two additional mill and pave teams in-house.

## Step 1: Increase Pay and Create Training Programs for Specialized Workforce

The Department is currently experiencing challenges recruiting and retaining job classifications (equipment operators in particular) that make the in-house paving activities. Because of the complexities with purchasing and operating an asphalt plant, as well as supply shortages in asphalt and aggregate, it is not recommended that the City purchase an asphalt plant at this time. When benchmarking asphalt plants throughout the nation, it was noted that only two municipalities currently own and operate an asphalt plant. A recent study determined that the City would have raise wages and salaries by 30% in order to be competitive with local and regional municipal counterparts. To attract and retain the skilled labor required for specialized tasks like asphalt overlay, the Department must raise pay for affected job classifications and offer competitive compensation packages. In tandem with enhanced compensation, the creation of training programs becomes essential. Investing in training initiatives tailored to the needs of pavement maintenance will empower the existing workforce and any new hires with the specialized skills essential for the success of in-house paving operations. Increasing pay for job classifications that make up the in-house paving crews is a critical step in order to recruit and retain employees to perform in-house paving.

## Step 2: Establish New Operations Yard

Due to the Department's current operations hub (Chollas Operations Yard) being at capacity, **the Department will have to find a new site capable of housing the personnel, materials, and equipment required to perform more overlay in-house. Based on the estimates identified in Section 2.8, the new yard will have to be approximately 22.5 acres and will cost over $265M.** At the time of this report, there are no real estate listings with a 22-acre plot (or larger) within the City of San Diego boundary. Urban constraints and competing land-use demands may make it challenging to find a suitable location that is both spacious enough and complies with local regulations.

## Step 3: Add Additional Resources for Fleet Operations Division

The General Services Department Fleet Operations Division provides critical maintenance support for the Department's equipment and vehicles. Without this support, the Department would not have the equipment necessary to perform the in-house paving goal of 20 miles per year with two new in-house paving teams. It is anticipated Fleet will be impacted by the addition of 164 vehicles and will require significant ramp-up to support the Department in achieving the in-house paving goals.

Fleet currently operates with an average ratio of 60 vehicles per technician, which is double the ideal ratio of 30 vehicles per technician. To align with this ideal ratio and adequately maintain the additional vehicles, Fleet would need to expand its workforce to service the 164 vehicles and equipment needed for the two new in-house mill and pave teams plus the current 295 vehicles Fleet currently manages for the Department. The expanded workforce will require specialized training for the new specialized equipment being requested as well as for maintenance of electric vehicles. This development is necessary to accommodate Electric Vehicle Supply Equipment (EVSE), ensuring that the fleet's infrastructure aligns with the City's Climate Action Plan and complies with the California Air Resources Board (CARB) Advanced Clean Fleet regulations. In addition to FTEs and training, it is recommended that Fleet receive a designated facility at the new operations yard to maintain and repair equipment.





Ensuring that Fleet is adequately resourced is critical to achieving the Department's in-house paving goals, since this work cannot be performed without functional vehicles and equipment.

## Step 4: Hire In-House Paving Personnel and Purchase New Equipment

Finding and hiring 106 new FTEs for in-house paving projects in the City of San Diego poses a multifaceted challenge. Firstly, the specialized nature of paving work demands skilled labor, and recruiting individuals with expertise in asphalt overlay, slurry seal, cape seal, and scrub seal applications is inherently challenging. Specialty positions, such as those required for these technical tasks, are often scarce in the labor market, making the recruitment process more competitive and time-consuming.

Moreover, the Department would face stiff competition from private contractors and other municipalities in the region vying for the same pool of qualified workers. Private contractors, often offering competitive salaries and benefits, can present an attractive alternative for skilled professionals. This heightened competition can extend the recruitment timeline and potentially lead to increased compensation packages to attract and retain top talent, further impacting the Department's budgetary considerations.

In essence, the intricate nature of specialized paving work, coupled with the competitive labor market, underscores the considerable time and effort that the Department would need to invest in sourcing, vetting, and ultimately hiring the necessary workforce for the successful implementation of its in-house paving projects.

Securing $36.9 million worth of new equipment for the Department's in-house AC overlay projects presents a set of formidable challenges. The specialized nature of paving equipment, tailored to tasks like AC overlay can be limited in the market. Locating and procuring this specialized machinery may require extensive research and engagement with equipment suppliers, with potential delays stemming from the scarcity of such specialized assets.

Furthermore, the acquisition of new equipment brings additional considerations beyond the initial purchase cost. Specialty equipment often demands more intricate maintenance protocols, requiring the Department to invest in specialized training and allocate resources for regular upkeep. Fuel considerations also become a notable factor, as specialized machinery may have unique fuel requirements that need to be factored into the operational costs.

Navigating these challenges necessitates a strategic and meticulous approach in identifying suitable suppliers, ensuring long-term maintenance plans, and accounting for the ongoing operational costs associated with fuel and maintenance. The Department must carefully balance the upfront investment in equipment with the long-term considerations to guarantee the efficacy and sustainability of the in-house paving projects.

# 5.0 Conclusion

The Department is currently grappling with the challenge of rising contractor costs, coupled with limitations in contractor and material availability, and a shortage of existing staff and equipment needed to meet annual pavement and rehabilitation goals. The exploration of alternative solutions was done due to escalating costs, a scarcity of paving contractors in the region, and concerns about managing growing work volumes. Various options were considered, ranging from a fully in-house approach, including the operation of a city-owned asphalt plant, to a phased transition, each presenting distinct benefits and challenges.

Benchmarking with other municipalities, particularly Los Angeles and St. Paul, MN, showcases successful models of in-house operations and asphalt plant ownership. It's noteworthy that the implementation of cape seal and scrub seal treatments remains unexplored among the surveyed cities. Ongoing challenges, particularly in recruiting and retaining skilled labor, underscore the complexities involved in transitioning to in-house pavement

maintenance and rehabilitation. The ultimate decision-making process must carefully balance the pursuit of control, cost-effectiveness, and efficiency against the significant upfront investments and ongoing challenges associated with in-house operations.

The prospect of transitioning paving operations in-house for the Department could achieve cost savings only for AC overlay projects, with an estimated per-mile cost reduction of approximately 9%. However, this shift requires a substantial initial investment totaling approximately nearly $302M for a new operations yard and new equipment. This financial commitment encompasses acquiring specialized equipment, establishing a new operations yard, and constructing a new asphalt plant to meet the Department's asphalt production needs.

An analysis of in-house costs versus contractor costs for slurry seal, cape seal, and scrub seal indicated that the Department would not achieve any cost savings for these treatment types if performed in-house, with costs being nearly 59% higher than when executed by a contractor.

**It is recommended that the Transportation Department expand its services by adding two additional mill and pave teams, enabling the performance of a total of 20 miles of proactive mill and pave work.** The Department has already initiated a budget request to add one new mill and pave team as part of the FY25 budget. This approach offers a cost-effective alternative to contractor services while aligning with benchmarks set by comparable jurisdictions, such as Dallas and Fort Worth, which achieve approximately 25 miles of in-house mill and pave. Performing some AC overlay projects using in-house crews instead of hiring contractors offers several benefits, including greater control over project timelines and quality, as in-house crews are directly accountable to local government standards and schedules while also providing an opportunity to build and retain in-house expertise, enhancing the Department's capacity to manage future infrastructure projects effectively

The addition of two mill and pave teams would be particularly beneficial for addressing "hot roads," which are high-visibility areas with numerous potholes and pavement issues that draw immediate attention from residents but are not slated for any near-term pavement maintenance and rehabilitation projects. Establishing a dedicated team to address these urgent concerns ensures a swift and effective response, especially in cases where the Department might not have the luxury of time to initiate an outsourced AC overlay project through the conventional contractor procurement process. By proactively addressing hot roads in-house, the Department can enhance its ability to promptly address critical pavement issues and maintain public satisfaction with the quality of street infrastructure in the City.



*Appendix B – In-House Paving Assessment*

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# Appendix C - Five-Year Plan Street List

The City of San Diego proposes to achieve a PCI of 70 over 10 years if the appropriate funding is invested. Following the Best Value Approach described in Section 3 of the PMP, a five-year average investment of $257M will raise the City's PCI score from 63 to 67. The table below displays the planned total repair miles that are required to be repaired through different rehabilitation and maintenance activities in the next five years for each Council District.

**Total Repair Miles of Maintenance and Rehabilitation per Plan Year**

| Council District | Year 1 (Total Investment $228M) | | Year 2 (Total Investment $259M) | | Year 3 (Total Investment $272M) | | Year 4 (Total Investment $281M) | | Year 5 (Total Investment $245M) | | Total (Total Investment $1,285M) | | % of CD Network Improved | PCI Year 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Maintenance | Rehabilitation | Maintenance | Rehabilitation | Maintenance | Rehabilitation | Maintenance | Rehabilitation | Maintenance | Rehabilitation | Maintenance | Rehabilitation | | |
| **1** | 21 | 11 | 37 | 12 | 33 | 18 | 29 | 15 | 34 | 12 | **154** | **67** | **52%** | **68** |
| **2** | 27 | 15 | 31 | 15 | 27 | 14 | 26 | 15 | 35 | 8 | **146** | **67** | **48%** | **63** |
| **3** | 27 | 10 | 37 | 10 | 28 | 11 | 26 | 13 | 35 | 5 | **153** | **48** | **54%** | **71** |
| **4** | 17 | 8 | 25 | 8 | 21 | 8 | 15 | 7 | 22 | 7 | **100** | **38** | **47%** | **63** |
| **5** | 25 | 12 | 51 | 14 | 41 | 15 | 37 | 15 | 44 | 12 | **197** | **69** | **60%** | **73** |
| **6** | 25 | 19 | 45 | 11 | 36 | 10 | 27 | 17 | 26 | 17 | **159** | **74** | **56%** | **64** |
| **7** | 26 | 12 | 42 | 13 | 30 | 15 | 29 | 14 | 33 | 11 | **160** | **65** | **59%** | **68** |
| **8** | 20 | 10 | 35 | 7 | 23 | 8 | 18 | 13 | 22 | 10 | **118** | **49** | **53%** | **69** |
| **9** | 22 | 9 | 33 | 7 | 25 | 9 | 22 | 10 | 26 | 5 | **128** | **40** | **57%** | **68** |
| **Total** | **210** | **106** | **336** | **97** | **264** | **108** | **229** | **119** | **277** | **87** | 1315 | 517 | 54% | 67 |

*Maintenance activities include cape seal, scrub seal, and slurry seal. Rehabilitation activities include AC overlay and street reconstruction.*

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The City of SAN DIEGO

SAN DIEGO AT WORK

# Pavement Management Plan Report


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