

2011 Pavement Condition Report



The Tigard Public Works Department is responsible for the maintenance of 150 miles of paved streets. The maintenance strategy for each street varies depending on the use and character of that street.

Accomplishments for 2011

Pavement projects completed in 2011 are summarized in the following table.

Project	Pavement Overlays	Slurry Seals
Length Completed	2.5 miles	12 miles
Funding Source	Street maintenance fee	Street maintenance fee
Cost	\$699,000	\$302,000
Cost Per Mile	\$280,000	\$25,000
Street Type	Collector, commercial, residential	Residential

A map, (Attachment A), of the 2011 pavement projects is included in this report.

2011 was a good year for Tigard’s roadways. The average Pavement Condition Index (PCI) of city streets increased from 68.7 at the end of 2010 to 69.0 at the end of 2011. This was better than our projected PCI of 68.1. Three factors were significant in this improvement:

- 1) Successful completion of a large slurry seal project in western and northern central Tigard.
- 2) A competitive bidding climate, likely due to the poor economy, resulted in favorable pricing for the city’s paving projects.
- 3) City street crews completed many “dig out” repairs. The repairs improved the condition of several streets, bringing them up to a level that made a slurry seal application feasible. This enabled us to slurry seal some streets that, prior to the repairs, would not have qualified for a slurry seal application.

Previous Council Action and the Street Maintenance Fee

Pavement maintenance is primarily funded through the city’s street maintenance fee. The street maintenance fee is a monthly user fee dedicated to the maintenance of existing roadways in Tigard. The fee was recommended by a citizen task force and established by Ordinance No. 03-10 in November 2003.

Since the fee was originally adopted, construction costs increased significantly, largely due to increases in the cost of asphalt, which is a petroleum product. The council re-visited the street maintenance fee in 2009 and determined the fee was not generating enough revenue to realistically address the city’s \$8.5 million road maintenance needs. In January 2010, the council adopted:

- **Ordinance No. 10-01** which amended the Tigard Municipal Code (TMC). The ordinance directs that beginning July 1, 2010 the street maintenance fee will be increased in three phases, with subsequent phase-ins taking effect April 1, 2011 and January 1, 2012. The ordinance also directs that the fee be adjusted for inflation.
- **Resolution No. 10-01** which established a long-term average PCI goal of 70 to 75 and also established an interim goal to “hold the line” by maintaining an average PCI of at least 67.

A long-term average PCI of 75 would allow the city to get the most out of street maintenance revenues by strategically paving streets before the underlying road structure is compromised. When an overall PCI gets below 75, street maintenance life cycle costs begin to increase, because streets are in poorer condition and need some level of reconstruction before they can be paved. Slurry seal applications are only feasible on streets with pavement in relatively good condition. When Resolution 10-01 passed, the council recognized that funding would not be adequate to get to a PCI of 75. The council sought to prevent a decline in the PCI below 67. Beyond this point, streets require more extensive reconstruction prior to paving; this results in substantially higher street maintenance costs.

- **Resolution No. 10-02** which adjusted the street maintenance fee in the city’s Master Fees and Charges Schedule.

Current street maintenance fees, as they appear in the city’s 2010-2011 Master Fees and Charges Schedule, are as follows:

Effective Dates	Before 7/1/10	7/1/10 – 4/1/11	4/1/11 – 1/1/12	After 1/1/12
Residential (Per House or Unit)	\$2.18	\$3.01	\$4.13	\$5.45**
Commercial and Industrial (Per Required Parking Space)	\$0.78	\$0.92	\$1.06	\$1.23**

** Note: The January 1, 2012, fee amounts have been adjusted for inflation based on the methodology adopted in Ordinance 10-01. These adjustments were included in the 2011-2012 Master Fees and Charges Schedule.

The Pavement Condition Index (PCI)

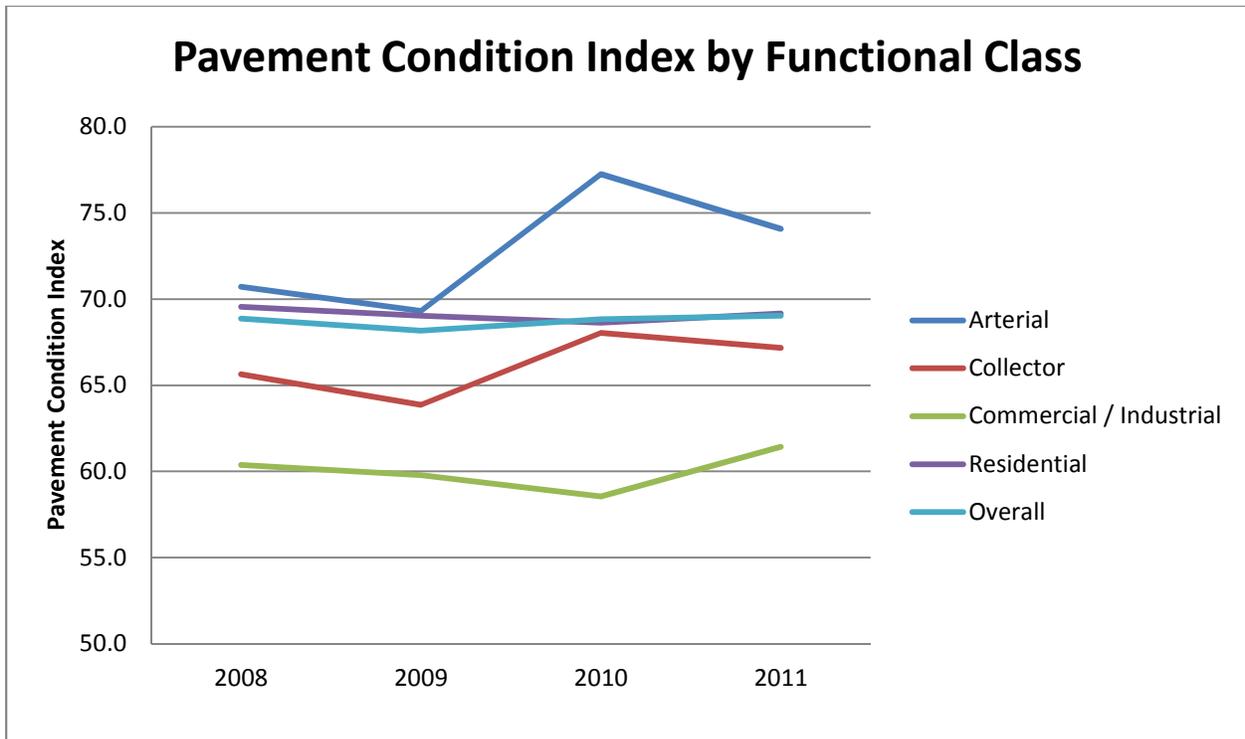
Pavement condition is measured by a Pavement Condition Index (PCI), with zero being the poorest condition and 100 being the best condition. PCI factors include pavement condition, pavement distress, structural strength, and smoothness of ride.

Paving Priorities

Attachment B is a map showing the paving projects that have been completed in the past three years. In order to maintain the overall street network in the best possible overall condition, we have focused our paving work on two main priorities:

- 1) Pavement overlays on arterials, collectors, commercial and neighborhood routes. Approximately \$700,000 has been spent this fiscal year constructing pavement overlays on 2.5 miles of important through routes.
- 2) Preventive maintenance on residential streets. Approximately \$300,000 has been spent this fiscal year applying slurry seal to 12 miles of residential streets. These slurry seals provide the most area of improved pavement per dollar, but are only effective if the pavement is in relatively good condition.

These priorities are reflected in the following graph.

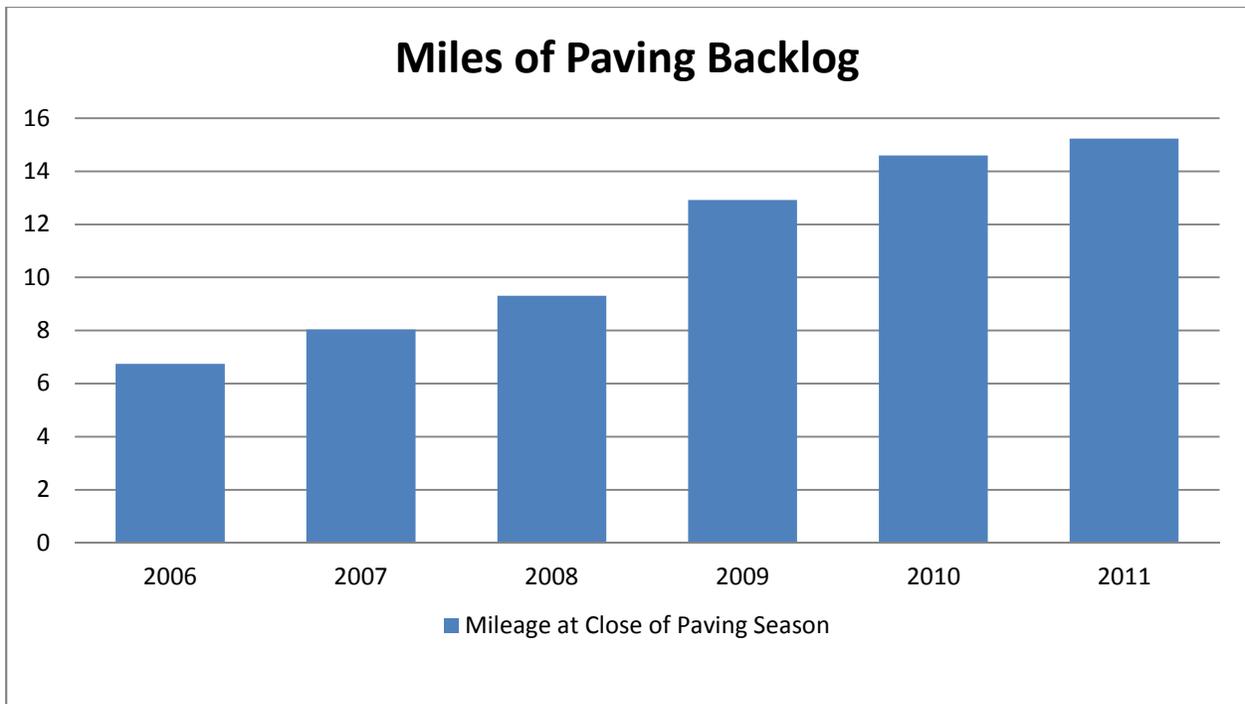


Pavement deteriorates rapidly on arterials and collectors because many thousands of vehicles use the roadway every day. This results in significant costs just to keep up with day-to-day deterioration.

The use of slurry seal applications and other preventive maintenance on residential streets has allowed us to maintain streets that are in good condition and keep a relatively high average pavement condition. To continue this momentum, residential streets in good condition will receive slurry seal applications every eight years.

Paving Backlog

The city's current reconstruction and pavement overlay strategy focuses on keeping arterials, collectors, and other key connection routes in good condition. However, there are many low-traffic-volume, local streets where the pavement condition has deteriorated beyond the level at which a slurry seal application can be effective. These streets make up the city's paving backlog. The following table shows the paving backlog, measured in miles, over a six-year period.



Currently, there are approximately 15 miles of paving backlogs. This is approximately 10 percent of our total street mileage. The cost to pave these streets would be approximately \$8 million. It is anticipated this backlog will level off as the street maintenance fee is fully phased-in.

Finance Director’s Findings

The finance director has reviewed this report and future pavement maintenance funding requirements as identified in the Pavement Management Program (PMP). Data has not changed significantly from what the council considered after the 2010 paving season.

Actual revenue collections for fiscal year 2011 were analyzed and they were sufficient to meet the annual funding level set from the street maintenance plan and the fiscal year 2011-2012 Adopted Budget. Completion of the street maintenance fee phase-in, along with an inflationary adjustment(s), is expected to generate sufficient revenue to fund the PMP in the coming years. The 2011-2016 Capital Improvement Plan PMP approved budget is as follows:

Fiscal Year	2012	2013	2014	2015	2016
PMP	\$1,115,400	1,390,400	1,690,400	1,690,400	1,690,400

Additionally, the split between customer types was analyzed to determine if costs were equitably split when compared to revenues collected. The allocation of the costs of the five-year plan is set in TMC 15.20.050 and is summarized as follows:

Road Type	Percentage of Residential Allocation	Percentage of Non-Residential Allocation
Arterial	62%	38%
Local Commercial/Industrial	0%	100%
Collector	50%	50%
Neighborhood/Local	100%	0%

It is important to realize the fee is based on a five-year plan and that there will be variance from one year to the next where one customer group may subsidize another in any given year; the important thing is that the program costs reflect the revenues collected by customer type over the five-year period. If they do not, the TMC instructs the Finance Director to make recommendations based on this review. The following table summarizes my findings:

Customer Class	Total PMP Expense Related to Street Maintenance Fee	Percentage of Total Expense per the TMC	Percentage of Revenue Collection	Share of Expenses Based on Revenue Collected	Variance
Residential	\$705,000	70%	62%	\$623,221	\$81,779
Non-Residential	\$296,000	30%	38%	\$377,779	(\$81,779)
Total	\$1,001,000			\$1,001,000	

Tigard incurred \$1,001,000 in FY 2011 in the PMP expenses related to the street maintenance fee. Based on the types of roads, (arterial, collector, etc.), that received pavement maintenance through the PMP, \$705,000 (70 percent) of the PMP expenses should have been born by residential customers and \$296,000 (30 percent) of the PMP expenses should have been born by non-residential customers.

The actual revenues collected in FY 2011 have a slightly different split. Sixty-two percent of the revenues came from the residential sector and 38 percent of the revenues came from the non-residential sector. Based on the size of the PMP and the way revenues were collected, a more equitable split would have been for \$623,221 to come from the residential sector and for \$377,779 to come from the non-residential sector. During the last year, the non-residential sector subsidized the residential sector by \$81,779, or eight percent of the total PMP. An eight percent variance, in one year of a five-year plan, is relatively small and does not merit a recommendation to adjust the street maintenance fee at this time.

Outlook for 2012

It is anticipated that approximately \$1.4 million in street maintenance fee revenue collected in fiscal year 2011-2012 will be available for paving projects in the summer of 2012. Approximately \$450,000 is planned to fund 14 miles of slurry seal applications. Approximately \$850,000 is planned to fund pavement overlays on about three miles of streets. The remaining funds, about \$100,000, will be used for crack sealing, pavement analysis, engineering, inspection, and program administration.

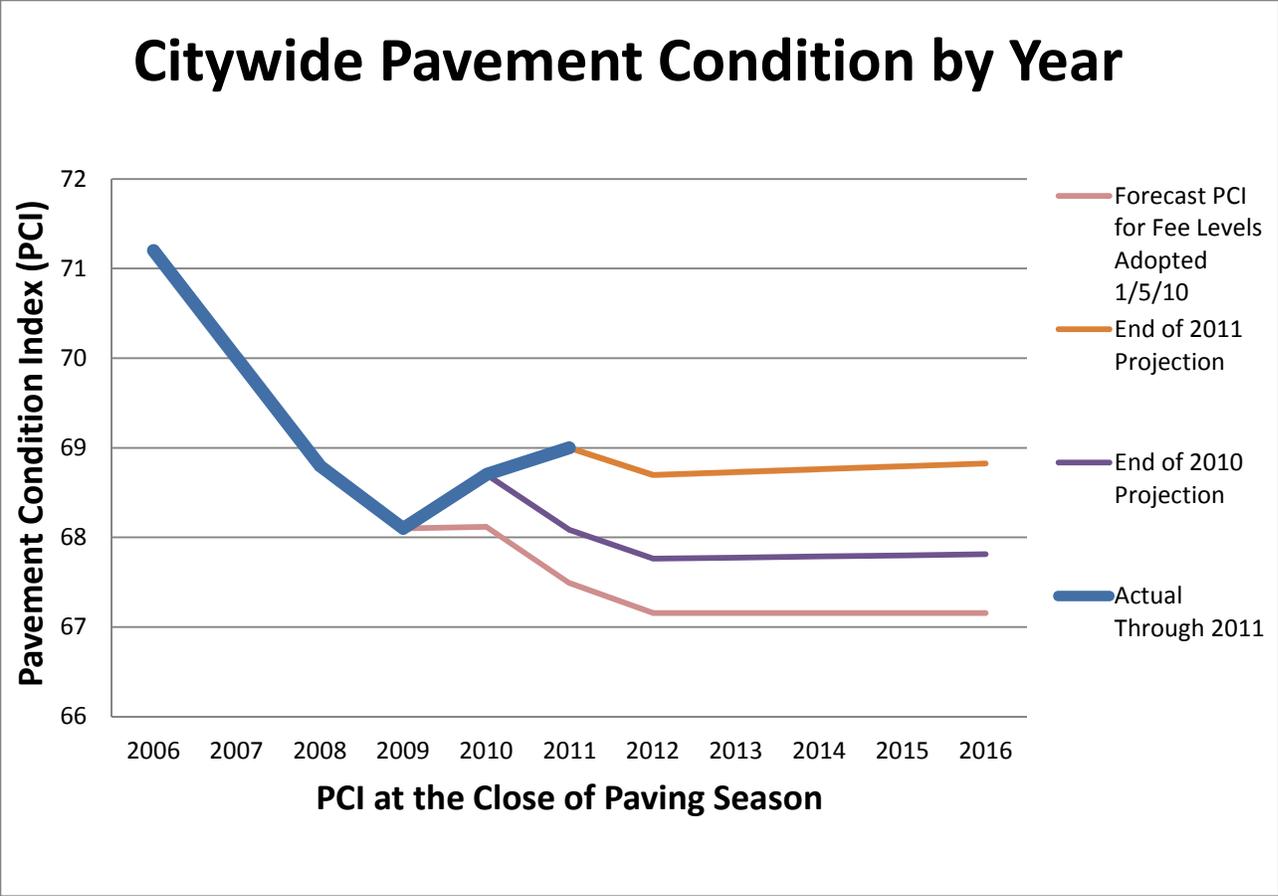
2012 is expected to be a more typical paving year as compared to the last couple of years. As the economy picks up, prices for asphalt, aggregate, fuel, and other key items are likely to increase. As more construction work becomes available, contractors will be less hungry for work and are likely to include more profit in their bids. This would translate to higher prices for paving work.

A map, (Attachment C), of the proposed 2012 pavement projects is included in this report. This map represents staff's projections as to what paving projects can be achieved with available funding in the summer of 2012. Changes in asphalt prices and the construction bidding climate may have a significant impact on the amount of work the city will be able to fund. Streets may need to be deleted from the pavement overlay list in order to keep the project within budget. On the other hand, streets could be added to the pavement overlay list if bids are lower than expected.

If the projected level of work can be completed, it is anticipated that the overall pavement condition index of Tigard's street system, currently at a PCI of 69.0, will decline to a PCI of 68.7. This is because anticipated 2012 funding will not keep up with a year of normal street deterioration. The paving backlog is also expected to increase slightly from 15 miles to 16 miles.

Outlook Beyond 2012

Once the city collects revenue under the fully phased-in street maintenance fees for an entire year, funding should prevent further increases in the paving backlog and should allow the city to maintain an average PCI of 67, as directed in Resolution No. 10-01. This is contingent upon asphalt prices remaining within the range of the fee's inflationary adjustment. The following chart depicts the actual and projected citywide PCI through 2016.



The better than expected paving progress made in 2010 and 2011 have resulted in a current average pavement condition index of 69.0, which is better than the 67.5 forecast at the end of 2009. This better pavement condition slightly reduces the cost necessary to “hold the line.” This raises our forecast from “hold the line” to a slight pavement condition index improvement from 68.7 to 68.9 in the years 2012 through 2016, provided pricing and other factors remain consistent with projections.

Pavement Maintenance Background

Residential Streets with Low Traffic Volumes

Residential streets with low traffic volumes tend to deteriorate due to weathering. As years of rain, sun, and freeze-thaw cycles wear the pavement from the top down, the sticky asphalt binder that holds the pavement together deteriorates. In a **slurry seal** application, a liquid mixture of asphalt emulsion and sand is applied to the roadway. The mixture hardens as it cools and counters the effects of weathering by restoring the asphalt binder near the pavement’s surface.

Slurry seal applications cost about one-tenth as much as pavement overlays and are the most cost-effective way to extend the life of residential streets. The application is applied when a street is still in relatively good condition in order to maintain that condition for several more years. Slurry seal applications don’t make streets look like new, but they do prevent further deterioration. Some streets have deteriorated to a condition that is too poor to slurry seal; these streets require pavement overlays and will be addressed as funding allows.

The city's slurry seal strategy is to work on an eight-year cycle by Neighborhood Network area, slurry sealing all of the low-traffic-volume streets that are in relatively good condition. Slurry seal projects require extensive public notification because sections of the street are closed for several hours at a time. Consolidating slurry seal streets by Neighborhood Network area improves the efficiency of both the notification process and the slurry seal application.

In order to keep up with pavement deterioration on low volume residential streets, it is necessary to slurry seal about 11 miles of roadway each year.

Streets with High Traffic Volumes and Streets Used by Heavy Vehicles

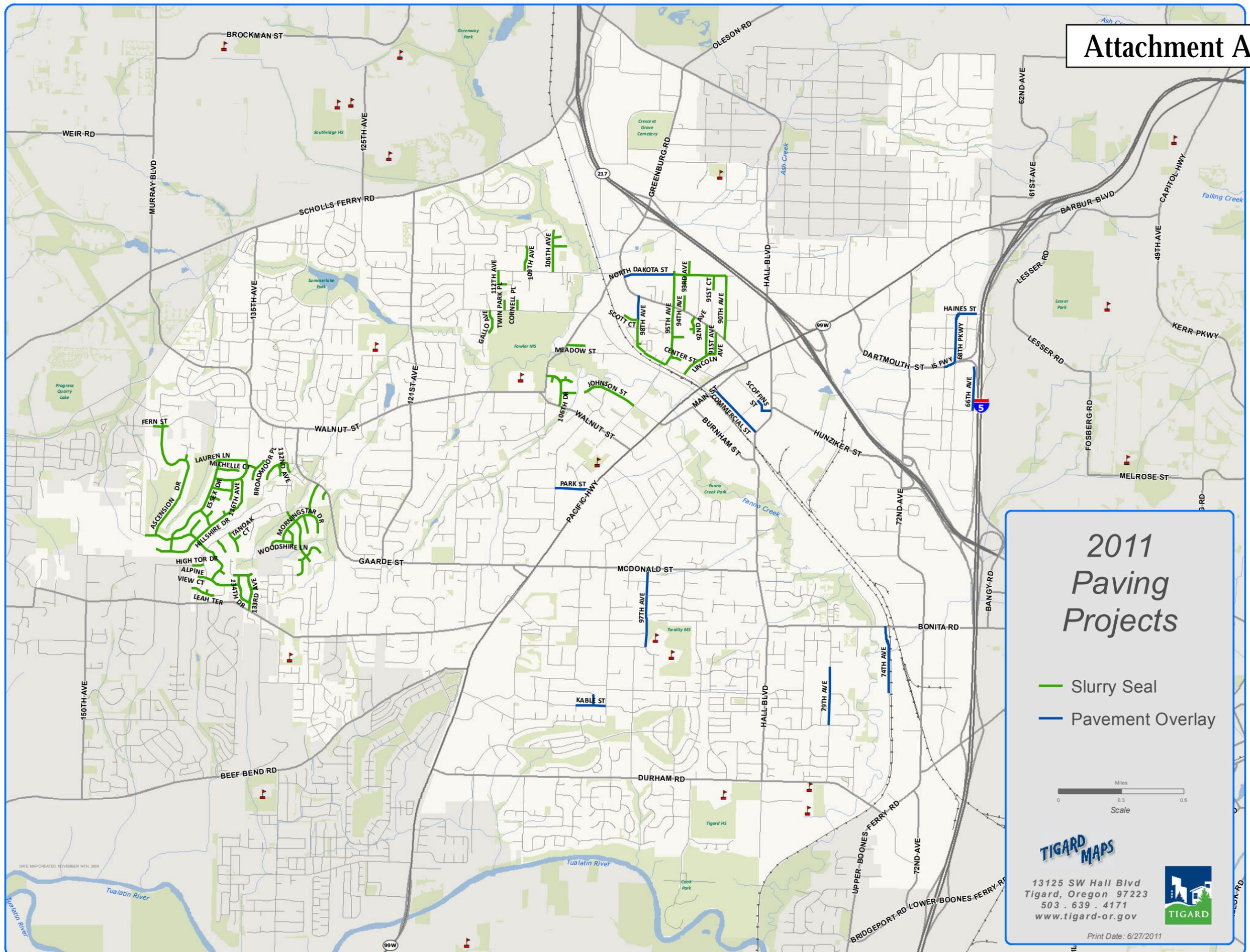
Streets with high traffic volumes and streets used by heavy vehicles are also affected by weather, but tend to deteriorate more due to the volume and weight of vehicles using the street. Deterioration on these streets most commonly takes the form of cracking from the repeated loading of thousands of vehicles, especially heavy vehicles, each day. A **pavement overlay** consists of spreading a new layer (typically 2 inches thick) of asphaltic concrete pavement on top of the existing street pavement. This covers minor cracking and provides additional structure which extends the life of the roadway.

Overlays are typically constructed when a street is in fair or good condition. Once a street deteriorates to poor condition, cracking has developed to a level where it compromises the structure of the pavement and its ability to withstand future loading. At this point reconstruction is necessary to remove and replace the cracked pavement and establish an adequate base. Such reconstruction often costs five times more than a pavement overlay.

The city's current pavement overlay strategy focuses on keeping arterials, collectors, and other key connection routes in good condition. When funding rises to a level adequate to protect our investment and keep these through streets in fair or better condition, the city will then be able to address some of the low-traffic-volume, local streets with poor pavement condition that need more extensive repair work.

In order to keep up with pavement deterioration on streets with high traffic volumes, significant heavy vehicle use, or poor pavement condition, it is necessary to overlay about 3.5 miles of roadway each year.

Attachment A



2011 Paving Projects

- Slurry Seal
- Pavement Overlay



TIGARD MAPS
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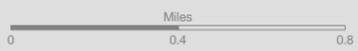


Print Date: 6/27/2011

2009 - 2011

Paving Projects

- 2011 Projects**
 - Slurry Seal
 - Pavement Overlay
- 2010 Projects**
 - Slurry Seal
 - Pavement Overlay
 - Federal Stimulus Pavement Overlay
- 2009 Projects**
 - Slurry Seal
 - Pavement Overlay

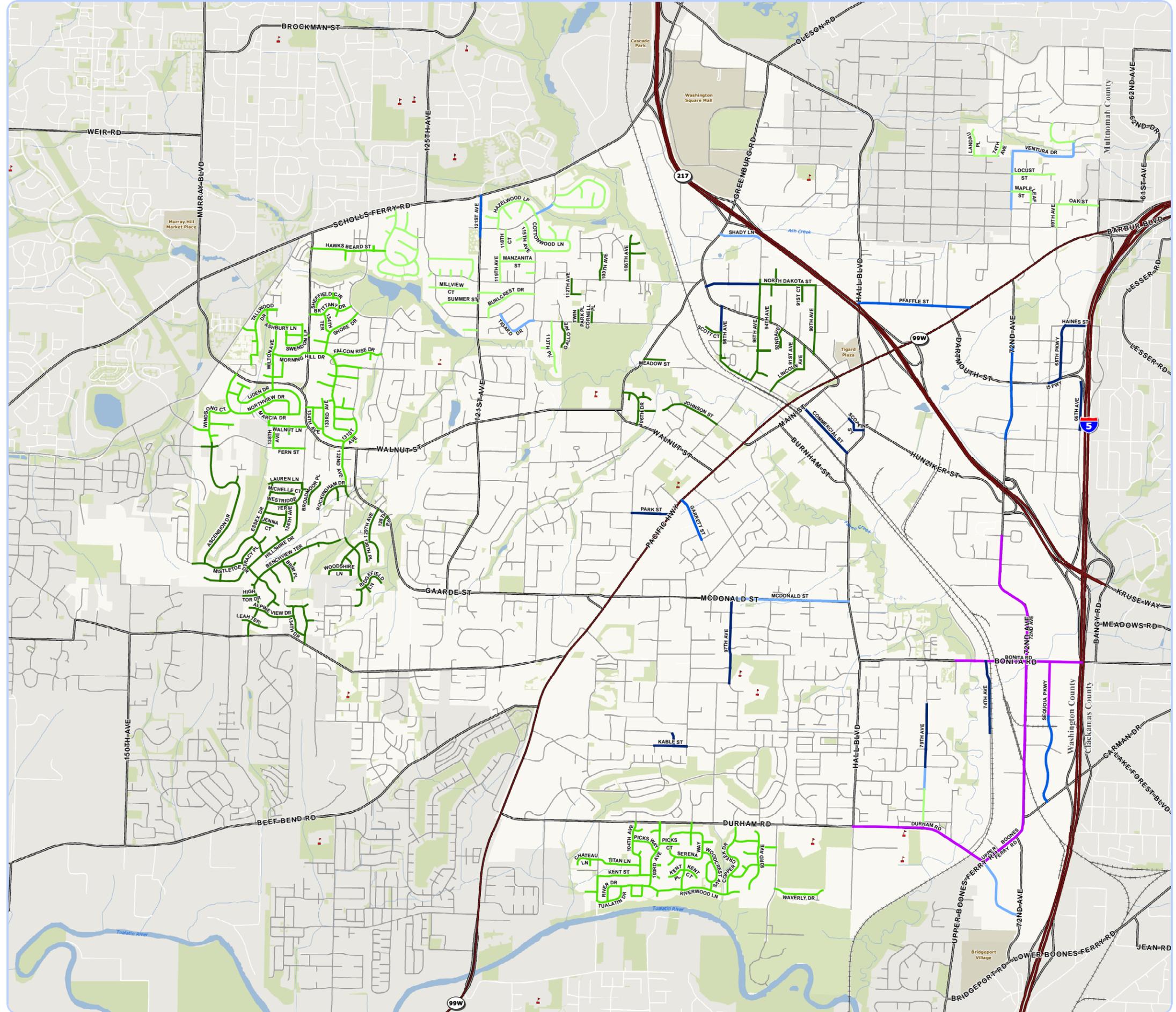


DATA SOURCES:
City of Tigard
Metro
Washington County



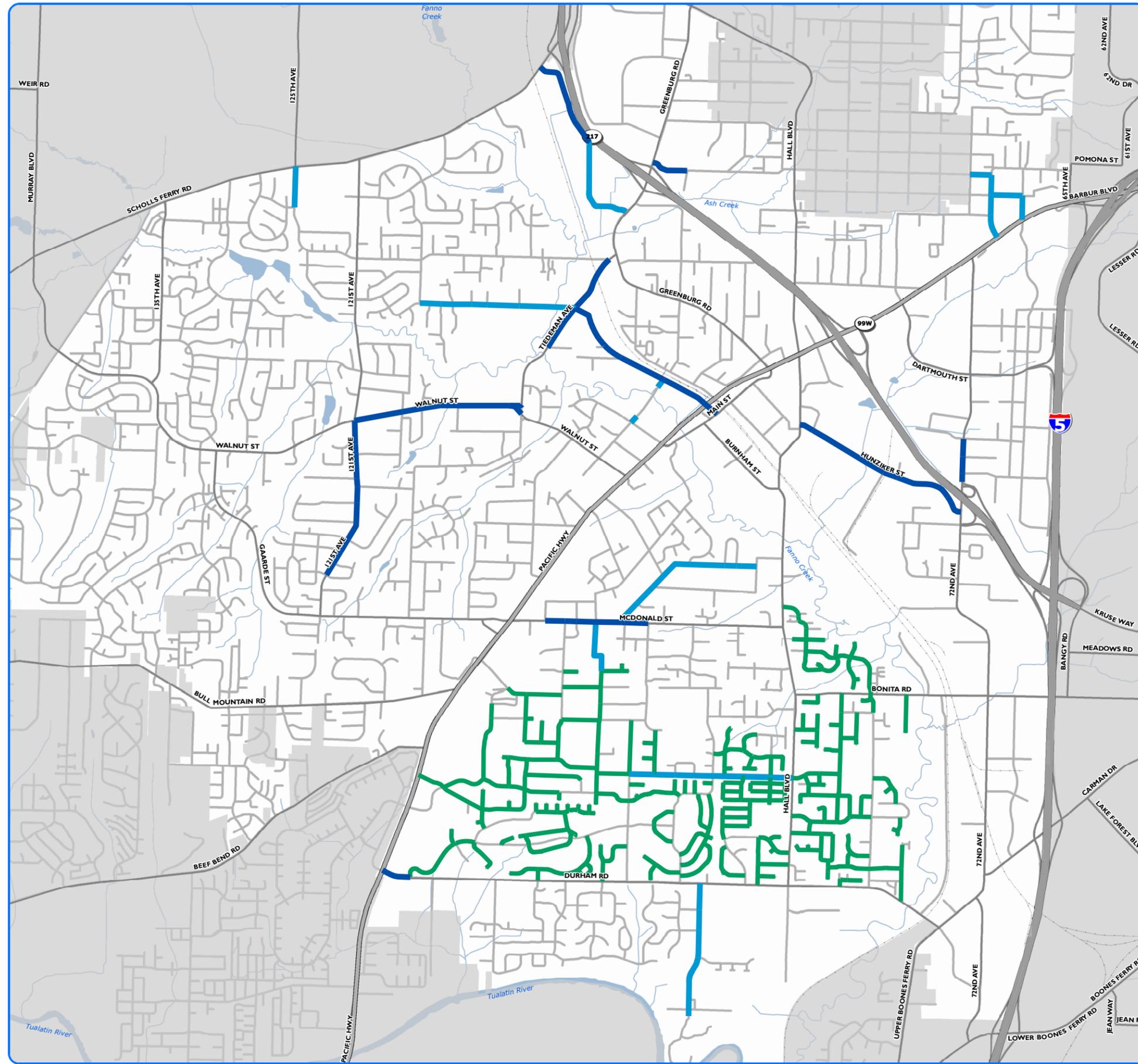
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2012 Paving Projects

- Pavement Overlay
- Additional Overlay If Funding Allows
- Slurry Seal



DATA SOURCES:
 City of Tigard
 Metro
 Washington County

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DATE MAP UPDATED: MAY 20TH, 2010