



# Memorandum

**TO:** TRANSPORTATION AND  
ENVIRONMENT COMMITTEE

**FROM:** John Ristow

**SUBJECT:** SEE BELOW

**DATE:** February 10, 2021

Approved

Date

2/18/21

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

## **RECOMMENDATION**

Accept report on Citywide pavement conditions, funding, and the planned delivery strategy.

## **BACKGROUND**

In a year with unprecedented public health and safety challenges, the Department of Transportation (DOT) and its partners successfully maintained and rehabilitated 177.5 of 206 planned miles of the 2,519-mile street network. The City's overall pavement condition improved and is currently rated overall as "Fair" with an average Pavement Condition Index (PCI) rating of 67 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 established new remote working procedures, established and enforced job site safety protocols for staff and contractors, navigated around parked vehicles of our residents who were sheltered in place, 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, but funding levels necessary to reach the goal were never obtained. 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 77, or "Good" condition. However, many years of underinvestment in

the 1,552-mile Local and Neighborhood Streets Network led to continued deterioration and the current overall PCI of 62, or “Fair” condition for these streets.

During the process of evaluating the residential street network and planning to perform maintenance on every residential segment by 2028, staff identified missing segments not included in the City’s street network inventory which resulted in an increase of 85 miles from 2,434 miles to 2,519 miles. Some of these miles are a result of developments and additions after the original build-out of the digital street network and some are attributed to discrepancies discovered after a thorough inspection of the entire street network. Of the 85 miles, 23 are within the Major Street Network and 62 are Local and Neighborhood Streets. Over the last year, City staff and a consultant added the missing miles to the current inventory and obtained PCI information to update the City’s pavement management system.

The remaining 28.5 miles planned for 2020 will be delivered after winter suspension during spring 2021 because the lower temperatures and wet weather are not optimal conditions for quality paving. In 2020, DOT started construction of two federally-funded projects that started later in the construction season due to Caltrans project compliance requirements. All Measure-T and VTA-Measure B funded streets planned for 2020 have been delivered except for a few segments that had utility conflicts scheduled to deliver in early 2021. DOT is still on track to maintain all local and neighborhood streets by 2028.

### **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.

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.

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

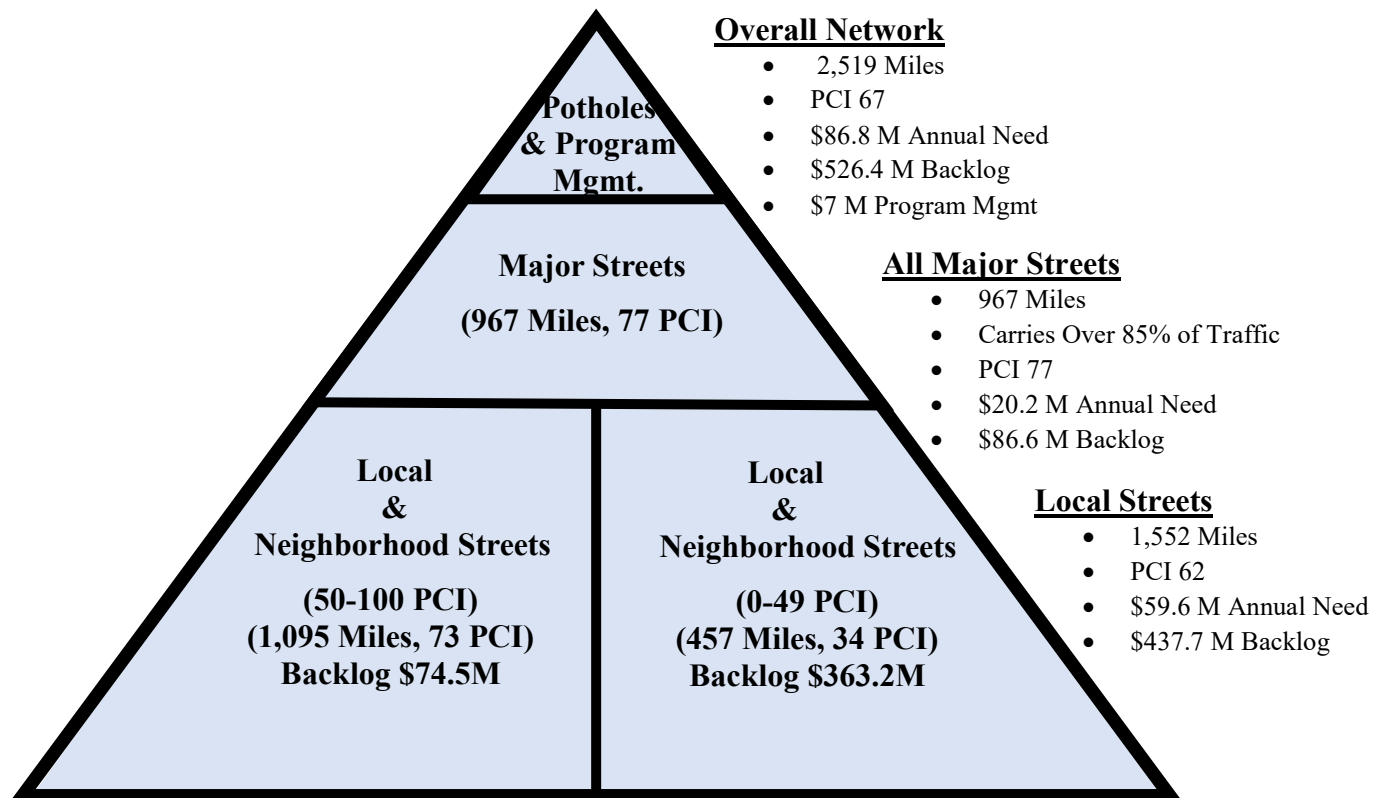
PCI Rating	PCI Categories
70 – 100	Good to Excellent
50 – 69	Fair to At Risk
25 – 49	Poor to Very Poor
0 – 25	Failed

**ANALYSIS****Current Pavement Condition and Projections**

The current average PCI for all San José streets is 67, which is a rating of “Fair,” and has increased from last year. To reach and sustain "Good" condition (PCI 70), and significantly reduce the backlog of deferred maintenance, the City would need to invest \$86.8 million annually for 10 years. While average funding levels for the next 10 years are estimated at approximately \$84.7 million per year and fall short of the total amount of needed funding by \$2.1 million, 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 67. There is currently a backlog of one-time maintenance needs totaling \$524.3 million and an annual overall funding need of \$86.8 million to bring and sustain the Citywide average street condition to "good" (PCI 70) over a 10-year period. This is lower than the \$539.7 million backlog reported last year and represents an improving trend.
- The City's 967-mile major street system is rated as "Good" with a PCI of 77. There is a one-time backlog on the major street system of \$86.6 million. Maintenance on the major streets is now fully funded at approximately \$20.2 million annually to maintain a PCI of 70.
- The City's 1,552 miles of local and neighborhood streets are rated as "Fair" with a PCI of 62. There is a one-time backlog on the local street system of \$437.7 million. Of significance is that 69% of the citywide deferred pavement maintenance backlog is associated with the 457 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 \$526.4 million to \$308.2 million in 2025. The long-term backlog of deferred maintenance will decrease to approximately \$389.3 million in 2030, an increase of \$19 million from last year's projection of \$371 million (Attachment B) caused by recently added streets to the inventory discussed earlier in the report and lower funding levels after 2028 due to Measure T being expended. This remains a dramatic improvement from the projected 10-year backlog reported in the 2017 and 2018 reports, which were estimated to reach \$1.8 billion and \$1.1 billion respectively.

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 repair 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 approach 70 by 2030.

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

In FY 2020-2021, approximately \$107.1 million in funding is available for pavement maintenance (excluding re-budgets and carry over encumbrances). This amount includes revenue from the City Construction Excise Tax, SB 1, State gas taxes, VTA regional vehicle registration fees, VTA 2016 Measure B, and the second year of City Measure T funding. It is expected that Measure T will boost annual funding by approximately \$37.5 million per year through FY 2026-2027 (2027 construction season). When accounting for ongoing, temporary and one-time funding, the 10-year average annual funding amount through FY 2029-2030 is \$84.7 million.

Through the 2030 construction season, \$84.7 million will be sufficient to fully fund pothole repairs and program management at \$7 million annually and will also fully support the \$20.2 million needed each 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 reduce 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 67) is met, but there is a shortfall of \$2.1 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 \$72.1 million, and to "Improve to Good" is \$86.8 million.

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

Funding Scenario	On-going Funding Allocation/Need				Shortfall to Achieve Scenario
	Pothole Repair & Program Mgmt	Major Streets	Local Streets	Total	
1. Current	\$7 M	\$28.1 M	\$48 M	\$84.7 M	N/A
2. Get No Worse (67 PCI)	\$7 M	\$26.8 M	\$38.3 M	\$72.1 M	\$0 M
3. Improve to Good (70 PCI) and Sustain)	\$7 M	\$ 20.2 M	\$59.6 M	\$86.8 M	\$2.1 M

With the increased funding, the average network PCI is projected to approach "Good" (PCI 70) by 2030, but will subsequently deteriorate as funding levels decrease when Measure T is expended. At that time, the expected annual budget will decrease to \$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 1,551 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 streets in poor condition 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 142 miles of local and neighborhood streets in the 2021 construction season. DOT inspection and engineering staff have assessed these streets, formulated engineering estimates, and will bid projects in the Spring and Summer of 2021. The number of miles in 2021 are slightly higher than what DOT completed in 2020, because of additional funds available mainly from project savings resulted from lower bids in 2020 compared to the Engineer's estimates. On average, resurfacing a street can be up to five times more costly than a surface preventative maintenance treatment. In 2021, about 50% of selected streets will be resurfaced, compared to 57% in 2020 and 21% in 2019.

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

In 2018, 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 street system. Both VTA 2016 Measure B and SB 1 call for complete street elements that result in safer streets with improved mobility options for grant fund eligibility. DOT incorporates 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 to provide 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. As part of the 2020 pavement maintenance program, DOT added 10 miles of new bikeways and enhanced 15 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 2020, the program delivered over 2,100 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 2021 pavement program will incorporate the fourth year of “Better Bikeway” improvements along selected corridors in the Downtown and adjacent areas to further connect the San José bike network (such as 4<sup>th</sup> St). The pavement program will also incorporate “quick-build” safety projects work along Vision Zero Priority Safety Corridors (such as Hillsdale Ave and Fruitdale 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.

### **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. 2020 marked the first year of delivering Measure T funded streets and DOT successfully has delivered all of 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.

### **2020 Summary**

With availability of VTA 2016 Measure B funds and projected revenues from City Measure T in the late winter of 2019, DOT quickly evaluated several possible delivery models to ensure the rapid deployment of new funding streams. A comprehensive nine-year plan was developed to maintain every local and neighborhood street by 2028 while keeping the major street network in good condition. In 2020, DOT turned the approved transportation dollars into 22 pavement construction projects for a total of 206 miles of street maintenance and over 2,100 ADA curb ramps along the pavement corridors. DOT successfully completed 177.5 out of 206 miles before suspending activities due to winter weather conditions, but completed all ADA curb ramps for 2020. The suspended miles are mostly on the major streets network and are part of a Federal grant project. Delays in the approval and review process led to DOT getting a late start to the project. Work on these remaining miles will resume this Spring 2021.

### **Three-Year Pavement Plan (2021-2023)**

To ensure public transparency and accountability, DOT developed a three-year look ahead that will be updated annually. The plan was first released in 2020 and 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 updated three-year plan includes 690 miles of city streets slated to be preserved or rehabilitated by the end of 2023, encompassing 234 miles of major streets and 458 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 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 year of the multi-year contract while meeting all goals identified for the pilot project. In 2021, DOT will be entering the second year of two renewal options with the selected low bid contractor. Also, DOT will plan to procure a second multi-year contract in 2021 as part of delivering local and neighborhood streets.

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



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 a more sustainable concrete mix and also 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.

### **COVID-19 Challenges and Lessons Learned**

DOT faced many challenges as a result of the global pandemic during construction season 2020. When the first shelter-in-place order was placed, DOT was in the middle of construction for five concrete projects and had to quickly develop, train, and enforce modified operating procedures for City inspectors, engineers, and contractors. DOT's top priority is to keep its employees safe, and collaborated with safety staff to ensure appropriate supplies of PPE. DOT worked with internal and external partners and council offices to coordinate construction hours and traffic restrictions. Staff modified outreach plans and collaborated with the Parking Compliance team to notify residents of imminent work by placing flyers on parked cars, delivering door hangers, and sending multiple mail notifications to minimize the impact of construction during the shelter-in-place period, and reduce incidents of towed vehicles on residents. The transition to a largely remote working environment was relatively seamless due to DOT's early adoption of a virtual project management system in 2018. The shift included placing all project documents and correspondence/communication to a cloud-based platform which allowed managing most of communications virtually while minimizing face-to-face interactions. DOT will continue to use the developed procedures in the upcoming construction season with the goal of maintaining critical transportation infrastructure to improve residents' quality of life.

### **CONCLUSION**

When the shelter-in-place order went into effect, the DOT pavement maintenance team and its partners worked tirelessly to ensure that the 2020 construction season could safely continue. In the face of challenges during the first year of delivering Measure T streets, the team adopted and modified procedures to deliver results while minimizing negative impacts on residents sheltering in place. 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. The use of the pavement story map and three-year plan dashboard have increased transparency with stakeholders and residents and chart a course to an improved street network. DOT will commence its second year of Measure T funded maintenance in 2021, and carries with it lessons learned that will apply both in a COVID and COVID-reduced environment. Most critically, the plan to maintain all residential streets by the end of 2028 remains on track. It has taken many years for the street network to deteriorate, and many more to achieve sufficient funding levels to address that challenge. Over the coming decade, the residents of San José will

see its pavement conditions continue to improve and backlogs continue to be reduced as its roads are repaired and maintained on a scale not previously seen.

### **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