Ad Hoc Street Improvement & Funding Committee

June 7, 2023 Meeting Agenda

Time & Location: 6:00 pm. At Cottage Grove City Hall, Council Chambers, 400 E. Main Street

Join the Street Improvement Funding Committee Meeting from your computer, tablet or smartphone.
https://meet.goto.com/CottageGrove/june72023streetfundingadhoccommittee

You can also dial in using your phone.
Access Code: 232-268-893
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1. Welcome
2. Staff Recap of street improvement and revenue need. (Faye Stewart)
3. Round Table Discussion regarding preferences of funding stream characteristics. (Richard Meyers)
4. Staff Presentation of 10 potential street revenue mechanisms for funding City street maintenance, preservation, and capital improvements.
5. Committee requested information, Paving vs Concrete and potential sales tax revenue.
6. Future meeting agenda topics.
7. Questions
8. Next Meeting will be at 6:00 p.m. on June 28, 2023 at Cottage Grove City Hall

Current Street Funding Options
The following are funding mechanisms that could raise revenue for street improvements;

- Gas Tax (Cottage Grove Municipal Code Chapter 5.26):
    - Current City tax is $.03 per gallon. An increase requires a City wide vote. Most cities have a $.03 tax. Portland is $.10, Coburg is $.06, and Eugene is $.05 the rest are $.03 or less.
    - Revenue generated decreases over time as vehicles become more efficient and as people shift to electric vehicles.
    - Electric vehicles are typically heavier than the similar combustion engine version.
    - Misses collection revenue from electric vehicles.
    - Travelers and people living outside the city limits contribute to the tax when fuel is purchased within the City limits.
    - State Highway Apportionment Fund Revenues for 2021-2022 was estimated to be $77.91 per capita (our population of 10,792 is used for the calculation). It is estimated to decrease in 2022-2023 to $76.42 per capita and $76.11 per capita in 2023-2024. The State Highway Apportionment Fund revenue increases as the City population increases. Last year the population increased by 637 people increasing the projected revenue by $49,629.00
    - City gas tax revenue is declining. $420,000 in 2017 to $325,000 in 2023.
- Transportation Utility Fee:
    - The Transportation Utility Fee (TUF) is a fee added to the current utility billing dedicated to transportation improvements and maintenance. TUFs are calculated in two ways; a flat fee per month or a fee based on trip generation methodology. The trip generation method is the same method the City uses to calculate Transportation System Development Fees on new development. Approximately 20 Oregon cities have TUFs. The majority of the TUFs are ongoing. Two have sunset clauses.
    - Creswell Council implemented a $4.00/month residential and a trip calculated fee on business. BiMart is expected to pay $500/month.
    - The fee is added to the utility bill. Currently there are 3,983 accounts. The revenue generated will increase as new utility accounts are added. Currently water, wastewater, and storm drain have a minimum charge of $90.19 per month without a TUF. The average residential billing using 6,000 gallons of water per month is approximately $100.00.
    - If a TUF is recommended staff recommends having FCS look at using trip generation manuals to calculate fees for the 55 businesses that are equivalent to residential fees.

- Property Tax:
    - Voters can approve a bond measure for transportation projects. General Obligation Bonds are sold to fund the projects with property tax revenue servicing the debt. Eugene and Springfield have been successful in passing voter-approved general obligation bond measures for street improvement projects. In general, approved measures last 3 to 5 years and require a vote to renew. It creates a capital improvement levy to pay for the debt. Successful measures have included specific improvement projects, annual reports to voters, and a citizen oversight committee.
    - Property tax values can increase up to 3% per year based on property tax assessments by the County Assessor. The amount paid is based on each property's value. Less value less paid or more value more paid.
    - 2023-24 Projected Assessed Valuation for CG is $826,688,881
- Local Improvement District (LID):
    - Under Cottage Grove Municipal Code Chapter 7.04 LIDs requires more than 67% support of the property owners in the defined geographical area or zone of benefit. Does not fund ongoing maintenance, only funds capital improvements. Citizens representing 33% or more of the LID can terminate the LID and overturn planned projects. Must have strong support for LID. LIDs are not Special Service Districts, they are specific to neighborhoods.
- Urban Renewal District:
    - Is used to improve and redevelop "blighted areas". Urban renewal district (URD) programs use "tax-increment financing. District boundaries are formed and projects are identified for the purpose of increasing property values. The increased property values from new development are frozen and used to fund bonds that generate revenue for the URD projects. Districts are limited in size, cannot be entire City, and must meet the definition of a blighted area.
- Bonding:
    - The City can sell Revenue Bonds to fund street improvements. To generate $5 million for improvements it would require $1,120,000 per year for bond repayment at 5.5% interest. Property tax rate of $1.43 per thousand to service debt over 5 years
    - Must have a dedicated revenue to service bonds; gas tax, TUF, road use fee, etc.
- Infrastructure Funding Companies:
    - There are Companies that specialize in helping cities make street improvements. Services include design, build, and finance. They have access to private funds at interest rates close to current bond rates. They contract with firms to design and construct the improvements. The companies charge a 4-5% administration fee to manage the design build. The amount of money financed is based on

the city's ability to service the debt. They also use the city streets as collateral for the loan.

- Local Sales/Income Tax
  - Local sales/income taxes can be on specific items or services.
  - Can be enacted by action of the City Council.
  - No State sales tax. Voted down by citizens several times.
  - Difficult to acquire sales data for predicting revenue generated in CG.
  - Employee Payroll Tax. Estimated 3635 employees inside CG urban growth area. Gross payroll is $145,000,000 per year. ½% tax would generate $725,000 or 1% would generate $1,425,000. DOR would collect revenue. The payroll tax is currently used by LTD in Cottage Grove.
- Per Day Road Use Fee, Electronic Tolling System
  - This is a revenue system used in many states and is currently being explored by ODOT to fund road and bridge improvements in the Portland area. The State is looking a possible 2025 date to implement.
  - Could generate revenue from all vehicles using the City roads (local, surrounding area, and travelers).
- City General Fund
  - The General Fund property tax revenue is budgeted at $5.3 million for 2022-23.
  - Would need to reduce or cut costs in the General Fund to generate about $1,200,000 to transfer to the Street Fund.

Potential Revenue Scenarios for the Different Funding Mechanisms:

- Gas Tax (Projections for the first year but expected to decrease each year):
  - $.01 increase would generate approximately $100,000 per year.
  - $.03 increase would generate approximately $320,000 per year.
  - $.05 increase would generate approximately $500,000 per year.
- Transportation Utility Fee:
  - $5.00 fee per month per housing unit added to the utility billing would generate $252,000.00 per year. A fee would need to be determined to charge commercial accounts based on trip generation.
  - $10.00 fee per month added to the utility billing would generate $504,000.00 per year.
- Property Tax:
  - $1.43 per thousand would generate approximately $1,120,000 per year (includes 5% uncollectible). The increase for a $350,000 home would be $500 per year or $41.70 per month.
- Per Day Road Use Fee:
  - $.10 per day with 37,500 vehicles could generate $3,750 per day, 112,500 per month, and $1,350,000 per year. More evaluation is needed to verify # of vehicles and revenue produced. This assumes 25,000

voting residents in the City and surrounding area and 1.5 vehicles per adult. There would be additional revenue generated by tourist and commercial use. Annual costs per vehicle would be $36.50 per year.

- There are 6877 registered vehicles within the City limits of Cottage Grove.

CITY OF COTTAGE GROVE
Ad Hoc Street Improvement & Funding Committee
Minutes of the Meeting
May 25, 2023

Present in Chambers:	Mayor Candace Solesbee, Councilor Dana Merryday, Councilor Mike Fleck, Commissioner Garland Burback, Citizen Michael Leborde, Citizen Robert Reetz, Citizen Amber Bahler, Citizen Michael Praegitzev, Citizen Chris Holloman
Present via GoTo Meeting:	Councilor Dreher, Finance Director Roberta Leikens
Staff Present:	Richard Meyers City Manager, Director of Public Works Faye Stewart, Recording Secretary Tina MacDonald.
Media Present:	Cindy Woolbriar - The Sentinel & KNND
Absent:	Citizen Tiffanie Williams, Citizen Jeff Conklin, YAC Member Kassidy Poetzl, Councilor Savage, Councilor Stinnett

1. Welcome (6:05 pm): Mayor Solesbee welcomed everyone to the first Committee meeting.

2. Introductions: Committee members introduced themselves and spoke about their time here in Cottage Grove.

3. Committee Purpose: Faye shared Resolution 2095 establishing this Committee. He spoke about the ongoing issue of the state of the roads. The City streets are deteriorated at a fast rate and combined with the rising costs of materials the City Council decided to establish this Ad Hoc Committee with the hopes of meeting 4 or 5 times to come up with a plan and/or recommendation to present to the City Council on August 14th. This evenings meeting intention is to present the Committee with information and background. We will then move forward with learning about revenue options or vehicles related to streets with the effort of how can we improve Cottage Grove streets and pay for it.

4. Committee Structure: Faye reached out to those who he felt would benefit the committee. There is a wide range of backgrounds and experiences being included.

5. Election of Chair and Vice Chair: The structure itself includes the voting for the Chair and Vice Chair. Staff prepares the agendas and information to be shared. The Chair and

Vice Chair will run the flow of the meetings. Mayor Solesbee entertained a motion for a Chair. Commissioner Burback nominated Councilor Fleck. He declined. Amber Bahler volunteered. Councilor Ervin seconded. All Committee members in favor. Commissioner Burback nominated Michael Praegitzev for Vice Chair. All Committee members in favor. Mayor Solesbee turned the meeting over to Chair Bahler.

6. Staff Presentation: (Dan Ingram, Emerio Engineering & Faye Stewart) Faye introduced Dan Ingram. As a retired Engineer from Lane County he is very knowledgeable of Cottage Grove's transportation system. In 2018 the City reached out to him regarding the Paver software and having it loaded with the City streets. This entailed gathering information about the state of the streets and uploading it into the software. He presented the report to the City Council in 2019. The report is included in the packet. In 2022 he updated the report which is also included. In the last 2 years Faye has worked with Dan in estimating the price on projects. Dan took a list of 8 different road segments and gave the City an estimate. In the first part of this year he updated the estimates, reduced some of the projects and repriced those.

   Dan presented his power point. See attached slide presentation.

   The intention is to familiarize the Committee members with street conditions visuals, how they come up with the numbers they are rating with and the curve of the pavement cycle. Dan spoke about maintaining the ones that are in a higher state of repair rather than the severely damaged ones as it is more cost effective. In the time in between reports many of the resources available were earmarked for other projects such as Safe Routes to School. There was not a huge push for maintaining the streets. He explained the PCI index. Right now Cottage Grove is in the upper portion of the poor category.

   Current PCI ratings on select Cottage Grove Streets presented. Faye asked if the PCI rating was done on E. Main Street before or after the chip seal and if it improved the PCI. Dan stated that it was done before. Councilor Fleck asked about how the PCI is derived, specifically about the base. Dan sees that the state of the City streets is largely based on aging. Councilor Ervin asked about the $200 million ballpark for repairs and what that includes. Is that for total reconstruction? It is and it may have gone up. He spoke about concrete prices skyrocketing. Asphalt includes diesel cost, oil, production, etc. There are cost comparisons that would need to be done on asphalt vs. concrete. ADA becomes involved when a curb is cut which brings in higher costs such as crosswalk lighting and other factors. Slurry seal is about the only treatment that can be done without triggering ADA. Vice Chair Michael P. asked about the availability of ADA grants since this will all have to be done at some point. Faye spoke about a current bill introduction that would provide grant funding to cities 15,000 in population or less that would give $20 million a year to be applied for that is specifically for ADA construction. The City is keeping an eye on that. Safe Routes to School provided $1.3 million for ADA improvements. The City spent approximately $800,000 of street funds combined with some funds from water, sewer and storm that paid for the paving portion of that project as well.

Chris Holloman shared different ideas for raising funds as well. These will be discussed at the next meeting. Faye spoke about SDC fees and what they can be used for. He also circled back to what Dan said about the $200 million being the current value of our transportation system. $30 million of that is deferred.

Dan continued with the presentation showing the street conditions. Richard asked for a description of what it is that we are looking at specifically. Dan explained the various distresses such as alligator cracks and weathering. 57.6 PCI was the average rating in 2018 for the streets in the City. Commissioner Garland talked about S. River Road being built for truck traffic and that it was supposed to hold up, which it has not.

The Row River Connector project was discussed. With the signal at Thornton Rd being ODOT the City can stop short of that intersection. ADA is on ODOT's horizon to come through. Faye mentioned that the cost would be around $780,000 to redo that section from Thornton Rd to Currin Blvd. There was discussion about the specifics of testing and geotech analysis on this stretch, what mix would work best and be the most cost effective. Faye shared that in 2018 Ryan Sisson engaged with Lane County to have them come down and take multiple core samples and make a recommendation for reclamation of the section. This information was not passed on to Dan for his analysis.

Dan went into detail about the graphs included in the packet. Specifically about preventative maintenance and saving money in the long run. When a street hits about 70 PCI would be a good time to hit those ones so they stay in good shape.

Dan elaborated on the Further Evaluation slide. Specifically about the cost, which has essentially doubled. Faye mentioned that the key is to break it down into sections and servicing the good roads, and then going on to reconstructing and so on.

Councilor Fleck spoke about the waste and storm water lines having to be done at the same time. He leans towards the funding of the whole project at the same time, which would be quite expensive. 16th Street to Ostrander is an example and is a $2.5 million project. Faye asked to break it down into 2 sections so the City did not have to do the water lines. That came in at around $830,000. That was a year earlier. Prices skyrocketed. The prices for Gateway from Thornton to Currin increased by 64%. Chris Holloman spoke about the rise in fuel prices.

Faye brought the Committee's attention back to the binder. It includes the updated PCI, 2019 Paver report and estimated costs. The Paver project works if you act and do the preservation and various things before the road starts to deteriorate. The road can be extended forever without having to totally rebuild. That is the goal. Most of the projects that Faye picked out were the ones that need immediate attention. A question would be how do we direct the funds? Do we put some into the neighborhoods or all on the collectors that are mainly travelled? This is one of the challenges that we have that can be answered by the program as far as what are the worst roads and what are the roads that need less maintenance and do preservation.

Councilor Ervin is hoping that the Committee is here to also talk about the approach to the project as far as materials and the long term costs and returns. Can we have presented to the Committee what the options are? Faye thinks that that information will be available. One of the questions will be how do we weigh spending the funds.

Michael Laborde asked about gaining knowledge as to where the traffic is and where the trucks are. Faye can possibly get research from engineering on traffic counts. That information is also available from observing the wear on the streets. Dan talked about the difference in impact from trucks vs. cars. Richard talked about the weight of electric vehicles, that they do not pay taxes and wear the roads down much quicker. Chris Holloman talked about possible fees on electric vehicles. Dan talked about how many other cities are having the same issues and possibly to look at how they are dealing with it as far as raising money. Bonds work in some cities.

Faye pointed out the next sections in the binder. Budgets, street capital improvements and purchases, street fund revenues, etc. The street fund revenues graph shows specific grants, projects and where the funds came from. Councilor Fleck mentioned how the legislation around electric cars is going to have to change. He also mentioned that raising the fuel tax was taken to the voters and did not pass. There was discussion about the drop in travel during covid, yet the commercial didn't seem to drop. Richard stated that the commercial vehicles do not pay city tax. We do not get a portion of the PUC either.

Faye said that in the next meeting we will walk through the street funding processes and how the funds can be used. Commissioner Burback talked about the cost of PUC. Robert asked about how the roads are paid for in new developments. The developer pays for these and the homeowners incur some of that cost. Faye said that originally the majority of the streets in the City at that time used Limited Improvement Districts. Neighborhoods and streets would go in and the property owners would pay a portion of the cost of paving, sidewalks, etc. Richard said that these are things that the Committee can look at as far as local streets such as Bryant. Do we use a Local Improvement District or what are the options for funding that? Do the homeowners have the responsibility? Councilor Fleck spoke to the challenges with LID's. He also wondered at the end of this do we want to look at the waste water and storm lines as a part of suggested projects or do we want to look at them separately? Is of huge importance to him. Michael P. says both come into play. Faye talked about the cost of the improvement of the utilities for the Safe Routes project. It was over half of the total cost. Chair Bahler asked that the costs of the infrastructure be provided at the next meeting.

Faye brought the Committee back to the binder and the last tab. Included are the past and proposed street funded projects over the last 6 years and the work session in 2022.

In talking about the next meeting Faye wants the Committee to discuss the vehicles that are available (gas tax, transportation utility fee, LID's) to municipal government to generate street funding. He will also try to gather the information about the current

conditions of the water, sewer & storm. Chair Bahler asked for the price estimates on alternative materials. Chris asked for a cost benefit analysis that the Committee could talk to the community about. Councilor Ervin asked about the trajectory as far as the timeline. The recommendation is due to Council by August 14th. Richard recommends that the next meeting be just revenue and funding. He asked about the meeting schedule. It was recommended every two weeks in order to meet that deadline. Councilor Merryday asked Faye how long it would take to gather the information that the Committee has requested. He is hopeful to have it for the next meeting. The cost benefit analysis may be available through Engineering. Chair Bahler wants to see the data that would narrow down what the options are. Faye disagreed and stated that the information on the data is just the data. It is about what are the options that we are going to send to the voters. He would like to have Lane County send a couple of staff down here to let the Committee know what they have done in this process. What does it take to go to the voters? Do we want to do some polling? Who would we use for polling? What kind of questions would we ask? What structure? What happens when the Council puts it on the election? What happens after that? We can get input from elections officials about the mechanics of what it takes. Do we have a town hall and have citizens come and give them an opportunity to voice their opinions? Councilor Fleck is not attached to having this done by August 14th in the interest of getting it done right and not have it rushed. Councilor Ervin talked about how funding and projects go hand in hand. Can we talk to the elections officials about how many projects can be going on at the same time? Mayor Solesbee would like to know how much money we can raise. Michael Laborde asked if we have done research about what other communities are doing in this situation. We may have to be a pioneer because what they are doing is not working. Richard wants to present background and what is out there in the next meeting.

Discussion about the next meeting date. Settled on either Wednesday or Thursday the first week of June.

Faye is going to work on getting information together. He can present what current capital project list is for water, sewer and storm. The City is also embarking on doing a new Water Master Plan. There will not be good data until that is updated and in place. Robert asked about options around a sales tax.

Faye thanked everyone for the time and input. The staff will do their best to provide the information requested.

Meeting was adjourned at 8:06 pm.

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Current Fuel Tax Rates

Site Navigation

Oregon State Fuel Taxes

Oregon fuel tax rates are as follows:

- Gasoline $0.38 per gallon
- Aviation Gasoline $0.11 per gallon
- Jet Fuel $0.03 per gallon
- Use Fuel $0.38 per gallon

Use fuel includes premium diesel, biodiesel, and any fuel other than gasoline used to propel a motor vehicle on public roads.

For propane and natural gas dispensed into motor vehicles, use the following information to determine the taxable use fuel gallons:

- Propane - Divide taxable gallons by 1.3.
- Natural Gas - Use your dispenser readings if your dispenser converts the natural gas to gasoline gallon equivalents (GGE) or diesel gallon equivalents (DGE). Otherwise, divide the natural gas gallons by 1.2.

The current tax rates for Gasoline and Use Fuel are effective January 1, 2022.
The current tax rate for Aviation Gasoline and Jet Fuel are effective January 1, 2016.

Required Disclosures

(http://www.oregon.gov)

ORS 646.932 (https://www.oregonlegislature.gov/bills_laws/ors/ors646.html), passed by the 1999 Oregon Legislature, requires service stations (as defined in the bill) to visibly post information as follows:

- The amount of the price per gallon that is federal tax;
- The amount of the price per gallon that is state tax;
- The amount of the price per gallon that is local tax;
- The total amount of federal, state and local taxes per gallon

The Oregon Department of Transportation is required to furnish this information to each facility in the state by posting the following information on this website.

Current Tax Rates - Gasoline

The information that is required to be posted is as follows:

- The federal fuel tax on a gallon of gasoline is $0.184 per gallon. If the gasoline is blended with alcohol federal fuel tax rates may apply. See IRS Publications (510) (https://www.irs.gov/pub/irs-pdf/p510.pdf) for more information.
- The Oregon state fuel tax on gasoline is $0.38 per gallon.
- Local fuel taxes if applicable.

Search

Gasoline Tax Rate

Jurisdiction	Tax Rate	State	Federal	Total Tax/Gallon	Administered by
City of Astoria	$0.03	$0.38	$0.184	$0.594	ODOT FTG
City of Canby	$0.03	$0.38	$0.184	$0.594	ODOT FTG
City of Coburg	$0.06	$0.38	$0.184	$0.624	ODOT FTG
City of Coquille	$0.03	$0.38	$0.184	$0.594	ODOT FTG
City of Cottage Grove	$0.03	$0.38	$0.184	$0.594	ODOT FTG
City of Eugene	$0.05	$0.38	$0.184	$0.614	ODOT FTG
City of Hood River	$0.03	$0.38	$0.184	$0.594	ODOT FTG
City of Milwaukie	$0.02	$0.38	$0.184	$0.584	ODOT FTG
City of Newport (Jun 1st - Oct 31st)	$0.03	$0.38	$0.184	$0.594	ODOT FTG

Jurisdiction	Tax Rate	State	Federal	Total Tax/Gallon	Administered by
City of Newport Nov 1st - May 31st)	$0.01	$0.38	$0.184	$0.574	ODOT FTG
City of Portland	$0.10	$0.38	$0.184	$0.664	ODOT FTG
City of Reedsport (May 1st - Oct 31st)	$0.03	$0.38	$0.184	$0.594	ODOT FTG
City of Reedsport (Nov 1st - Apr 30th)	$0.00	$0.38	$0.184	$0.564	ODOT FTG
City of Springfield	$0.03	$0.38	$0.184	$0.594	ODOT FTG
City of Tigard	$0.03	$0.38	$0.184	$0.594	ODOT FTG
City of Troutdale	$0.03	$0.38	$0.184	$0.594	ODOT FTG
City of Veneta	$0.03	$0.38	$0.184	$0.594	ODOT FTG
City of Warrenton	$0.03	$0.38	$0.184	$0.594	ODOT FTG
City of Woodburn	$0.01	$0.38	$0.184	$0.574	ODOT FTG
Multnomah County	$0.03	$0.38	$0.184	$0.594	ODOT FTG
Washington County	$0.01	$0.38	$0.184	$0.574	ODOT FTG
Without Local Tax Locations	$0.00	$0.38	$0.184	$0.564	ODOT FTG
City of Cornelius	$0.02	$0.38	$0.184	$0.584	City
City of Dundee	$0.02	$0.38	$0.184	$0.584	City
City of Happy Valley	$0.02	$0.38	$0.184	$0.584	City
City of Hines	$0.01	$0.38	$0.184	$0.574	City
City of North Plains	$0.03	$0.38	$0.184	$0.594	City
City of Oakridge	$0.03	$0.38	$0.184	$0.594	City
City of Sandy	$0.02	$0.38	$0.184	$0.584	City
City of Scappoose	$0.03	$0.38	$0.184	$0.594	City
City of Silverton	$0.02	$0.38	$0.184	$0.584	City
City of Sisters	$0.03	$0.38	$0.184	$0.594	City

Jurisdiction	Tax Rate	State	Federal	Total Tax/Gallon	Administered by
City of Stayton	$0.03	$0.38	$0.184	$0.594	City
City of The Dalles	$0.03	$0.38	$0.184	$0.594	City
City of Tillamook	$0.015	$0.38	$0.184	$0.579	City

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Fuel tax rates in jurisdictions not administered by ODOT may change without our knowledge. ODOT is not aware of any additional local fuel taxes, other than the cities listed above. If other local fuel taxes on gasoline apply they should also be posted along with the state and federal fuel tax

For current federal fuel tax rates or information including gasohol, refer to IRS Publications (510) (https://www.irs.gov/pub/irs-pdf/p510.pdf) for IRS Form 720 (https://www.irs.gov/pub/irs-pdf/f720.pdf) and instructions (https://www.irs.gov/pub/irs-pdf/i720.pdf).

Current Tax Rates - Diesel

The following information below is provided as a courtesy and is not required:

- The federal fuel tax on a gallon of diesel is $0.244 per gallon.
- The Oregon state fuel tax on diesel (Use Fuel Tax) is $0.38 per gallon.
- Additional local fuel taxes are listed below.

Search

Diesel Tax Rate

Jurisdiction	Tax Rate	State	Federal	Total Tax/Gallon	Administered by
City of Astoria	$0.03	$0.38	$0.244	$0.654	ODOT FTG
City of Canby	$0.03	$0.38	$0.244	$0.654	ODOT FTG
City of Coquille	$0.03	$0.38	$0.244	$0.654	ODOT FTG
City of Cottage Grove	$0.03	$0.38	$0.244	$0.654	ODOT FTG
City of Eugene	$0.05	$0.38	$0.244	$0.674	ODOT FTG
City of Hood River	$0.03	$0.38	$0.244	$0.654	ODOT FTG
City of Milwaukie	$0.02	$0.38	$0.244	$0.644	ODOT FTG

Jurisdiction	Tax Rate	State	Federal	Total Tax/Gallon	Administered by
City of Newport (Jun 1st - Oct 31st)	$0.03	$0.38	$0.244	$0.654	ODOT FTG
City of Newport (Nov 1st - May 31st)	$0.01	$0.38	$0.244	$0.634	ODOT FTG
City of Portland	$0.10	$0.38	$0.244	$0.724	ODOT FTG
City of Reedsport (May 1st - Oct 31st)	$0.03	$0.38	$0.244	$0.654	ODOT FTG
City of Reedsport (Nov 1st - Apr 30th)	$0.00	$0.38	$0.244	$0.624	ODOT FTG
City of Springfield	$0.03	$0.38	$0.244	$0.654	ODOT FTG
City of Tigard	$0.03	$0.38	$0.244	$0.654	ODOT FTG
City of Troutdale	$0.03	$0.38	$0.244	$0.654	ODOT FTG
City of Veneta	$0.03	$0.38	$0.244	$0.654	ODOT FTG
City of Warrenton	$0.03	$0.38	$0.244	$0.654	ODOT FTG
City of Woodburn	$0.01	$0.38	$0.244	$0.634	ODOT FTG
Without Local Tax Locations	$0.00	$0.38	$0.244	$0.624	ODOT FTG
City of Cornelius	$0.02	$0.38	$0.244	$0.644	City
City of Dundee	$0.02	$0.38	$0.244	$0.644	City
City of Happy Valley	$0.02	$0.38	$0.244	$0.644	City
City of Hines	$0.01	$0.38	$0.244	$0.634	City
City of North Plains	$0.03	$0.38	$0.244	$0.654	City
City of Oakridge	$0.03	$0.38	$0.244	$0.654	City
City of Sandy	$0.02	$0.38	$0.244	$0.644	City
City of Scappoose	$0.03	$0.38	$0.244	$0.654	City
City of Silverton	$0.02	$0.38	$0.244	$0.644	City
City of Sisters	$0.03	$0.38	$0.244	$0.654	City

Jurisdiction	Tax Rate	State	Federal	Total Tax/Gallon	Administered by
City of Stayton	$0.03	$0.38	$0.244	$0.654	City
City of The Dalles	$0.03	$0.38	$0.244	$0.654	City
City of Tillamook	$0.015	$0.38	$0.244	$0.639	City

Showing 32 out of 32 items

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Fuel tax rates in jurisdictions not administered by ODOT may change without our knowledge. ODOT is not aware of any additional local fuel taxes, other than the cities listed above.

For current federal fuel tax rates or information including kerosene and biodiesel, refer to IRS Publications (510) (https://www.irs.gov/pub/irs-pdf/p510.pdf) for IRS Form 720 (https://www.irs.gov/pub/irs-pdf/f720.pdf) and instructions (https://www.irs.gov/pub/irs-pdf/i720.pdf)

Related Links

- ORS 646.932 (https://www.oregonlegislature.gov/bills_laws/ors/ors646.html)
- IRS Excise Tax (https://www.irs.gov/businesses/small-businesses-self-employed/excise-tax)
- FTA - Motor Fuel Excise Tax Rates (https://taxadmin.memberclicks.net/assets/docs/Research/Rates/mf.pdf)
- Federal Highway Administration (https://www.fhwa.dot.gov/)

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Agencies Listing (https://www.oregon.gov/pages/a_to_z_listing.aspx)

Bond Measures to Fix Streets

On November 8, 2022, Eugene voters resoundingly approved a fourth street repair bond measure. The $61.2 million, five-year bond serves as an extension of the 2017 street bond. The money will be utilized to fund specific improvements:

- Repairs to 42 street projects covering 44.6 lane miles of roads throughout the city.
- $15 million for walking, biking and safety improvement projects to include bike lanes, crosswalks, off-street paths, pedestrian bridges and street tree projects.

These projects are slated for construction between 2025-2029.

The cost to the homeowner is $0.63 per $1000 of assessed property value, the same rate as the 2017 street bond measure. For an average home assessed at $267,531 this costs approximately $169 per year in property tax.

As with the 2008, 2012, and 2017 street bonds, an outside auditor and citizen review committee will review completed street repair projects after each construction season to determine whether the bond proceeds were spent consistent with the bond measure. They groups will also produce an annual report for the City Manager and Eugene City Council.

The 2022 bond measure set aside significantly more money than previous bond measures for walking, biking, safety and street tree projects. City staff are charged with drafting a specific project list for the walking, biking, safety and street tree projects utilizing. The project will utilize the following criteria to create a list:

- Projects and policies identified in the Transportation System Plan, Vision Zero Action Plan, and Climate Action Plan 2.0;
- Geographical distribution throughout the community;
- Community input on walking, biking, safety, and street tree needs.

The draft project list will be shared with the community for feedback before going to the Eugene City Council for approval by November 1, 2023.

Current Condition of City Roads

The City's transportation system includes more than 500 miles of streets, with a replacement value of more than $1 billion. Even with proper maintenance, streets deteriorate and eventually need repair. Signs of wear and distress include rutting, cracking and potholes. However, if addressed early enough, only the surface of a deteriorated street needs to be replaced, instead of the entire street. Resurfacing a street is significantly more cost effective than a full rebuild, which includes a new road base.

Public Works staff prepare the Pavement Management Report on an annual basis. It provides a look at the current condition of city roads. At the end of 2021 Public Works estimated there were $87.6 million in needed street repairs throughout the city, a significant decrease since 2008, when voters first approved a street repair bond.

History of Road Repair Funding

In 2000 the capital budget didn't include funding for preservation of the street system. At the time it was estimated there was about $53 million in needed street repairs. By 2008, that number had increased to $171 million and was projected to grow to more than $280 million in 10 years.

A majority of funding for current street repair projects comes from two sources: street repair bonds and a local gas tax (implemented in 2003). Combined, they account for nearly $12 million a year for street repairs, with the bond money accounting for about $9 million of that total.

According to the Pavement Management Report, about $15.4 million is needed per year over the next decade to return all streets to good condition and keep any additional streets from needing to be reconstructed. Once this is achieved, it's estimated the annual street repair budget would be $11 million.

In 2008, Eugene voters approved a five-year, $35.9 million bond measure to fix city streets. Voters again showed their support for street repairs with the approval of a new, $43 million bond in 2012 and a $51.2 million bond measure in 2017. The proposed 2022 bond measure would serve as an extension of the 2017 bond measure.

When voters approved the bond measures, they also approved a specific list of streets to be improved. In 2008, the measure promised to fix 32 streets. Because of economic factors and cautious spending, crews were able to fix an additional 10 streets with the 2008 bond money.

The 2012 bond included a list of 76 streets to be fixed and provided an average of $516,000 per year for bicycle and pedestrian projects. City staff are on target to meet the objectives of the 2012 bond. Because of continued favorable bids and resourceful spending, staff funded additional streets in 2019 using remaining money from the 2012 bond.

The 2017 bond measure, which started in 2019, committed to making necessary repairs and improvements on 91 streets. As of July 2022, staff are on track to complete all of the 2017 bond projects by 2024.

Working with the Active Transportation Committee and under the guidance of the Transportation System Plan, the city has also identified and completed an average of $1 million in safety improvements for people who bike and walk.

Road Bond Transparency

The bond measures established several levels of accountability. The bonds require an outside auditor and citizen-led committee to evaluate the City's work on an annual basis. The citizen-led committee, the Street Repair Review Panel (SRRP), is comprised of a number of different stakeholders from throughout the community. Each member brings a different background and area of expertise to the panel.

The auditor and SRRP work independently. Each year they file a report after researching the previous summer's construction work. The reports are then reviewed by the City Manager and presented to the Eugene City Council. All of the reports can be found on the City website.

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Quick Links

- 2022 Street Repair Review Panel Final Report
- 2022 Pavement Management Report
- 2021 Street Repair Review Panel Final Report

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Eugene Public Works
Street Repair Review Panel

GO Bonds
Fixing Eugene's Streets

Memorandum

Date: February 1, 2022

To: Sarah Medary, City Manager

From: Street Repair Review Panel

Subject: 2021 Report of the Street Repair Review Panel

It is our pleasure to present the 2021 annual report of the Street Repair Review Panel, focusing on the third year of implementing the 2017 bond measure to fix streets. The body of this memo is largely the same with what has been presented in previous years with an added emphasis on Progress, Current Conditions, and Funding Update.

Background

The Street Repair Review Panel was initially formed in 2009 to review the implementation of the 2008 street repair bond. This year's report responds to the accountability provisions in Measure 20-275, the 2017 bond measure to fix streets. The 11-member panel met three times over a three-month period in preparation of this report. 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, 2021.

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 2021.

Highlights from our review of the 2021 street bond projects include the following:

- **Progress** –2021 was the third year of the third 5-year bond measure that will continue to work towards reducing the preservation backlog and remain focused on active transportation and safety. While revenue collection will end in 2023 the completion of the listed projects is scheduled for 2024. There was a dramatic increase in projects completed in 2021 in comparison to the challenges of 2020.
- **Current Conditions** - The projects funded in 2021 by the 2017 voter-approved bond measure resulted in the reconstruction or resurfacing of 21 streets and approximately $10.4 million dollars in expenditures. The total includes projects started in 2020 and completed in 2021, projects completed in 2021, and the design phase for the transformational project along 8th Ave that started in 2020 which is scheduled for 2022 construction. The long awaited $8 million South Willamette Street Improvement project finished construction in 2021. As noted in previous reports, the 2007 Pavement Management Report projected the anticipated backlog for rehabilitation needs would reach more than $282 million in 2016 if steps were not taken to reduce the backlog. The backlog of street repair projects in 2021 was projected at $87.6 million, an increase from $82.7 million in 2020. Since the implementation of the 2008 bond, more than 200 lane miles of street work has been completed using bond funds.
- **Funding Update** – The construction industry faced hurdles with supply chain issues, price fluctuations, and labor shortages that combined to result in higher than expected bid prices. From the projects already awarded for 2022 construction we expect the steep price increase trend to continue. The committee has noted concerns about the impacts of continued high prices on the balance available for the remaining bond measure projects. If prices continue to climb it may be necessary for staff to identify local funds to complete all or part of the 12 projects identified for construction in 2024.
- **Vision Zero** – In recognition of Council's Vision Zero 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. In 2021 enhanced pedestrian crossings were built in numerous locations.

- **Active Transportation -** The 2017 measure allocated funding for bicycle and pedestrian projects guided by the Transportation System Plan (TSP), City staff, and the Active Transportation Committee (ATC). In 2021, significant improvements for people who walk and bike continued, including the installation of sidewalk ramps and improved bicycle lanes. Roughly half of the annual allocation will be used on the off-street path system. The committee encourages increased transparency and consistency with the selection of projects and use of funds for people who walk and bike through implementation of the TSP and coordination with the ATC.
- **Collaborating with Partners and Leveraging Bond Funds –** Eugene's Pavement Preservation Program 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 to avoid emergency repairs. The 2021 projects created opportunities to repair underground utilities including the water, wastewater and stormwater systems. We also appreciate the ability to leverage bond funds with other sources of revenue. A 2021 example of this type of fund leveraging includes the rehabilitation of neighboring local street segments using fuel tax funds. We encourage staff to continue to look for these types of opportunities.
- **Communicating with Citizens and Businesses** – Construction, by nature, is disruptive and residents recognize that in a busy construction season it is a challenge to coordinate activities to keep a project on schedule. In the past several projects have been extremely frustrating for neighbors, with streets torn up for extended periods without visible signs of progress. The committee recognizes improvements made in project communication in 2021. We continue to encourage the department to coordinate projects and look for new and better ways to proactively coordinate communications and minimize impact to the public, impacted businesses and residents.
- **Achieving Sustainability Goals** –The City's paving program is designed to extend the life of city streets before they fall into the reconstruct category. This helps to extend the life of the streets, and when combined with recent paving techniques, greatly reduces the City's environmental footprint. Eugene is a leader using reclaimed asphalt materials, reducing the mining and production of virgin rock and asphalt materials. The continued use of warm mix asphalt saves energy, reduces emissions, and is an excellent example of the department's commitment to sustainability efforts, consistent with the City's Climate Recovery Ordinance. The committee encourages staff to continue to be industry leaders in looking for ways to responsibly implement emerging technologies to address climate impacts of construction and help achieve the goals of the Climate Action Plan 2.0. It is important to understand that the real impact on the climate comes not from how we build roads, but how we use them. The amount of active transportation funding in this bond measure has increased, and staff are using these funds strategically to maximize improvement for walking, bicycling, and transit. However, achieving our climate recovery goals will require a far greater commitment of economic and political capital than what staff can achieve through bond measure projects.
- **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 attached report. The selection of bicycle and pedestrian projects is guided by the Transportation System Plan, City staff and the Active Transportation Advisory Committee. The memo in Appendix C explains in more detail how these safety improvement projects are selected.
- **Recognizing the Continued Economic Value of Street Bond Projects** – A functioning transportation system is important for the community and economy, including local job creation, and the bond is essential to maintaining the City's infrastructure.
- **Bottom Line** – We believe the community is getting a good return for its investment in street repairs, and the bond funds are being used wisely to meet the objectives of Ballot Measure 20-275. An upfront investment in repairing and maintaining Eugene's streets saves the community significant money.

We feel Public Works 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/2110/Street-Repair-Review-Panel. Please feel free to contact any of us for additional information.

SRRP Members

John Barofsky
Jeannine Parisi
Allen Hancock
Jim Mender
Kirsten London
Brian McMurray
John Quilter
Matt Roberts
Ollie Snowden
Gary Wildish
Sue Wolling

City of Eugene Staff

Sarah Medary
Eric Johnson
Katie Marwitz
Scott Milovich
Cathy Mueller
Rachael Love
Brian Richardson
Lacey Risdal
Matt Rodrigues
Jamie Garner
Jenifer Willer

Citizen Street Repair Review Panel
2021 Report
Implementation Update for Measure 20-275 Bonds to Fix Streets

GO Bonds
FIXING EUGENE'S STREETS

Eugene

2021 Report to the Citizen Street Repair Review Panel

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Jamie Garner
Jenifer Willer

Cover photo from 2021 projects: Completed paving on Willamette St.

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 2017 voter-approved Bond Measure 20-275, the schedule for construction of these projects, and the details of bond projects constructed in 2021. The street repair measure approved $51.2 million in bonding authority over a five-year period. With this funding, construction of bond-funded projects will be completed in 2024.

KEY TERMS

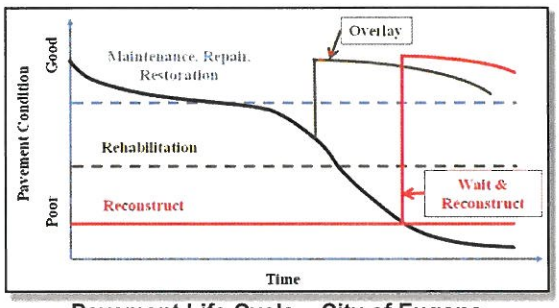
Bond - Bond Measure 20-275, Bonds to Fix Streets, approved by Eugene voters in November 2017.

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 volume. 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.

Full Depth Reclamation (FDR) – An alternative to a traditional reconstruction treatment that utilizes and reuses existing pavement and/or road base materials. The existing roadway materials are pulverized to a specified depth, mixed with a cement paste for strengthening, and allowed to cure for 18-48 hours. Once cured, the roadway is repaved. Two of the benefits of performing a reclamation treatment are reducing mining and producing new materials by reusing what is on-site and shortening the time the neighborhood is impacted due to lane closures.

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 inlay 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, 2012, and 2017 street repair bond measures, was predominately funded with local fuel tax revenue and the reimbursement fee component of transportation system development charges.



Pavement Life Cycle – City of Eugene Transportation Service Profile Presentation

Reclaimed Asphalt Pavement (RAP) - Reclaimed asphalt pavement is the grindings from the existing pavement during the inlay process, described above. 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 percent of asphalt pavement can be made up of reclaimed asphalt pavement. The City of Eugene has recently increased that percentage to 35 percent for all paving projects and has piloted even higher amounts. Other reclaimed asphalt materials, such as shingles, can also be used to replace virgin asphalt binder in pavements. Reclaimed asphalt pavements can also be used as base rock.

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, full depth reclamation may sometimes be used as an alternative to traditional reconstruction. Reconstruction may be four to five times more expensive than an inlay treatment, making it the most expensive of the repair options, which is why the City prioritizes preserving streets before they reach the point of needing reconstruction.

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:

Paving on Fairmount Boulevard

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 the 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 financed by the bond were specifically listed in the Bond (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 2017 bond measure stated that the City will allocate an annual average of $1,000,000 to support bicycle and pedestrian projects, also known as active transportation 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, the Active Transportation Committee, and the City's goals to increase safety on City streets. In 2021, active transportation and safety improvements were added to several projects. These improvements are further described in the project details, below, and included in Appendix C of this report.

New Concrete Path and Light Poles on the South Bank Path

Complete Streets and 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 elements of the street such as curbs, gutters, 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 $1,000,000 of the bond proceeds over a period of five years to fund bicycle and pedestrian projects.

Stormwater Pipe Work on Primrose Street

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, state and 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. State gas taxes have been used to pay for signal upgrades and traffic calming.

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.

Vision Zero

In November of 2015, the Eugene City Council joined a growing number of cities around the country in adopting a Vision Zero Resolution that states "no loss of life or serious injury on our transportation system is acceptable." Vision Zero is a data-driven approach to educate the community and enable the City to prioritize resources based on evidence of the greatest need and impact.

The City regularly combines Vision Zero principles with ongoing pavement preservation projects. Cost effective intersection enhancements such as countdown pedestrian signals and audible pedestrian signals will continue to be a priority and standard practice on future projects. ODOT has shown that the inclusion of these types of enhancements can significantly reduce fatal and life-changing injury crashes.

ADA Transition Plan

As part of Title II of the Americans with Disabilities Act (ADA) of 1990, the City of Eugene conducted an evaluation of its public rights-of-way and developed a transition plan that outlines in detail how the organization will ensure safe access to all facilities for all individuals. Public Works collected detailed data on over 15,000 ramps and 250 pedestrian signals to develop transition schedules specific to these facilities. The Public Works Director approved an updated supplement to the City's ADA Transition Plan focused on the Public Rights-of-Way by Administrative Order in July 2015. All capital rehabilitation projects are evaluated for access compliance and potential improvements during scoping and preliminary design.

ADA Ramp Under Construction on Laurelhurst Drive

The ADA Transition plan identifies a goal of upgrading 200 ramps annually 2021-2053. In 2021, the City constructed and upgraded 330 sidewalk ramps, 306 through capital improvement projects and 24 through private development construction. The ADA Transition plan and yearly updates can be visited at the following link: https://www.eugene-or.gov/2416/ADA-Transition-Plan

CAP 2.0 & Capital Waste Diversion

Public Works Engineering strives to be a leader in sustainability, focusing on climate change goals and greenhouse gas (GHG) emission tracking as outlined in Eugene's Climate Action Plan (CAP 2.0). GHGs contribute to global warming by trapping heat within the earth's atmosphere through a process known as the greenhouse effect.

Through the Capital Improvement Program process, GHGs from construction were estimated at the concept phase and then calculated post-construction. There were 14 projects in 2021 which contributed approximately 4200 metric tons of CO_2e . While GHGs are an inevitable byproduct of construction, we plan to mitigate our impact on the environment in a number of ways including selecting materials that have lower embodied GHG emissions, especially for the 2 biggest emitters, asphalt and concrete; by planting trees and increasing tree canopy; and by continuing to identify opportunities to reuse and recycle materials as often as possible. In 2021 approximately 17,784 tons of material was reported as diverted from the waste stream yielding a diversion rate of 89%. Concrete and asphalt, depending on the project type, continue to have the greatest potential for additional diversion opportunities.

Funding Status and Forecast

Project cost estimates, used in project selection, 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.

Three projects originally scheduled for 2021 were shifted to 2022 due to higher than average construction bids, and extensive public engagement and resulting community commitments that extended the design phase.

- 8th Avenue, between Lincoln St to Mill St, received federal grant funds to widen sidewalks, provide protected bike lanes, and convert the street from one-way travel to two-way. The project is scheduled to be awarded in the Spring of 2022.
- 4th Avenue and Mill Street Paving included ongoing coordination with the Riverfront Development and the construction contract was awarded in late 2021 with planned Spring 2022 construction.
- 17th Avenue, 19th Avenue and Mill Street Paving was advertised for bidding in 2021 but received only a single high cost bid that was nearly double the engineer's estimate. The project was rebid in the fall of 2021, under a more favorable bid climate and received three competitive bids. The low bidder was nearly $900K lower than previous bids and the contract has been awarded for completion in 2022.

Details on an annual project-by-project basis are provided in the following pages and summarized in Appendix A. Based on costs to date we are currently projecting exhausting the bond total which will require the use of additional local funds to supplement upcoming projects.

The 2017 bond measure also allocated an average of $1,000,000 for pedestrian and bicycle improvements each year. In 2021 the project expenditures on all pedestrian and bicycle improvements funded by the bond were estimated at $1,604,926. After the first three years of construction, the pedestrian and bicycle expenditures are tracking right at the $1 million annual average. Additional details are provided in Appendix C.

2021 Bond Construction Projects & Project Development

The following pages are reports on individual projects completed in 2021. The total costs for each project listed are estimated as not all of the 2021 construction-related costs have been finalized as of January 3, 2022.

Completed Paving on Terry Street

ARROWSMITH ST, BAILEY HILL RD, ROOSEVELT BLVD & TERRY ST PAVING

Project Description: This project consisted of rehabilitation of four streets in the Active Bethel Citizens and West Eugene Community Organization neighborhoods in Council Ward 8.

- Arrowsmith Street from W 11th Avenue to Terry Street
- Bailey Hill Road from W 5th Avenue to W 11th Avenue
- Roosevelt Boulevard from Beltline Road to approximately 800 feet east
- Terry Street from Royal Avenue to Roosevelt Boulevard

Treatment Methodology:

- Arrowsmith Street was rehabilitated by removing 2 inches of surfacing and paving back 4 inches for a total pavement depth of 6 inches. A significant portion of Arrowsmith Street required reconstruction by removing the surface down to a depth of 24 inches and replacing with 18 inches of aggregate and 6 inches of pavement.
- Bailey Hill Road was rehabilitated with a series of different pavement treatments. Between 5th Avenue and 7th Avenue, the existing surfacing was removed to a depth of 8 inches and replaced with 8 inches of pavement. Between 7th Avenue to 11th Avenue, the existing surfacing was removed to a depth of 9 inches and replaced with 9 inches of pavement in the northbound lane only. The southbound lane, center lane, and parking lanes were rehabilitated by removing 1 to 3 inches of existing pavement and replaced with 2 to 4.5 inches of new pavement.
- Roosevelt Boulevard was reconstructed by removing the surfacing to a depth of 18 inches and replaced with 11 inches of cement treated base and 7 inches of pavement. The center lane was over laid with a slurry seal treatment.
- Terry Street was rehabilitated by removing the top 3 inches of pavement and replaced with 3 inches of new pavement.

Costs: Total project costs, from all funding sources, are estimated at $2,172,461.

Preliminary Estimate based on Pavement Management System (PMS) Surface Evaluation =	$1,314,400
Total Projected/Actual Paving Bond Funds Used =	$2,037,879
Difference =	($723,479)

Additional Sources of Funding: Local Gas Tax, Active Transportation Bond, EWEB, Stormwater Utility, Wastewater Utility, and Parks and Open Space funds.

Active transportation Bond funds were used for the addition of a bike ramp and buffered bike lanes on Bailey Hill Road.

Project Photo:

Completed Paving on Bailey Hill Road

LINCOLN STREET PAVING

Project Description: This project consisted of rehabilitation of a street in the Jefferson Westside Neighbors and Friendly Area Neighbors neighborhoods in Council Ward 1.

- Lincoln Street from 13th Avenue to 22nd Avenue.

Treatment Methodology:

- Lincoln Street from 13th Avenue to 19th Avenue was reconstructed by removing the existing surfacing down to a depth of 9.5 inches and replaced with a two inch aggregate base and 7.5 inches of concrete pavement.
- Lincoln Street from 19th Avenue to 22nd Avenue was reconstructed by removing the existing surfacing down to a depth of 18 inches and replaced with 12 inches of aggregate and 6 inches of asphalt pavement. Some sections were over excavated with an additional 12 inches of aggregate due to the quality of the subgrade.

Reconstruction of the street between 13th Ave and 19th Ave is still ongoing and expected to be complete in late January 2022.

Costs: Total project costs, from all funding sources, are estimated at $3,323,650.

Preliminary Estimate based on Pavement Management System (PMS) Surface Evaluation =	$1,590,000
Total Projected/Actual Paving Bond Funds Used =	$2,183,404
Difference =	($593,404)

Additional Sources of Funding: Stormwater utility funds, Wastewater utility funds, Road Fund (Traffic Calming), Active Transportation Bond, and EWEB funds.

The Road Fund was used to install traffic calming on Jefferson Street between 13th Ave and 28th Ave. Stormwater funds were used to improve the stormwater system along Lincoln Street. Wastewater funds were used to improve the sewer system along High Street. Active Transportation Bond funds were used to cover the costs of building curb extensions at select intersections.

Project Photo:

Completed Paving on Lincoln Street

FAIRMOUNT BLVD & 19TH AVE PAVING

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

- Fairmount Boulevard from 15th Avenue to Columbia Street
- 19th Avenue from Agate Street to Fairmount Boulevard

Treatment Methodology:

- Fairmount Boulevard reconstructed the travel lanes with the removal of surfacing down to 16 inches and replaced with 10 inches of aggregate and 6 inches of asphalt pavement. The existing 4.5-foot-wide on street parking concrete panels were left in place.
- 19th Avenue was reconstructed with the removal of surfacing down to 11.5 inches and replaced with 2 inches of aggregate and 9.5 inches of Portland Cement Concrete panels.

Costs: Total project costs, from all funding sources, are estimated at $3,550,000.

Preliminary Estimate based on Pavement Management System (PMS) Surface Evaluation =	$1,898,000
Total Projected/Actual Paving Bond Funds Used =	$2,300,000
Difference =	($402,000)

Additional Sources of Funding: Local Gas Tax, EWEB, Stormwater Utility, Wastewater Utility, Parks and Open Space SDCs, and Road Fund (Neighborhood Livability)

Curb extensions were added on both Fairmount Boulevard and 19th Avenue. Wastewater funds were used to remove community sewers throughout the project limits. Additionally, Parks and Open Space funds were used to make pedestrian improvements at Pre's Rock to include a new sidewalk and a viewing platform.

Project Photo:

Completed Paving on Fairmount Boulevard

OAK ST & 20TH AVE PAVING

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

- Oak Street from 17th Avenue to 20th Avenue
- 20th Avenue from Willamette Street to Oak Street

Treatment Methodology:

- Oak Street was reconstructed from 19th Avenue to 20th Avenue removing the surfacing down to 27.5 inches and replaced with 18 inches of aggregate and 9.5 inches of pavement. Between 17th Avenue and 19th Avenue, concrete panels were replaced with 18 inches of aggregate and 9 inches of Portland Cement Concrete.
- 20th Avenue was rehabilitated with removal of the top 3 inches of asphalt and replaced with 3 inches of new pavement.

Costs: Total project costs, from all funding sources, are estimated at $1,350,000.

Preliminary Estimate based on Pavement Management System (PMS) Surface Evaluation =	$825,000
Total Projected/Actual Paving Bond Funds Used =	$765,090
Difference =	$59,910

Additional Sources of Funding: Local Gas Tax, Active Transportation Bond, EWEB, Wastewater Utility, and Road Fund (Neighborhood Livability)

Local Gas Tax funds were used to rehabilitate Willamette Street between 18th and 19th Avenues and restripe the two-way conversion between 18th and 20th Avenues. Active Transportation Bond funds were used for bike lane striping. The Road fund was used to replace the traffic signal at 18th and Willamette to accommodate the two-way conversion.

Additionally, 19th Avenue between Willamette Street and Oak Street was originally listed as a Bond street but was identified as a good candidate for a slurry seal treatment and was added to the annual slurry seal project funded by Local Gas Tax funds.

Project Photo:

Completed Paving on 19th Avenue

WINDSOR CIRCLE PAVING

Project Description: This project consisted of rehabilitation of a street in Churchill Area Neighbors neighborhood in Council Ward 8.

- Windsor Circle from Wilshire Lane looped back to Wilshire Lane

Treatment Methodology:

- Windsor Circle was fully reconstructed with the removal of surfacing down to 18 to 32 inches and replaced with 12 to 24 inches of aggregate and 6 to 8 inches of asphalt pavement. The existing asphalt was reused onsite for the aggregate base to the fullest extent.

Costs: Total project costs, from all funding sources, are estimated at $933,128.

Preliminary Estimate based on Pavement Management System (PMS) Surface Evaluation =	$776,000
Total Projected/Actual Paving Bond Funds Used =	$820,706
Difference =	($44,706)

Additional Sources of Funding: Stormwater Utility, Wastewater Utility, and Maintenance funds

Project Photo:

Completed Paving on Windsor Circle

PRIMROSE ST, LAURELHURST DR & LAVETA LN PAVING

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

- Primrose Street from Barger Drive to approximate 100 feet north of Parker Place
- Laurelhurst Drive from Melrose Loop to Barger Drive
- Laveta Lane from Barger Drive to the end

Treatment Methodology:

- Primrose Street, Laurelhurst Drive, and Laveta Lane were rehabilitated by removing one to four inches of pavement and replaced with two to four inches of pavement for a total depth of 4 to 7 inches of pavement.

Costs: Total project costs, from all funding sources, are estimated at $1,179,000.

Preliminary Estimate based on Pavement Management System (PMS) Surface Evaluation =	$629,000
Total Projected/Actual Paving Bond Funds Used =	$1,102,000
Difference =	($473,000)

Additional Sources of Funding: Local Gas Tax, EWEB, Wastewater Utility, and Stormwater Utility

Local Gas Tax funds were used to slurry seal adjacent cul-de-sacs. Bond funds were also used to build curb extensions on select intersections throughout the project.

Project Photo:

Completed Paving on Laurelhurst Drive

5-Year Street Bond Project List - Costs and Forecast

Project Map #	GJB	Street name	From	To	Ward(s)	Proposed Treatment	Programmed Cost (2017) plus inflation	*Projected / Actual Cost*	Difference
Construction Year 2019									
9	900049	11th Ave (A)	Tyinn St	Bertelsen St	8	Overlay	$ 1,874,000	$ 761,039	1,112,961
12	900044	19th Avenue (C) *(incl 2019 Construction)*	Hilyard St	Agate St	1	Reconstruction	$ 1,146,000	$ 1,457,568	(311,568)
1	900051	3rd Avenue (L)	High St	Pearl St	7	PCC panel replacement	$ 118,000	$ 1,801,438	$ 95,562
65		Mill Street (L)	2nd Ave	3rd Ave		Reconstruction/Overlay	$ 60,000		
3		5th Avenue (L)	Chambers St	Grant St		Reconstruction/Overlay	$ 250,000		
36		Charnelton Street (L)	4th Ave	6th Ave		Reconstruction/Overlay	$ 360,000		
70		Olive Street (L)	5th Ave	6th Ave		Pavement Removal and Replacement	$ 131,000		
60		Lawrence Street (L)	NS Dwy 36	6th Ave		Reconstruction	$ 978,000		
27	900047	Brookside Drive (L) *(incl 2019 Construction)*	Brae Burn Dr (North)	Address 999	2	Reconstruction	$ -	$ 722,240	$ 84,760
28		Brookside Drive (L)	Brae Burn Dr (South)	Montara Way		Reconstruction	$ 437,000		
83		Sundance Street (L)	Sundial Rd	East End		Pavement Removal and	$ 270,000		
84		Sundance Street CDS (L)	North End	Sundance St		Pavement Removal and Replacement	$ 100,000		
18	900045	Alder Street (L)	24th Ave	27th Ave	3	Reconstruction/Pavement Removal and Replacement	$ 309,000	$ 702,061	$ (393,061)
44	900048	Fair Oaks Drive (L)	Oakway Rd	Fairway Lp	4	Reconstruction	$ 253,000	$ 1,675,831	$ (401,831)
24		Bedford Way (L)	Oakway Rd	Fair Oaks Dr		Reconstruction	$ 200,000		
54		Lariat Drive (L)	Oakway Rd	Lariat Dr		Reconstruction	$ 392,000		
55		Lariat Meadows Drive (L)	Lariat Dr	East End		Pavement Removal and Replacement	$ 300,000		
56		Lariat Mesa (L)	Lariat Dr	East End		Reconstruction/Pavement Removal and Replacement	$ 129,000		
23	900046	Balfour Street (L)	Terresa Ave	North End	5	Reconstruction	$ 150,000	$ 1,237,457	$ (77,457)
29		Calgary Street (L)	Holly Ave	Elanco Ave		Reconstruction	$ 254,000		
43		Elanco Ave + CDS (L)	Norkenzie Rd	North End		Reconstruction	$ 137,000		
87		Terresa Avenue (L)	Montreal Ave	Gilham Rd		Reconstruction	$ 237,000		
76		Quebec Street (L)	Calgary St	Elanco Ave		Reconstruction	$ 224,000		
67		Montreal Avenue (L)	Calgary St	Balfour St		Reconstruction	$ 158,000		
						Projected Construction Year 2019 Totals =	**$ 8,467,000**	**$ 8,357,634**	**$ 109,366**
Construction Year 2020									
73	900135	Polk Street (L)	6th Ave	7th Ave	7	Overlay	$ 124,800	$ 162,253	87,867
34		Chambers Street (C) *(incl 2020 Construction)*	11th Ave	13th Ave		Pavement Removal and Replacement	$ 125,320		
12	900044	19th Avenue (C) *(incl 2020 Construction)*	Hilyard St	Agate St	1	Reconstruction	$ 397,300	$ 242,000	$ 155,300
27	900047	Brookside Drive (L) *(incl 2020 Construction)*	Brae Burn Dr (North)	Address 999	2	Reconstruction	$ 238,100	$ 664,000	$ (425,900)
49	900133	Garden Avenue (L)	Moss St	Walnut St	3	Pavement Removal and Replacement	$ 411,800	$ 516,000	$ 20,600
89		Walnut Street (L)	Garden Ave	Frankling Blvd		Pavement Removal and Replacement	$ 124,800		
5	900070	8th Avenue (L) *(Design & Permitting)*	Willamette St	Mill St	1	Pavement Removal and Replacement	$ 533,500	$ 513,010	$ 20,490
13	900253	20th Avenue (A) *(Design & Permitting)*	Willamette St	Oak St	1	Overlay	$ 104,000	$ 244,580	$ 171,420
69		Oak Street (A) *Design & Permitting)*	18th Ave	20th Ave		Overlay	$ 312,000		
						Projected Construction Year 2020 Totals =	**$ 2,371,620**	**$ 2,341,843**	**$ 29,777**
Construction Year 2021									
20	900244	Arrowsmith Street (L)	Terry St	11th Ave	8	Overlay	$ 228,200	*$ 2,082,064*	$ (870,264)
21		Bailey Hill Rd (A)	5th Ave	11th Ave	8	Overlay	$ 630,600		
79		Roosevelt Blvd (A)	Beltline	800' East	8	Overlay	$ 223,200		
88		Terry Street (C)	Royal Ave	Roosevelt Blvd	8	Overlay	$ 129,800		
62	900257	Lincoln Street (C)	13th Ave	22nd Ave	1	Reconstruct	$ 1,719,700	*$ 2,095,383*	$ (375,683)
10	900151	17th Avenue (L)	Oak Street	Hilyard St	3	Reconstruct	$ 823,000	*$ 1,754,956*	$ (477,656)
11		19th Avenue (C)	Oak Street	High St	1	Overlay	$ 324,500		
64		Mill Street (L)	16th Ave	18th Ave	3	Overlay	$ 129,800		
45	900104	Fairmount Blvd (L)	15th Ave	Columbia St	3	Reconstruct	$ 1,094,600	*$ 2,676,136*	$ (623,236)
12		19th Avenue (C)	Agate St	Fairmount Blvd	3	Overlay	$ 958,300		
52	900242	Jessen Drive (L)	Elizabeth St	Hwy 99	6	Overlay	$ 252,000	*$ 1,078,211*	$ 198,089
57		Laurelhurst Drive + 5 CDS (L)	Melrose Lp	Barger Dr	6	Overlay	$ 395,900		
59		Laveta Lane (L)	Barger Dr	South End	6	Overlay	$ 129,800		
75		Primrose Street + 1 CDS (L)	Barger Dr	100' N of Parker Pl	6	Overlay	$ 154,700		
38		Clarey Street (L)	Bean St	1071' South	6	Overlay	$ 162,200		
78		Robin Avenue (L)	200' E of Ruskin St	396' E of Taney St	6	Overlay	$ 181,700		
5	900070	8th Avenue (L) *(incl 2021 Construction)*	Willamette St	Mill St	1	Pavement Removal and Replacement	$ 671,600	*$ 620,990*	$ 50,610
13	900253	20th Avenue (A) *(incl 2021 Construction)*	Willamette St	Oak St	1	Overlay	$ 108,100	*$ 802,199*	$ (342,599)
69		Oak Street (A) *(incl 2021 Construction)*	18th Ave	20th Ave		Overlay	$ 351,500		
34	900135	Chambers Street (C) *(incl 2021 Construction)*	11th Ave	13th Ave	7	Pavement Removal and Replacement	$ 130,300	*$ 444,510*	$ (314,210)
91	900240	Windsor Circle East/West (L)	Wilshire Ln	Wilshire Ln	8	Reconstruct	$ 1,249,200	*$ 822,063*	$ 427,137
						Projected Construction Year 2021 Totals =	**$ 10,048,700**	**$ 12,376,512**	**$ (2,327,812)**

5-Year Street Bond Project List - Costs and Forecast

Project Map #	GJB	Street name	From	To	Ward(s)	Proposed Treatment	Programmed Cost (2017) plus inflation	*Projected/ Actual Cost*	Difference
Construction Year 2022									
39	900103	Coburg Road (A)	Oakway Rd	Ferry Street Bridge	4	Overlay	$ 2,524,200	*$ 2,524,200*	
33		Catalina Street (L)	Juhl St	Willhi St	6	Overlay	$ 168,700		
37		Chase Street + CDS (L)	500' N of Marshall St	North End	6	Overlay	$ 168,700		
40	900246	Concord Street (L)	Berntzen Rd	Jacobs Dr	6	Overlay	$ 252,000	*$ 1,090,000*	
42		Echo Hollow CDS (L)	West End	Echo Hollow Rd	6	Reconstruct	$ 168,700		
48		Fuller Avenue (L)	Echo Hollow Rd	Jay St	6	Overlay	$ 135,000		
50		Hawthorne Avenue (L)	West End	Fairfield Ave	7	Overlay	$ 196,900		
30		Candlelight Drive (L)	Avalon	Royal Ave	6	Overlay	$ 366,700		
82		Stagecoach Road (L)	Candlelight Dr	Surrey Ln	6	Overlay	$ 112,500		
85		Surry Lane (L)	Stagecoach Rd	Welcome Wy	6	Overlay	$ 135,000		
90	900245	Welcome Way (L)	Candlelight Dr	Royal Ave	6	Overlay	$ 163,100	*$ 1,033,800*	
80		Royal Ave CDS (L)	Royal Ave	End	6	Overlay	$ 112,500		
58		Laurelhurst Drive + Sheffield Ct CDS (L)	Harriet Ave	Royal Ave	6	Overlay	$ 144,000		
72	900302	Polk Street (C)	W 18th Ave	28th Ave	1	Overlay	$ 751,400	*$ 751,400*	
81	900304	Spyglass Drive (L)	Cal Young Rd	Spyglass Dr	5	Overlay	$ 723,300	*$ 723,300*	
53	900294	Lakevie Drive (C)	207' E of Sarah Ln	Gilham Rd	5	Reconstruct	$ 258,700	*$ 539,900*	
41		Crescent Avenue (A)	Norkenzie Rd	Address 1670	5	Overlay	$ 281,200		
2	900043	4th Avenue (C)	Pearl St	Coburg Rd	7	Overlay	$ 262,800	*$ 554,683*	(162,083)
65		Mill Street (L)	3rd Ave	4th Ave	7	Overlay	$ 129,800		
						Projected Construction Year 2022 Totals =	**$ 7,055,200**	***$ 7,217,283***	**$ (162,083)**
Construction Year 2023									
15	TBD	46th Avenue (C)	Fox Hollow Rd	Donald St	2	TBD	$ 516,000	*$ 516,000*	
16	TBD	Agate Street (C)	163 Black Oak Rd	Firland St	2	TBD	$ 689,000	*$ 689,000*	
19	TBD	Amazon Parkway (A)	19th Ave	2693 S of E 24th	2	TBD	$ 1,661,200	*$ 1,661,200*	
35	TBD	Chambers Street (C)	18th Ave	24th Ave	1	TBD	$ 1,062,200	*$ 1,062,200*	
69	TBD	Oak Street (A)	7th Ave	13th Ave	1	TBD	$ 698,400	*$ 698,400*	
74	TBD	Portland Street (L)	29th Ave	31st Ave	2	TBD	$ 485,500	*$ 485,500*	
77	TBD	River Road (A)	Maxwell Rd	Beltline Rd	7	TBD	$ 792,000	*$ 792,000*	
6	TBD	8th Avenue (C)	Monroe St	Garfield St	1	TBD	$ 2,264,800	*$ 2,264,800*	
26	TBD	Broadway (A)	Mill St	11th Ave	3	TBD	$ 1,033,000	*$ 1,033,000*	
69	TBD	Pearl Street (A)	Broadway	17th Ave (Amazon Bridge)	3	TBD	$ 726,500	*$ 726,500*	
						Projected Construction Year 2023 Totals =	**$ 9,928,600**	***$ 9,928,600***	**$ -**
Construction Year 2024									
69	TBD	Oak Street (A)	13th Ave	17th Ave	1	TBD	$ 146,000	*$ 146,000*	
63	TBD	Linnea Avenue + 1 CDS (L)	Norkenzie Rd	Tarpon St	5	TBD	$ 216,600	*$ 216,600*	
25	TBD	Brewer Avenue (L)	Brewer Ave	South End	5	TBD	$ 1,014,700	*$ 1,014,700*	
31	TBD	Carmel Avenue (L)	Diane St	Norwood St	4,5	TBD	$ 547,500	*$ 547,500*	
66	TBD	Monterey Avenue (L)	Norkenzie Rd	Larkspur Ave	5	TBD	$ 216,600	*$ 216,600*	
68	TBD	Norwood Street (L)	Monterey St	Marlow St	4	TBD	$ 373,500	*$ 373,500*	
22	TBD	Bailey Lane (C)	Bogart Ln	Luella St	4	TBD	$ 496,400	*$ 496,400*	
14	TBD	24th Avenue (A)	Harris St	Agate St	3	TBD	$ 439,200	*$ 439,200*	
17	TBD	Alder Street (L)	30th Ave	32nd Ave	2	TBD	$ 522,000	*$ 522,000*	
5	TBD	Hilyard Street (C)	W Amazon	40th Ave	2	TBD	$ 883,300	*$ 883,300*	
8	TBD	11th Ave (A)	Charnelton St	Grant St	1	TBD	$ 1,546,400	*$ 1,546,400*	
46	TBD	Franklin Blvd (A)	Walnut	11th Ave	3	TBD	$ 1,666,680	*$ 1,666,680*	
						Projected Construction Year 2024 Totals =	**$ 8,068,880**	***$ 8,068,880***	**$ -**
						Total Programmed Costs =	***$ 45,940,000***	***$ 48,290,752***	***$ (2,350,752)***

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

Pedestrian and Bicycle Improvements Project List

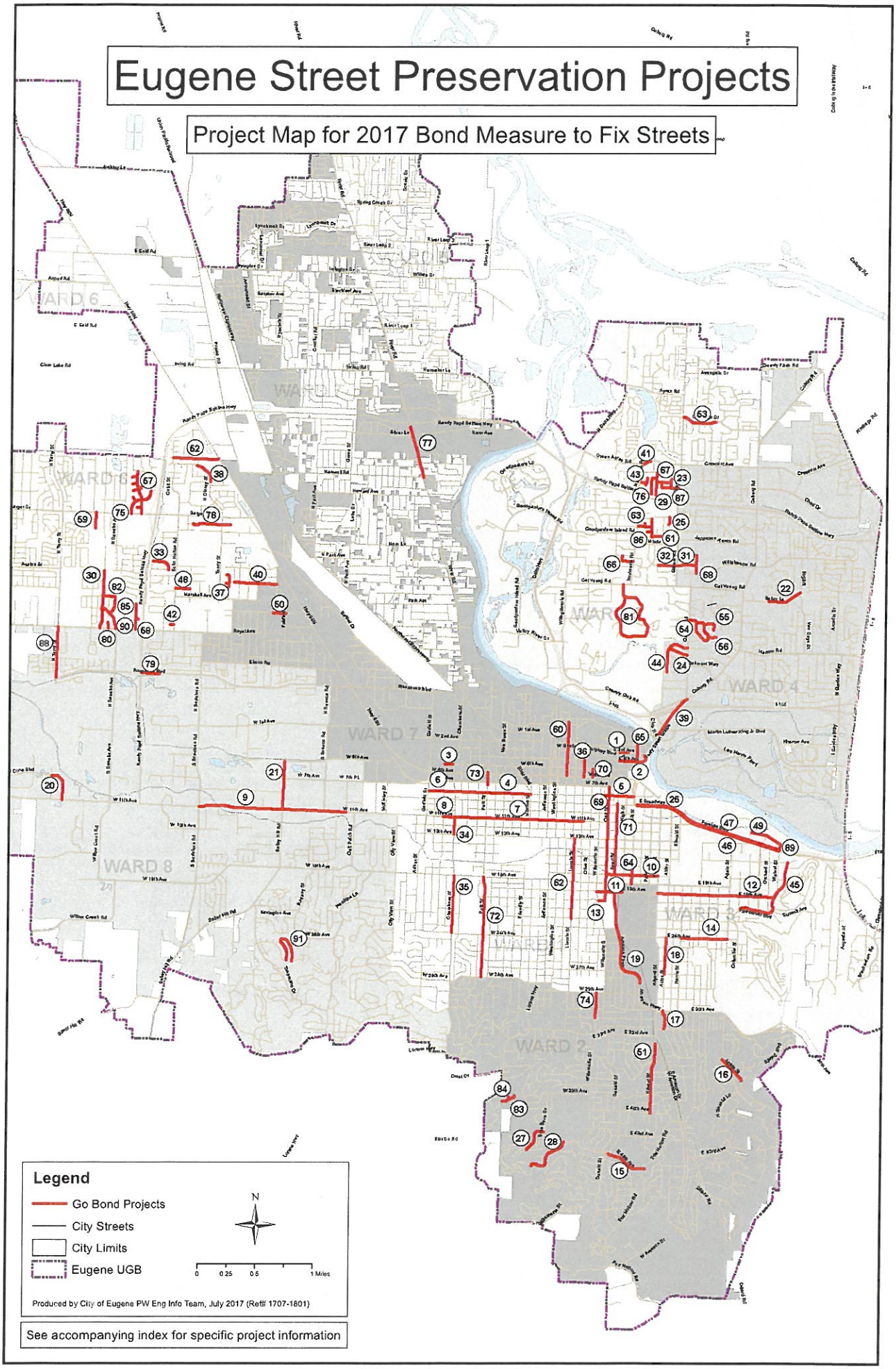
Projects			Average Annual Allocation $1,000,000	*Projected/ Actual Cost*	Difference
Construction Year 2019					
Alder Street				$ 140,124	
Lawrence Street				$ 3,988	
W 11th Avenue				$ 4,578	
E 19th Avenue				$ 58,796	
			Construction Year 2019 Pedestrian & Bicycle Repairs Total =	**$ 207,486**	**$ 792,514**
Construction Year 2020					
Garden Avenue, Walnut Street, Villard St & Moss St Paving				$ 72,854	
Roosevelt Path				$ 158,056	
Safe Routes to School: Crosswalk Enhancements & Speed Monitoring (2020 Local Match)				$ 71,000	
Alder Street Neighborhood Greenway				$ 116,471	
19th Avenue Diversion at Alder Street				$ 58,796	
5th, Olive, and Charnelton Street				$ 8,100	
			Construction Year 2020 Pedestrian & Bicycle Repairs Total =	**$ 485,277**	**$ 514,723**
Construction Year 2021					
South Bank Shared Use Path Repair & Realignment				$ 83,427	
Downtown Riverfront Park				$ 500,000	
West Bank Path Lighting & Resurfacing				$ 631,180	
NE Livable				$ 322,566	
Safe Routes to School: Crosswalk Enhancements & Speed Monitoring (Construction Complete in 2021)				$ 67,753	
				$ 1,604,926	**$ (604,926)**
			Total Pedestrian and Bicycle Improvement Project Costs =	**$ 5,000,000**	**$ 2,297,689**	**$ 2,702,311**

Summary of Bond Costs

Total Street Projects in 2017 Dollars with inflation = $ 45,940,000
Total Pedestrian & Bicyclist Improvements = $ 5,000,000
Bond Issuance Costs = $ 260,000
Total Bond Costs = $ 51,200,000

Eugene Street Preservation Projects

Project Map for 2017 Bond Measure to Fix Streets



See accompanying index for specific project information

Project List for 2017 Bond Measure to Fix Streets

Exhibit A

MAP NUMBER	STREET NAME	FROM	TO
1	03RD AVENUE	HIGH ST	PEARL ST
2	04TH AVENUE	COBURG RD	PEARL ST
3	05TH AVENUE	CHAMBERS ST	GRANT ST
4	08TH AVENUE	CHAMBERS ST	MONROE ST
5	08TH AVENUE	WILLAMETTE ST	MILL ST
6	08TH AVENUE	GARFIELD ST	CHAMBERS ST
7	11TH AVENUE	CHARNELTON ST	CHAMBERS ST
8	11TH AVENUE	CHAMBERS ST	GRANT ST
9	11TH AVENUE	TYINN ST	BERTELSEN RD
10	17TH AVENUE	HILYARD ST	OAK ST
11	19TH AVENUE	WILLAMETTE ST	HIGH ST
12	19TH AVENUE	HILYARD ST	FAIRMOUNT BLVD
13	20TH AVENUE	WILLAMETTE ST	OAK ST
14	24TH AVENUE	HARRIS ST	AGATE ST
15	46TH AVENUE	FOX HOLLOW RD	DONALD ST
16	AGATE STREET	N 163 BLACK OAK RD	FIRLAND ST
17	ALDER STREET	30TH AVE	32ND AVE
18	ALDER STREET	24TH AVE	27TH AVE
19	AMAZON PARKWAY	19TH AVE	2693 S OF E 24TH
20	ARROWSMITH STREET	TERRY ST	11TH AVE
21	BAILEY HILL ROAD	5TH AVE	11TH AVE
22	BAILEY LANE	BOGART LN	LUELLA ST
23	BALFOUR STREET	TERRA AVE	NORTH END
24	BEDFORD WAY	OAKWAY RD	FAIR OAKS DR
25	BREWER AVENUE	BREWER AVENUE	SOUTH END
26	BROADWAY	MILL ST	11TH AVE
27	BROOKSIDE DRIVE	BRAE BURN DR (NORTH)	ADDR 999
28	BROOKSIDE DRIVE	BRAE BURN DR (SOUTH)	MONTARA WAY
29	CALGARY STREET	HOLLY AVE	ELANCO AVE
30	CANDLELIGHT DRIVE	AVALON	ROYAL
31	CARMEL AVENUE	GILHAM RD	NORWOOD ST
32	CARMEL AVENUE	DIANE ST	GILHAM RD
33	CATALINA STREET	JUHL ST	WILLHI ST
34	CHAMBERS STREET	11TH AVE	13TH AVE
35	CHAMBERS STREET	18TH AVE	24TH AVE
36	CHARNELTON STREET	4TH AVE	6TH AVE
37	CHASE STREET + CDS	500' NORTH OF MARSHALL	NORTH END
38	CLAREY STREET	BEAN ST	1071' S OF BEAN ST
39	COBURG ROAD	FERRY STREET BRIDGE	OAKWAY RD
40	CONCORD STREET	BERNTZEN RD	JACOBS DR
41	CRESCENT AVENUE	NORKENZIE RD	ADDRS 1670
42	ECHO HOLLOW CDS	WEST END (CDS) (880-960)	ECHO HOLLOW RD
43	ELANCO AVENUE + 1 CDS (NORTH)	NORKENZIE RD	END OF NORTHERLY CDS
44	FAIR OAKS DRIVE	OAKWAY RD	FAIRWAY LP
45	FAIRMOUNT BOULEVARD	15TH AVE	COLUMBIA ST
46	FRANKLIN BOULEVARD EB	WALNUT ST	11TH AVE
47	FRANKLIN BOULEVARD WB	WALNUT ST	11TH AVE

Project List for 2017 Bond Measure to Fix Streets

Exhibit A

MAP NUMBER	STREET NAME	FROM	TO
48	FULLER AVENUE	ECHO HOLLOW RD	JAY ST
49	GARDEN AVENUE	MOSS ST	WALNUT ST
50	HAWTHORNE AVENUE	WEST END	FAIRFIELD AVE
51	HILYARD STREET	W AMAZON DR	40TH AVE
52	JESSEN DRIVE	ELIZABETH ST	HWY 99
53	LAKEVIEW DRIVE	207' E OF SARAH LN	GILHAM RD
54	LARIAT DRIVE	OAKWAY RD	LARIAT DR
55	LARIAT MEADOWS DRIVE	LARIAT DR	EAST END
56	LARIAT MESA	LARIAT DR	EAST END
57	LAURELHURST DRIVE + 5 CDS	MELROSE LP	BARGER DR
58	LAURELHURST DRIVE + SHEFFIELD CT	HARRIET AVE	ROYAL AVE
59	LAVETA LANE	BARGER DR	SOUTH END
60	LAWRENCE STREET	DRWY 36	6TH AVE
61	LEMMING AVENUE	TARPON ST	SHILO ST
62	LINCOLN STREET	13TH AVE	22ND AVE
63	LINNEA AVENUE + 1 CDS	NORKENZIE RD	TARPON ST
64	MILL STREET	16TH AVE	18TH AVE
65	MILL STREET	2ND AVE	4TH AVE
66	MONTEREY AVENUE	NORKENZIE RD	LARKSPUR AVE
67	MONTREAL AVENUE	CALGARY ST	BALFOUR ST
68	NORWOOD STREET	MONTEREY ST	MARLOW ST
69	OAK STREET	7TH AVE	20TH AVE
70	OLIVE STREET	5TH AVE	6TH AVE
71	PEARL STREET	BROADWAY	17TH AVE (AMAZON BRIDGE)
72	POLK STREET	18TH AVE	28TH AVE
73	POLK STREET	67' N OF 6TH AVE	72' S OF 7TH AVE
74	PORTLAND ST	29TH AVE	31ST AVE
75	PRIMROSE STREET + 1 CDS	BARGER RD	100' N OF PARKER PL (S)
76	QUEBEC STREET	CALGARY ST	ELANCO ST
77	RIVER ROAD	MAXWELL RD	BELTLINE RD
78	ROBIN AVENUE	200' EAST OF RUSKIN ST	396' EAST OF TANEY ST
79	ROOSEVELT BLVD	BELTLINE	APPROX 800' EAST OF BELTLINE
80	ROYAL AVENUE CUL DE SAC	ROYAL AVE	N END CDS
81	SPYGLASS DRIVE	CAL YOUNG RD	LOOP AROUND BACK TO SPYGLASS DR
82	STAGECOACH ROAD	CANDLELIGHT DR	SURREY LN
83	SUNDANCE STREET	SUNDIAL RD	EAST END
84	SUNDANCE STREET CDS	NORTH END	SUNDANCE ST
85	SURRY LANE	STAGECOACH	WELCOME WY
86	TARPON STREET + CUL-DE-SAC	BREWER AVE	LEMMING AVE
87	TERRESA AVENUE	MONTREAL AVE	GILHAM RD
88	TERRY STREET	ROYAL AVE	ROOSEVELT BLVD
89	WALNUT STREET	FRANKLIN BLVD	GARDEN AVE
90	WELCOME WAY	CANDLELIGHT DR	ROYAL AVE
91	WINDSOR CIRCLE EAST/WT	WILSHIRE LN	WILSHIRE LN

Eugene Public Works
Engineering

December 2021

Street Repair Review Panel,

This memo summarizes walking and bicycling projects built in 2021 using Pavement Bond Measure (PBM) funds and offers a look ahead to projects anticipated for construction in 2022.

Background

The 2017 Pavement Bond Measure stipulates that the city identify and complete an average of $1 million in safety improvements for people who bike and walk each year of the bond (2019-2023). Transportation Planning staff works with the Active Transportation Committee (ATC) to develop a list of walking and bicycling projects for review, based on guidance provided by the Transportation System Plan, maintenance needs, and community requests, including partners at LTD and Safe Routes to School. The projects include additions to scheduled pavement projects as well as stand-alone projects.

Where do the Walking and Biking Projects Come From?

Staff uses the Transportation System Plan (TSP) to identify network improvements for walking and bicycling. The TSP is the city's transportation policy document and long-term vision for transportation improvements.

For pavement preservation projects city staff consult the TSP to determine what network improvements should be made based on system connectivity needs. Pavement projects present an opportunity to implement some TSP project types, such as bike lane striping, because striping will be entirely replaced as part of the pavement project.

There are also projects developed based on community input (ATC, etc.), coordination with 4j and Bethel Safe Routes to School programs, and through site investigations by city staff. The Vision Zero Action Plan is also used to evaluate project locations to improve safety outcomes for people walking and bicycling.

Through discussions with staff and the Active Transportation Committee, it has been decided that about half of the money should be spent on shared use path maintenance with the other half used for discretionary walking and bicycling projects throughout Eugene.

How Were PBM Walking/Biking Funds Spent in 2021?

Some of the walking and bicycling projects occur on streets where there is a pavement project while others do not. Projects developed in 2021 are listed below.

Projects Occurring with Pavement Projects

- Bailey Hill Road at 7th Avenue. When 7th Avenue was repaved a few years ago, bike lanes were added in each direction to connect to bike lanes on Bailey Hill Road. As a result of the curvature of the southeast corner of the intersection from Bailey Hill Road at 7th Avenue, encroachment into the bike lanes is common. The Bailey Hill Road pavement project included curb separation for people bicycling north on Bailey Hill Road who turn east onto 7th Avenue. Encroachment was eliminated by physically separating the two transportation modes.

Discretionary Projects

- Safe Routes to School. A $750,000 grant was received from ODOT to add school speed zone flashers and enhanced crossings to several school zones in both 4j and Bethel School Districts in 2020. Approximately $68,000 of bond money was used in 2021 in addition to the $72,000 used in 2020 to pay the grant match

required by ODOT. While this project was awarded in 2020, construction was complete in 2021 and additional funds were utilized to help fund final construction costs.

- South Bank Path and Downtown Riverfront Park. A $850,000 grant was received from ODOT to replace and repair the South Bank Path from the Frohnmayer Bridge to the Hilyard Street entrance at the former EWEB property. Approximately $83,000 of the bond was used to pay the grant match required by ODOT for the path replacement.
- Northeast Livable Streets. A $755,000 grant was received from ODOT to add enhanced crossings and improved pedestrian connections in the northeastern neighborhoods of Harlow, Northeast, and Cal Young. Approximately $280,000 from the bond measure was used with the ODOT funds to complete the projects and improve walking and bicycling safety across busy streets, and to improve pedestrian safety at intersections.

What Projects are you Exploring for 2022?

There are many additional walking and bicycling projects planned for 2022. Some are large grant-funded projects and others are smaller improvements that will improve active transportation conditions for folks traveling on our local street network. (Funding source identified in parentheses.)

- High Street Protected Bike Lanes (ODOT). Install 2-way protected bike lane on west side of High Street from 19th Avenue to 6th Avenue.
- 8th Avenue Protected Bike Lanes (ODOT). Install protected bike lanes on 8th Avenue from Mill Street to Lincoln Street.
- 17th Avenue/19th Avenue/Mill Street. Project will include creating a better connection between the Amazon Path and High Street on 19th Avenue.
- 4th Avenue and Mill Street. Project will include installation of a 2-way protected bikeway on the south side of 4th Avenue from the DeFazio Bridge entrance to Mill Street.
- Riverbank Path Wayfinding. Adding bicycle wayfinding signs to the Riverbank Path system.
- SRTS Howard Avenue (ODOT). Pay grant match for a protected active transportation space on Howard Avenue from River Road to Howard Elementary.
- SRTS Bethel (ODOT). Pay grant match for enhanced pedestrian crossings of Royal Avenue and North Danebo Avenue.
- Fern Ridge Path Rehab and Lighting. This project would include spot repairs on the Fern Ridge Path and add lighting to an unlighted segment of the path from City View Street to Acorn Park Street.

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

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

MOSSADAMS

Report of Independent Accountants

To City of Eugene, Oregon

We have performed the procedures enumerated below on the 2017 General Obligation Bond funded expenditures of the City of Eugene, Oregon (the "City") for the year ended December 31, 2021 (the "Reporting Period"). The City is responsible for the 2017 General Obligation Bond funded expenditures (the "expenditures").

The City has agreed to and acknowledged that the procedures performed are appropriate to meet the intended purpose of evaluating the City's compliance with the requirements of voter approved Ballot Measure 20-275 and City Council Resolution No. 5204 for the Reporting Period. This report may not be suitable for any other purpose. The procedures performed may not address all the items of interest to a user of this report and may not meet the needs of all users of this report and, as such, users are responsible for determining whether the procedures performed are appropriate for their purposes.

The procedures we performed and our findings are as follows:

1) We obtained from the City a listing of the expenditures for the Reporting Period. The total amount of expenditures was $10,199,153.

2) We sorted the expenditures by dollar amount, and in descending order by dollar amount, we selected the largest expenditure amounts until 33.3% or more of the total expenditures were selected. This resulted in selecting 8 expenditures totaling $3,612,625, or 35.4% of total expenditures. We agreed each selected expenditure's reported account and fund number, and reported accounting period date to a vendor invoice, certification of payment, or signed contract provided by the City. We noted no variances between expenditures and supporting documentation.

3) For expenditures selected in the previous step, we noted each expenditure was for an eligible cost as described in voter approved Ballot Measure 20-275 and City Council Resolution No. 5204.

4) We obtained from the City a listing of new construction projects awarded during the Reporting Period, which were funded by 2017 General Obligation Bond proceeds. We haphazardly selected one new construction project awarded and obtained the procurement file from the City. We compared the procurement file to the procurement requirements contained in the City's Public Contracting Rules and noted no differences.

5) We obtained from the City an accounting of the $29,201,212 in unspent 2017 General Obligation Bond proceeds as of December 31, 2021. We compared that amount to the $39,300,365 in unspent bond proceeds as of December 31, 2020, as reported in the prior year independent accountant's report on applying agreed upon procedures dated January 27, 2021, less the $10,199,153 of expenditures for the year ended December 31, 2021 provided by the City. We found the City's accounting and the calculated amount of unspent 2017 General Obligation Bond proceeds as of December 31, 2021 to be in agreement.

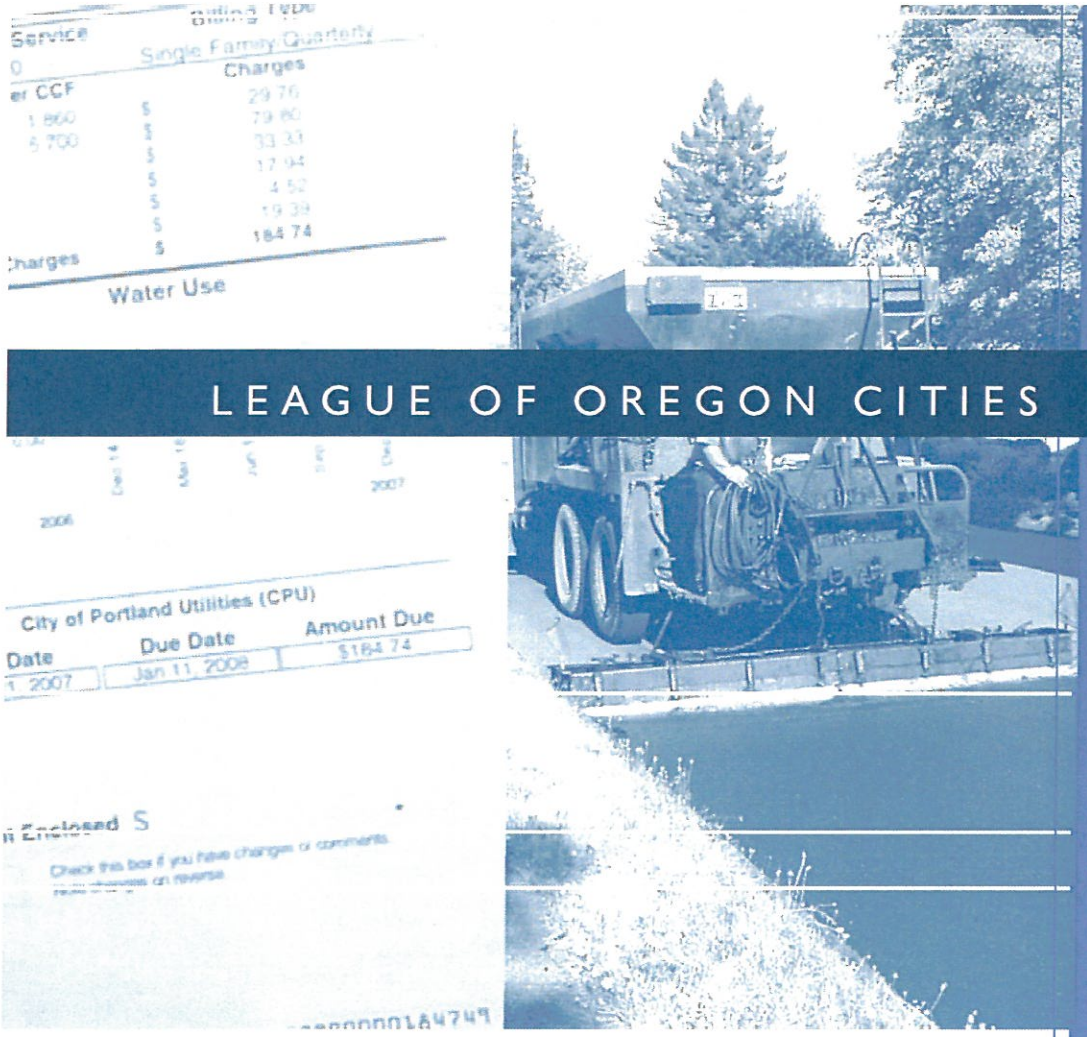
We were engaged by the City to perform this agreed-upon procedures engagement and conducted our engagement in accordance with attestation standards established by the American Institute of Certified Public Accountants. An agreed-upon procedures engagement involves performing specific procedures that the engaging party has agreed to and acknowledged to be appropriate for the intended purpose of the engagement and reporting on findings based on the procedures performed. We were not engaged to and did not conduct an examination or review engagement, the objective of which would be the expression of an opinion or conclusion, respectively, on the expenditures of the City for the Reporting Period. Accordingly, we do not express such an opinion or conclusion. Had we performed additional procedures other matters might have come to our attention that would have been reported to you.

We are required to be independent of the City and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements related to our agreed-upon procedures engagement.

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

Moss Adams LLP

Eugene, Oregon
January 31, 2022



LEAGUE OF OREGON CITIES

TUF SOLUTIONS FOR LOCAL STREET FUNDING

A SURVEY ON TRANSPORTATION UTILITY FEES (TUFs)

JANUARY 2008

Published by the League of Oregon Cities

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For questions about this report please contact:

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LEAGUE of Oregon CITIES

BACKGROUND

Oregon cities are turning to new local revenue sources to help address the growing backlog of road maintenance and preservation as state gas tax funds have failed to keep pace with transportation costs. The streets in many cities have deteriorated past the point of maintenance, and now require expensive reconstruction work.

Most cities rely on the state gas tax as the main source of street funding, but the state gas tax has not increased since 1993, and the rising cost of materials and labor has diminished the purchasing power of this revenue source. Furthermore, the limitations on property taxes imposed by Oregon voters have depleted city general funds to the point where most cities cannot devote any property tax revenue to street maintenance. Another LOC report provides greater detail about the municipal transportation funding gap (see LOC's 2007 report, "City Streets: Investing in a Neglected Asset").

In the search for new revenue options to address the deficit caused by a stagnant gas tax, a number of cities have chosen to implement local transportation utility fees (TUFs). Transportation utility fees have many names: street user fee, road maintenance fee, etc. (see page 19). Regardless of the terminology, the basic idea is the same: a fee is assessed on the utility bills of water/sewer customers, and the revenue is designated for city transportation infrastructure projects.

According to a 1993 Institute of Transportation Engineers (ITE) Journal article, the use of transportation utility fees as a means to supplement street maintenance funding began in the West. Four of the first 10 cities in the nation to implement TUFs were Oregon cities. The popularity of these fees grew for the following reasons:

1. New Revenue: Due to diminishing financial resources, and escalating costs, cities need more revenue for streets.
2. Equity: TUFs charge the fee based on an estimated street usage calculation, not property value.

(Source: Ewing, Reid. "Transportation Utility Fees," ITE Journal (June 1993).

Currently, there are 19 cities in Oregon with transportation utility fees, and several more considering this funding mechanism. Most of city TUFs have been adopted since 2000, which illustrates the increasingly popularity of this funding source.

There are two common methods used in calculating a transportation utility fee: a flat fee, and the more complicated trip generation methodology. Cities using trip generation establish different rates for different categories of use. Most cities use the Institute of Transportation Engineers (ITE) manual as a model for their trip generation methodology.

For many cities, transportation utility fees are a major source of revenue for street funds. The city of Ashland collected almost $1 million from its transportation utility fee in 2006-07. About one-third of Ashland's street fund revenue is attributable to the transportation utility fee. See Appendix N (page 31) for more revenue information.

Despite the success of several Oregon cities, transportation utility fees have also brought some controversy and political tension. The purpose of this study is to analyze the experiences of those cities that have pursued transportation utility fees as a source of street funding.

CHOOSING THE RIGHT OPTION

In order to develop a transportation funding solution, cities first analyze existing street conditions, conduct a major street inventory and analysis, and then determine the overall maintenance need.

Several cities formed transportation funding committees and task forces. Transportation committees are often comprised of both elected officials and private citizens, and the role of the committee is to help the city analyze street inventory reports, prioritize projects based on the needs of the community, and propose local funding options. For example, the city of Tigard established a Transportation Financing Strategies Task Force, which proposed a street maintenance fee, and later a three cent gas tax.

Many cities initiate an education effort to broaden the public's understanding of the deteriorating condition of city streets, the benefits of preventative maintenance, and the need for new transportation revenue. If the public understands the problem, they may be more open to the solutions being considered.

Once cities have identified the severity of the transportation funding problem, they must then explore various revenue options. To date, 19 cities have implemented transportation utility fees. The benefits of TUFs depend on whether a city uses a flat fee or trip generation methodology.

The city of La Grande does not have a large influx of outside motorists, so residents are the primary users, going to and from their homes, to work, and to other businesses. The city felt that a flat fee for residential and non-residential users was the fairest way to charge customers for the use of city streets. A flat fee is also very easy to administer. However, the city only collects about $200,000 annually, which is substantially lower than what would be collected using a trip generation methodology. The business community, however, has had no complaints about La Grande's street user fee.

By contrast, Medford has a substantial amount of street traffic coming from outside the city. Many people living outside of Medford come into the city for work, shopping, etc. A trip generation methodology allows the city to charge businesses for the extra traffic they generate. While trip generation methodologies can be initially confusing to the public, and can be controversial with the business community, Medford worked to educate the business community and the public at large, and everyone accepted the resulting fee without controversy.

A transportation utility fee may not be the best solution for every community. A city considering a transportation utility fee should evaluate whether or not this is the best mechanism to achieve desired funding goals, and should assess the political environment of the community and the attitude of citizens towards various fees and taxes.

IMPLEMENTING A TRANSP. UTILITY FEE

In 2007, the League of Oregon Cities informally surveyed each of the cities currently collecting a transportation utility fee. There are unique experiences for each of the cities, but there are many similarities as well.

Below is a list of actions taken by the cities surveyed. Please note that these are experiences from a select number of cities. A city considering a transportation utility fee must evaluate the political environment of their community, and the city's need for transportation funding. For more information on specific city experiences, see page 9.

- **Outside Data and Information:** Some cities hired private consultants to collect data, varying from an assessment of the street network, a market analysis of a gas tax, or a public opinion poll on transportation funding options. These outside resources provide the council with hard data on the condition of city streets and the various funding options.

- **Present the Problem and Propose Solutions:** Most cities began with a broad discussion about the condition of city streets and the various street funding options. Many cities worked to inform the public of the deteriorating condition of local streets, the cost benefits of preventative maintenance, and the need for new transportation revenue. With the help of public input, these cities eventually proposed transportation utility fees as a local funding tool.

- **Proposal Comes from a Committee/Board:** Several cities found that the City Council and the public were more responsive to a transportation utility fee if the proposal comes from a committee that has citizen members. For example, Tigard has a Transportation Financing Strategies Task Force, and it proposed a street maintenance fee, and later a three cent gas tax.

- **Accountability and Credibility:** The city has to have a good track record of using money efficiently and appropriately. The Philomath City Council decided that street maintenance had become a greater need than funding for city's parks. The city implemented a road maintenance fee, and chose not to seek renewal of a popular voter-approved, parks local option tax. This decision showed the public that the council can appropriately prioritize services, and direct limited resources towards the city's most pressing needs.

- **Public Education:** Many of the cities that successfully implemented transportation utility fees engaged in public information campaigns. Beyond the standard public hearings, many cities hosted town hall meetings, did presentations to civic groups, and published newsletter articles and fliers. Education is also important if a city chooses to use a trip generation methodology. Tualatin heard complaints from the business community, as well as a group of senior citizens. The city did a presentation at a local Chamber of Commerce meeting, explaining the science of trip generation, informing businesses of what each user would pay, and showing the fee was equitable across the various groups. The city also did a presentation at the senior center, explaining that residential users pay a $1.42 flat fee.

- **Negotiate with Opponents:** Despite a major public education effort, there may still be strong opponents. For many cities, it is the business community. If possible, work to educate these

groups specifically, and negotiate if necessary. Some cities have made compromises with local businesses in order to gain support for local funding. Milwaukie capped its street maintenance fee at $250 per month, which was a major reduction for the city's large businesses.

- **Have an Implementation Plan in Place:** Many of the cities had the fee rates set and the collection process in place before approving the enabling ordinance. This helps create a smooth implementation process. Corvallis passed its transportation maintenance fee in September, 2005, but did not develop the implementation process until after the ordinance was adopted. The city began collecting the fee in July, 2006. By that time, many of the residents had forgotten about this fee, and were confused by the increase on their utility bill.

Maintaining Community Support

Even if a transportation utility fee is implemented without much opposition, that does not mean that controversy will not arise later. Furthermore, if a city wants to raise an existing fee, community support will once again be needed. Here are methods used by cities to maintain public support:

- **Maintain Accountability and Credibility:** Once a city has passed a transportation utility fee to collect revenue for street projects, the city must use the revenue efficiently and for the purpose for which it was raised. Four years after Wilsonville implemented its road maintenance user fee, the Road Maintenance Task Force concluded that for the upcoming 5-year period, the project goals could be achieved with a 10 percent reduction in the utility fee.

- **Show the Public Results:** In order to illustrate the success of transportation utility fees, many cities make an effort to show the public the positive results of the fee revenue. Several cities post signs at TUF-funded project sites, advertising the use of fee revenue, and many publish project lists and progress reports in newsletters and online. Seeing the improvements to city streets can help preserve public support for this local funding source.

LEGAL CHALLENGES

Disclaimer: Any city considering a transportation utility fee should consult with their city attorney regarding legal issues and relevant statutory requirements.

Before implementing a new ordinance, it is necessary to consider what legal issues may arise. Following are some issues that should be considered when creating a transportation utility fee.

What is a City's Authority to Implement a Transportation Utility Fee?

An Oregon city may implement a TUF pursuant to several different types of authority, the broadest of which is home rule authority. City home rule authority is derived from the Oregon Constitution and very broad in nature. With home rule authority, Oregon cities do not need any enabling state statutes or other grants of authority to carry out the functions listed in a city charter. This is true unless federal, state, or city legislation expressly preempts a city from certain functions. Cities considering transportation utility fees should consult with their city attorneys, and review the city charter.

Is a TUF a Fee or a Property Tax Limited by Measure 5?

Oregon courts have heard arguments on the "fee vs. tax" debate, and have repeatedly ruled that TUFs are fees, not property taxes, and therefore not subject to Measure 5 tax limitations.

In Oregon, a property "tax"is defined as:

1) Any charge imposed by a governmental unit;
2) Upon a property owner;
3) As a direct consequence of their ownership of that property; and
4) Does not include any incurred charges and assessments for local improvements. (Oregon Constitution, Article XI, Section 11b and ORS 310.140(1)).

There have been no legal challenges to transportation utility fees in several years. This precedent has been further strengthened by court decisions on other utility surcharges, such as the ruling of *Knapp v. City of Jacksonville*, 18 OTR 22 (2004), which upheld Jacksonville's public safety fee.

However, courts have discussed when a user fee can constitute a property tax. These cases dealt with storm drainage user fees and would be used by a court in any TUF analysis. See *Roseburg School District v. City of Roseburg*, 316 Or. 374 (1993), for more information.
Any 'fee vs. tax' analysis must look to the above definition of a "property tax" and apply a simple two-pronged test:

1) Is the charge in question imposed on users of a system or on property owners as a direct consequence of ownership? To be valid, the charge must be imposed on users and not owners.

2) Does the ordinance authorize the city to possess or take some other ownership interest in the property? A city's authority to possess or take ownership interests in a property may increase the likelihood of the TUF being classified as a tax subject to Measure 5.

In addressing the two-prongs above, cities should consider the following issues when considering the Measure 5 implications of TUFs:

- What triggers payment of the TUF? Does the obligation to pay the fee arise when streets are used or upon some other criteria, such as the size or type of improvements on the property? To avoid being classified as a property tax, TUFs must be triggered by the occupant's use of streets.

- How is the TUF calculated? Look to the trip generation formula to decide whether an occupant's use of the streets actually triggers payment. If other criteria are used and those criteria don't relate directly to street use, the ordinance could be classified as a tax.

- Who pays the TUF? Does the responsibility to pay rest with the occupant/user of the property or with the owner? For example, in the Roseburg case, the storm drainage utility fees were imposed on the people responsible for paying water utility charges and not on the owners of the property. The storm drainage utility fee was upheld as a fee.

- Has the city complied with procedural requirements? ORS 305.583 (9) requires a city to provide a public notice of the classification of a TUF as a fee not subject to the limits of Measure 5. It would also be wise for the city to make findings on the record regarding the purpose, validity, and methodology of the TUF as a fee.

- How does the city address enforcement of the TUF? Courts have stated that ordinance provisions which allow a city to take possession or attach a lien against a property may be an indication that the fee is a tax on property and subject to Measure 5 limitations. Some cities have chosen to use water shut-offs as an enforcement technique. Cities should contact their city attorneys regarding the risks of using liens to enforce TUFs.

Are There Legal Limitations on the Use of Funds?

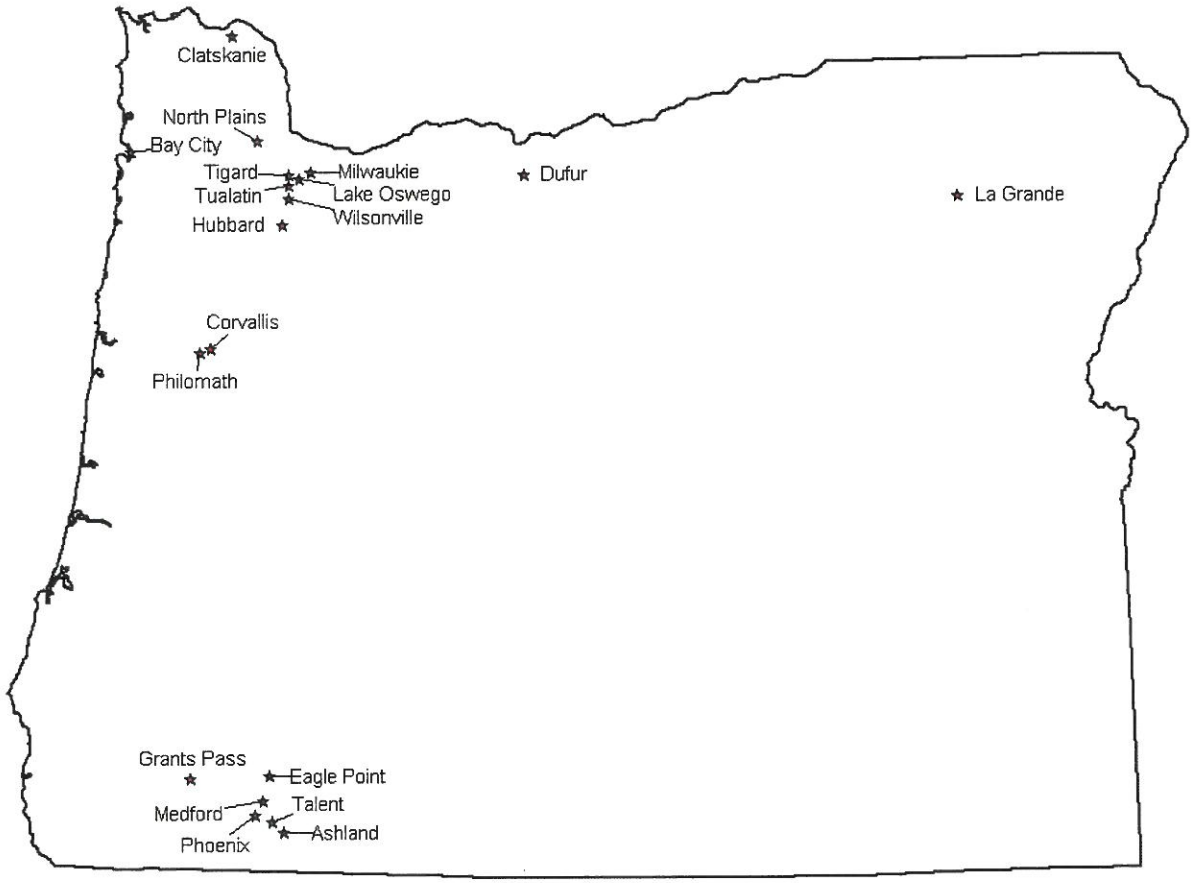
Existing law places no express restrictions on the use of TUF funds, other than the restrictions that normally apply to the use of government funds. However, many cities place self-imposed restrictions or parameters on the use of these funds.

There are some legal and policy arguments that fees should be used in a targeted, narrow manner which relates to the reason for assessing the fees. The law regarding this concept is not concrete and remains untested. In terms of fiscal accountability, cities would be wise to use the fees for a purpose related to the activity for which the fee is charged.

IMPLEMENTING TRANSPORTATION UTILITY FEES

EXPERIENCES FROM OREGON CITIES

OREGON CITIES CURRENTLY COLLECTING TRANSPORTATION UTILITY FEES



11/07

CITY OF CORVALLIS

TRANSPORTATION UTILITY FEE QUICK FACTS

Population: 53,900

Date Passed: 2005

TUF Revenue '06-07: $408,000

TUF as % of Street Fund: 12%

Fee Title: Transp. Maintenance Fee

Fee Methodology: Res. - Flat Fee; Com. - Trip Generation

TUF Revenue Projects: Street reconstruction and overlays.

The Corvallis Experience

In 1993, Corvallis was in a good position to provide adequate street funding – including pavement maintenance – at an average rating of 85 out of 100. The city had the following funding sources:

- System development charges (SDCs) to provide extra capacity;
- Development requirements to provide adequate street and sidewalk infrastructure;
- State gas tax share that kept up with inflation; and
- A property tax levy devoted to the street fund that was growing with assessed values.

However, since 1993, the purchasing power of state highway fund revenues has decreased due to inflation. Measure 50 (1997) reduced property tax revenue, forcing the city to prioritize services. Eventually the city stopped using any general fund revenue for streets, and furthermore transferred the property tax levy revenues to the general fund. At the same time revenues declined, the burden on the street fund increased, with a third of street lighting costs moving from the general fund to the street fund.

In response to the declining street fund revenues, the city formed a task force to look at current transportation funding resources and assess the funding need. The task force came up with two funding options: a vehicle registration fee and a transportation maintenance fee. After Benton County voters turned down a county vehicle registration fee, the council decided to move forward with a transportation maintenance fee. The city worked to inform the public about the state of city streets, and the need for additional investments. The city conducted over 20 presentations to business and community groups, such as Kiwanis and Rotary, in order to make their case.

The city also made concessions in the transportation maintenance fee ordinance to alleviate some of the concerns from the public and local business community. The fee is structured so that 75 percent of the revenue comes from residential users. In addition, the ordinance will sunset in 2011.

The transportation maintenance fee generates over $400,000 per year and the revenue is dedicated to specific pavement maintenance projects. Almost 50 percent of Corvallis' locally raised street fund revenue comes from the transportation maintenance fee, which has helped the city bridge part of the street funding gap.

CITY OF LA GRANDE

TRANSPORTATION UTILITY FEE QUICK FACTS	
Population: 12,540	Fee Title: Street User Fee
Date Passed: 1985	Fee Methodology: Flat Fee
TUF Revenue '06-07: $200,000	TUF Revenue Projects: Major street projects; maintenance, preservation, reconstruction.
TUF as % of Street Fund: 23%	

The La Grande Experience

Since 1986, La Grande has collected a street user fee, which raises about $200,000 per year. The city has used this revenue to match state and federal grants, which allows the city to complete more projects.

La Grande's street user fee was passed by the City Council with little opposition or controversy. There was a public input process during council meetings, and the city also held neighborhood meetings. Using "before and after" pictures from street projects funded by bonds, the city illustrated the benefit of adequate funding for needed street projects.

La Grande structured its street user fee as a flat fee for all users - residential and commercial. Currently, the rate is $4 per month, per water meter. The city determined that most of the traffic in La Grande is local, so the fee was designed to charge city residents for their use of streets. While this formula limits the amount of revenue the city will receive from commercial users, it was more palatable to the local business community, which made for a smooth implementation of the fee.

To promote the city's progress using street-user-fee dollars, the city posts signs at user-fee-funded project sites, and periodically publishes a list of completed and upcoming projects in the city newsletter.

La Grande generates a list of needed street projects using a pavement management system called the S.O.S. system. A citizen street maintenance committee then prioritizes this project list based on the needs of the community and funding resources available.

It is the city's policy that street user fee funds be used only for major street improvements, such as reconstruction and overlays. The general guideline is that the project must be curb-to-curb, and at least one block. Although La Grande has generated local street fund revenue and has successfully completed several needed street projects, the unmet funding need keeps growing.

CITY OF MEDFORD

TRANSPORTATION UTILITY FEE QUICK FACTS			
Population:	73,960	Fee Title:	Street Utility Fee
Date Passed:	1991	Fee Methodology:	Trip Generation
TUF Revenue '06-07:	$4,807,000	TUF Revenue Projects:	Pavement maintenance; street improvements/reconstruction.
TUF as % of Street Fund:	38%		

The Medford Experience

It took Medford four years to implement a street utility fee. The fee was developed by the appointed Street Finance Committee, whose members included one councilor, two developers, two small business owners, a retiree, and a college professor. The committee examined various financing options including bonds, a local gas tax, utility excise taxes, but ultimately settled on the idea of a user fee to fund the maintenance of the city streets.

The council then held a series of hearings and meetings over the next two years in which they made many modifications to the fee methodology before adopting the ordinance in 1991. Prior to adoption of the ordinance, other meetings were held and presentations were made to the Transportation Committee of the Medford/Jackson County Chamber of Commerce. One request from this group was the addition of a clause in the ordinance indicating that no more than five percent of the annual street utility fee revenues could be used for general administration.

Several months prior to the street utility fee going into effect, the need for additional street funding received a great deal of media attention. The city also mailed fliers to every water utility customer, explaining what a street utility fee was and how it would be spent.

In 1996, the city formed a Transportation Funding Committee (TFC) to find ways to fund the backlog of needed improvements to arterial and collector streets. The committee drafted a list of 17 top priority street projects and meets annually to review the progress of these projects. Fees have increased more than once at the recommendation of the TFC in order to keep up with increasing project costs.

Medford's street utility fee has allowed the city to improve many of its streets and maintain them at a "good" condition. However, the city still does not have enough funding to maintain its pavement at the level which is most cost-effective and at the lowest pavement life-cycle cost.

CITY OF MILWAUKIE

TRANSPORTATION UTILITY FEE QUICK FACTS	
Population: 20,835	Fee Title: Street Surface Maint. Fee
Date Passed: 2006	Fee Methodology: Trip Generation
TUF Revenue '06-07: N/A - ($500,000 projected for 2007-08)	TUF Revenue Projects: Pavement preservation and maintenance.

The Milwaukie Experience

In 2006, Milwaukie enacted a new street maintenance fee, which was part of a funding package the city assembled with the support of its budget committee and a citizen utility advisory committee.

The city had considered street funding options in the past, but never implemented any new revenue sources. The city's latest street funding proposal began in 2004. A private inspection found that the condition of city streets was rapidly deteriorating and passing the point at which effective maintenance and preservation could prevent the need for reconstruction.

The City Council set goals for and requested the development of a Street Surface Maintenance Program by resolution in July, 2006. This resolution called for the development of a plan to improve and properly maintain Milwaukie's streets. It also called for the development of new, local revenue sources in order to fulfill the goals of the Street Surface Maintenance Program.

While considering various funding options, the city worked to get public input and involvement. The resulting proposal included three new funding sources: a trip-based street maintenance fee; a two cent gas tax; and a 1.5 percent privilege tax on Portland General Electric.

The city worked hard to educate the community about the need for street funding, and the benefits of this street funding proposal. The city negotiated with large, local businesses, and the final compromise was a $250 cap on the street maintenance fee.

The City Council enacted the street maintenance fee and the privilege tax in 2006. The two cent gas tax was passed later in April, 2007. After the city's diligent work to educate the public, and its willingness to negotiate and compromise, the city now has a funding package that will allow the city to adequately improve and maintain its city streets.

CITY OF NORTH PLAINS

TRANSPORTATION UTILITY FEE QUICK FACTS

Population: 1,755	Fee Title: Transp. Utility Fee
Date Passed: 2003	Fee Methodology: Res. - Flat Fee. Com. - Number of Trucks
TUF Revenue '06-07: $20,500	TUF Revenue Projects: Cracksealing; patching; potholes; save for bigger projects.
TUF as % of Street Fund: 15%	

The North Plains Experience

North Plains' transportation utility fee (TUF) was originally adopted in 2004 as a local revenue tool for funding street maintenance and preservation. The two main goals of the city's plan for a smooth implementation were: first, to keep the fee low; and second, to put a two-year sunset clause on the ordinance.

By comparison, North Plains' TUF rate is low – The city charges 90 cents per month for residential users and a fee per truck rate for non-residential users. There are few major commercial or industrial users, so most of the small businesses pay the residential rate. The highest commercial bill is only $16.

North Plains' street fund consists of revenue from the state highway fund, Washington County's gas tax, "major streets transportation improvement program" (MSTIP) funds, and traffic impact fees, as well as the city's own transportation utility fee revenue. With the declining purchasing power of the state highway fund, the street fund cannot adequately finance street maintenance and preservation. The revenue raised by the transportation utility fee has allowed the city to complete needed street projects, which would not have happened without this local revenue source.

The low fees, however, mean limited TUF revenue for the city. The TUF raises around $20,000 per year, which does not go far with current escalating construction costs. The city must save the TUF revenues for several years in order to fund any major maintenance project. However, due to declining revenues in the general fund, which pays for police services and city administration, the street fund is the only local resource for street maintenance, so every bit helps.

The original TUF ordinance had a sunset date of 2006. The council approved the ordinance again, with another two-year sunset. The city feels the sunset clause gives the public a periodic opportunity to comment on the fee, and it gives the city a chance to evaluate the program. The next sunset will be in 2008, and the city hopes to renew its transportation utility fee, so the city can work to complete more needed street projects.

CITY OF PHILOMATH

TRANSPORTATION UTILITY FEE QUICK FACTS	
Population: 4,460	Fee Title: Road Maintenance Fee
Date Passed: 2003	Fee Methodology: Res. - Flat Fee Com. - Trip Generation
TUF Revenue '06-07: $51,000	TUF Revenue Projects: Street preservation & maintenance - 75% residential.
TUF as % of Street Fund: 25%	

The Philomath Experience

The Philomath City Council passed a road maintenance fee in 2003. Since its implementation, the pavement condition index has shown that there are fewer streets in the fair to poor range.

While the ordinance was under consideration, the city made efforts to educate the public and the business community about the declining condition of the street system, and in street funding. The city used newsletters and other public forums to help gain support.

The council wanted to keep the street utility fee under $2 per month for single family residences. The original fee was set at $1.90 for residential users, and recently was raised to $2. Non-residential users are charged based on a trip generation formula. There are few large commercial or industrial users in Philomath, so the highest commercial bill is around $70.

While considering this new road maintenance fee, the council was also considering renewing a popular voter-approved, parks local option tax. The council decided that street maintenance had become a greater need than funding for city's parks, and chose not to seek renewal of the levy. This decision showed the public that the city can appropriately prioritize services, and direct limited resources towards the city's most pressing needs.

Philomath designates 100 percent of road maintenance fee dollars to pavement projects. The revenue cannot be used for sidewalks, street lighting, or even fee administration costs.

After the passage of the ordinance, the city notified everyone of when the fee would be appearing on their bill. Few complaints were received once the city began collecting the fee.

The road maintenance fee has been in effect for several years, but the city still works hard to keep the public is informed. The annual road-maintenance-fee-funded projects are spread around the city so that all citizen realize the benefit of the fee revenue. The city also posts signs at project sites, and publishes projects lists in the newsletter. These continued efforts have helped maintain community support for this local funding source, and have allowed Philomath to continue in its efforts to improve and maintain city streets.

CITY OF TUALATIN

TRANSPORTATION UTILITY FEE QUICK FACTS	
Population: 25,650	Fee Title: Road Utility Fee
Date Passed: 1990	Fee Methodology: Trip Generation
TUF Revenue '06-07: $600,000	TUF Revenue Projects: Street slurry seals, overlays, reconstruction, 1/7 for streetlighting.
TUF as % of Street Fund: 15%	

The Tualatin Experience

Tualatin's road utility fee was originally passed in 1990. Since then, this funding tool has assisted the city in better managing its street network, and positive community support has led to the expansion of the program into additional surcharges for street trees and sidewalks.

The planning phase of the road utility fee lasted about a year and a half from start to finish. In 1989, the city hired a consultant to analyze the funding needs of the city, and explore new revenue sources. The consultant determined that an additional $350,000 per year was needed to fund street maintenance activities, and formed a list of 14 different funding options. The City Council ultimately decided on a combined road and street lighting utility fee. Under the current formula, one-seventh of the revenue goes to street lighting expenses, the rest goes to road projects.

City staff laid the groundwork for this fee by talking with local businesses and educating the public on the need for increased street funding. Many difficult questions were asked of the city and by the city. If good answers were not found, the city went back and worked on changes to the fee structure.

The city's proposed methodology: 75 percent of the revenue would come from non-residential users. The business community was concerned about this, so city officials made a presentation at a Chamber of Commerce meeting. The city explained the fee formula, and gave examples of the estimated bills for various businesses. This helped the business community see that the fee was structured to account for different types of businesses, and their impact on streets. The Chamber of Commerce decided to publish the city's road utility fee materials, but remained neutral on the issue and gave no endorsement. There was no business opposition to the fee at the public hearings.

The city held similar meetings throughout the community and published many newsletter articles on the proposed fee. A small group of senior citizens came to a public hearing concerned that this fee would drastically increase utility bills. The mayor and staff made a presentation at the senior center to address these concerns and clarify that residential users would pay only $1.42 per month.

Due to the overwhelming success of the road fee, the city implemented two new surcharges, one for sidewalks, the other for street trees. The city has been successful in expanding the utility fee program because the city has established credibility in the use of these funds. Citizens and businesses see the results, and appreciate the improvements to the community.

REPEALED TRANSPORTATION UTILITY FEES

Note: This is not a comprehensive list. Other TUFs in these categories may not be listed.

Transportation Utility Fees Repealed by City Councils

Eugene: In 2001, Eugene was struggling with a backlog of pavement preservation projects. The city convened a citizen committee to explore street funding options. The committee's proposal included a three cent gas tax and a transportation system maintenance fee (TSMF). The City Council approved the TSMF in late 2002, and the gas tax in early 2003.

Despite public outreach efforts, there was considerable resistance to the TSMF, and petitions were circulating to refer the ordinance. In September, 2003, the council repealed the ordinance. The three cent gas tax, however, was implemented without much opposition.

The city may revisit the idea of a transportation system maintenance fee. In 2006, due to continuing growth in the maintenance backlog and the potential loss of county revenue sharing through the Secure Rural Schools Act, a council sub-committee was formed to once again look at transportation funding. In 2007, the council put together a five-part funding proposal that included a transportation system maintenance fee.

Springfield: As early as 2000, Springfield's long-term financial planning for its street fund indicated that the city would face severe funding challenges for street infrastructure. After a long term analysis of street funding options, the City Council adopted a transportation system maintenance fee (TSMF) in February, 2003, quickly followed by the passage of a three cent local fuel tax.

The TSMF was sharply criticized, and a petition campaign collected sufficient signatures to refer the fee to the voters. At that point the City Council chose to repeal the TSMF. The local gas tax was successfully implemented.

Although the gas tax has brought in new revenue to the street fund, the repeal of the TSMF, and continued escalation in the cost of construction materials has created concerns that the city's revenues will be inadequate to maintain the current level of service past 2009. As a result, staff are now beginning to explore funding alternatives for council consideration later this year.

Transportation Utility Fees Repealed by Voters

Sandy: In 2002, after several voter-defeated local tax measures, the Sandy City Council passed a street maintenance fee as a source of revenue for the street fund. This fee was also controversial with the public and was referred to the voters by petition in September, 2002. The city decided to place a gas tax on the same ballot, in order to give the voters options. With only a voters' pamphlet statement in support of the gas tax, 65 percent of the voters approved the gas tax, while 75 percent rejected the street maintenance fee.

APPENDICES

SPECIFIC INFORMATION ON OREGON CITY TRANSPORTATION UTILITY FEES

APPENDIX A

General Information on Transportation Utility Fees [1]

City	2006 Population	Fee Title	Ordinance & Code #	Passage Date
Ashland	21,430	Transportation Utility Fee	Code 4.26	1989
Bay City	1,195	Street Maint. & Repair Fee	Ord. 602	2003
Clatskanie	1,675	Street Utility Fee	Res. 2001-43	1999
Corvallis	53,900	Transportation Maint. Fee	Code 3.05	2005
Dufur	630	Street Maintenance Fee	Ord. 318	2001
Eagle Point	8,340	Transportation Utility Fee	Ord . 11-78	1999
Grants Pass	30,930	Transportation Utility Fee	Code 8.60	2001
Hubbard	2,960	Transportation Utility Fee	Code 13.45	2001
La Grande	12,540	Street User Fee	Ord. 2708	1985
Lake Oswego	36,350	Street Maintenance Fee	Code Chap. 37	2003
Medford	73,960	Street Utility Fee	Code 4.75	1991
Milwaukie	20,835	Street Maintenance Fee	Code 3.25	2006
North Plains	1,755	Transportation Utility Fee	Code 2.20	2003
Philomath	4,460	Road Maintenance Fee	Code 14.20	2003
Phoenix	4,740	Transportation Utility Fee	Code 13.28	1994
Talent	6,415	Transportation Utility Fee	Ord. 678	2000
Tigard	46,300	Street Maintenance Fee	Code 15.20	2003
Tualatin	25,650	Road Utility Fee	Code 3-4	1990
Wilsonville	16,885	Road Maintenance User Fee	Ord. 484	1997

1. To view the city ordinances, visit www.orcities.org (A-Z Index - "T" for Transportation Utility Fee). Not all ordinances are available online.

APPENDIX B

Transp. Utility Fee Ordinances - Voter Approval & Sunset Clauses [1]

City	Voter Approval	Sunset Clause
Ashland	No	No
Bay City	No	No
Clatskanie	No	No
Corvallis	No	2011
Dufur	No	No
Eagle Point	No	No
Grants Pass	No	No
Hubbard	No	No
La Grande	No	No
Lake Oswego	No	No
Medford	No	No
Milwaukie	No	No
North Plains	No	2008
Philomath	No	No
Phoenix	No	No
Talent	No	No
Tigard	No	No
Tualatin	No	No
Wilsonville	No	No

1. To view city ordinances, visit www.orcities.org (A-Z Index - "T" for Transportation Utility Fee).

APPENDIX C

Transp. Utility Fee Ordinances - Methodology

City	Methodology [1] (per month)
Ashland	Commercial: $0.34 - $2.68/100 sq. ft. - 8 commercial categories; $2.68/guest room - hotels; $2.68 per required parking space - all other classifications. Residential: $7.49 - single family; $4.97/unit - multi-family.
Bay City	Commercial: $5 per equivalent dwelling unit. Residential: $5 flat fee.
Clatskanie	Commercial: $5/unit; $2.50/unit - motels. Residential $2.50 flat fee.
Corvallis	Commercial: $.021 x trip generation. Residential: $1.36 flat fee - single-family; $.94/unit - multi-family.
Dufur	Commercial & Residential: $5 flat fee per water meter.
Eagle Point	Commercial: $6 + $1/1,000 sq. ft. Residential: $3 per unit flat fee (add $3 for home occupations).
Grants Pass	Commercial: Trip generation, category of use, building size. Residential: Category of use, number of units.
Hubbard	Commercial: Trip generation. Residential: Flat fee of $4.50.
La Grande	Commercial & Residential: $4 flat fee per water meter.
Lake Oswego	Commercial: Calculation based on gross floor area (GFA) and trip generation. Residential: $3.75/mo. per household.
Medford	Commercial & Residential: Trip generation based on the land usage (home, office, etc.). Fee = Units x Trips x Rate.
Milwaukie	Commercial: $0.35 per daily trip (according to ITE-based calculation - $250 maximum). Residential: $3.35 - single family (minimum rate); $2.10/unit - multi-family; other residential classifications.
North Plains	Commercial: Based on number of trucks. Residential: $0.90 flat fee.
Philomath	Commercial: Based on trip generation, gross square footage, and truck traffic. Residential: $2 flat fee.
Phoenix	Commercial & Residential: Number of units x Chargeable daily trips (based on category) x $0.22958 (current rate).
Talent	Commercial & Residential: Number of units x Chargeable daily trips (based on ITE land use code categories) x per trip rate ($0.38). Single family residential charge is $3.93.
Tigard	Commercial: $0.78/parking space (5 space minimum; 200 space maximum); $0.78/fueling point for gas stations. Residential: $2.18 per unit.
Tualatin	Trip generation and land use categories based on type of use and building size.
Wilsonville	Rates based on 1. vehicle trip generation based on land use; 2. gross square footage; 3. amount of truck traffic.

1. More methodology information is in city ordinances, some of which are available online at www.orcities.org (A-Z Index - "T" for Transp. Utility Fee).

APPENDIX D

Transp. Utility Fee Ordinances - Use of Revenues Specifically Listed

Please note, an item not specifically listed in the ordinance does not mean it is specifically excluded.

	Street Projects									
City	**Operation**	**Admin.**	**Maintenance**	**Repair**	**Improvement**	**Reconstruction**	**Construction**	**Bicycle/Ped.**	**Sidewalks**	**Other***
Ashland	✓	✓	✓ 1	✓	✓	✓	✓	✓	✓	
Bay City			✓ 1	✓						
Clatskanie			✓	✓						
Corvallis		✓	✓			✓				Note 2
Dufur			✓		✓					
Eagle Point	✓	✓	✓							
Grants Pass	✓	✓	✓	✓	✓	✓			✓	Note 3
Hubbard	✓	✓	✓	✓	✓	✓				
La Grande			✓	✓		✓	✓			
Lake Oswego	✓		✓	✓	✓	✓		✓	✓	Note 4
Medford	✓	✓	✓	✓	✓	✓				Note 5
Milwaukie			✓	✓		✓				Note 6
North Plains	✓	✓	✓	✓			✓			Note 7
Philomath			✓							Note 8
Phoenix	✓	✓	✓ 1	✓	✓	✓		✓		Note 9
Talent	✓		✓ 1	✓	✓			✓		Note 10
Tigard	✓	✓	✓	✓		✓				Note 11
Tualatin	✓	✓	✓	✓	✓	✓				Note 12
Wilsonville			✓			✓				Note 13

* Notes are listed on page 27.

APPENDIX D (continued)

Transp. Utility Fee Ordinances - Use of Revenues Specifically Listed

Notes:

1. "Maintenance" includes patching, crack-sealing, coating, overlays.

2. Corvallis: Up to $20,000 may be used for administration. Of the remaining revenue, 37.5 percent is used for arterial and collector street overlays, and 62.5 percent for improvements to Western and Walnut Boulevards.

3. Grants Pass: Transportation utility fee revenue is also used to fund traffic projects such as signal maintenance and traffic calming.

4. Lake Oswego: "Street System" also includes curbs, paths, bridges. Revenue may also fund engineering work.

5. Medford: No more than 5 percent can be transferred for general city purposes for equitable share of the cost of accounting, management, and government.

6. Milwaukie: Revenue is used for the city's Street Surface Maintenance Program, which covers maintenance and preservation work.

7. North Plains: May also fund planning and design work for transportation projects.

8. Philomath: All revenues collected are used to contract for overlays of existing improved street sections. Revenue is distributed 75 percent for residential streets; 25 percent for non-residential (same as fee revenue collection).

9. Phoenix: Revenue may be used for sidewalks, street sweeping, curbs and gutters, striping, signals, signs, street trees, illumination. In 2006, the council dedicated 21 percent of transportation utility fee revenues for a new "Highway 99 Maintenance Fee."

10. Talent: Revenue may be used for sidewalks, street sweeping, curbs and gutters, striping, signals, signs, street trees, illumination, and transit facilities.

11. Tigard: Engineering design, construction management, project advertisements are al considered "street maintenance." Projects using street maintenance fee revenue are confined to maintenance, repair and reconstruction of existing streets - no new construction.

12. Tualatin: Revenue is distributed 1/7 to street lighting, 6/7 to street maintenance. Street trees, sidewalks, and landscape enhancements are covered under an additional utility fee.

13. Wilsonville: Revenue is distributed 50 percent to residential and 50 percent to non-residential (same as fee revenue collection).

APPENDIX E

Transp. Utility Fee Ordinances - Administrative Officer

City	Administrative Officer
Grants Pass	City Manager
Medford	Public Works Director
Milwaukie	Engineering (primary); Comm. Dev. Dir.; Pub. Works; Finance (Directors)
Talent	City Manager
Tigard	City Engineer (primary); Finance Director.
Tualatin	City Engineer (primary); Finance Director; Operations Director
Wilsonville	Public Works Director; Finance Director; Community Dev. Director

Note: Ashland, Bay City, Clatskanie, Corvallis, Dufur, Eagle Point, Hubbard, La Grande, Lake Oswego, North Plains, Philomath, and Phoenix did not designate an "administrative officer" in a specific section of the ordinances/resolutions.

APPENDIX F

Transp. Utility Fee Ordinances - Rate Reductions

City	Rate Reductions
Ashland	Low income senior citizens (same as other utilities)
Corvallis	May be available to non-residential properties where the premises have developed and implemented a transp. demand management program that has been approved by the city.
Grants Pass	Petition to adjust rates. If approved - 50 percent reduction for 12 mos. or until vehicle is registered.
Hubbard	Low income senior citizens (same as other utilities)
La Grande	Low income senior citizens (over 65) - 50% reduction.
Milwaukie	Waived for low income, residential customers. City will reduce rates if county/state/federal funding is adopted.
Phoenix	Low income senior citizens (same as other utilities)
Wilsonville	Home businesses charged as residential users.

Note: Bay City, Clatskanie, Dufur, Eagle Point, Lake Oswego, Medford, North Plains, Philomath, Tigard, and Tualatin did not have specific language regarding rate reductions, however there may be language in the billing rules of other utilities, which would apply to transportation utility fees.

APPENDIX G

Transp. Utility Fee Ordinances - Exemptions and Waivers Specifically Listed [1]

City	Exempt Class by Resolution	City-Owned Property	City-Owned Parking Lots	Other Gov't Property	Publicly-Owned Parklands [2]	Railroad Property [3]	Farm & Forestry	Tri-Met Parking [4]	Vacant Property	Undeveloped Property
Ashland [5]	✓									
Bay City	✓	✓								
Corvallis			✓		✓	✓			✓	✓
Eagle Point										✓
Grants Pass	✓			✓					✓	✓
Hubbard	✓								✓	
Lake Oswego			✓		✓	✓		✓	✓	✓
Medford										✓
Milwaukie			✓		✓	✓			✓	✓
North Plains										✓
Philomath										✓
Phoenix	✓								✓	
Talent	✓								✓	
Tigard					✓	✓	✓		✓	✓
Tualatin			✓		✓	✓	✓	✓	✓	✓
Wilsonville										✓

Note: Clatskanie, Dufur and La Grande had no exemptions or waivers specifically listed in the ordinances/resolutions.

1. Not technically an exemption/waiver, but most cities do not charge this fee to utility customers outside of city limits. Dufur charges the fee to users inside and outside city limits. Grants Pass, Phoenix and Talent charge the fee to customers who have an annexation agreement with the city.
2. Publicly Owned Parklands, Open Spaces, Greenways, unless an area designated for parking.
3. Railroads property, excluding developed property.
4. Tri-Met parking used by mass transit passengers.
5. Ashland exempts churches from the transportation utility fee.

APPENDIX H

Transp. Utility Fee Ordinances - Delinquent Bills

FUND DISTRIBUTION

Most of the cities state that if insufficient funds are collected from a utility bill to cover all of the utility funds (water, sewer, etc.), the amount for the transportation utility fee is paid first to the street fund.

A few cities do not pay the street fund first, however. Corvallis covers any penalty fees, then credits the street fund. Phoenix and Talent proportionally allocate money to each utility fund. Tigard also does a proportionate allocation, but after interest and penalty fees have been paid.

LATE FEES

A few cities did reference late fees in the ordinance. Bay City charges a 5 percent late fee to delinquent bills. La Grande levies a 9 percent interest rate to delinquent bills, and will also collect court costs and attorney fees if a decision is found in favor of the city. Grants Pass sets an interest rate for delinquent bills by resolution.

ENFORCEMENT AND FEE RECOVERY

Several cities have provisions regarding the enforcement of the utility fee ordinance, and recovery of delinquent bills. Recovery procedures include collections and termination of utility service (water/sewer). Several ordinances also state that the city has the authority to use any means available under law to collect delinquent fees.

Grants Pass has an extensive section on the recovery of unpaid fees, and Wilsonville has a thorough enforcement provision.

Under the enforcement provisions, several cities also grant city employees access to premises for inspection, repair or enforcement of the transportation utility fee ordinance. Tualatin and Corvallis have inspection provisions granting the administrative officer the authority to inspect premises, but only in order to determine the property's fee designation.

LANDLORD VS. TENANT

Several cities mention that collection and enforcement procedures are the same as for the other utilities, or the finance department in general. This may mean that regulations regarding landlords and tenants may exist in another document, and would apply to the transportation utility fee.

A few ordinances speak specifically to the issue of responsible parties. The ordinances of Bay City, Milwaukie, North Plains, Talent and Tualatin state that if the "responsible party" (or tenant) does not pay, the property owner is ultimately responsible for the delinquent bill. Bay City, North Plains, and Tualatin specifically mention a lien on property if the owner does not cover a delinquent bill.

APPENDIX I

Transp. Utility Fee Ordinances - Appeal of Fee Determination

All the cities have an appeal procedure regarding transportation utility fee calculations, except Clatskanie, Dufur, and La Grande.

Most of the ordinances have an appeal process including the following steps:

1. A user can petition the council, in writing, for a hearing on a review of a fee determination.
2. Within a certain number of days (30 - 60), the council reviews the findings of fact, and makes a decision.
3. The notice of the decision is given to the user in writing.

Furthermore, many of the ordinances state the council's decision is the final order, and only allow one appeal, unless the classification of the property changes. A few cities charge a fee for an appeal petition, but the fee is refunded if the fee determination is reversed.

In Corvallis and North Plains, the appeal of the city engineer's fee designation goes to the city manager, not the council. The decision of the city manager is final.

Grants Pass' ordinance states that the burden of proof is on the petitioner. It also requires the petitioner to keep paying the fee while the appeal is under review.

In Wilsonville, the appeal is first filed with the Community Development Director, who evaluates the merits of the appeal. The director shall make a decision and file a report within 90 days. The director's decision can be further appealed to the City Council.

Tigard's appeal process is similar to Wilsonville in that the appeal goes first to the Engineer, whose decision can also be appealed to the council. Furthermore, the Tigard City Council can choose to form a subcommittee to review the appeal.

In Phoenix's ordinance, the first step after a fee determination appeal is to have the Public Works director conduct a 24-hour traffic count at the premises. If the petition is still unsatisfied with the fee determination, they can appeal to the city council.

APPENDIX J

Transp. Utility Fee Ordinances - Streets Eligible for TUF Funds

Ordinances from Ashland, Bay City, Eagle Point, Grants Pass, Hubbard, La Grande, Medford, Phoenix and Talent have language establishing which streets would be eligible for projects funded by transportation utility fee revenue.

The City shall maintain all accepted local streets within city-owned land, city rights-of-way, and city easements and maintain other accepted local streets within or adjacent to the city. Such local streets specifically exclude private streets and streets not yet accepted by the city for maintenance. (Section 4.26.040, Ashland Municipal Code)

Grants Pass' ordinance also states that publicly accepted streets within the Urban Growth boundary are eligible for project funding through TUF revenue. The ordinance also specifically excludes state highways, along with private streets.

Under the "Benefited Streets" section of La Grande's ordinance, unpaved roads will not be paved using street user fee revenue, unless the council finds it is in the "public interest."

By ordinance, Grants Pass and Medford establish the streets that will benefit from TUF revenue by developing and implementing a maintenance plan.

APPENDIX K

Transp. Utility Fee Ordinances - Street Lighting

A few of the cities allow transportation utility fee revenue to be used on street lighting.

Talent and Phoenix list "illumination" in the list of eligible transportation facilities.

Tualatin designates 1/7 of the road utility fee revenue for street lighting.

A few cities adopted utility fees specifically and exclusively for street lighting.
Here are the rates: (this is not a comprehensive list)

City	Street Lighting Utility Fee Rate (monthly)
Cascade Locks	$2.25/meter - residential; $3.50/meter - high density residential; $7/meter - commercial and public agencies.
Cornelius	$2 per utility account
Klamath Falls	$2 per utility account
Nyssa	$2.50 per utility account
Toledo	$5 per water account

APPENDIX L

Transp. Utility Fee Ordinances - Standard Ordinance Provisions

PURPOSE STATEMENT

Many of the ordinances have a "declaration of purpose," which broadly describes the need for the fee, and the approved use of the funds. Each purpose statement is worded differently, but below is a sample from Grants Pass' ordinance:

The City Council hereby finds, determines and declares the necessity of providing for the continued operation, maintenance and upgrading of the city's streets and other transportation-related facilities as a Comprehensive Transportation Utility. There is hereby created a Transportation Utility Fund (the Fund) for the purpose of undertaking such activities as are necessary in order that streets and other transportation-related facilities may be properly operated, maintained and upgraded; and that the health, safety and welfare of the City and its inhabitants and visitors may be safeguarded. (Section 8.60.040; Grants Pass City Code)

USE OF FUNDS LANGUAGE

As stated in Appendix D, there are specific uses designated for transportation utility fee revenue. Several cities have other language in ordinances regarding the use of revenues:

It shall not be necessary that the operations, administration and maintenance expenditures from the street fund specifically relate to any particular property from which the fees for said purposes were collected. (Section 13.45.030, Hubbard City Code)

The fees paid and collected by virtue of this ordinance shall not be used for general or other governmental proprietary purposes of the city..... (Section 4.757, Medford City Code)

ORDINANCE REVISION AND REVIEW

Most of the ordinances state that the transportation utility fee ordinances can be revised by the council from time to time by resolution or ordinance.

Philomath's ordinance (passed in 2003) stated that the city could not raise the rate until June 2005. During the second year of the program, and every year thereafter, the public works committee reviews the road maintenance billing rates.

Grants Pass' ordinance requires the council to review the TUF rates every 5 years.

Wilsonville could not raise the TUF rates for the first 3 years. There is to be a review the 4th year of every 5-year maintenance cycle.

A review of Tigard's ordinance (passed in 2003) was required 3 years after its passage, and rates were reestablished based on an annual average cost of the 5 year maintenance plan. The ordinance also stated that the city would take into account additional revenues received if additional state funding became available.

La Grande's ordinance declared that a public hearing was required to make changes to the street user fee. The city is required to give 10 days notice of the hearing.

Phoenix transportation utility fee rates automatically increases annually according to the CPI.

APPENDIX M

Transp. Utility Fee Ordinances - Other Provisions

NEW DEVELOPMENT

utility fee. For Corvallis, Grants Pass, Medford and Tigard, that is the moment with which the developed property is hooked up to the water/sewer utility. In Phoenix, the developed property must start paying upon completion, or occupancy - whichever comes first. In Talent, the property starts being assessed the transportation utility fee after the water meter is installed.

CHANGE IN CLASSIFICATION

Under Corvallis' ordinance, if the use of a property changes so that the fee increases or decreases, the responsible party is required to notify the city within 30 days. If the responsible party fails to notify the city, and the change would result in a lower fee, no refund is given. If the change would result in a higher fee, the city calculates the amount owed to the city.

NOT A PROPERTY TAX

Bay City, Grants Pass, Philomath, Phoenix, Talent and Wilsonville all state in the transportation utility fee ordinances that this fee is not a property tax, and are not subject to the property tax limitation under Article XI, Section 11(b) of the Oregon Constitution.

In section 8.60.020 of Grants Pass' city code, the city even stipulates an argument as to why the fee is not a tax.

COLLECT NO MORE THAN NEEDED

Talent and Phoenix specifically state in their ordinances that "transportation utility fees shall not be imposed in amounts greater than that which is necessary, in the judgment of the city council....." (Talent Ordinance #678, Section 3)

MIXED USES

Some cities address the issue of fee designation for mixed use properties. Tualatin has a specific provision stating that, except under certain circumstances, "no road utility bill will be apportioned among mixed uses or related property or combinations of mixed uses and related properties." (Tualatin Municipal Code 3-4-140)

APPENDIX N

Transp. Utility Fee Ordinances - TUF Revenue vs. Highway Fund

	2006-07 Revenue	
City	**Transp. Utility Fee**	**State Highway Fund**
Ashland	$970,123	$989,809
Bay City	$49,000	$55,335
Clatskanie	$28,000	$78,059
Corvallis	$408,000	$2,505,620
Dufur	Not Available	$29,003
Eagle Point	$125,000	$371,787
Grants Pass	$738,000	$1,360,688
Hubbard	Not Available	$135,996
La Grande	$200,000	$587,232
Lake Oswego	$1,136,000	$1,695,937
Medford	$4,807,000	$3,403,847
Milwaukie	N/A [1]	$971,128
North Plains	$20,500	$81,011
Philomath	$51,000	$207,504
Phoenix	$69,000	$219,982
Talent	$91,000	$296,486
Tigard	$1,165,000	$2,149,401
Tualatin	$600,000	$1,196,614
Wilsonville	$583,000	$783,851

1. Collections began July 1, 2007. Milwaukie estimates $575,000 for FY 2007-08.

APPENDIX O

Transportation Utility Fees - Sample Documents

Several sample documents are available on LOC's web site to assist cities who are interested in implementing transportation utility fees.

The League of Oregon Cities' web site address is: www.orcities.org

Click on the A-Z Index, "T" for "Transportation Utility Fee."

Documents located on this web page include:

- Ordinances
- Administrative Documents
- Public Information Materials
- Press Releases
- Transportation Funding Committee Information

For additional resources on transportation funding and public information efforts, visit the following pages on LOC's web site:

- Transportation Funding (A-Z Index - "T")
- Gas Tax, Local (A-Z Index - "G")

Please note that these are sample documents only. Cities must consult legal counsel regarding the use of these items and potential conflicts with state and city laws.

PAVING FINDER

ASPHALT

CONCRETE VS ASPHALT ROADS – WHICH IS THE BETTER CHOICE?

If it is better to use concrete vs asphalt roads is not always so easy to determine. While both concrete and asphalt are popular materials for roads, there are a few pros and cons to each that can make one a far better material for the job at hand than the other.

Concrete roads are more environmentally friendly and have more longevity compared to asphalt roads, though asphalt is more cost-effective and can be a safer alternative to asphalt in areas that get a lot of snow.

Read on as we go through the pros and cons of concrete vs asphalt roads.

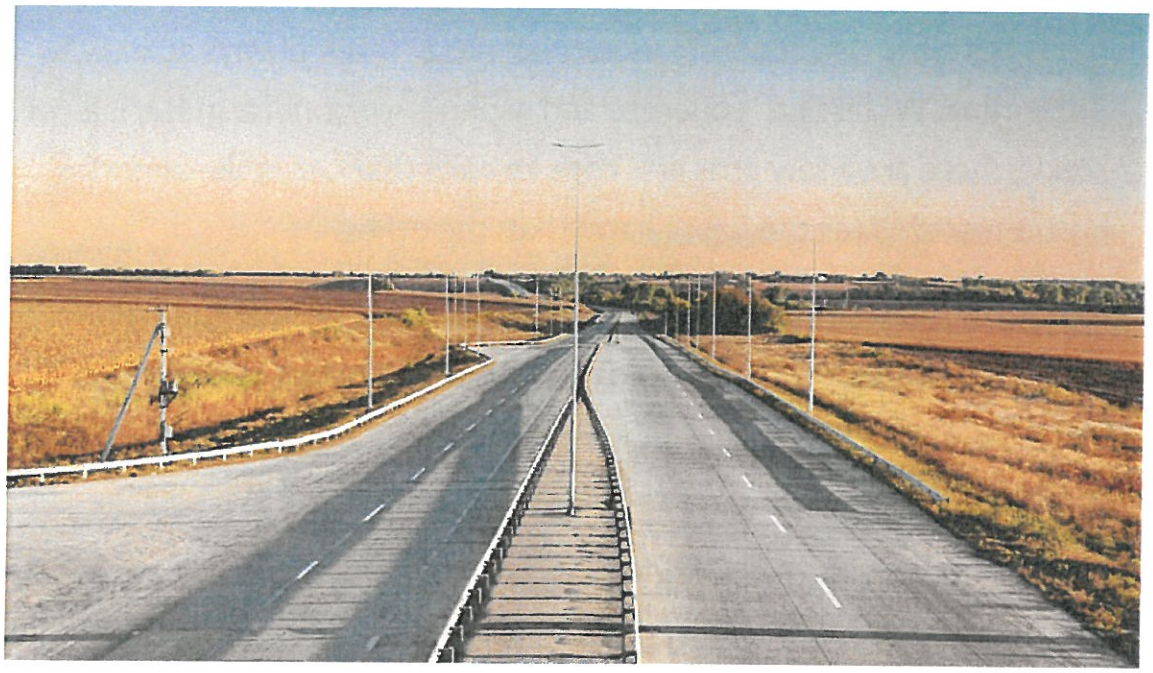
rock), water, and cement. Cement is in the mix as a binding agent to hold the aggregate together. The stiff, unforgiving slabs of concrete form when the mixture dries. Construction crews will often try to refrain from making the surfaces of concrete roads perfectly smooth, as perfectly smooth concrete is often more prone to breakage.

To reinforce concrete, construction crews will often use steel bars.

THE PROS OF CONCRETE ROADS

LONGER LIFESPAN

When it comes to concrete vs asphalt roads, concrete roads have a much longer lifespan. In fact, many concrete roads can last up to 20 to 40 years with minimal maintenance; it is around two to four times the average lifespan of asphalt roads. This is one of the many reasons people also use concrete to make catch basins [https://pavingfinder.com/expert-advice/how-to-build-a-concrete-catch-basin/], especially in areas with heavy rainfall.



trucks that travel over them every day. Concrete handles weight much better than asphalt, meaning it is less prone to rutting or dips. If you're planning on paving roads where there will be a high volume of large trucks, concrete is the better material.

Of course, the one major downside to using concrete on long stretches of highway is that it can get expensive very fast, which is something to consider in any road-building project.

SAFER FOR MOTORISTS

Thanks to the longevity of concrete roads and the strength to hold more weight without dips forming, there is a smaller chance of potholes forming. Not only does this make it safer for motorists, but it also helps traffic to flow much smoother too.

BETTER FUEL EFFICIENCY

According to a number of studies of concrete roads vs asphalt roads over the past decade, concrete roads can reduce CO2 emissions [https://www.britpave.org.uk/news/Concrete-roads-save-traffic-co2-emissions-and-costs/120118] and increase driver fuel efficiency. It is said that drivers get anywhere from 1-7% better fuel efficiency when driving on concrete roads compared to asphalt roads. This is because concrete roads don't fold as much under the weight of vehicles.

MORE ENVIRONMENTALLY FRIENDLY

In general, the production of concrete roads is more environmentally friendly than that of asphalt roads. Essentially, concrete uses less energy during the construction process [https://www.acpa.org/why-concrete/sustainability-environmental/#:~:text=Concrete%20produces%20a%20smaller%20environmenta

It is also worth noting that concrete does not produce any sort of toxic runoff like asphalt does, meaning it is not a threat to local waterways. With its unique permeability, concrete allows rainwater to pass through it so that groundwater can be replenished, just as grass would allow water to pass through.

Of course, neither of these options is *sustainable* options, though that does not mean one isn't better for the environment than the other.

SAVING ON RESOURCES

Concrete, which is made from cement, is produced from limestone. Limestone is readily available and a very abundant resource that does not need to be imported in.

NO OIL DAMAGE

Unlike asphalt roads, concrete roads do not suffer damage from oil leaks.

BETTER FOR COLDER TEMPERATURES

choice for drivers in snowy or icy conditions.

RECYCLABLE

Many consider concrete to be recyclable, as old slabs of concrete can be ground up and used as gravel in other projects, such as gravel driveways [https://pavingfinder.com/expert-advice/gravel-driveway/].

COLORING AND STAMPING

One of the biggest aesthetic advantages of concrete is that it can be stamped and colored much easier than asphalt. You've likely been in urban settings where the concrete is colored in certain places to section off bike lanes or to promote safer crosswalks. The number of aesthetic possibilities is much greater with concrete than with asphalt.

LIGHT COLOR

One of the main reasons you'll often see concrete roadways in hot areas is that the lighter color is more reflective than asphalt. This means that it reflects the radiation from the sun instead of absorbing and storing it as asphalt does.

With a cooler surface, concrete can help surrounding buildings, meaning businesses and homes, cut back on their energy costs. It doesn't get as hot in urban settings with concrete compared to those with asphalt, either.

CONS OF CONCRETE ROADS

DIFFICULT REPAIRS

Repairing concrete roads if they do get damaged can be an arduous process. It is impossible to patch holes and cracks on concrete roads vs

PAVING FINDER

COSTLY

Concrete costs a lot more than asphalt, both in terms of the construction process and the potential repair process.

BUMPY RIDES

Concrete slabs can sit at different levels, causing rides to be bumpier than asphalt. It is also often the case that drivers can feel the expansion joints in the road when driving on concrete, especially if they don't have newer cars with high-quality suspension.

MORE ROAD NOISE

During the construction process, the texture is brushed onto the concrete's surface. Beyond drivers feeling the rhythmic bump of each suspension joint they pass over, it is also often the case that these roads are incredibly noisy.

LESS GRIP

lose traction quickly. It is also the case that water does not evaporate as fast, nor does snow melt as fast, as concrete has a much lower heat absorption rate than asphalt.

HIGH REFLECTIVITY

If you've ever driven on a long asphalt road on a very hot, sunny day, you've probably noticed the high reflectivity characteristic. Driving on asphalt roads in this kind of heat and sunlight for a long time can be a major strain on the eyes.

NON-ABSORBANT

While asphalt has a great way of absorbing spills, such as oils, chemicals, and other pollutants, concrete does not.

LONG CURE TIMES

After it is poured, concrete typically has to sit for seven days before it is cured. Of course, there are high-early-strength varieties of concrete too, which can cure in a day to three days, though these are much more expensive. If you're looking to get a job done quickly, asphalt is a much better choice.

WHEN TO USE CONCRETE ROADS

While concrete roads can be used in a number of different projects, they are best for:

- New construction
- Urban road expansion
- Build new roads in urban regions
- Underground utility repair

use it to build new bridges and roads or use it for other construction projects entirely.

Because concrete does not require as much maintenance or repairs, there are fewer costs to maintain it, including machinery costs, fuel costs, labor costs, etc.

WHAT ARE ASPHALT ROADS?

Asphalt roads are often made up of aggregates (gravel, sand, and crushed rock), filler, and binder (bitumen). Bitumen is a very different kind of binding agent than cement, as it is a dark and sticky substance that is derived from crude oil.

When roads are built using asphalt, fine aggregate is mixed with bitumen while heated up before it is poured onto a bed of large aggregate. Once it is laid down, it is pressed into place using a steamroller.

The beauty of asphalt is that it is ready to be driven on once it cools down to the surrounding air temperature. It is also much more flexible

PAVING FINDER

PROS OF ASPHALT ROADS

COST-EFFECTIVE

When it comes to concrete vs asphalt roads, the materials for asphalt roads cost less than they do for concrete. Plus, since the construction process moves a lot faster for asphalt roads, it requires less time and energy to build, meaning less spent on labor and machinery.

EASY TO REPAIR

Unlike concrete, it is possible to repair asphalt in patches. If there is a small crack or dip somewhere in the road, filling it up and patching it over is quite easy.

BETTER TRACTION

There are many people who deal with dynamic driving situations, especially those who live in hilly areas or regions that have inclement weather. Compared to concrete roads, asphalt roads offer far more traction and skid resistance, making them a safer option in many ways.

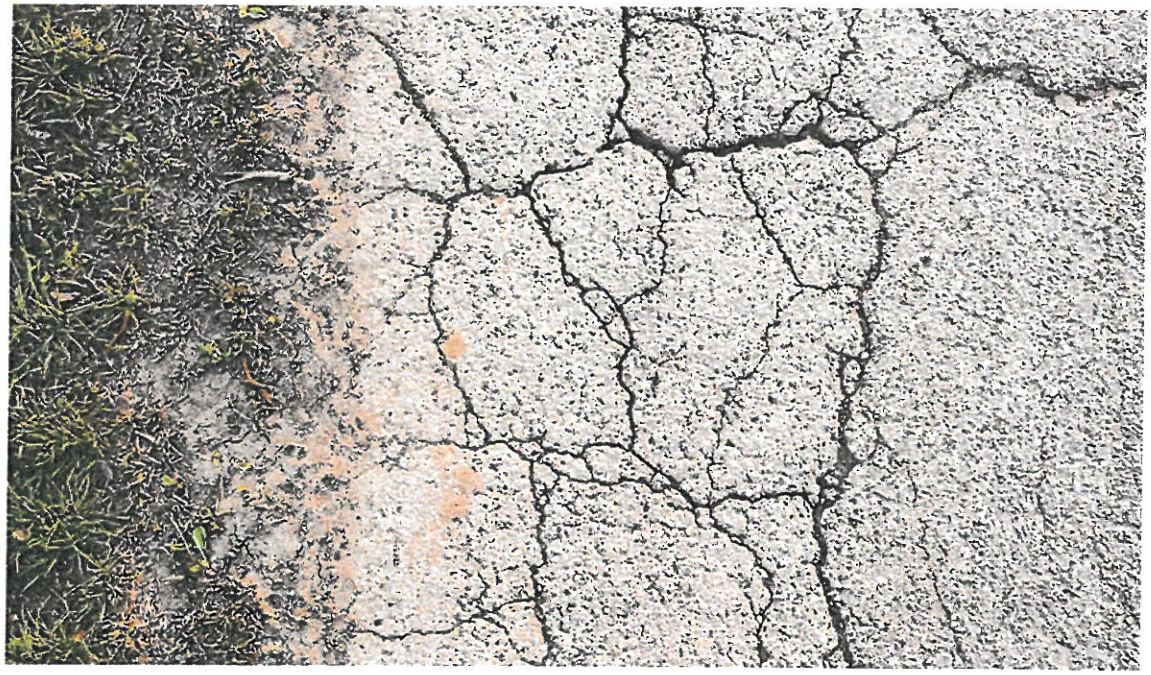
LESS NOISE

While concrete roads can be very noisy to drive on, asphalt roads are generally quiet. This is especially true for brand-new asphalt roads.

BETTER HEAT ABSORPTION

Though asphalt can get really hot, the good thing is that it has excellent heat absorption for those who live in snowy areas. After a long bout of inclement weather, snow and ice will melt much faster off the road than concrete. Rainwater will also evaporate much faster on asphalt.

and re-use it to surface new roads.



CONS OF ASPHALT ROADS

SHORTER LIFESPAN

Asphalt roads have a much shorter lifespan than concrete roads. On average, asphalt roads last around ten years. Maintaining an asphalt road requires it to be re-laid and repaired on a more regular basis.

EASILY DAMAGED

When heavier weather approaches, asphalt tends to take on more damage. In regions with heavy snowfall or monsoons, this can be a huge problem. Oil leaks can also have an impact on damage when asphalt absorbs it, as it can weaken the binding agent. When the binding agent is weakened, the roads can soften, leaving them open to further damage.

NOT GREAT FOR CERTAIN TYPES OF ROADWAYS

Because asphalt is prone to cracking and breaking under stress, it is not the best choice for high-turning points or stopping points. Of course, to

when temperatures get low.

LESS ENVIRONMENTALLY FRIENDLY

When asphalt is melted during the construction stage, it can emit greenhouse gases. Compared to concrete roads, building asphalt roads can cause far more pollution.

MORE PRONE TO FREEZE DAMAGE

When winters roll around and the freeze-thaw cycles begin, it can wreak havoc on asphalt roads. These kinds of roads become far more brittle in extremely cold temperatures due to their less flexible makeup.

USES MORE NATURAL RESOURCES

Asphalt is made from bitumen, which is produced from imported petroleum. Every day, the reserve of bitumen is reduced more and more, meaning it will eventually cost us more to import and use for major roadways.

WHEN TO USE ASPHALT ROADS

- Jobs that require cost-efficiency

FINAL THOUGHTS – CONCRETE VS ASPHALT ROADS – WHICH ONE IS BEST?

There isn't a one-size-fits-all answer for which of these materials is better for building roads. It's crucial to consider the specifications of your project when trying to choose the better material.

Concrete is a more sustainable [https://pavingfinder.com/expert-advice/eco-friendly-parking-lot/] option that promotes better fuel efficiency and longevity. But it can also be expensive and difficult to repair. It is also worth noting that many governments are shifting to the use of concrete roads thanks to the reduced chance of potholes and added longevity.

On the other hand, **asphalt** can be more cost-effective and safer for drivers due to its skid-resistant nature, though it is less environmentally friendly and more prone to damage.

Consider the parameters of your road-building project and the pros and cons of each when making your next decision.

PAVING FINDER

When Should you Replace Asphalt Driveway – A Complete Guide Replace Asphalt Driveway – A Complete Guide

Driveway Thickness – What is Your Best Option? Thickness – What is Your Best Option?

How To Build A Concrete Catch Basin – 8 Steps To Follow How To Build A Concrete Catch Basin – 8 Steps To Follow

Concrete Maintenance – 11 Factors to Make Your Pavement Last Concrete Maintenance – 11 Factors to Make Your Pavement Last

Asphalt Driveway Maintenance and Care – All You Need To Know Asphalt Driveway Maintenance and Care – All You Need To Know

Having A Crushed Concrete Driveway – The Pros and Cons Having A Crushed Concrete Driveway – The Pros and Cons

America's Cement Manufacturers™

Paving Cost Comparisons: Warm-Mix Asphalt Versus Concrete

July 2014

PCA Market Intelligence

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Paving Cost Comparisons: Warm-Mix Asphalt Versus Concrete

Key Findings

- ***Concrete pavement*** enjoys both an initial and life cycle cost advantage over HMA as well as the most cost effective WMA case for many roadways.

- ***WMA production uses less fuel than hot-mix asphalt (HMA):*** With temperature reductions of up to 100°F, burner fuel consumption can be reduced by up to 50 percent of HMA production levels; however, typical savings run between 11 and 35 percent.

- ***Estimates that reliance on warm mix asphalt could save the Department of Transportation $3.6 billion are incomplete:*** When looking at just fuel cost savings, PCA was able to closely match that figure with $3.4 billion. What that number does not account for are admixture costs, which can negate a large portion of the fuel cost savings.

- ***Most WMA is produced using water-based foaming methods:*** According to the National Asphalt Pavement Association (NAPA), in 2012, 88 percent of all WMA produced was through water-based foaming at the plant. The remaining 12 percent used additives.

- ***Water-based foaming methods may require other additives:*** Water-based foaming production carries the largest concern for moisture related problems. To counter increased moisture susceptibility, anti-stripping agents (ASA) may be required.

- ***There may be durability concerns with WMA:*** Moisture susceptibility from incomplete aggregate drying and insufficient binder stiffness can lead to pavement deformation such as rutting and fracturing. Multiple studies have addressed concerns that WMA is less resistant to such moisture problems than HMA. Results are mixed. More research is required for moisture susceptibility as well as long-term analysis, as it is still a relatively new technology.

- ***WMA pavements can perform on par with HMA***: To achieve the same level of quality as HMA, WMA mixes require additional measures – in the form of chemicals, waxes, and to varying extents, anti-stripping agents. These add to asphalt paving costs.

Paving Cost Comparisons: Warm-Mix Asphalt Versus Concrete

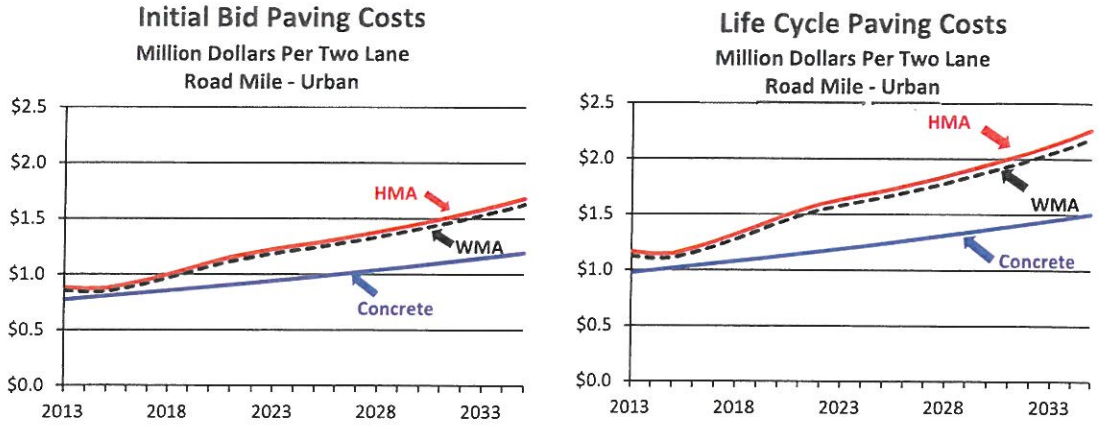
Overview

The U.S. Department of Transportation's (DOT) current initiatives involve adopting best practices for the sake of efficiency and ultimately cost savings. The program *Everyday Counts* is one initiative. In this forum, warm-mix asphalt (WMA) has been featured as an innovative technology that will play a big role in cost saving endeavors. Concerning this relatively new technology, the DOT suggests WMA could save "$3.6 billion by 2020." [1] Research suggests that DOT estimates do not represent the net effect of fuel savings versus additional costs of additives and stripping agents. The savings estimates attached to WMA, therefore, may be exaggerated.

In terms of cost saving initiatives, amidst even the strongest fuel saving case for warm-mix asphalt, concrete remains the most cost effective pavement material for many roadways. Concrete pavement not only costs less over the life cycle of a roadway, but since 2008, also outperforms asphalt on initial cost for many roadways.

The purpose of this report was to investigate the proposed energy cost savings associated with producing WMA instead of traditional hot-mix asphalt (HMA), discuss the different production methods used and how they affect asphalt costs; and demonstrate that concrete pavement is still the most cost effective choice and should be included in the infrastructure recovery dialogue.

The real cost saver is not warm-mix asphalt....it's concrete.



Source: WisPAVE, PCA

[1] At the Transportation Research Board's Annual Meeting in Washington, D.C. on January 15, 2014, Transportation Secretary Anthony Foxx outlined his vision for tackling the infrastructure deficit.

Warm-mix asphalt may be a cheaper alternative to hot-mix asphalt. Concrete, however, remains the most cost effective option for many roadway systems. Using DOT initial bid and life cycle cost software, analyses were performed to compare hot-mix to warm-mix asphalt. An equivalent concrete pavement road was also analyzed. For the warm-mix asphalt representative, the strongest fuel savings case of 50 percent was used. The only difference from the hot-mix equivalent was the savings due to burner fuel reductions – admixture and stripping agent costs were not included for this scenario. The warm-mix alternative clearly saves on cost compared to hot-mix, both on initial and life cycle costs.

Compared to both the hot-mix case and the most favorable fuel savings case for warm-mix, concrete remains the least expensive option both for initial road construction and life cycle costs for many roadways. For an urban two-lane road in 2013, warm-mix asphalt paving costs were estimated at $852,238 per two-lane mile compared to $878,513 per two-lane mile for a hot-mix asphalt roadway – or a savings of roughly $26,000.

Even with the WMA improvement in asphalt paving process, a concrete road was cheaper – requiring only $769,269 per two-lane mile, or roughly $83,000 dollars cheaper than the lowest cost asphalt paving process. By 2020, these savings are expected to grow[2]. The warm-mix roadway is estimated to save roughly $32,000 per two-lane mile over hot-mix. The concrete roadway is estimated to save almost $186,000 over the best warm-mix case[3].

What is Warm-Mix Asphalt?

Warm-mix asphalt is defined by the Federal Highway Administration (FHWA) as "a general term for technologies that reduce the temperature needed to produce and compact asphalt mixtures for the construction of pavements. WMA temperatures generally start 30° - 70°F lower during mixing and remain lower during trucking, placement, and compaction."

This equates to lower energy costs, specifically the amount of burner fuel used in asphalt production. Because lower temperatures are required to dry the aggregate and heat the final asphalt mix for pavement use, less fuel is burned in the process – resulting in the implied savings.

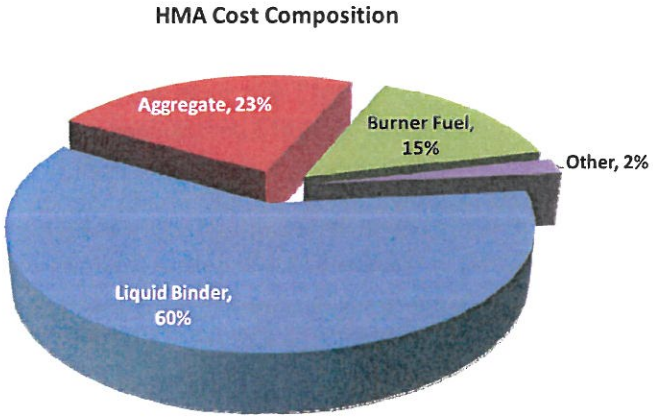
While warm-mix asphalt can lead to lower production costs initially, the net effect of the additional measures required to perform as well as HMA can offset a large portion of these savings. For several production methods, slightly colder asphalt mix temperatures require additives to provide adequate coating of the liquid asphalt binder – at extra cost. These come in the form of chemicals and organic waxes. Other production methods use special equipment that injects water directly into the mix, creating a foaming effect that aids in coating the aggregate with the asphalt binder.

To combat potential moisture problems, other materials called anti-stripping agents can be introduced as well. The technical details and associated costs are discussed in a later section.

[2] Based on EIA oil price projections.

[3] Using WisPAVE Life Cycle Cost Analysis software from WisDOT, these are the total initial costs for HMA, WMA and concrete equivalents.

Concrete pavement remains the least expensive choice for roadway pavement. Since 2008, concrete outperforms asphalt on initial bid costs for an equivalent, urban roadway – even with the proposed energy cost savings associated with warm-mix asphalt. Because less frequent maintenance is required and the life span is much longer than with an asphalt roadway, concrete also exhibits a life cycle cost advantage for the same urban road. Admixture and anti-stripping agent costs further augment concrete's cost advantages.



Source: PCA Analysis

Burner fuel reduction – WMA versus HMA.

There are numerous reports describing a wide range of burner fuel savings associated with warm-mix asphalt processes. The majority of research suggests that WMA production can save from 11 to 50 percent in burner fuel consumption[4]. In a report performed by the National Cooperative Highway Research Program (NCHRP) in 2013 entitled: *Fuel Usage Factors in Highway and Bridge Construction,* the total fuel consumption was measured for several categories of items used in highway and bridge construction, ranging from grading/excavating to the hauling and placing of asphalt pavement.

The report also provided a comparison of the fuel consumption between the production of HMA and WMA. While the initial fuel consumption for HMA production – 2.0 gallons of diesel fuel per ton – was provided by a FHWA technical document from 1980, the WMA fuel consumption number was not physically measured, but rather assigned as 20 percent less than that of HMA production. This assumption translates into a reduction of 0.4 gallons of diesel fuel per ton of asphalt mix.

[4] In a February 2008 report, *Warm-mix Asphalt: European Practice*, performed by the International Technology Scanning Program, and sponsored in part by the Federal Highway Administration (FHWA), the "burner fuel savings with WMA typically range from 20 to 35 percent."

In actuality, the amount of burner fuel consumed for HMA and WMA depends on the production method used. There are three types of methods: organic additives, chemical additives, and water or plant foaming, each with several different sub variations and brands. Altogether there are 22 different WMA technologies in practice in the U.S. The technical details of these methods are summarized in a later section.

According to NAPA in 2012, "plant foaming was used most often in producing WMA, with more than 88 percent of the market; additives accounted for about 12 percent of the market." PCA investigated the fuel savings for each of the three methods and found that chemical additives save up to 50 percent (1.0 gallon), organic additive technologies save up to 35 percent (0.7 gallon), and water-based foaming up to 20 percent (0.4 gallon). Most water-based foaming technologies save between 11 and 14 percent. Only ***the strongest*** cases put forth for each method were considered in the analysis – in other words, asphalt's best foot forward in cost reduction. Three popular WMA processes were assessed, each representing one of the three method categories: Double-Barrel Green® for water-based, Sasobit® for organic additives, and Advera® for the chemical additive technologies.

Method	Example Product	Burner Fuel Savings
Chemical Additives	Advera®	1.0 gal/ton (50%)
Organic Additives	Sasobit®	0.7 gal/ton (35%)
Water-Based Foaming	Double-Barrel Green®	0.4 gal/ton (20%)

Source: FHWA, PCA

Net warm-mix asphalt paving cost savings from burner fuel reduction WITHOUT additives.

It has been stated that warm-mix asphalt could save $3.6 billion by 2020. To assess this possibility requires future projections regarding both hot-mix and warm-mix asphalt costs as well as paving activity. Because asphalt prices are sensitive to movements in oil prices, expected changes for both burner fuel and asphalt bid prices must be considered. For this, PCA relies on oil and energy costs projections provided by the Energy Information Administration (EIA). According to the EIA, oil prices are expected to increase by 8.6 percent from 2013 levels by 2020.

Three fuel savings scenarios were considered: chemical additives with 50 percent savings, organic additives with 35 percent, and water-based foaming with 20 percent. The benchmark for hot-mix asphalt burner fuel consumption was set at 2.0 gallons of diesel fuel per ton. This translates to the following fuel gallon savings: 1.0 gal/ton for chemical additives, 0.7 gal/ton for organic additives, and 0.4 gal/ton for water-based foaming.

Ratios of fuel cost reductions to hot-mix asphalt bid price projections were used to find the asphalt cost savings percentages for each of the three scenarios. Diesel price projections from the EIA were used for the burner fuel prices. As an example, in 2014, the price of a gallon of diesel is expected to be $3.48 and the price of a ton of hot-mix asphalt is expected to bid at $46.02. Therefore, with a 50 percent reduction in fuel usage, or 1.0 gallon, the savings are $3.48 per ton (7.6 percent) in 2014. For a 35 percent fuel

reduction, or 0.7 gallon, the savings are $2.44 per ton (5.3 percent). For 20 percent fuel reduction, or 0.4 gallon, the savings are $1.39 per ton (3.0 percent). The table below is a summary of the fuel cost savings projected out to 2020.

	Price Inputs		Fuel Cost Savings			Asphalt Bid Price Savings		
Year	Diesel Price ($/gal)	HMA Bid Price ($/ton)	Chemical 1.0 gal/ton	Organic 0.7 gal/ton	Water-Based 0.4 gal/ton	Chemical	Organic	Water-Based
2014	$3.48	$46.02	$3.48	$2.44	$1.39	7.6%	5.3%	3.0%
2015	$3.56	$45.89	$3.56	$2.49	$1.42	7.8%	5.4%	3.1%
2016	$3.68	$48.19	$3.68	$2.57	$1.47	7.6%	5.3%	3.1%
2017	$3.81	$51.01	$3.81	$2.67	$1.52	7.5%	5.2%	3.0%
2018	$3.94	$54.28	$3.94	$2.76	$1.58	7.3%	5.1%	2.9%
2019	$4.08	$57.80	$4.08	$2.86	$1.63	7.1%	4.9%	2.8%
2020	$4.20	$61.61	$4.20	$2.94	$1.68	6.8%	4.8%	2.7%

Source: EIA, PCA

The cost savings per lane mile were then calculated in an effort to duplicate the $3.6 billion figure. Admixture costs were excluded at first, thus illustrating warm-mix's effect on energy costs alone. Initial and life cycle cost analyses were performed for one hot-mix asphalt and the three warm-mix asphalt scenarios. From the initial cost findings, the cost for one lane mile of road was calculated for each scenario from 2014 to 2035.

In terms of paving activity, only state DOT jurisdictions were considered. Interstates, arterials, and collectors were included while local roads were excluded. The amount of lane miles that are paved each year was measured at 4.7 percent. Using the latest PCA analysis of Oman Systems bid tabulation data, asphalt's market share of state DOT roads was estimated at 86%. Applying the stock of roads that are likely to be repaved annually, with the portion that are asphalt yields a rough approximation of lane miles under state DOT jurisdiction paved with asphalt. This translates into an average of 74,391 lane miles.

Applying the lane mile savings for each warm-mix scenario from 2014 to 2020, the total cost savings were calculated. A weighted average, using NAPA's share of 88 percent water-foamed and 12 percent additives was applied to find a final savings of approximately $3.4 billion, closely matching the original claim of $3.6 billion. The following table illustrates the lane mile savings for the weighted average of the warm-mix scenarios as compared to the lane mile cost of a hot-mix asphalt road, projected to 2020.

Cumulative Savings - Before Additive and ASA Costs			
	Asphalt Paved Lane Miles	Average Savings	Total Savings
2014	74,391	$5,959	$443,279,439
2015	74,391	$6,078	$452,153,780
2016	74,391	$6,302	$468,779,365
2017	74,391	$6,551	$487,315,088
2018	74,391	$6,733	$500,907,900
2019	74,391	$6,987	$519,780,287
2020	74,391	$7,203	$535,844,369
Total	**520,737**	-	**$3,408,060,228**

Source: Oman Systems, Inc., FHWA, PCA

Admixture requirements for warm-mix asphalt.

The lower temperatures of warm-mix asphalt result in lower energy costs in the process of asphalt production. PCA calculates the cost savings at $3.4 billion compared to estimates that warm mix asphalt could save the DOT $3.6 billion. Unfortunately, slightly colder asphalt mix temperatures require additives to provide adequate coating of the liquid binder. These admixtures drive up asphalt paving costs and can negate a large portion of the fuel cost savings. Research suggests that these estimates do not include the admixture costs and the savings estimates attached to WMA may be exaggerated.

There are 22 WMA production technologies currently used in the U.S. These technologies fall under three broader categories: organic additives, chemical additives, and water-based foaming technologies. Water-based methods do not use additives and therefore require no additional cost for production once initial plant equipment upgrades are performed.

Chemical additives to warm-mix asphalt and costs: The role of the chemical additive is to provide adequate aggregate coating by the liquid binder at lower production temperatures. There are two major types of chemical additive processes. One is called "dispersed asphalt technology," which replaces a portion of the liquid binder with an asphalt emulsion product combined with a chemical additive. The other method uses synthetic zeolites, which are typically used in water softeners[5]. Burner fuel savings for chemical additives can reach 50 percent of HMA levels. This translates to a reduction of 1.0 gallon of diesel fuel per ton. Although they have the greatest reduction in fuel usage, chemical additives can add between $3.50 and $4.50 to the cost of a ton of asphalt mix[6].

Organic additives to warm-mix asphalt and costs: Similar to the chemical additives, organic additives lower the viscosity of the liquid binder, allowing for aggregate coating at lower-than-normal temperatures. The difference is the material used. Instead of a chemical interacting with the binder, an organic wax is added. The wax melts and helps bond the binder to the aggregate, reducing the amount of heat that is normally needed for this bonding to occur. Burner fuel savings with organic additives typically range between 20 and 35 percent. For the purposes of this analysis, the higher end of 35 percent was chosen. This equates to a 0.7 gallon per ton fuel savings. Organic additives can add between $2.00 and $3.50 for each ton of asphalt mix produced[6].

Water-based foaming additives to warm-mix asphalt and costs: Water or plant foaming is the most commonly used group of WMA technologies (88 percent of 2012 WMA production). Water is pumped into the asphalt mix via a spraying mechanism and interacts with the heated liquid binder creating a foaming effect, which then coats the aggregate. Burner fuel savings for water-based foaming

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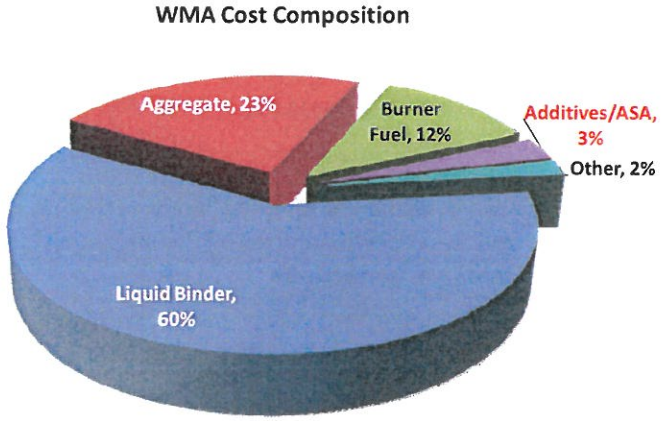
[5] At the molecular level, a zeolite is a chemical whose mass is about 20 percent water that is trapped within its crystalline structure. This water gets released at temperatures close to the boiling point of water. When it comes in contact with the heated asphalt binder in the production process, it creates a foaming effect, which helps coat the aggregate at lower temperatures. Ultimately, the temperature needed to complete the asphalt mix is lowered significantly.

[6] *Warm Mix Asphalt Performance. Potential Benefits And Other Parameters.* Ryerson University, Ontario, Canada. Winter 2010.
http://www.academia.edu/3042215/Warm_Mix_Asphalt_Performance_Potential_Benefits_and_other_Parameters_-_Course_Report

methods range between 11 and 14 percent, with a few claims of up to 20 percent. The higher end of 20 percent was chosen for this analysis. Because these techniques do not use additives, there is no added cost per ton, excluding the initial equipment installation costs.



Source: PCA Analysis

Moisture susceptibility and preventative costs.

Moisture susceptibility: One reason hot-mix asphalt production requires temperatures upwards of 340°F is because of the moisture content in the aggregate. A major role of the burner in asphalt production is to dry the aggregate enough to allow adequate bonding with the liquid asphalt binder, as too much moisture in the mix can adversely affect this bonding. Incomplete drying of the aggregate can lead to a phenomenon called "stripping," in which the aggregate and binder separate. This can cause the pavement to fail structurally, causing rutting and fracturing. Lowering the temperature during production increases the risk for incomplete drying. Warm-mix asphalt production uses lower temperatures. Further still, the most common form of WMA production is **water**-based foaming.

Anti-stripping countermeasures: Anti-stripping agents help strengthen bonds between the aggregate and asphalt binder. Hydrated lime is one of the most common examples and has been used in hot-mix asphalt for decades. Other examples are tallow diamine (TDA) and bis-hexamethylene triamine (BHMT), both liquid agents. ASAs can add between $1.32 and $7.50 per ton of asphalt mix, thus driving up pavement costs[7].

Asphalt binders can vary greatly, with or without additives. Work performed by the FHWA has demonstrated that a binder's stiffness is crude source dependent. The choice of anti-stripping agent can depend heavily on the physical nature of the binder. Some work well with one type of binder, while others may not. Modified binders further complicate the situation as they can also affect the physical nature of the binder.

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[7] Prices for hydrated lime from USGS: http://minerals.usgs.gov/minerals/pubs/commodity/lime/mcs-2013-lime.pdf. TDA, BHMT prices and mix percentages taken from http://www.alibaba.com/ and http://www.asphaltmagazine.com/archives/2005/Spring/Effect_Antistripping_Additives_On_PG_Grades_Asphalt_781778887_7202005152935.pdf

WMA can contain more Reclaimed Asphalt Pavement (RAP) than HMA. This could save on costs in that less virgin materials would be needed; however, the reason for higher levels of RAP is to add to the pavement's structural durability. Another consequence of moisture susceptibility is decreased binder stiffness, which can lead to structural problems. RAP can increase this stiffness. Typically, RAP content in an asphalt mix falls between 10 and 25 percent. Warm-mix asphalt may require higher RAP content to ensure the adequate binder stiffness is maintained.

While increased RAP can reduce the need for virgin materials, it comes at a price too – structural integrity of the pavement. Increased binder stiffness can lead to reduced resistance to thermal cracking. The right combination of production methods, binders, and virgin/reclaimed aggregates must be reached to avoid these issues.

Research on moisture susceptibility: The severity of moisture concerns can vary significantly, and multiple studies have provided mixed conclusions. After reviewing previous research on the subject, the National Cooperative Highway Research Program (NCHRP) states, "the conclusion of several laboratory studies is that WMA has increased moisture susceptibility as compared to HMA..."[8]

As part of their own research, the NCHRP tested samples from the three groups of WMA technologies: chemical additives, organic wax additives, and water foaming. Most of the WMA pavement samples performed well over the specified times. Anti-stripping agents improved performance metrics that were used to gauge moisture susceptibility, especially for the water foaming samples.

WMA production uses less burner fuel; however, chemical and organic wax additives cost money. Depending on the extent of moisture susceptibility, anti-stripping agents may also be required, further adding to paving costs. While many of the WMA field samples performed well in the study, the NCHRP concluded in reference to moisture susceptibility, "several issues regarding WMA remain unclear, and future research is suggested."

Net warm-mix paving cost savings from burner fuel reduction INCLUDING additives.

When accounting for additives and anti-stripping costs, the initial savings of warm-mix asphalt could shrink to as little as $300 million. This suggests the savings estimate could be exaggerated more than ten-fold. To estimate the net warm-mix savings from burner fuel reduction including additives, PCA used the lowest possible admix costs for both the chemical and organic additive groups while excluding the anti-stripping agent (ASA) costs from the water-based foaming group. In doing so, the greatest cost savings accrued to warm-mix asphalt over hot-mix asphalt can be estimated. Including additive costs ***while excluding ASA costs*** yields a potential net savings of approximately $2.7 billion by 2020.

[8] *Evaluation of the Moisture Susceptibility of WMA Technologies,* National Cooperative Highway Research Program 2014 http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_763.pdf

Cumulative Savings - With Additive Costs			
	Asphalt Paved Lane Miles	*Average Savings*	*Total Savings*
2014	74,391	$4,713	$350,601,941
2015	74,391	$4,853	$360,992,832
2016	74,391	$5,004	$372,226,289
2017	74,391	$5,230	$389,076,922
2018	74,391	$5,383	$400,479,202
2019	74,391	$5,612	$417,498,026
2020	74,391	$5,799	$431,371,531
Total	**520,737**	-	**$2,722,246,742**

Source: Oman Systems, Inc., FHWA, PCA

If the costs for anti-stripping agents are considered, the savings drop to under $300 million. The reason for such a significant difference is that the large majority of WMA is produced using water-based foaming (88 percent). If we consider the lowest end of the ASA cost range, $1.32 per ton (hydrated lime), the resulting savings are as follows[9]:

Cumulative Savings - With Additive and ASA Costs			
	Asphalt Paved Lane Miles	*Average Savings*	*Total Savings*
2014	74,391	$328	$24,377,410
2015	74,391	$368	$27,353,839
2016	74,391	$452	$33,644,758
2017	74,391	$579	$43,080,929
2018	74,391	$627	$46,653,706
2019	74,391	$795	$59,145,033
2020	74,391	$882	$65,604,404
Total	**520,737**	-	**$299,860,078**

Source: Oman Systems, Inc., FHWA, PCA

Conclusions

Warm-mix asphalt is a growing technology in Europe and the United States. Since its adoption on U.S. soil in the 2000s, production of WMA has grown to 87 million tons in 2012, roughly 24 percent of total U.S. asphalt production.

WMA production requires less fuel than HMA. Fuel is consumed by burners, which dry the aggregate and heat the mix once the liquid binder is added. Diesel fuel is the most common burner fuel. Typical asphalt plant production consumes approximately 2 gallons of diesel fuel for every ton of mix.

[9] The severity of moisture susceptibility with warm-mix asphalt pavements will dictate the need for ASAs. Depending on the extent of use with these ASAs, the savings could be considerably less.

Estimates that reliance on warm mix asphalt could save the Department of Transportation $3.6 billion by 2020 appear to be incomplete: These savings refer to the reduction of burner fuel that warm-mix provides. PCA investigated these claims and matched fairly close to this number at $3.4 billion when looking at fuel reductions only. These estimates were found to be incomplete, as they do not appear to take into account any admixture costs that are associated with these new technologies.

There are currently 22 WMA production technologies in practice in the U.S. These technologies fall under three broader categories: chemical additives, organic additives, and water-based foaming.

Depending on the method used, the amount of fuel consumed during warm-mix production can be reduced by 11 to 50 percent of hot-mix asphalt levels. Chemical additives result in the greatest burner fuel reductions at up to 50 percent of HMA levels. Organic additives can reduce burner fuel consumption by up to 35 percent and water-based foaming can save between 11 and 20 percent. In 2012, 88 percent of all WMA produced in the U.S. was performed via water-based foaming.

Because temperatures are lower than normal hot-mix production levels, the risk for incomplete aggregate drying is increased. Incomplete aggregate drying can lead to increased moisture susceptibility. Excessive moisture in asphalt pavements can cause a phenomenon called "stripping," in which the aggregate separates from the binder. This can cause the pavement to fail structurally. Anti-stripping agents, typically liquid additives, can alleviate moisture susceptibility in WMA – at a cost.

Studies have produced various conclusions regarding moisture susceptibility in WMA pavements. In a recent report by the NCHRP, several WMA samples performed on par with HMA. Chemical and organic additive technologies were represented in the majority of the samples. Anti-stripping agents were also found to reduce moisture related risks, particularly with water-foamed samples. Further research on moisture susceptibility was suggested.

Using the strongest fuel savings case provided, PCA was able to reach a projected fuel cost savings of $3.4 billion by 2020. The next step was to incorporate the additive costs in order to reach a net savings figure. Accounting for conservative chemical and organic wax additive costs, the net savings falls to $2.7 billion. With the most conservative ASA costs included, the net savings by 2020 falls below $300 million, a difference of over ten-fold.

When discussing transportation and infrastructure recovery, concrete pavement should also be included in the dialogue. Even with the advent of warm-mix asphalt and the savings it provides, concrete pavements remain the most cost effective alternative. For an urban road, concrete costs less than both the hot-mix and most fuel reducing warm-mix equivalents, initially and throughout the life of the road. ***Yes, warm-mix asphalt is more cost effective than hot-mix but still does not compare to concrete pavement.***

Concrete vs Asphalt Roads: Pros and Cons of Each

Concrete vs Asphalt Roads: Pros and Cons of Each

Both concrete and asphalt are go-to materials for paving a road or parking lot. Discover the pros and cons of each as we compare concrete vs asphalt roads.

Keyword(s): concrete vs asphalt roads

Where the idea of an open road used to conjure smooth blacktops radiating heat from the sun, today's roads are turning more gray.

Concrete road paving is quickly reaching the same popularity as asphalt, and the reasons are many. However, it's not always apparent which paving method is the best for your job. Read on to discover the pros and cons of concrete vs asphalt roads.

Concrete Road Advantages

The biggest benefit of concrete road construction is the longevity. Lasting 20-40 years on average, paving in concrete can boast two to four times the lifespan of asphalt.

Concrete, it may surprise you to know, is recyclable. Once crushed into gravel, concrete can be used in a variety of ways.

High truck volume is better suited to concrete roads, as they hold up better under the weight and pressure. This sturdy surface is less prone to dips and rutting, meaning it is a favorite for freeway construction.

Though not immune to the freeze-thaw cycle, concrete is more resistant. Where asphalt tends to embrittle over time, concrete is more hearty.

Concrete tends to be a greener material. Producing it creates less environmental pollution, and cars run with better fuel efficiency on concrete. Concrete is also produced from limestone, which is widely available.

Concrete Disadvantages

Though concrete lasts a long time, repairing it is a bigger chore. Holes or cracks can't be simply patched--instead, entire slabs must be replaced.

Concrete doesn't always make for a smooth ride, either. In order to create enough grip on the road, texture is brushed into the surface. This, and slabs settling over time, can make for a somewhat bumpy and noisy roadway.

The costs of concrete roads are also higher than that of asphalt, both in installation and repair.

Concrete is not as "grippy" as asphalt, either. Spills, vehicle chemicals, and other pollutants do not absorb into concrete as well as asphalt. This material is also more prone to slippage during rain or snow.

Advantages of Asphalt Roads

Asphalt has an attractive price point, even as prices have slowly begun to creep up over time. Like concrete, asphalt is 100% recyclable. When melted down, it can be used again to create new roadways.

New asphalt is quieter than concrete. Though it creates a smooth drive, it also boasts better traction and skid resistance.

Since asphalt is black, it utilizes the natural heat from the sun to help keep the roads clear after storms. Heat absorbing into asphalt creates an ideal atmosphere for snow melt and moisture evaporation.

Asphalt is ideal for rural roadways because of the ease of maintenance and repair. Budgeting for small roadway repairs or patching is much simpler and faster than replacing entire slabs of roadways on less heavily trafficked areas such as country roads.

Disadvantages

The process of melting asphalt creates greenhouses gasses, which contribute to environmental pollution. This happens regardless of new production or recycling.

Asphalt is a cheaper and faster solution for short-term projects, but

the repairs are sometimes just as extensive as concrete. With only a 10-year lifespan, asphalt must be re-laid or repaired on a much more regular basis.

Concrete Vs Asphalt Roads: Which is Better?

There is no simple answer to the question of which material is preferable. When trying to decide between concrete vs asphalt roads, it's important to consider the specifics of your project first and foremost.

Choosing material for your paving project can't be decided on initial costs alone. Need some guidance? Visit us at Perrin Construction to get the perfect bid for your paving project, today.

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How is Asphalt Made? A Look Inside the Manufacturing Process

ASPHALT

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PAVING FINDER

ASPHALT

ASPHALT VS CONCRETE ROADS – 5 FACTORS TO CONSIDER

The decision making process for selecting paving materials is often based on the initial cost of asphalt vs concrete roads. However, **several factors need to go into your evaluation of asphalt vs concrete roads** for a new highway or replacement of an existing road.

While the price is always a factor, you also need to think about the paving material's other five inherent factors. Evaluate how it is made, lifetime durability, maintenance requirements, expected traffic impact, climate effects, and the environmental impact of the type of product you choose.

PAVING FINDER

Asphalt is a manufactured aggregate comprised of a smooth blend of bituminous oil, sand, and gravel. When roads are built using asphalt construction, hot asphalt is poured onto a heavier aggregate bed of gravel and pressed into it with a steamroller.

Once the asphalt cools, it is strong enough to withstand automobile traffic. Asphalt is smooth, black, and does not absorb water. While asphalt is tough and durable, it offers enough flexibility to adjust to imperfect underlying surfaces.

When choosing asphalt or concrete for your project, consider the following:

1. The initial cost of building asphalt vs concrete road
2. Long term durability and maintenance costs
3. How climate affects which road type you need
4. Impact of traffic type and quantity
5. Environmental impact

CHOOSING ASPHALT

The National Asphalt Pavement Association cites **three key reasons to choose Asphalt** for your road-paving project:

1. Asphalt is the most popular road surfacing material in the USA, as 94% of roads in the U.S. are asphalt. [https://www.asphaltpavement.org/uploads/documents/GovAffairs/NAPA%252 02-14%2520Final.pdf]
2. Asphalt paving construction can be completed quickly. Traffic delays for both commuters and long-haul truckers will be minimized. You'll be able to drive across your new asphalt surface in three to four

3. Asphalt holds up better under harsh weather conditions and provides a smoother ride. Concrete can be eroded by salt during winter and has a brushed or tined surface, which is not smooth and can create a noisier ride.

CHOOSING CONCRETE

Concrete consists of binding material called cement, composed of lime, silica, alumina, and gypsum, which are mixed with sand, aggregate and water.

As the mixture dries (cures), it forms a stiff, unforgiving solid surface. The natural color of concrete is grey, but adding colors provides almost any desired shade.

The **Portland Cement Association** [http://www.cement.org/] boasts **three facts that should cause you to choose Concrete** for your road-paving project:

1. Concrete holds up better than asphalt under heavy traffic and heavy truck volumes and is easier to see at night due to it's lighter color.
2. Concrete pavement requires little to no maintenance [https://www.shapedbyconcrete.com/#news?article=sustainability-practices] throughout its life.
3. Unlike asphalt, it does not need repeated resurfacing, patching, or spot repairs.

PAVING FINDER

1. THE INITIAL COST OF BUILDING ASPHALT VS CONCRETE ROAD

ASPHALT

Concrete can cost, on average, 50 percent more than asphalt, making asphalt a better value for your money. Asphalt can run about $4 to $6 per square foot.

CONCRETE

Concrete is usually the most expensive option initially. Concrete can cost 2-3 times as much as asphalt and about 6X the gravel cost. Concrete can run $5 to $10 per square foot.

2. LONG TERM DURABILITY AND MAINTENANCE COSTS

Along with the initial cost of the paving material, you should also evaluate the life-cycle costs, of which the cost to maintain the road and durability are a large part.

ASPHALT

contact with the driveway, increasing skid resistance.

Asphalt has higher annual maintenance costs than concrete. You may need to apply top layer sealants, depending on your climate. Those sealants may need refreshing every 3 or 5 years.

However, repairing an asphalt roadway is simpler [https://www.ayresassociates.com/asphalt-vs-concrete-not-black-white-choice/] than a concrete road, as total removal and reconstruction are not needed. Just the top layer of asphalt is removed and replaced. The asphalt material removed can then be recycled.

The typical asphalt road will last 20 – 30 years.

CONCRETE

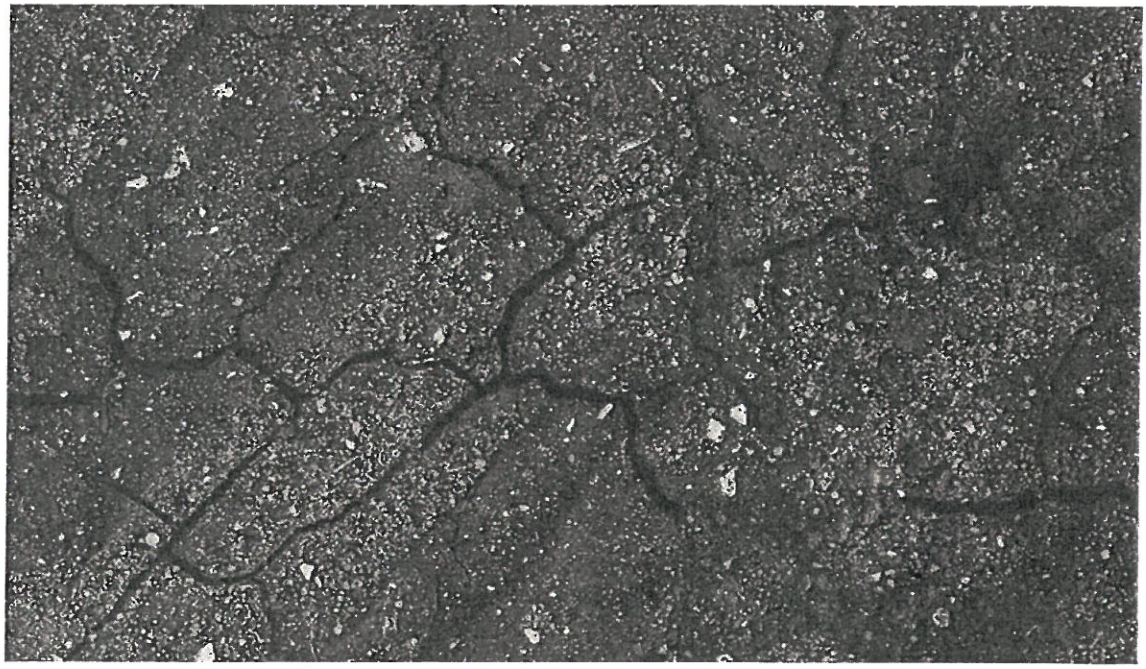
Concrete, if installed correctly, has two to four times the lifespan of asphalt and is easier to maintain.

Concrete is considerably less prone to wear and tear defects like rutting, cracking, stripping loss of texture, and potholes that can occur with flexible pavement surfaces like asphalt. However, Concrete is prone to cracking under extreme pressure and is costly to repair. Holes or cracks can't be patched–instead, entire slabs must be replaced.

Less frequent maintenance translates into lower ownership costs [https://www.cement.org/docs/default-source/th-paving-pdfs/leg_issues/public-private-partner-pca-logo.pdf?sfvrsn=2sfvrsn=2].

- A recent PCA survey concluded that concrete pavement lasts 29.4 years on average before a significant rehabilitation is required.
- Asphalt pavements required a significant rehabilitation after 13.8 years.

Concrete has the longest lifetime and will need to be replaced only about every 30 to 40 years.



3. HOW CLIMATE AFFECTS WHICH ROAD TYPE YOU NEED

Temperature changes, the impact of the sun's heat, snow and ice, and rain, all can take a heavy toll on roadways.

ASPHALT

Asphalt's black color absorbs the sun and facilitates snow and ice melt. If the sun can't reach the surface, it's okay to apply salt because chemicals won't damage asphalt.

Asphalt road provides better safety of the vehicle against snow and skidding. [https://pavingfinder.com/expert-advice/advantages-of-asphalt/] The reason is that its surface isn't as rigid, allowing it to expand and contract depending on the climate.

leading to distorted and unattractive surfaces.

CONCRETE

- Cold weather can cause concrete to expand and contract, leading to cracking. [http://www.lassp.cornell.edu.sethan.simscience/cracks/advanced/temp_loads.ht
- Concrete can also be damaged by road salt. Salt damages concrete over time by causing corrosion to occur under the surface, causing cracking and crumbling.
- Finally, concrete is slippery when icy or rainy providing poor vehicle traction.

4. IMPACT OF TRAFFIC TYPE AND QUANTITY

Pavement wearing is a process involving deterioration by vehicle and load other. Factors influencing this type of wear are the actual traffic load or volume and the vehicle type.

Passenger cars have little effect on a pavement's service life from a materials fatigue perspective.

A number of experiments were conducted by the American Association of State Highway and Transportation Official (AASHO) to determine how traffic contributed to the deterioration of highway pavements. According to the results of AASHO Road Test [https://pavementinteractive.org/reference-desk/design/structural-design/aasho-road-test/], heavily loaded trucks can do more than 10,000 times the damage done by an average passenger car.

ASPHALT

greater than 1200 vehicles.

All asphalt pavements have a bridging action that makes them flexible, which means **they can withstand occasional overloads without serious damage to the road.** Asphalt pavements can be designed to suit any type of conditions for traffic, soils, and materials.

Asphalt is a popular pavement material for low- and medium-traffic roadways, [https://www.asphaltroads.org/assets/_conrol/content/files/pavement_type_selectic and has proven itself over time under heavy truck traffic in urban and rural settings.

Heavy vehicles like delivery trucks put a lot of pressure on asphalt roads. **Consistent stress on asphalt can cause different types of cracks and lead to the formation of potholes**.

CONCRETE

High traffic counts and heavy truck volumes make concrete a desirable choice because it simply holds up better under heavy loads. State departments of transportation tend to go with concrete on interstates.

Concrete is regarded as less susceptible to rutting, frost heaves in colder climates and stresses related to the constant pounding it takes from heavy loads.

PAVING FINDER

5. ENVIRONMENTAL IMPACT

For pavements, each phase of the life-cycle, including raw materials production, construction, maintenance, use, and end-of-life, poses a unique burden on the environment.

The LEED Green Building Rating System [http://www.usgbc.org/LEED] used by many contractors is a scorecard for the design, construction, and operation of green buildings. Pavement type selection of asphalt vs concrete road can contribute directly to some LEED credits.

ASPHALT

Asphalt pavements require 20 percent less energy [https://www.asphaltroads.org/why-asphalt/environment/] to produce and construct than other pavements. Asphalt paving is a sustainable construction process. When appropriately designed and built, the road itself doesn't wear out.

Asphalt pavements do not leach. Once they are constructed, asphalt pavements have a low environmental impact. Studies show asphalt pavements and stockpiles of reclaimed asphalt pavement don't leach.

of product every year and reuses or recycles about 99 percent of it.

CONCRETE

According to a Department of Transportation Study, **concrete has a low lifetime impact on the environment due to its lower energy cost i** [https://pavingifnder.com/expert-advice/parking-lot-paving/] nitially, better recyclability, and lower lifetime reflection of sunlight into the atmosphere.

The Construction Materials Recycling Association estimates that about **140 million tons of concrete are recycled each year** [https://www.cdrecycling.org/materials/concrete/] in the U.S., reducing the construction projects' environmental impact.

Concrete does not rust, rot or burn, saving energy and resources needed to replace or repair damaged buildings and infrastructure.

- While each paving material has some environmental benefits, neither is a sustainable product. Asphalt and concrete are made from materials that are drilled for or mined and have an adverse environmental impact.
- Both surfaces are impermeable, leading to water runoff and potential problems for local water treatment facilities, rivers, and streams.
- Both release Volatile Organic Compounds (VOC). [https://www.aexcelcorp.com/log/eco-friendly-traffic-paint/3-ways-asphalt-nd-concrete-are-affecting-the-planet/] Petroleum-based asphalt is a high volatile organic compound. As the product converts to asphalt, significant quantities of harmful greenhouse gases are released into the atmosphere. The cement producing process for concrete requires high levels of heat and generates significant VOC emissions.

PAVING FINDER

	Asphalt	Concrete
Composition	Aggregate made from bituminous oil, sand, and gravel	Aggregate made from sand and crushed rock, cement, and water.
Initial Cost	Average cost $4 to $6 per square foot	Average cost $5 to $10 per square foot
Durability	Asphalt has an average service life of 20-30 years.	Concrete has an average service life of 30 to 40 years.
Maintenance & Requirements Costs	Asphalt roads require resurfacing every 3-5 years.	Concrete roads require Low maintenance requirements and costs.
Climate impact	Asphalt offers better safety against snow, ice & skidding. Extreme heat can cause asphalt to soften.	Concrete does not soften in warm climates. Extreme cold can cause cracking.
Environment impact	Asphalt requires 20% less energy to produce but can emit greenhouse gases. Asphalt doesn't leach and is recyclable.	The use of industrial byproducts in concrete lowers energy usage and reduces the generation of greenhouse gases. Concrete can be 100% recycled at the end of its service life.

offers a guarantee on their work.

- The cheapest contractor is usually not the best contractor for the job. However, the highest-priced contractor does not always mean they are the best. Be sure you get estimates from several contractors. Look at the cost of the proposed materials, and ask for testimonials.

- Contractors vary in their experience, sourcing of materials, [https://pavingfinder.com/expert-advice/tips-for-hiring-a-local-paving-company/] and pricing. Beware of estimates that are significantly lower or higher than all of the rest, as that can be a sign of inexperience, low-quality materials used, poor workmanship, or price gauging.

- Don't even think about working with a contractor that does not guarantee their work. [https://pavingfinder.com/expert-advice/tips-for-hiring-a-local-paving-company/]

PAVING FINDER

Thoroughly evaluate the five factors we've discussed and the ultimate use for your project to consider whether to choose asphalt vs concrete roads. When considering cost, be sure to look at both the initial cost and the life-cycle cost. **The paving material that offers the most advantages for your project needs is going to be your best choice.**

Look for paving contractors that have been in business for a while. They should have good testimonials and reviews for projects that are similar to yours. Ask other business owners for their paving contractor referrals. Be sure to consider all the factors discussed in this article for your road-building project, and **choose your contractor carefully.**

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