



**2015**

**Pavement  
Management Plan**



Baker City Public Works Department

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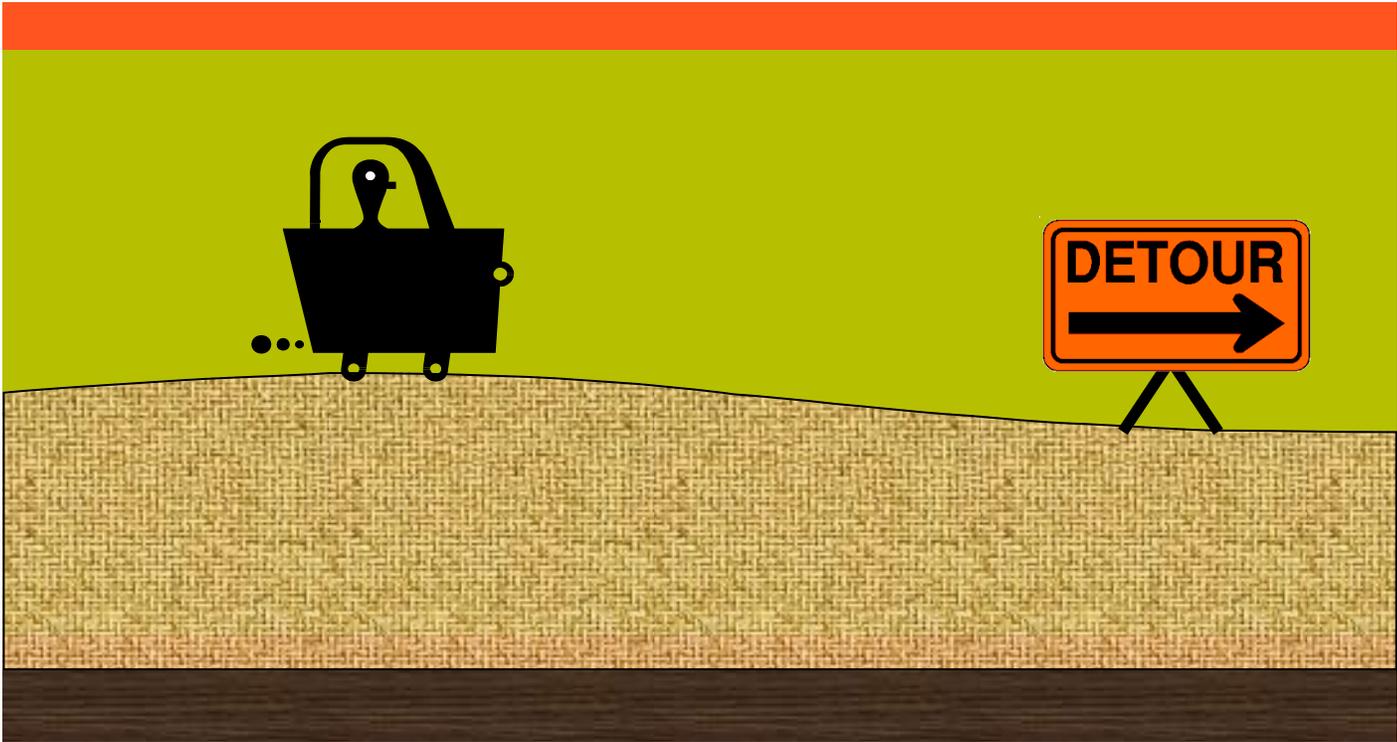
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# Introduction



Date: February 28, 2015  
To: Baker City Public Works Advisory Committee (PWAC)  
Subject: 2015 Pavement Management Plan

The Pavement Management Plan has been in place in Baker City for years. We have tried to objectively evaluate each of the streets in Baker City and categorize their quality. It has become increasingly difficult to meet the goals of the pavement program due to stagnant funding and increasing maintenance costs. This is most clearly shown on pages 9 and 10 of this year's Plan. You'll note the increase of lane miles moving from "Good" condition to "Fair" condition in the same years as the skyrocketing costs of asphalt products. The Street Fund revenue comes primarily from the State Gas Tax and from a portion of the Baker City property tax revenue. Neither the gas tax or property tax revenue stream is increasing at the same pace as the cost of street maintenance costs.

We had an opportunity in 2014 to capitalize on lower cost asphalt and because of that we deviated from our approved plan. We successfully completed the asphalt overlay of Pocahontas Road from 10<sup>th</sup> Street to the UPRR tracks. This was possible due to a portable asphalt plant being brought into Baker City for the Best Frontage Road construction project. This was a great partnership project working with Baker County. This year that discounted cost of asphalt won't be a possibility, so we will go back to our initial strategy of chip sealing many streets to keep them in "Good" or "Very Good" condition.

The 2015 projects include a larger chip seal project and a fog seal project to seal the newly reconstructed Resort Street and Best Frontage Road, and streets recently receiving an asphalt overlay treatment including Pocahontas Road, E Street and L Street. The ability to complete an overlay project every year is more difficult with the high cost of the required ADA improvements. Even though we are proposing to spend just over \$455,000 this year, we will try to reserve some funding in the budget to set aside money for next year's overlay project. We will focus on streets that are highly traveled and have the greatest impact in the community.

We will continue to utilize every tool in our street maintenance tool box to work towards meeting the Pavement Management Plan goals. Thank you for taking the time to be part of the Committee and assist the Public Works Department in maintaining our transportation network.

Sincerely,

Michelle Owen  
Director of Public Works  
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541-524-2031



# Program Background



In the fall of each year an engineering technician drives each paved city street to conduct a street inspection.

The following street characteristics are analyzed and noted:

- The street's ride quality;
- Surface cracking;
- Trench settlement;
- Drainage issues; and
- Any other items that affect the street's structural integrity.

The photo to the right is an example of the rating form used by staff when conducting the inspection.

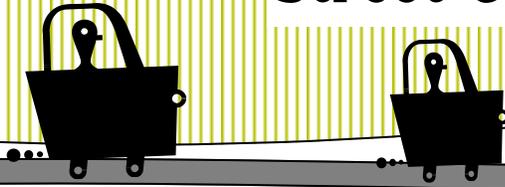
It is through this inspection that each paved street is rated. This rating system assists staff in determining what maintenance techniques, if any, will be recommended.

Each street is placed into a category by rating the defects found in each section of pavement. A street starts with a rating value of 100. The number of defects found, based on the inspection, are subtracted from 100 to arrive at the rating value for that street section.

After the street is rated, it is placed in the appropriate condition category based upon the rating value. There are five street condition categories: Very Good, Good, Fair, Poor, and Very Poor.

| ASPHALT PAVEMENT RATING FORM                               |  |                        |                        | DATE <u>10/2/14</u> |                   |                   |
|--|--|------------------------|------------------------|---------------------|-------------------|-------------------|
| STREET   |  |                        |                        | ZONE                | ROUTE             | LENGTH            |
| Twentfirst - Broadway to N.side Baker                      |  |                        |                        | SW                  | 097               | 661               |
| Defects  |  |                        |                        |                     |                   |                   |
| Cracks   |  |                        |                        |                     |                   |                   |
| TYPE   | RATING   | INSTRUCTIONS           | RATING                 | COMMENTS            |                   |                   |
| Transverse   | Rate 0 - 10<br>(10= Major Crack at 25' Intervals)  |                        | 2                      |                     |                   |                   |
| Longitudinal   | Rate 0 - 5<br>(5= Joint Cracks Full Length of Block)   |                        | 1                      |                     |                   |                   |
| Alligator  | Rate 0 - 60<br>(60= 100% of Road Surface)  |                        | —                      |                     |                   |                   |
| Shrinkage  | Rate 0 - 60<br>(60= 100% of Road Surface)  |                        | 1                      |                     |                   |                   |
| Subtotal crack defects ratings (cannot exceed 60)          |  |                        |                        | 4                   |                   |                   |
| Other Defects  |  |                        |                        |                     |                   |                   |
| TYPE   | RATING   | INSTRUCTIONS           | RATING                 | COMMENTS            |                   |                   |
| Trench Settlement or Bad Patching                          | Rate 0 - 10  |                        | 1                      |                     |                   |                   |
| Pot Holes  | Rate 0 - 5<br>(5 = Five per Block)   |                        | —                      |                     |                   |                   |
| Deficient Drainage   | Rate 0 - 5   |                        | —                      |                     |                   |                   |
| Base Failure   | Rate 0 - 5   |                        | —                      |                     |                   |                   |
| Other Defects  | Rate 0 - 10<br>Corrugations <input type="checkbox"/> Ravelling <input type="checkbox"/> Rutting <input type="checkbox"/> |                        | —                      |                     |                   |                   |
| Subtotal other defects ratings (cannot exceed 40)          |  |                        |                        | 1                   |                   |                   |
| Overall Ride Quality                                       |  |                        |                        |                     |                   |                   |
| TYPE   | INSTRUCTIONS   | QUANTITY               | RATING                 | COMMENTS            |                   |                   |
| Transverse Crack   | 1 Noticeable/50'=15  | 2                      | —                      |                     |                   |                   |
| Patch or Settlement  | 1 Noticeable/100'=10   | 6                      | 9                      |                     |                   |                   |
| Subtotal Ride Quality Ratings (Maximum 20)                 |  |                        |                        | 9                   |                   |                   |
| overall ride quality converted rating (use subtotal above) |  |                        |                        | 2                   |                   |                   |
| total defects ratings (cracks+other+overall r.q.)          |  |                        |                        | 7                   |                   |                   |
| Suggested Maintenance                                      |  |                        |                        |                     |                   |                   |
| Overlay  | DCH  | Crackfill 1st Priority | Crackfill 2nd Priority | Asphalt Crackfill   | Grind and Overlay | Fog Seal Patching |
|  |  |                        | X                      |                     |                   |                   |
| Condition Rating   |  |                        |                        |                     |                   |                   |
| Possible Points  | 100  | Defects                | 7                      | =                   | Rating            | 93                |
|  |  |                        |                        |                     |                   | 2013 Rating       |
|  |  |                        |                        |                     |                   | 83                |
| Categories   |  |                        |                        |                     |                   |                   |
| Very Good  | 100 - 96   | Good                   | 97 - 89                | Fair                | 88 - 70           | Poor              |
|  |  |                        |                        |                     |                   | Poor              |
|  |  |                        |                        |                     |                   | 68 - 45           |
|  |  |                        |                        |                     |                   | Very Poor         |
|  |  |                        |                        |                     |                   | 44 - 0            |
| Other Comments:<br><u>AC Crackfill - Big Improvement</u>   |  |                        |                        |                     |                   |                   |
| Ride Quality Conversion Chart                              |  |                        |                        |                     |                   |                   |
| Ride Quality   | Defect Rating  |                        |                        |                     |                   |                   |
| 1 - 6  | 1  |                        |                        |                     |                   |                   |
| 7 - 12   | 2  |                        |                        |                     |                   |                   |
| 13 - 17  | 3  |                        |                        |                     |                   |                   |
| 18 - 20  | 4  |                        |                        |                     |                   |                   |

# Street Condition: "Very Good"



**Rating Range: 98-100**

**10.7% of City Streets are in the Very Good Category**

137,401.7 yds.<sup>2</sup>

With no more than the occasional crack, streets within this category have stable, excellent ride qualities. The "Very Good" category generally only includes streets which have been recently overlaid or constructed.

Recommended treatments: Fog seal, 1/4"-#10 chip seal to prevent oxidation, and possible minor crack filling.

## Pocahontas Rd. (RR Tracks-Hwy. 30)

Linking residential, commercial and industrial properties - Pocahontas Rd. users have a much smoother ride after its overlay this year.

Constructed

2014

Ratings

**2014: 100**    2013: 85    2012: 90    2011: 91 90



## L Loop (East of Birch Street)

Receiving a low volume of residential traffic, L Loop has maintained its annual rating of "99" for the past six years.

Constructed

2007

Previous Treatments

2010: Chip Seal

Ratings

**2014: 99**    2013: 99    2012: 99    2011: 99



# Street Condition “Good”



**Rating Range: 89-97**

**50.2% of City Streets are in the Good Category**

573,425.5 yds.<sup>2</sup>

A “Good” street rating generally includes stable ride qualities. Distress characteristics may include: gray or light-colored appearance (due to oxidation), some transverse and longitudinal cracking, and possible isolated trench settlement.

Recommended treatments: Crack filling, fog seal, chip seal, and possible thin overlay.

## 2nd Street (Dewey Ave. to Place St.)

A street overlay in 2008 boosted this section of 2nd Street from a rating of “86” in the “Fair” category to a “100” in 2008.

Constructed

1981

Previous Treatments

2010: Chip Seal

2008: Thin Overlay

2003: Fog Seal

Ratings

**2014: 97**

2013: 98

2012: 98

2011: 97



## H Street (10th St. to 17th St.)

Since 1997, H Street has received a street rating each year that is in the mid to high “90s”.

Constructed

1973

Previous Treatments

2009: Chip Seal

2003: Fog Seal

1988: Overlay/Fog Seal

Ratings

**2014: 93**

2013: 95

2012: 96

2011: 94

# Street Condition: "Fair"



**Rating Range: 70-88**

**37.65% of City Streets are in the Fair Category**

479,332.9 yds.<sup>2</sup>

The "Fair" street category includes streets which are considered to be generally stable, although minor areas of structural weaknesses could be evident. Ride qualities are good to fair. Distress characteristics may include: transverse, longitudinal and some alligator cracking; trench settlement or drainage deficiencies.

Recommended treatments: Extensive patching and chip seal application or thin overlay.

## Church Street (Clark St. to Oak St.)

The annual ratings of this section of Church Street have kept it within the "Fair" category since 2007.

Constructed

1976

Previous Treatments

2004: Fog Seal

1996: Fog Seal

1990: Fog Seal

Ratings

**2014: 83**

2013: 88

2012: 87

2011: 84



## Chestnut Street (Washington to N. Church)

This area of Chestnut Street has been teetering between the Good and Fair street categories for the last decade.

Constructed

1979

Previous Treatments

2004: Fog Seal

1994: Fog Seal

Ratings

**2014: 84**

2013: 86

2012: 90

2011: 90



# Street Condition “Poor”



**Rating Range: 45-69**

**1.45% of City Streets are in the Poor Category**

17,423 yds.<sup>2</sup>

A street receiving the rating of “Poor” is a street which has areas of instability with evidence of structural deficiency. Ride qualities range from fair to poor. Distress characteristics may include transverse, longitudinal, alligator, and shrinkage cracking. Trench settlement and drainage deficiencies will also be evident. To alleviate settlement and drainage issues, extensive cracking filling and patching would need to be accomplished. If the street base is in such condition that rehabilitation is possible, an overlay is recommended; otherwise street reconstruction is necessary.

## 5th Street (Campbell St. to E St.)

Forty-five years after its construction, the slow decline of this section of 5th Street has finally placed it in the Poor category.

Constructed  
1969

Previous Treatments  
2000: Fog Seal  
1993: Fog Seal  
1989: Chip Seal

Ratings

**2014: 69**    2013: 70    2012: 72    2011: 72



## Canal Street (4th St. to 5th St.)

This is Canal Street’s first debut in the Poor category as well. Cracks in the street were filled with asphalt in 2004.

Constructed  
1984

Previous Treatments  
2000: Fog Seal  
1985: Fog Seal

Ratings

**2014: 68**    2013: 70    2012: 76    2011: 73

# Street Condition: "Very Poor"



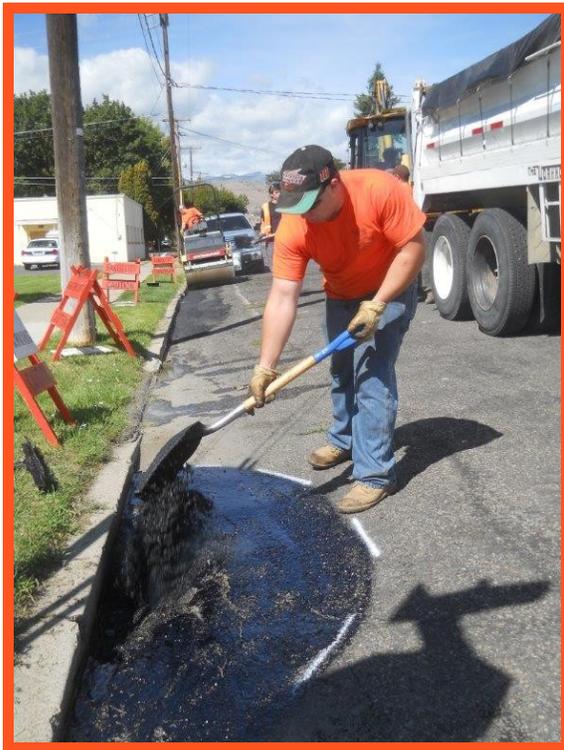
**Rating Range: 0-44**

**0% of City Streets are in the Very Poor Category**

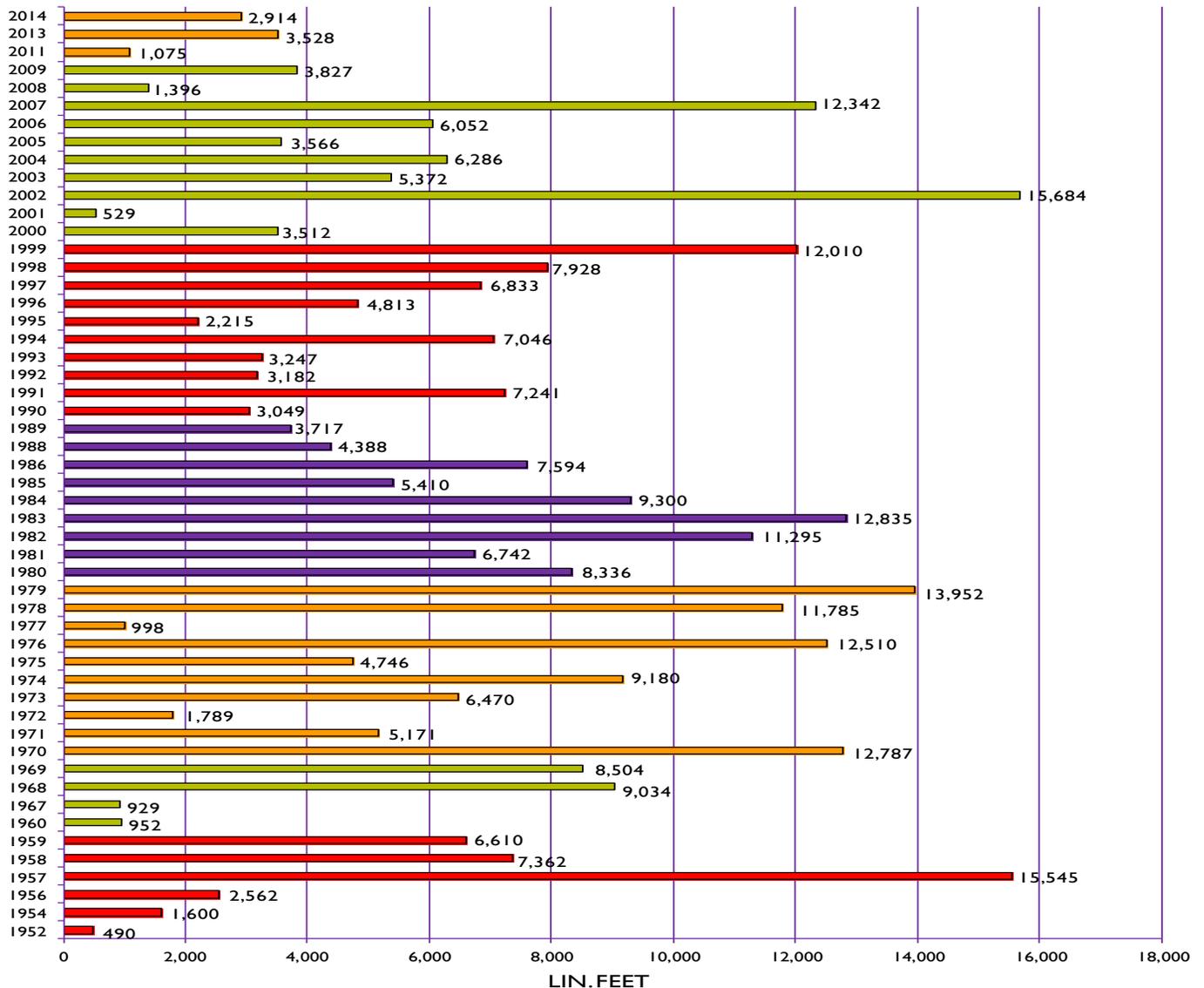
Streets within the "Very Poor" category have many areas of instability with obvious structural deficiencies. Ride qualities are poor. Distress characteristics generally include alligator and shrinkage cracking with potholes, extensive trench settlement, and drainage deficiencies. The cost of maintaining the pavement in an acceptable condition would exceed the maintenance funds available.

Recommended treatment: Although the recommended treatment would be to perform emergency maintenance only and to schedule reconstruction as soon as possible, with current funding constraints we now have to look at other factors such as traffic flow, balancing the need vs. utilizing funds to perform preventative maintenance work on arterial or collector streets.

Clifford Street has been the only street ever placed within the "Very Poor" category. Its ratings left it within that category from 2011-2013. Public Works crews performed extensive asphalt patching in 2014 which addressed some of the alligator cracks and areas of settlement in the street. The recent street patching slightly improved the street's ride quality, boosting it into the lower range of the "Poor" category this year.



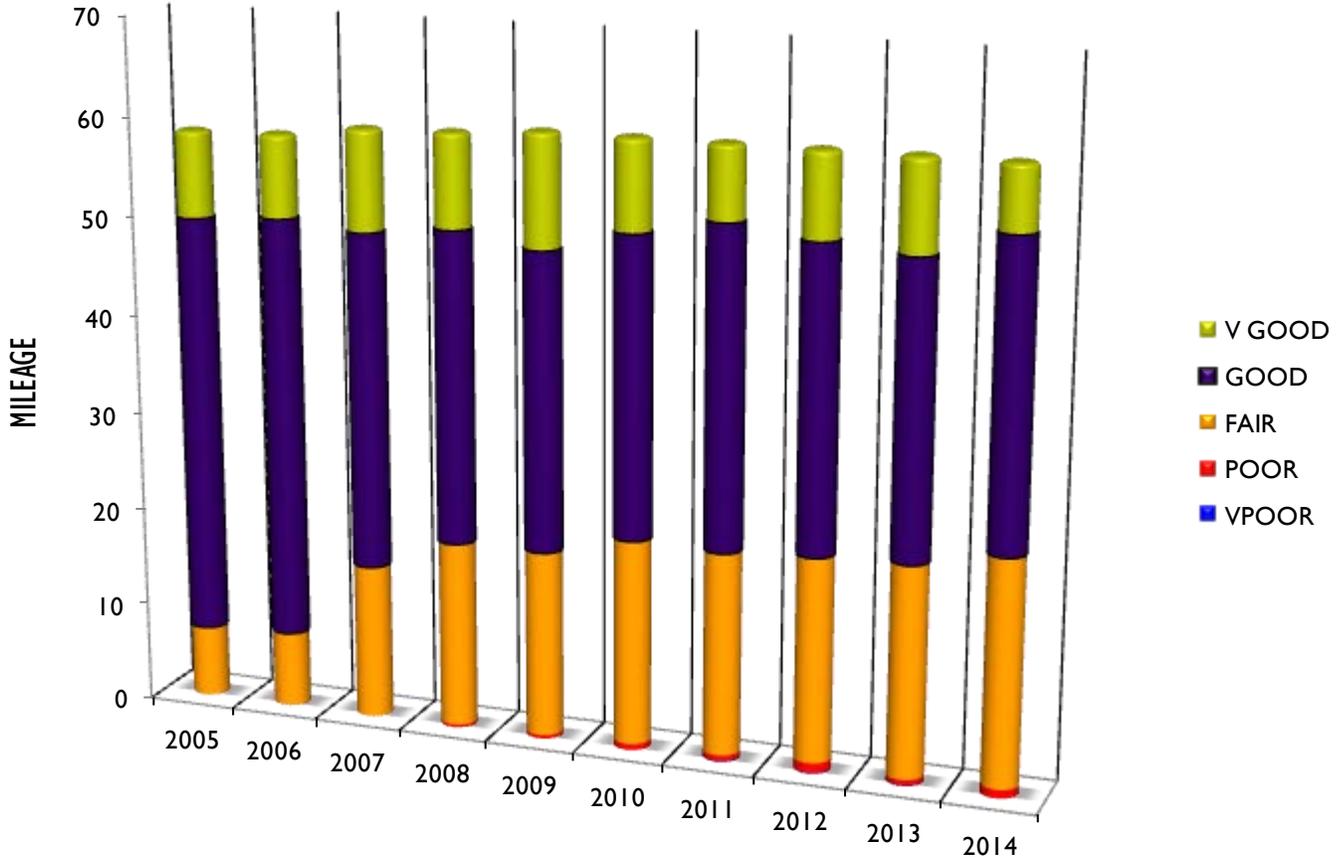
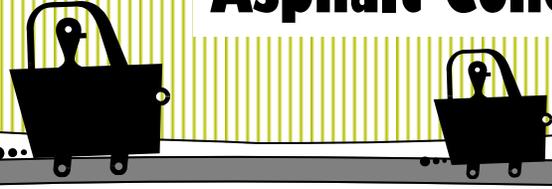
# New Asphalt Applied 1952-2014



This chart illustrates how many feet of new asphalt (streets that were recently constructed or a thin overlay was completed) were applied in each calendar year for the last 63 years. Chip seal and/or fog seal treatments are not considered to be substantial asphalt surface treatments. The absence of a year indicates that no new asphalt was applied that year. This year's footage does not include Best Frontage Rd. (Campbell St. to H St.), as its construction was not completed prior to the annual street rating being conducted.

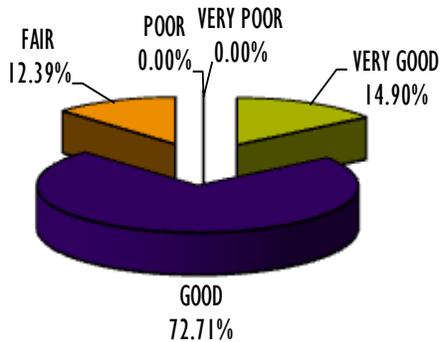
The bar labeled 1957 has 15,545 feet (2.94 miles) of streets that were newly paved that year. The majority of the streets constructed in 1957 have not received any substantial asphalt treatment in over 58 years. The average life expectancy of an asphalt street is 20-25 years, depending upon the time of construction, the type of street base used, etc.

# Asphalt Condition Ratings 2005- 2014

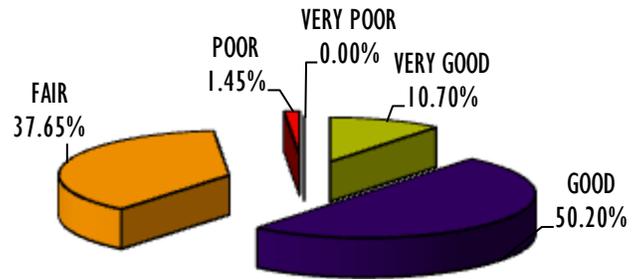


As you can see, our street infrastructure continues to age, and with age there is a steady decline in every street's overall ride quality and structural integrity. With the costs of routine maintenance perpetually increasing, we can assume that the number of streets within the "Fair" street rating category will continue to increase while the streets within the "Good" street rating category will steadily decrease.

2005 ASPHALT STREET PERCENTAGES



2014 ASPHALT STREET PERCENTAGES

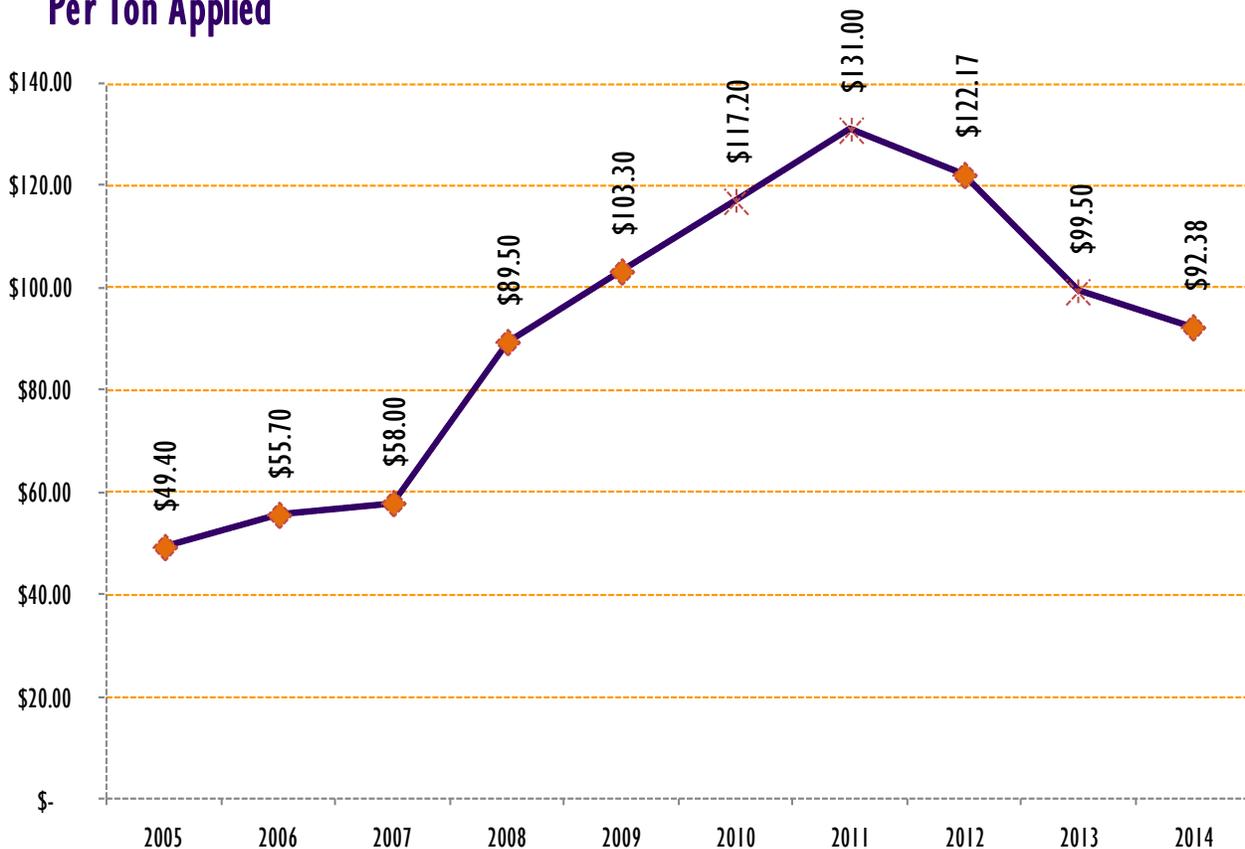


# The Cost of Deferred Maintenance



As illustrated below, we are currently seeing a trend in decreasing asphalt costs, something we hope to also see with fog seal and chip seal oil costs.

## Contract Cost of Asphalt Per Ton Applied



Note: Baker City did not overlay streets in 2009, 2010 or 2012. The costs for these years were derived by using the average costs from surrounding years.

\*The lower cost of asphalt reflected for 2014 was influenced by the quantity of asphalt purchased this year. The Pocahontas Road overlay project and Best Frontage Road construction were completed during the same period of time, allowing for purchase of asphalt at a lower per ton cost.

# The Cost of Deferred Maintenance

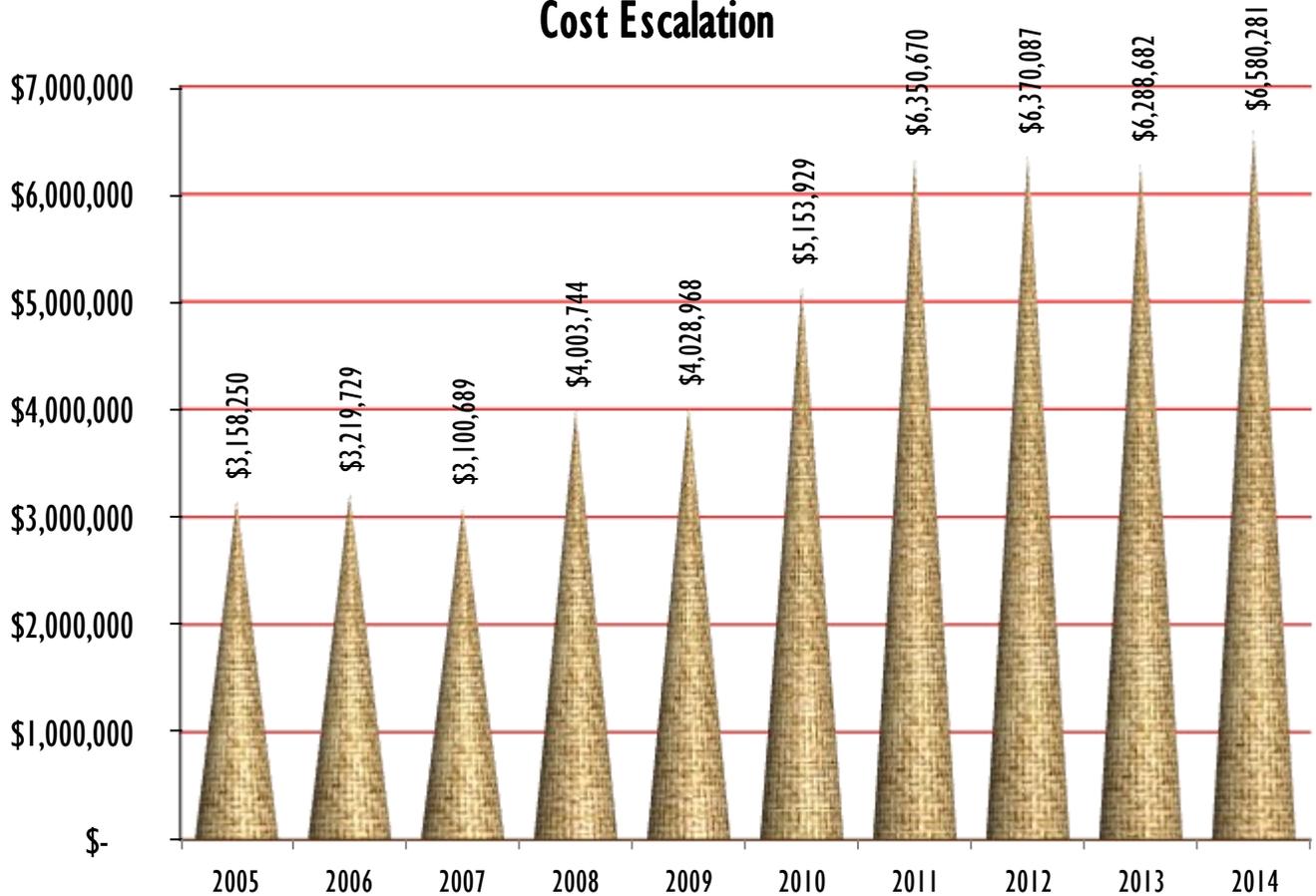


...Continued

This graph illustrates the approximate cost to treat every paved street with the recommended treatment for its condition category, further demonstrating the level of maintenance needed but not funded for each of the represented years.

As you can see, deferred maintenance costs, in most years, continue to rise.

### Cost Escalation



# Street Condition Ratings By Mileage

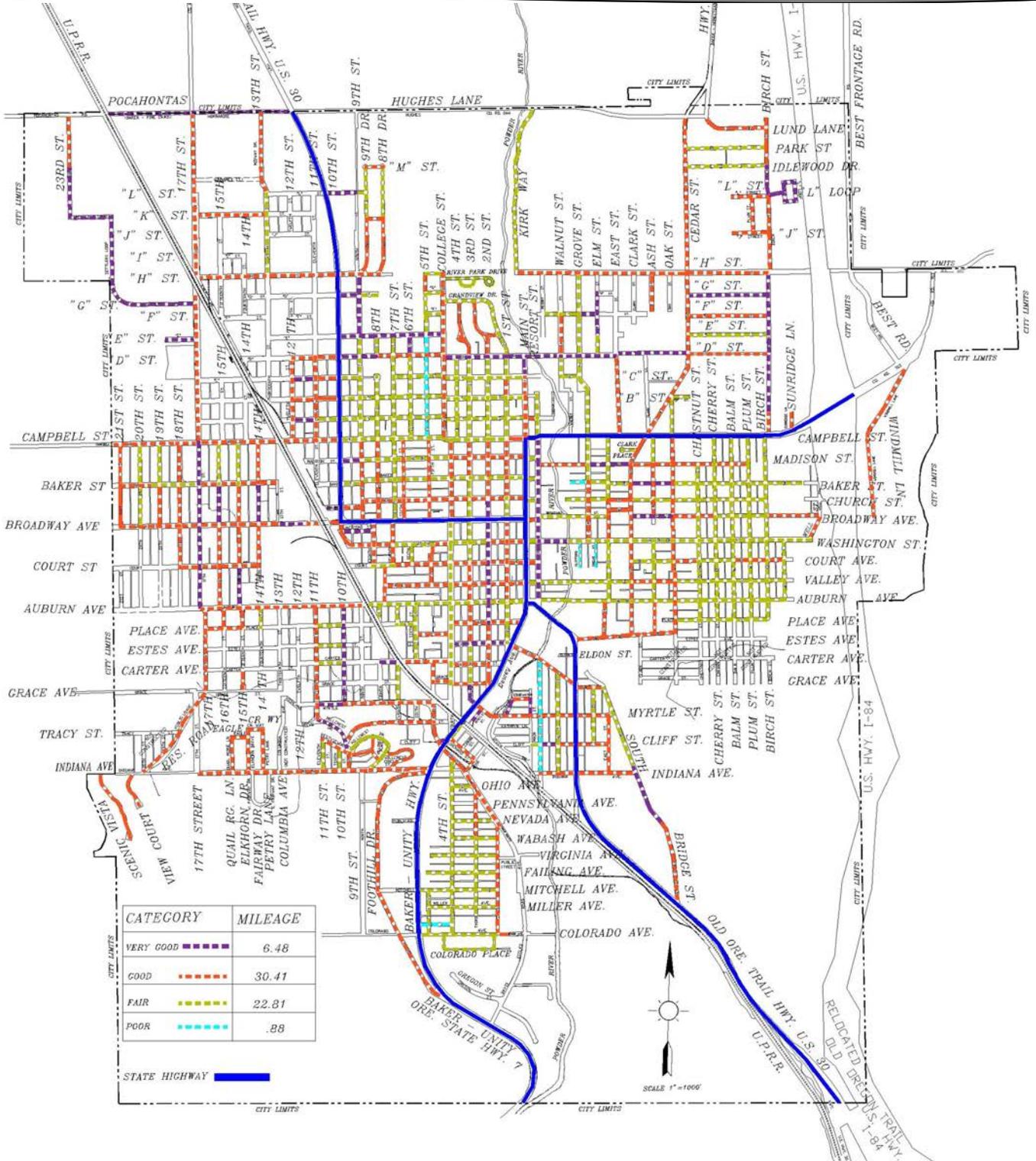
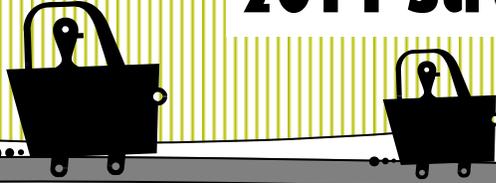


|      | Very Good | Good  | Fair  | Poor | Very Poor | Total Miles Asphalt Streets | Gravel Double Chip         | Gravel Collector | Gravel Local | Total Miles Gravel Streets | Total Miles Unopened Streets | Total Miles All Streets |
|------|-----------|-------|-------|------|-----------|-----------------------------|----------------------------|------------------|--------------|----------------------------|------------------------------|-------------------------|
| 2014 | 6.48      | 30.41 | 22.81 | 0.88 | 0         | 60.58                       | 0.82                       | 1.01             | 7.81         | 9.64                       | 11.47                        | 81.69                   |
| 2013 | 9.22      | 29.43 | 21.33 | 0.54 | 0.08      | 60.58*                      | 0.82                       | 1.01             | 7.81         | 9.64                       | 11.47                        | 81.69                   |
| 2012 | 8.52      | 30.44 | 20.57 | 1.00 | 0.08      | 60.61                       | 0.82                       | 1.01             | 7.81         | 9.64                       | 11.47                        | 81.72                   |
| 2011 | 7.38      | 32.13 | 20.44 | 0.58 | 0.08      | 60.61                       | 0.82                       | 1.01             | 7.81         | 9.64                       | 11.47                        | 81.72                   |
| 2010 | 9.09      | 30.18 | 20.71 | 0.63 | 0.00      | 60.61                       | 0.82                       | 1.01             | 7.81         | 9.64                       | 11.47                        | 81.72                   |
| 2009 | 11.39     | 30.05 | 18.81 | 0.36 | 0.00      | 60.61                       | 0.82                       | 1.14             | 8.06         | 10.02                      | 11.70                        | 82.33                   |
| 2008 | 9.46      | 31.46 | 18.80 | 0.28 | 0.00      | 60.00                       | 0.82                       | 1.14             | 8.06         | 10.02                      | 11.70                        | 81.72                   |
| 2007 | 10.16     | 33.93 | 15.69 | 0.00 | 0.00      | 59.78                       | 0.82                       | 1.14             | 7.95         | 9.91                       | 11.80                        | 81.49                   |
| 2006 | 8.33      | 42.69 | 7.67  | 0.00 | 0.00      | 58.69                       | 0.82                       | 1.14             | 7.95         | 9.91                       | 11.98                        | 80.58                   |
| 2005 | 8.72      | 42.54 | 7.25  | 0.00 | 0.00      | 58.51                       | 0.82                       | 1.14             | 7.95         | 9.91                       | 11.98                        | 80.40                   |
| 2004 | 9.93      | 43.06 | 5.52  | 0.00 | 0.00      | 58.51                       | 0.82                       | 1.14             | 7.95         | 9.91                       | 11.98                        | 80.40                   |
| 2003 | 9.35      | 45.96 | 2.54  | 0.00 | 0.00      | 57.85                       | 0.82                       | 1.27             | 7.95         | 10.04                      | 11.98                        | 79.87                   |
| 2002 | 9.21      | 46.84 | 1.13  | 0.00 | 0.00      | 57.18                       | 0.82                       | 1.27             | 7.95         | 10.04                      | 11.98                        | 79.20                   |
| 2000 | 7.30      | 47.20 | 2.76  | 0.00 | 0.00      | 57.26                       | New Category Added in 2002 | 1.77             | 8.19         | 9.96                       | 11.98                        | 79.20                   |
| 1999 | 6.18      | 49.81 | 1.16  | 0.00 | 0.00      | 57.15                       |                            | 1.77             | 8.19         | 9.96                       | 11.98                        | 79.09                   |
| 1998 | 6.81      | 48.78 | 0.90  | 0.00 | 0.00      | 56.49                       |                            | 2.10             | 8.19         | 10.29                      | 12.13                        | 78.91                   |
| 1997 | 5.33      | 50.72 | 0.17  | 0.00 | 0.00      | 56.22                       |                            | 2.18             | 8.24         | 10.42                      | 12.00                        | 78.64                   |
| 1996 | 6.04      | 49.38 | 0.55  | 0.00 | 0.00      | 55.97                       |                            | 2.18             | 8.24         | 10.42                      | 12.00                        | 78.39                   |
| 1995 | 5.58      | 48.34 | 1.41  | 0.00 | 0.00      | 55.33                       |                            | 4.50             | 6.20         | 10.70                      | 12.28                        | 78.31                   |
| 1994 | 6.85      | 45.34 | 2.88  | 0.00 | 0.00      | 55.07                       |                            | 4.50             | 6.20         | 10.70                      | 12.54                        | 78.31                   |
| 1993 | 7.20      | 43.04 | 3.98  | 0.00 | 0.00      | 54.22                       |                            | 4.77             | 6.20         | 10.97                      | 12.56                        | 77.75                   |
| 1992 | 6.95      | 44.09 | 2.66  | 0.00 | 0.00      | 53.70                       |                            | 5.22             | 6.20         | 11.42                      | 13.08                        | 78.20                   |
| 1991 | 6.45      | 39.00 | 7.37  | 0.02 | 0.14      | 52.98                       |                            | 5.87             | 6.33         | 12.20                      | 13.00                        | 78.18                   |
| 1990 | 6.84      | 38.31 | 5.47  | 1.05 | 1.31      | 52.98                       |                            | 5.87             | 6.33         | 12.20                      | 13.00                        | 78.18                   |
| 1989 | 6.62      | 36.04 | 6.57  | 1.98 | 1.30      | 52.51                       |                            | 5.94             | 6.93         | 12.87                      | 12.77                        | 78.15                   |

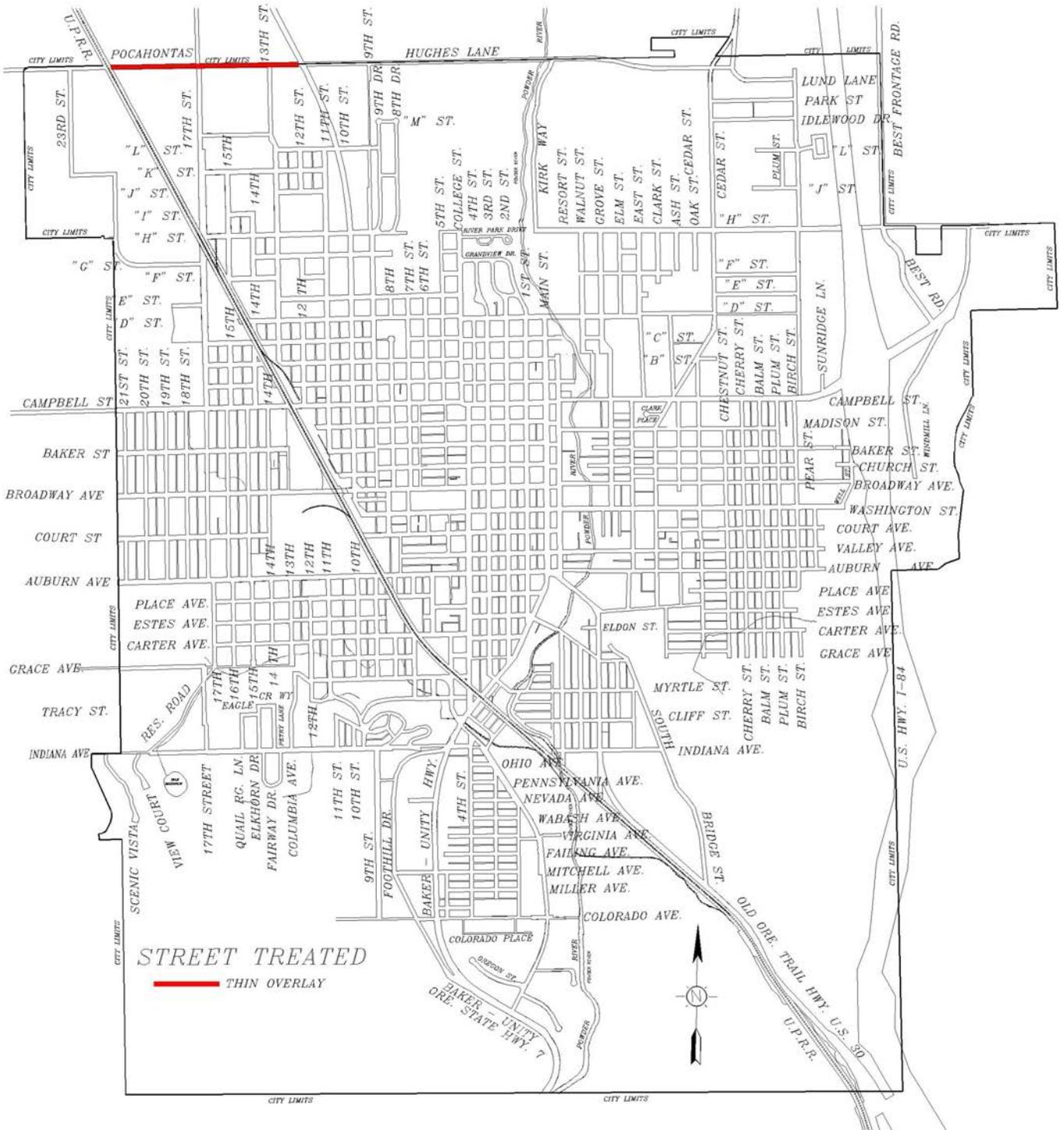
**Notes:**

- Due to weather conditions in 2001, the annual street inspection was not completed. Partial inspection showed some degradation.
- In order to conform to the 1996 Transportation Plan, some gravel streets were reclassified at that time.
- \* The variation in total asphalt street mileage from 2012 to 2013 was due to a correction made in M Street's dimensions as well as the modified dimensions of newly-constructed Resort Street.

# 2014 Street Condition Ratings



# Streets Treated-2014





# The Goal of Pavement Management

## Objectives & Achievements



Maintaining Baker City's existing transportation system at the highest level possible with the available funding.



### Objectives<sup>1</sup>

1. Keep most of Baker City's paved streets in the "Very Good" or "Good" categories.
2. Do not allow any street to remain in the "Poor" category for more than 2 years.
3. Do not allow any paved street to deteriorate below the "Poor" category.
4. Increase the percentage of paved streets in the "Very Good" category.
5. Monitor deterioration patterns. Recognize future needs and plan to minimize their impact.

<sup>1</sup> A detailed explanation of the pavement rating system can be found on pages 3-7.



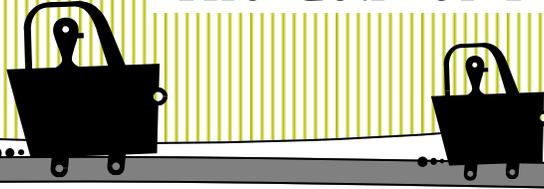
### Review of Achievements Toward Objectives

1. The program continues to meet objective number one. Currently nearly 61% of Baker City's paved streets are in the "Very Good" and "Good" categories. Our ongoing analysis continues to demonstrate that band-aid treatments, like the single chip seal, temporarily elevate or maintain ratings on streets that are otherwise showing a steady decline.
2. There are currently six street sections in the "Poor" category, totaling .88 mile. Last year there was .54 mile of paved streets within this category. This is the first year that Canal Street and 5th Street (Campbell St to D St) have received a "Poor" rating. Work completed on B Street this year (9th St - 10th St) boosted it into the "Fair" category once again after sitting in the "Poor" category for the previous two years.
3. Pavement conditions continue to decline, with the overall deterioration continuing to overwhelm the available resources needed to address the appropriate maintenance. Maintenance work accomplished in 2014 on Clifford Street elevated its previous rating of "40" in the "Very Poor" category to a rating of "46" in the "Poor" category.
4. Maintaining this objective is largely influenced by community growth and streets being constructed through new development or with the assistance of grant program funding. Without new construction, additions to the "Very Good" category are the result of overlay projects or chip sealing of higher-rated "Good" streets. Raising the percentage by adding new streets is more indicative of current community growth than success of the "Pavement Management Plan". New streets incorporated into the system add increased pavement maintenance responsibilities to the program. Within the last decade, approximately 2.34\* miles of paved public streets have been added to the system.
5. We continue to monitor and analyze deterioration patterns in our pavement system. Current and future needs have been identified in past reports. We continue to systematically set priorities and utilize available resources to provide the best use of the taxpayer dollar.

\*This figure does not include Best Frontage Road (Campbell St. - H St.).

# The Goal of Pavement Management

## Maintenance Tasks



### 2015 Maintenance Tasks<sup>2</sup>

Focusing on Program Objectives 1 – 4, street maintenance this year will involve chip sealing approximately 3.9 miles (76,170 yd<sup>2</sup>) and fog sealing approximately 1.75 miles (43,666 yd<sup>2</sup>) of city streets.

Factors considered when selecting streets for chip seal:

- The street has not been chip sealed since 2007; and
- The street is rated in the lower range of the “Good” category. The “Good” category consists of ratings in the 89 - 97 range; or
- The street is rated in the mid-“Fair” category. The “Fair” category includes ratings in the 70 - 88 range.

Fog seal is generally applied to recently constructed streets because it seals the asphalt.

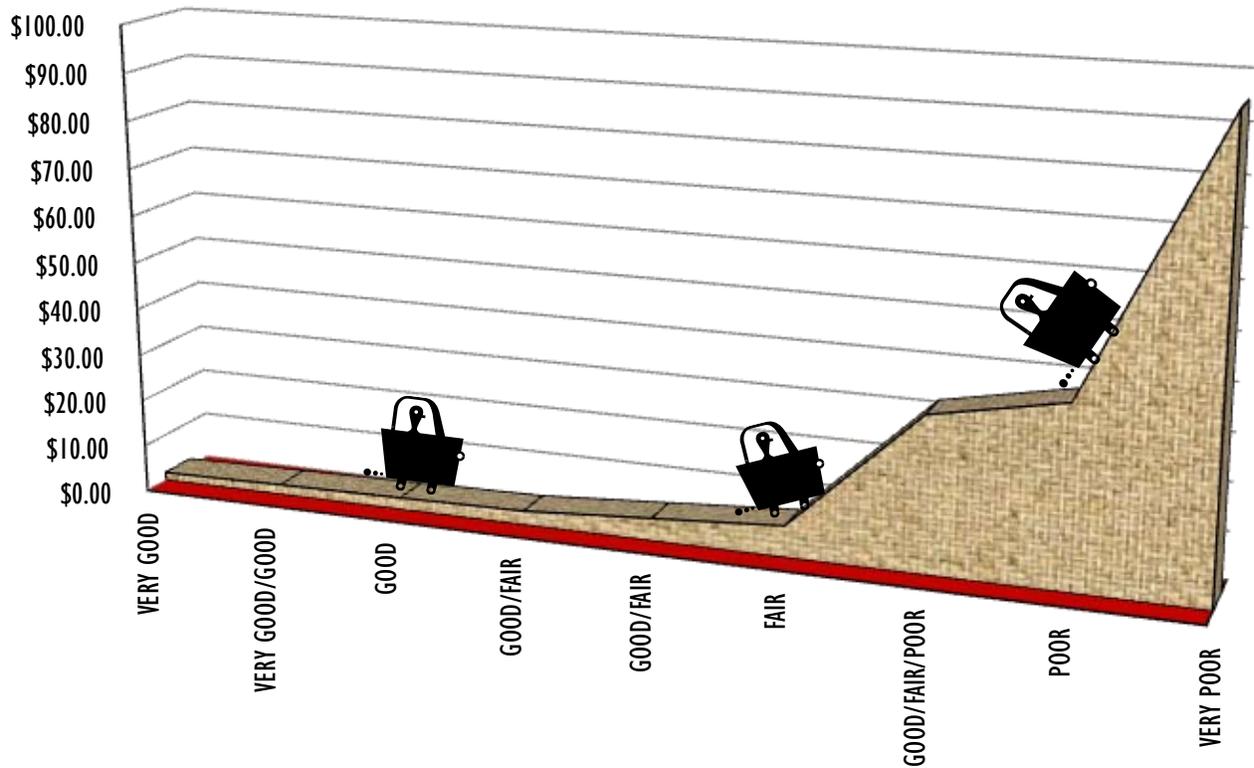
<sup>2</sup> See pages 19-20 for a detailed explanation of maintenance procedures.



# 2015 Pavement Management Cost Curve



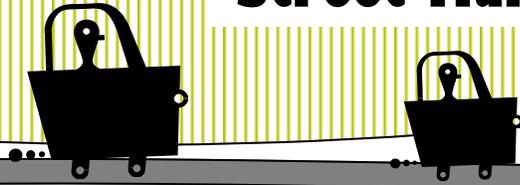
This graph represents the very foundation upon which the Pavement Management Plan was developed. Maintaining streets in the “Fair”, “Good”, and “Very Good” Categories provides the citizens of Baker City with the most cost effective transportation system.



| STREET CATEGORY | COST PER SQUARE YARD | TYPE OF MAINTENANCE                      |
|-----------------|----------------------|--|
| VERY GOOD       | \$1.69               | FOG SEAL (NO PREP)                       |
| VERY GOOD/GOOD  | \$2.15               | 1/4"-10 SINGLE CHIP (NO PREP)            |
| GOOD            | \$2.55               | FOG SEAL (INCLUDING PATCHING)            |
| GOOD/FAIR       | \$3.00               | 3/8"-1/4" SINGLE CHIP SEAL (SOME PREP)   |
| GOOD/FAIR       | \$4.80               | DOUBLE CHIP SEAL (SOME PATCHING)         |
| FAIR            | \$6.64               | DOUBLE CHIP SEAL (CONSIDERABLE PATCHING) |
| GOOD/FAIR/POOR  | \$32.59 <sup>3</sup> | THIN OVERLAY (MINOR PATCHING)            |
| POOR            | \$37.93 <sup>3</sup> | THIN OVERLAY (CONSIDERABLE PATCHING)     |
| VERY POOR       | \$95.40 <sup>3</sup> | REBUILD                                  |

<sup>3</sup>The added cost for required ADA compliance is not included within these estimated amounts.

# Street Maintenance Procedures



## Crack Fill



Filling existing narrow cracks with hot liquid asphalt compound or emulsified asphalt sealer. This seals the crack and keeps moisture from penetrating the asphalt and street base. Wide cracks are filled with a 1/4" mix of hot asphalt compacted into and overlapping the cracks. Sealant is then applied to the surface to effectively fill the crack.

## Thin Overlay

Placing a thin asphalt mat, generally 1" - 1 1/2" thick, on an existing asphalt street. An asphalt pre-level mat may be applied prior to the top mat with a motor grader or paving machine.

Various combinations of patching, crack filling, grinding, and other rehab work is completed prior to the application. A fog seal or 1/4"-#10 chip seal is applied within two years of the overlay to seal the new asphalt.

"Fair" or "Good" category streets with solid bases are generally targeted for thin overlays.



## Fog Seal



Emulsified asphalt coating applied to existing asphalt surfaces. The coating seals and rejuvenates the existing asphalt. Used as preventative maintenance to extend the operational life of a street.

"Good" and "Very Good" rated streets and newly-constructed or overlaid street are fog sealed. Products used in the past: CRF with a sand blotter as well as GSB-88.

# Street Maintenance Procedures-Cont'd



## 1/4" -#10 Single Chip Seal

An application of emulsified asphalt and a single layer of graded aggregate. The aggregate is usually 1/4"-#10 in size. Patching and crack filling are generally not necessary prior to the chip seal application.

Streets in the "Very Good" and "Good" categories are targeted for this treatment.

## 3/8"-1/4" Single Chip Seal

An application of emulsified asphalt and a single layer of graded aggregate. The aggregate is usually 3/8"-1/4" in size. Patching and crack filling are completed in preparation of the application.

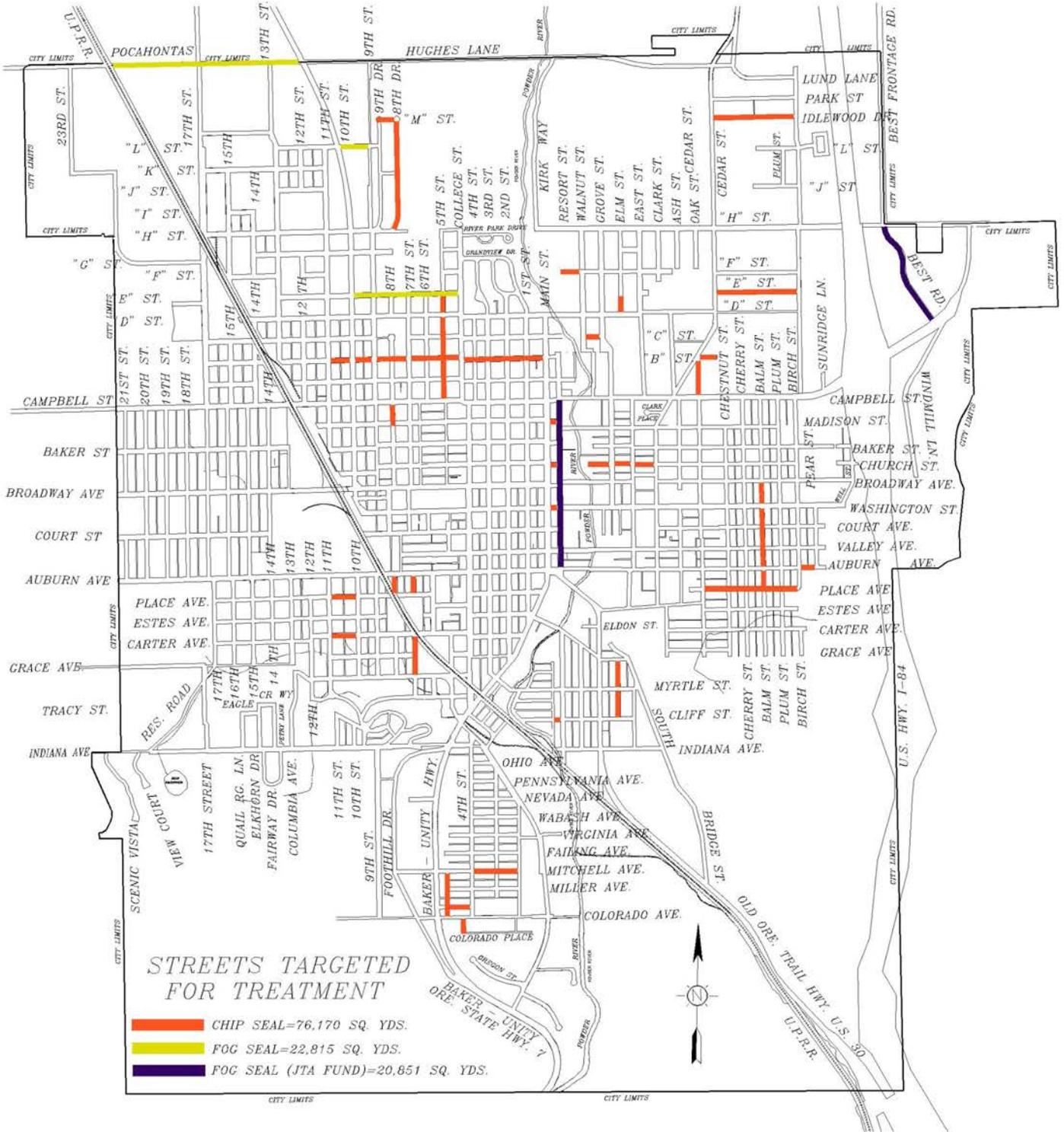
Streets in the "Good" and "Fair" categories traditionally receive this treatment.

## Double Chip Seal

Similar to a single chip seal application, emulsified asphalt is applied, a 3/8"-1/4" chip aggregate is applied, loose rock is swept up, then another coat of emulsified asphalt and 1/4"-#10 chip aggregate is applied over the 3/8"-1/4" layer. Extensive patching is completed prior to the chip seal application.

Streets in the "Good" and "Fair" categories are generally selected to receive this treatment.

# Streets Selected for Treatment-2015



# Street Preventative Maintenance

## 2015 Estimated Project Costs



### Chip Seal

|  |   |                     |
|--|---|---------------------|
| Application to Selected City Streets               | 76,170 yd <sup>2</sup> @ \$3.36/yd <sup>2</sup> | \$255,931.20        |
| Preparing Streets Prior to Application             | 76,170 yd <sup>2</sup> @ \$1.14/yd <sup>2</sup> | \$86,833.80         |
| <b>Subtotal of Chip Seal Application and Prep:</b> |   | <b>\$342,765.00</b> |

### Fog Seal

|   |  |                   |
|---|--|-------------------|
| Application to Pocahontas Rd. & E St. & L St. | 22,815 yd <sup>2</sup> @ \$.30/yd <sup>2</sup> | \$6,844.50        |
| Application to Best Frontage Rd. & Resort St. | 20,851 yd <sup>2</sup> (JTA Funds)             |                   |
| <b>Subtotal of Fog Seal Application:</b>      |  | <b>\$6,844.50</b> |

### Total Estimated Cost

|  |              |                     |
|--|--------------|---------------------|
| Total Chip and Fog Seal Application:                       | \$349,609.50 |                     |
| Engineering (10%)  | \$34,960.95  |                     |
| Administration (7.7%)                                      | \$29,611.92  |                     |
| Contingency (10%)  | \$41,418.24  |                     |
| <b>2015 Total Preventative Maintenance Estimated Cost:</b> |              | <b>\$455,600.61</b> |

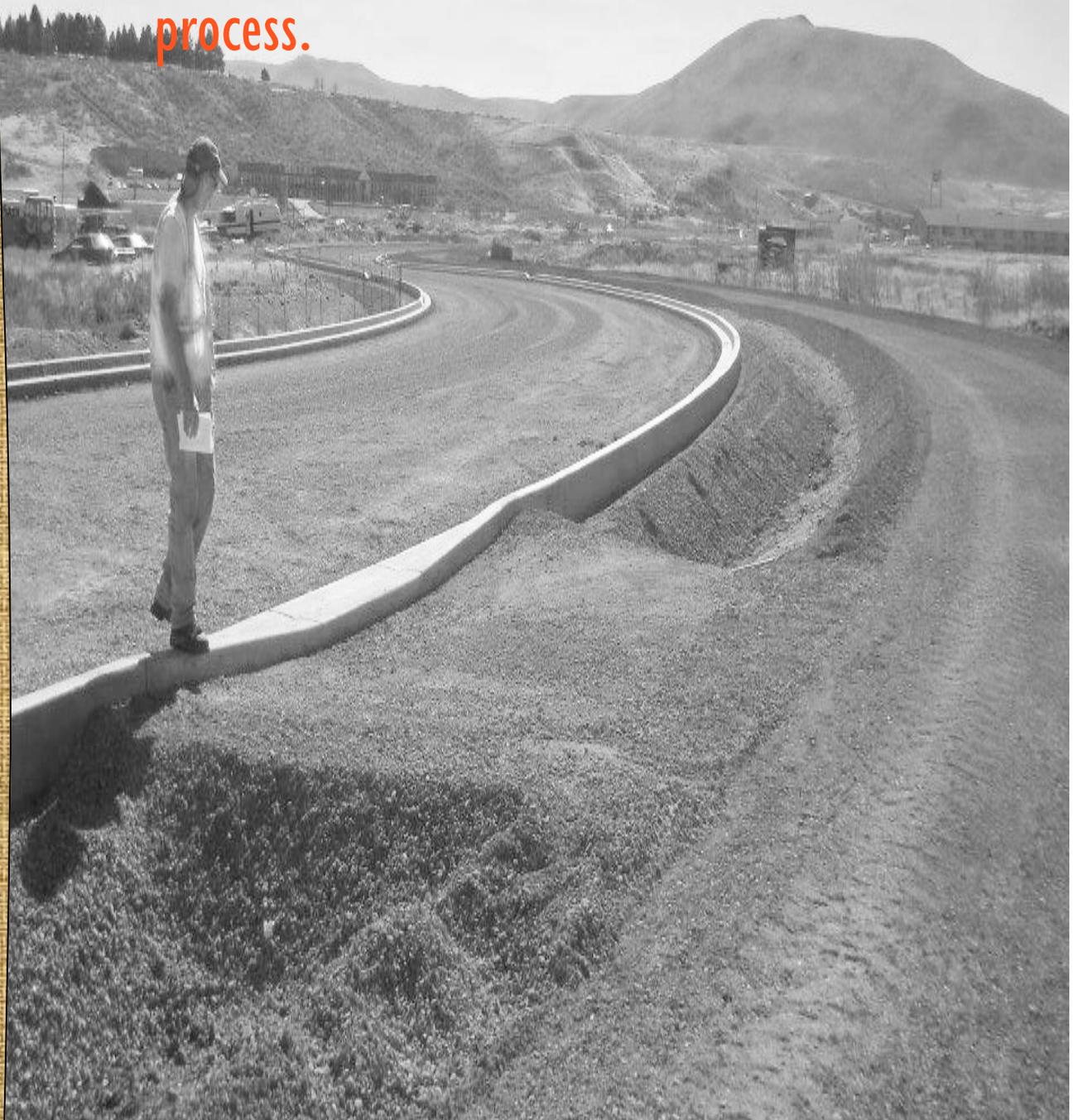
Revenue for pavement maintenance work comes from the Surface Transportation Program (STP) and Serial Management Levy (now a portion of the tax base).

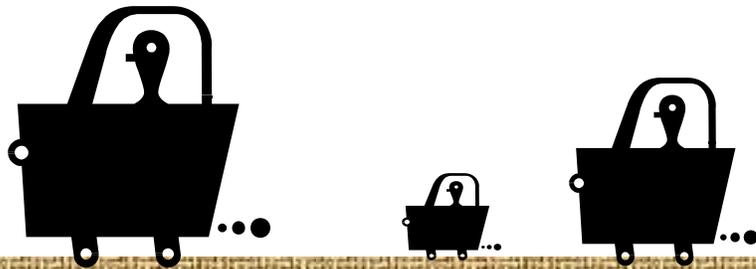
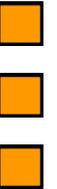
The crack filling and asphalt patching necessary to prep streets for treatment are funded in the Street Maintenance Department of the State Tax Street Fund and not the Preventative Maintenance Department.



## A Pavement Management Plan...

- Identifies immediate and long-term street maintenance needs.
- Provides information to the public to better inform them during the decision making process.





# 2015 Pavement Management Plan