



Memorandum

TO: TRANSPORTATION AND
ENVIRONMENT COMMITTEE

FROM: John Ristow

SUBJECT: SEE BELOW

DATE: February 12, 2020

Approved

Date

2-20-20

**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 2019 construction season was historic in size and scope for the City of San José, resulting in maintenance on nearly 290 miles of the 2,434-mile street network. The City's overall pavement network condition has remained steady this year and is currently rated overall as "Fair" with an average Pavement Condition Index (PCI) rating of 66 on a scale of 0-100, with 100 being a new street. Thanks to new revenue streams such as 2016 VTA Measure B, SB1, and City Measure T, pavement conditions will improve, and the maintenance backlog will decrease by the end of the new 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, 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 944-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 75, or "Good" condition. Many years of underinvestment in the 1,490-mile Local and Neighborhood Streets Network led to continued deterioration and the current overall PCI of 60, or "Fair" condition.

Due to added funding from 2016 VTA Measure B, which had previously been delayed by a lawsuit, DOT performed pavement maintenance on local and neighborhood streets in 2019 for

the first time since 2011. The passage by San José voters of Measure T, the Disaster Preparedness, Public Safety, and Infrastructure Bond Measure, which provides \$300 million for maintenance on local and neighborhood streets in the worst condition, will roll into implementation starting in the 2020 construction season. DOT has established a plan to perform maintenance on all local and neighborhood streets by 2028, while utilizing ongoing funding sources for cost effective preventive and corrective maintenance on major streets, preserving the condition of that network.

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 944 miles of major streets and one fifth of the 1,490 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

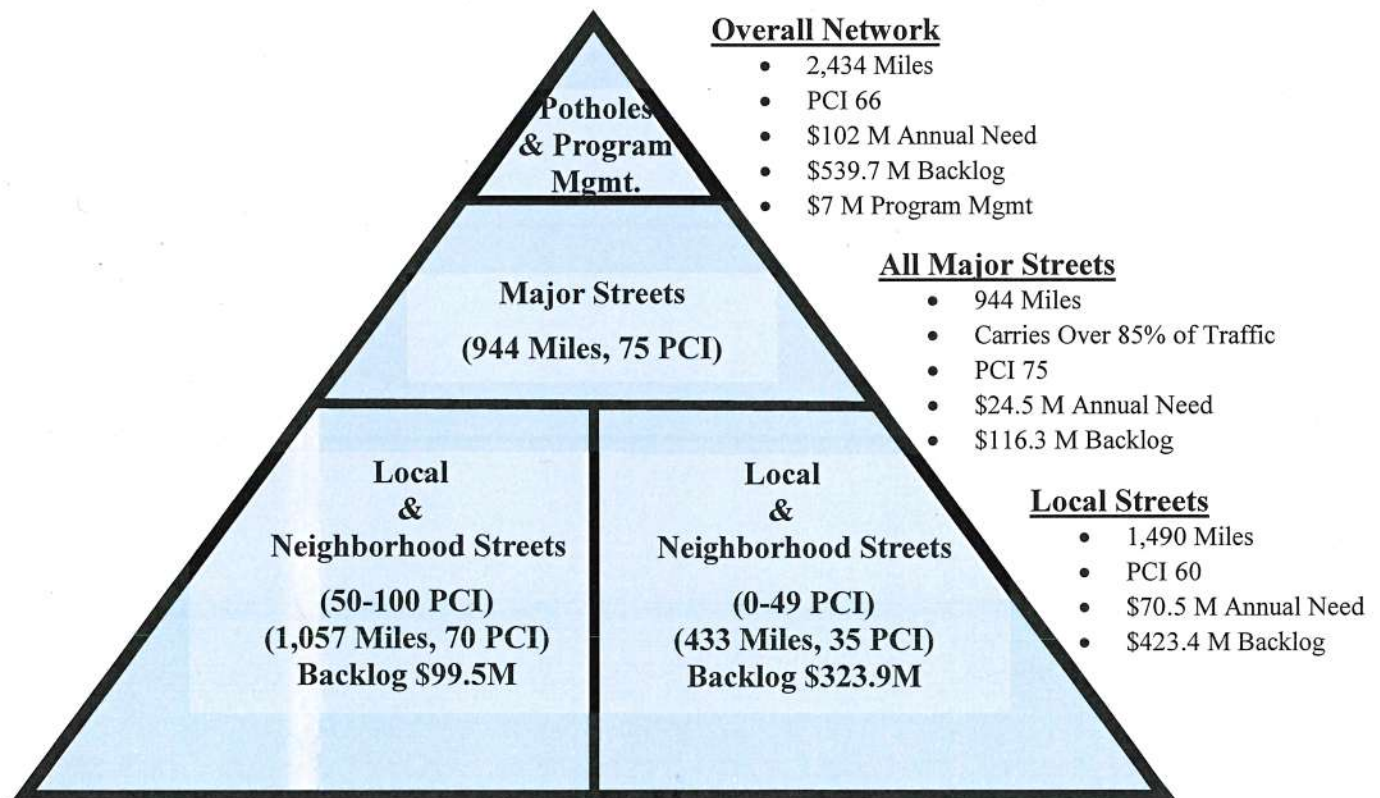
Current Pavement Condition and Projections

The current average PCI for all San José streets is 66, which is a rating of "Fair," and has not changed 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 \$102 million annually for 10 years. While average funding levels for the next ten years are estimated at approximately \$87.1 million per year and fall short of the total amount of needed funding by \$14.9 million, this

funding level allows for a significant reduction of the backlog and has fundamentally changed the situation from previous years.

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 2,434-mile street network is rated in "Fair" condition at a PCI of 66. There is currently a backlog of one-time maintenance needs totaling \$539.7 million and an annual overall funding need of \$102 million to bring and sustain the Citywide average street condition to "good" (PCI 70) over a 10-year period. This is essentially the same as the \$539.1 million backlog reported last year and represents a stabilization of the backlog.
- The City's 944-mile major street system is rated as "Good" with a PCI of 75. There is a one-time backlog on the major street system of \$116.3 million. Maintenance on the major streets is now fully funded at approximately \$24.5 million annually to maintain a PCI of 70.

- The City's 1,490 miles of local and neighborhood streets have a PCI of 60, a rating in the "Fair" category. There is a one-time backlog on the local street system of \$423.4 million. Of significance is that 60% of the citywide deferred pavement maintenance backlog is associated with the 433 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 \$539.7 million to \$395.1 million in 2024. The long-term backlog of deferred maintenance will continue to decrease to approximately \$370 million in 2029, a reduction of \$227 million from last year's projection of \$597 million (Attachment B). This is a dramatic improvement from the projected 10-year backlog reported in the 2017 report, which was estimated to reach \$1.1 billion.

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 approach 70 by 2029.

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 of 2,434 miles. City staff and consultant are in the process of identifying all missing segments to add to the current inventory and obtain PCI information. DOT will share detailed analysis on these segments in the next report.

Current Pavement Maintenance Funding Levels and Projections

In FY 2019-2020, approximately \$111.8 million in funding is available for pavement maintenance. This amount includes revenue from the City Construction Excise Tax, state gas taxes, VTA regional vehicle registration fees, VTA 2016 Measure B, a \$17.2 million one-time federal grant, and the first 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 2028-2029 is \$87.1 million.

Through the 2029 construction season, \$87.1 million will be sufficient to fully fund pothole repairs and program management at \$7 million annually. It will also fully support the \$24.5 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 1,490 miles of local and neighborhood streets will be performed by 2028.

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 66) is met, but there is a shortfall of \$14.9 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 \$78.2 million, and to "Improve to Good" is \$102 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	\$24.5 M	\$55.6 M	\$87.1 M	N/A
2. Get No Worse (66 PCI)	\$7 M	\$31 M	\$40.2 M	\$78.2 M	\$0 M
3. Improve to Good (70 PCI) and Sustain	\$7 M	\$24.5 M	\$70.5 M	\$102 M	\$14.9 M

With the increased funding, the projected average network PCI is projected to approach "Good" (PCI 70) by 2029 but will subsequently deteriorate as funding levels decrease when Measure T is expended. At that time, the expected annual budget will decrease to \$55.2 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.

Maintaining 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 nearly 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 128 miles of local and neighborhood streets in the 2020 construction season. DOT inspection and engineering staff have assessed these streets, formulated engineering estimates, and will bid projects in the Spring and Summer of 2020. The number of miles in 2020 are lower than what DOT completed in 2019, because the 2020 plan includes the zones that are in the worst overall condition that are more costly to rehabilitate. On average, resurfacing a street can be up to five times more costly than a surface preventative maintenance treatment. In 2020, about 57% of selected streets will be resurfaced, compared to 21% in 2019.

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 enhance existing or install new bike lanes, and upgrade 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 2019, DOT added 15 miles of bikeways and enhanced another 18 miles of existing bikeways as part of the pavement maintenance program.



The pavement maintenance program also improves accessibility Citywide by building ADA curb ramps to compliance. In 2019, the program delivered over 2,400 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.

Of particular note and interest is that the 2020 pavement program will incorporate the third year of “Better Bikeway” improvements along selected corridors in the Downtown and adjacent areas to further connect the San José bike network. Notable streets planned for the third year of Better Bikeways improvements include: 10th Street, 11th Street, and San Antonio Street. The pavement program will also incorporate “quick-build” safety projects work along Vision Zero Priority Safety Corridors (such as Senter Road, McLaughlin Avenue and Fruitdale Avenue) 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, add pedestrian refuge areas to reduce traffic exposure, and to slow turning movements to provide maximum opportunity for drivers to yield to pedestrians.

The Road Ahead

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. The information below describes highlights and opportunities with delivering this expanded program.

Year One 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 2019, DOT turned the approved transportation dollars into 12 pavement construction projects for a total of 277 miles of street maintenance while completing a further 12 miles of streets from 2018 projects that had been suspended due to winter weather conditions. All projects were successfully completed before the winter suspension for the first time in recent history which also included the installation of over 2,400 ADA curb ramps along the pavement corridors. Using an online platform, DOT coordinated with all internal and external stakeholders and incorporated complete street features such as protected bike lanes, video detection at signalized intersections, and road reconfigurations. The total number of miles delivered in 2019 were roughly three times more than the miles delivered in 2018 and ten times more than 2013.

Three-Year Pavement Plan (2020-2022)

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 first three-year plan includes 635 miles of city streets slated to be preserved or rehabilitated by the end of 2022, encompassing 213 miles of major streets and 422 miles of local and neighborhood streets. An interactive pavement project map on the City Website¹ lets the public see the big picture.

Outreach

With annual maintenance mileage totals expected to approach 10% of the 2,434-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 2019, DOT ensured that the City of San José was the first Bay Area city to adopt a modified specification for production and placement of asphalt called “SUPERPAVE” which was initially implemented by Caltrans in 2015 to improve durability and performance. DOT and DPW materials experts determined that the local adoption of this specification would result in increased service life and reduced maintenance costs over the life of the pavement. DOT and DPW collaborated with local producers, contractors, and trade associations, to tailor the SUPERPAVE specification for San José and incorporate it for resurfacing work.

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

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

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.

In addition to innovations in materials and construction methods, DOT interviewed staff from other City departments, contracting experts, and other jurisdictions to explore ways of procuring longer-term maintenance contracts with the goals of increasing efficiency, reducing cost, and ensuring more consistent construction quality. In 2020, DOT is planning to pilot a procurement method to meet these goals with one or more projects. If the pilot is successful, DOT plans to transition more projects to the new procurement process that will be more aligned with three-year maintenance cycles.

CONCLUSION

The City has entered a new decade with a markedly upgraded outlook for its street network, which will result in improved conditions, a reduced maintenance backlog, and project delivery on a scale not seen in some time by residents. The 2019 construction season was a great success, and provided valuable insights and lessons learned as the City begins its first year of Measure T fund expenditure on its local and neighborhood street network in 2020. City and local leaders have been instrumental in this process and in addition to securing and advocating for more funding, have been strong partners in the outreach and education of residents and stakeholders. While the expansion of the pavement program happened quickly, DOT has continued to invest in its people, improve its processes, respond to the needs and concerns of the public, and proactively plan its work in order to maximize the opportunity provided by the new and needed funding.

COORDINATION

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

/s/

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Director of Transportation

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

Attachments