CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Office of the City Auditor

Report to the City Council
City of San José

STREET PAVEMENT MAINTENANCE: ROAD CONDITION IS DETERIORATING DUE TO INSUFFICIENT FUNDING

Report 15-02
February 2015

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Office of the City Auditor
Sharon W. Erickson, City Auditor

February 20, 2015

Honorable Mayor and Members
Of the City Council
200 East Santa Clara Street
San José, CA 95113

Street Pavement Maintenance: Road Condition Is Deteriorating Due to Insufficient Funding

The City of San José (City) is responsible for maintaining the largest municipal road network in northern California with about 2,400 miles of roads. Sixty percent of San José streets show significant distresses and are worn to the point where expensive repairs may be needed. On a scale from 0 to 100, the overall Pavement Condition Index (PCI) was 63 – a ■ fair rating.

San José's pavement condition has been declining over the last decade. More and more streets fall into the worst condition categories. In 2014, ■ poor and ■ failed roads together made up 23 percent of San José's 2,400-mile network.

■ Fair Pavement

6th Street at St. James Street (District 3), PCI 62,
last maintenance in 2005
Source: Auditor photograph, January 2015

■ Failed Pavement

Wilsham Drive (District 4), PCI 18,
last maintenance in 1997
Source: Auditor photograph, November 2014

On opinion surveys, residents consistently give street repair low marks. In 2014, only 28 percent of San José residents rated street repair as "good" or "excellent" – the lowest rating of any City service.

San José's current pavement condition is a result of chronic underfunding of road maintenance. Pavement must be treated preventively every 7 to 10 years to maintain its quality. San José has regularly missed this target due to insufficient funding. Only 38 percent of San José streets received maintenance within the last 10 years.

Without additional funding, San José's roads will continue to deteriorate. At current funding levels, the overall PCI will drop to ■ poor in 10 years. Thirty-eight percent or 900 miles of pavement are currently on the verge of deteriorating from ■ fair to ■ poor in just a few years.

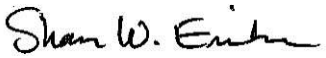
To eliminate the backlog of ■ poor and ■ failed roads (as well as those past the target 10-year maintenance cycles), the Department of Transportation (DOT) estimates it would need $504 million in one-time funding. To raise the average pavement condition to ■ good (from a PCI score of 63 to 70) in the next 10 years, DOT would need $104 million annually. We reviewed these cost estimates and found them to be reasonable. In recent years, actual funding ranged from $15 to $30 million per year – far short of DOT's estimated need.

San José relies heavily on state gasoline taxes, federal grants, and one-time sources of aid. Other California cities, too, have experienced challenges in funding pavement maintenance, but many relied on a wider variety of funding sources including general fund monies and sales tax revenues.

We recommend the City identify a sustainable, predictable funding stream to maintain roads annually, and develop a multi-year plan to use one-time funding to bring the road network up to ■ good condition by addressing maintenance backlogs and reconstructing ■ poor and ■ failed streets. In addition, DOT should deploy technology improvements for its field inspectors, improve public information, and document its procedures for projecting future funding needs.

This report includes four recommendations. We will present this report at the March 2, 2015 meeting of the Transportation and Environment Committee. We would like to thank the Department of Transportation for the time and insight during the audit process. The Administration has reviewed this report and its response is shown on the yellow pages.

Respectfully submitted,



Sharon W. Erickson
City Auditor

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SE:lg

Audit Staff: Jazmin LeBlanc
Minh Dan Vuong

cc: Hans Larsen
Norberto Dueñas
Dave Sykes
Jim Ortbal
Rick Doyle
Jennifer Maguire
Kevin O'Connor
Jon Calegari
Noe Veloso
John Burchfiel

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Introduction

The mission of the City Auditor's Office is to independently assess and report on City operations and services. The audit function is an essential element of San José's public accountability and our audits provide the City Council, City management, and the general public with independent and objective information regarding the economy, efficiency, and effectiveness of City operations and services.

In accordance with the City Auditor's fiscal year (FY) 2014-15 Audit Work Plan, we have completed an audit of the Department of Transportation's pavement maintenance program.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. We limited our work to those areas specified in the "Audit Objective, Scope, and Methodology" section of this report.

The Office of the City Auditor thanks the management and staff from the Department of Transportation, Public Works Department, City Attorney's Office, and City Manager's Office for their time, information, insight, and cooperation during the audit process.

Background

The Department of Transportation (DOT) is responsible for maintaining the City of San José's (City) road network – the largest municipal network in northern California with about 2,400 miles of roads.[1] This network is among the City's most valuable assets, estimated at $4.2 billion to replace, and provides the foundation for the City's economy. Trucks, buses, and bicyclists use the City's roads, in addition to motorists.

DOT distinguishes among 540 miles of "priority streets," 400 miles of "other major streets," and 1,470 miles of "residential streets."

[1] San José measures the size of its street network in units of "30-foot equivalent miles:" an area equivalent to 30 feet width and 1 mile length. In some jurisdictions, pavement is measured in center line miles, which ignore the width of the road, or in lane miles, which are 10 to 12 feet wide and 1 mile long. San José has 1,900 center line miles or 4,200 lane miles.

Nearly all of the City's roads are made of asphalt, or asphalt over Portland cement concrete. These types of road construction are common across the country and provide a smooth, high-quality roadway, but require maintenance every 7 to 10 years in order to stay in good condition. Roads deteriorate because of age, weather, and especially use – particularly from heavy trucks.

Exhibit 1 shows roads undergoing maintenance; pictured are a preventive slurry seal and an asphalt overlay (a more involved maintenance treatment for more deteriorated roads).

Exhibit 1: Maintenance Types

Preventive Maintenance – Slurry Seal: Applying a thin layer of sealing material to preserve existing pavement.

Leigh Avenue at Curtner Avenue (District 6)
The far lane is receiving a slurry seal; the closest lane was already slurry sealed. The center lanes have not yet been sealed.

Overlay: Adding a layer of new asphalt on top of existing, distressed pavement.

Berryessa Road between Capitol Avenue and Piedmont Road (District 4)
Construction in the left lane to add an asphalt layer on top of the existing surface. The right lane already received an overlay.

Source: Auditor photographs, October 2014

Asphalt needs maintenance treatments in order to stay useful, but with these treatments, roads can last for decades. Preventive maintenance, including sealing

the pavement surface, can prevent water from penetrating the pavement structure and helps control the effects of oxidation, surface cracks, and raveling (the dislodging of aggregates in the asphalt mix).

Identifying Road Condition Using the Pavement Condition Index (PCI)

San José assesses its pavement condition using a Pavement Condition Index (PCI) score, on a 0 to 100 scale. It is based on rating procedures developed by the US Army Corps of Engineers in the 1970s and described in ASTM Standards.[2]

PCI scores provide a quick way to understand the overall quality of pavement, and are used to determine which type of pavement treatments would be effective for a given road segment, as shown in Exhibit 2. Maintenance costs can vary depending on the severity of distresses identified and type of road being maintained: Corrective repairs are more expensive than preventive maintenance and more heavily traveled arterial roads are generally more expensive to maintain than residential streets.

Exhibit 2: Pavement Condition Index Descriptions

Pavement Condition Index (PCI)	Description	Effective Maintenance
Excellent or Very Good PCI 80 to 100	Newly constructed or resurfaced pavement with few signs of distress	Little to no maintenance required. May require crack sealing.
Good PCI 70 to 79	Pavement shows only low levels of distress	Mostly preventive maintenance such as slurry sealing, crack sealing, and microsurfacing. $3 to $5 per square yard.
Fair PCI 60 to 69	Pavement is significantly distressed. See cover letter for photo.	Dig-outs and preventive maintenance: slurry sealing or microsurfacing. $7 to $9 per square yard.
At Risk PCI 50 to 59	Deteriorated pavement	More extensive dig-outs along with seal and microsurfacing treatments. May require resurfacing. $9 to $13 per square yard.
Poor PCI 25 to 49	Pavement shows extensive distress. See Exhibit 14 for photo example.	Requires major rehabilitation with resurfacing. From about $25 to $45 per square yard.
Failed PCI 0 to 24	Extremely rough pavement. See cover letter for photo.	Needs complete reconstruction. $90 to $125 per square yard.

Source: Metropolitan Transportation Commission and 2014 Department of Transportation cost estimates

[2] ASTM International is an organization that develops technical standards. In its Standard concerning the pavement condition index, it describes various types of damage and field survey methods to determine PCI.

Optimizing Maintenance through Use of a Pavement Management System

Industry best practices recommend using a pavement management system (PMS) to optimize strategies for maintaining pavement. Pavement management systems include these five key components:

- *Pavement Condition Surveys*. San José uses a contractor to annually survey pavement condition in the field. This includes sampling about 30 percent of San José's 11,000 street segments each year. A contractor takes photos of each segment and describes the types of distress and severity found in the segments; the software then calculates a score for each road segment. The Metropolitan Transportation Commission (MTC) provides training to ensure quality and consistency across jurisdictions.
- *Database containing all related pavement information*. San José uses the MTC's *StreetSaver* software to gauge pavement conditions and identify appropriate treatments. All 109 Bay Area jurisdictions use StreetSaver.
- *Analysis scheme*. Analysis schemes are the algorithms used to interpret the data in a database in a meaningful way.
- *Decision criteria*. These are the criteria used to guide pavement management decisions. These criteria are also incorporated into StreetSaver.
- *Implementation procedures*. These are the methods used to make management decisions about which roadway sections to improve and when.

DOT uses a comprehensive pavement management system, using the MTC's StreetSaver program.

Types of Maintenance

For preventive maintenance, DOT applies surface seals to streets in ■ excellent to ■ fair condition. These treatments, including slurry sealing and microsurfacing, extend the useful life of the pavement.

DOT also resurfaces streets, which includes repairing any underlying damage and applying a new layer of rubberized asphalt (with or without first removing the old top layer of asphalt).

For a few streets in particularly poor condition, DOT has experimented with cold-in-place recycling (CIR) techniques: Milling the deteriorated asphalt, rejuvenating it, and replacing it in one continuous process. CIR can lower costs, construction impacts, and environmental impacts. San José has been recognized for its CIR projects by the Greenroads Foundation and the International Pavement Management Association.

City Staff Organization

Pavement maintenance staff is housed within DOT. Overall, the department had 406 full-time equivalent (FTE) authorized positions and operating expenditures of nearly $73 million and authority over special funding and capital improvement programs of approximately $178 million in FY 2013-14. In addition to pavement maintenance, DOT is responsible for traffic maintenance and operations, storm drains, sanitary sewers, street landscapes, on- and off-street parking, and for planning and managing projects including the BART extension to San José.

The City's Pavement Maintenance staff, described in Exhibit 3, is housed within the Infrastructure Maintenance Division of DOT.

Exhibit 3: Pavement Maintenance Staff

Staffing	Responsibilities	Funding source
7 engineers	Program management, planning construction	Capital budget (gasoline tax revenue)
6 inspectors	Prepare for and oversee construction	Capital budget (gasoline tax revenue)
17 FTE maintenance workers	Pavement-related repairs – involving concrete or heavy equipment	Capital budget (gasoline tax revenue)
3 FTE maintenance workers	Pothole and corrective repairs	Operating budget (General Fund) and capital budget (gasoline tax revenue)

Source: Department of Transportation and Auditor analysis

Seven engineers manage the overall pavement program and plan construction projects. Contractors, who bid competitively for the City's work, provide raw materials and carry out construction work. Six DOT inspectors prepare for and oversee construction in the field.

The City ended its in-house residential street sealing in FY 2011-12, but still has about three FTE maintenance workers to make small safety-related repairs, such as filling potholes, funded mainly by the General Fund. In addition, about 17 FTE maintenance workers carry out other pavement-related repairs that are more extensive than pothole repairs. The Public Works Department facilitates procurement and operates a laboratory to test the quality of construction and pavement conditions for roadwork in process.

Audit Objective, Scope, and Methodology

Our audit objective was to assess the street pavement's current condition and to evaluate DOT's projections of its funding need. Our audit scope included DOT's pavement maintenance program, but excluded pothole repair and sidewalks. Our methodology included:

- To understand pavement maintenance practices, we interviewed DOT staff, industry experts, and pavement maintenance staff from other jurisdictions. We further reviewed industry publications and DOT's prior reports to the City Council.[3]
- To assess the pavement condition, we gained an understanding of PCI scores and distress types, reviewed the field surveyor's data collection and processing methods, gained an understanding of the *StreetSaver* software, summarized and analyzed PCI and maintenance records, carried out field observations, and documented the funding history. We performed limited reliability testing of 2014 PCI data and standard reports in *StreetSaver* and found them sufficiently reliable for our audit purposes. We did not audit PCI scores prior to 2014.
- To validate DOT's projections of its funding needs as described in this report, we analyzed DOT's methodology, parameters, and assumptions.
- We made limited condition, funding, and maintenance comparisons to other jurisdictions, including: Fremont, Los Angeles, Sacramento, San Diego, San Francisco, and Sunnyvale, by interviewing their agencies' staff, reviewing public reports, and/or reviewing their maintenance and condition reports.
- To understand management controls over construction and condition assessments, we observed and interviewed DOT inspectors at a construction site, laboratory staff at Public Works, and the field survey consultant.

[3] The City Council held a study session on October 12, 2010: http://www.sanjoseca.gov/clerk/Agenda/20101012/20101012mm.pdf

Since then, key DOT reports to the City Council included:

October 25, 2011: http://www3.sanjoseca.gov/clerk/Agenda/20111025/20111025_0601.pdf

March 27, 2012: http://www3.sanjoseca.gov/clerk/Agenda/20120327/20120327_0602.pdf

March 5, 2013: http://sanjoseca.gov/DocumentCenter/View/12270

April 16, 2014 information: https://www.piersystem.com/external/content/document/1914/2145209/1/04-16-14DOT.PDF

December 12, 2014 information: http://www.piersystem.com/external/content/document/1914/2435642/1/12-12-14DOT.PDF

January 20, 2015 study session: http://sanjoseca.gov/DocumentCenter/View/39359

Finding I Road Condition Is Deteriorating Due to Insufficient Funding

Summary

Sixty percent of San José streets show significant distresses and are worn to the point where expensive repairs may be needed. On a scale from 0 to 100, the overall Pavement Condition Index (PCI) was 63 – a fair rating.

San José's pavement condition has been declining over the last decade. In 2014, poor and failed roads together made up 23 percent of San José's 2,400-mile network. On opinion surveys, residents consistently give street repair low marks. In 2014, only 28 percent of residents rated street repair as "good" or "excellent" – the lowest rating of any City service.

Current pavement conditions are a result of the City chronically underfunding road maintenance. Experts agree that pavement must be treated every 7 to 10 years to maintain its quality. San José has consistently been missing this target due to insufficient funding. Only 38 percent of San José streets received maintenance within the last 10 years.

To eliminate the backlog of poor and failed roads (as well as those past the target 10-year maintenance cycles), DOT estimates it would need $504 million in one-time funding. To raise the average pavement condition to good (from a PCI score of 63 to 70) in the next 10 years, DOT would need $104 million annually. We reviewed these cost estimates and found them to be reasonable, based on the methodology and assumptions. In recent years, actual funding ranged from $15 to $30 million per year, far short of DOT's estimated need.

San José relies heavily on state gasoline taxes, the county vehicle registration fee, and local development taxes to fund pavement maintenance. In addition, DOT has occasionally secured one-time grants, such as from the Recovery Act. Other California cities, too, have experienced challenges in funding pavement maintenance, but many relied on a wider variety of funding sources including general fund monies, sales tax revenues, or bonds.

Without additional funding, San José's roads will continue to deteriorate. Thirty-eight percent or 900 miles of pavement are on the verge of deteriorating from fair to poor in only a few years.

We recommend the City identify a sustainable, predictable funding stream to maintain roads annually, and develop a multi-year plan to use one-time funding to bring the road network up to good condition by addressing maintenance backlogs and reconstructing poor and failed streets. In addition, DOT

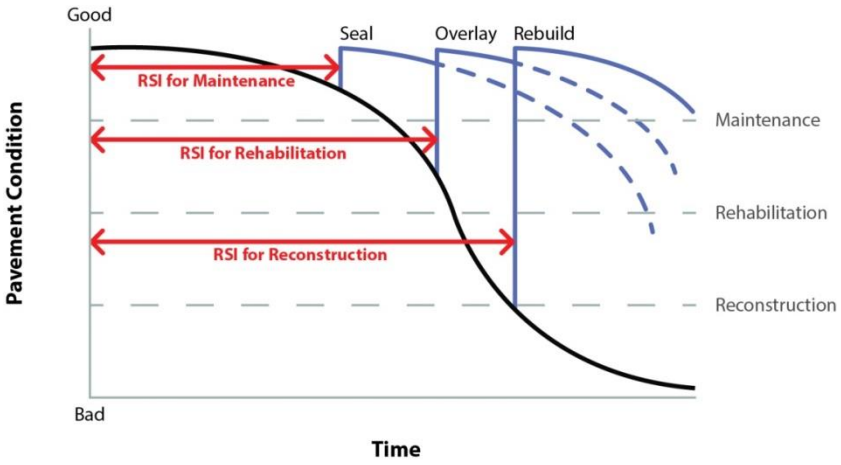
should deploy technology improvements for its field inspectors, improve public information, and document its procedures for estimating future funding needs.

Average Pavement Condition in San José Is Only Fair

San José's pavement, on average, is in fair condition. In December 2014, San José's Pavement Condition Index (PCI) was 63, averaged over the entire network of 2,400 miles. Without maintenance treatments applied soon, the typical roadway will quickly fall into poor condition.

Pavement does not deteriorate uniformly over time. Pavement has been extensively studied in university settings as well as by state engineers and the US Army Corps of Engineers. Engineering studies have found that pavement deteriorates along a sigmoidal curve, as shown in Exhibit 4. Pavement quality stays high for many years before quickly dropping to poor condition and then slowly continues to deteriorate.

Exhibit 4: Pavement Deterioration Curve



RSI = remaining service interval

Source: http://www.pavementinteractive.org

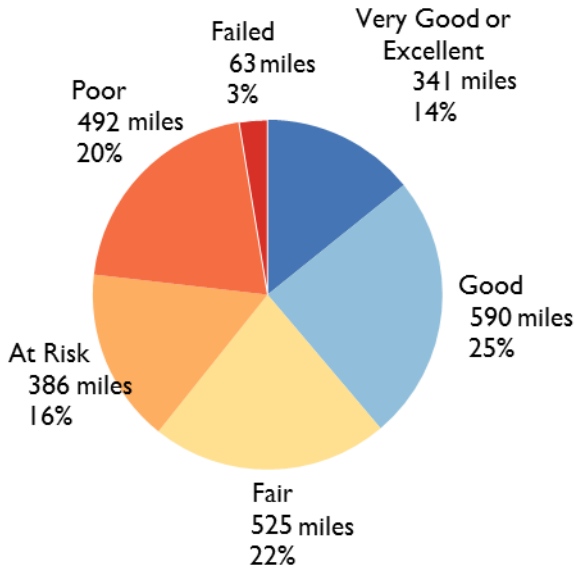
38 Percent of the City's Pavement Is on the Brink of Rapid Deterioration

As Exhibit 4 indicates, there is a critical period when pavement deteriorates rapidly, moving from requiring relatively low-cost maintenance to requiring high-cost fixes. According to DOT, this period – when pavement deteriorates rapidly – is generally when pavement is ranked in the fair and at-risk categories, with PCI scores ranging from 50 to 69. Pavement in these categories can move, as the curve above indicates, from nearly good condition (PCI 70) to poor condition (PCI 49 and below) in just a few years if treatments are not applied.

This is not just a matter of aesthetics; it is also a matter of cost. It is 3 or 4 times more expensive to restore pavement with a PCI score of 49 than 69.

As of December 2014, 38 percent of the pavement was in fair or at-risk condition – meaning that within a few years San José can expect those roads to drop to poor condition and require 3 to 4 times the funding to restore them than they would cost now. Exhibit 5 shows a breakdown of San José's network by condition category.[4]

Exhibit 5: Pavement Condition by Category (December 2014)



In 30-foot-wide miles and as percentage of 2,400 miles.

Source: Auditor analysis of StreetSaver data as of December 2014.

No Neighborhood Is Immune

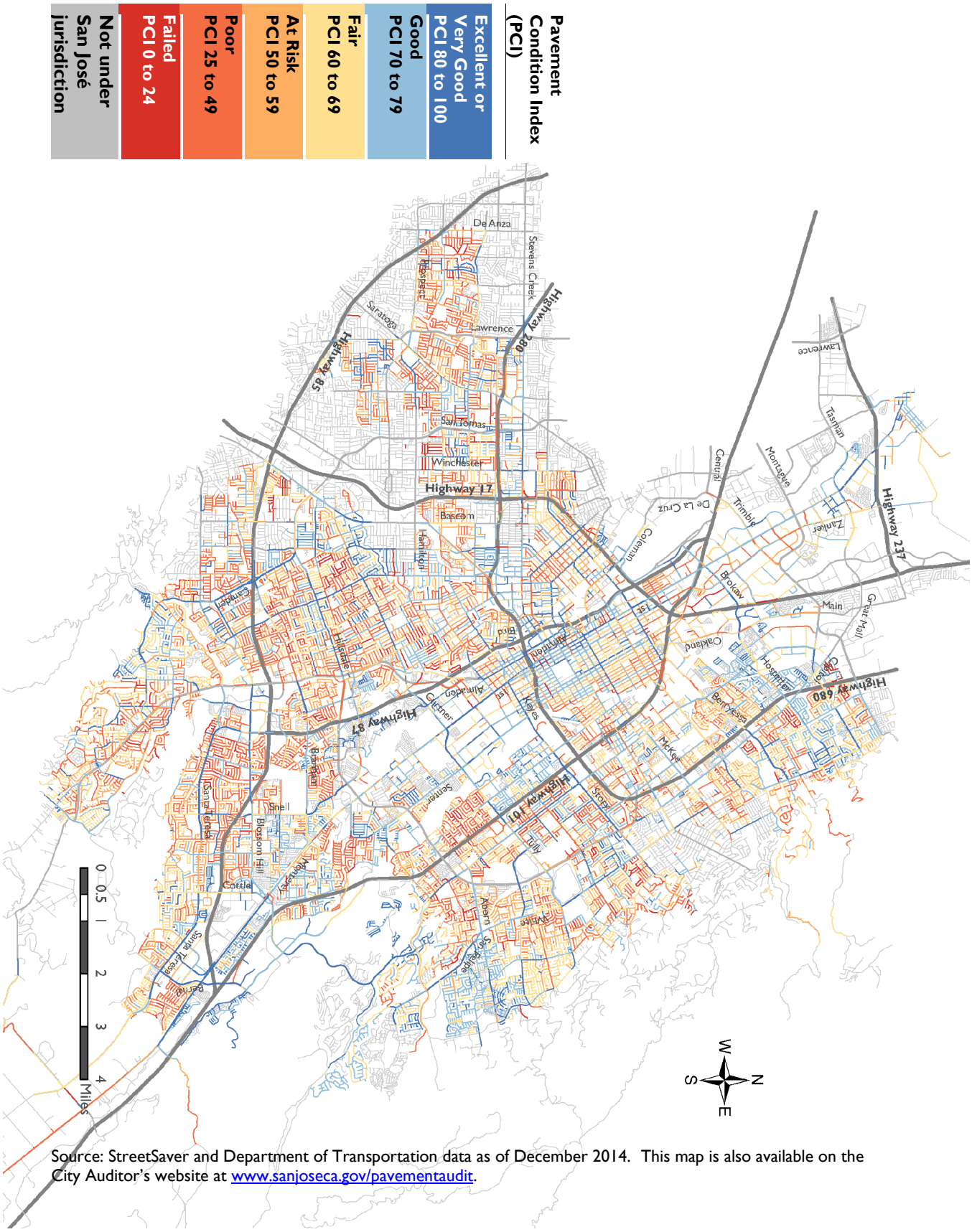
As shown above, almost a quarter of the network was already in poor or failed condition, as of December 2014. Failed streets can be difficult and dangerous to drive on. Furthermore, failed streets have deteriorated to the point where they are visibly damaged, but more fundamentally, the underground layers of the roadway are damaged and in need of reconstruction.

The map in Exhibit 6 shows the pavement condition of each San José street as of December 2014. No neighborhood is immune; there are poor and failed streets spread across the entire city and many more at risk or in fair condition.

This map is also available on the City Auditor's website at www.sanjoseca.gov/pavementaudit.

[4] We found these December 2014 scores to be reasonable based on field surveys in 2013 and 2014 covering 82 percent of the network; both DOT and the contracted field surveyor had data quality controls in place.

Exhibit 6: Street-by-Street Map of Pavement Condition (December 2014)

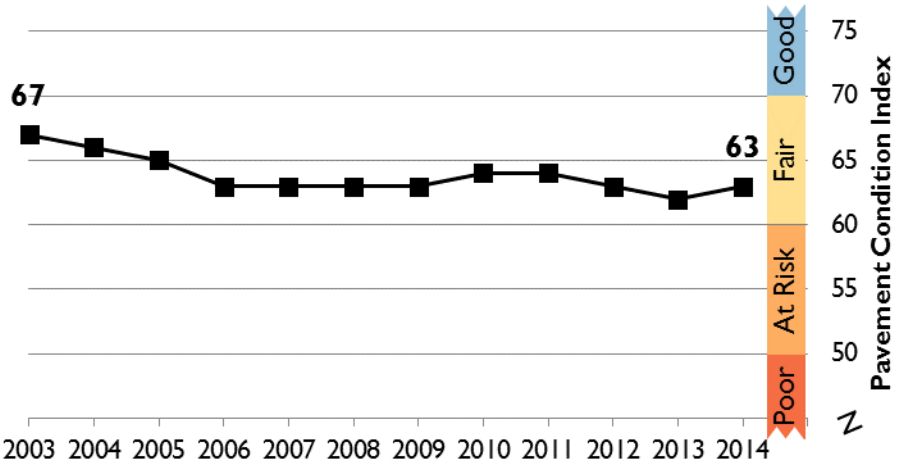


Source: StreetSaver and Department of Transportation data as of December 2014. This map is also available on the City Auditor's website at www.sanjoseca.gov/pavementaudit.

Pavement Condition Is Getting Worse

San José's pavement condition has been declining over the last decade: In 2003, San José reported a PCI of 67. By December 2014, the network average had dropped four points, as shown in Exhibit 7.

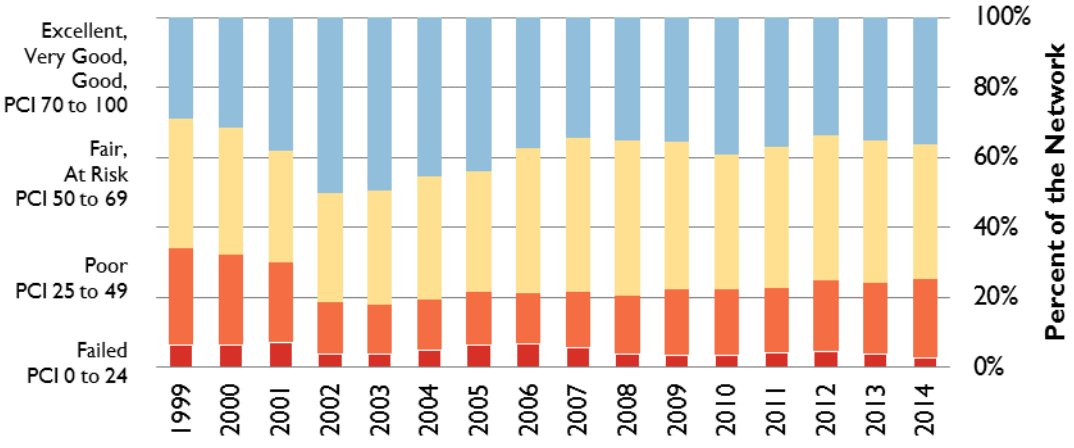
Exhibit 7: Pavement Condition Deteriorated Since 2003



Sources: Metropolitan Transportation Commission 3-year moving average for 2003-2013; 2008 extrapolated; StreetSaver data as of December 2014.

The average masks the extremes. In 2003, for example, half the network was in ■ good or ■ very good condition, but now good and very good pavement make up just 39 percent of the network. In 2003, ■ poor and ■ failed roads together made up only one fifth of San José's 2,400-mile network, but by 2014 they had crept up to 23 percent, as seen in Exhibit 8.

Exhibit 8: Pavement Condition Breakdown Since 1999

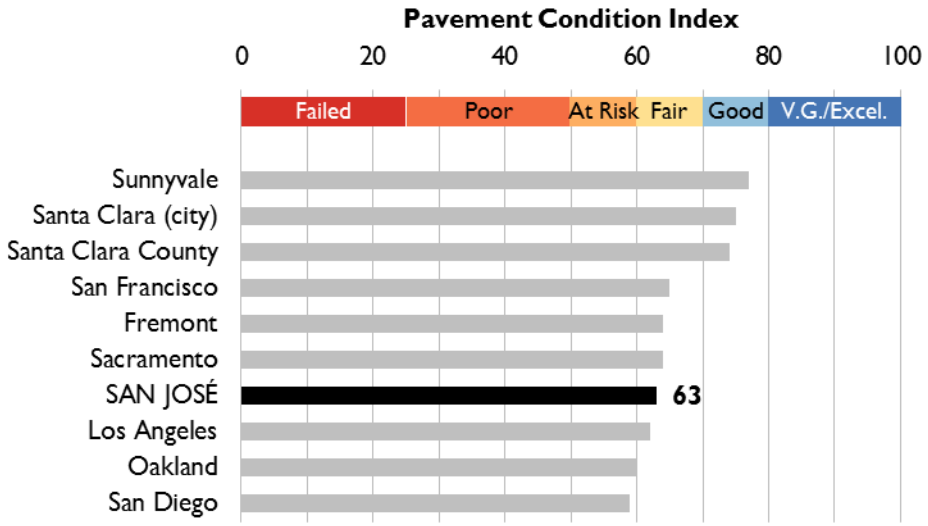


Source: StreetSaver report "Condition Categories by Year"

San José's Pavement Condition Is Worse Than Many Other Cities'

San José's pavement condition ranked in the bottom third of 109 Bay Area jurisdictions, according to a report from the Metropolitan Transportation Commission (MTC), which has published annual condition and need summaries for the Bay Area composed of nine counties. San José's rank in comparison to selected California jurisdictions is shown in Exhibit 9.[5]

Exhibit 9: Pavement Condition, Comparison to other Cities



3-year moving average for 2013; San José: December 2014; San Diego: Overall Condition Index 2012 estimate; Los Angeles: 2014; Sacramento: Pavement Quality Index 2013.

Sources: Metropolitan Transportation Commission, staff reports from Sacramento and San Diego, Los Angeles Controller's audit.

San José Is Far Behind in Preventive Maintenance

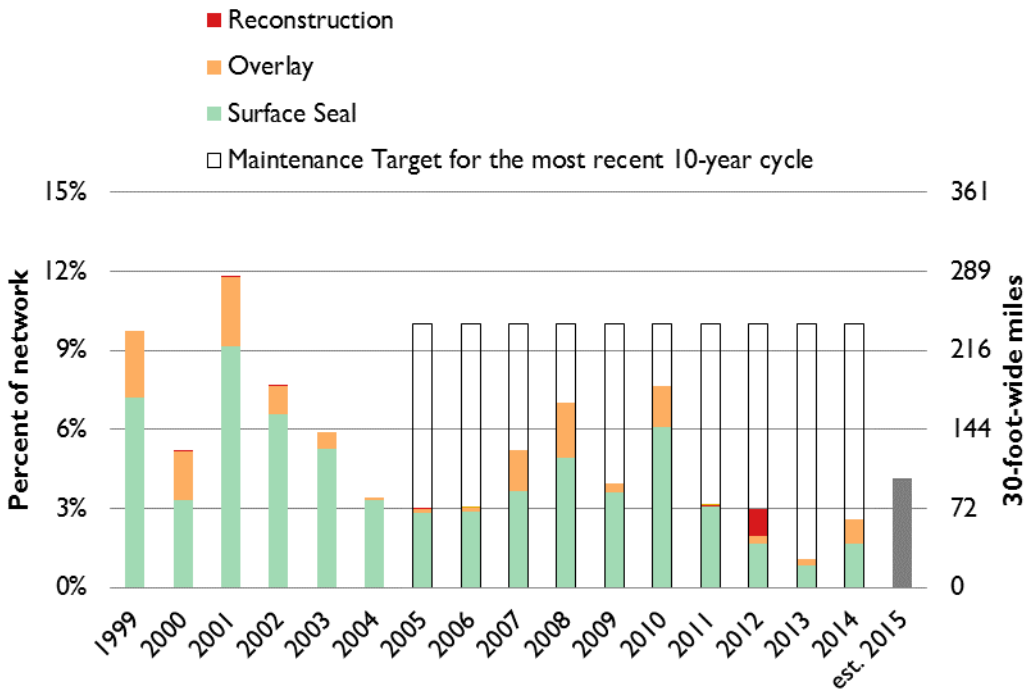
Today's pavement condition is a result of chronic underfunding of pavement maintenance. DOT's goal is to maintain each street every ten years, adopted from pavement industry practices.[6] Industry experts agree that preventive maintenance of applying seals or resurfacing the top layer of asphalt every 7 to 10 years can extend the overall lifespan of the pavement. Skipping regular preventive maintenance leads to cracks in the pavement, which over time destroy the surface and the base. Then it becomes much more expensive to repair ■ poor or ■ failed pavement, because overlays, reconstruction, or rehabilitation are needed.

[5] For further comparisons, see our Appendix B or see the 2014 Metropolitan Transportation Commission's "Street Fight" Report at http://www.mtc.ca.gov/news/street_fight/.

[6] For arterial streets, DOT's goal is to maintain them every 8 years.

In the 16-year period we reviewed, San José never met the goal of 10-year maintenance intervals due to insufficient funding. In 2014, DOT was able to maintain only 63 miles of pavement or less than 3 percent of the overall network, as shown in Exhibit 10. This falls far short of the 240 miles or 10 percent needed to attain a 10-year cycle. Funding and maintenance levels fluctuated over the last ten years, but not in a single year did DOT come close to meeting the goal.

Exhibit 10: Maintenance Levels Since 1999 Fell Short of the 10-Year Goal

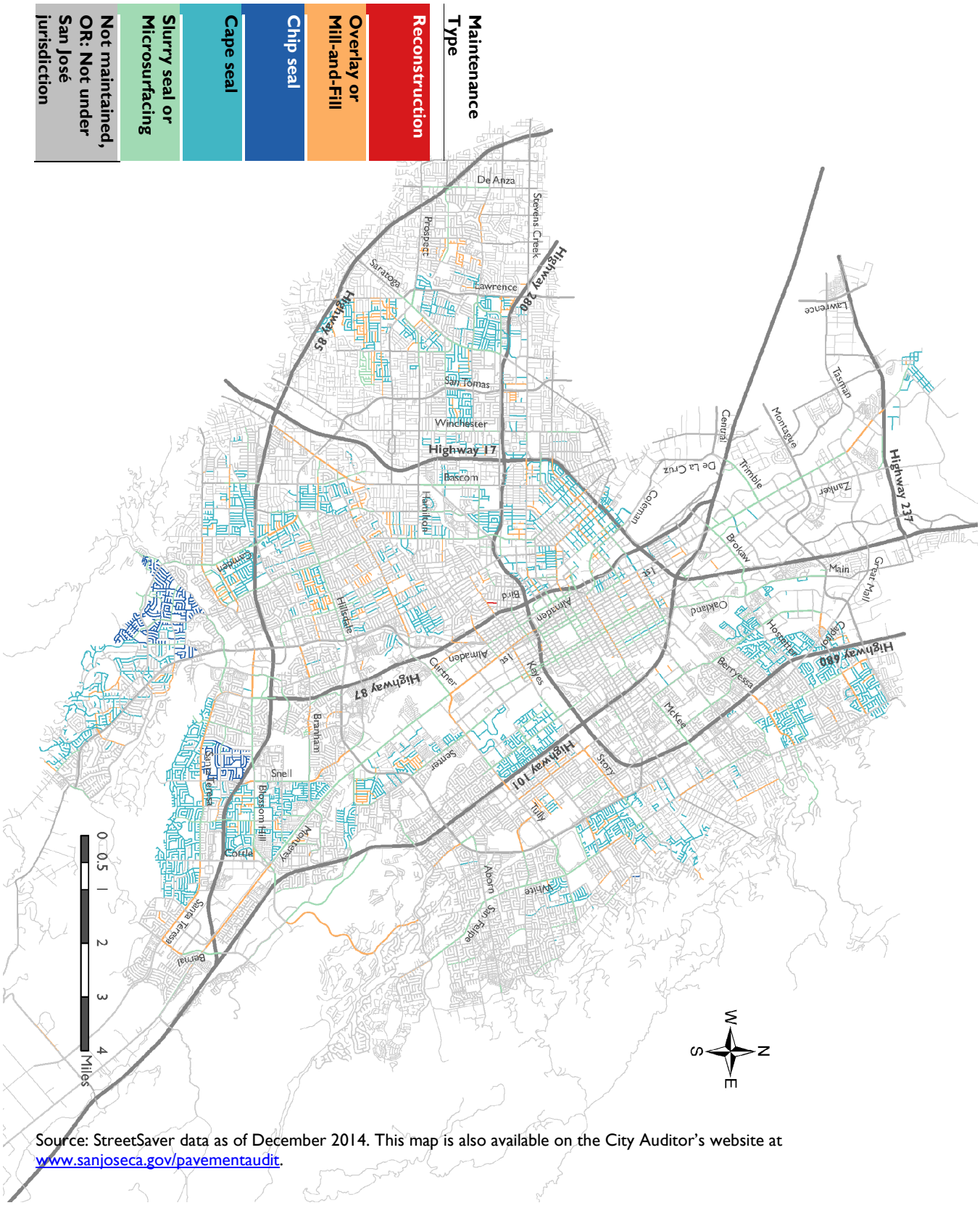


Source: Auditor analysis assuming constant network size of 381 million square feet. StreetSaver report "Historical Network Summary Statistics." DOT estimates it will maintain 100 miles in 2015.

Many Streets Have Not Been Maintained for Ten Years or More

The map in Exhibit 11 shows which roads were maintained in the last ten years. In that time period, DOT had mainly been sealing residential roads and applying overlays on arterial roads, covering 38 percent of the network. With a target of maintaining all streets on a 10-year cycle, that figure should be 100 percent. Streets that received maintenance were generally in better condition than those that did not. Appendix B also shows a map of maintenance by decade since the 1970s.

Exhibit 11: Street-by-Street Map of Maintenance, 2005-2014



Source: StreetSaver data as of December 2014. This map is also available on the City Auditor's website at www.sanjoseca.gov/pavementaudit.

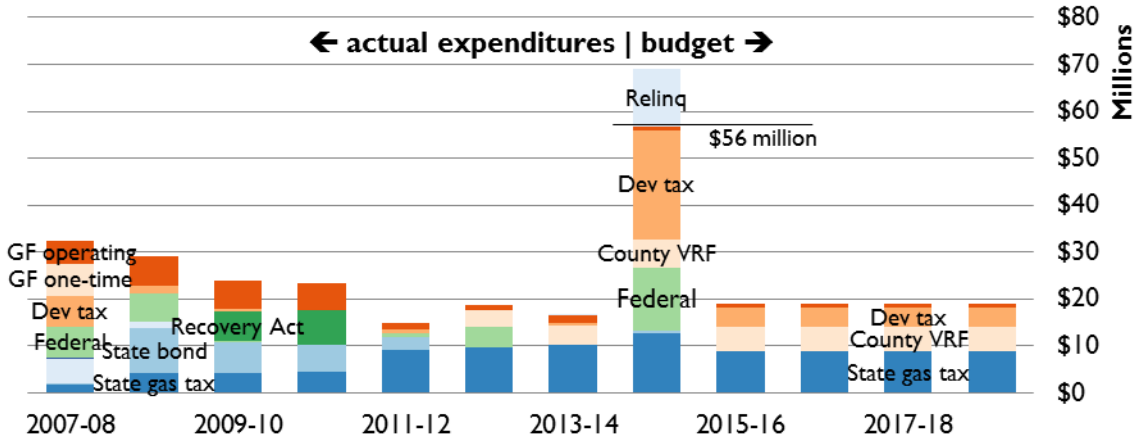
Other Deterioration Causes

Pavement can also deteriorate due to weather (rain and freezing temperatures exacerbate cracks and potholes), and poor construction – such as contractors using sub-standard raw materials. It appears that these two factors are not major drivers of deterioration in San José as it enjoys a favorable climate and DOT inspects and controls the construction process. San José's pavement deterioration is mainly driven by inadequate preventative maintenance.

San José Has Chronically Underfunded Street Repair

Pavement maintenance is considered a capital program as it is funded through the City's capital budget. In FY 2014-15, the City budgeted $56 million in expenditures on pavement maintenance, but this was the only year in the last decade with expenditures so high. In previous years, expenditures ranged from about $15 to $30 million. Funding in FY 2014-15 came from the following revenue sources: state gasoline taxes, a county vehicle registration fee, and local development taxes, as well as one-time funding for relinquishment[7] and a grant.

Exhibit 12: Expenditures by Source, Since FY 2007-08



- GF: San José general fund
- Dev tax: San José taxes/fees on new developments
- County VRF: Measure B (2010) levies a $10 vehicle registration fee for street repair.
- State bond: Proposition 1B (2006) issued bonds for street repair and other transportation projects.
- State gas tax: Proposition 42 (2002) directed gasoline taxes towards transportation projects.
- Relinq: One-time funding of $12 million pursuant to the state relinquishing Routes 82 and 130 to San José's control was budgeted in 2012-13, but will be expended in 2014-15

Source: Auditor analysis of Financial Management System reports, 2015-2019 Adopted Capital Budget and budget reports, not adjusted for inflation

[7] The state relinquished state routes 82 (The Alameda and Monterey Road) and 130 (Alum Rock Avenue) to San José's local control.

In the past, the City has used General Fund money for pavement maintenance, such as for the residential slurry seal program, for in-house maintenance staff, and for a one-time infusion of $7 million in FY 2007-08. These General Fund monies were significantly cut in FY 2011-12: some positions were eliminated and some positions switched funding sources to the gasoline tax-funded capital budget.

Funding Has Been Insufficient

We estimate that if San José did not have a backlog of roads in ■ poor and ■ failed condition, the cost of performing just preventive maintenance alone on a 10-year cycle would be at least $35 million dollars per year,[8] plus inflation. This number is useful to consider for determining the base amount that San José should budget in perpetuity to maintain its roads, but many San José roads already need more expensive maintenance than just preventive treatment.

Over the last seven fiscal years, DOT spent between $15 million and $30 million per year on pavement maintenance, as shown in Exhibit 12. This equates to about $15 to $30 per resident per year.

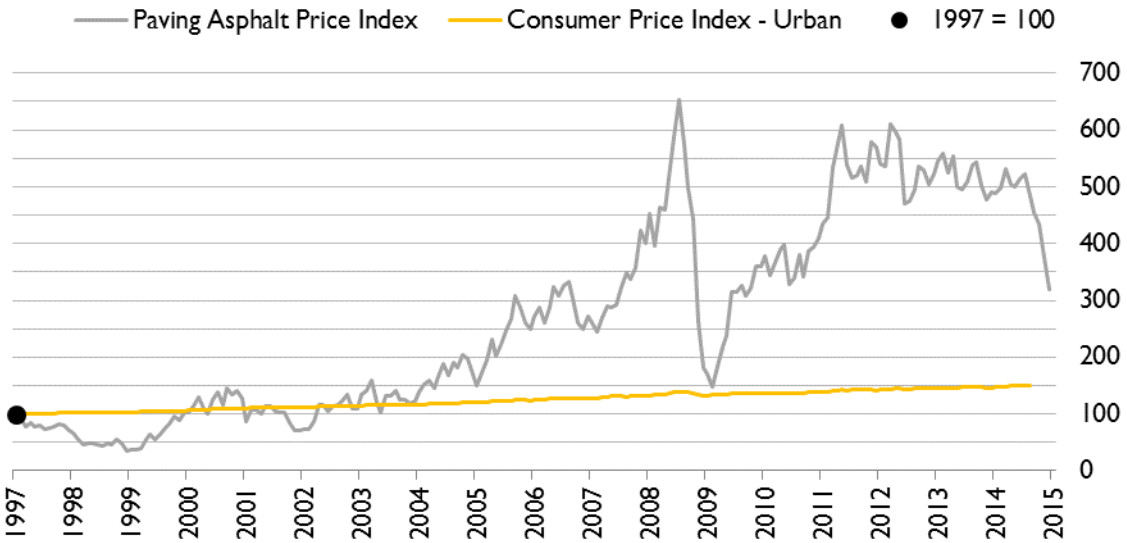
The City mostly relied on gasoline tax revenues from the state and on federal grants, such as from the Recovery Act. A new funding stream became available in FY 2012-13, when Santa Clara County's new vehicle registration fee directed some revenues towards cities for pavement maintenance.

Rising Costs

San José's funding challenges have been exacerbated by rising construction costs. San José's pavement is generally made of asphalt which is a mixture of aggregates (rocks, pebbles, and sand) and tar (an oil product). Since 2003, asphalt prices have quadrupled before recent declines, as seen in Exhibit 13. Asphalt prices outpaced general inflation.

[8] The estimated annual cost of slurry sealing or microsurfacing the street network on a 8-to-10-year cycle, or 264 miles, was $35 million at 2015 unit costs. These types of maintenance are purely preventive. Actual funding needs are larger since streets need more expensive maintenance over time.

Exhibit 13: Price Index for Paving Asphalt



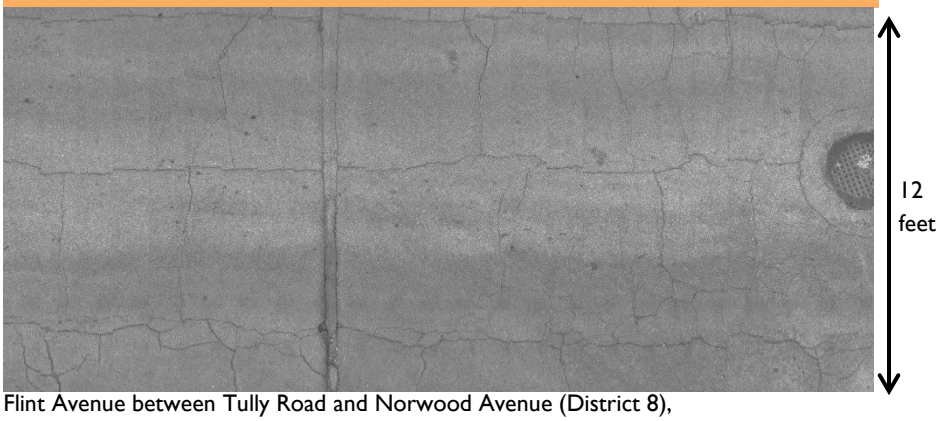
Source: Auditor analysis of California Department of Transportation, *California Statewide Paving Asphalt Price Index*, which is based on oil prices at several California fields; U.S. Bureau of Labor Statistics, *Consumer Price Index – All Urban Consumers.*

Residential Streets Are ■ at Risk and Lack Funding Altogether

Residential streets, which make up 60 percent of San José's overall network, were in worse condition than the network as a whole: While the overall street network has a ■ fair PCI of 63, residential streets overall were ■ at risk with a PCI of 58. Examples are shown in Exhibit 14.

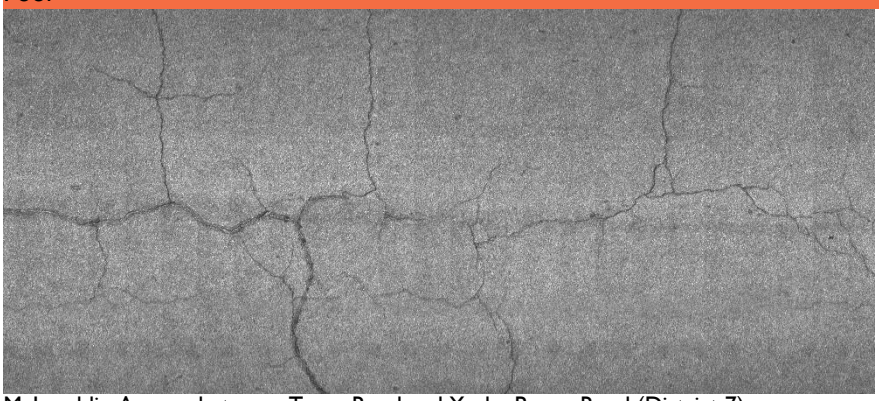
Exhibit 14: Photos of Residential Streets

At Risk



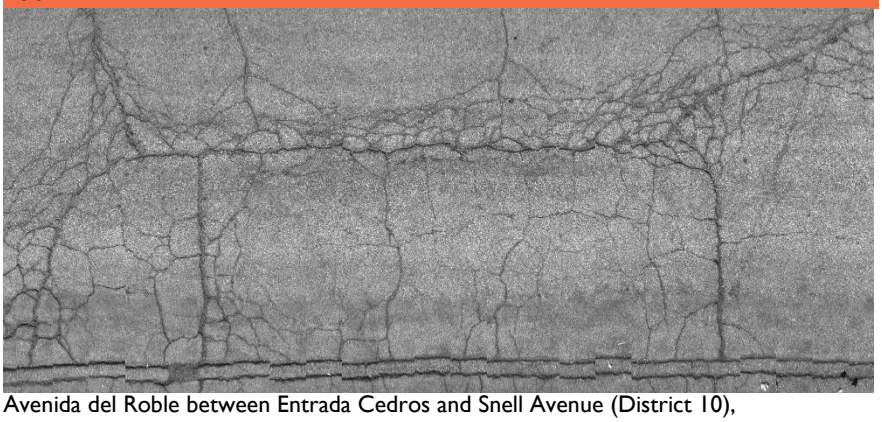
Flint Avenue between Tully Road and Norwood Avenue (District 8),
PCI 54, last maintenance in 2006

Poor



McLaughlin Avenue between Tuers Road and Yerba Buena Road (District 7),
PCI 48, last maintenance in 1999

Poor



Avenida del Roble between Entrada Cedros and Snell Avenue (District 10),
PCI 31, last maintenance in 1997

Source: Photographs by Adhara Systems, Inc, a consultant to the Department of Transportation, October 2014; condition and maintenance data from StreetSaver

Residential streets have not received any maintenance treatments since FY 2011-12. Even before FY 2011-12, residential streets did not receive adequate maintenance; only about 55 percent of residential streets received maintenance treatments over the 10 calendar years before 2011.

In 2012, the City Council accepted a proposal to focus limited maintenance funds on 540 miles of priority streets and designated the *Priority Street Network* (see Appendix A).[9] While the Priority Street Network program has allowed DOT to preserve pavement on the City's most heavily used roads, it has eliminated funding to 1,900 miles of less traveled roads, including **all** residential streets.[10]

Partly to blame for the funding challenges is San José's pervasive suburban land use. In denser San José neighborhoods, one residential street-mile supports 500 to 800 residents, whereas one mile in an outlying residential neighborhood supports only 200 to 300 residents – both roads cost about the same to maintain. This creates a revenue problem for San José; there are more miles of roads to maintain per resident in San José than in denser jurisdictions, creating a larger financial burden per resident.

Worn Pavement Negatively Impacts Residents

On opinion surveys over the past four years, San José residents have consistently given street repair very low marks. Only 28 percent of residents rated street repair as "good" or "excellent," making it the lowest-rated City service on the 2014 National Citizen Survey.[11]

Residents also thought transportation important: 72 percent of residents thought it was "essential" or "very important" for the community to focus on the overall "built environment" including overall design, buildings, parks, and transportation systems.

In addition, motorists driving on worn roads face higher costs from increased tire wear, higher fuel consumption, additional repairs, and faster depreciation. TRIP, a national transportation research group, has estimated for the San José urban area that drivers will incur an extra $760 in such vehicle operating costs per year.[12]

[9] As of December 2014, the Priority Street Network had an average PCI of 74; this was in ■ good condition.

[10] The Priority Street Network was created to provide funding for streets with the high traffic volume, public transit use, bicycle lanes, or in economic development areas. This meant, however, that no funding was going towards maintaining residential streets. DOT previously had crews dedicated to sealing residential streets, but these were eliminated in budget cuts in FY 2011-12.

[11] The City Auditor's *Service Efforts and Accomplishments Report* included results from The National Citizen Survey on a variety of City services. The report and survey results are available online at www.sanjoseca.gov/SEA.

[12] TRIP's report is available online at www.tripnet.org/docs/CA_Transportation_by_the_Numbers_TRIP_Report_Sep_2014.pdf.

On ■ poor and ■ failed roads, pedestrians and bicyclists face an increased risk of falling and injuring themselves, often due to potholes. Even though the City paid out only $3,000 in pothole-related claims, it did receive 94 claims over the 5-year period ending December 2014. Exhibit 15 shows damaged roads where potholes appear to create hazards for pedestrians and drivers.

Exhibit 15: Potholes

Crossing Shasta Avenue at Park Ave. (District 6), PCI 78, last maintenance in 2002; potholes filled in January 2015

Source: Auditor photograph, October 2014

Park Avenue at Montgomery Street (District 6), PCI 42, last maintenance in 1984

Source: Auditor photograph, January 2015

Engineers and environmental advocates have also found that greenhouse gas emissions from pavement reconstruction are about seven times higher than consistent preventive maintenance over the same time period. Preventive maintenance reduces the need to produce asphalt and reduces the number of truck trips for construction.

In the Next Years, San José Faces Massive Costs to Maintain Its Pavement

San José faces two critical road maintenance needs: rehabilitation of ■ poor and ■ failed roads (major components of DOT's infrastructure backlog) and ongoing maintenance of roads in ■ good and ■ fair condition. In early 2015, DOT projected its funding needs and potential pavement condition outcomes over the next ten years.[13] We found DOT's estimates to be reasonable, after reviewing the methodology, assumptions, and parameters. Those assumptions include:

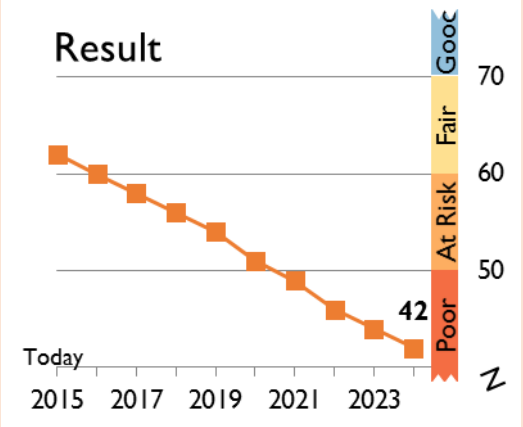
[13] DOT will report these projections to the City Council's Transportation and Environment Committee on March 2, 2015: http://www.sanjoseca.gov/DocumentCenter/View/40013

- For priority streets: Apply microsurfacing every 8 years. Apply a thin overlay (bonded wearing course) if the PCI falls below 50. Apply a rubberized asphalt overlay if the PCI falls below 40. Reconstruct the structure if the PCI falls below 25. "Other major streets" have largely similar parameters.
- For residential streets: Apply a slurry seal every 10 years. Apply a thin overlay (bonded wearing course) if the PCI falls below 50. Apply a rubberized asphalt overlay if the PCI falls below 40. Reconstruct the structure if the PCI falls below 25.
- The costs for these maintenance treatments per square yard are as follows: Microsurfacing $5 to $13, slurry seal $3 to $9, thin overlay (bonded wearing course) $28, rubberized asphalt overlay $45, reconstruction $90 to $125. At these costs in 2014, $1 million could have paid for either slurry sealing 18.9 miles, or overlaying 1.3 miles with rubberized asphalt, or reconstructing 0.5 miles. DOT entered a 3 percent inflation rate and a 0 percent interest rate into StreetSaver.
- In the StreetSaver optimization calculation that trades off the benefits of better condition with the costs to attain that condition, arterial streets are weighted at 1.00, collector streets at 0.72, and residential streets at 0.55.

The following exhibits show the projected deterioration of pavement condition if no maintenance were performed (Exhibit 16), projected deterioration of pavement condition if the current budget is maintained (Exhibit 17), the funding need to maintain overall pavement condition at the current level (Exhibit 18), and the funding need to attain a condition of ■ good (Exhibit 19).

Exhibit 16: Projection: No Street Maintenance

If the City stopped pavement maintenance for the next ten years (a street maintenance budget of $0), the overall network would deteriorate to ■ poor condition, with a PCI of 42 in 2024.

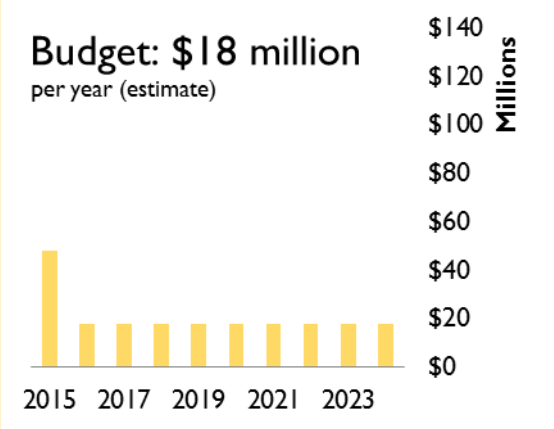


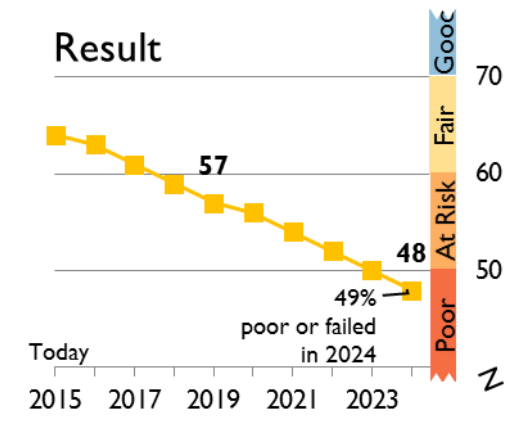
Source: Department of Transportation projection as of January 2015

Exhibit 17: Projection: Continue the Current Budget

The Adopted 2015-2019 Capital Improvement Program (CIP) plans for the following funding levels for pavement maintenance over the next five fiscal years: $48 million in 2014-15, and from then on $18 million per year. These funding levels assume that no new revenue sources will become available.

With such funding, in five years PCI would significantly deteriorate to 57 – an ■ at-risk score. Assuming the $18 million funding level continues beyond the Five-Year CIP, in 2024, the PCI would fall to 48 – a ■ poor score. By 2024, half of all San José roads would be in ■ poor or ■ failed condition.





Source: Department of Transportation projection as of January 2015 and Auditor analysis.

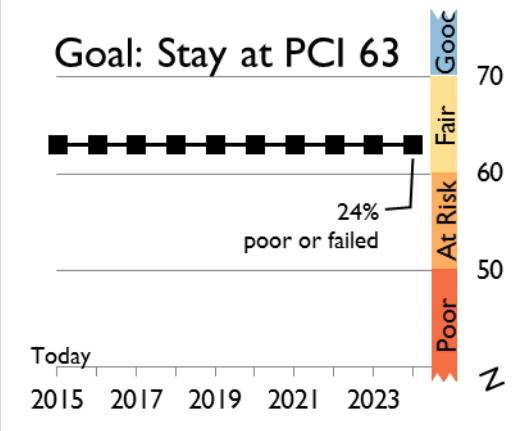
For simplicity, it was assumed that fiscal years and calendar years align.

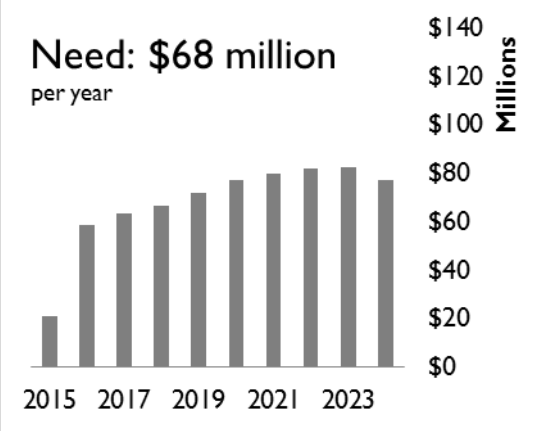
The CIP forecasts level funding of: $4.0 million from development fees, $5.4 million from County vehicle registration fees, and $8.8 million from state gasoline taxes. In 2014-15, an additional $16 million are budgeted in development fees and $14 million from a grant. Not shown here are an additional $8 million in 2014-15 budget adjustments.

Exhibit 18: Projection: Increase Funding to Maintain Current Pavement Condition

To maintain the current fair PCI of 63 over the next ten years, DOT would need to spend about $68 million per year. For comparison, this is $68 per resident per year or more than three times the CIP or twice the San José Public Library's operating expenditures.

In 2024, a quarter of streets would still be in poor or failed condition.





Source: Department of Transportation projection as of January 2015 and Auditor analysis.

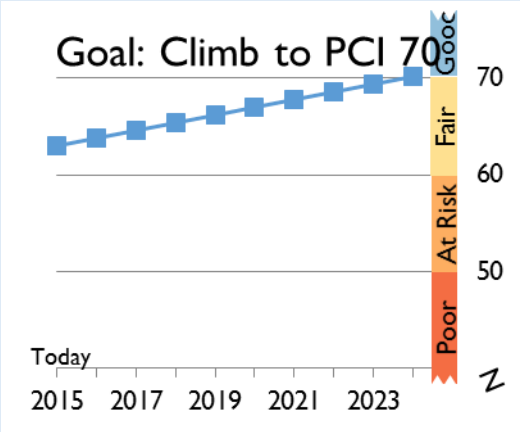
Under this scenario, the funding need in the first year is relatively small, because the streets today are already at PCI 63.

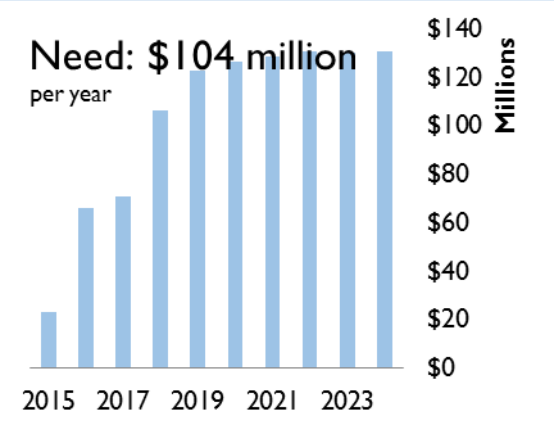
Exhibit 19: Projection: Attain ■ Good Pavement Condition

To gradually attain a network average in ■ good condition (PCI 70), DOT would need to spend about $104 million per year. For comparison, this is $104 per resident per year or more than five times the current CIP funding or three times the Library's operating expenditures.

This scenario specifies a gradual climb over 10 years to a target PCI of 70 for the entire network and also, respectively, for the priority streets, other major streets, and residential streets.

By 2024, the fraction of ■ poor or ■ failed streets would fall significantly, and there would be significant improvements to residential streets (currently at PCI 58).





Source: Department of Transportation projection as of January 2015 and Auditor analysis.

The funding need in the first year is relatively small, because the streets today are already at PCI 63, close to the 2015 PCI goal that only gradually climbs to PCI 70.

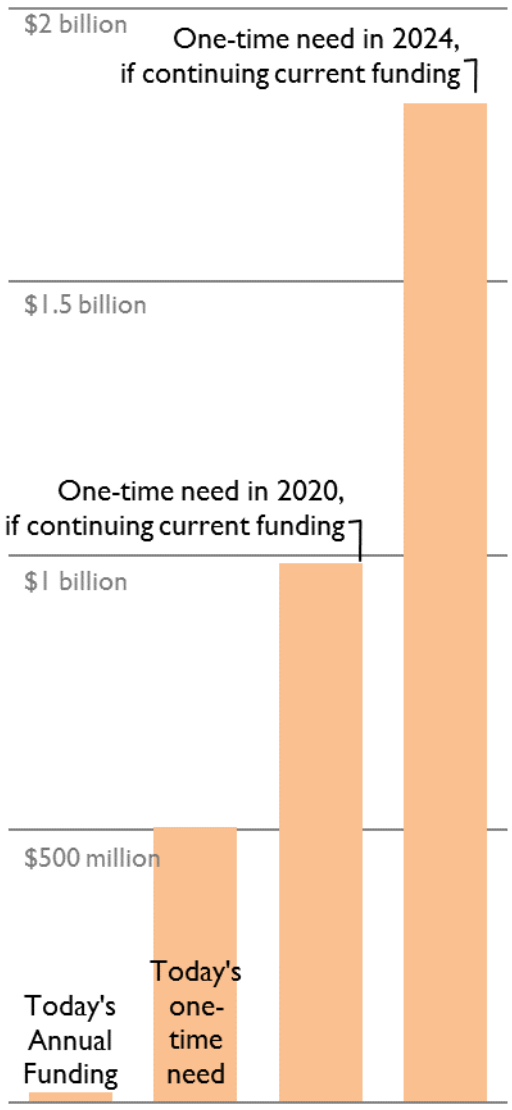
One-time Funding Need to Address the Entire Backlog

To bring all streets that are currently in ■ poor or ■ failed condition into ■ good or ■ excellent condition, plus address the maintenance needs of those streets "overdue" in a ten-year maintenance cycle, DOT would need a one-time cash infusion of $504 million this year. For comparison, this is $504 per resident (one-time) or the sum of the Police, Fire, and Library Departments' annual operating expenditures.

The bulk of this cost is to repair and maintain the 1,470 miles of residential streets ($385 million). Of those, the 242 residential miles in the worst condition contributed $222 million to the total need.

If left unaddressed and assuming a continuation of current funding levels, by 2020 that one-time funding need will jump to $1 billion and by 2025 it will escalate to $1.8 billion, due to inflation and further pavement deterioration. Exhibit 20 shows the escalating costs of further deferring maintenance on the backlog.

Exhibit 20: One-time Funding Need to Maintain ■ Poor, ■ Failed, and Overdue Streets



Source: Department of Transportation and Auditor's analysis.

Major Cost Drivers

The major cost drivers of these future needs are: the large size of the residential network and its relatively poor condition, the high price tag for treating pavement in ■ poor or ■ failed condition, and the lack of adequate funding in the past.

Factoring in uncertainty about the future, DOT could face costs as high as $111 million per year to reach a PCI of 70 or $73 million per year to maintain a PCI of 63 (assuming 6 percent inflation). Conversely, if costs do not rise as fast as DOT has projected, it would still take $91 million per year to reach a PCI of 70 or $60 million per year to maintain a PCI of 63 (assuming 2 percent inflation).

Inaction Today Will Lead to Escalating Costs Tomorrow

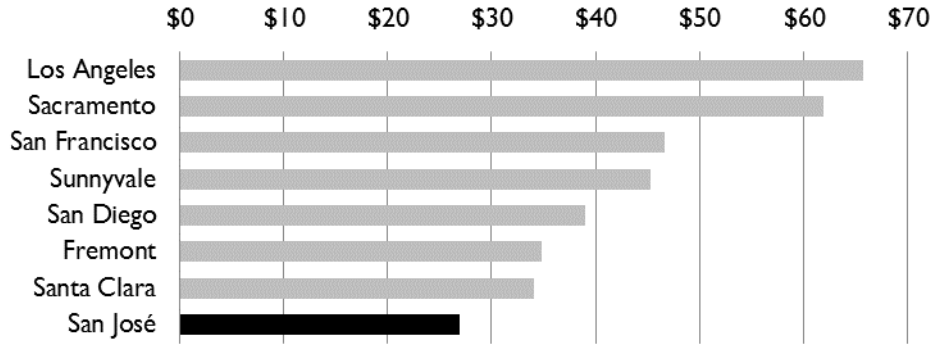
Spending $1 today on pavement maintenance can avoid the need to spend $2 in five years, or almost $4 in ten years while attaining the same outcome. The costs escalate rapidly because pavement is at risk of rapidly deteriorating when 7 to 20

years have passed since the last maintenance. Inadequate funding over the last decade burdened today's residents with avoidable costs, because the unit costs for repair only get more expensive with time. Similarly, ignoring today's preventive maintenance needs will burden future residents with even larger costs.

Other Jurisdictions Use a Variety of Funding Sources to Maintain and Improve Their Pavement

Similar to San José, many other California cities also experienced funding challenges, maintenance backlogs, and pavement conditions below targets. In contrast to San José, many of these jurisdictions pull resources from a wider variety of sources. Overall, other jurisdictions we sampled also dedicate more money per resident towards pavement maintenance – see Exhibit 21. As described previously, in the past eight years, San José spent about $15 to $30 per resident per year on pavement maintenance.

Exhibit 21: Comparison of Cities' Per-Capita, Per-Year Spending (Annual Average Based on FY 1999-00 Through FY 2011-12)



Source: Auditor analysis of *State Controller's Streets and Roads Annual Report*; expenditures for street reconstruction, patching, overlay and sealing; normalized by population from the US Census Bureau's 2000 and 2010 Censuses, 2012 American Community Survey; annual average FY 1999-00 through FY 2011-12, not adjusted for inflation. Jurisdictions may categorize their pavement maintenance expenditures differently.

State Gasoline Tax

The state assesses a tax on gasoline which, in part, benefits local agencies' pavement maintenance projects. The state gas tax of about 36 cents per gallon, however, has eroded in real value, due to increasing fuel efficiency and the lack of inflation adjustments.

All California cities and counties are allocated portions of this tax, but solely relying on this tax is usually insufficient. According to the Sacramento Area Council of Governments, the state gas tax covers on average only about 25 percent of local road maintenance and rehabilitation costs; in 1975 the gas tax

had covered about 75 percent. San Diego relies mostly on gas taxes, spending only about $39 per resident per year in recent years, and has a pavement condition of 59,[14] far short of its goal of 70.

General Funds

San José has not spent meaningful General Fund money on pavement maintenance since FY 2007-08. The last remnants of General Fund money, which went towards slurry-sealing residential streets and operating the maintenance crews, ended in FY 2011-12. For context, since FY 2002-03, San José experienced General Fund shortfalls in all but one fiscal year. The City Council can choose to direct General Fund money towards pavement maintenance through the annual budget process, but it competes with other major services such as police, fire, library, and parks services. San José also lacks budget policies that set aside a consistent stream of operating and maintenance funds for capital investments.

In contrast to San José, Sunnyvale's policy makers have dedicated General Fund money towards pavement maintenance for decades. Sunnyvale's PCI of 77 is a result of maintaining about 12 percent of its streets **each year** throughout the 1990s. Even after funding cuts in the 2000s, Sunnyvale was still maintaining 7 percent of its streets each year. In total, Sunnyvale plans to spend about $39 per resident per year on pavement maintenance, including regular slurry and chip seals to neighborhood streets.

San Francisco also plans to spend about $86 million of General Fund money over the next three years on pavement maintenance, as part of its plan to increase its average PCI score of 64 in 2011 to 70 in 2021.

Local Sales Taxes

Cities and counties can raise their own sales taxes, with voter approval, on top of the state's 7 ½ cent rate. Santa Clara County currently has a total 8 ¾ cent sales tax rate which includes taxes for transit and the Bay Area Rapid Transit (BART) extension, but no funding towards pavement maintenance. San José currently does not assess its own city sales tax and the City Council in 2014 declined to forward a potential tax vote to the electorate.

Sales taxes generated for general government use require a majority of voters to approve and sales taxes for specific uses require two-thirds voter approval. The next opportunity to ask voters to approve such taxes is in 2016. When San José considered potential sales taxes in 2014, the City's Budget Office estimated that a ¼ cent sales tax would generate about $34 million annually and a ½ cent sales tax would generate about $68 million annually.

[14] Estimated 2012 Overall Condition Index

Other counties and cities have successfully raised sales taxes that also benefit pavement maintenance. Alameda County approved a measure to increase its sales tax rate by ½ cent for 30 years and expected $3 billion over the 30 year period for street and highway pavement improvements benefiting Fremont, Berkeley, and Oakland, among others. Los Angeles County also approved a ½ cent sales tax (Measure R) in FY 2008-09 and the City of Los Angeles in total spends about $53 per resident per year to maintain the largest municipal road network in the nation. Even so, Los Angeles' vast street network has a PCI of 62 and a significant backlog of roads in poor condition (38 percent of roads). Sacramento relies on a ½ cent sales tax for pavement maintenance and has a Pavement Quality Index of 64, with a backlog of unmet maintenance needs.

Local Vehicle Registration Fee

San José benefits from a $10 county vehicle registration fee, which Santa Clara County voters approved in 2010. The fee is used for pothole repairs, repaving and maintaining local streets, improving traffic flow on local roads; improving safety; paying for other congestion and pollution mitigation projects; and providing matching funds for federal and state funding. Alameda County and San Francisco have a similar fee.

Local Bonds

Agencies can also issue general obligation bonds, with voter approval. This provides an upfront stream of funding, but spreads the cost of debt service, including interest on the borrowing, over a long time. Borrowing for capital projects can make sense to spread the cost of paying for such improvements over the useful life of the improvement and involve future users in paying for the service. Bonds for pavement must be used for pavement repairs that are considered capital improvements and not for maintenance.

San Francisco voters approved a $248 million general obligation bond issuance in 2011 to fund street safety and road improvements. Of that, San Francisco planned to spend about $148 million on repaving and street reconstruction to augment revenues it already used from sales tax, vehicle registration fees, the state gasoline tax, and federal funds. It anticipated this would move its PCI from 64 to 70 over a ten year period. San Francisco had identified a one-time backlog in 2011 of $460 million. Without the bond funds, it anticipated that its PCI would fall to 54 by 2021.

Appendix C summarizes and compares these cities.

Federal Funding and Grants

The federal gas tax is not used for local road improvements; it is mainly used for bridge and highway improvements. Federal funds are occasionally made available for local road improvements; for example, the American Recovery and

Reinvestment Act provided about $14 million in one-time funds for San José pavement projects. However, federal and other grant funds do not provide a predictable funding stream and as such, should not be relied upon for annual preventive maintenance. In FY 2014-15, San José will receive a $14 million grant from the MTC's "One Bay Area Grant" program.

Difficult Choices

In every year of providing insufficient funds towards pavement maintenance, the City has been kicking the proverbial can further down the road, burdening future generations with escalating costs.

San José's policy makers face difficult trade-offs: DOT requires more funding for roads just to maintain the *current* condition. But to *improve* the pavement condition, the City requires unprecedented funding levels. Finding funds among existing revenue streams and/or obtaining voter approval for new revenue streams is difficult, as San José still faces other budget challenges.

Recommendation #1: The Department of Transportation, together with the City Manager's Office, should identify a sustainable, predictable funding stream to maintain roads annually, and develop a multi-year plan to use one-time funding to bring the road network up to ■ good condition by addressing maintenance backlogs and reconstructing ■ poor and ■ failed streets.

Improving Technology for Inspectors

DOT's inspectors spend most of their time in the field overseeing contractors and construction sites for pavement projects. They play a key role in ensuring that construction work meets engineering standards and contract terms, such as by measuring the depth of a new asphalt overlay or the amount and quality of material used.

At the time of our audit, inspectors prepared almost all field paperwork on handwritten forms and then typed up their notes at the office. DOT can streamline these processes and enable inspectors to spend more time on value-added work by providing inspectors with records management software and mobile computers to use in the field.

Recommendation #2: To efficiently use inspectors' time, the Department of Transportation should provide records management software and mobile computers to its inspectors.

Improving Public Information About Pavement Maintenance

DOT can improve its public website to provide more information about past and upcoming pavement projects, street condition information, and basic information about pavement funding, and maintenance strategies. Before our audit, the website contained a phone number to call for potholes, brief descriptions of maintenance types, and street lists of prior years' maintenance.[15] Other agencies post a wider variety of information on their websites which may be helpful for San José residents as well. Examples include:

- Sunnyvale describes the reasons for sealing residential streets, provides a list of future streets to be maintained, and explains to residents what they can expect from construction impacts.[16]
- Sacramento provides construction maps on its website and describes its pavement maintenance program in detail, with a "frequently asked questions" section.
- Palo Alto's Pavement Maintenance Program website provides construction maps, details about its funding, and performance measures. Furthermore, Palo Alto's open data website provides its entire PCI dataset and geographic information files to the public.
- San Francisco describes for residents what to expect during construction and has detailed descriptions for each project.
- Los Angeles provides an interactive, searchable condition map, a list of future streets to be maintained, and also department reports.

We believe San José can match the level of information provided by these other cities. DOT has hired a new Public Information Officer, has previously reported all these pieces of information to the City Council, and has the capability to post interactive maps. Providing San José residents with such information enhances transparency, accountability, and customer service. Once residents can look up their own street online, they no longer need to call DOT to inquire about past or future maintenance. During our audit, DOT began to add information to its website, such as a searchable interactive map of pavement condition at www.sanjoseca.gov/index.aspx?NID=4608.

[15] DOT's website: http://sanjoseca.gov/index.aspx?NID=3586

[16] These other agency websites can be found at:

Sunnyvale: http://sunnyvale.ca.gov/Departments/PublicWorks/StreetMaintenance.aspx
Sacramento: http://portal.cityofsacramento.org/Public-Works/Maintenance-Services/Street-Maintenance
Palo Alto: http://www.cityofpaloalto.org/gov/depts/pwd/street_maintenance/default.asp
San Francisco: http://sfdpw.org/index.aspx?page=1114
Los Angeles: http://bss.lacity.org/

Recommendation #3: To improve transparency and accountability, the Department of Transportation should include on its website: condition maps, lists/maps of planned maintenance, performance measures, and other relevant information.

Improving Documentation

Prior to our audit, DOT had not formally documented its procedures and methodology for calculating funding needs and future condition. As part of the 2015 projections of future costs and PCI, DOT has added comments and annotations to its spreadsheets used to calculate street condition and projected costs. This type of written documentation (including data sources, calculation methodology, and definitions of key terms) will make it easier for new staff members and stakeholders to understand and replicate the methodology. If key assumptions change over the years, these should also be noted. In addition, DOT should document its choices for the parameters, such as the construction unit cost and inflation rate, and also describe in more detail how the StreetSaver calculations relate to its further spreadsheet analysis.

Recommendation #4: To ensure the integrity of its projections of pavement condition and funding needs, the Department of Transportation should develop procedures which include data sources, calculation methodologies, and definitions of key terms.

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Conclusion

The City of San José is responsible for maintaining 2,400 miles of street pavement. As of December 2014, streets showed significant distresses and were worn to the point where expensive repairs might be needed. The current pavement condition resulted from the City not spending enough money on road maintenance for many years. Only 38 percent of streets received maintenance within the last 10 years. To eliminate the backlog of ■ poor and ■ failed roads (as well as those past the target 10-year maintenance cycles), DOT would need an estimated $504 million in one-time funding. To raise the average pavement condition to ■ good (from a PCI score of 63 to 70) in the next ten years, DOT would need approximately $104 million annually.

RECOMMENDATIONS

Recommendation #1: The Department of Transportation, together with the City Manager's Office, should identify a sustainable, predictable funding stream to maintain roads annually, and develop a multi-year plan to use one-time funding to bring the road network up to ■ good condition by addressing maintenance backlogs and reconstructing ■ poor and ■ failed streets.

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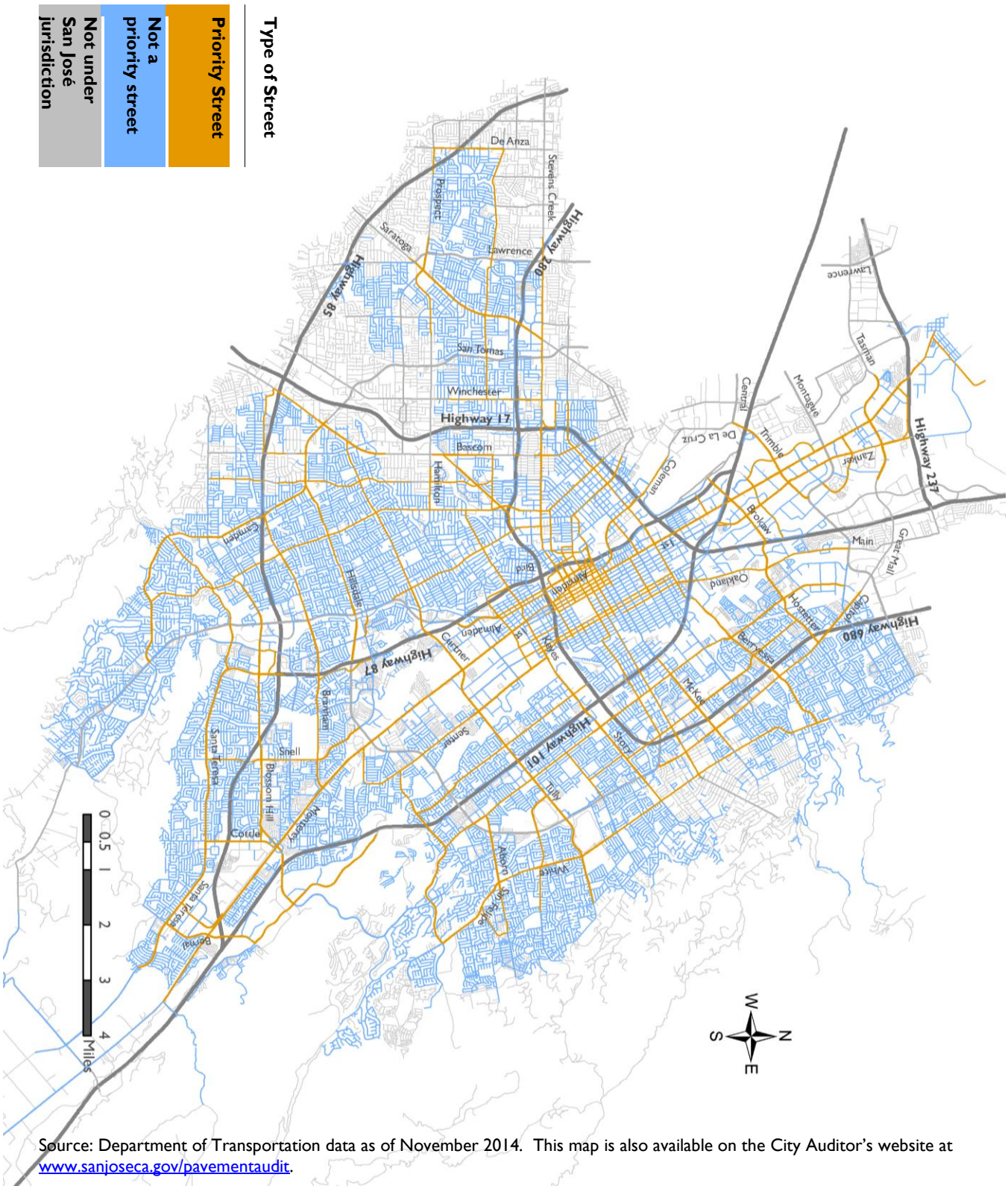
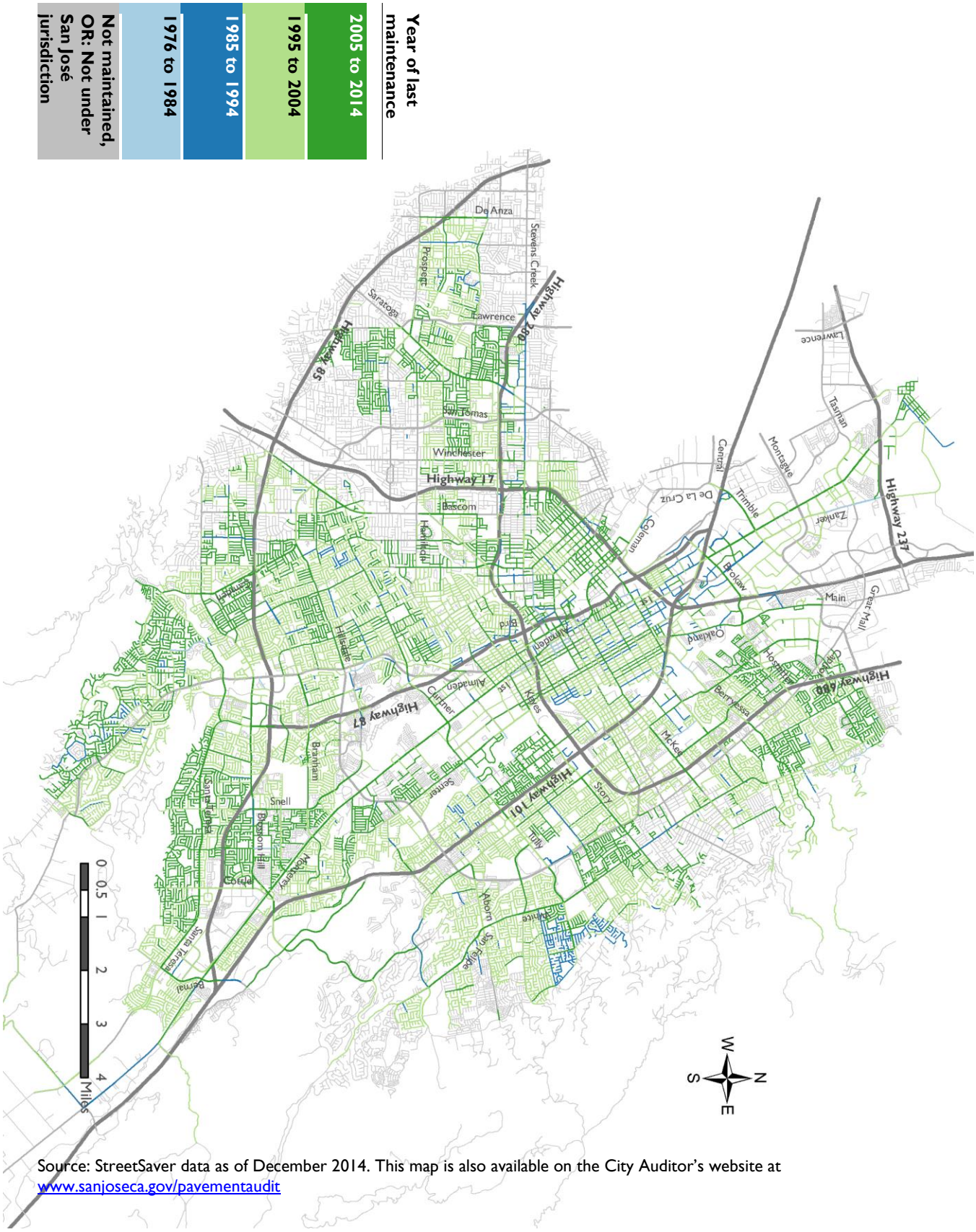
APPENDIX A
Map: San José's Priority Streets



Source: Department of Transportation data as of November 2014. This map is also available on the City Auditor's website at www.sanjoseca.gov/pavementaudit.

APPENDIX B
Street-by-Street Map: Last Maintenance by Decade



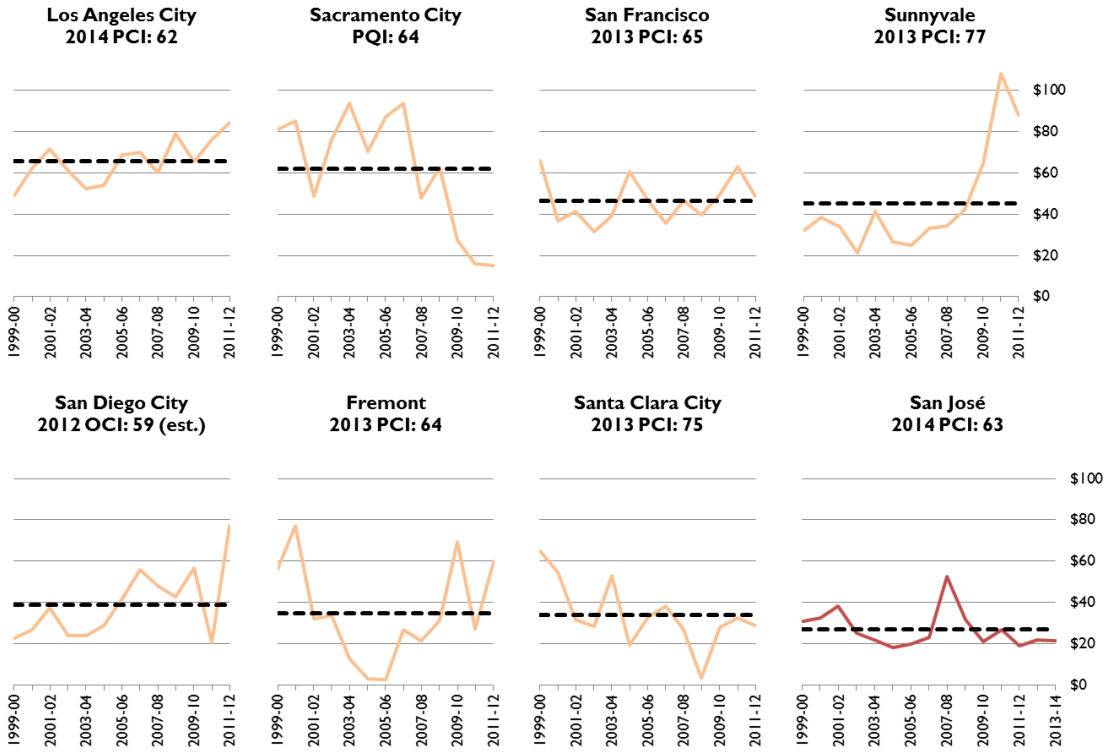
Source: StreetSaver data as of December 2014. This map is also available on the City Auditor's website at www.sanjoseca.gov/pavementaudit

APPENDIX C
Comparison to Other Jurisdictions

Summary Statistics

City	Street Miles (30 feet wide)	PCI	In Poor or Failed Condition	Backlog	Funding Sources
Sunnyvale	365	↑ 77	3%	$19 million	General fund, gas tax, vehicle reg fee
San Francisco	940	↑ 65	23%	$1.1 billion	General obligation bond, sales tax, general fund, grants, vehicle reg fee
Sacramento	1,549	PQI ↓ 64	8%	$90 million	Sales tax, gas tax, grants
Los Angeles (city)	10,267	↓ 62	38%	$2.4 billion	Sales tax, gas tax, grants, fees
San José	**2,400**	↓ 63 (2014)	**23%**	**$504 million**	**Gas tax, grants, vehicle reg fee**
San Diego	3,847	OCI ↓ 59 (2012)	25%	$478 million	Gas tax, grants
Santa Clara	590 lane miles	↓ 75			
Fremont	1,069 lane miles	↑ 64	23%	$133 million	Gas tax, sales tax, vehicle reg fee

Expenditures per Population



Sources: Auditor analysis of

- Funding sources from: auditor interviews with various agencies' staff and their reports;
- Expenditure data from: *State Controller's Streets and Roads Annual Report*, FY 2000 through FY 2012; City of San José Finance Department; using only expenditures for street reconstruction, patching, overlay and sealing; not adjusted for inflation; jurisdictions may categorize their pavement maintenance expenditures differently;
- Population data from: US Census Bureau, *2000 Census*, *2010 Census* , *2012 American Community Survey 5-year estimates,* assuming linear population growth from 2000 Census to 2010 Census;
- Pavement condition data from: 2014 Metropolitan Transportation Commission *Street Fight* Report, staff reports from various agencies, San José StreetSaver data as of December 2014, and auditor's conversion estimates for center line miles and lane miles.

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: Sharon W. Erickson
City Auditor

FROM: Hans F. Larsen

SUBJECT: **RESPONSE TO AUDIT OF STREET PAVEMENT MAINTENANCE**

DATE: February 19, 2015

Approved [signature] Date 2/19/15

The Department of Transportation (DOT) has reviewed the City Auditor's report titled *Street Pavement Maintenance: Road Condition is Deteriorating due to Insufficient Funding*. We sincerely appreciate the detailed and professional review of the City's pavement maintenance program by the City Auditor's Office and we are in general agreement with the recommendations presented in the audit report. DOT looks forward to continuing our effort towards finding new funding sources for pavement maintenance, as well as implementing other measures that can enhance our efficiency in communicating about and delivering pavement maintenance services to the San Jose community.

The following are DOT's responses to each of the audit recommendations.

Recommendation #1: The Department of Transportation, together with the City Manager's Office, should identify a sustainable, predictable funding stream to maintain roads annually, and develop a multi-year plan to use one-time funding to bring the road network up to good condition by addressing maintenance backlogs and reconstructing poor and failed streets.

Response to Recommendation #1: DOT agrees with this recommendation. The City Council held a Study Session in 2010 on the topic of pavement maintenance, and since then, DOT has provided annual reports to the Transportation and Environment Committee and the City Council on the status of pavement conditions and strategies to increase needed investment. DOT will continue working with the City Manager's Office, the City Council, key stakeholders within the community, and at all levels of government on funding and delivering desirable levels of pavement maintenance. The report being presented to the Transportation and Environment Committee on March 2, 2015 will reestablish expectations about projected future pavement conditions, funding needs, and the City's pavement maintenance funding strategy.

Recommendation #2: To efficiently use inspectors' time, the Department of Transportation should provide records management software and mobile computers to its inspectors.

Response to Recommendation #2: DOT agrees with this recommendation. DOT recently hired a Department Information Technology (IT) Manager who is actively assessing the

department's technology uses and needs, and developing a strategic roadmap for advancing its most important technology priorities. DOT and the Department IT Manager recognize the importance of the work that the pavement inspectors do and how records management software and mobile technology can increase their efficiency and effectiveness. However, there are a number of other technology projects that have a greater importance for DOT and the community that should be completed first, such as improving the work order systems for reporting and managing various service requests like streetlight outages and illegal dumping, and automating the system for reviewing and analyzing traffic collision data to make our streets safer. Therefore, the implementation of this recommendation is included in the DOT technology plan for future completion.

Recommendation #3: To improve transparency and accountability, the Department of Transportation should include on its website: condition maps, lists/maps of planned maintenance, performance measures, and other relevant information.

Response to Recommendation #3: DOT agrees with this recommendation and has already included on its website a map showing the pavement condition of each street in the City. Members of the public can zoom in and click on a selected street to view its current condition. DOT is actively working to make additional information available in the near future, including the items recommended by the City Auditor. The condition map may be viewed at http://www.sanjoseca.gov/index.aspx?NID=4608.

Recommendation #4: To ensure the integrity of its projections of pavement condition and funding needs, the Department of Transportation should develop procedures which include data sources, calculation methodologies, and definitions of key terms.

Response to Recommendation #4: DOT agrees with this recommendation and has already initiated the development of the recommended procedures for documenting the pavement maintenance information. The updated pavement maintenance conditions being reported to the Transportation and Environment Committee on March 2, 2015 are supported with documentation recommended by the City Auditor.

Conclusion

The audit confirmed that street conditions in San José are deteriorating primarily due to one reason: insufficient funding. The audit states that "current pavement conditions are a result of the City not spending enough money on road maintenance." DOT completely agrees with this finding and concurs that the only way to reverse this trend is to obtain the funding needed to eliminate the one-time backlog of deferred maintenance and perform regular, on-going preventive maintenance, as described in Recommendation #1. DOT also agrees with the other three recommendations, but realizes that they are minor in comparison to Recommendation #1. While they represent worthwhile enhancements to the pavement maintenance program, they will

not have a noticeable impact on one of the most pressing problems facing San José, which is the declining conditions and unfunded needs of the street pavement network.

The Department of Transportation thanks the City Auditor's Office for conducting this audit and further raising community awareness about the conditions and under investment in the City's pavement maintenance program.

HANS F. LARSEN
Director of Transportation

For questions, contact Jim Ortbal, Assistant Director of Transportation at (409) 535-3845.