



# Memorandum

**TO:** TRANSPORTATION AND ENVIRONMENT COMMITTEE

**FROM:** John Ristow

**SUBJECT:** SEE BELOW

**DATE:** February 16, 2022

Approved

Date

2/18/22

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

## **RECOMMENDATION**

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

## **EXECUTIVE SUMMARY**

The Department of Transportation (DOT) provides an annual report to the Transportation and Environment Committee regarding street pavement condition, current and projected funding levels and impact on the street network, as well as noteworthy information regarding past and future project delivery. In 2021, the citywide Pavement Condition Index (PCI) improved to a score of 68 (on a scale from 0 to 100 where 100 is a new street), funding levels remained sufficient to assure improving conditions for the next several years, and the projected maintenance backlog is expected to dramatically decrease over the next five years. With the expiration of City Measure T funding expected in fiscal year 2027-2028, the 10-year maintenance backlog is projected to increase for the first time since its passage and adoption. However, DOT's plan to maintain all local and neighborhood streets by the 2028 construction season remains on track and staff continue to innovate with new technologies, such as carbon sequestering concrete, while delivering services with an equity lens.

## **BACKGROUND**

DOT and its partners successfully maintained and rehabilitated 167 of 220 planned miles of the 2,519-mile street network in the 2021 construction season. The City's overall pavement condition improved and is currently rated overall as "Fair" with an average Pavement Condition Index (PCI) rating of 68 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. This all happened while staff continued in the second year of hybrid working procedures, established and enforced job site safety protocols for staff and contractors, navigated around parked vehicles of our residents who were at home, and continued to maintain critical infrastructure throughout the City.

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 40% 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 76, or “Good” condition. However, many years of underinvestment in the 1,552-mile Local and Neighborhood Streets Network led to continued deterioration, although the current overall PCI of 63, or “Fair” condition for these streets represents a significant improvement from the beginning of the revamped maintenance program in 2018.

### **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***

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

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.

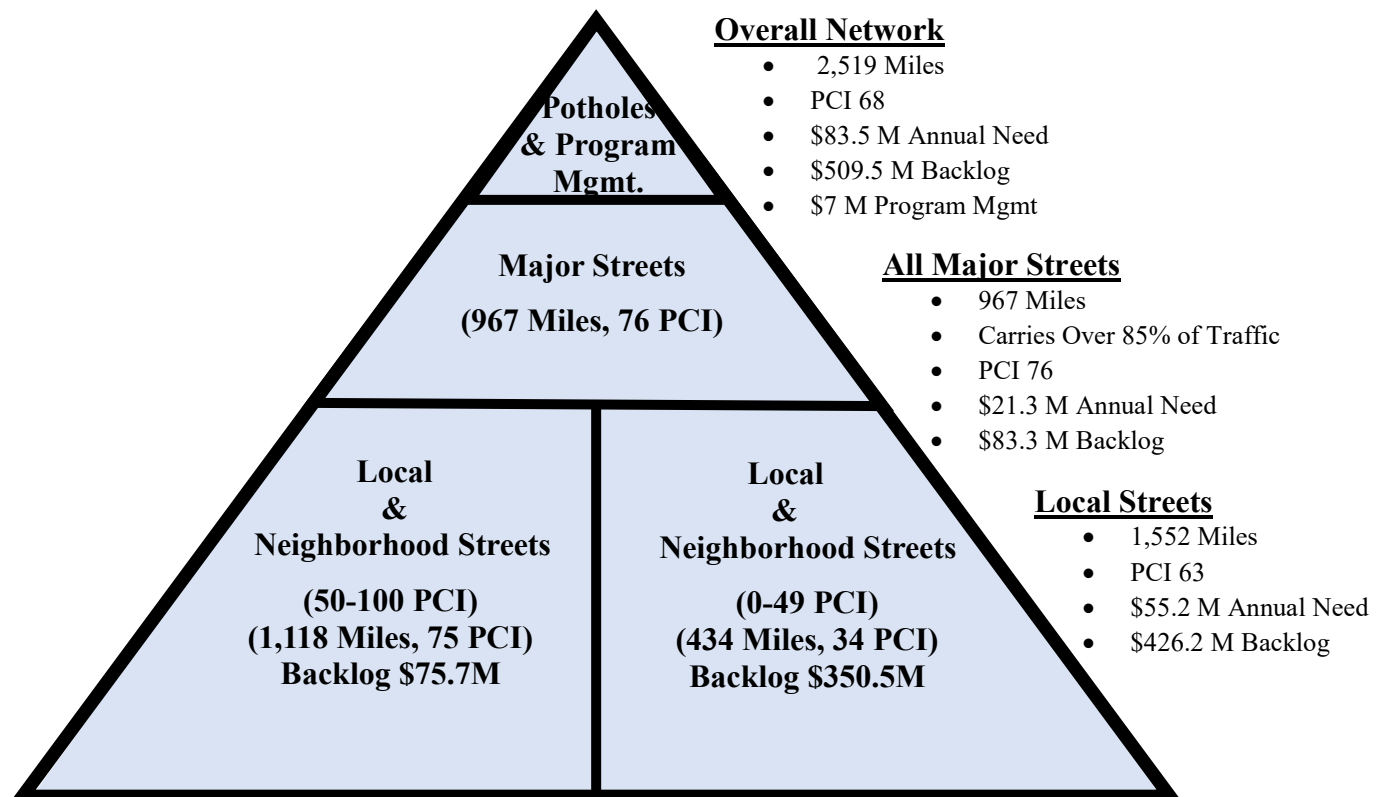
**ANALYSIS**

**Current Pavement Condition and Projections**

The current average PCI for all San José streets is 68, which is a rating of “Fair,” and has increased from the prior rating of 67. To reach and sustain "Good" condition (PCI 70), and significantly reduce the backlog of deferred maintenance, the City needs to invest \$83.5 million annually for 10 years. While average funding levels for the next ten years are estimated at approximately \$81.2 million per year and fall short of the total amount of needed funding by \$2.3 million due to the expiration of Measure T in fiscal year 2027-2028, this funding level allows for a significant reduction of the backlog and has fundamentally changed the situation from previous years where the annual shortfall was \$42.7M in 2018 and \$77.5M in 2017.

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 is rated in "Fair" condition at a PCI of 68. There is currently a backlog of one-time maintenance needs

totaling \$509.5 million and an annual overall funding need of \$83.5 million to bring and sustain the Citywide average street condition to “good” (PCI 70) over a 10-year period. This is a decrease from the \$526.4 million backlog reported last year.

- The City's 967-mile major street system is rated as "Good" with a PCI of 76. There is a one-time backlog on the major street system of \$83.3 million. Maintenance on the major streets is now fully funded at approximately \$25.1 million annually to maintain a PCI of 70.
- The City's 1,552 miles of local and neighborhood streets have a PCI of 63, a rating in the "Fair" category, which is an improvement of one point from the previous report. There is a one-time backlog on the local street system, which has decreased from 437.7 million to \$426.2 million. Of significance is that 70% of the citywide deferred pavement maintenance backlog is associated with the 434 miles in “Poor” or “Failed” condition of local and neighborhood streets.

At current and projected funding levels, the backlog of deferred pavement maintenance will decrease from the current \$509.5 million to \$298.3 million in 2026. The long-term backlog of deferred maintenance will increase to approximately \$516.1 million in 2031, an increase of \$126.8 million from last year’s projection of \$389.3 million (Attachment B) primarily caused by 85 miles of street inventory added in 2021 and the expiration of Measure T funding ending in FY 27-28. 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 increasing trend is expected to continue as the window of Measure T appropriations begins to narrow.

It is important to note that \$300 million in Measure T funds is largely responsible for the projected backlog decrease as the funds will 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 reach 70 in the coming years.

### **Current Pavement Maintenance Funding Levels and Projections**

The remaining 53 miles planned for 2021 will be delivered after winter suspension during spring 2022 because the lower temperatures and wet weather are not optimal conditions for quality paving.

Through the 2031 construction season, \$81.2 million will be enough to fully fund pothole repairs and program management at \$7 million annually. It will also fully support the \$21.3 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 2030.

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

While the additional funding will make a significant positive impact on the condition of the City’s streets and reduces the deferred maintenance backlog, it still does not fully address the City’s pavement maintenance needs in perpetuity. The investment needed for City streets to remain in the current "Fair" condition (not drop below PCI 68) is met, but there is a shortfall of \$2.3 million annually to reach and sustain "Good" condition (PCI 70). As shown in Figure 3 below, the annual average investment needed to "Get No Worse" is \$71.5 million, and to "Improve to Good" is \$83.5 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. Current	\$7 M	\$25.1 M	\$49.1 M	\$81.2 M	N/A
2. Get No Worse (68 PCI)	\$7 M	\$28.7 M	\$35.8 M	\$71.5 M	\$0 M
3. Improve to Good (70 PCI) and Sustain	\$7 M	\$21.3 M	\$55.2 M	\$83.5 M	\$2.3 M

With the increased funding, the average network PCI is expected to reach “Good” (PCI 70) by 2031 but will subsequently deteriorate as funding levels decrease when Measure T is expended. Beginning Fiscal Year 2027-2028, the expected annual budget will decrease by \$37.5 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 Street 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 191 miles of local and neighborhood streets in the 2022 construction season. DOT inspection and engineering staff have assessed these streets, formulated engineering estimates, and will bid projects in the Spring and Summer of 2022.

### **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 2021, DOT added 13 miles of bikeways and enhanced another six miles of existing bikeways.

*Figure 4 – San José Complete Street Implementation*



The pavement maintenance program also improves accessibility Citywide by building ADA curb ramps to compliance. In 2021, the program delivered over 2,143 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.

All major streets will be evaluated for safety and bicycle improvements, but of particular note and interest is that the 2022 pavement program will incorporate “quick-build” safety projects work along Vision Zero Priority Safety Corridors (such as Curtner Ave and White Rd) 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.

### **Mode Shift: Shortfall to Project Delivery**

DOT has now shifted from a resource-constrained environment to one where proper maintenance of the pavement network is nearly fully funded and expectations are higher than ever before with respect to project delivery. 2021 marked the second year of delivering Measure T funded streets and DOT successfully has delivered those projects despite the global pandemic and modified field operations of public health safety requirements. The information below describes highlights and opportunities with delivering this expanded program.

### **2021 Summary**

In 2021, DOT turned the approved transportation dollars into 33 pavement construction projects for a total of 220 miles of street maintenance and over 2,143 ADA curb ramps along the pavement corridor. DOT successfully completed 167 out of the 220 miles before suspending activities due to winter weather conditions and delays in the procurement for design consulting services but completed all ADA curb ramps for 2021. Work on these remaining miles will resume this Spring 2022.

### **Three-Year Pavement Plan (2022-2024)**

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 (2022-2024) includes 751 miles of city streets slated to be preserved or rehabilitated by the end of 2024, encompassing 218 miles of major streets and 533 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**

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<sup>1</sup> City of San Jose Pavement Webpage: <https://www.sanjoseca.gov/your-government/departments/transportation/roads/pavement>



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 will grow as more streets are maintained. DOT will work to refine its coordination 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 will be 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 started and implemented a multi-year contract as a pilot for delivering local and neighborhood streets with the goal of reducing cost, saving time, and faster procurement process. DOT and the City Attorney's Office worked together to develop the procurement/expectation language that ensures compliance with all requirements. DOT successfully awarded and delivered the first two years of the multi-year contract while meeting all goals identified for the pilot project. In 2022, DOT will be entering the last option-year with the selected low bid contractor. Recognizing the proven benefits of this contractual model, DOT also procured a second multi-year contract in February as part of delivering local and neighborhood streets.

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 is also developing a specification for the use of carbon sequestration technology on curb ramp and concrete projects. Carbon sequestered concrete is just as strong as conventional concrete but uses five percent less cement in the concrete mix. Carbon dioxide gas is injected into the cement and once the concrete hardens, it permanently traps carbon dioxide from escaping into the atmosphere.

### **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 287 out of 356 miles (roughly 80%) of local and neighborhood streets designated in EPC areas will be



maintained by the end of 2024. DOT also anticipates completing pavement maintenance for nearly 65% of the local street network in this same timeframe.

In 2022, DOT will be maintaining 66 EPC miles, which is roughly 35% of the 191 miles of Local and Neighborhood Streets selected for maintenance in 2022. DOT will deliver approximately 20 out of those 66 EPC miles through a stand-alone project, which has been added to the 2022 plan without impacting the existing 3-year plan (2022-2024). This project will be funded by the project savings from the 2019-2021 construction seasons through cost-effective project management and historically low bid prices.

DOT will continue to cross-reference with MTC's data to better track maintenance progress in EPC areas and update pavement maintenance plans annually.

## **CONCLUSION**

With lessons-learned from 2020, the DOT pavement maintenance team and its partners worked to ensure that the 2021 construction season could safely continue. The team has continued to learn about the street network as maintenance activities expand, resulting in a more accurate database that now captures miles previously unaccounted for. Although condition will continue to drive many of the maintenance decisions made by DOT staff, new datasets and methods of analysis have allowed the team to assess its performance in delivering equitable services to our residents. The coming construction season will contain the first standalone project to center on equitable distribution of maintenance as a result of these efforts. The use of the pavement story map and three-year plan dashboard have received high praise from both residents and elected officials alike while increasing public transparency and accountability. DOT will commence its third year of Measure T funded maintenance in 2022 and carries with its lessons learned that will apply both in a COVID and COVID-reduced environment. Most critically, the plan to maintain all local and neighborhood streets by the end of 2028 remains on track.

## **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