



Eugene City Council

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EUGENE CITY COUNCIL AGENDA

February 17, 2016

12:00 PM CITY COUNCIL WORK SESSION

Harris Hall

125 East 8th Avenue

Eugene, Oregon 97401

Meeting of February 17, 2016;
Her Honor Mayor Kitty Piercy Presiding

Councilors

George Brown, President	Pat Farr, Vice President
Mike Clark	George Poling
Chris Pryor	Claire Syrett
Betty Taylor	Alan Zelenka

CITY COUNCIL WORK SESSION

Harris Hall

12:00 p.m. A. A. COMMITTEE REPORTS AND ITEMS OF INTEREST FROM
MAYOR,
CITY COUNCIL AND CITY MANAGER

12:30 p.m. B. WORK SESSION:
Review of 2015 Implementation of Bond Measure to Fix Streets and 2016
Pavement Management Report

**time approximate*

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EUGENE CITY COUNCIL

AGENDA ITEM SUMMARY



Work Session: Review of 2015 Implementation of Bond Measure to Fix Streets and 2016 Pavement Management Report

Meeting Date: February 17, 2016
 Department: Public Works
www.eugene-or.gov

Agenda Item Number: B
 Staff Contact: Kurt Corey
 Contact Telephone Number: 541-682-8421

ISSUE STATEMENT

This work session is an opportunity for the Eugene City Council to review the implementation of Measure 20-197, the 2012 bond measure to fix streets. To facilitate this review, two documents were prepared: the Citizen Street Repair Review Panel 2015 Report, and the independent accountant's report by Isler CPA. These reports are provided as informational items in compliance with the City Council resolution placing the bond measure on the ballot. This work session will also review the 2016 Pavement Management Report.

BACKGROUND

Council Action History

Following considerable study and discussion, including forming a Council Committee on Transportation Funding and convening an ad hoc citizen Street Maintenance Task Force, the council on July 28, 2008, approved Resolution 4953, calling a city election on a measure authorizing the issuance of \$35.9 million of general obligation bonds to fund street preservation projects. Eugene voters on November 4, 2008, approved Measure 20-145, the 2008 bond measure to fix streets. Beginning in April 2010 and continuing through February 2014, the council received annual reports from the Street Repair Review Panel and the independent accountant regarding implementation of the 2008 bond measure.

On July 9, 2012, the council approved Resolution 5063, calling a city election on a measure authorizing the issuance of \$43 million of general obligation bonds to fund street preservation projects, and bicycle and pedestrian projects. In November 2012, Eugene voters overwhelmingly approved Measure 20-197 that continues the City's road repair program for another five years. The new bond measure promises to fix 76 more streets and provide an average of \$516,000 per year for bicycle and pedestrian projects. The bond measure took effect in 2014 and continues the bond-funded pavement preservation program that was first approved by local voters in 2008.

The 2012 bond measure to fix streets continued the requirements related to accountability. The City Council resolution and the information provided to voters specified:

- In order to promote accountability in the use of bond proceeds, the City Manager will

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contract with an outside auditor to prepare an annual written report on the use of the bond proceeds. The auditor will ascertain and report on whether the bond proceeds were used for the authorized purposes and in compliance with the restrictions set forth above. The City Manager will provide the report to the council and make the report publicly available. (Resolution 5063, Section H)

- To further promote accountability and citizen involvement in street preservation projects, the City Manager will convene the Citizen Street Repair Review Panel. The panel will prepare an annual report, separate and distinct from the report prepared by the outside auditor, documenting the City's use of the bond proceeds and noting whether the bond proceeds were used in compliance with the terms of this resolution. The City Manager will provide the Street Repair Review Panel's report to the council and make the report publicly available. (Resolution 5063, Section I)

Street Repair Review Panel

In October 2009, a citizen group was initially formed to review the implementation of the 2008 road bond measure and report whether the bond funds were used in compliance with the council resolution. The citizen member Street Repair Review Panel, including five founding members, reconvened in December 2015 to review the ongoing implementation of Measure 20-197. The 11 community members serving on the 2015 SRRP were: John Barofsky, Janet Calvert, Allison Camp, Mel Damewood, Paul Holbo, Dave Perez, John Quilter, Ollie Snowden (chair), Clayton Walker, Gary Wildish and Sue Wolling. During the past year, the committee met three times over a three-month period in preparation of the report, which included a physical inspection of the projects completed in 2015.

On February 3, 2016, the Street Repair Review Panel unanimously approved its annual report (Attachment A), focusing on the second year of implementing the 2012 bond measure to fix streets, which included the following conclusion:

Based on this limited review and all materials presented to us, we unanimously conclude that the bond proceeds were used for the authorized purposes and in compliance with the limitations and restrictions outlined in Council Resolution 5063. (SRRP 2015 Report, Page i).

The 2015 SRRP report recognized the progress made on fixing Eugene's streets. The projects funded in 2015 resulted in the reconstruction or resurfacing of 17 streets totaling more than 13.2 lane miles. The 2012 bond also allocated funding for bicycle and pedestrian projects guided by the Pedestrian and Bicycle Master Plan, City staff and the Bicycle and Pedestrian Advisory Committee. In 2015, significant safety improvements for people who walk and bike include installing sidewalk ramps, adding new pedestrian crossing beacons, increasing buffer zones and adding shared lane markings. The positive economic impacts include the funding of more than 91 full-time equivalent jobs during the period of construction.

The report from the SRRP highlighted the City's sustainability achievements. Eugene was recognized for its use of recycled asphalt pavement, allowing for less asphalt waste in landfills. The continued use of warm mix asphalt also saves on energy and emissions (as detailed in the attached report), and offers an excellent example of the department's commitment to

sustainability efforts, especially following the approval of the Climate Recovery Ordinance. In addition to helping achieve sustainability goals, the bond measure projects are designed to improve safety and result in complete streets that are safe for people of all ages and abilities, balance the needs of different modes, and support local land uses, economies, cultures, and natural environments. This ties into the council's strategy of "Vision Zero," a resolution which calls for eliminating traffic-related deaths or serious injuries on city streets. The improvements funded through the bond enhance safety for all road users, including those who drive, walk or bike.

A web site tracking the bond measure implementation has been established at www.eugene-or.gov/gobonds. The panel's 2015 report has been placed on the internet, and links to the online report will be included in the weekly community bulletin and provided to other community and business organizations. The Street Repair Review Panel is scheduled to reconvene following completion of the 2016 construction season.

Independent Accountant's Report

The accounting firm of Isler CPA, who also performed the annual audit of the City's FY15 financial statements, was contracted to perform sufficient agreed-upon procedures in order to determine whether the expenditure of general obligation bonds were made in accordance with the purposes and limitations outlined in the street repair bond resolution – namely, that expenditures were:

1. Used only for costs related to street preservation projects, bicycle and pedestrian projects and payment of bond issuance costs, and not to expand the motor capacity of the street system; and also,
2. Limited to projects included in Exhibit A to the resolution, unless upon completion of all of the projects listed in Exhibit A, the council adds other street preservation projects to the list in order to utilize unspent bond proceeds.

The accountant's procedures were performed for expenditures incurred from January 1, 2015, through December 31, 2015, and were conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. The independent accountant expenditure testing concluded:

All tested expenditures were recorded in the proper account, fund and period and were spent on street projects included in Exhibit A of City Council Resolution No. 5063 or other street preservation projects approved by City Council, as permitted under Resolution 5063. No exceptions were noted.

Further, it was the summary conclusion of the independent accountant that, "Based on our limited testing, we noted that the City followed the purpose and limitation of the City Council Resolution #5063." The Isler CPA report is included as Appendix C to the SRRP 2015 Report and has been placed on the internet at www.eugene-or.gov/gobonds.

Pavement Management Report

The annual Pavement Management Report is produced to update information and data regarding the City of Eugene's transportation system including improved streets, unimproved streets and off-street shared-use paths. Currently, Public Works manages 1,355 lane miles (542 centerline

miles) of streets, and approximately 45 miles of off-street shared-use paths within the city limits. The report includes a breakdown of the street transportation system in terms of pavement type, level of improvement, and functional classification.

The 2016 Pavement Management Report (Attachment B) reviews current treatment programs and costs and projects future treatment needs using 2015 rating and inventory data. The 2016 Pavement Management Report shows progress has been made on the condition of Eugene's streets, but more work is needed to further reduce the backlog of needed repairs of city streets. Specifically, based on the 2014 ratings and reported in the 2015 report, the calculated backlog of repairs on improved asphalt streets was \$84 million. As of the end of 2015, the current backlog has been calculated to be \$79 million. Overall, even though the backlog figure declined in 2015, the projected level of funding beyond the 2012 bond measure is insufficient to stabilize the backlog over the long term. A significant impact to the unstable backlog is the declining condition to residential streets. Annually, a number of residential streets are falling into a more costly treatment category due to lack of funding to repair them.

The report also details how the pavement management system is used to inspect and rate pavement surfaces, explains Eugene's pavement preservation program, and includes updated information about treatment types and costs. Electronic copies of the 2016 Pavement Management Report are available at www.eugene-or.gov/DocumentCenter/View/25694.

RELATED CITY POLICIES

Council's goals include "Transportation Initiative: Develop mechanisms to adequately fund our transportation system for cars, trucks, bikes and pedestrians including maintenance and preservation and capital reconstruction."

COUNCIL OPTIONS

This work session is informational; no action is requested.

CITY MANAGER'S RECOMMENDATION

This work session is informational; no action is requested.

SUGGESTED MOTION

This work session is informational; no motion is requested.

ATTACHMENTS

- A. Citizen Street Repair Review Panel 2015 Report, including Auditor's Report
- B. 2016 Pavement Management Report

FOR MORE INFORMATION

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Staff E-Mail: Kurt.A.Corey@ci.eugene.or.us

Citizen Street Repair Review Panel 2015 Report

Implementation Update for Measure 20-197 Bonds to Fix Streets





Memorandum

Date: February 3, 2016
 To: Jon Ruiz, City Manager
 From: Street Repair Review Panel
 Subject: 2015 Report of the Street Repair Review Panel

It is our pleasure to present the 2015 annual report of the Street Repair Review Panel, focusing on the second year of implementing the 2012 bond measure to fix streets. This panel initially was formed in 2009 to review the implementation of the 2008 road bond measure. This report was written in response to the accountability provisions in Measure 20-197, the 2012 bond measure to fix streets.

The 11-member panel met three times over a three-month period in preparation of this report, which included a physical inspection of the projects completed in 2015. We reviewed and accepted the report prepared by the City's external auditor (Appendix D) with respect to the City's use of the bond proceeds through December 31, 2015.

Based on this limited review and all materials presented to us, we unanimously conclude that the bond proceeds were used for the authorized purposes and in compliance with the limitations and restrictions outlined in Council Resolution 5063. We are also providing a detailed report, prepared at our request and with our approval, from the Public Works staff on the bond projects constructed in 2015.

Highlights from our review of the 2015 street bond projects include the following:

- **Progress** – The projects funded in 2015 by the 2012 voter-approved bond measure resulted in the reconstruction or resurfacing of 17 streets totaling more than 13.2 lane miles. The backlog of street repair projects decreased by \$5 million in 2015 to \$79 million. The 2007 Pavement Management Report projected the anticipated backlog for rehabilitation needs would reach more than \$282 million in 2015 if steps were not taken to reduce the backlog. That's a difference of more than \$200 million. The 2012 measure also allocated funding for bicycle and pedestrian projects guided by the Pedestrian and Bicycle Master Plan, City staff and the Bicycle and Pedestrian Advisory Committee. In 2015, significant safety improvements for people who walk and bike include installing sidewalk ramps, adding new pedestrian crossing beacons, increasing buffer zones and adding shared lane markings.
- **Acknowledging Variability in Funding Forecasts** – Preliminary estimates indicate the City came in under budget on the 2015 projects, but forecasting future costs remains a challenge. One reason for this is that estimates are based on surface observations while the actual treatment is determined by rigorous project-specific scientific testing. For the 2015 projects, as shown in Appendix A, the actual costs were \$323,000 less than programmed—but the actual costs could just as easily have turned out somewhat greater than programmed. Additionally, there could be other variables in the years ahead. While the price of oil hasn't proved to have a significant economic impact on the overall costs of the bond projects to date, the possibility remains. There are also other macro-economic factors such as competitive trends and an expected uptick in local construction projects this summer that could stretch contractors thin and drive up prices. We will let you know if we perceive any significant trends developing as the bond measure continues to be implemented. The pedestrian and bicycle improvement costs for the first two years continues to exceed the expected annual average of \$516,000, but it's our understanding that staff intentionally "front loaded" the cost of the bicycle and pedestrian projects to accommodate the scheduling of large grant projects in future years.
- **Collaborating with Partners and Leveraging Bond Funds** – Eugene's Pavement Preservation Program (PPP) requires strong coordination with internal and external utility stakeholders to schedule and

coordinate the street work with any needed upgrades and repairs to the nearby streets and utility facilities. The 2015 projects created opportunities to repair underground utilities including the wastewater and stormwater systems. This is a cost-effective way to avoid emergency repairs in the future. We also appreciate the effort to leverage bond funds with other sources of revenue, such as the use of transportation SDCs to pay for signal upgrades on bond-funded paving projects.

- **Continuing to Communicate with Citizens and Businesses** – Construction, by nature, is disruptive. City staff continued to work with residents and stakeholders to minimize inconveniences. One potentially disruptive project included the work in the Friendly Area Neighborhood. Two schools were adjacent to the project. Unforeseen complications pushed the work into the school year. The City and contractors worked with the schools to reduce impacts to buses, parents, and teachers. We continue to encourage the department to coordinate projects as much as possible and to continue to look for new and better ways to proactively coordinate communications and minimize impact to the traveling public and impacted businesses and residents.
- **Achieving Sustainability Goals** –The PPP is designed to extend the life of city streets before they fall into the reconstruct category. This helps to not only extend the life of the streets, but when combined with recent paving techniques, greatly reduces the City’s environmental footprint. Eugene was recognized for its use of recycled asphalt pavement allowing for less asphalt waste in landfills. The continued use of warm mix asphalt saves energy, reduces emissions (as detailed in the attached report), and is an excellent example of the department’s commitment to sustainability efforts, consistent with the City’s Climate Recovery Ordinance.
- **Building Safe and Complete Streets** – The bond projects are designed to improve safety for people of all ages and abilities, balance the needs of different modes, and support local land uses, economies, cultures, and natural environments. This ties into the Council’s strategy of “Vision Zero,” a resolution that calls for eliminating traffic-related deaths or serious injuries on city streets. The improvements funded through the bond enhance safety for all road users, whether driving, walking or bicycling.
- **Understanding the Process for Selecting Projects** – SRRP members often are asked what process is used to select streets for repairs. The streets chosen for bond funding were selected using the criteria listed on page 3 of the report. Bicycle and pedestrian projects were not listed in the bond measure. Their selection is guided by the Pedestrian and Bicycle Master Plan, City staff and the Bicycle and Pedestrian Advisory Committee. The memo by Associate Transportation Planner Reed Dunbar (Appendix C) explains in more detail how these safety improvement projects are selected.
- **Recognizing the Continued Economic Value of Street Bond Projects** – Based on the Oregon Department of Transportation Highway Division jobs multiplier model, the bond measure projects completed in 2015 conservatively sustained approximately 91 full-time equivalent jobs during the period of construction.
- **Bottom Line** – We believe the community is getting a good return for its investment in street repairs, and the bonds are being used wisely to meet the objectives of Ballot Measure 20-197. An upfront investment in repairing and maintaining Eugene’s streets saves the community significant money in the long run.

We feel Public Works Director Kurt Corey and his staff are doing an excellent job designing and constructing bond measure projects. We appreciate the support they have given us in the course of our review. The committee also continues to express its appreciation to the voters and taxpayers of Eugene for their ongoing support of the bond measures that have made our community a better place to live and do business.

Additional information about the Street Repair Review Panel can be found at www.eugene-or.gov/gobonds. Please feel free to contact any of us for additional information.

SRRP Members

John Barofsky	John Quilter
Janet Calvert	Ollie Snowden
Allison Camp	Clayton Walker
Mel Damewood	Gary Wildish
Paul Holbo	Sue Wolling
Dave Perez	

City of Eugene Staff

Kurt Corey	Jeff Lankston
Cinimint Harper	Brian Richardson
Eric Johnson	Mark Schoening
Eric Jones	Robert Tintle
Paul Klope	Jenifer Willer

2015 Report to the Citizen Street Repair Review Panel

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Photos on cover from 2015 projects: Completed paving on Brae Burn (left); Completed paving and shared lane bike markings on Fillmore Street (upper right); Construction of a median island crossing (lower right)

INTRODUCTION

BACKGROUND

This report has been compiled for use by the Street Repair Review Panel (SRRP). It is intended to provide background on projects included in the 2012 voter-approved Bond Measure 20-197, the schedule for construction of these projects, and the details of bond projects constructed in 2015. The street repair measure approved \$43 million in bonding authority over a five-year period, with construction of bond-funded projects starting in 2014 and completing in 2018.

KEY TERMS

Bond - Bond Measure 20-197, Bonds to Fix Streets, approved by Eugene voters in November 2012.

Inlay – An inlay treatment consisting of removing a specified depth of the existing pavement surface and repaving that same depth with a new pavement surface. This treatment works well where the pavement distress is isolated to the removed portion of the pavement. At times, the inlay treatment needs to be supplemented with an “overlay,” which is when an additional thickness of pavement is placed over the inlaid pavement. An overlay is used when engineering analysis shows that the existing structure does not have sufficient strength to accommodate the projected traffic loading. The term “overlay” is commonly used to describe both the inlay and overlay practices.

One of the benefits of performing an inlay treatment is that the new pavement surface will match existing adjacent structures and not increase the street cross grade. Another benefit of an inlay is that in the removal of the existing pavement, contractors grind up the old pavement and stockpile the material to be recycled into new pavement.



Removing top layers of pavement on 40th Avenue for inlay treatment

Pavement Preservation Program (PPP) - This is the current capital project program to preserve Eugene’s improved street system. A priority for this program is to preserve streets that have not yet degraded to a point where reconstruction is required. Preserving a street through overlay or similar treatment is four to five times more cost effective than waiting to repair a street until after it requires reconstruction. This program was initiated in 2003 and, until passage of the 2008 and 2012 street repair bonds, was predominately funded with local fuel tax revenue and the reimbursement fee component of transportation system development charges.

Reclaimed Asphalt Pavement (RAP) - Reclaimed asphalt pavement is the grindings from the existing pavement during the inlay process described above. While reclaimed asphalt materials can be used as base rock and shoulder materials, the most common and effective use of this material is to supplement virgin materials used to make new asphalt pavement and reduce the use of costly asphalt binder. In Oregon, it is common to specify up to 30% of asphalt pavement can be made up of reclaimed asphalt pavement. Other reclaimed asphalt materials, such as shingles, can also be used to replace virgin asphalt binder in pavements.



Paving on 19th Avenue

Reconstruction – Once the street has deteriorated to the point that it can no longer be repaired with an inlay or overlay, it is repaired by reconstructing the pavement and underlying base. Traditional reconstruction involves digging up the existing pavement, any existing base rock, and subsurface soils to the depth that will accommodate a new pavement structure. As discussed above, in-place recycling may sometimes be used as an alternative to traditional reconstruction. Reconstruction is the most expensive of the repair options, which is why the City prioritizes preserving streets before they reach the point of needing reconstruction. Reconstruction may be four to five times more expensive than an inlay treatment.

Warm Mix Asphalt - Warm mix asphalt pavement is identical to conventional hot mix asphalt pavement, except that through a special mixing process it is produced at a temperature approximately 50 to 100 degrees cooler than conventional hot mix asphalt. In Eugene, all asphalt concrete producers have retrofitted their plants to produce warm mix asphalt using a water-foaming process. The foaming process allows temperature reductions of approximately 50 degrees. This reduction in temperature has several advantages:

1. It reduces energy consumption to produce asphalt concrete, lowering costs and greenhouse gas emissions.
2. It reduces off-gassing (smoke) of asphalt concrete by keeping temperature under the boiling point of “light oils” in the liquid asphalt, benefiting construction workers and the public.
3. Because the light oils are not boiled off, the liquid asphalt coating the rock particles is slightly thicker, which slows the aging process of the asphalt.
4. It reduces the oxidation caused during high temperature production that causes premature aging of the asphalt, which should provide a longer life product.

The use of warm mix asphalt pavement is specified for all City of Eugene paving projects.

SRRP MISSION

Per Resolution No. 5063 the SRRP “will prepare an annual report, separate and distinct from the report prepared by the outside auditor, documenting the City’s use of the bond proceeds and noting whether the bond proceeds were used in compliance with the terms of this Resolution.”

CRITERIA FOR PROJECT SELECTION AND SCHEDULING

STREET PROJECTS

Street projects to be included in the bond were specifically listed (see Appendix A). All street projects were identified by the Public Works Maintenance Pavement Management System as priorities for repair. In addition, the following criteria were used to select streets for the bond measure:

1. Citizen input with respect to prioritizing major streets in need of reconstruction.
2. Scientific information about needed street rehabilitation and reconstruction from the pavement management system.
3. Geographic distribution throughout the community to ensure all areas of the City receive a benefit from the bond proceeds.

The City has a longstanding policy to use capital preservation funds on the improved street system. An improved street has been designed for the type of soils and traffic use of the street and includes a storm drainage system. Curb and gutter is the traditional mark of a storm drainage system, but can include roadside swales and planters. The bond measure street list consisted of improved streets in need of preservation as identified in the pavement management system.

The list of the street bond projects, with their estimated repair cost from the Pavement Management System and the year constructed or planned year of construction, is included in Appendix A of this report. In scheduling the street repair projects, the priorities were preserving streets prior to their needing reconstruction, grouping projects by location for cost savings, and coordinating with utility work. The list includes a comparison of programmed costs to actual costs with any difference noted. Differences in total project costs on individual projects may affect the funding available for future projects.

BICYCLE AND PEDESTRIAN IMPROVEMENT PROJECTS

The 2012 bond measure stated that the City will allocate an annual average of \$516,000 to support bicycle and pedestrian projects. These projects were not named in the bond measure; rather, the selection of the projects would be guided by the Pedestrian and Bicycle Master Plan, City staff and the Bicycle and Pedestrian Advisory Committee. In 2015, the practice continued to add pedestrian and bicycle improvements to several paving projects and to complete a stand-alone project. These improvements are further described in the project details, below, and included in Appendix C of this report.

USE OF OTHER FUNDS IN CONJUNCTION WITH STREET BOND FUNDS

The use of street-repair bond funds is limited to the overlay or reconstruction of the driving surface of streets as well as to preserve existing integral elements of the street such as curbs, gutters, sidewalks, on-street bike lanes, traffic signals, street lights, medians, traffic calming devices, and other integral parts of a street preservation project. In addition, the City will allocate an annual average of \$516,000 of the bond proceeds over a period of five years to fund bicycle and pedestrian projects. (Resolution 5063, Section D).



Installation of new stormwater pipe on 22nd Avenue

However, there is often a need or an opportunity to complete additional work as part of the construction contracts for street preservation. The additional work may be funded by wastewater and stormwater utility funds, local gas taxes, transportation system development charges, or state and federal grants.

Wastewater and stormwater utility funds are typically used to repair and rehabilitate the existing wastewater and stormwater systems, respectively, that underlie much of the city's street system. Making these repairs in coordination with the street bond projects is a cost-effective way to accomplish the work and precludes emergency repairs in the future that would require cutting new pavement.

Local gas taxes have been used to include adjacent streets in the street bond project contracts.

Transportation system development charges (SDCs) are often used to upgrade existing signal systems during pavement preservation projects. The work typically includes installing new conduit under the pavement to connect the traffic detection loops to the signal controllers and installing audible pedestrian devices for pedestrian crossing signals.

Sustainability and Gains through Technical Developments

The City of Eugene continually strives to improve the quality, environmental footprint, and cost efficiency of its projects. In 2015, Eugene continued to use warm mix asphalt pavement and increased use of reclaimed binder to meet these sustainability criteria.

Warm mix asphalt continued to be specified for all the paving projects in 2015 in place of conventional hot mix asphalt; nearly 42,000 tons of warm mix asphalt pavement was placed on capital paving projects in 2015. As explained in the Key Terms section of this report warm mix asphalt



provides environmental and human health benefits as well as a potentially longer lasting product. The National Cooperative Highway Research Program (NCHRP) estimates that there is a CO₂ savings of 12 pounds per ton of pavement using warm mix as compared to hot mix asphalt. The NCHRP also estimates that the use of warm mix asphalt reduces the energy used in the asphalt batch plant by about 30% compared to hot mix asphalt.

Reclaimed asphalt pavement (RAP) has been used in Eugene for more than 20 years. Like the State of Oregon, Eugene's current standard specification allows up to 30% RAP, by weight, to be used in new asphalt pavement mixes. For several years, local asphalt producers have been supplying mixes that maximize the allowed RAP content.

Increasing the amount of reclaimed asphalt binder in pavement mixes potentially impacts the quality and longevity of the asphalt pavement, so increasing the allowed reclaimed asphalt binder in mixes needs to be done with consideration as RAP contents greater than 20% to 30% is an emerging technology without much research conducted on long-term impacts to the pavement quality. Nationally, multiple organizations are experimenting with increasing the reclaimed asphalt binder content, and Eugene provided pavement samples for research by the Asphalt Pavement Association of Oregon in 2013.

In Eugene, typical RAP materials result in a one-to-one replacement of the virgin asphalt cement needed for a typical Level 2, ½" dense graded asphalt pavement used on residential and collector streets in Eugene. Since the asphalt cement generally makes up about a quarter of the cost of asphalt pavement, reducing the amount of virgin asphalt cement used has the potential to decrease materials costs as well as conserving virgin resources.

Based on positive test results on pilot projects constructed in 2013 to increase RAP usage, Eugene continued to select projects to increase the reclaimed binder in asphalt pavements. In 2015, the City specified 35% binder replacement through the use of reclaimed asphalt materials on 19th Avenue, 22nd Avenue, Fillmore Street and Friendly Street. The specification allows flexibility for the contractors to meet the 35% binder replacement value using RAP or a combination of RAP and reclaimed asphalt shingles (RAS) depending on materials availability and plant capabilities.



**ASPHALT
PAVEMENT
ASSOCIATION
OF OREGON**

City Leads State in Use of RAP

The City of Eugene is leading the state in the use of recycled asphalt pavement, according to a statewide industry group.

In an article titled "City of Eugene leads the way in RAP" in its spring 2015 Centerline newsletter, the Asphalt Pavement Association of Oregon credits Eugene with being the first entity in Oregon to exceed the standards specified by the Oregon Department of Transportation for the use of recycled asphalt pavement (RAP).

"One of the reasons we're exploring higher levels of RAP content is to meet City sustainability goals," says Jenifer Willer, P.E., manager of the City's pavement preservation program. "Using RAP means less asphalt waste in landfills. But there's also potential for economic benefit.

"Our local contractors are as eager to do this as we are," Willer says. "They have huge stockpiles of RAP and this is a cost-effective way to reuse material and lower their production cost."

The full article is available online at the [APAO web site](#) (page 4).

By its nature, reclaimed asphalt binders are stiffer and pavements that contain higher contents of reclaimed asphalt binders are more susceptible to cracking. To compensate for this potential, the grade of virgin asphalt binder typically used for Eugene paving with higher than 30% binder replacement was replaced with a “softer” binder that should better resist cracking.

In the use of increased reclaimed binder content, Eugene is on the forefront of this technology and while we are being leaders, we are also proceeding with caution and choosing projects on a case by case basis. Typically, we are choosing streets with lower traffic volumes in order to minimize the chances of unintended consequences.

Nearly 13,000 tons of RAP was used on 2015 capital paving projects, reducing the need for nearly 750 tons of asphalt cement and 12,000 tons of aggregate to be mined, refined, processed and subsequently shipped to the pavement producers. Using warm mix asphalt with typical reclaimed asphalt pavement content resulted in an estimated reduction of 1,000 MT CO₂e compared to using hot-mix asphalt pavement with no reclaimed pavement on 2015 capital paving projects.

Funding Status and Forecast

In 2012, project costs were estimated for each street for the purpose of selecting streets to be included in the bond measure. These cost estimates were based on the overall surface condition of each street as described in the City’s Pavement Management System. A unit cost was assigned to each street based on whether the street rehabilitation treatment was assumed to be a reconstruct or an overlay. Approximately 18 months prior to construction, more detailed pavement testing is conducted to determine specific treatments to each street based on the existing pavement structure, subgrade soil conditions and traffic loading. Actual rehabilitation treatments may be different than the original assumptions, requiring more, less or a combination of rehabilitation techniques.

For the streets scheduled for 2015 construction, the 2012 estimated cost with inflation was \$5,428,000. As of January 1, 2016, although not all project contracts have been closed out, the projected actual cost for the 2015 bond projects is \$5,105,000; a net difference of \$323,000 below the costs projected in 2012. Details on an annual project-by-project basis are provided in the following pages and summarized in Appendix A. As construction is completed each year, Appendix A will be updated and included in future reports to track the funding status of the overall bond funds.

The 2012 bond measure also allocated an average of \$516,000 for pedestrian and bicycle improvements each year. In 2015, the project expenditures on all pedestrian and bicycle improvements funded by the bond are estimated at \$481,200, which is \$34,800 under the annual average allocation. Future year distributions of bond-funded improvements will continue to be adjusted to maintain an annual average of \$516,000.

2015 Bond Construction Projects

The following pages are reports on individual projects. The total costs for each project listed are estimated as not all of the 2015 construction-related costs have been finalized as of January 1, 2016.



Installation of a shared lane pavement marking in 2015

15th Avenue and 17th Avenue

Project Description: This project consisted of rehabilitation of two streets in the Fairmount Neighbors neighborhood in Council Ward 3:

- 15th Avenue from Agate Street to Fairmount Boulevard
- 17th Avenue from Agate Street to Fairmount Boulevard

This project also included adding bicycle shared lane markings on 15th Avenue funded by the pedestrian and bicycle component of the bond.

Treatment Methodology:

- 15th Avenue was partially rehabilitated by removing the top 2-inch-thick layer of existing asphalt pavement and repaving the pavement surface. The Portland cement concrete (PCC) section of 15th Avenue was reconstructed for its full depth.
- 17th Avenue was reconstructed for its full depth.

Costs: Total project costs, from all funding sources, are estimated at \$2,149,000.

Preliminary Estimate based on Pavement	
Management System (PMS) Surface Evaluation =	\$1,673,000
Total Projected/Actual Paving Bond Funds Used =	\$1,908,000
<hr/>	
Difference =	\$(235,000)

Preliminary surface conditions indicated 17th Avenue could be rehabilitated. Upon more detailed pavement soils testing, 17th Avenue needed to be reconstructed, which increased the overall project costs.

Bond funds used for pedestrian and bicycle improvements on this project: \$38,000.

Additional Sources of Funding: Stormwater and wastewater utility funds paid for minor utility work.



17th Avenue post-project

19th Avenue, 22nd Avenue, Fillmore Street

Project Description: This project consisted of rehabilitation of four streets in the Friendly Area Neighbors neighborhood in Council Ward 1:

- 19th Avenue from Chambers Street to Fillmore Street
- 22nd Avenue from Polk Street to Friendly Street
- Fillmore Street from 19th Avenue to 24th Avenue

Shared lane bicycle markings and crosswalk markings were added to this project with funding from the bond for pedestrian and bicycle improvements. As part of the same construction contract, this project also completed gas tax funded portions of 22nd Avenue (Chambers to Fillmore) and Friendly Street (24th to 28th avenues).

Treatment Methodology: These sections were rehabilitated by removing the top layer(s) of existing asphalt pavement and repaving the streets.

Costs: Total project costs, from all funding sources, are estimated at \$1,232,000.

Preliminary Estimate based on Pavement	
Management System (PMS) Surface Evaluation =	\$863,000
Total Projected/Actual Paving Bond Funds Used =	\$701,000
<hr/>	
Difference =	\$162,000

Bond funds used for pedestrian and bicycle improvements on this project totaled \$10,000.

Additional Sources of Funding: Local gas taxes paid for paving on non-bond funded streets. Stormwater and wastewater utility funds paid for minor utility work. SDC's paid for traffic signal upgrades.

Project Photos:



Fillmore Street post-construction



22nd Avenue post-construction

25th Avenue, City View Street and Timberline Drive

Project Description: This project consisted of rehabilitation of three streets in the Churchill Area Neighbors neighborhood in Council Ward 8:

- 25th Avenue from Hawkins Lane to Brittany Street
- City View Street from 28th Avenue to 29th Avenue
- Timberline Drive from Warren Street to Wintercreek Drive

Treatment Methodology: 25th Avenue was rehabilitated by removing the top layer(s) of the existing paved surface and repaving the street. City View Street was rehabilitated with a 1-inch-thick overlay over the existing paved surface. Timberline Drive was rehabilitated with a 2-inch-thick overlay over the existing paved surface. Spots of failed pavement were removed for their full depth and reconstructed prior to the rehabilitation treatments.

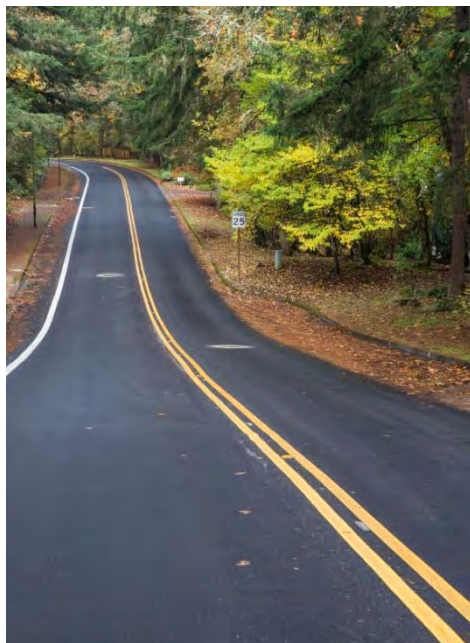
Costs: Total project costs, from all funding sources, are estimated at \$1,028,000.

Preliminary Estimate based on Pavement	
Management System (PMS) Surface Evaluation =	\$935,000
Total Projected/Actual Bond Funds Used =	\$958,000
<hr/>	
Difference =	(\$23,000)

During construction, sections of 25th Avenue were not able to support the construction traffic resulting in a significant number of pavement failures that were not anticipated which increased the project cost.

Additional Sources of Funding: Stormwater and wastewater utility funds.

Project Photo:



Timberline Drive post-construction

39th Avenue, 40th Avenue and Brae Burn Street

Project Description: This project consisted of rehabilitation of four streets in the Southwest Hills Neighborhood Association neighborhood in Council Ward 2:

- 39th Avenue from Willamette Street to Brae Burn Drive
- Brae Burn Drive from 39th Avenue to Willamette Street
- 40th Avenue from Donald Street to Hilyard Street

This contract also included rehabilitation of Donald Street funded by the local gas tax.

Treatment Methodology: These street sections were rehabilitated by removing the top 2 to 3 inches of the existing asphalt pavement and repaving the streets.

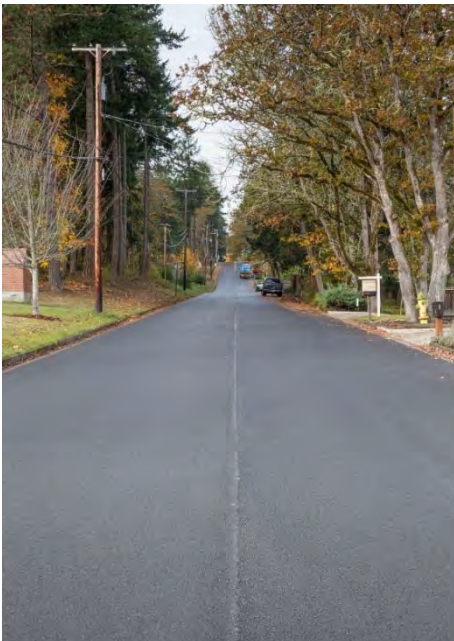
Costs: Total project costs, from all funding sources, are estimated at \$2,164,000.

Preliminary Estimate based on Pavement	
Management System (PMS) Surface Evaluation =	\$899,000
Total Projected/Actual Paving Bond Funds Used =	\$836,000
Difference =	\$63,000

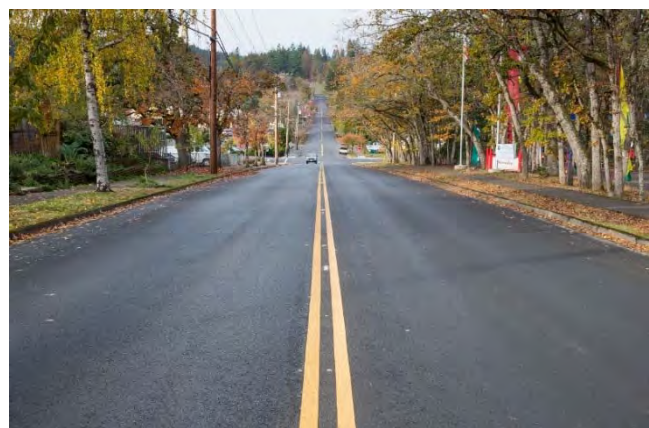
Bicycle and pedestrian bond funds were used on Donald Street to improve the pedestrian crossing at 39th Avenue to Tugman Park in the amount of \$19,000.

Additional Sources of Funding: Local gas taxes paid for non-bond funded street paving. Stormwater and wastewater utility funds were used for minor system repairs.

Project Photos: See cover for a photo of Brae Burn Street



39th Avenue post-construction



40th Avenue post-construction

Avalon, Elizabeth and Juhl Streets, Cascade Drive, Knoop Avenue

Project Description: This project consisted of rehabilitation of five streets in the Active Bethel Citizens neighborhood in Council Ward 6:

- Avalon Street from Echo Hollow Road to Juhl Street
- Cascade Drive from Avalon Street to Juhl Street
- Elizabeth Street from Knoop Avenue to Royal Avenue
- Juhl Street from north of Avalon Street to Elizabeth Street
- Knoop Avenue from Echo Hollow Road to Elizabeth Street

Treatment Methodology: These streets were rehabilitated by removing existing pavement and repaving with a thicker pavement structure resulting in at least 4 inches of pavement structure.

Costs: Total project costs, from all funding sources, are estimated at \$722,000.

Preliminary Estimate based on Pavement	
Management System (PMS) Surface Evaluation =	\$826,000
Total Projected/Actual Paving Bond Funds Used =	\$627,000
<hr/>	
Difference =	\$199,000

There were several street sections that were anticipated to require full depth reconstruction that were able to be rehabilitated at less expense.

Additional Sources of Funding: Stormwater and wastewater utility funds and Transportation SDCs for traffic signal upgrades.

Project Photos:

(Clockwise from upper right) post-project photos of the Intersection of Avalon Street and Cascade Drive, Knoop Avenue, and Elizabeth Street



Mahlon Avenue (Garden Way to Honeysuckle Lane)

Project Description: This project consisted of rehabilitation of this street in the Harlow Neighbors neighborhood in Council Ward 4. This street was included in a local gas tax-funded project to repave Willakenzie Road and Garden Way.

Treatment Methodology: Mahlon was rehabilitated by removing the existing pavement and repaving the street with a thicker pavement structure resulting in at least 4 inches of pavement structure.

Costs: Total project costs, from all funding sources, are estimated at \$1,013,000.

Preliminary Estimate based on Pavement	
Management System (PMS) Surface Evaluation =	\$232,000
Total Projected/Actual Bond Funds Used =	\$75,000
<hr/>	
Difference =	\$157,000

Mahlon Avenue was anticipated to require full depth reconstruction, but was able to be rehabilitated at less expense.

Bicycle and pedestrian bond funds were used to remark the bicycle lanes on Garden Way to add a buffer zone between the parking lane and the bicycle lane and to remark bicycle lanes on Willakenzie Road as a buffered bike lane. The total amount of bond funds used for bicycle and pedestrian improvements on this project were \$20,000.

Additional Sources of Funding: Local gas taxes for non-bond street paving; stormwater and wastewater utility funds.

Project Photo:



Mahlon Avenue post-construction

2015 Pedestrian and Bicycle Improvement Projects

Project Description: In addition to the pedestrian and bicycle improvements incorporated into the paving projects described above, pedestrian and bicycle improvements were constructed at five locations for \$349,000:

- Install sidewalk ramps, median and rectangular rapid flashing beacon on Barger Drive.
- Install sidewalk ramps, median and rectangular rapid flashing beacon on Bailey Hill Road.
- Install sidewalk ramps, median and rectangular rapid flashing beacon on Oakway Road.
- Widen sidewalk at 29th Avenue near Amazon Parkway.
- Install bicycle shared lane markings on various streets.

See the Memo in Appendix C for additional projects that included bond funds for pedestrian and bicycling improvements.

Pedestrian and Bicycle Improvements Funded in 2015: The 2012 bond measure allocated a total of \$2,580,000 for pedestrian and bicycle improvements. This total amount averages out to \$516,000 per year over the five year bond. In the second year of construction, this project and expenditures on all pedestrian and bicycle improvements funded by the bond totaled \$481,200 which was less than the average allocation. Over the first two years of the bond-funded projects, the actual expenses are estimated to be \$191,200 over the allocated average. Future year distributions of bond-funded improvements will continue to be adjusted to maintain an annual average of \$516,000.

Project Photo:



Rectangular rapid flashing beacon crossing installed on Bailey Hill Road

5-Year Street Bond Project List - Costs and Forecast

Project Map #	Street name	From	To	Ward(s)	Proposed Treatment	Programmed Cost (2012) plus inflation	Projected/ Actual Cost	Difference
Construction Year 2014								
1	1st Avenue (C)	Washington St	Van Buren St	7	Overlay	\$ 544,000		
55	Madison Street (L)	1st Ave	8th Ave	1, 7	Reconstruction	\$ 969,000	\$ 2,154,000	\$ (95,000)
58	Monroe Street (L)	1st Ave	Blair Blvd	1, 7	PCC panel replacement	\$ 546,000		
8	13th Avenue (C/A)	Washington St	Garfield St	1	Reconstruction/Overlay	\$ 2,392,000	\$ 2,109,000	\$ 283,000
9	13th Avenue (C)	Bertelsen Rd	Commerce St	8	Reconstruction/Overlay	\$ 169,000	\$ 410,000	\$ 78,000
44	Interior Street (L)	north end	south end	8	Reconstruction/Overlay	\$ 319,000		
21	43rd Avenue (C)	North Shasta Lp	Dillard Rd	2	Pavement Removal and Replacement	\$ 165,000	\$ 1,319,000	\$ (618,000)
40	Firland Blvd (C)	Spring Blvd	Agate St	2	Reconstruction	\$ 97,000		
59	North Shasta Loop (C)	Firland Blvd	North Shasta Lp	2	Reconstruction/Overlay	\$ 439,000		
25	Broadway (C)	Mill St	Pearl St	1, 3	Overlay	\$ 184,000	\$ 854,000	\$ (482,000)
33	Coburg Road (A)	south end of Ferry Street Bridge	north end of viaduct	3, 7	Pavement Removal and Replacement	\$ 188,000		
43	Goodpasture Loop (C)	Goodpasture Island Road		5	Overlay	\$ 1,103,000	\$ 925,000	\$ 178,000
Construction Year 2014 Totals =						\$ 7,115,000	\$ 7,771,000	\$ (656,000)
Construction Year 2015								
10	15th Avenue (L)	Fairmount Blvd	Agate St	3	Reconstruct	\$ 1,020,000	\$ 1,908,000	\$ (235,000)
11	17th Avenue (L)	Fairmount Blvd	Agate St	3	Reconstruct	\$ 653,000		
12	19th Avenue (L)	Fillmore St	Chambers St	1	Pavement Rem/Overlay	\$ 85,000	\$ 701,000	\$ 162,000
13	22nd Avenue (L)	Friendly St	Polk St	1	Pavement Rem/Overlay	\$ 181,000		
39	Fillmore Street (L)	19th Ave	24th Ave	1	Pavement Rem/Overlay	\$ 597,000		
14	25th Avenue (C)	Hawkins Ln	Brittany St	8	Overlay	\$ 231,000	\$ 958,000	\$ (23,000)
32	City View Street (L)	28th Ave	29th Ave	8	Reconstruct	\$ 278,000		
67	Timberline Drive (C)	Warren St	Wintercreek Dr	8	Reconstruction/Overlay	\$ 426,000	\$ 836,000	\$ 63,000
19	39th Avenue (C)	Willamette St	100' East of Densmore	2	Overlay	\$ 215,000		
20	40th Avenue (C)	Hilyard St	Donald St	2	Overlay	\$ 169,000		
24	Brae Burn Drive (C)	39th Ave	Willamette St	2	Overlay	\$ 515,000	\$ 627,000	\$ 199,000
22	Avalon Street (L)	Echo Hollow Rd	Juhl St	6	Reconstruct	\$ 298,000		
30	Cascade Drive (L)	Avalon St	Juhl St	6	Reconstruct	\$ 170,000		
37	Elizabeth Street (L)	Knoop Ave	Royal Ave	6	Overlay	\$ 120,000		
48	Juhl Street (L)	north side of address 1424	south end	6	Reconstruct	\$ 160,000		
49	Knoop Avenue (L)	Echo Hollow Rd	Elizabeth St	6	Overlay	\$ 78,000		
56	Mahlon Avenue (L)	Garden Way	Honeysuckle Ln	4	Pavement Rem/Overlay	\$ 232,000		
Construction Year 2015 Totals =						\$ 5,428,000	\$ 5,105,000	\$ 323,000
Construction Year 2016								
4	5th Avenue (L)	Bertelsen Rd	west end	8	Reconstruct	\$ 664,000		\$ -
5	6th Avenue (L)	Bertelsen Rd	Commercial St	8	Overlay	\$ 166,000		\$ -
6	7th Avenue (L)	Bertelsen Rd	Oscar St	8	Reconstruct	\$ 863,000		\$ -
15	27th Avenue (L)	Columbia St	south end	3	Overlay	\$ 117,000		\$ -
28	Capital Drive (L)	Spring Blvd	50' north of Crest De Ruta	3	Reconstruct	\$ 418,000		\$ -
31	Centennial Loop (L)	MLK Jr Blvd		4	Reconstruct	\$ 678,000		\$ -
34	Commercial Street (L)	5th Ave	south end	8	Overlay	\$ 230,000		\$ -
38	Fairfield Avenue (C)	Hwy 99	Royal Ave	7	Reconstruct	\$ 701,000		\$ -
46	Jacobs Drive (L)	Hwy 99	Fairfield Ave	6, 7	Reconstruct	\$ 840,000		\$ -
53	Lincoln Street (L)	5th Ave	13th Ave	7	Overlay	\$ 392,000		\$ -
62	Potter Street (L)	24th Ave	29th Ave	3	Reconstruct	\$ 847,000		\$ -
66	Spring Boulevard (L)	Fairmount Blvd	Capital Dr	3	Overlay	\$ 150,000		\$ -
70	Van Ness Street (L)	23rd Ave	27th Ave	3	Overlay	\$ 134,000		\$ -
71	Washington Street (A)	8th Ave	13th Ave	1	Reconstruct	\$ 751,000		\$ -
75	Willamette Street (L)	10th Ave	13th Ave	1	Reconstruct	\$ 613,000		\$ -
Construction Year 2016 Totals =						\$ 7,564,000	\$ -	\$ -
Construction Year 2017								
2	1st Avenue (L)	west end	Blair Blvd	7	Reconstruct	\$ 548,000		\$ -
3	2nd Avenue (C)	Garfield St	Blair Blvd	7	Reconstruct	\$ 1,255,000		\$ -
16	30th Avenue (A)	Spring Blvd overpass	Agate St	2, 3	Reconstruct	\$ 2,871,000		\$ -
23	Best Lane (L)	Willakenzie Rd	Kentwood Dr	4	Overlay	\$ 157,000		\$ -
27	Calvin Street (L)	Western Dr	Harlow Rd	4	Reconstruct	\$ 273,000		\$ -
36	East Amazon Drive (A)	Hilyard St	Dillard Rd	2	Reconstruct	\$ 1,322,000		\$ -
42	Garfield Street (C)	Roosevelt Blvd	6th Ave	7	Reconstruct	\$ 1,891,000		\$ -
45	Ione Avenue (L)	Best Ln	Adkins St	4	Overlay	\$ 77,000		\$ -
47	Jefferson Street (C)	8th Ave	18th Ave	1	Reconstruct	\$ 1,237,000		\$ -
52	Leigh Street (L)	Western Dr	north end	4	Reconstruct	\$ 184,000		\$ -
54	Lydick Way (L)	Tomahawk Ln	Harlow Rd	4	Overlay	\$ 87,000		\$ -

5-Year Street Bond Project List - Costs and Forecast

Project Map #	Street name	From	To	Ward(s)	Proposed Treatment	Programmed Cost (2012) plus inflation	Projected/ Actual Cost	Difference
60	Pioneer Court (L)	Pioneer Pike	north end	4	Reconstruct	\$ 112,000		\$ -
64	Satre Street (C)	Bailey Ln	Western Dr	4	Overlay	\$ 714,000		\$ -
68	Tomahawk Lane (L)	Harlow Rd	580' north of Harlow	4	Overlay	\$ 92,000		\$ -
73	Western Drive (L)	Calvin St	west end	4	Reconstruct	\$ 454,000		\$ -

Construction Year 2017 Totals = \$ 11,274,000 \$ - \$ -

Construction Year 2018

7	7th Place (C)	Hwy 99 (7th Ave)	Bailey Hill Rd	1, 7, 8	Reconstruct	\$ 3,417,000		\$ -
17/18	30th Avenue (L)	Willamette Street	Ferry Street	2	Reconstruct	\$ 437,000		\$ -
26	Buff Way (L)	Woodside Dr	Forrester Wy	4	Reconstruct	\$ 179,000		\$ -
29	Carmel Avenue (L)	Minda Dr	400' south	5	Reconstruct	\$ 132,000		\$ -
35	Corydon Street (L)	Forrester Wy	Tandy Turn	4	Reconstruct	\$ 41,000		\$ -
41	Forrester Way (L)	Coburg Rd	west side of driveway 1033	4	Reconstruct	\$ 248,000		\$ -
50	Larkspur Avenue (L)	Norkenzie Rd	604' west	5	Reconstruct	\$ 211,000		\$ -
51	Larkspur Loop (L)	Norkenzie Rd		5	Reconstruct	\$ 171,000		\$ -
57	Mill Street (L)	30th Avenue		2	Reconstruct	\$ 49,000		\$ -
61	Piper Lane (L)	Chasa St	Fir Acres Dr	5	Reconstruct	\$ 196,000		\$ -
63	Roland Way (L)	Oakway Rd	Cal Young Rd	5	Reconstruct	\$ 216,000		\$ -
65	Sharon Way (L)	Coburg Rd	east side of driveway 1023	4	Reconstruct	\$ 376,000		\$ -
69	Tulip Street (L)	Crescent Ave	Holly Ave	5	Reconstruct	\$ 118,000		\$ -
72	West Amazon Drive (A)	Hilyard St	Fox Hollow Rd	2	Reconstruct	\$ 1,463,000		\$ -
74	Willamette Street (A)	24th Ave	29th Ave	1, 2	Reconstruct	\$ 1,232,000		\$ -
76	Woodside Drive (L)	Cal Young Rd	Sharon Wy	4	Reconstruct	\$ 423,000		\$ -

(x) Street Classification Key: (L) = Local; (C) = Collector; (A) = Arterial

Construction Year 2018 Totals = \$ 8,909,000 \$ - \$ -

Total Programmed Costs = \$ 40,290,000 \$ 12,876,000 \$ 27,414,000

Pedestrian and Bicycle Improvements Project List

Projects	Average Annual Allocation \$516,000	Projected/ Actual Cost	Difference
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Construction Year 2014

2014 Pedestrian & Bicycle Repairs		\$ 410,000	
Acorn Park Sidewalks		\$ 128,000	
1st, Madison, Monroe		\$ 92,000	
13th Avenue (Washington to Garfield)		\$ 25,000	
Goodpasture Island Loop Pedestrian Signals		\$ 29,000	
Roosevelt Blvd Pedestrian Signals and Sidewalk Infill		\$ 58,000	
Construction Year 2014 Pedestrian & Bicycle Repairs Total =		\$ 742,000	\$ (226,000)

Construction Year 2015

2015 Pedestrian & Bicycle Improvement Project		\$ 349,000	
15th and 17th Avenues Markings		\$ 38,000	
Fillmore and Friendly Streets Markings		\$ 10,000	
Donald Street Crossing		\$ 19,000	
Garden Way and Willakenzie Markings		\$ 20,000	
Valley River Way Pedestrian Signal Upgrades		\$ 20,000	
South Willamette Street Improvements		\$ 12,700	
Tugman Bridge and Sidewalk Improvements		\$ 12,500	
Construction Year 2015 Pedestrian & Bicycle Repairs Total =		\$ 481,200	\$ 34,800

Construction Years 2016 - 2018

\$ 1,356,800

Total Pedestrian and Bicycle Improvement Project Costs = \$ 2,580,000 \$ 1,223,200 \$ 1,356,800

Summary of Bond Costs

Total Street Projects in 2012 Dollars with inflation = \$ 40,290,000

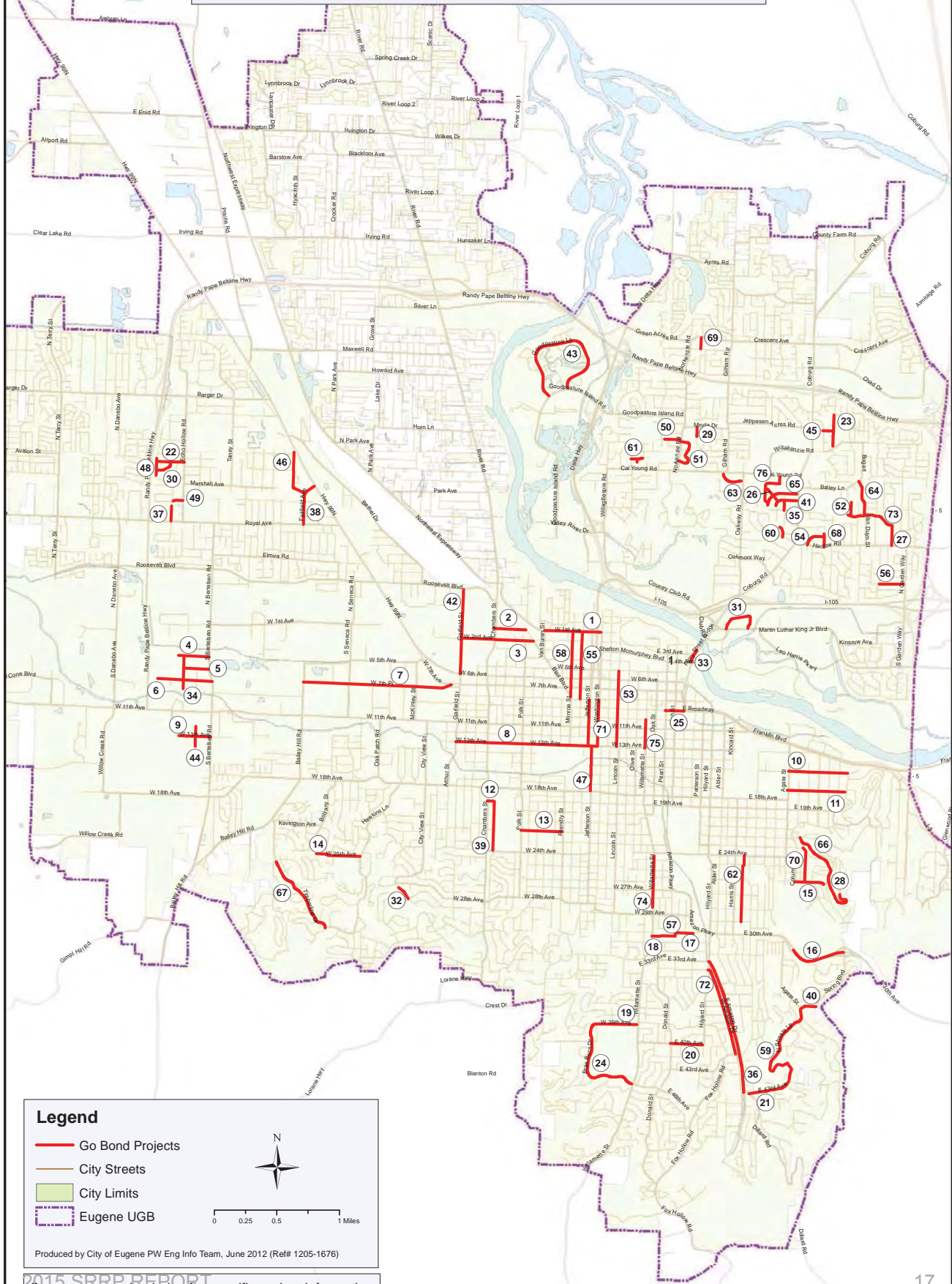
Total Pedestrian & Bicyclist Improvements = \$ 2,580,000

Bond Issuance Costs = \$ 130,000

Total Bond Costs = \$ 43,000,000

Eugene Street Preservation Projects

Project Map for 2012 Bond Measure to Fix Streets



Legend

- Go Bond Projects
- City Streets
- City Limits
- Eugene UGB



0 0.25 0.5 1 Miles

Produced by City of Eugene PW Eng Info Team, June 2012 (Ref# 1205-1676)

2015 SPPB REPORT See accompanying index for specific project information

Project List for 2012 Bond Measure to Fix Streets

Map #	Street Name	Limits
1	01ST AVE	WASHINGTON ST - VAN BUREN ST
2	01ST AVE	BLAIR BLVD - WEST END
3	02ND AVE	BLAIR BLVD - GARFIELD ST
4	05TH AVE	BERTELSEN RD - WEST END
5	06TH AVE	BERTELSEN RD - COMMERCIAL ST
6	07TH AVE	BERTELSEN RD - OSCAR ST
7	07TH PL	7TH AVE/HWY 99 - BAILEY HILL RD
8	13TH AVE	WASHINGTON ST - GARFIELD ST
9	13TH AVE	BERTELSEN RD - COMMERCE ST
10	15TH AVE	FAIRMOUNT BLVD - AGATE ST
11	17TH AVE	FAIRMOUNT BLVD - AGATE ST
12	19TH AVE	FILLMORE ST - CHAMBERS ST
13	22ND AVE	FRIENDLY ST - POLK ST
14	25TH AVE	HAWKINS LN - BRITTANY ST
15	27TH AVE	COLUMBIA ST - SPRING BLVD
16	30TH AVE	SPRING OVERPASS - AGATE ST
17	30TH AVE	MILL ST (WEST) - FERRY ST (EAST)
18	30TH AVE	MILL ST - WILLAMETTE ST
19	39TH AVE	WILLAMETTE ST - 100' EAST OF DENSMORE RD
20	40TH AVE	HILYARD ST - DONALD ST
21	43RD AVE	N SHASTA - DILLARD RD
22	AVALON ST	ECHO HOLLOW RD - JUHL ST
23	BEST LN	WILLAKENZIE RD - KENTWOOD DR
24	BRAE BURN DR	39TH AVE - WILLAMETTE ST
25	BROADWAY	MILL ST - PEARL ST
26	BUFF WAY	WOODSIDE DR - FORRESTER WAY
27	CALVIN ST	WESTERN DR - HARLOW RD
28	CAPITAL DR	SPRING BLVD - 50' N OF CRESTA DE RUTA ST
29	CARMEL AVE	MINDA DR - 400' SOUTH OF MINDA DR
30	CASCADE DR	AVALON ST - JUHL ST
31	CENTENNIAL LP	MLK, JR BLVD (EAST) - MLK, JR BLVD/CLUB RD
32	CITY VIEW ST	28TH AVE - 29TH AVE
33	COBURG RD	SS FERRY ST BRIDGE - 50' S OF EWEB ON/OFF RAMP
34	COMMERCIAL ST	5TH AVE - SOUTH END
35	CORYDON ST	FORRESTER WAY - TANDY TURN
36	EAST AMAZON DR	HILYARD ST - DILLARD RD
37	ELIZABETH ST	KNOOP AVE - ROYAL AVE
38	FAIRFIELD AVE	WS HWY 99 - ROYAL AVE
39	FILLMORE ST	19TH AVE - 24TH AVE
40	FIRLAND BLVD	SPRING BLVD - AGATE ST
41	FORRESTER WAY	COBURG RD - WS DRWY 1033
42	GARFIELD ST	ROOSEVELT - 6TH AVE
43	GOODPASTURE LOOP	GOODPASTURE IS RD (EAST INTERSECTION) - GOODPASTURE IS RD (WEST INTERSECTION)
44	INTERIOR ST	NORTH END OF CUL DE SAC - SOUTH END OF IMPROVED SECTION

Map #	Street Name	Limits
45	IONE AVE	BEST LN - ADKINS ST
46	JACOBS DR	HWY 99N - FAIRFIELD AVE
47	JEFFERSON ST	8TH AVE - 18TH AVE
48	JUHL ST	NS ADDR 1424 - SOUTH END
49	KNOOP AVE	ECHO HOLLOW RD - ELIZABETH ST
50	LARKSPUR AVE	NORKENZIE RD - 640 FEET WEST OF NORKENZIE RD
51	LARKSPUR LOOP	NORKENZIE RD (N) - NORKENZIE RD (S)
52	LEIGH ST	NORTH END - WESTERN DR
53	LINCOLN ST	5TH AVE - 13TH AVE
54	LYDICK WAY	TOMAHAWK LN - HARLOW RD
55	MADISON ST	1ST AVE - 8TH AVE
56	MAHLON AVE	GARDEN WAY - HONEYSUCKLE LN
57	MILL ST	30TH AVE (NORTH) - 30TH AVE (SOUTH)
58	MONROE ST	1ST AVE - BLAIR BLVD
59	NORTH SHASTA LOOP	FIRLAND - 43RD AVE
60	PIONEER CT	PIONEER PIKE - NORTH END
61	PIPER LN	CHASA ST - FIR ACRES DR (INCL CUL-DE-SAC)
62	POTTER ST	24TH AVE - 29TH AVE
63	ROLAND WAY	OAKWAY RD - CAL YOUNG RD
64	SATRE ST	BAILEY LN - WESTERN DR
65	SHARON WAY	COBURG RD - ES DRWY 1023
66	SPRING BLVD	FAIRMOUNT BLVD - CAPITAL DR
67	TIMBERLINE DR	WARREN ST - WINTERCREEK DR
68	TOMAHAWK LN	HARLOW RD - 580' NORTH OF HARLOW RD
69	TULIP ST	CRESCENT AVE - HOLLY AVE
70	VAN NESS ST	23RD AVE - 27TH AVE
71	WASHINGTON ST	8TH AVE - 13TH AVE
72	WEST AMAZON DR	ES HILYARD - SS FOX HOLLOW
73	WESTERN DR	CALVIN ST - WEST END/MONROE MIDDLE SCHOOL
74	WILLAMETTE ST	24TH AVE - 29TH AVE
75	WILLAMETTE ST	10TH AVE - 13TH AVE
76	WOODSIDE DR	CAL YOUNG RD - SHARON WAY



December 2015

Street Repair Review Panel,

This memo summarizes the process for determining street characteristics for people who walk and bike and how the Pavement Bond Measure (PBM) is used to enhance the environment for active transportation modes. In addition, project summaries for 2015 and a look ahead to 2016 have also been provided.

Background

The 2012 Pavement Bond Measure includes the following language, "...Council determined that an annual average of \$516,000 should be allocated over a period of five years to support bicycle and pedestrian projects guided by the Pedestrian and Bicycle Master Plan, City staff, and the Bicycle and Pedestrian Advisory Committee." Transportation Planning works with BPAC to develop a list of bicycle and pedestrian projects for review. The projects include additions to pavement projects and stand-alone improvements for people who walk and bike.

Where do the Walking and Biking Projects Come From?

In 2012, City Council accepted the Pedestrian and Bicycle Master Plan as a resource for network improvements related to walking and bicycling. In 2016, the PBMP will be assimilated into the city's Transportation System Plan (TSP). The TSP, currently in process, is the city's transportation policy document and long-term vision for transportation resources. Policies, project tables, and maps for improving the walking and bicycling environment will be included in TSP and adopted by City Council.

For pavement preservation projects city staff consult the TSP to determine what, if any, changes should be explored during project planning. Pavement projects present an opportunity to implement some improvements, such as bike lane striping, because striping will be entirely replaced as part of the project. .

There are also projects developed based on community input, coordination with 4j and Bethel Safe Routes to School programs, and through site investigations by city staff.

What Bike/Ped Projects Were Built in 2015 Using the PBM?

Some of the walking and bicycling projects occur on streets where there is a pavement project while others do not. Projects developed in 2015 are listed below. Pictures for some projects are located at the end of this memo.

Projects Occurring with Pavement Projects

- 15th Avenue (Fairmount to Agate): add shared lane markings; extend island on Villard using striping
- 18th Avenue (Josh to Bertelsen): move the bike lane at Bertelsen outside of the right turn only lane
- 22nd Avenue (Friendly to Polk): add shared lane markings; replace existing crosswalks (PIC #1)
- Fillmore Street (19th to 24th): add shared lane markings from 24th to 22nd; crosswalk at 22nd
- Donald Street (32nd to 40th): add bumpouts at 39th Avenue; move ramp to Tugman Park path; add sidewalk to Pearl Street (PIC #2)
- Friendly Street (24th to 28th): add shared lane markings
- Garden Way (Harlow to Sisters View): add a door zone buffer to the existing bike lane (PIC #3)
- Willakenzie Road (Bogart to Coburg): buffer the existing bike lanes (PIC #4)

Discretionary Projects

- 29th at Amazon: widen the sidewalk on 29th Avenue from Ferry to Amazon Pkwy. Install radius from 29th Avenue sidewalk to shared use path and rebuild the failing shared use path. Replace ramps and remove failing trees and old bike shelters; replace tree wells and bike shelters with stormwater planters. (PIC #5)
- Bailey Hill RRFB: add a rectangular rapid flashing beacon (RRFB) across Bailey Hill Road at the Fern Ridge Path. (PIC #6)
- Barger Drive RRFB: add a pedestrian crossing island and RRFB across Barger west of Devos Street.
- Oakway RRFB: replace the existing crossing island and pedestrian ramps and add an RRFB across Oakway Road south of Westwood Lane.

What Projects are you Exploring for 2016?

Anticipated 2016 projects include:

- Complete the sidewalk on the north side of Goodpasture Island Road east of the new bridge over Delta Hwy
- Install an RRFB on Division Avenue at Lone Oak
- Install a sidewalk on the east side of Fairfield Avenue by Fairfield Elementary School
- Buffer the existing bike lanes on Lincoln Street (11th to 5th) and study adding a new northbound bike lane from 13th to 11th
- Explore moving the bus shelter on Willamette Street (currently south of 12th Alley) off of the existing sidewalk by extending and building new sidewalk into the bus bay
- Study one-way to two-way conversion of 8th Avenue (Lincoln to Monroe)
- Contribute funding to the Willamette Street trial (23rd to 29th Avenues)

If you have any questions about planning for walking and bicycling projects, or use of PBM funds to deliver these projects, please contact me: reed.c.dunbar@ci.eugene.or.us, (541) 682-5727.

Sincerely,
 Reed Dunbar, AICP
 Associate Transportation Planner (Bicycle and Pedestrian Planner)

PIC #1: 22nd Avenue



PIC #2: Tugman Park Ramp (Donald Street)



PIC #3: Garden Way Door Zone Buffer



PIC #4: Willakenzie Bike Lane Buffer



PIC #5: 29th at Amazon



PIC #6: Bailey Hill RRFB





INDEPENDENT ACCOUNTANT'S REPORT ON APPLYING AGREED-UPON PROCEDURES



To Jon Ruiz, City Manager
City of Eugene
Eugene, Oregon

We have performed the procedures enumerated below, which were agreed to by the City of Eugene ("City"), solely to assist you in connection with the determination of whether the expenditure of the 2012 general obligation bond funds approved for issuance through voter's approval of Ballot Measure 20-197 were expended in accordance with the purposes and limitations outlined in City Council Resolution No. 5063; namely that such expenditures were: a) used only for costs related to street preservation projects, fund bicycle and pedestrian projects and payment of bond issuance costs and not to expand the motor vehicle capacity of the street system; and, b) limited to projects included in Exhibit A to the Resolution unless upon completion of all of the projects listed in Exhibit A the Council adds other street preservation projects to the list in order to utilize unspent bond proceeds. Management is responsible for the accounting records pertaining to the use of the bond proceeds. This agreed-upon procedures engagement was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. The sufficiency of these procedures is solely the responsibility of those parties specified in this report. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose.

All procedures were performed for expenditures incurred from January 1, 2015 through December 31, 2015. All procedures we performed were limited to documentation and information supplied to us by the City, as follows:

- An Excel spreadsheet detailing all payments made, charges allocated and/or invoices received by the City for expenditures related to the use of the bond proceeds
- Copies of Resolution No. 5063 and Ballot Measure 20-197
- Copies of bids and contracts issued by the City for any projects to be completed using the bond proceeds
- Copies of supporting documentation including, but not limited to, invoices, cancelled checks, payroll records, certifications of payments and bank statements; and
- Copies of the City's general ledger detail for the bond fund accounts.

The procedures we performed and the associated findings are as follows:

- (1) *Expenditure testing.* From January 1, 2015 through December 31, 2015, total expenditures for the projects funded by the 2012 bond proceeds were \$6,355,849 per the City's general ledger. We tested \$3,463,857 or 55%, of those expenditures. All tested expenditures were supported by appropriate documentation such as vendor invoices, certifications of payment, payroll records, signed contracts, and photographs of the work in progress. All tested expenditures were recorded in the proper account, fund and period and were spent on street projects included in Exhibit A of City Council Resolution No. 5063 or other street preservation projects approved by City Council, as permitted under Resolution 5063. No exceptions were noted.

- (2) We reviewed bids and contracts related to two of seven new construction projects during 2015. The bidding and contracting process for the two projects complied with the City's procurement policies and procedures.
- (3) We recalculated the amount of unspent bond proceeds and compared that amount to the actual amount of bond proceeds remaining. The following is a summary of the 2012 bond proceeds and project expenditures from inception of the Street Bond project to December 31, 2015:

	From Issuance to 12/31/2014	From 1/1/2015 12/31/2015	Total
Bond proceeds	\$ 8,500,000	\$ 6,289,700	\$ 14,789,700
Project expenditures	8,445,638	6,355,849	14,801,487

As of December 31, 2015, the City had \$1,700,000 outstanding on the line of credit facility. From January 1, 2015 through December 31, 2015, the City received \$6,289,700 in bond proceeds and was charged interest of \$34,081; the City repaid \$8,123,781 during the same period. At December 31, 2015, the City had \$28,210,300 in authorized borrowing remaining on the bonds (\$43,000,000 authorized less \$14,789,700 in proceeds received to date).

Based on our limited testing, we noted that the City followed the purpose and limitation of the City Council Resolution 5063.

We were not engaged to and did not conduct an audit, the objective of which would be the expression of an opinion on the financial records. Accordingly, we do not express such an opinion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

This report is intended solely for the information and use of the City Manager of the City of Eugene, and is not intended to be and should not be used by anyone other than this specified party.

Isler CPA

Isler CPA

Eugene, Oregon
January 26, 2016

2016 PAVEMENT MANAGEMENT REPORT

An Update on Asphalt Pavement Conditions and Programs
(2015 Rating & Inventory Data)



A Few Definitions:

Full Depth Reclamation (FDR) – Blends Asphalt Surfacing, Base Aggregate and Subgrade Soils using a Reclaimer. Cementitious material (such as Cement, Asphalt, Fly ash or Lime) is Added in a Small Quantity to Construct a New Road Base.

A collage of three photographs on a light blue background. The top-left photo shows a large yellow and white reclaimer machine operating on a road. The top-right photo shows a long, straight road with a fresh asphalt surface. The bottom-center photo shows a road with a large, dark asphalt patch.

Prepared by:
Public Works Maintenance
Surface Technical Team
1820 Roosevelt Blvd.
Eugene, OR 97402



Item B.

Cover Photos (top left – clockwise): GO BONDS, Severe Alligator in Local Street, Surface Operations Maintenance Staff, Asphalt repair-FDR with Slurry Paste

EXECUTIVE SUMMARY

The annual Pavement Management Report is produced to update information and data regarding the City of Eugene's transportation system including improved streets, unimproved streets and off-street shared-use paths. This report provides surface descriptions and associated mileage, reviews current treatment programs and costs, and projects future treatment needs based on several funding scenarios.

The transportation system is conservatively estimated to represent a \$500 million public asset. This asset is typically described in lane miles and/or centerline miles. Currently, Public Works manages 1355 lane miles (542 centerline miles) of streets, and approximately 45 miles of off-street shared-use paths within the City limits. This report includes a breakdown of the street transportation system in terms of pavement type, level of improvement, and functional classification.

Street (and off-street shared-use paths) conditions data are collected by Public Works Maintenance staff through on-site inspections. Pavement distress information is collected and a Pavement Condition Index (PCI) score is generated. Formulas and methodology within MicroPaver helps establish efficient treatment requirements and identify financial implications of various response strategies. The Pavement Management System (PMS) also provides a detailed street inventory and condition trends using a combination of CenterLine and MicroPaver software street condition information collected since 1987.

The City established a local gas tax in 2003 for a Pavement Preservation Program (PPP) due to the fact that street repair funding was not at a level to keep pace with rehabilitation needs. In 2007, it was reported that the anticipated backlog for rehabilitation needs would reach more than \$282 million by 2016 (2007 Pavement Management Report). In 2008, a \$35.9 million, five-year bond measure was approved by voters and another five-year bond for \$43 million was approved by voters in 2012. Between these funding sources more than 126 streets in Eugene are identified to be repaired by 2018. The revenues from the local gas tax and the bond measures have helped reduce the backlog of street repair projects. Specifically, based on the 2014 ratings and reported in the 2015 Pavement Management Report the calculated backlog of repairs on improved asphalt streets was \$84 million; as of the end of 2015 the current backlog has been calculated to be \$79 million.

In addition to the infusion of local gas tax and bond funding, other factors have contributed to the current status of the backlog:

- Several projects previously defined as needing to be reconstructed have been designated for overlay treatment after detailed testing was performed. An overlay treatment is much less expensive than a reconstruct treatment and can provide a comparable service life if the base is properly designed and undamaged.

EXECUTIVE SUMMARY – (continued)

- According to the Construction Costs Forecast (ODOT, October 2012) costs will continue to increase at a steadier rate rather than with the volatility of recent years. Changes in costs for construction materials and labor will affect long-term backlog estimates.
- New construction techniques such as in-place recycling (also known as in-place cement treated base) which strengthens existing roadbed materials for reuse have been successfully used in place of conventional reconstruction techniques resulting in substantial cost savings.
- There has been an increase in inventory of improved streets through capital improvement projects (CIP), privately engineered public improvements (PEPI) and jurisdictional transfers.

Overall, even though the backlog figure declined in 2015, the projected level of funding beyond the 2012 bond measure is insufficient to stabilize the backlog long term. A significant impact to the unstable backlog is the declining condition to residential streets. Annually, a number of streets are falling into a more costly treatment category due to lack of funding to repair them. It is also important to note that the backlog estimate is limited to improved asphalt streets. It does not take into account the repair needs for concrete streets, unimproved streets, sidewalks, off-street shared-used paths, or other elements of the transportation system.

The 2016 report uses three funding scenarios to project treatment needs and costs over a 10-year period. The analyses for all three scenarios use costs updated by Engineering in 2011 and are adjusted to include a 2% inflation factor. Following is a summary of the analyses:

- Maintaining the current level of funding, including the 2012 bond measure, results in a total projected backlog of \$186 million in 10 years. Prior to approval of the 2012 bond, the projected 10-year backlog was \$264 million. The current bond measure funding will end in 2019 decreasing pavement preservation from an average of \$11.3 million to \$3.1 million unless additional funding is approved.
- After the 2012 bond measure funding has ended, future funding of \$9.5 million annually is needed to prevent arterials and collectors from falling into the reconstruct range and eliminate the reconstruct backlog for arterial and collector streets in 10 years.
- Increasing the funding level to \$17 million annually is needed to prevent any street from falling into the reconstruct range and eliminate the total reconstruct backlog in 10 years. Residential streets account for approximately 62% (lane miles) of the system and over half of the current backlog is for the treatment of these streets.

SCOPE OF THIS REPORT

This report is made up of four primary sections:

Street Inventory: The street inventory is discussed including improvement status and functional classification definitions.

Pavement Management System (PMS): A brief history and description of the Pavement Management System used by the City, the selection process and conversion to MicroPaver system is discussed. Included in this section are the rating methodology, pavement inspection frequency, pavement conditions described by the Pavement Condition Index (PCI), specific distress definitions and the resulting reports.

Pavement Preservation Program (PPP): The Pavement Preservation Program is highlighted in this report, including Maintenance and Engineering Division roles, treatment types and estimated unit costs, project prioritization, sustainable construction, current treatment costs, projected funding, historical and projected funding graphs, unimproved streets, and off-street shared-use paths.

Projects: This section includes completed and future project lists and maps, including a list and map of the projects identified in the 2012 bond measure.

EUGENE'S STREET INVENTORY

The City of Eugene has jurisdictional responsibility for many different types and classifications of transportation facilities. Many factors such as age, development type, traffic loads, use, and future transportation needs affect the maintenance and rehabilitation planning for the system. The segment inventory component of the PMS allows a reporting of both centerline miles (intersection to intersection) and lane miles of each segment of the system. While commonly used in reporting distance, centerline miles do not relate equally across streets of different widths or different number of lanes. For this report, comparisons typically are shown both in centerline and 12 foot-wide lane miles unless otherwise noted.

Improvement Status

For purposes of establishing budget allocations and rehabilitation priorities, and performing maintenance activities based on established maintenance policies, the City of Eugene divides the street inventory into two distinct categories:

Improved streets are those which have been fully designed for structural adequacy, have storm drainage facilities provided which include curbs and gutters, and have either an asphalt concrete (AC) or a Portland cement concrete (PCC) surface. Typically, these streets were either fully improved when the area was developed and paid for by the developer, or were improved through a local improvement district (LID) and paid for in part by the abutting property owners. In some cases a street may have been fully improved while under state or county jurisdiction and then surrendered to the City. Improved streets receive the highest level of ongoing maintenance and are eligible for rehabilitation funding through Eugene's Capital Improvement Program (CIP) and Pavement reservation Program (PPP).

Unimproved streets are those with soil, gravel, or asphalt mat surfaces that have typically evolved to their existing state, have not been structurally designed, and have few if any, drainage facilities and no curbs or gutters. Typically, an unimproved street must be fully improved through a local improvement district, funded in part by the abutting property owners before a higher level of service will be provided (see “City of Eugene Street Maintenance Policy and Procedure Manual” for levels of maintenance service). Unimproved streets receive a low level of ongoing maintenance limited primarily to emergency pothole patching (three inches or greater in depth) and minimal roadside ditch maintenance. To address the growing number of potholes on City streets, the City Council augmented the street repair budget with General Fund allocations for a total of \$2.35 million from FY 2009 through FY 2011. Subsequently, Public Works has allocated \$200,000 per year from Road Fund for enhanced street repairs. The Maintenance Division has addressed potholes by either filling individual potholes or by performing maintenance overlays over entire street segments. During the past eight years more than 100 unimproved streets, representing more than 31 lane miles, have been resurfaced as a temporary treatment. In addition, several unimproved streets have been brought up to full urban street standards through assessment projects, attributable in part to more flexible design standards.

The following tables categorize Eugene’s Improved and Unimproved Street System in Centerline Miles and 12-foot Lane Miles by Pavement Type and by Functional Class.

IMPROVED SYSTEM	Asphalt (ACP)		Asphalt over Concrete (APC)		Concrete (PCC)		Gravel		Undeveloped		Total	
	Miles	12' Lane Miles	Miles	12' Lane Miles	Miles	12' Lane Miles	Miles	12' Lane Miles	Miles	12' Lane Miles	Miles	12' Lane Miles
Major Arterial	13.97	64.39	0.03	0.16	0.51	2.26	0	0	0	0	14.51	66.81
Minor Arterial	63.19	213.59	2.27	7.51	3.56	11.92	0	0	0	0	69.02	233.02
Major Collector	30.21	92.81	1.15	2.72	3.09	8.29	0	0	0	0	34.45	103.82
Neighborhood Collector	23.86	61.83	0.45	1.23	1.58	4.35	0	0	0	0	25.89	67.41
Residential	309.76	717.62	1.71	4.37	21.32	54.25	0	0	0	0	332.79	776.24
Total	440.99	1150.24	5.61	15.99	30.06	81.07	0	0	0	0	476.66	1247.3

UNIMPROVED SYSTEM	Asphalt (ACP)		Bituminous Surface (BST)		Concrete (PCC)		Gravel		Undeveloped		Total	
	Miles	12' Lane Miles	Miles	12' Lane Miles	Miles	12' Lane Miles	Miles	12' Lane Miles	Miles	12' Lane Miles	Miles	12' Lane Miles
Major Arterial	0	0	0	0	0	0	0	0	0	0	0	0
Minor Arterial	1.69	3.15	0	0	0	0	0	0	0	0	1.69	3.15
Major Collector	3.25	7.34	0	0	0	0	0	0	0	0	3.25	7.34
Neighborhood Collector	4.13	8.31	0	0	0	0	0	0	0	0	4.13	8.31
Residential	38.71	63.89	4.27	6.45	0.03	0.03	8.64	12.74	4.7	5.93	56.35	89.05
Total	47.78	82.69	4.27	6.45	0.03	0.03	8.64	12.74	4.7	5.93	65.42	107.86

Functional Classifications

The quantity and associated vehicle weight of traffic using streets is a critical factor affecting the rate at which pavement and roadbeds deteriorate. Eugene divides streets into five categories called functional classifications (FC), each representing a different volume and type of vehicular usage. The MicroPaver terminology for functional classification/section rank is identified as follows:

Major Arterial (FC-1) - (A): Major Arterials are usually four or more lanes and generally connect various parts of the region with one another within the city and with the “outside world”. They serve as major access routes to regional destinations such as downtowns, universities, airports, and similar major focal points within the urban area. Major Arterials typically carry an average of more than 20,000 vehicles per day. Major Arterials receive high priority maintenance.

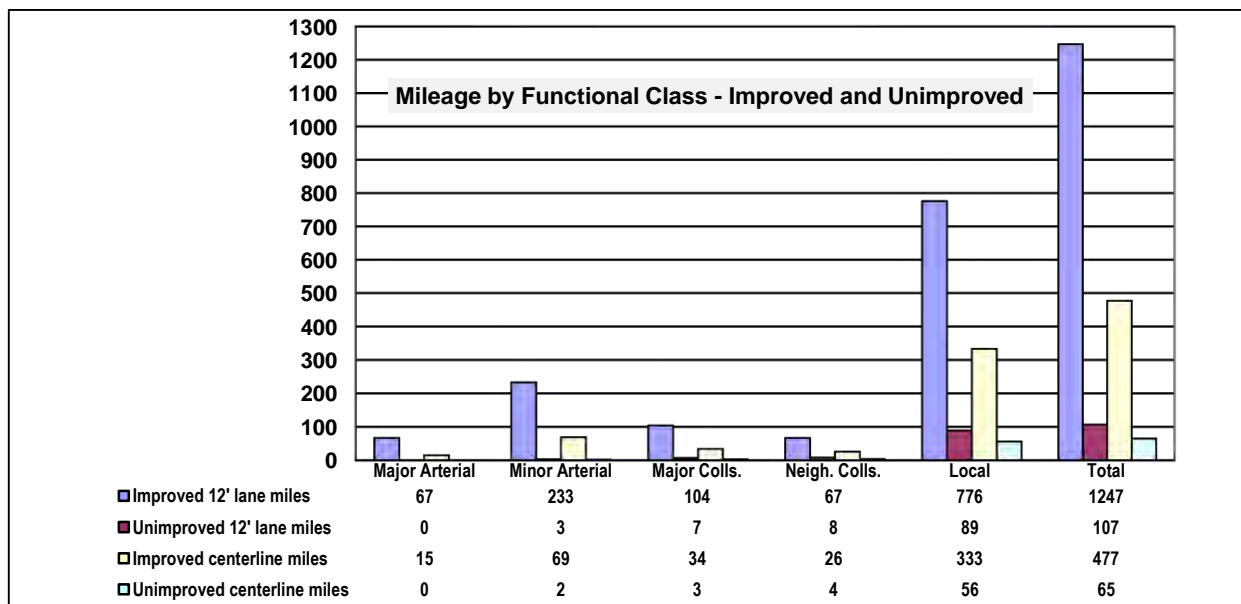
Minor Arterial (FC 2) - (B): Minor Arterials are typically two or three lanes. These streets provide the next level of urban connectivity below major arterials. In most cases their main role tends to be serving intra-city mobility. Minor Arterials carry between 7,500 and 20,000 vehicles per day. Minor Arterials receive priority maintenance.

Major Collector (FC-3) - (C): Major Collectors can be found in residential, commercial, and industrial areas. They typically carry between 2,500 and 7,500 vehicles per day. Major Collectors have a higher priority for maintenance than local streets.

Neighborhood Collector (FC-4) - (D): Neighborhood Collectors are found only in residential neighborhoods and provide a high degree of access to individual properties in a neighborhood. They typically carry between 1,500 and 2,500 vehicles per day.

Local (FC-5 - (E): Local streets provide access to individual properties along the roadway. They are narrow, slow-speed, and low-volume service facilities. They typically carry fewer than 1,500 vehicles per day, and receive low priority maintenance. Local streets are also referred to as Residential streets.

The following graph illustrates both centerline miles and lane miles by improvement type and functional classes.



PAVEMENT MANAGEMENT SYSTEM

A Pavement Management System (PMS) performs analysis of collected rating data and reports on the current and projected conditions of the street system. In addition, it is used to evaluate the effectiveness of planning and funding priorities, and provides guidance in the decision making process. The goal of the decision making process is to prevent pavement failures through judicious maintenance.

City of Eugene implemented MicroPaver in 2013. MicroPaver combines visual field inspection ratings, compiled under strict criteria, with computer tracking and condition analysis. Beginning in 2010 the rating methodology was revised to the WDOT's Extended (WSEXT) method, collection of deterioration values by area, lineal footage thus keeping the program consistent with industry standards. This also allowed for smoother transition to MicroPaver with the ability to migrate three years of rating data with some modifications. With this migrated condition data, rating the entire asphalt street system the last three years plus construction history we are able to perform an analysis with rational accuracy to report financial needs and road conditions. There will be some variation in the outcomes of the analysis due to slight differences in rating and calculation methodology but overall the data is consistent.

Pavement Inspection Frequency

Two predominant work efforts required to maintain the PMS are updating the street inventory and performing the annual inspection of surface conditions.

City streets are divided into segments based on their Functional Classification (FC), pavement type, and geometric design. Segments are the basic unit for evaluating streets and surface conditions. A segment is defined as a portion of a street with a beginning and ending description. Changes in geometric features are used as a guide for determining segments. Examples of geometric differences are surface type, segment width, surface age, and extent of past rehabilitations.

Field inspections are conducted by pavement raters who walk each individual street segment evaluating the pavement surface for signs of distress. City arterial and collector streets are inspected annually; residential streets inspections are completed in a three-year cycle; and off-street shared-use path inspections are completed in a two-year cycle.

Staff have performed inspections on the entire street system using MicroPaver since 2013 and this year completed inspections of shared-use paths. Inspection data was evaluated for accuracy with the assistance from an outside consultant in 2014. It was determined that three years of street inspection provided an accurate baseline in MicroPaver for analysis. In 2016, staff plan to return to the standard inspection cycle as described above.

Pavement Condition Index (PCI), Deduct Values, and Distresses

Pavement distresses are dependent on pavement type and are rated by severity and extent. MicroPaver provides a numerical value calculated internally based on deduct values for the distresses rated per street segment. MicroPaver defines this value as Pavement Condition Index (PCI) which will be the term used throughout this report.

A street with a PCI of 100 represents a new or recently rehabilitated street. This PCI value is the basis used to analyze the surface treatment needs. Distress data are collected using ACER Tablets and then uploaded to the pavement management software. MicroPaver method rates severities and all their extents for up to 20 different distresses. As the condition of a streets' surface begins to deteriorate, the PCI decreases. Asphalt distresses typically observed are alligating, longitudinal and transverse cracks, rutting, and raveling. Distresses in concrete streets typically observed and rated include cracks per panel, raveling, joint spalling, faulting, and crack sealing. Descriptions of some common distresses are shown below:

Alligator Cracking: When the asphalt begins to crack in all direction it is called alligator cracking.



Longitudinal Cracking/Transverse Cracking: These are cracks that run parallel to the roadway centerline (longitudinal) and perpendicular to the roadway center line (transverse). These distresses usually divide the piece into different sections and which are caused by repeated traffic loading. The low-severity cracks are not considered serious to the overall function and safety of the road. Medium to high-severity cracks are usually caused by heavy traffic loads and environmental factors and can become very serious distresses. The picture below shows longitudinal cracking.



Rutting: When the traffic of the street becomes heavy for long periods of times the asphalt begins to sink into the wheel path of the vehicles causing a rut. When there is a rut it is usually a long length of the road and is 1 to 2 feet wide and there are almost always two ruts, one for each wheel path of the vehicle. The severity of the rut is rated on the average rut depth from $\frac{1}{4}$ " – over $\frac{3}{4}$ " in depth.



Joint Spalling: Spalling is the deterioration of the edges of a concrete slab within 2 feet (0.6m) of the joint. The edges get chipped off concrete slabs causing spalling. Spalling is caused by heavy traffic loads and environmental factors.



Raveling: The roads, mainly asphalt, over time become worn out and rough not smooth as when they were first put in, often due to age and the effects of UV rays. Raveling measures the severity of the roughness and coarseness of the top layer of the street.



Faulting: Faulting is the difference in elevation across the slab. One side may be leaning up more over the other side. Causes are soft foundations, heavy traffic, poor construction, and environmental damage.



How Pavement Management System Information is Used

The primary purpose of maintaining a PMS is to collect and analyze information relating to street system condition and deterioration trends. With this vital information Public Works managers ensure the most cost-effective maintenance or rehabilitation strategies are identified and performed at the optimum time.

Each year the PMS is used to generate several reports requested by other agencies as well as statistical data requested within our own agency. The following is a sample of reports produced with PMS data:

- Pavement Preservation Project List
- Crack Seal Program
- Five-Year Surface List – five-year moratorium for street cutting
- ODOT Oregon Mileage Report
- City of Eugene Public Infrastructure Table
- Annual Insurance Marketing Report
- Transportation Service Profile

PAVEMENT PRESERVATION PROGRAM

Street preservation and rehabilitation, capital improvements, off-street shared-use path projects, and maintenance efforts make up Eugene's Pavement Preservation Program (PPP). Additionally, the City has budgeted funding for Maintenance Operations to repair portions of the unimproved street system through the Enhanced Street Repair Program. Both PW Maintenance and PW Engineering have important roles within the PPP.

PW Maintenance Roles

Maintenance Division Surface Technical team completes the pavement rating, budget and street life analysis, resulting in a proposed list of projects which is forwarded to Engineering for field testing and final grouping. Surface Technical staff is responsible for producing this report. Operations staff is responsible for the preventative maintenance of all City streets (including concrete streets) and off-street shared-use paths. Preventative maintenance designed to extend the life of the transportation asset is of highest priority. Fully improved asphalt streets receive the highest level of maintenance. Maintenance activities are performed to mitigate hazardous conditions and to extend the useful life of the street. The goal of preventative maintenance is to prevent a street's PCI from slipping from preventative maintenance or minor rehabilitation into a reconstruction category.

PW Engineering Roles

The Engineering Division typically receives projects proposed for preservation from the Maintenance Division three years in advance of the planned construction. Engineering then performs field investigations to confirm the need for treatment, and reviews historic data on construction and maintenance of the streets. Streets are then prioritized for detailed pavement testing and design recommendations based on the available funding and the assessed condition of the streets. The pavement testing and design reports identify whether a street needs to be reconstructed or rehabilitated (overlaid) and the range of treatment options available. If a street is determined to be a full reconstruct, it is typically deferred until funding is identified and available, such as street repair bond measures.

The Engineering Division is responsible for capital project management including design, stakeholder coordination and communication, contract administration, and construction management. For analysis and reporting of projected backlogs, the Engineering Division has provided construction costs based on historic and current road projects.

Treatment Types and Estimated Costs

For the purpose of reporting projected backlogs the Engineering Division provides construction costs based on historic and present road projects. Treatments reflected in the backlog analysis are limited to three types; slurry seal, overlay, and reconstruction and reporting is based on a system wide approach, not at the project level performed by Engineering. Each functional class has an estimated unit cost for overlay and reconstruction treatments. For local streets (FC-5) an additional maintenance option, slurry seal, is considered.

Slurry Seal: The slurry seal option allows for a cost-effective treatment to seal the surface and restore the skid resistance of local street segments, which do not carry high traffic loads. This treatment is not used on streets which require strengthening or reconstruction. Typical slurry seal costs include street cleaning, removal of vegetation, minor base repairs (dig-outs), sealing of cracks, and application of an emulsified asphalt aggregate mixture to the entire paved surface. Associated costs include replacement of striping and pavement markings, and other work needed to return the street to normal operation.

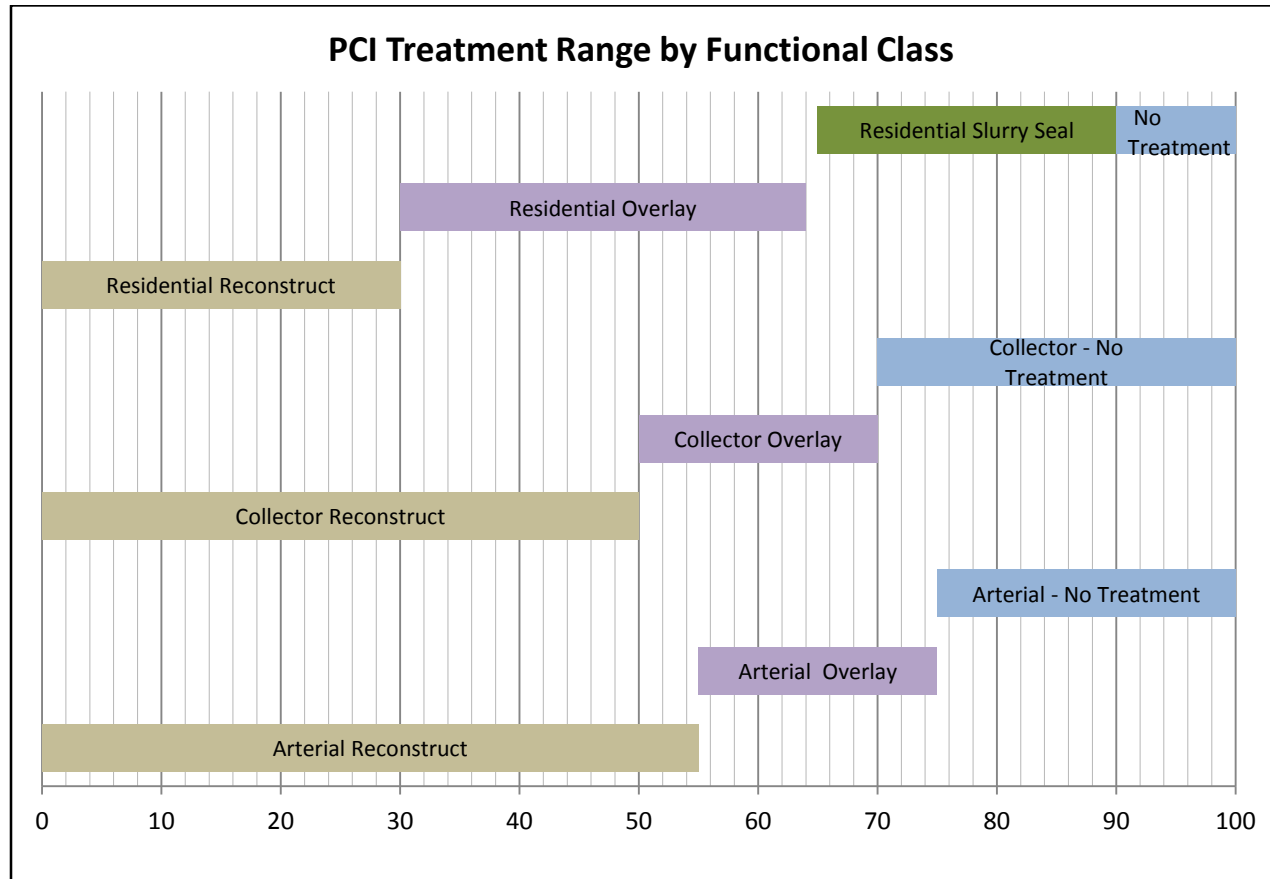
Overlay: Typical overlay rehabilitation costs include milling of existing pavement to a moderate depth to remove existing cracking and increase strength of the structural section. Isolated areas of severely distressed pavement are removed and replaced including a new aggregate base. Associated costs include replacement of striping and pavement markings, adjustment of manholes, and other work needed to return the street to normal operation.

Reconstruct: Typical street reconstruction costs include removal of the existing pavement and base structural section and replacement with a new structural section which will meet a 20-year design life. Isolated areas of curb and gutter are replaced where they would not be suitable to contain new paving or have severe drainage problems.

The following table identifies the estimated costs for the various treatment types including costs to upgrade curb ramps to comply with The American with Disabilities Act (ADA). The slurry seal treatment is exempt from ADA requirements.

Treatment – Functional Class Improved System	12' Lane Mile Cost		
	Updated Eng. 2006 cost	Updated Eng. 2012 cost	2016 cost with 2% inflation
Overlay - FC 1 & 2	\$215,000	\$243,000	\$268,000
Overlay - FC 3 & 4	\$184,000	\$214,000	\$236,000
Overlay - FC 5	\$169,000	\$195,000	\$214,000
Re-Const - FC 1 & 2	\$765,000	\$724,000	\$799,000
Re-Const - FC 3 & 4	\$677,000	\$679,000	\$750,000
Re-Const - FC 5	\$505,000	\$505,000	\$558,000
Slurry Seal - FC 5	\$19,000	\$25,000	\$29,000

The following graph identifies the trigger points (PCI) for each treatment based on Functional Class.



Project Prioritization

Selecting streets or street segments for treatment is done through a process involving analysis, testing, and staff experience. Using the data produced by MicroPaver, and combining this information with estimated revenues allows staff to approximate backlogs and group potential street segments for consideration for treatment under the Pavement Preservation Program.

Streets are not prioritized on a “worst first” basis. Public Works’ main objective is to keep street segments from slipping into the reconstruction category, which typically costs four to five times more per lane mile than rehabilitation. By rehabilitating (overlaying) a street before it significantly deteriorates, 15 to 20 years of useful life can be added to a street at a substantial cost savings over reconstruction. Once a street has deteriorated to the point that it must be reconstructed, the opportunity for preventive street maintenance (overlay) is lost. For these reasons, streets that are categorized as overlay projects receive the highest priority for corrective treatment. If at some point in the future there are additional funds available, or if the majority of overlay projects have been addressed, reconstruction projects will be scheduled.

A prioritized list of 32 street repair projects to be funded by a local bond measure was approved by Eugene voters in 2008. The list, approved by City Council, was developed by staff based on citizen input, information about needed street rehabilitation and reconstruction from the pavement management system, and equitable geographic distribution of projects throughout the

community. Subsequently, a 12 member Street Repair Review Panel (SRRP) was formed to document the use of the bond proceeds. In 2011, City Council approved the addition of 22 streets selected in the same manner and recommended by the citizen review panel to be repaired.

In 2012, a second five-year bond measure was approved by Eugene voters with a prioritized list of 76 street repair projects (Exhibit A) and additional funding to support bicycle and pedestrian improvement projects. The list was developed using the same criteria as above and approved by City Council.

Sustainable Construction

Since 2008, Eugene has been in the forefront of sustainable construction and paving practices, some of which include paving with warm mix asphalt (WMA), using reclaimed asphalt pavement (RAP), and full depth reclamation (FDR). Production of warm mix asphalt is a “green” solution for the environment with noticeable reduced energy consumption and greenhouse gas emissions. Exposure to fuel emissions, fumes, and odors are reduced for asphalt producers, construction workers and the public. Benefits of paving with WMA are the ability to extend the paving season in colder weather, longer haul distances, and better road performance. Warm mix asphalt is identical to conventional hot mix asphalt, except that through a special mixing process it is produced at a temperature approximately 50 to 100 degrees cooler than conventional hot mix asphalt. This mixing process for asphalt aids in compaction during paving, assists in preventing premature aging and slowing the aging process of asphalt. In Eugene, all asphalt producers have retrofitted their plants to produce warm mix asphalt.

Council set goals in 2011 for waste reduction by requiring that the quantity of materials placed in landfills be reduced. In addition to using WMA, Public Works conducted two pilot projects specifying that reclaimed asphalt shingles (RAS) be used as a binder in the asphalt mix, thereby keeping this material from entering the waste stream. The City continues to use warm mix asphalt and in-place recycling techniques to improve the quality, environmental footprint, and cost efficiency of the street bond projects. Key terms in sustainable construction practices:

In-Place Recycling: A process in which a large piece of equipment called a reclaimer pulverizes and mixes the existing base rock and a portion of subgrade soils with dry cement and water to create a cement-treated base. This process greatly reduces the use of virgin materials and trucking that are needed using conventional remove-and-replace construction techniques.

Full Depth Reclamation: When applicable, partial or full-depth reclamation (FDR) is used as a cost and time-saving alternative to traditional reconstruction. Associated costs include replacement of striping and pavement markings, adjustment of manholes, and other work needed to return the street to normal operation.

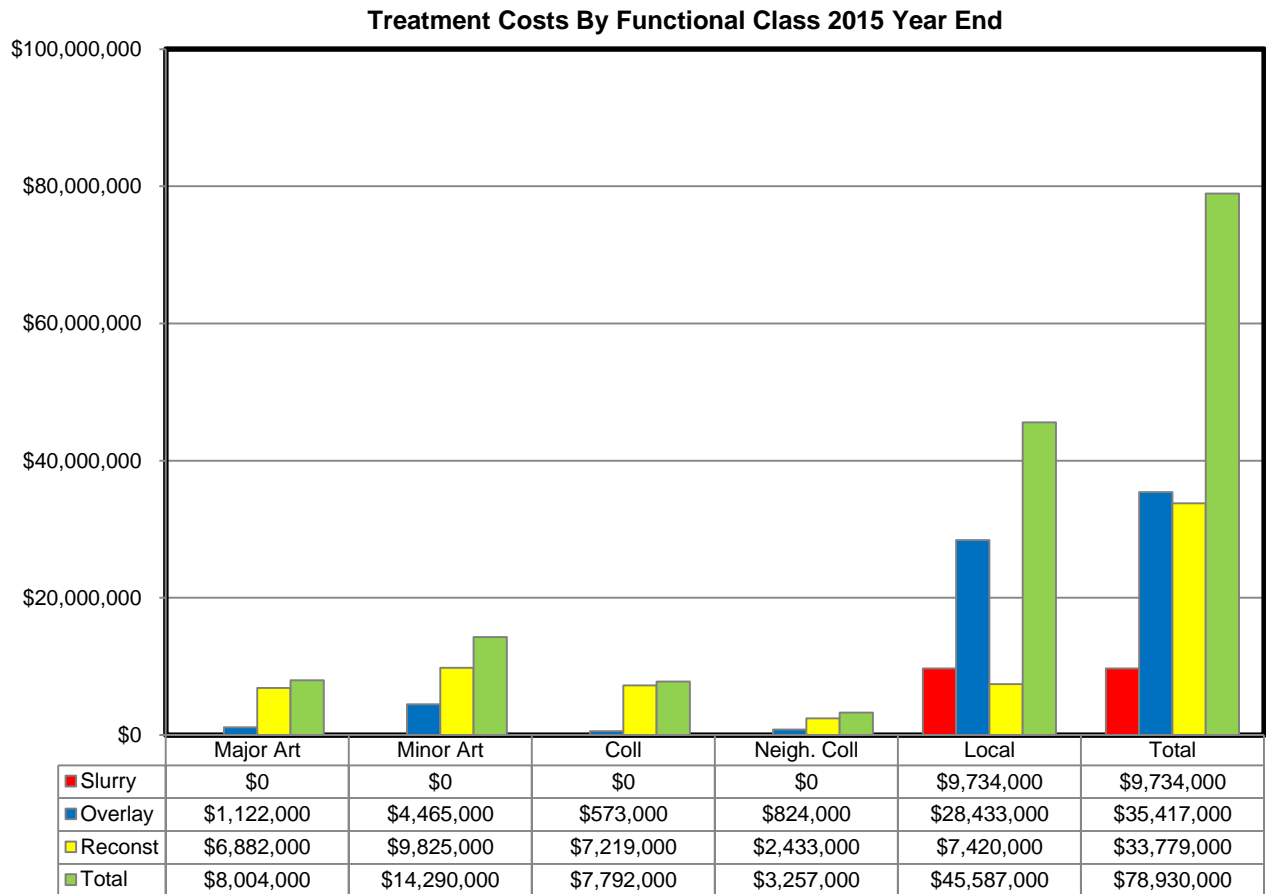
Crack Seal: Placing specialized materials into cracks in unique configurations to keep water and other matter out of the crack and the underlying pavement layers. Crack sealing can be used for two different reasons in pavement maintenance. One is a treatment to seal the cracks in order to prevent moisture intrusion into the pavement. The other is preparatory work to other treatments, such as overlays, and slurry seals.

Reclaimed Asphalt Pavement (RAP): The term given to removed and/or reprocessed pavement materials containing asphalt and aggregates. These materials are generated when asphalt pavements are removed for reconstruction, resurfacing, or to obtain access to buried utilities. When properly crushed and screened, RAP consists of high-quality, well-graded aggregates coated by asphalt cement that can be reused as a substitute for a portion of virgin materials in asphalt and aggregate base.

Recycled Asphalt Shingles (RAS): A primary reason for the high potential value of recycled shingles is that they contain ingredients that hot mix asphalt (HMA) producers purchase to enhance their paving mixtures including asphalt cement (or AC “binder”) and mineral aggregate. Asphalt shingles also contain a fibrous mat made from organic felt (cellulose) or fiberglass that can also be valuable as fiber in some asphalt paving mixes.

Current Treatment Costs

This chart provides detail of the current cost for treatment of the entire improved system excluding concrete streets at the end of the 2015 rating period. The total estimated treatment cost backlog at the end of 2015 is \$79 million down from \$84 million reported in 2014.



Projected Funding for Pavement Preservation Program FY15 through FY21

From the inception of the Pavement Preservation Program (PPP), Eugene has been faced with the challenge of securing adequate, sustainable funding for this program. Currently there are several sources that contribute funding for pavement rehabilitation and reconstruction projects. The primary source of ongoing revenue is the City's local motor vehicle fuel tax ("gas tax"), which is currently levied at 5 cents per gallon. The reimbursement component of Transportation System Development Charges (SDCs) have historically generated close to \$800,000 per year for PPP projects. In the current economic environment, building permit activity continues to be low, reducing the level of this funding stream. The cumulative effect of these factors is that PPP annual revenues, which were once projected at \$4.2 million per year, are now projected to level out at approximately \$3.1 million per year

In 2008, voters approved a \$35.9 million dollar bond measure dedicated to 32 street preservation projects and shared-use path rehabilitation work. Based on numerous economic factors construction bids were significantly less than anticipated allowing 22 streets to be added to the original 32 streets approved by voters.

In 2012, voters approved a second \$43 million bond measure dedicated to 76 street preservation projects plus \$516,000 annually to support bicycle and pedestrian projects. The measure will generate approximately \$8 million annually for FY14 through FY18.

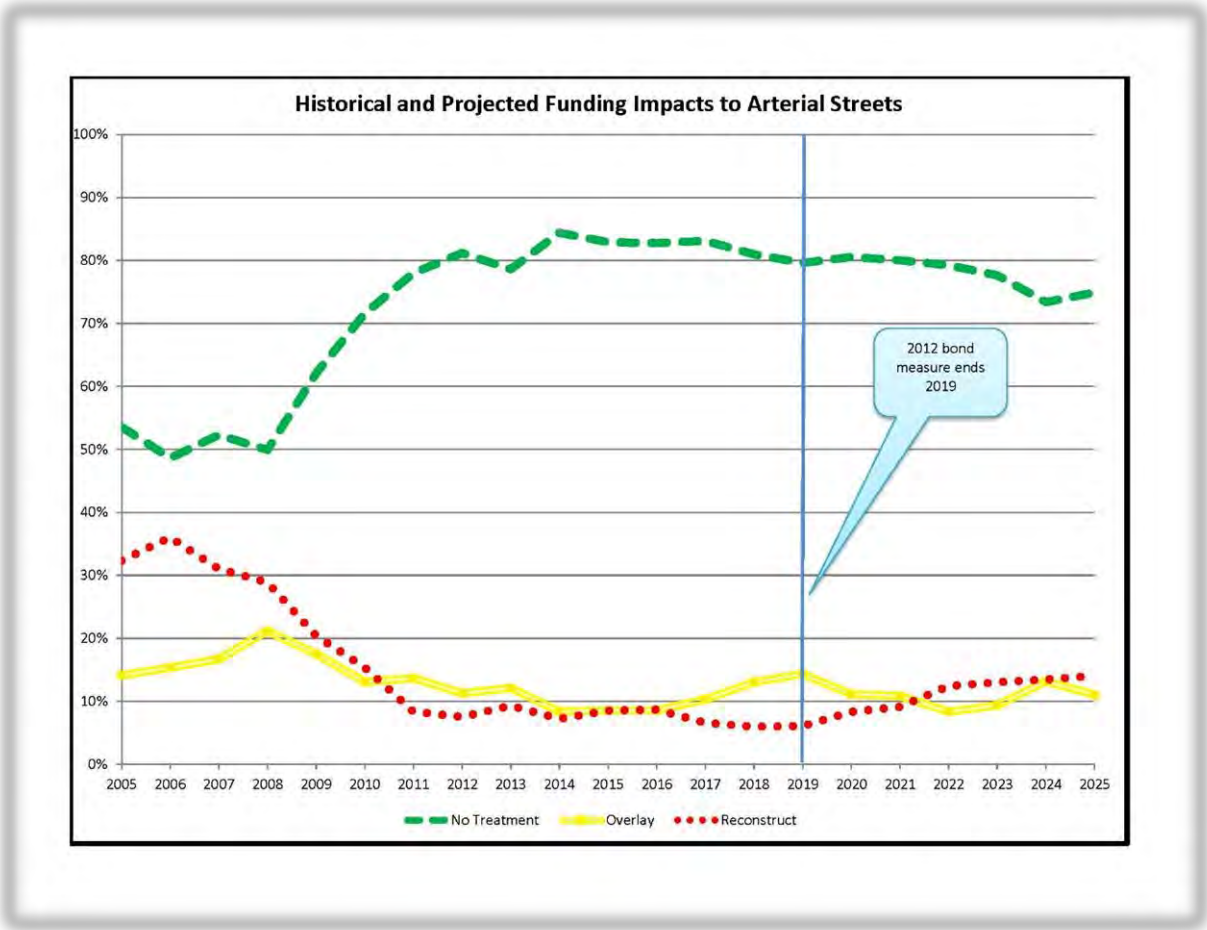
With the funding identified approximately 112 lane miles of City streets and will be repaired. To date approximately 3 miles of off-street shared-use paths have been repaired.

Projected Funding Sources Pavement Preservation Projects FY15 through FY21

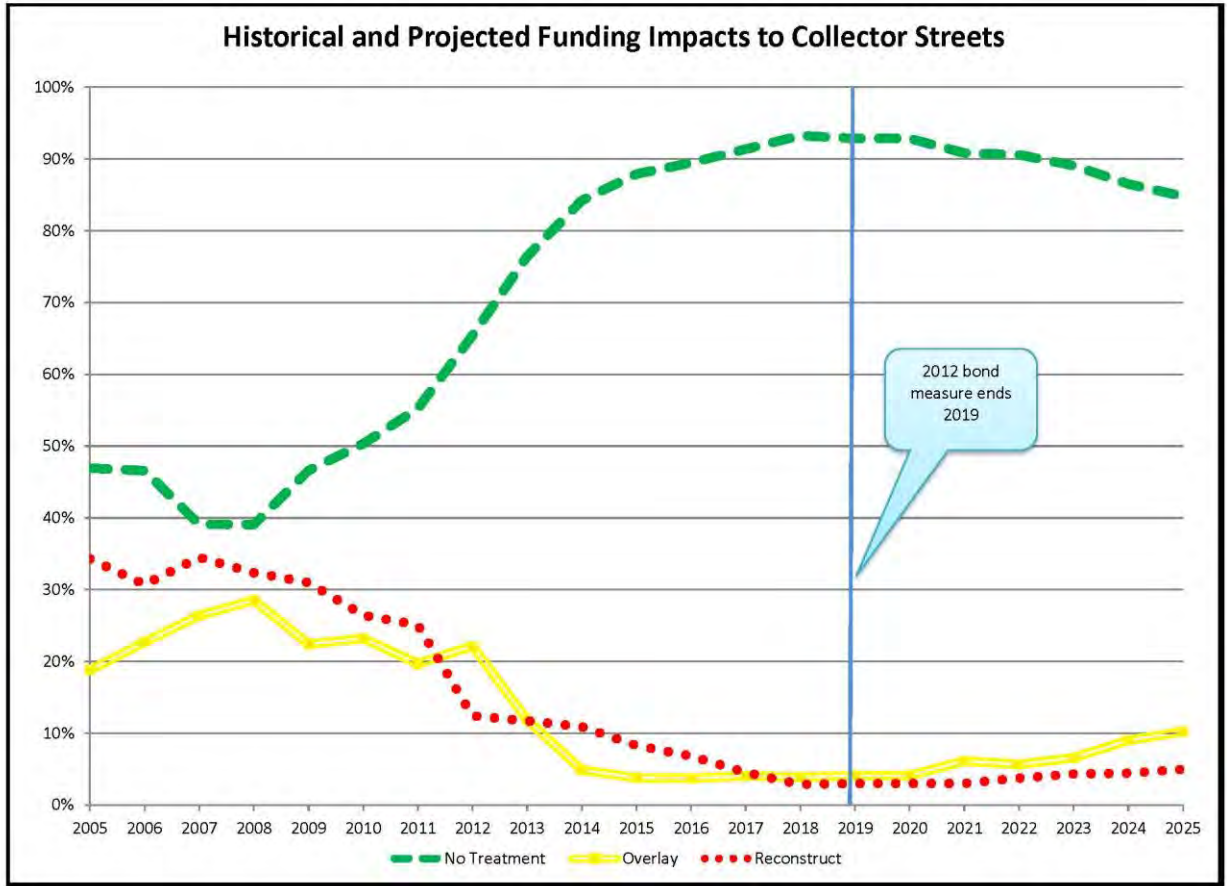
Fiscal Year	Local Gas Tax	SDC	Bond	Other	Total Funding
FY14 (actual)	\$2,868,768	\$641,561	\$9,530,000	\$28,571	\$13,068,900
FY15 (actual)	\$2,996,958	\$413,861	\$6,869,279	\$73,480	\$10,353,578
FY16 (est)	\$2,997,000	\$245,721	\$8,290,000	\$20,700	\$11,553,421
FY17 (est.)	\$2,880,000	\$259,200	\$8,590,000	\$20,700	\$11,749,900
FY18 (est)	\$2,880,000	\$259,200	\$8,900,000	\$20,700	\$12,059,900
FY19 (est)	\$2,880,000	\$259,200	\$6,220,000	\$20,700	\$9,379,900
FY20 (est)	\$2,880,000	\$259,200	\$0	\$20,700	\$3,159,900
FY21 (est)	\$2,880,000	\$259,200	\$0	\$20,700	\$3,159,900

Historical and Projected Funding Outcomes

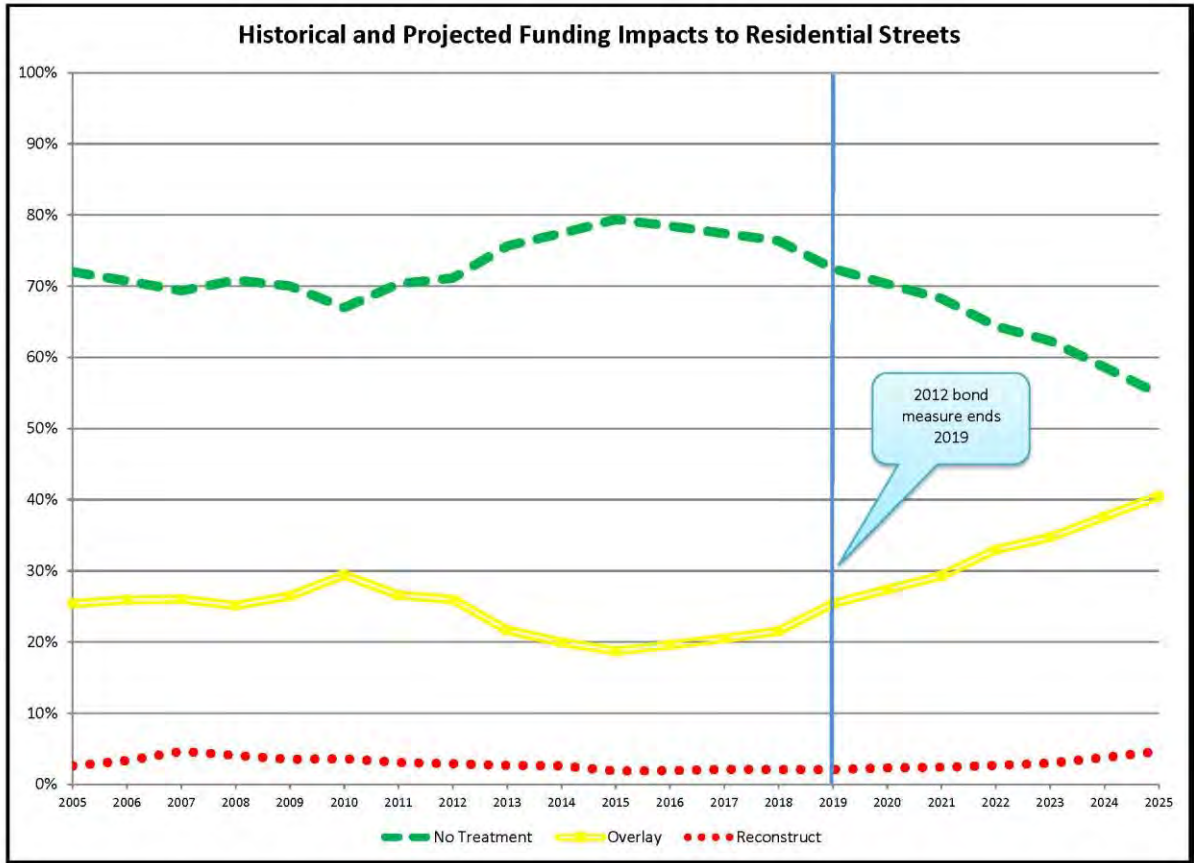
Using the PMS software, an analysis for a 10-year period (2015 through 2025) has been completed based on the current funding, including the 2012 bond measure. The PMS software evaluates the deterioration of each segment based on individual PCI ratings. The software then projects when to apply the necessary treatment at the proper time. When possible, the system applies a less expensive treatment earlier in the degradation curve to prevent the street from falling into an overlay or reconstruct range. In the following four graphs this projected evaluation includes historical data to present a more comprehensive view of the street system. The graphs show the impact of past and current funding over a 20-year period (2005 to 2025). Each graph indicates the **percentage** of streets that fall within a specific treatment range (reconstruct, overlay and no treatment). Plotting the percentages of streets within a treatment range over time visually demonstrates the overall condition of streets within that class. This is useful when deciding how to allocate funds in future years.



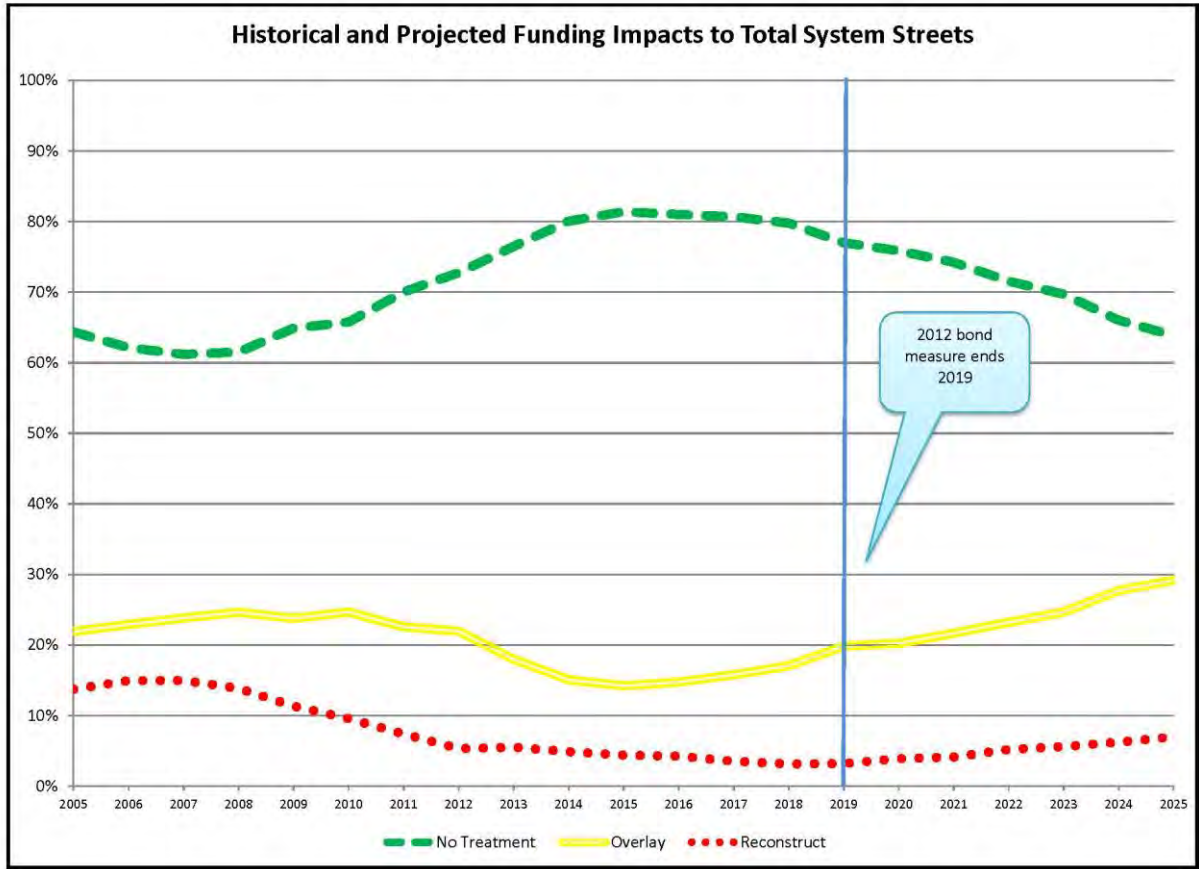
Arterial streets have been a major focus of the Pavement Preservation Program since 2002; as a result the percentage of arterial streets within the reconstruct treatment range steadily declined and remains stable during the bond periods. This stabilization provided an opportunity for funding to be allocated towards street preservation and allowing funds to be directed primarily to the collector system with a small portion dedicated to the residential system. However, analysis reveals that once funding levels resume to gas tax only the arterial system begins to deteriorate with overlay treatments falling into the costly reconstruct treatment.



Similar to arterial streets, reconstruction and overlay treatment needs have decreased since 2008 as a result of completed and upcoming projects. Analysis indicates a stable collector system with minimal increase in both overlay and reconstruct treatments. As with the arterial system, once the bond ends in 2019 it is projected that streets which have previously been treated will begin to show expected deterioration.



Residential (Local) streets make up 66% of the total street system backlog in 10 years. To date residential streets have not been adequately funded to keep them from deteriorating, therefore we see very little change from the overlay and no treatment projections reported in 2014. The 2012 bond measure identifies approximately 15 centerline miles for repair, less than 5% of the functional class. The percentage of streets within the overlay treatment range continues to increase. Looking back, the percentage of residential streets within the no-treatment range has been dropping and is projected to continue so that by 2025, 50% of residential streets will require treatment.



This graph of the combined arterial, collector and residential streets reflects the impacts to the overall street system due to insufficient funding for residential street treatments as well as a treatment strategy that includes reconstruction and overlay treatment. The percentage of streets needing “no treatment” declines, while streets requiring a “reconstruct” treatment increases.

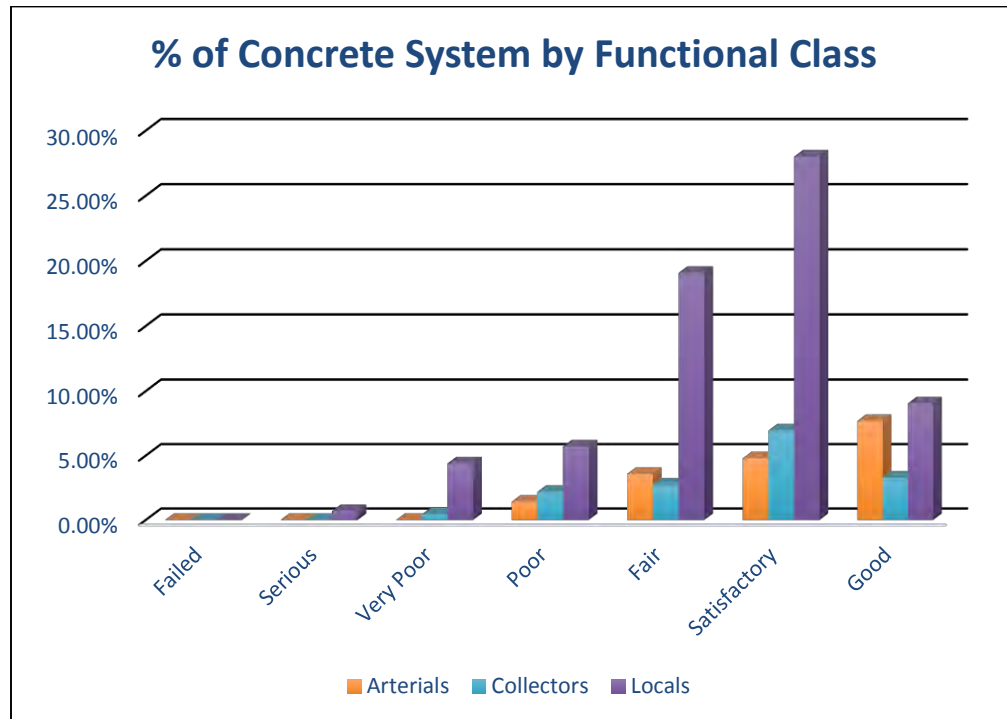
Concrete Improved Street System

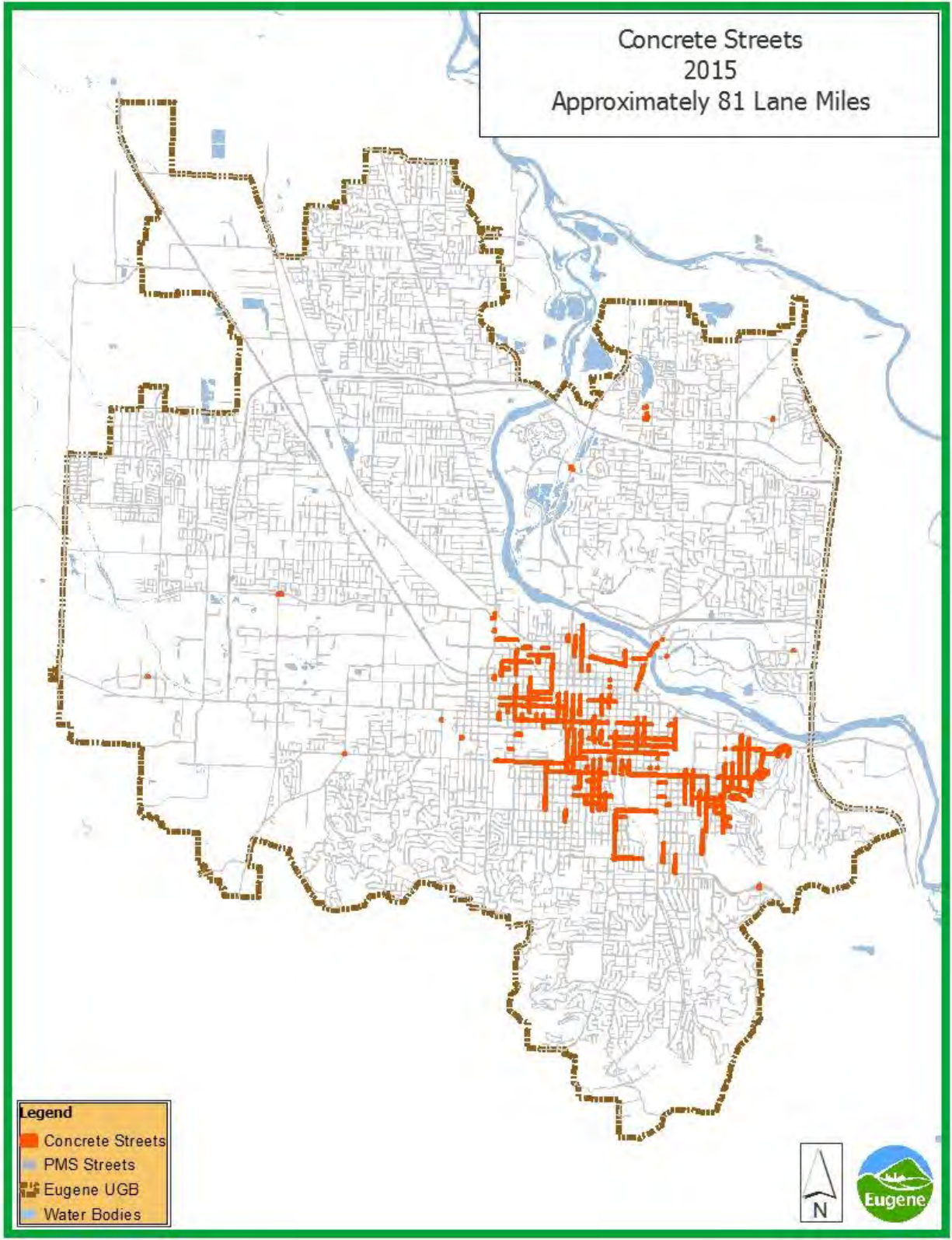
Of the 542 centerline miles of streets 30 centerline miles (81 lane miles) are concrete. In 2015 staff were able to refine concrete street inventory data so condition inspections could be completed. Unlike asphalt streets, concrete streets require panel counts plus an average width and length of the panel for the calculation of PCIs. Concrete segments are best evaluated when defined as a city block. Historical concrete designs for typical city blocks contained 66 panels, 3 columns of panels within a block length, or 33 panels with 2 columns.

Concrete streets like bike paths are built for a life of 50 or more years until complete reconstruction. Deterioration of concrete streets occur within individual panels with many panels in a street not requiring repair. Due to these unique factors for concrete streets, analyses which predict future needs of this system tend to be less accurate than asphalt surfaces. However like unimproved streets and bike paths we can provide a current condition of this system.

Past repair for these streets were primarily provided by City maintenance crews which consisted of panel replacements for the worst deteriorated panels. Historical construction data indicate that 60% of concrete streets are over 70 years in age. Based on past maintenance repairs these streets over time may have had a majority of panels replaced.

With the gas tax and bonds the City has contracted several concrete projects during this funding period. Approximately 2 miles or 7 lane miles have been repaired, this includes reconstructing asphalt intersections to a concrete surface for their durability to handle heavy traffic.





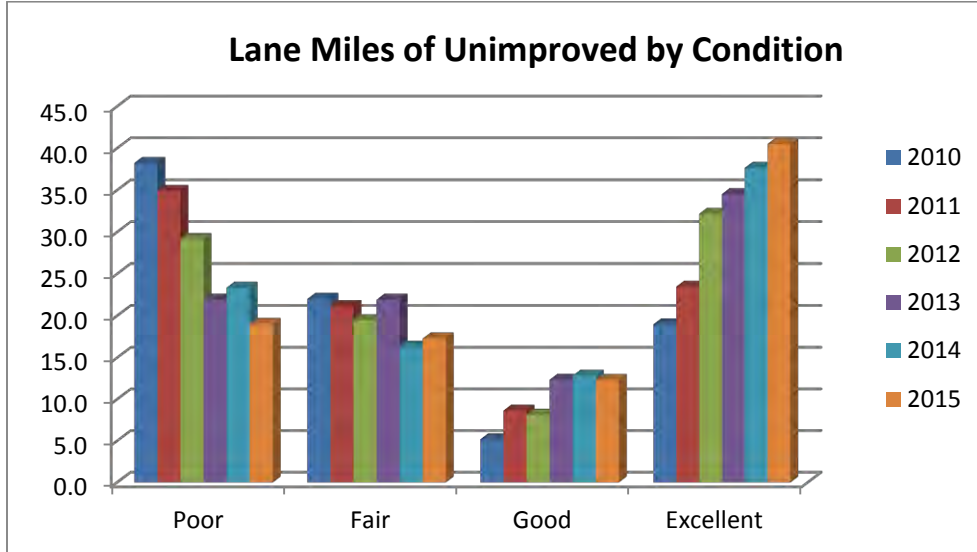
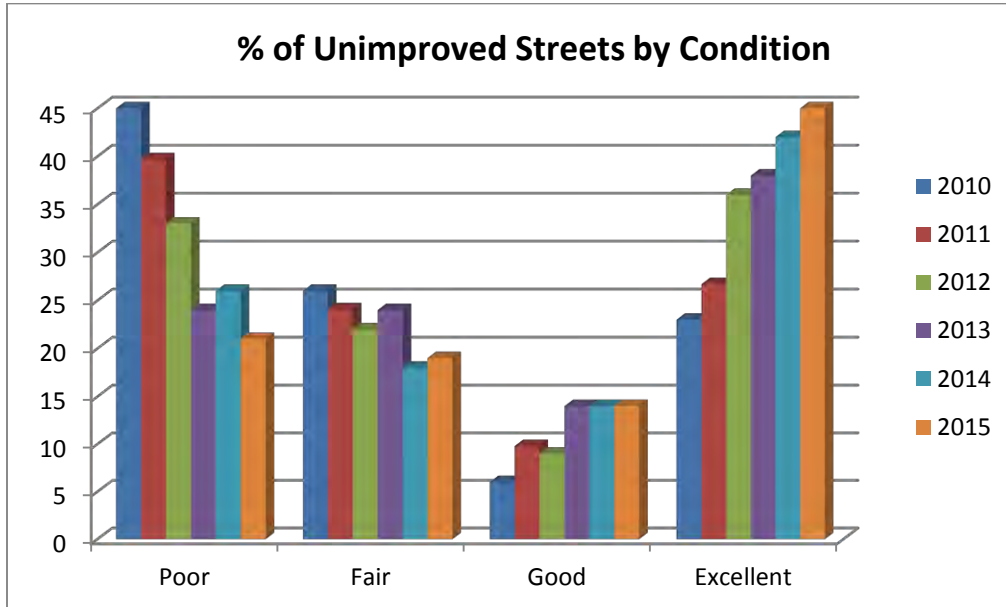
Unimproved Street System

The City's transportation system consists of 542 centerline miles of improved and unimproved streets. The unimproved portion of this total includes 52 centerline miles (89 lane miles) of asphalt and bituminous surface streets. This section of the report is intended to describe the overall condition of unimproved asphalt streets, potential treatment needs, associated rehabilitation costs, along with a projected backlog repair cost for addressing this classification of street. It is important to note that any treatment short of being brought up to full urban street standards should be considered temporary. The estimated cost to improve this classification to meet the urban street standards is approximately \$60 million. In addition, the following backlog figure is separate from the improved street backlog figure.

Based on 2015 rating data of the unimproved streets system there is a backlog of temporary repair projects, typically maintenance overlays, totaling an estimated \$3.32 million, down from \$3.76 million reported in 2014. The following charts and graphs indicate that 59 percent of the system falls into a no treatment category, up from 50 percent reported in 2014, due in large part to recent maintenance overlay and FDR treatments completed over the past several years. More than 100 unimproved streets have benefited from full or partial treatment since 2008. Twenty one percent of the system falls into the "poor" category. As funding allows, Public Works Maintenance plans on spending \$200,000 annually to address a portion of these streets.

2015 Unimproved Asphalt Street Condition and Rehabilitation Report (2015 Rating Data)						
PCI	Lane Miles	% of System	Condition	Rehabilitation Cost	Unit Cost/SQFT *	Treatment **
0-10	1.07	1.20%	Poor	\$170,100	\$2.50	FDR
11-20	5.60	6.28%	Poor	\$709,950	\$2.00	FDR or 2" HMAC
21-30	12.36	13.85%	Poor	\$1,017,708	\$1.30	1.5"-2" HMAC
31-40	6.80	7.62%	Fair	\$559,811	\$1.30	1.5"-2" HMAC
41-50	5.91	6.63%	Fair	\$487,055	\$1.30	1.5"-2" HMAC
51-60	2.48	2.79%	Fair	\$204,606	\$1.30	1.5"-2" HMAC
61-65	2.11	2.36%	Fair	\$173,529	\$1.30	1.5"-2" HMAC
66-70	2.70	3.02%	Good	\$0	\$0.00	No Treatment
71-80	4.26	4.77%	Good	\$0	\$0.00	No Treatment
81-85	5.37	6.03%	Good	\$0	\$0.00	No Treatment
86-90	4.01	4.50%	Excellent	\$0	\$0.00	No Treatment
91-100	36.51	40.94%	Excellent	\$0	\$0.00	No Treatment
			Total Rehabilitation	\$3,322,759	* Unit cost based on recent project costs	** Example treatments. Actual treatment would need further analysis.
	89.19	100.00%				

The following graphs are a visual representation of the information provided on the preceding page.



Off-Street Shared-Use Paths

Shared-use paths are used by a variety of non-motorized users, including pedestrians, cyclists, skaters, and runners. Shared-use paths are typically wider than an average sidewalk and paved (asphalt or concrete).

There are approximately 45 miles of shared-use paths within city limits identified by the PWE Transportation Planning section. In 2015, staff converted 44 miles of shared-used paths and rated the conditions using MicroPaver. Shared-use path analysis in last years' report was based on 2011 surveys using the WSEXT rating methodology. With updated information a current representation of this infrastructure may be shown in the following graphs and charts. An important note is the increase of shared-use paths in a condition above a 90 PCI, in 2011 approximately 19 miles were in this range and in 2015, 30 miles are in this range.

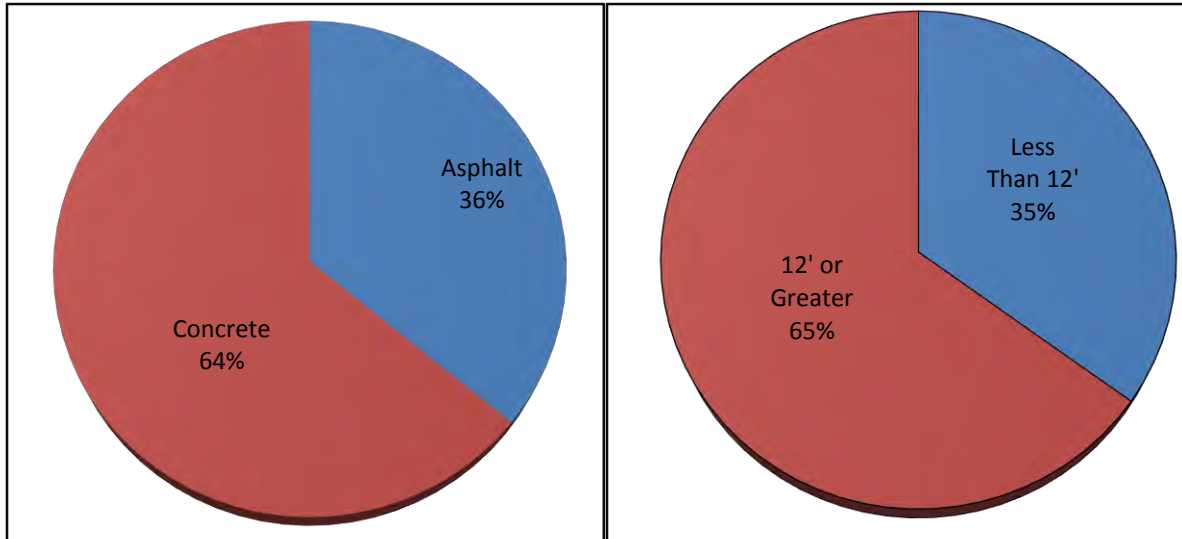
The City standards for shared-use paths require a concrete structure no less than six inches deep and 12 feet wide. Paths designed, constructed or reconstructed to current standards are expected to have a 50 year life.



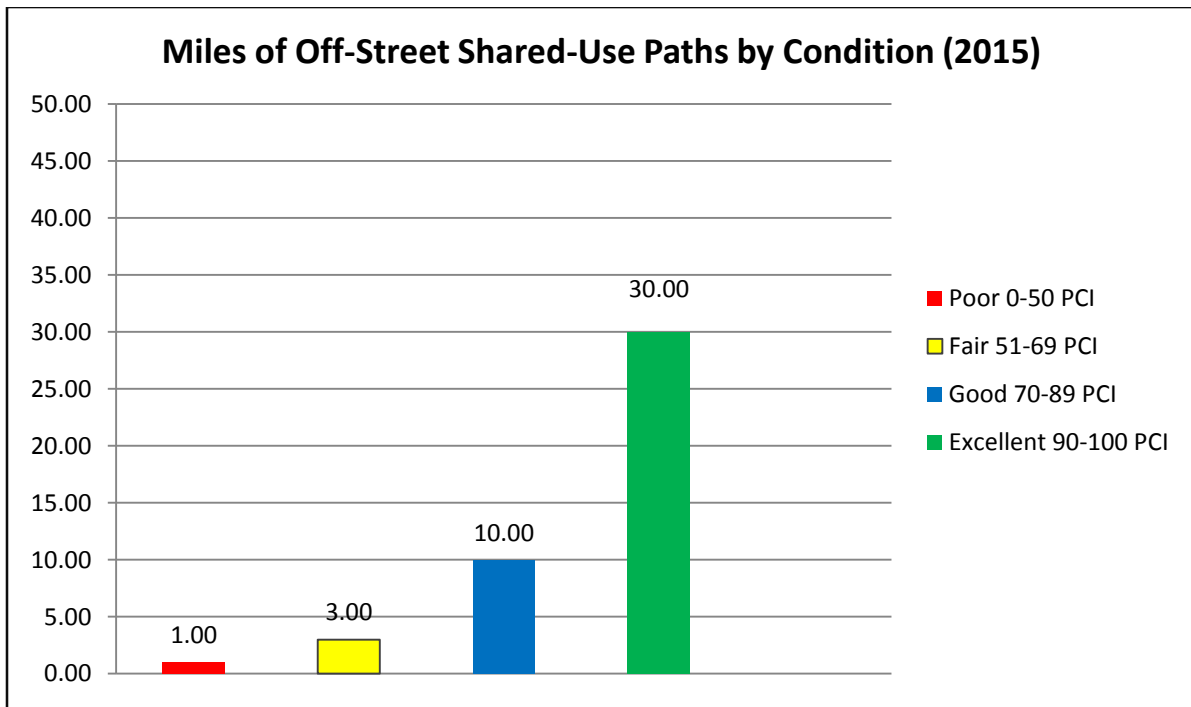
The following graphs show the division of 2015 surface types and widths within the system.

Off-Street Shared-Use Path Surface Type:

Off-Street Shared-Use Path Existing Widths:



The following graph shows the path condition in 2015 for the system.



Shared-use path projects have been historically funded by state and federal grants and more recently by voter-approved bond measures. There is currently no long-term funding identified specifically for shared-use paths. The following is a list of completed and current projects, including shared-use paths funded by the bond measures.

Name	Fiscal Year	Funding
Fern Ridge Chambers - City View	2004	STP-U
Garden Way Bike Path	2005	STP-U
Monroe Bikeway	2006	STP-U
N Bank Path Club Rd 3000'W	2006	STP-U
West Bank Trail	2007	Transportation Enhancement (TE) Funds
Delta Ponds Bridge	2007	Various Federal Funds
Amazon: SEHS - 31st Bike Path	2009	PBM
Fern Ridge Path Rehab/Westmoreland Connector	2010	PBM
South Bank Path Rehab	2011	PBM
West Bank Trail Extension	2011	STP-U/TE
Fern Ridge: Chambers - Arthur	2012	ODOT Rapid Readiness Funds
W Bank: Greenway - Copping	2012	PBM
Amazon/Willamette River Path Connectors	2012	State Urban Trail Funds
North Bank Path: DeFazio Bridge to Leisure Ln.	2012	STP-U
Fern Ridge: Terry - Greenhill	2013	STP-U/TE
South Bank Path - Riverplay to DeFazio Bridge	2013	PBM
South Bank Path - Knickerbocker Bridge to Franklin Blvd	2015	
Fern Ridge Path - Commerce to Connector Path	2016	LGT

Project Funding Abbreviations

PBM – Paving Bond Measure

LGT – Local Gas Tax/SDC/Other

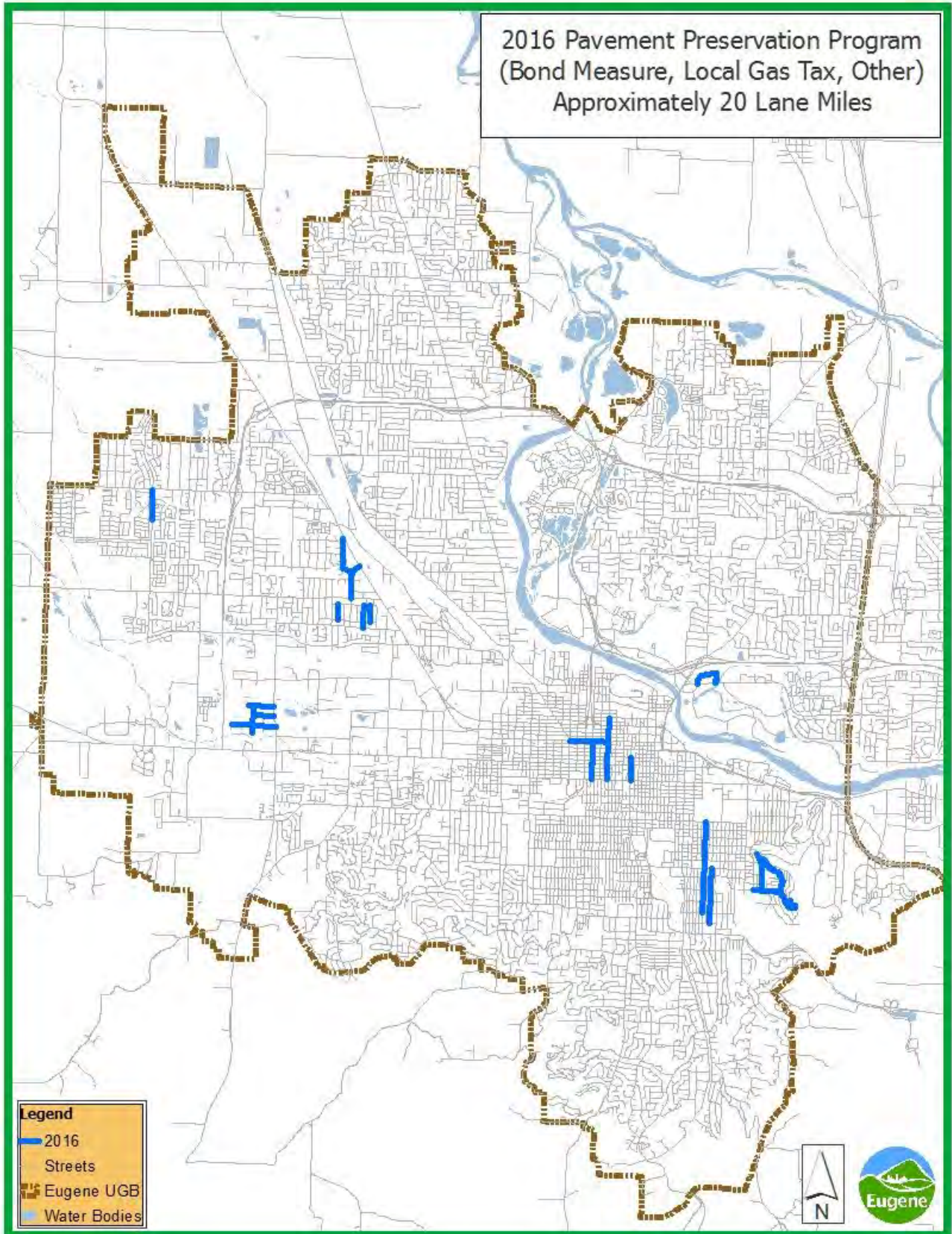
STP-U – Surface Transportation Funds-Urban (Federal)

TE – Transportation Enhancement (Federal)

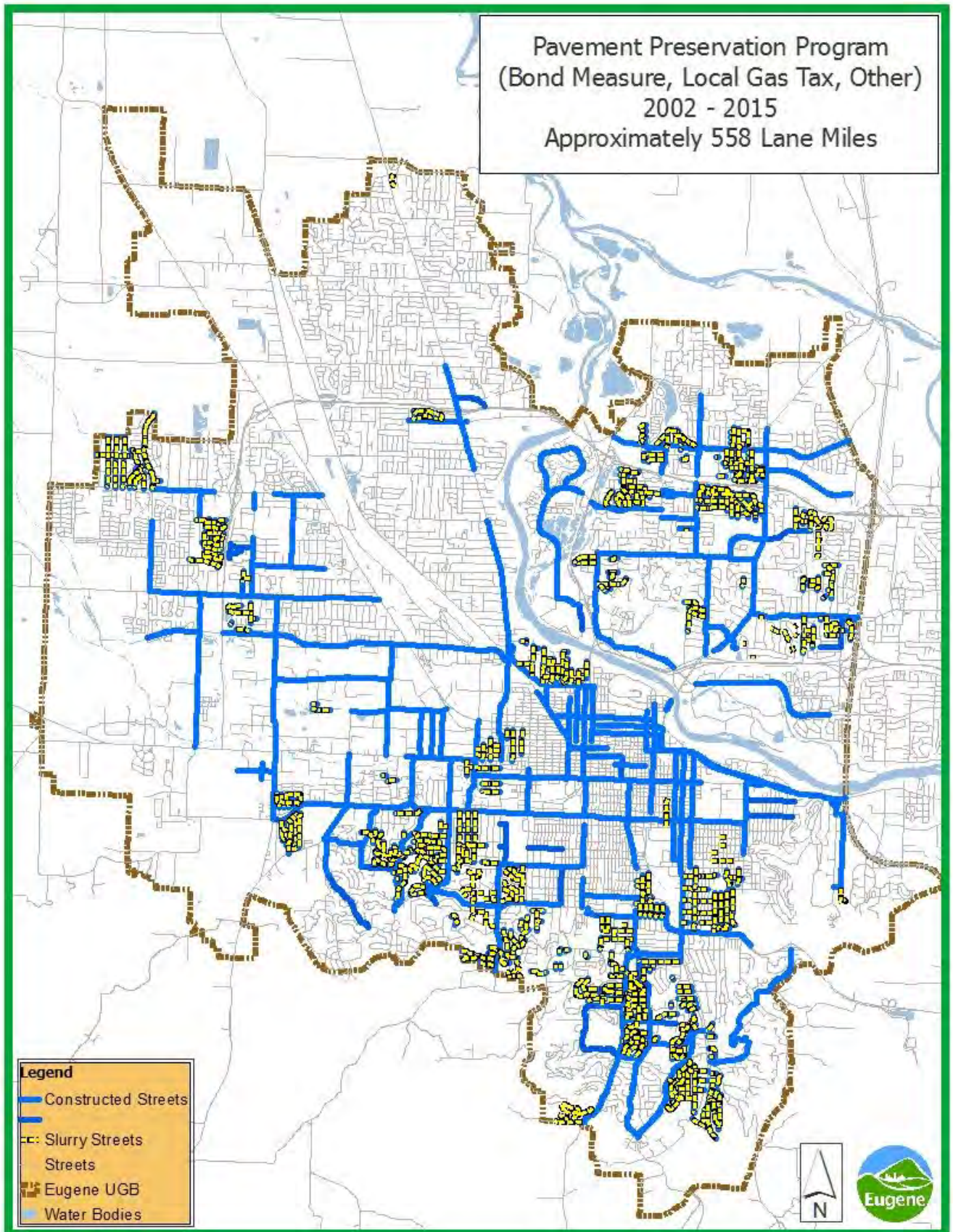
Scheduled Street Projects for 2016

2016 Project Name and Limits	Lane Miles	Funding
5th Ave. (Bertelsen – West End)	0.84	PBM
6th Ave. (Bertelsen - Commercial)	0.67	PBM
7th Ave. (Bertelsen - Oscar)	1.47	PBM
8th Ave. (Lincoln - Monroe)	1.07	LGT
27th Ave. (Spring - Columbia)	0.52	PBM
Alva Park Dr. (Bell - Wood)	0.31	LGT
Capital Dr. (Spring – Crest De Ruta)	0.71	PBM
Centennial Lp. (ML King Blvd - ML King Blvd/Club Rd)	1.15	PBM
Commercial St. (5th Ave – West End)	0.93	PBM
Davis St. (Bell - Wood)	0.44	LGT
Fairfield Ave. (Hwy 99 - Royal)	0.89	LGT
Harold St. (Wood - Bell)	0.33	LGT
Harris St. (18th – 28th)	2.40	LGT
Jacobs Dr. (Pattison - Fairfield)	1.06	PBM
Lincoln St. (W 5th - W 13th)	1.58	PBM
Potter St. (24th – 29th)	1.44	PBM
Spring Blvd. (Fairmount - Capital)	0.66	PBM
Terry St. (Barger – Olympic Circle)	0.79	LGT
Van Ness St. (E 23Rd - E 27th)	0.59	PBM
Washington St. (W 8th - W 13th)	0.95	PBM
Willamette St. (E 10th - E 13th)	0.78	PBM

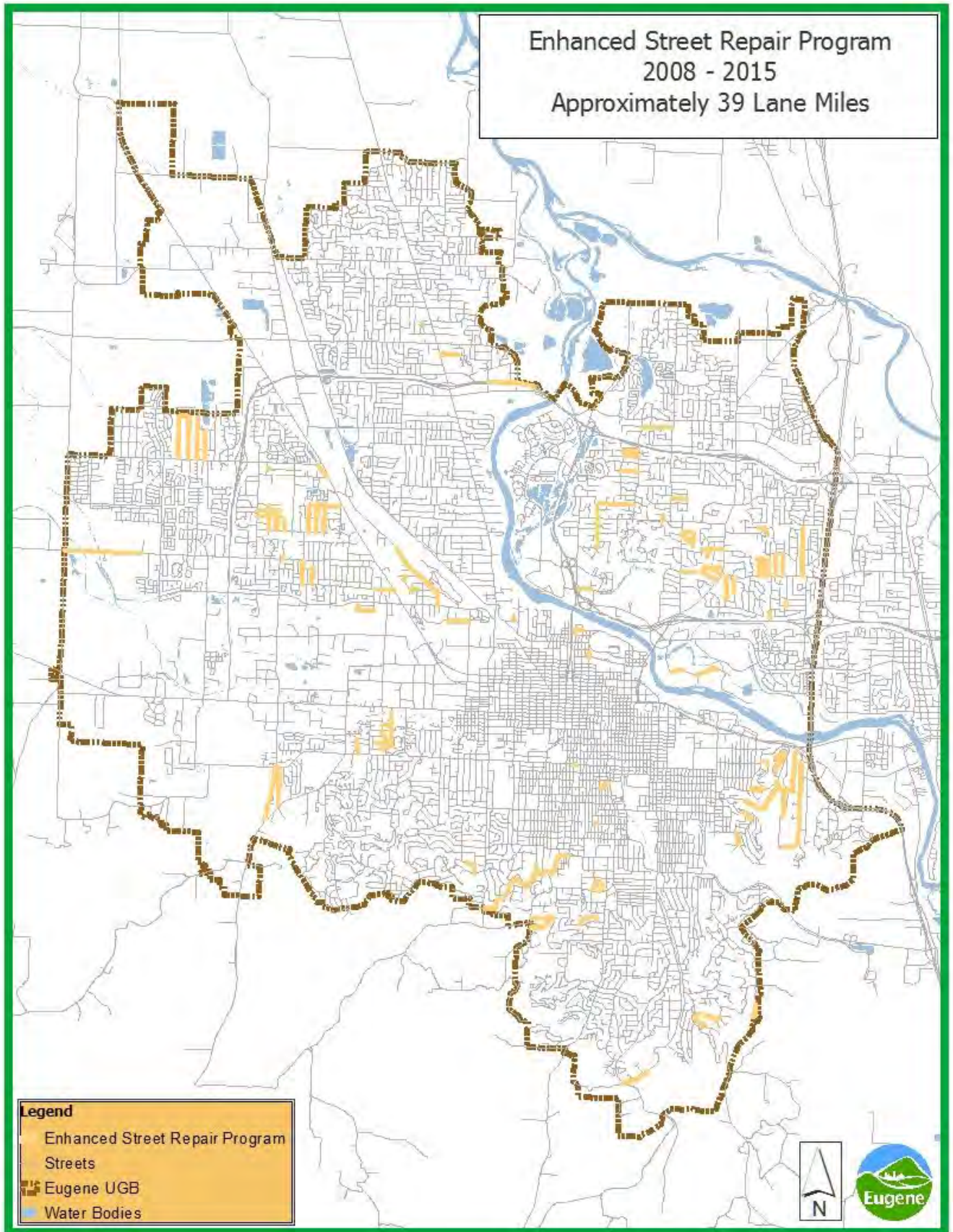
The following map illustrates the Pavement Projects scheduled for 2016.

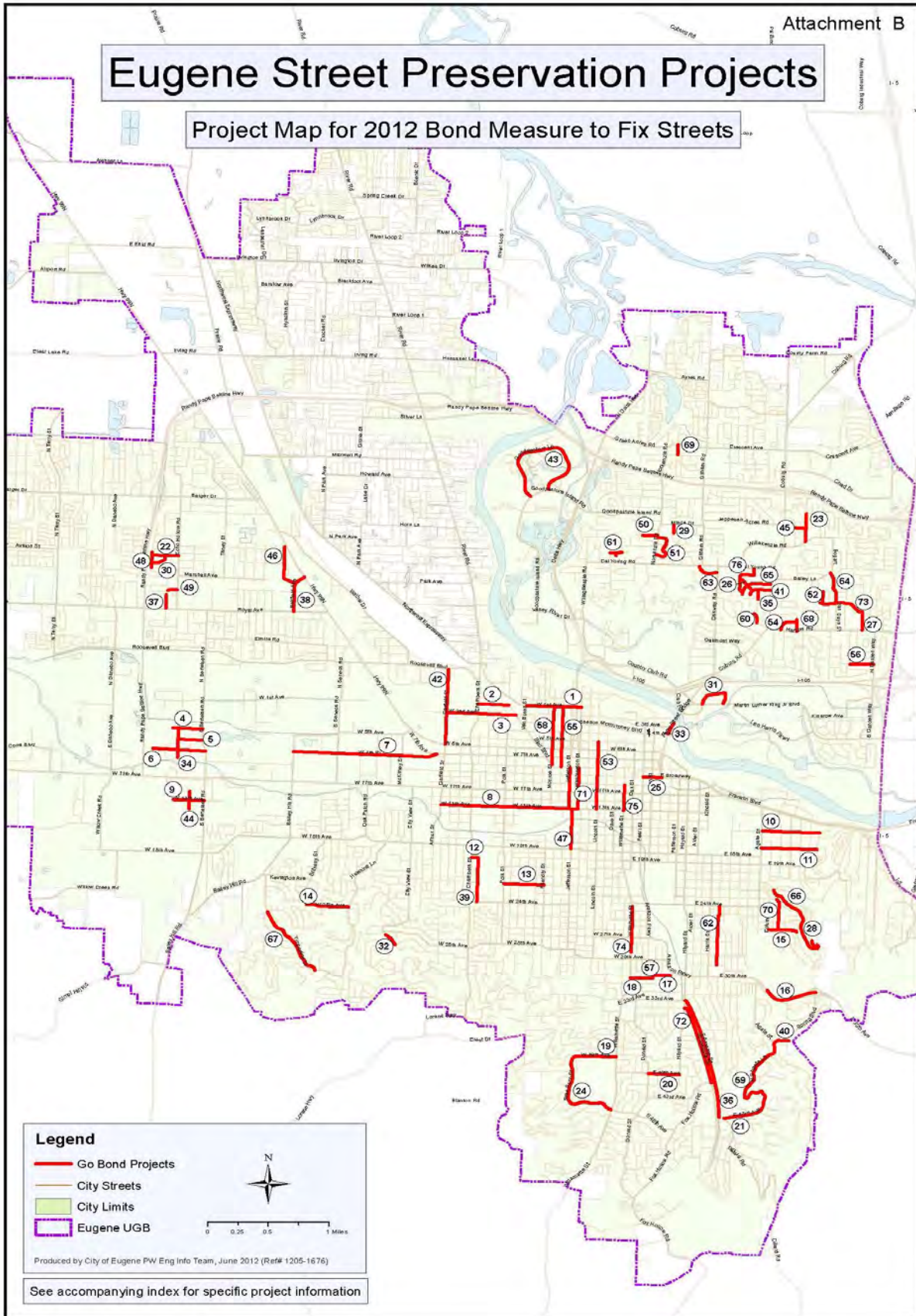


The following map illustrates Pavement Preservation Projects since inception of the program 2002 - 2015.



The following map illustrates the Enhanced Street Repair Program 2008-2015.





Project List for 2012 Bond Measure to Fix Streets

Map #	Street Name	Limits
1	01ST AVE	WASHINGTON ST - VAN BUREN ST
2	01ST AVE	BLAIR BLVD - WEST END
3	02ND AVE	BLAIR BLVD - GARFIELD ST
4	05TH AVE	BERTELSEN RD - WEST END
5	06TH AVE	BERTELSEN RD - COMMERCIAL ST
6	07TH AVE	BERTELSEN RD - OSCAR ST
7	07TH PL	7TH AVE/HWY 99 - BAILEY HILL RD
8	13TH AVE	WASHINGTON ST - GARFIELD ST
9	13TH AVE	BERTELSEN RD - COMMERCE ST
10	15TH AVE	FAIRMOUNT BLVD - AGATE ST
11	17TH AVE	FAIRMOUNT BLVD - AGATE ST
12	19TH AVE	FILLMORE ST - CHAMBERS ST
13	22ND AVE	FRIENDLY ST - POLK ST
14	25TH AVE	HAWKINS LN - BRITTANY ST
15	27TH AVE	COLUMBIA ST - SPRING BLVD
16	30TH AVE	SPRING OVERPASS - AGATE ST
17	30TH AVE	MILL ST (WEST) - FERRY ST (EAST)
18	30TH AVE	MILL ST - WILLAMETTE ST
19	39TH AVE	WILLAMETTE ST - 100' EAST OF DENSMORE RD
20	40TH AVE	HILYARD ST - DONALD ST
21	43RD AVE	N SHASTA - DILLARD RD
22	AVALON ST	ECHO HOLLOW RD - JUHL ST
23	BEST LN	WILLAKENZIE RD - KENTWOOD DR
24	BRAE BURN DR	39TH AVE - WILLAMETTE ST
25	BROADWAY	MILL ST - PEARL ST
26	BUFF WAY	WOODSIDE DR - FORRESTER WAY
27	CALVIN ST	WESTERN DR - HARLOW RD
28	CAPITAL DR	SPRING BLVD - 50' N OF CRESTA DE RUTA ST
29	CARMEL AVE	MINDA DR - 400' SOUTH OF MINDA DR
30	CASCADE DR	AVALON ST - JUHL ST
31	CENTENNIAL LP	MLK, JR BLVD (EAST) - MLK, JR BLVD/CLUB RD
32	CITY VIEW ST	28TH AVE - 29TH AVE
33	COBURG RD	SS FERRY ST BRIDGE - 50' S OF EWEB ON/OFF RAMP
34	COMMERCIAL ST	5TH AVE - SOUTH END
35	CORYDON ST	FORRESTER WAY - TANDY TURN
36	EAST AMAZON DR	HILYARD ST - DILLARD RD
37	ELIZABETH ST	KNOOP AVE - ROYAL AVE
38	FAIRFIELD AVE	WS HWY 99 - ROYAL AVE
39	FILLMORE ST	19TH AVE - 24TH AVE
40	FIRLAND BLVD	SPRING BLVD - AGATE ST
41	FORRESTER WAY	COBURG RD - WS DRWY 1033
42	GARFIELD ST	ROOSEVELT - 6TH AVE
43	GOODPASTURE LOOP	GOODPASTURE IS RD (EAST INTERSECTION) - GOODPASTURE IS RD (WEST INTERSECTION)
44	INTERIOR ST	NORTH END OF CUL DE SAC - SOUTH END OF IMPROVED SECTION

Exhibit A

Map #	Street Name	Limits
45	IONE AVE	BEST LN - ADKINS ST
46	JACOBS DR	HWY 99N - FAIRFIELD AVE
47	JEFFERSON ST	8TH AVE - 18TH AVE
48	JUHL ST	NS ADDR 1424 - SOUTH END
49	KNOOP AVE	ECHO HOLLOW RD - ELIZABETH ST
50	LARKSPUR AVE	NORKENZIE RD - 640 FEET WEST OF NORKENZIE RD
51	LARKSPUR LOOP	NORKENZIE RD (N) - NORKENZIE RD (S)
52	LEIGH ST	NORTH END - WESTERN DR
53	LINCOLN ST	5TH AVE - 13TH AVE
54	LYDICK WAY	TOMAHAWK LN - HARLOW RD
55	MADISON ST	1ST AVE - 8TH AVE
56	MAHLON AVE	GARDEN WAY - HONEYSUCKLE LN
57	MILL ST	30TH AVE (NORTH) - 30TH AVE (SOUTH)
58	MONROE ST	1ST AVE - BLAIR BLVD
59	NORTH SHASTA LOOP	FIRLAND - 43RD AVE
60	PIONEER CT	PIONEER PIKE - NORTH END
61	PIPER LN	CHASA ST - FIR ACRES DR (INCL CUL-DE-SAC)
62	POTTER ST	24TH AVE - 29TH AVE
63	ROLAND WAY	OAKWAY RD - CAL YOUNG RD
64	SATRE ST	BAILEY LN - WESTERN DR
65	SHARON WAY	COBURG RD - ES DRWY 1023
66	SPRING BLVD	FAIRMOUNT BLVD - CAPITAL DR
67	TIMBERLINE DR	WARREN ST - WINTERCREEK DR
68	TOMAHAWK LN	HARLOW RD - 580' NORTH OF HARLOW RD
69	TULIP ST	CRESCENT AVE - HOLLY AVE
70	VAN NESS ST	23RD AVE - 27TH AVE
71	WASHINGTON ST	8TH AVE - 13TH AVE
72	WEST AMAZON DR	ES HILYARD - SS FOX HOLLOW
73	WESTERN DR	CALVIN ST - WEST END/MONROE MIDDLE SCHOOL
74	WILLAMETTE ST	24TH AVE - 29TH AVE
75	WILLAMETTE ST	10TH AVE - 13TH AVE
76	WOODSIDE DR	CAL YOUNG RD - SHARON WAY

