



# Memorandum

**TO:** TRANSPORTATION AND ENVIRONMENT COMMITTEE

**FROM:** John Ristow

**SUBJECT:** SEE BELOW

**DATE:** February 13, 2023

Approved

Date

2/17/23

**SUBJECT: PAVEMENT MAINTENANCE CONDITIONS, FUNDING, AND PROGRAM DELIVERY STRATEGY**

## **RECOMMENDATION**

Accept report on Citywide Pavement Conditions, Funding, and the planned Program Delivery Strategy.

## **BACKGROUND**

The Department of Transportation (DOT) and its partners successfully maintained and rehabilitated 230 of 249 planned miles of the 2,519-mile street network in the 2022 construction season. The City's overall pavement condition improved and is currently rated overall as "Good" for the first time in recent memory, with an average Pavement Condition Index (PCI) rating of 71 on a scale of 0-100, with 100 being a new street. Thanks to revenue streams such as 2016 VTA Measure B, State Senate Bill (SB1), and City Measure T which remain in place, pavement conditions will improve, and the maintenance backlog will continue to decrease through the current decade.

In 2010, the City Council established a goal of improving pavement conditions to an overall "Good" rating with a PCI of 70 by 2020. In 2011, as the funding targets were not met and the backlog grew, the City Council provided direction to staff to prioritize use of available maintenance funds on the City's most important and heavily traveled major streets. This resulted in the creation of the 967-mile Major Street Network, representing 38% of the entire City street system, but carrying over 85% of traffic in and through the City. Because of sustained investments and maintenance on the Major Street Network, DOT has been able to stabilize and improve the average PCI for these streets to an overall PCI of 78, or "Good" condition. However, many years of underinvestment in the 1,552-mile Local and Neighborhood Streets Network led to continued deterioration. The current overall PCI of 67, or "Fair" condition for these streets represents a significant improvement from the beginning of the revamped maintenance program in 2018 when the PCI for these streets was at 61.

**Pavement Condition Overview**

DOT utilizes a standard set of pavement condition rating criteria established by the Metropolitan Transportation Commission (MTC) to regularly assess the conditions of the City’s streets. Data from these assessments are then entered into the City’s Pavement Management System (PMS) where pavement conditions and funding needs are formulated and can be analyzed. In a typical year, approximately half of the City’s 967 miles of major streets and one fifth of the 1,552 miles of local and neighborhood streets are assessed. The resulting data is then entered into the PMS and the Citywide Pavement Condition Index (PCI) is automatically updated.

*Figure 1 – Pavement Condition Index (PCI) Rating System*

PCI Rating	PCI Categories
70 – 100	Good to Excellent
50 – 69	Fair to At Risk
25 – 49	Poor to Very Poor
0 – 25	Failed

The condition of a street, or network of streets, falls into one of four categories in the PCI rating system that range from “Excellent” (PCI 100) to “Failed” (PCI 0). Figure 1 provides a general description of the PCI rating scale and associated condition ratings. Visual examples of pavement in various states of condition that correlate to the PCI scale are highlighted in Attachment A. It is important to understand, however, that the condition rating of a street goes beyond its visual characteristics. Different types of failures (e.g. cracking, raveling, shoving, sinking, etc.) and the degree of failure can have varying effects on the condition rating.

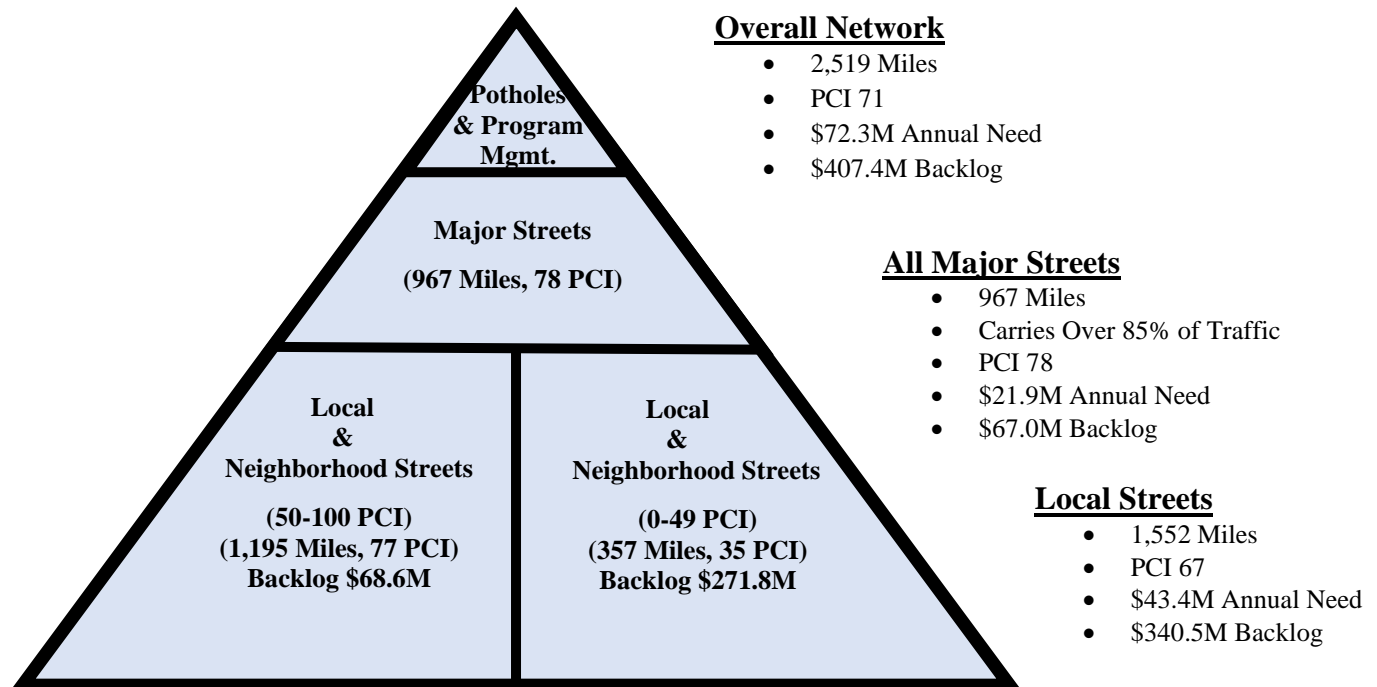
**ANALYSIS**

**Current Pavement Condition and Projections**

The current average PCI for all San José streets is 71, which is a rating of “Good,” and has increased from last year’s rating of 68. To sustain an overall "Good" condition (PCI 70), and further reduce the backlog of deferred maintenance, the City needs to invest \$72.3 million annually for 10 years. Average funding levels for the next 10 years are estimated at approximately \$74.4 million per year, meaning there is no maintenance shortfall during this time period. This current average funding level allows for a significant reduction of the backlog and has fundamentally changed the situation from previous years where the annual shortfall was \$42.7 million in 2018 and \$77.5 million in 2017. However, it is important to note that Measure T funds will be exhausted in fiscal year 2027-2028.

As illustrated in Figure 2 below, three categories of pavement maintenance have been identified and their associated funding requirements have been estimated in order to better define the City’s total annual funding need for pavement. In sequential priority order, they include Pothole Repairs and Program Management, All Major Streets, and Local and Neighborhood Streets.

**Figure 2 – San José Pavement Maintenance Pyramid**



Highlights of the condition of San José’s street network are as follows:

- The overall condition of the City's entire 2,519-mile street network has recently improved to a “Good” rating with a PCI of 71 from a “Fair” rating and PCI of 68 in 2022. There is currently a need of one-time maintenance funding totaling \$407.4 million and an annual overall funding need of \$72.3 million to sustain the Citywide average street condition at a “Good” rating (PCI 70) over a 10-year period. This is a 20% decrease from the \$509.5 million backlog reported last year as seen in Attachment B.
- The City's 967-mile major street system is rated as "Good" with a PCI of 78. There is a one-time need on the major street system of \$67 million. Maintenance on the major streets is now fully funded at approximately \$25.9 million annually to maintain a PCI of 70.
- The City's 1,552 miles of local and neighborhood streets have a PCI of 67, a rating in the "Fair" category, which is an improvement of four points from the previous report. The one-time backlog on the local street system has decreased from \$426.2 million to \$340.5 million.

At current and projected funding levels, the backlog of deferred pavement maintenance will decrease to \$230.9 million in 2027. In the 2022 report, staff had estimated the 2027 backlog to be \$298.3 million, meaning the 2027 projected backlog has decreased by \$67.4 million due to work performed in the past year. The 10-year backlog of deferred maintenance is estimated to be \$465.8 million in 2032. This is a dramatic improvement from the projected 10-year backlog reported in the 2017 report, which was estimated to reach \$1.1 billion, but it is important to note that this number is expected to increase again when Measure T appropriations are fully spent.

The \$300 million in Measure T funds are largely responsible for the projected backlog decrease as the funds allow DOT to tackle the worst local and neighborhood streets and free existing funding sources to preventively maintain streets on the residential network before they deteriorate and cost up to five times more to repair. The overall Citywide PCI is projected to maintain a PCI rating of 70 or above in the coming years.

**Current Pavement Maintenance Funding Levels and Projections**

Work on the remaining 19 miles planned for 2022 has already started and will be completed in the spring of 2023. The remaining streets were postponed during the winter months because the lower temperatures and wet weather are not optimal conditions for quality paving. Through the 2032 construction season, \$74.4 million will be enough to fully fund pothole repairs and program management at \$7 million annually. It will also fully support the \$21.9 million needed each to year to maintain an average PCI of 70 or better on the Major Street Network. Additionally, appropriate and prescribed maintenance on all 1,552 miles of local and neighborhood streets will be performed by end of 2028.

**On-going Pavement Maintenance Funding Needs and Projected Conditions**

While the current funding situation has resulted in an elevated citywide street condition, the City’s pavement maintenance needs are not addressed in perpetuity. The investment needed for City streets to remain in the current "Good" condition (not drop below PCI 70) is \$72.3 million and is met by the \$74.4 million average 10-year funding level, but there is a shortfall of \$0.9 million annually to sustain the current PCI of 71. As shown in Figure 3 below, the annual average investment needed to "Get No Worse" is \$75.3 million,

**Figure 3 – Annual Funding Needs (in \$ millions)**

Funding Scenario	On-going Funding Allocation/Need				Shortfall to Achieve Scenario
	Pothole Repair & Program Management	Major Streets	Local Streets	Total	
1. Maintain PCI 70	\$7 M	\$29.0 M	\$36.3 M	\$72.3 M	(\$2.1 M)
2. Maintain PCI 71	\$7 M	\$32.0 M	\$36.3 M	\$75.3 M	\$0.9 M

With the increased funding, the average network PCI is expected to maintain “Good” (PCI 70) by 2032 but will subsequently decrease. At that time, the expected annual budget will become \$54.4 million which will provide for pothole repairs and program management, major streets maintenance, and a portion of the required annual local and neighborhood street maintenance. The chart in Attachment C further illustrates the on-going funding needs and contrasts that with current projected funding estimates.

### **Improving Neighborhood Streets – Where Most of Our Residents Live**

The City’s Local and Neighborhood Street Network is organized into 135 geographically contiguous “Pavement Maintenance Zones” (PMZs). The PMZs were established years ago to support efficient planning and delivery of paving projects, maximize the amount of paving work completed at one time within a neighborhood area, and provide a geographic spread of pavement maintenance across the City. With over 1,500 miles of local and neighborhood streets, DOT has utilized the PMZ model as a basis to develop and deliver the nine-year maintenance plan for the Local and Neighborhood Streets Network.

To prioritize zones for repair over the cycle of Measure T annual allocations, DOT analyzed the condition of each PMZ to determine the average PCI and the total miles of poor streets in each zone for the entire Local and Neighborhood Streets Network. To the extent possible, zones in the worst condition will be targeted earlier in the maintenance plan to avoid higher construction costs due to further deterioration of the street, inflation, and price increases in later years. It is important to note that when a zone is scheduled for maintenance, typically every street in that zone will receive the appropriate and prescribed treatment based on its condition, which will provide comprehensive maintenance coverage to contiguous streets in a neighborhood, minimizing mobilization costs and disruption to residents.

With this strategy, DOT intends to provide pavement maintenance to approximately 161 miles of local and neighborhood streets in the 2023 construction season. DOT inspection and engineering staff have assessed these streets, formulated engineering estimates, and will bid projects in the Spring and Summer of 2023.

### **Complete Streets, Accessibility and Traffic Safety**

In 2018, City Council adopted the “San José Complete Streets Design Standards and Guidelines” which helps guide implementation of the Envision San José 2040 General Plan as it relates to the public right of way and City street system. Both VTA 2016 Measure B and Senate Bill 1 call for complete street elements that result in safer streets with improved mobility options in order to be eligible to receive funds. DOT uses these guidelines to incorporate complete street elements to the extent possible as future projects are planned, designed, budgeted, and delivered. DOT takes advantage of the annual pavement maintenance program to install various improvements that result in safer streets with improved mobility options.

Newly paved streets provide a cost-effective opportunity to reconfigure vehicle lanes, enhance existing or install new bike lanes, and upgrade vehicle and bike detection systems, where appropriate, in a way that maximizes safety and the orderly flow of traffic for all roadway users while minimizing the impact to vehicle capacity and on-street parking. Figure 4 illustrates a “complete street” implemented through the pavement program. In 2022, DOT added 8.5 miles of bikeways and enhanced another 8.9 miles of existing bikeways.

The pavement maintenance program also improves accessibility Citywide by building ADA curb ramps to compliance. In 2022, the program delivered over 2,128 ADA curb ramps along the pavement corridors and will continue to install an average of over 2,000 annually through the remaining eight years of the maintenance cycle.



***Figure 4 – San José Complete Street Implementation***

All major streets will be evaluated for safety and bicycle improvements, but of particular note and interest is that the 2023 pavement program will incorporate “quick-build” safety projects work along Vision Zero Priority Safety Corridors (such as Berryessa Rd, Tully Rd, San Carlos St, and Saratoga Ave) to create safer streets for walking, biking and driving. With speeding and high speeds being a top factor in traffic fatalities, roadways will be re-engineered with paint and bollards to create curb extensions that shorten crossing distances, pedestrian refuge areas added to reduce traffic exposure, and to slow turning movements to provide maximum opportunity for drivers to yield to pedestrians.

### **Project Delivery**

The 2022 construction season marked the third year of Measure T funded street projects. The information below describes highlights and opportunities with delivering this expanded program.

### **2022 Summary**

In 2022, DOT turned the approved transportation dollars into 29 pavement construction projects for a total of 249 miles of street maintenance and over 2,128 ADA curb ramps along the pavement corridor. DOT successfully completed 230 out of the 249 miles before suspending activities due to winter weather conditions but completed all ADA curb ramps for 2022. Work on these remaining miles will resume this spring 2023.

### **Three-Year Pavement Plan (2023-2025)**

To ensure public transparency and accountability, DOT developed a three-year look ahead that will be updated annually. The plan is a first-of-its kind forecast for DOT and shows a commitment to prioritize hundreds of miles of local streets in poor condition, while continuing to maintain major streets that carry the most traffic through the City. This plan has been coordinated with internal and external stakeholders including utility companies, managers of planned construction projects, elected officials, and other City departments to enable smooth delivery and reduced disturbances to residents and businesses. Importantly, this three-year plan enables DOT to carefully overlay multiple department strategies by examining potential Vision Zero interventions, pedestrian safety enhancements, and bike plan recommendations and deliver them more quickly and efficiently. Each year this plan will be shared publicly, giving residents and commuters an idea of when the streets they use will be refreshed or resurfaced. The most updated three-year plan (2023-2025) includes 745 miles of city streets slated to be preserved or rehabilitated by the end of 2025, encompassing 224 miles of major streets and 518 miles of local and neighborhood streets. An interactive pavement project map on the City website<sup>1</sup> lets the public see the big picture.

### **Outreach**

With annual maintenance mileage totals expected to approach 10% of the 2,519-mile street network on an annual basis for the foreseeable future, concurrent with other large capital projects, resident concerns will increase around traffic delays resulting from construction work. Along with traffic impacts, the potential for utility and development conflicts has grown as more streets are maintained. DOT has refined its planning with contractors, utility companies and other jurisdictions through the inclusion of its local street pavement plan in the annual coordination process with external stakeholders. DOT will also continue to mitigate resident concerns through proactive notification, increased internal and external stakeholder coordination, presence at community meetings, and project implementation measures taken to minimize the impact of pavement maintenance activities. Resident outreach and education are critical to the successful implementation of maintenance on the local and neighborhood streets. For pavement maintenance activities to succeed, vehicles must be moved, trees trimmed, and extensive ADA ramp and concrete work performed where required.

### **Innovation**

DOT continuously researches and implements innovative solutions in areas of construction materials, use of environmentally friendly practices, and project delivery methods with a goal of increasing efficiency and providing longer lasting sustainable projects. In 2020, DOT implemented a multi-year contract as a pilot for delivering local and neighborhood streets with the goal of reducing cost, saving time, and speeding up the procurement process. DOT successfully awarded and delivered all three years of its first multi-year contract while meeting

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<sup>1</sup> City of San Jose Pavement Webpage: <https://www.sanjoseca.gov/paving>



all goals identified for the pilot project. Recognizing the proven benefits of this contractual model, DOT procured a second multi-year contract in February 2022 to prepare for three resurfacing projects in the 2022-2024 construction seasons. DOT has also been working on the third multi-year contract, which will be awarded in May 2023 to prepare for three successive resurfacing projects in the 2023-2025 construction seasons.

DOT has been using sustainable construction methods and materials on the City's roadways such as "Cold In-Place Recycling" which re-uses existing roadway asphalt to provide a strong base instead of hauling away existing material, and Rubberized Hot Mix Asphalt which is derived from recycled tires. Staff also developed a specification for the use of low-carbon concrete mix designs by establishing a global warming potential (GWP) threshold and enabling a reduced cement content, while ensuring the same concrete strength and quality. In addition, DOT specified and piloted the use of carbon dioxide (CO<sub>2</sub>) sequestration technology on concrete curb ramp projects. CO<sub>2</sub> gas is injected into fresh concrete where it mineralizes and becomes permanently trapped in the hardened concrete rather than released into the atmosphere. Sequestered CO<sub>2</sub> in concrete has been shown to increase concrete strength, thereby enabling the cement content (and carbon footprint) to be reduced further. The low-carbon mix design used was about 40% lower in GWP than a baseline mix design.

### **Equity Priority Communities (EPC)**

Although DOT has tracked equity in paving operations for several years, DOT started considering equity as a prioritization criterion for the Local and Neighborhood Pavement Maintenance program in 2022. DOT cross-referenced the selected zones with census tracts designated by MTC as "Equity Priority Communities" (EPC), formerly known as "Communities of Concern" to better track equity in service delivery. Results confirmed that 313 out of 354 miles (roughly 88%) of local and neighborhood streets designated in EPC's will be maintained by the end of 2025. DOT anticipates completing pavement maintenance for nearly 76% of the local street network in this same timeframe.

In the 2022 construction season, DOT maintained 66 miles of streets in EPC's, which is roughly 35% of the 191 miles of Local and Neighborhood Streets selected for maintenance in 2022. DOT delivered approximately 20 out of those 66 miles through one stand-alone project, which was added to the 2022 plan without impacting DOT's overall multi-year paving program. This project was funded by the savings from the 2019-2021 construction seasons through cost-effective project management, low bid prices, and aggressive project design and delivery.

Of the 161 miles of local and neighborhood streets planned for the 2023 construction season, DOT will maintain 31 miles in EPC's. DOT will continue to cross-reference with MTC's data to better track maintenance progress in EPC areas and update pavement maintenance plans annually. DOT also is also introducing a performance measure that will compare pavement condition in EPC's and non-EPC's for the local streets paving program to support and ensure equitable pavement maintenance across the City.



## **CONCLUSION**

Several funding measures introduced by elected officials and approved by the voters have resulted in a dramatic shift of street conditions in the City of San José. Since 2019, DOT has built a pavement project delivery team and implemented virtual project management software, multi-year contracts with exercised options, utilized minor contracts to increase efficiency and engage local businesses, incorporated equity as a project criterion, and used green concrete technologies to be scaled throughout the City in the thousands of curb ramps constructed each year. As a result, the City's PCI has improved from 66 to 71 in that same timeframe, bringing San José's streets up to "good" condition, meeting an initial goal of the program. While this accomplishment is worth noting, there is still much work to be done and DOT is still just halfway through the eight-year plan to maintain all local and neighborhood streets. Measure T allocations will expire after fiscal year 2027-2028, so staff will continue to express the needs required to keep streets in "good" condition, and most efficiently utilize allocated funding at any level. DOT commences the 2023 paving season with improved processes and a trained staff that will continue improving the City's street network.

## **COORDINATION**

This report has been coordinated with the City Manager's Budget Office and the City Attorney's Office.

/s/

JOHN RISTOW  
Director of Transportation

For questions, please contact Rick Scott, Deputy Director, (408) 794-1925.

**ATTACHMENTS:** A - City Streets - PCI Examples  
B - Deferred Maintenance Backlog Projection  
C - Pavement Funding Projections