City of Ferndale

Pavement Management Update (2016-17) – Final Report
October 2017

NCE

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Background

The Humboldt County Association of Governments (HCAOG) is the designated Regional Transportation Planning Agency (RTPA), and is responsible for developing regional transportation. As part of this process a Pavement Management Program(PMP) is needed to assist in determining the future transportation needs of the region.

A PMP is a tool designed to assist cities and counties with answering typical pavement network questions such as:

- What does the City's pavement network consist of? How many miles of streets are in a jurisdiction? What is the total pavement area of these public streets?
- What is the existing condition of the public street pavement network? Is this an acceptable level for the City? If not, what is an acceptable level? How much additional funding is needed to achieve an acceptable level? How much is needed to maintain the public street pavement at this level?
- How will the condition of the pavement network respond over time under existing funding levels?
- What maintenance strategies are needed to maintain or improve current pavement conditions?
- What maintenance activities or treatments have occurred in the past on any given street?
- What impact would either additional funding, or a decrease in funding, have on the condition of the overall pavement network?
- What are the maintenance priorities under different budget constraints?

Nichols Consulting Engineers, Chtd. (NCE) was selected by HCAOG to update the City's StreetSaver PMP. Field surveys were completed in February 2017 and all survey data was entered into the City's PMP. NCE also reviewed the preventive maintenance and rehabilitation decision tree and updated the costs. Then, a budget needs analysis was performed, followed by three budgetary scenarios.

Purpose

The purpose of this report is to assist decision makers in utilizing the results of the StreetSaver Pavement Management Program (PMP). Specifically, this report assesses the adequacy of ideal and projected revenues to meet the maintenance needs recommended for the City. It also maximizes the return from expenditures by:

1) Implementing a multi-year street rehabilitation and maintenance program
2) Developing a preventive maintenance program
3) Selecting the most cost effective repairs

This report examines the overall condition of the street network and highlights options for improving the current network level pavement condition index (PCI). These options are developed by conducting "what if" analyses. By varying the budget amounts available for pavement maintenance and repair, the impacts of different funding strategies on the City's streets over the next twenty years were determined.

Network Description

The City of Ferndale oversees the repair and maintenance of approximately 9.3 centerline miles of pavement, or 61 pavement sections. Table 1 below summarizes the network by functional class.

Table 1: Network Summary Statistics for City-Maintained Sections

Functional Class	Sections	Centerline Miles	Lane Miles	% of the Entire Network (by Pavement Area)
Collector	7	2.3	4.6	24.1%
Residential/Local	54	7.0	14.1	75.9%
Total	**61**	**9.3**	**18.7**	**100%**

The network replacement cost of the City maintained sections is approximately $13.3 million. This cost is defined as the full reconstruction of all pavement sections in the City's pavement network and does not include related infrastructure assets, such as sidewalks, signals, markings, signs, etc.

A listing of all pavement sections in the network and their corresponding current PCI and attribute data is included in Appendix A.

Pavement Current Condition

The pavement condition index, or PCI, is a measurement of the pavement condition and ranges from 0 to 100. A newly constructed street will have a PCI of 100, while a failed street will have a PCI of 25 or less. **The average 2017 PCI of the City's entire street network is 52, with a remaining service life of approximately 13 years**. Note that these values are projected and area-weighted calculations from StreetSaver. The remaining service life for the network is based on the projection that if no further funding were allocated to pavements, the network will reach "Very Poor/Failed" condition in approximately 13 years.

Figure 1 below illustrates the definitions of the five pavement condition categories. Note that the StreetSaver Maintenance and Rehabilitation Decision Tree in Appendix B assigns different condition category titles from those in Figure 1.

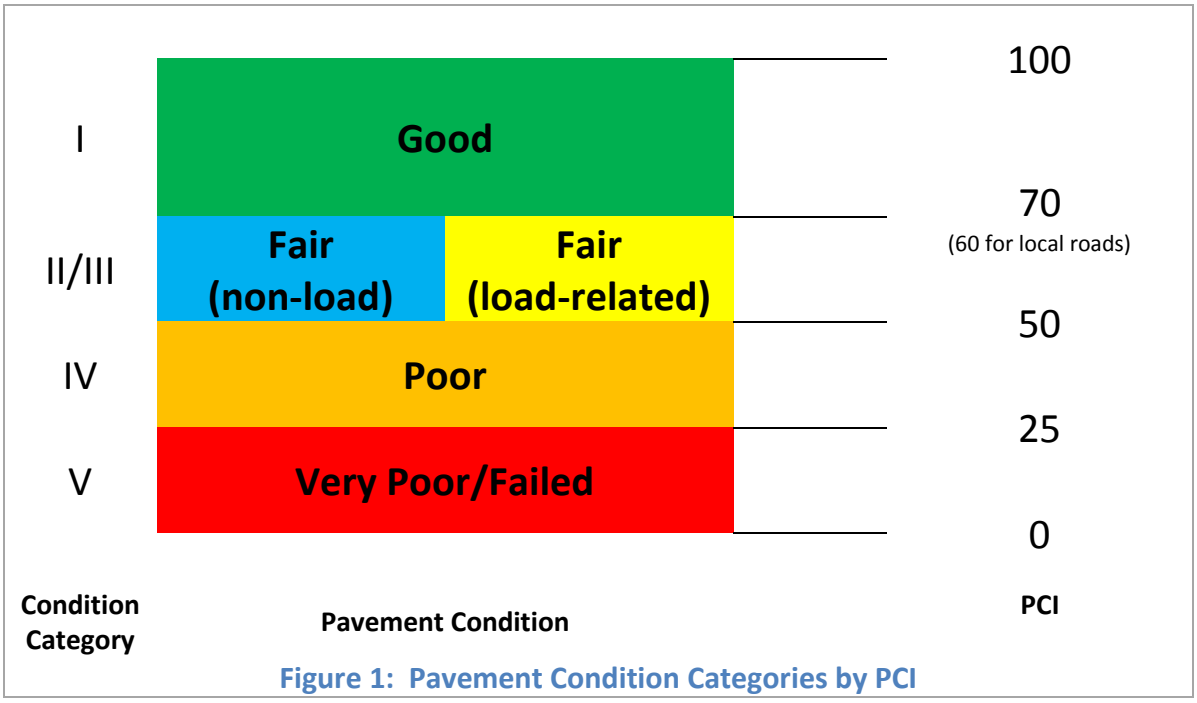


Figure 1: Pavement Condition Categories by PCI

Figure 2 includes representative photos showing streets with different PCIs.

Figure 2: Streets with Different PCIs

Table 2 below provides the pavement condition breakdown for the network by PCI range or condition category. About 48.8% of the entire City's streets for 2017 are in the "Good" condition category. Conversely, 40.9 % of the pavement area falls in the "Poor" or "Very Poor/Failed" condition categories.

Table 2: 2017 Pavement Condition Breakdowns by Area (Entire Network)

Condition Category	PCI Range	Collector (%)	Residential	Entire Network (%)
Good (I)	70-100	16.5%	32.3%	48.8%
Fair (II/III)	50-69	0%	10.3%	10.3%
Poor (IV)	25-49	1.7%	9.1%	10.8%
Very Poor/Failed (V)	<25	5.9%	24.2%	30.1%
Total		**24.1%**	**75.9%**	**100%**

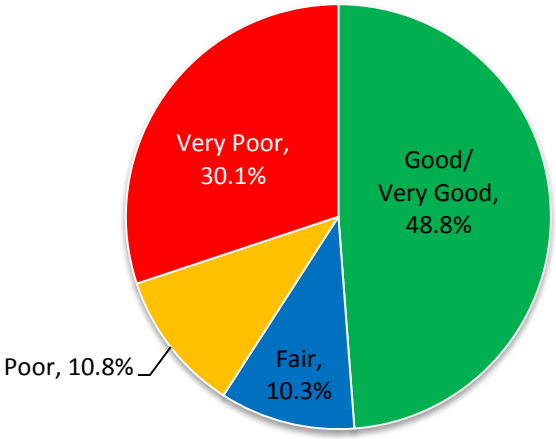


Figure 3: Pavement Condition Summary by Condition Categories (Entire Network by Area, 2017)

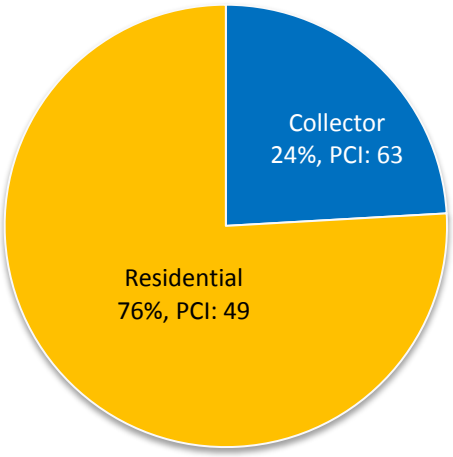


Figure 4: Pavement Condition Summary by Functional Classification (Entire Network by Area, 2017)

Maintenance and Rehabilitation

Historically, the City has utilized a program of crack sealing, base repairs, and overlays as maintenance and rehabilitation strategies. As the pavement condition deteriorates base repairs and asphalt overlays have been applied. Digouts or base repairs are typically used as treatment by itself or as preparation prior to overlays and surface seals as necessary. These treatments are formalized in the maintenance and rehabilitation Decision Tree shown in Appendix B.

Figure demonstrates that pavement maintenance follows the old colloquial saying of "pay me now, or pay me more later". History has shown that it costs much less to maintain streets in good condition than to repair streets that have failed. By allowing pavements to deteriorate, streets that once cost $2.50 per square yard ($/sy) to slurry seal may soon cost $43.00/sy to overlay or $86.00/sy to reconstruct. In other words, significant delays in repairs can cost over 35 times more.

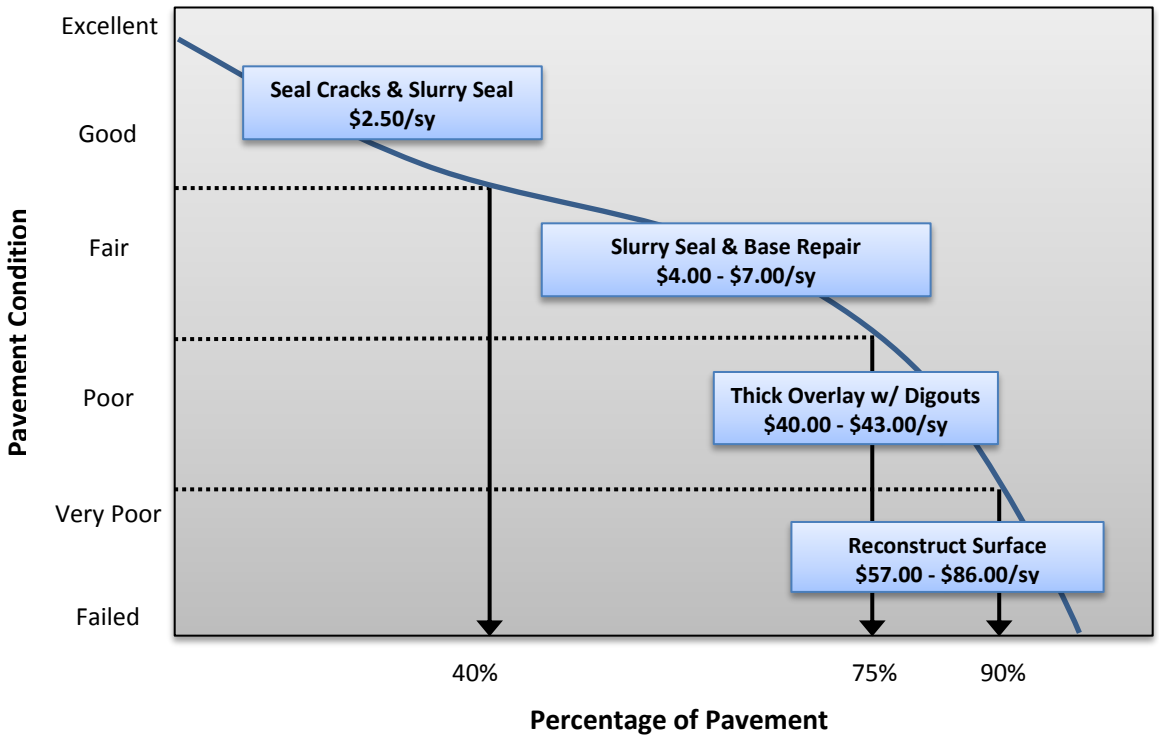


Figure 5: Costs of Maintaining Pavements over Time

Budget Needs

Based on the principle that it costs less to maintain streets in good condition than those in bad condition, the PMP strives to develop a maintenance strategy that will improve the overall condition of the network to an optimal PCI and then sustain it at that level. In addition, there is currently $2.9 million of deferred maintenance. If the maintenance needs are not addressed, the quality of the street network will inevitably decline. In order to correct these deficiencies, a cost effective funding and maintenance and rehabilitation strategy must be implemented.

The first step in developing a cost effective maintenance and rehabilitation strategy is to determine the maintenance "needs" of the pavement network. Using the StreetSaver budget needs module, the maintenance needs over the next twenty years were estimated to be approximately $6.6 million. If the City of Ferndale follows the strategy recommended by the program, the average network PCI will increase to 80 by 2036. If, however, no maintenance is applied over the next twenty years, already distressed streets will continue to deteriorate, and the network PCI will drop to 17 by 2036. The results of the budget needs analysis are summarized in Table 3 below.

Table 3: Summary Results from Needs Analysis

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
PCI Treated	84	82	80	79	78	80	78	78	78	79	
PCI Untreated	52	49	47	46	44	42	40	39	37	35	
Needs ($Thousands)	2,860	52	35	100	55	331	42	164	236	229	
Year	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**Total**
PCI Treated	81	81	80	80	81	83	81	83	81	80	--
PCI Untreated	33	32	30	28	27	25	23	21	19	17	--
Needs ($Thousands)	307	220	114	258	328	743	21	414	0	72	6,581

The results of the budget needs analysis represent the ideal funding strategy recommended by the StreetSaver PMP. Note that the more than half is “front-loaded” since deferring repairs will cost more. Of the $6.6 million in maintenance needs shown, approximately $3.4 million (51%) is earmarked for preventive maintenance or life extending treatments and approximately $3.2 million (49%) is allocated for the more costly rehabilitation and reconstruction treatments.

Budget Scenarios

Having determined the maintenance needs of the street network, the next step in developing a cost effective maintenance and rehabilitation strategy is to conduct several "what-if" analyses. Using StreetSaver's budget scenario module, the impacts of various budget "scenarios" may be evaluated. The program projects the effects of the different scenarios on pavement condition index (PCI), deferred maintenance (unfunded backlog), and average remaining service life of the network. By examining the effects on these indicators, the advantages and disadvantages of different funding levels and maintenance strategies become clear.

Scenario 1: Increase PCI to 70 – This scenario requires $5.9 million to improve the PCI to 70 in ten years and maintain it at that level for the next ten years. By 2036, the deferred maintenance will decrease to approximately $0.5 million.

Scenario 2: Maintain Current PCI – In this scenario, the goal is to maintain the current network PCI of 52 over the next twenty years that requires a total of $3.25 million. The deferred maintenance still increases to $3.9 million by the end of 2036.

Scenario 3: RMRA funding[1] – This scenario shows the impact of RMRA funding over the next twenty years. The network PCI will decrease to 23 and the deferred maintenance will increase to $9.7 million.

Note: The deferred maintenance consists of pavement maintenance that is needed, but cannot be performed due to lack of funding. Shrinking budgets have forced many cities and counties to defer much needed pavement maintenance. By deferring maintenance, not only does the frequency of citizens' complaints about the condition of the network increase, but the cost to repair these streets rises as well. More detailed results of the budget needs scenarios may be found in Appendix C.

Appendix E contains maps generated from the GIS Toolbox in StreetSaver, which illustrate the results of each scenario. The maps show the entire pavement network, highlighting the color-coded condition category of each pavement section throughout the network in 2036 for each budget scenario. A map illustrating the present conditions is also provided for comparison.

[1] Road Maintenance and Rehabilitation Account (RMRA - Streets and Highways Code Sec 2030 et sec. – also known as Senate Bill 1) includes funds from the taxes enacted by the Road Repair and Accountability Act of 2017. The first full year of funding will be FY2018-19 and the City is expected to receive $24,000.

Scenario 1: Increase PCI to 70

This scenario requires $5.9 million to improve the PCI to 70 in ten years and maintain it at that level for the next ten years. Approximately 16% of the budget is allocated to preventive maintenance treatment such as slurry seals and 84% to rehabilitation and reconstruction. The percentage of the pavement network in the "Good" condition category will increase to 72.4% by 2036. The deferred maintenance will decrease from $2.9 million to $0.5 million, and the remaining service life of the overall network will increase to 22 years. The results of the budget scenario analysis for Scenario 1 are summarized in Table 4 and Figure 6. Appendix D provides a list of sections selected for treatment by the StreetSaver Program for this scenario.

Table 4: Summary Results for Scenario 1

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Budget ($ Thousands)	24	431	352	298	328	586	0	226	591	633	
Deferred Maintenance ($ Thousands)	2,837	2,584	2,338	2,128	2,238	1,766	1,850	1,916	1,449	984	
PCI	52	55	57	59	61	65	63	63	68	73	
Remaining Service Life (Years)	13	15	16	17	18	20	19	19	21	22	
Year	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**Total**
Budget ($ Thousands)	0	115	308	66	417	17	356	392	245	519	5,904
Deferred Maintenance ($ Thousands)	1,169	1,586	1,382	1,438	1,109	1,156	850	526	492	507	--
PCI	70	70	71	70	72	70	70	71	70	70	--
Remaining Service Life (Years)	22	22	22	21	23	22	22	21	22	22	--

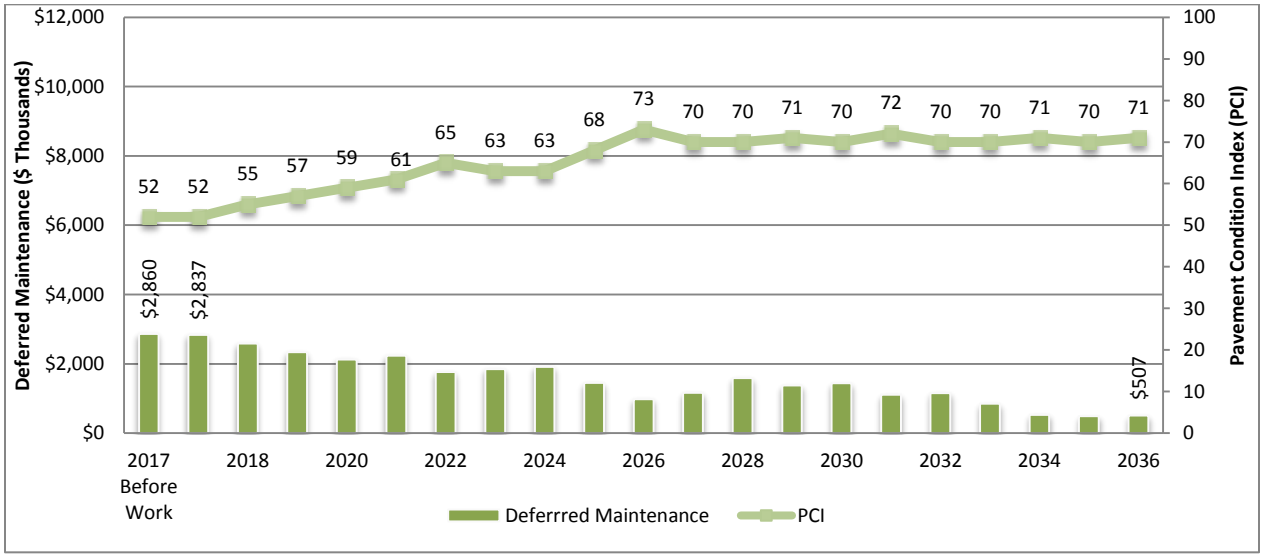


Figure 6: PCI vs Deferred Maintenance for Scenario 1

Scenario 2: Maintain Current PCI

A total of $3.25 million is required to maintain the current network PCI of 52 over the next twenty years. By 2036, approximately 47.9% of the network will be in "Good" condition and the deferred maintenance will reach $3.9 million. The remaining service life of the overall network is projected to increase to 14 years. The results of the budget scenario analysis for Scenario 2 are summarized in Table 5 and Figure 7.

Table 5: Summary Results for Scenario 2

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Budget ($ Thousands)	24	238	125	186	129	137	127	193	192	102	
Deferred Maintenance ($ Thousands)	2,837	2,778	2,764	2,679	3,003	3,004	2,998	3,130	3,100	3,215	
PCI	52	53	52	53	53	52	52	52	53	52	
Remaining Service Life (Years)	13	14	14	15	14	15	15	14	15	15	
Year	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**Total**
Budget ($ Thousands)	222	68	177	65	240	253	281	10	484	0	3,253
Deferred Maintenance ($ Thousands)	3,229	3,726	3,679	3,789	3,565	3,565	3,407	3,509	3,283	3,891	--
PCI	53	52	53	52	52	53	54	52	54	52	--
Remaining Service Life (Years)	15	15	15	15	15	15	16	15	15	14	--

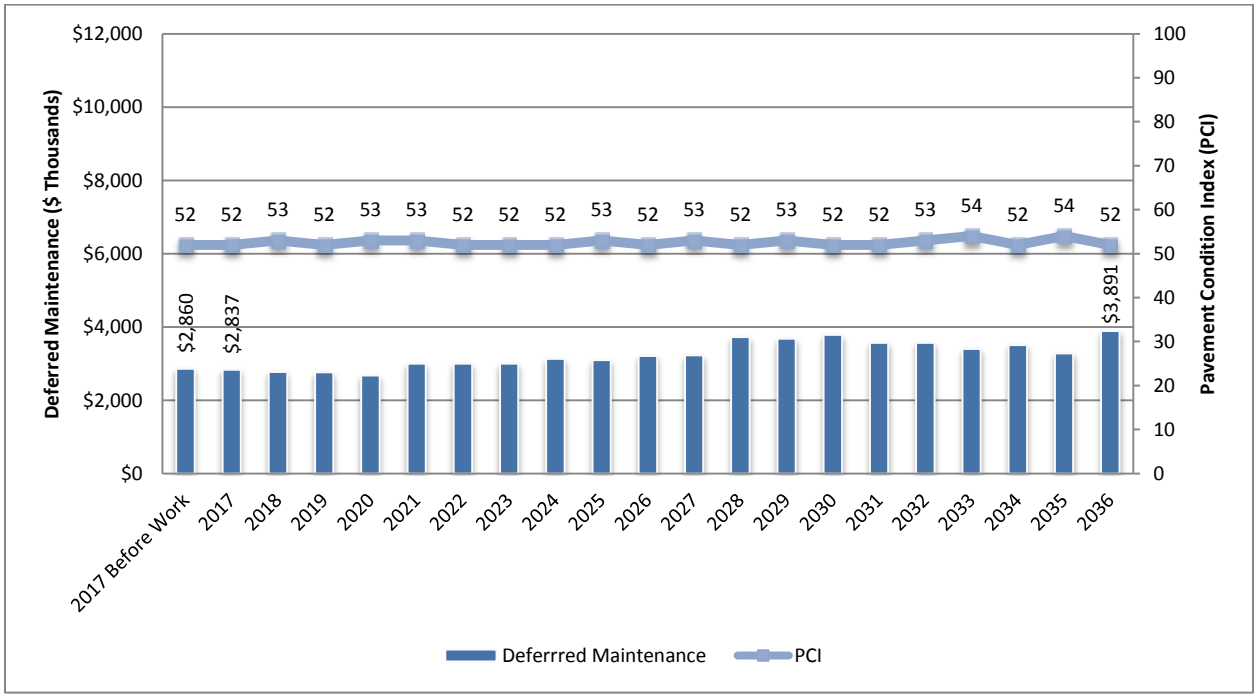


Figure 7: PCI vs Deferred Maintenance for Scenario 2

Scenario 3: RMRA Funding

The City is expected to receive as much as $24,000 from RMRA beginning in FY2018/19. The results indicate that the network PCI will decrease to 23 and the deferred maintenance will increase significantly to $9.7 million by 2036. The remaining service life will decrease to 5 years. The results are summarized in Table 6 and Figure 8.

Table 6: Summary Results for Scenario 3

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Budget ($ Thousands)	0	8	24	24	24	24	24	24	24	24	
Deferred Maintenance ($ Thousands)	2,860	3,034	3,148	3,243	3,738	3,948	4,071	4,404	4,559	4,721	
PCI	52	50	48	46	45	44	42	41	40	38	
Remaining Service Life (Years)	13	12	12	11	11	10	10	9	10	9	
Year	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**Total**
Budget ($ Thousands)	24	24	24	24	24	24	24	24	24	24	440
Deferred Maintenance ($ Thousands)	4,870	5,461	6,125	6,340	7,964	8,108	8,389	9,168	9,566	9,726	--
PCI	37	35	34	33	31	30	28	27	25	23	--
Remaining Service Life (Years)	8	8	7	7	7	6	6	6	5	5	--

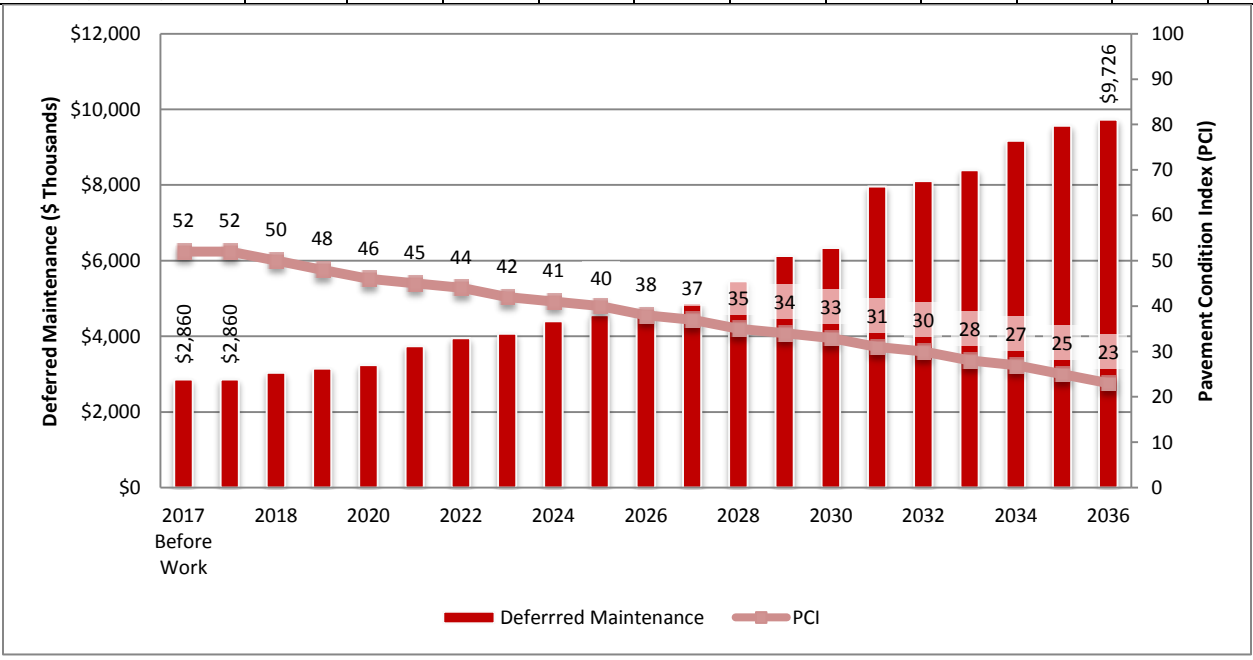


Figure 8: PCI vs Deferred Maintenance for Scenario 3

Scenario Comparisons

The following two figures graphically illustrate the annual changes in PCI and deferred maintenance for each scenario.

Figure 9 illustrates the change in PCI over time for the different budget scenarios. Scenario 1 (Increase PCI) will increase the network PCI to 70 than it will be maintained at that level between 2027 and 2036, Scenario 2 (Maintain Current PCI) will maintain the 2017 PCI of 52 in 2036 and Scenario 3 (RMRA Funding) will result in decrease of the network PCI to 23.

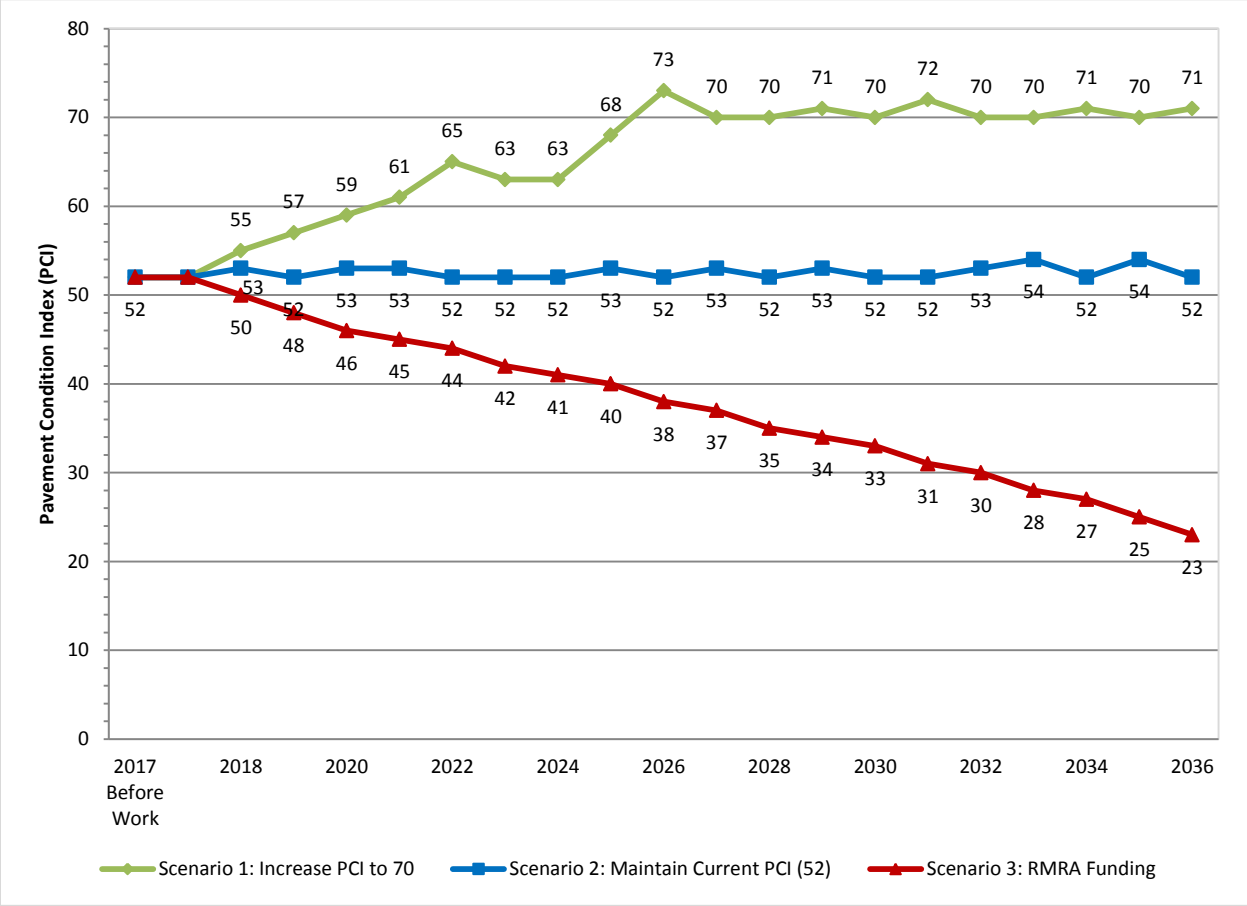


Figure 9: Annual Pavement Condition Index by Scenario

Figure 10 illustrates the change in deferred maintenance over time for the different budget scenarios. Note that Scenario 1 (Increase PCI) will decrease the deferred maintenance to approximately $2.3 million, but Scenario 2 (Maintain Current PCI) will increase it by approximately $1.0 million. Also Scenario 3 (RMRA Funding) will increase the deferred maintenance to $9.7 million.

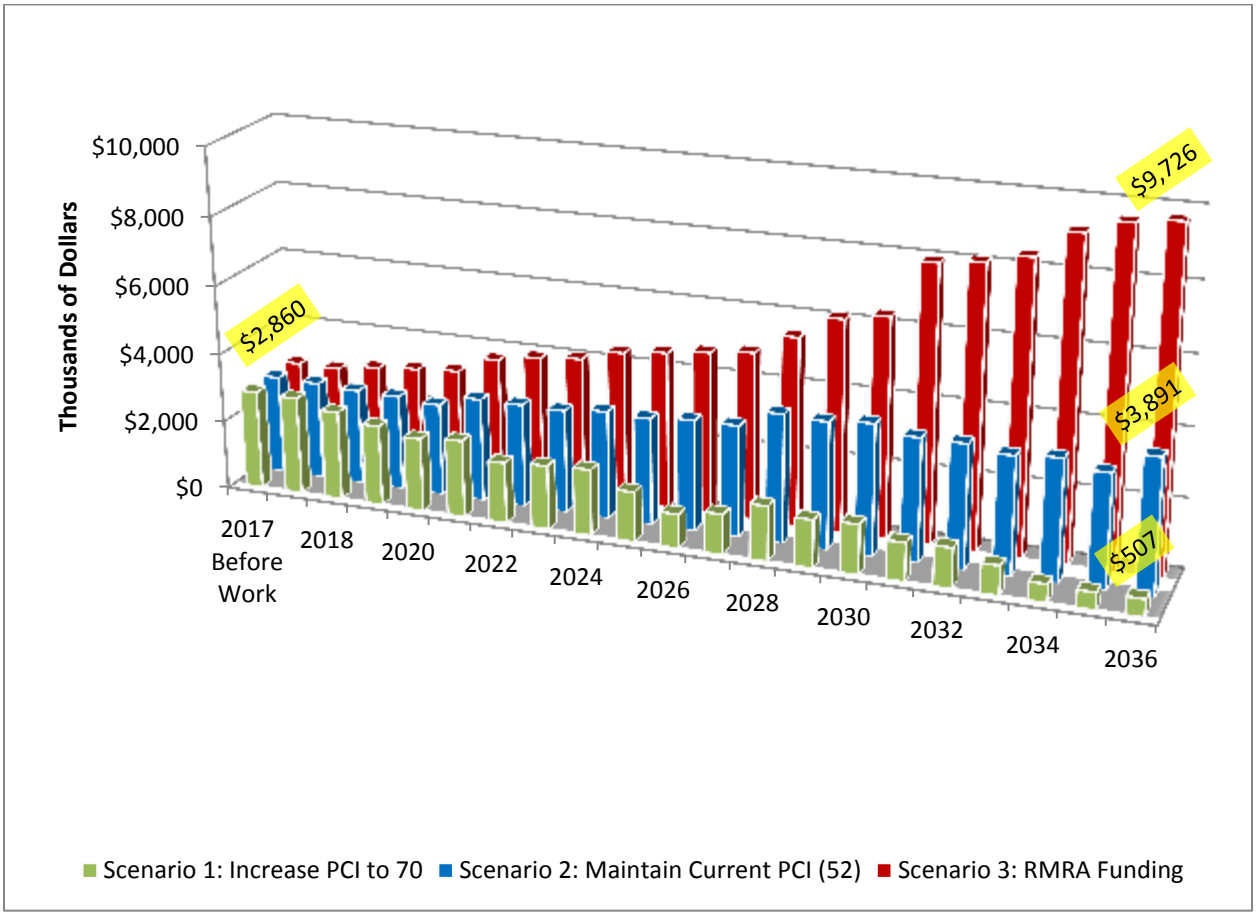
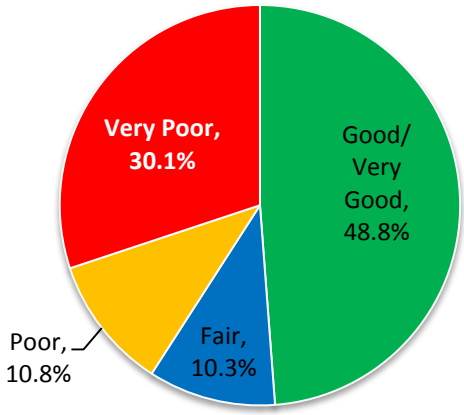
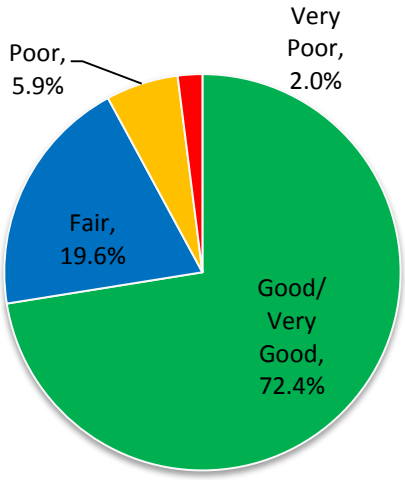


Figure 10: Annual Deferred Maintenance by Scenario

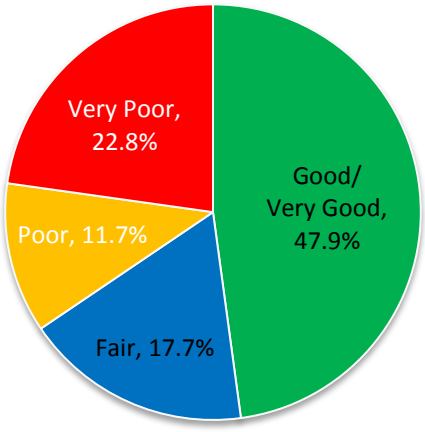
Figure 11 illustrates the pavement condition changes under various scenarios. Currently 48.8% of the network is in the "Good" condition category and 40.9% in "Poor" or "Very Poor/Failed" condition categories. For Scenario 1 (Increase PCI), there are clear improvements; roads in "Good" condition will increase to 72.4%. Additionally roads in "Poor" or "Very Poor/Failed" condition will decrease to 7.9% by 2036. Under Scenario 2 (Maintain Current PCI), there are no significant changes from the current condition. Under Scenario 3 (RMRA Funding), 73.6% of the network will fall into "Very Poor/Failed" and "Poor" condition categories.



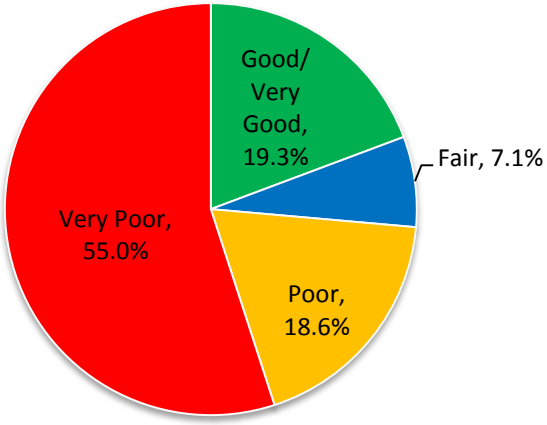
Current Condition 2017



2036 Condition (Scenario 1: Increase PCI to 70)



2036 Condition(Scenario 2: Maintain Current PCI)



2036 Condition(Scenario 3: RMRA Funding)

Figure 11: Pavement Condition Changes under Scenarios 1-3

Discussion

To summarize, the City of Ferndale has a substantial investment of $13.3 million in their entire paved network. Overall, the City-funded network is in "Fair" condition with a 2017 network PCI of 52. Of the 9.3 centerline miles of City-funded streets, approximately 59.1% of the streets currently fall into the "Fair" or "Good" condition categories.

The projected City budget (including RMRA) will result in the PCI dropping to 23 over the next twenty years and the deferred maintenance will increase to $9.7 million. Furthermore, the analyses indicate that the City needs to spend approximately $6.6 million over the next twenty years to repair essentially all streets. By doing so, streets then can be maintained in good condition with on-going preventive maintenance.

Clearly, the most desirable scenario is to decrease the deferred maintenance as much as possible (Scenario 1). However, the goal should be to offer residents a safe and functional pavement network without unduly increasing the maintenance burden in the future.

Recommendations

A. Pavement Budget

The recommended scenario for the City of Ferndale is presented in Scenario 1, with a total budget of $5.9 million over twenty years. This plan will increase the 2017 network PCI to 71 by 2036, and will also increase the percentage of pavement sections that are in "Good" condition to 72.4%. In addition, the deferred maintenance will decrease to a little over $0.5 million by 2036.

B. Pavement Maintenance Strategies

The City's pavement maintenance strategies should include seals, overlays, and reconstruction. Crack sealing, one of the least expensive treatments, can keep moisture out of pavements and prevent the underlying aggregate base from premature failures. Slurry seals are also cost-effective for pavements currently in good condition.

Therefore, we recommend that the City implement a well-funded preventive maintenance program. This is necessary to at least maintain the portion of the street network that is in "Good" condition and avoid escalating the deferred maintenance even more.

C. Maintenance and Rehabilitation Decision Tree

The maintenance and rehabilitation Decision Tree and the associated unit costs should be reviewed and updated annually to reflect new construction techniques/repairs and changing costs so the budget analysis results can be reliable and accurate.

D. Next Steps

To summarize, we recommend that the City undertake the following steps:

- Implement/ maintain a preventive maintenance strategy.
- Determine other funding sources to at least maintain the current pavement condition. Examples of some funding sources are listed below:

Federal Funding Sources

- Community Development Block Grants (CDBG)
- Congestion Mitigation & Air Quality Improvement (CMAQ)
- Secure Rural Schools and Community Self-Determination Act
- Surface Transportation Block Grant Program
- Highway Safety Improvement Program (HSIP)
- HSIP High Risk Rural Roads Set-Aside (HR3)

State Funding Sources

- Active Transportation Program (ATP) which now includes the Bicycle Transportation Account (BTA) and Safe Routes to Schools (SR2S)
- State Transportation Improvement Program (STIP)
- AB 2766 (vehicle surcharge)
- Vehicle License Fees (VLF)
- CalRecycle grants
- Transportation Development Act (TDA)
- Traffic Safety Fund
- Transportation Uniform Mitigation Fee (TUMF)

Local/Regional Funding Sources

- Local sales taxes
- Development impact fees
- General funds
- Various assessment districts – lighting, maintenance, flood control, special assessments, community facility districts
- Traffic impact fees
- Traffic safety/circulation fees
- Utilities e.g., stormwater, water, wastewater enterprise funds
- Transportation mitigation fees
- Flood Control Districts
- Enterprise Funds (solid waste and water)
- Parcel/property taxes

- Vehicle registration fees
- Vehicle code fines
- Underground impact fees
- Solid waste funds
- Transient Occupancy Taxes (TOT)

APPENDIX A

Section Description Inventory

Section Description Inventory Report

This report lists a variety of section description information for each of the City's pavement sections. It lists the street and section identifiers, limits, functional class, surface type, number of lanes, lengths, widths, Inspected 2017 PCI, and area identifier.

All of the City's pavement sections are included in the report. The report is sorted alphabetically by Street Name and Section ID. The field descriptions in this report are listed below:

COLUMN	DESCRIPTION
Street ID	Street Identification - A code up to ten characters/digits to identify the street. Generally, the street name is truncated to six characters. The Street ID should be unique for each street.
Section ID	Section Identification - A code up to ten characters/digits to identify the section number. The Section ID must be unique for each section of one street.
Street Name	Street Name - The name of the street as indicated by street signs in the field.
Begin Location	Beginning limit of the section.
End Location	Ending limit of the section.
Lanes	Number of travel lanes.
Length (ft)	Length of the section in feet.
Width (ft)	Average width of the section in feet.
Surface Type (ST)	Surface Type (A = AC Pavement, O = AC Overlay of AC Pavement, C = AC Overlay of PCC Pavement, P = PCC Pavement, ST = Surface treatment over gravel base/subgrade).
Functional Class (FC)	Functional Classification (C = Collector, R = Residential).
PCI Date	The last inspection date or rehabilitation date.
PCI	Average PCI for the section. The value is projected for 2017 and is based on the last calculated PCI (i.e. from inspection or maintenance data).

Section Description Inventory
Sorted by Street Name

Street ID	Section ID	Street Name	Begin Location	End Location	Lanes	Length (ft)	Width (ft)	Surface Type	FC	PCI Date	PCI
F-3RDST	010	3RD STREET	A ST	SHAW AVE	2	300	44	A	R	12/5/2016	44
F-4THST	010	4TH STREET	PIXLEY	A ST	2	558	44	A	R	12/5/2016	71
F-5THST	010	5TH STREET	OCEAN AVE	SHAW AVE	2	645	37	A	R	10/19/2009	41
F-5THST	020	5TH STREET	SHAW AVE	ARLINGTON AVE	2	2297	32	A	R	12/5/2016	89
F-5THST	030	5TH STREET	ARLINGTON AVE	VAN NESS AVE	2	1350	25	A	R	10/19/2009	22
F-AST	010	A STREET	5TH ST	3RD ST	2	613	36	A	R	12/5/2016	44
F-ARLAVE	010	ARLINGTON AVE	W CITY LIMIT	5TH ST	2	924	14	A	R	10/19/2009	23
F-ARLAVE	020	ARLINGTON AVE	5TH ST	MAIN ST	2	1745	35	A	R	12/5/2016	88
F-ARLAVE	030	ARLINGTON AVE	MAIN ST	E END	2	499	35	A	R	12/5/2016	38
F-BERDST	010	BERDING STREET	FRANCIS ST	CLEVELAND ST	2	553	27	A	R	12/5/2016	78
F-BERDST	020	BERDING STREET	CLEVELAND ST	EUGENE ST	2	232	47	A	R	12/5/2016	86
F-BERDST	030	BERDING STREET	EUGENE ST	HERBERT ST	2	2233	41	A	R	10/19/2009	35
F-BLUFST	010	BLUFF STREET	CRAIG ST	E CITY LIMIT	2	2404	20	A	C	12/5/2016	87
F-BROWST	010	BROWN STREET	MAIN ST	BERDING ST	2	374	30	A	R	12/5/2016	67
F-BROWST	020	BROWN STREET	BERDING ST	CRAIG ST	2	311	35	A	R	12/5/2016	50
F-CLEVST	010	CLEVELAND STREET	BERDING ST	HARRISON ST	2	352	37	A	R	12/5/2016	63
F-CRAIST	010	CRAIG STREET	OCEAN AVE	WASHINGTON ST	2	680	47	A	R	12/5/2016	53
F-CREACT	010	CREAM COURT	W CDS	JACOBSEN WAY	2	609	35	A	R	12/5/2016	78
F-DEWAVE	010	DEWEY AVENUE	HERBERT ST	E CDS	2	363	21	A	R	12/5/2016	64
F-DEEAVE	010	DEWEY EXTENSION AVENUE	W CDS	JACOBSEN WAY	2	508	36	A	R	12/5/2016	78
F-EMERLN	010	EMERSON LANE	S CDS	WASHINGTON ST	2	447	19	A	R	12/5/2016	80
F-EUGEST	010	EUGENE STREET	FRANCIS ST	BERDING ST	2	383	43	A	R	12/5/2016	84
F-EUGEST	020	EUGENE STREET	BERDING ST	HARRISON ST	2	348	31	A	R	12/5/2016	88
F-EUGEST	030	EUGENE STREET	HARRISON ST	END OF PAVEMENT	2	362	12	A	R	10/19/2009	30
F-FERAVE	010	FERN AVENUE	N END	MAIN ST	2	842	38	A	R	12/5/2016	65
F-FERAVE	020	FERN AVENUE	MAIN ST	BERDING ST	2	365	33	A	R	12/5/2016	82
F-FRANST	010	FRANCIS STREET	S END	SW BRIDGE	2	221	24	A	R	12/5/2016	63
F-FRANST	020	FRANCIS STREET	NE BRIDGE	OCEAN AVE	2	774	48	A	R	10/19/2009	41
F-GRAAVE	010	GRANT AVENUE	SCHLEY AVE	LINCOLN AVE	2	809	32	A	R	12/5/2016	59
F-HARAVE	010	HARRISON AVENUE	CLEVELAND ST	CLEVELAND ST	2	234	35	A	R	12/5/2016	74
F-HERBST	010	HERBERT STREET	ROSE AVE	DEWEY AVE	2	640	23	A	R	10/19/2009	32
F-HERBST	020	HERBERT STREET	DEWEY AVE	FERN AVE	2	197	37	A	R	12/5/2016	90
F-HERBST	030	HERBERT STREET	FERN AVE	MAIN ST	2	660	37	A	R	12/5/2016	90
F-HOWAST	010	HOWARD STREET	MAIN ST	E END	2	644	46	A	R	12/5/2016	71
F-JACWAY	010	JACOBSEN WAY	S CDS	N CDS	2	710	32	A	R	12/5/2016	76
F-LEWAVE	010	LEWIS AVENUE	MAIN ST	BERDING ST	2	343	33	A	R	12/5/2016	63

Street ID	Section ID	Street Name	Begin Location	End Location	Lanes	Length (ft)	Width (ft)	Surface Type	FC	PCI Date	PCI
F-LINAVE	010	LINCOLN AVENUE	CROWLEY AVE	GRANT AVE	2	403	16	A	R	12/5/2016	90
F-LINCST	010	LINCOLN STREET	MILTON AVE	TENNYSON AVE	2	620	42	A	R	12/5/2016	55
F-MADIST	010	MADISON STREET	ARLINGTON AVE	TENNYSON AVE	2	399	45	A	R	10/19/2009	43
F-MAINST	010	MAIN STREET	OCEAN AVE	LEWIS AVE	2	1453	44	A	C	12/5/2016	83
F-MAINST	020	MAIN STREET	LEWIS AVE	MARKET ST	2	4349	38	A	C	12/5/2016	88
F-MCKAVE	010	MCKINLEY AVENUE	GRANT ST	DEWEY AVE	2	1475	36	A	R	12/5/2016	53
F-MILAVE	010	MILTON AVENUE	MAIN ST	LINCOLN ST	2	234	47	A	R	12/5/2016	45
F-MILAVE	020	MILTON AVENUE	LINCOLN ST	E END	2	176	35	A	R	10/19/2009	30
F-OCEAVE	010	OCEAN AVENUE	SHAW AVE	5TH ST	2	1135	30	A	C	10/19/2009	13
F-OCEAVE	020	OCEAN AVENUE	5TH ST	MAIN ST	2	465	59	A	C	12/5/2016	48
F-OCEAVE	030	OCEAN AVENUE	MAIN ST	CRAIG ST	2	696	48	A	C	10/19/2009	47
F-PIXLEY	010	PIXLEY	4TH ST	5TH ST	2	299	34	A	R	10/19/2009	41
F-ROSAVE	010	ROSE AVENUE	HERBERT ST	W CITY LIMIT	2	1970	36	A	R	10/19/2009	27
F-SCHAVE	010	SCHLEY AVENUE	ROSE AVE	GRANT AVE	2	960	38	A	R	12/5/2016	59
F-SHAMCT	010	SHAMSI COURT	3RD ST	N CDS	2	309	36	A	R	12/5/2016	85
F-SHAAVE	010	SHAW AVENUE	OCEAN AVE	MAIN ST	2	2011	32	A	R	12/5/2016	84
F-SHAAVE	020	SHAW AVENUE	MAIN ST	BERDING ST	2	373	30	A	R	12/5/2016	44
F-SHAWLN	010	SHAW LANE	W CDS	SHAW AVE	2	247	19	A	R	12/5/2016	90
F-TENAVE	010	TENNYSON AVENUE	MAIN ST	LINCOLN ST	2	488	47	A	R	10/19/2009	32
F-VNEAVE	010	VAN NESS AVENUE	CALIFORNIA ST	MAIN ST	2	1923	35	A	R	12/5/2016	36
F-VANAVE	010	VANSTON AVENUE	MAIN ST	W END	2	237	41	A	R	12/5/2016	70
F-WASHST	010	WASHINGTON STREET	MAIN ST	BERDING ST	2	373	31	A	R	10/19/2009	33
F-WASHST	020	WASHINGTON STREET	BERDING ST	SCHLEY AVE	2	1202	31	A	R	10/19/2009	33
F-WATAVE	010	WATSON AVENUE	ROSE AVE	S CDS	2	296	34	A	R	10/19/2009	29
F-WILDRD	010	WILDCAT ROAD	S CITY LIMIT	OCEAN AVE	2	1530	21	A	C	10/19/2009	33

Section Description Inventory
Sorted by Descending PCI

Street ID	Section ID	Street Name	Begin Location	End Location	Lanes	Length (ft)	Width (ft)	Surface Type	FC	PCI Date	PCI
F-HERBST	020	HERBERT STREET	DEWEY AVE	FERN AVE	2	197	37	A	R	12/5/2016	90
F-HERBST	030	HERBERT STREET	FERN AVE	MAIN ST	2	660	37	A	R	12/5/2016	90
F-LINAVE	010	LINCOLN AVENUE	CROWLEY AVE	GRANT AVE	2	403	16	A	R	12/5/2016	90
F-SHAWLN	010	SHAW LANE	W CDS	SHAW AVE	2	247	19	A	R	12/5/2016	90
F-5THST	020	5TH STREET	SHAW AVE	ARLINGTON AVE	2	2297	32	A	R	12/5/2016	89
F-ARLAVE	020	ARLINGTON AVE	5TH ST	MAIN ST	2	1745	35	A	R	12/5/2016	88
F-EUGEST	020	EUGENE STREET	BERDING ST	HARRISON ST	2	348	31	A	R	12/5/2016	88
F-MAINST	020	MAIN STREET	LEWIS AVE	MARKET ST	2	4349	38	A	C	12/5/2016	88
F-BLUFST	010	BLUFF STREET	CRAIG ST	E CITY LIMIT	2	2404	20	A	C	12/5/2016	87
F-BERDST	020	BERDING STREET	CLEVELAND ST	EUGENE ST	2	232	47	A	R	12/5/2016	86
F-SHAMCT	010	SHAMSI COURT	3RD ST	N CDS	2	309	36	A	R	12/5/2016	85
F-EUGEST	010	EUGENE STREET	FRANCIS ST	BERDING ST	2	383	43	A	R	12/5/2016	84
F-SHAAVE	010	SHAW AVENUE	OCEAN AVE	MAIN ST	2	2011	32	A	R	12/5/2016	84
F-MAINST	010	MAIN STREET	OCEAN AVE	LEWIS AVE	2	1453	44	A	C	12/5/2016	83
F-FERAVE	020	FERN AVENUE	MAIN ST	BERDING ST	2	365	33	A	R	12/5/2016	82
F-EMERLN	010	EMERSON LANE	S CDS	WASHINGTON ST	2	447	19	A	R	12/5/2016	80
F-BERDST	010	BERDING STREET	FRANCIS ST	CLEVELAND ST	2	553	27	A	R	12/5/2016	78
F-CREACT	010	CREAM COURT	W CDS	JACOBSEN WAY	2	609	35	A	R	12/5/2016	78
F-DEEAVE	010	DEWEY EXTENSION AVENUE	W CDS	JACOBSEN WAY	2	508	36	A	R	12/5/2016	78
F-JACWAY	010	JACOBSEN WAY	S CDS	N CDS	2	710	32	A	R	12/5/2016	76
F-HARAVE	010	HARRISON AVENUE	CLEVELAND ST	CLEVELAND ST	2	234	35	A	R	12/5/2016	74
F-4THST	010	4TH STREET	PIXLEY	A ST	2	558	44	A	R	12/5/2016	71
F-HOWAST	010	HOWARD STREET	MAIN ST	E END	2	644	46	A	R	12/5/2016	71
F-VANAVE	010	VANSTON AVENUE	MAIN ST	W END	2	237	41	A	R	12/5/2016	70
F-BROWST	010	BROWN STREET	MAIN ST	BERDING ST	2	374	30	A	R	12/5/2016	67
F-FERAVE	010	FERN AVENUE	N END	MAIN ST	2	842	38	A	R	12/5/2016	65
F-DEWAVE	010	DEWEY AVENUE	HERBERT ST	E CDS	2	363	21	A	R	12/5/2016	64
F-CLEVST	010	CLEVELAND STREET	BERDING ST	HARRISON ST	2	352	37	A	R	12/5/2016	63
F-FRANST	010	FRANCIS STREET	S END	SW BRIDGE	2	221	24	A	R	12/5/2016	63
F-LEWAVE	010	LEWIS AVENUE	MAIN ST	BERDING ST	2	343	33	A	R	12/5/2016	63
F-GRAAVE	010	GRANT AVENUE	SCHLEY AVE	LINCOLN AVE	2	809	32	A	R	12/5/2016	59
F-SCHAVE	010	SCHLEY AVENUE	ROSE AVE	GRANT AVE	2	960	38	A	R	12/5/2016	59
F-LINCST	010	LINCOLN STREET	MILTON AVE	TENNYSON AVE	2	620	42	A	R	12/5/2016	55
F-CRAIST	010	CRAIG STREET	OCEAN AVE	WASHINGTON ST	2	680	47	A	R	12/5/2016	53
F-MCKAVE	010	MCKINLEY AVENUE	GRANT ST	DEWEY AVE	2	1475	36	A	R	12/5/2016	53
F-BROWST	020	BROWN STREET	BERDING ST	CRAIG ST	2	311	35	A	R	12/5/2016	50

Street ID	Section ID	Street Name	Begin Location	End Location	Lanes	Length (ft)	Width (ft)	Surface Type	FC	PCI Date	PCI
F-OCEAVE	020	OCEAN AVENUE	5TH ST	MAIN ST	2	465	59	A	C	12/5/2016	48
F-OCEAVE	030	OCEAN AVENUE	MAIN ST	CRAIG ST	2	696	48	A	C	10/19/2009	47
F-MILAVE	010	MILTON AVENUE	MAIN ST	LINCOLN ST	2	234	47	A	R	12/5/2016	45
F-3RDST	010	3RD STREET	A ST	SHAW AVE	2	300	44	A	R	12/5/2016	44
F-AST	010	A STREET	5TH ST	3RD ST	2	613	36	A	R	12/5/2016	44
F-SHAAVE	020	SHAW AVENUE	MAIN ST	BERDING ST	2	373	30	A	R	12/5/2016	44
F-MADIST	010	MADISON STREET	ARLINGTON AVE	TENNYSON AVE	2	399	45	A	R	10/19/2009	43
F-5THST	010	5TH STREET	OCEAN AVE	SHAW AVE	2	645	37	A	R	10/19/2009	41
F-FRANST	020	FRANCIS STREET	NE BRIDGE	OCEAN AVE	2	774	48	A	R	10/19/2009	41
F-PIXLEY	010	PIXLEY	4TH ST	5TH ST	2	299	34	A	R	10/19/2009	41
F-ARLAVE	030	ARLINGTON AVE	MAIN ST	E END	2	499	35	A	R	12/5/2016	38
F-VNEAVE	010	VAN NESS AVENUE	CALIFORNIA ST	MAIN ST	2	1923	35	A	R	12/5/2016	36
F-BERDST	030	BERDING STREET	EUGENE ST	HERBERT ST	2	2233	41	A	R	10/19/2009	35
F-WASHST	010	WASHINGTON STREET	MAIN ST	BERDING ST	2	373	31	A	R	10/19/2009	33
F-WASHST	020	WASHINGTON STREET	BERDING ST	SCHLEY AVE	2	1202	31	A	R	10/19/2009	33
F-WILDRD	010	WILDCAT ROAD	S CITY LIMIT	OCEAN AVE	2	1530	21	A	C	10/19/2009	33
F-HERBST	010	HERBERT STREET	ROSE AVE	DEWEY AVE	2	640	23	A	R	10/19/2009	32
F-TENAVE	010	TENNYSON AVENUE	MAIN ST	LINCOLN ST	2	488	47	A	R	10/19/2009	32
F-EUGEST	030	EUGENE STREET	HARRISON ST	END OF PAVEMENT	2	362	12	A	R	10/19/2009	30
F-MILAVE	020	MILTON AVENUE	LINCOLN ST	E END	2	176	35	A	R	10/19/2009	30
F-WATAVE	010	WATSON AVENUE	ROSE AVE	S CDS	2	296	34	A	R	10/19/2009	29
F-ROSAVE	010	ROSE AVENUE	HERBERT ST	W CITY LIMIT	2	1970	36	A	R	10/19/2009	27
F-ARLAVE	010	ARLINGTON AVE	W CITY LIMIT	5TH ST	2	924	14	A	R	10/19/2009	23
F-5THST	030	5TH STREET	ARLINGTON AVE	VAN NESS AVE	2	1350	25	A	R	10/19/2009	22
F-OCEAVE	010	OCEAN AVENUE	SHAW AVE	5TH ST	2	1135	30	A	C	10/19/2009	13

APPENDIX B

Maintenance and Rehabilitation Decision Tree

Maintenance and Rehabilitation (M&R) Decision Tree

This report presents the current maintenance and rehabilitation decision tree that exists in the database. The decision tree forms the basis for all of the budgetary computations that are included in this volume. ***Changes to the decision tree will make the results in the budget reports invalid.*** All pavement treatment unit costs relevant to the street types in the database were updated.

The decision tree lists the treatments and costs selected for preventive maintenance and rehabilitation activities. Each line represents a specific combination of functional classification and surface type.

The preventive maintenance portion of the report is identified as Condition Category I – Very Good. All preventive maintenance treatment listings are assigned only to sections in Condition Category I where the PCI $\geq$ 70. Sections with PCI values less than 70 are assigned to treatments listed in Categories II through V.

In the preventive maintenance category (PCI $\geq$ 70), a time sequence is used to identify the appropriate treatment and cost. Each preventive maintenance treatment description consists of three parts: 1) a CRACK treatment, 2) a SURFACE treatment, and 3) a RESTORATION treatment. These three parts allow the user to specify one of three different preventive maintenance treatments depending on the prior maintenance history of the section.

1. The CRACK treatment part can be used to specify the most frequent type of preventive maintenance activity planned (typically crack seals).
2. The SURFACE treatment part can be used to specify more extensive and less frequent preventive maintenance activities, such as chip seals or slurry seals. For example, a crack seal can be specified on a 3-year cycle with a slurry seal specified after 5 years.
3. The RESTORATION part can be used to specify a surface restoration treatment (such as an overlay) to be performed after a specified number of surface treatments. For example, after a certain number of successive slurry seals, an overlay can be specified instead of another slurry seal.

Rehabilitation treatments are assigned to sections in Condition Categories II through V (PCI less than 70). Each line is defined by a specific combination of functional classification, surface type, and condition category.

COLUMN	**DESCRIPTION**
Functional Class	Functional Classification identifying the branch number.
Surface	Surface Type identifying the branch number.
Condition Category	Condition Category (I through V).
Treatment Type	First Row (Crack Treatment) indicates localized treatment (e.g. crack sealing). Second Row (Surface Treatment) indicates surface treatment (e.g. slurry sealing). Third Row (Restoration Treatment) indicates surface restoration (e.g. overlay).
Treatment	Name of treatments from the "Treatment Descriptions" report.

COLUMN	DESCRIPTION
Yrs. Between Crack Seals	First Row - number of years between successive treatment applications specified in the first row (i.e. CRACK treatment).
Yrs. Between Surface Seals	Second Row - number of years between successive treatment applications specified in the second row (i.e. SURFACE treatment).
Number of Sequential Seals	Number of times that the treatment application in the second row (i.e. SURFACE treatment) will be performed prior to performing the treatment application in the third row.

Note that the treatments assigned to each section should not be blindly followed in preparing a street maintenance program. Engineering judgment and project level analysis should be applied to ensure that the treatment is appropriate and cost effective for the section.

Decision Tree

Printed: 04/18/2017

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Arterial	AC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	SLURRY SEAL	$2.50		7	
			Restoration Treatment	1" AC OVERLAY	$19.00			2
		II - Good, Non-Load Related		SLURRY SEAL W/ DIGOUTS	$5.00			
		III - Good, Load Related		SLURRY SEAL W/ DIGOUTS	$7.00			
		IV - Poor		2" AC OVERLAY W/ DIGOUTS	$43.00			
		V - Very Poor		RECONSTRUCT SURFACE (6" AC)	$86.00			
	AC/AC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	SLURRY SEAL	$2.50		7	
			Restoration Treatment	1.5" AC OVERLAY	$19.00			2
		II - Good, Non-Load Related		SLURRY SEAL W/ DIGOUTS	$5.00			
		III - Good, Load Related		SLURRY SEAL W/ DIGOUTS	$7.00			
		IV - Poor		2" AC OVERLAY W/ DIGOUTS	$43.00			
		V - Very Poor		RECONSTRUCT SURFACE (6" AC)	$86.00			
	AC/PCC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	3		
			Surface Treatment	SLURRY SEAL	$2.50		6	
			Restoration Treatment	DO NOTHING	$0.00			2
		II - Good, Non-Load Related		SLURRY SEAL W/ DIGOUTS	$5.00			
		III - Good, Load Related		SLURRY SEAL W/ DIGOUTS	$7.00			
		IV - Poor		2" AC OVERLAY W/ DIGOUTS	$43.00			
		V - Very Poor		RECONSTRUCT SURFACE (6" AC)	$86.00			
	PCC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	3		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		DO NOTHING	$1.11			
		III - Good, Load Related		DO NOTHING	$1.51			
		IV - Poor		THICK AC OVERLAY(2.5 INCHES)	$1.92			
		V - Very Poor		RECONSTRUCT STRUCTURE (AC)	$14.00			

Functional Class and Surface combination not used

Decision Tree

Printed: 04/18/2017

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Arterial	ST	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		SINGLE CHIP SEAL	$1.11			
		III - Good, Load Related		SINGLE CHIP SEAL	$1.51			
		IV - Poor		SINGLE CHIP SEAL	$1.92			
		V - Very Poor		THICK AC OVERLAY(2.5 INCHES)	$7.67			

Functional Class and Surface combination not used

Decision Tree

Printed: 04/18/2017

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Collector	AC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	SLURRY SEAL	$2.50		7	
			Restoration Treatment	1.5" AC OVERLAY	$19.00			2
		II - Good, Non-Load Related		SLURRY SEAL W/ DIGOUTS	$4.00			
		III - Good, Load Related		SLURRY SEAL W/ DIGOUTS	$6.00			
		IV - Poor		2" AC OVERLAY W/ DIGOUTS	$40.00			
		V - Very Poor		THICK AC OVERLAY(2.5 INCHES)	$57.00			
	AC/AC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	SLURRY SEAL	$2.50		7	
			Restoration Treatment	1.5" AC OVERLAY	$19.00			2
		II - Good, Non-Load Related		SLURRY SEAL W/ DIGOUTS	$4.00			
		III - Good, Load Related		SLURRY SEAL W/ DIGOUTS	$6.00			
		IV - Poor		2" AC OVERLAY W/ DIGOUTS	$40.00			
		V - Very Poor		THICK AC OVERLAY(2.5 INCHES)	$57.00			
	AC/PCC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	4		
			Surface Treatment	SLURRY SEAL	$2.50		7	
			Restoration Treatment	DO NOTHING	$0.00			3
		II - Good, Non-Load Related		SLURRY SEAL W/ DIGOUTS	$4.00			
		III - Good, Load Related		SLURRY SEAL W/ DIGOUTS	$6.00			
		IV - Poor		2" AC OVERLAY W/ DIGOUTS	$40.00			
		V - Very Poor		THICK AC OVERLAY(2.5 INCHES)	$57.00			
	PCC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		DO NOTHING	$1.11			
		III - Good, Load Related		DO NOTHING	$1.51			
		IV - Poor		THICK AC OVERLAY(2.5 INCHES)	$1.92			
		V - Very Poor		THIN AC OVERLAY(1.5 INCHES)	$7.47			

Functional Class and Surface combination not used

Decision Tree

Printed: 04/18/2017

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Collector	ST	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		SINGLE CHIP SEAL	$1.11			
		III - Good, Load Related		SINGLE CHIP SEAL	$1.51			
		IV - Poor		SINGLE CHIP SEAL	$1.92			
		V - Very Poor		THICK AC OVERLAY(2.5 INCHES)	$7.47			

Functional Class and Surface combination not used

Decision Tree

Printed: 04/18/2017

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Residential/Local	AC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	SLURRY SEAL	$2.50		8	
			Restoration Treatment	1.5" AC OVERLAY	$19.00			2
		II - Good, Non-Load Related		SLURRY SEAL W/ DIGOUTS	$4.00		9	
		III - Good, Load Related		SLURRY SEAL W/ DIGOUTS	$5.00			
		IV - Poor		SURFACE TREATMENT (CAPE OR SLURRY)	$10.00			
		V - Very Poor		2" AC OVERLAY W/ DIGOUTS	$40.00			
	AC/AC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	SLURRY SEAL	$2.50		8	
			Restoration Treatment	1.5" AC OVERLAY	$19.00			2
		II - Good, Non-Load Related		SLURRY SEAL W/ DIGOUTS	$4.00		9	
		III - Good, Load Related		SLURRY SEAL W/ DIGOUTS	$5.00			
		IV - Poor		SURFACE TREATMENT (CAPE OR SLURRY)	$10.00			
		V - Very Poor		2" AC OVERLAY W/ DIGOUTS	$40.00			
	AC/PCC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	4		
			Surface Treatment	SLURRY SEAL	$2.50		8	
			Restoration Treatment	DO NOTHING	$0.00			3
		II - Good, Non-Load Related		SLURRY SEAL W/ DIGOUTS	$4.00			
		III - Good, Load Related		SLURRY SEAL W/ DIGOUTS	$5.00			
		IV - Poor		SURFACE TREATMENT (CAPE OR SLURRY)	$10.00			
		V - Very Poor		2" AC OVERLAY W/ DIGOUTS	$40.00			
	PCC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	4		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		DO NOTHING	$1.11			
		III - Good, Load Related		DO NOTHING	$0.00			
		IV - Poor		THICK AC OVERLAY(2.5 INCHES)	$1.92			
		V - Very Poor		THICK AC OVERLAY(2.5 INCHES)	$7.27			

Functional Class and Surface combination not used

Decision Tree

Printed: 04/18/2017

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Residential/Local	ST	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		SINGLE CHIP SEAL	$1.11			
		III - Good, Load Related		SINGLE CHIP SEAL	$1.51			
		IV - Poor		SINGLE CHIP SEAL	$1.92			
		V - Very Poor		THICK AC OVERLAY(2.5 INCHES)	$7.27			

Functional Class and Surface combination not used

Decision Tree

Printed: 04/18/2017

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Other	AC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.60	4		
			Surface Treatment	SINGLE CHIP SEAL	$1.74		8	
			Restoration Treatment	MILL AND THIN OVERLAY	$5.04			3
		II - Good, Non-Load Related		SINGLE CHIP SEAL	$1.11			
		III - Good, Load Related		THIN AC OVERLAY(1.5 INCHES)	$3.99			
		IV - Poor		THICK AC OVERLAY(2.5 INCHES)	$5.97			
		V - Very Poor		RECONSTRUCT STRUCTURE (AC)	$8.75			
	AC/AC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.60	4		
			Surface Treatment	SINGLE CHIP SEAL	$1.74		8	
			Restoration Treatment	MILL AND THIN OVERLAY	$5.04			3
		II - Good, Non-Load Related		DOUBLE CHIP SEAL	$1.52			
		III - Good, Load Related		HEATER SCARIFY & OVERLAY	$5.95			
		IV - Poor		HEATER SCARIFY & OVERLAY	$6.14			
		V - Very Poor		RECONSTRUCT STRUCTURE (AC)	$8.75			
	AC/PCC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.60	4		
			Surface Treatment	SINGLE CHIP SEAL	$1.74		8	
			Restoration Treatment	MILL AND THIN OVERLAY	$5.04			3
		II - Good, Non-Load Related		DOUBLE CHIP SEAL	$1.52			
		III - Good, Load Related		HEATER SCARIFY & OVERLAY	$5.95			
		IV - Poor		HEATER SCARIFY & OVERLAY	$6.14			
		V - Very Poor		RECONSTRUCT STRUCTURE (AC)	$8.75			
	PCC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		DO NOTHING	$1.11			
		III - Good, Load Related		DO NOTHING	$1.51			
		IV - Poor		THICK AC OVERLAY(2.5 INCHES)	$1.92			
		V - Very Poor		THICK AC OVERLAY(2.5 INCHES)	$7.27			

Functional Class and Surface combination not used

Decision Tree

Printed: 04/18/2017

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Other	ST	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		SINGLE CHIP SEAL	$1.11			
		III - Good, Load Related		SINGLE CHIP SEAL	$1.51			
		IV - Poor		SINGLE CHIP SEAL	$1.92			
		V - Very Poor		THICK AC OVERLAY(2.5 INCHES)	$7.27			

Functional Class and Surface combination not used

APPENDIX C

Budget Needs

Projected PCI / Cost Summary

Preventative Treatment / Cost Summary

Rehabilitation Treatment / Cost Summary

Budget Needs Reports

The purpose of this module is to answer the question: ***If the City had all the money in the world, what sections should be fixed and how much will it cost?*** Based on the Maintenance & Rehabilitation (M&R) decision tree and the PCIs of the sections, the program will then select a maintenance or rehabilitation action and compute the total costs over a period of twenty years. The Budget Needs represents the "ideal world" funding levels, while the Budget Scenarios reports in the next section represent the most "cost effective" prioritization possible for the actual funding levels.

A budget needs analysis has been performed. The summary results from the analysis are shown below. An interest rate of 3% and an inflation factor of 3% were used to project the costs for the next twenty years. This report shows the total twenty-year budget that would be required to meet the City's standards as exemplified in the M&R decision tree.

As indicated in the report, with a budget of 6.6 million dollars over the next twenty years the PCI of the street network will improve from the current level of 52 to 80 by 2036. If no treatments are programmed, the weighted average PCI is projected to deteriorate from 52 to 17 by 2036.

Budget Needs reports included in this volume are listed below:

- Projected PCI/Cost Summary
- Preventative Maintenance Treatment/Cost Summary
- Rehabilitation Treatment/Cost Summary

Needs - Projected PCI/Cost Summary

This report summarizes and projects the City's network PCI values over a twenty-year period, both with and without treatments applied. These costs are based on those in the M&R decision tree. It also projects the costs over a twenty-year period.

COLUMN	DESCRIPTION
Year	Year in the analysis period.
PCI Treated	Projected network average PCI with all needed treatments applied.
PCI Untreated	Projected network average PCI without any treatments applied.
PM Cost	Total preventive maintenance treatment cost.
Rehab Cost	Total rehabilitation treatment cost.
Cost	The budget required for each year in the analysis period to meet the City's standard as shown on the M&R decision tree.
Total Cost	Total budget required over a twenty-year period.

Needs - Projected PCI/Cost Summary

Inflation Rate = 3.00 %

Printed: 04/19/2017

Year	PCI Treated	PCI Untreated	PM Cost	Rehab Cost	Cost
2017	84	52	$55,850	$2,804,303	$2,860,153
2018	82	49	$21,739	$29,972	$51,711
2019	80	47	$23,819	$10,909	$34,728
2020	79	46	$17,971	$81,718	$99,689
2021	78	44	$55,078	$0	$55,078
2022	80	42	$254,276	$76,269	$330,545
2023	78	40	$42,422	$0	$42,422
2024	78	39	$163,524	$0	$163,524
2025	78	37	$111,098	$125,090	$236,188
2026	79	35	$151,287	$77,462	$228,749
2027	81	33	$289,452	$17,710	$307,162
2028	81	32	$219,571	$0	$219,571
2029	80	30	$114,122	$0	$114,122
2030	80	28	$257,506	$0	$257,506
2031	81	27	$328,183	$0	$328,183
2032	83	25	$743,439	$0	$743,439
2033	81	23	$20,624	$0	$20,624
2034	83	21	$414,057	$0	$414,057
2035	81	19	$0	$0	$0
2036	80	17	$71,752	$0	$71,752

% PM	PM Total Cost	Rehab Total Cost	Total Cost
51.01%	$3,355,770	$3,223,433	$6,579,203

Needs - Preventive Maintenance Treatment/Cost Summary

This report summarizes each preventive maintenance treatment type, quantity of pavement affected, and total costs over the twenty-year period. It also summarizes the total quantities and costs over the next twenty years.

COLUMN	DESCRIPTION
Treatment	Type of preventive maintenance treatments needed.
Year	Year in the analysis period (i.e. 2017, 2018, … and 2036).
Area Treated	Quantities in linear feet (Seal Cracks) or square yard (Slurry Seal).
Cost	Maintenance treatment cost.

Needs - Preventive Maintenance
Treatment/Cost Summary

Inflation Rate = 3.00 % Printed: 04/19/2017

Treatment	Year	Area Treated		Cost
1.5" AC OVERLAY	2022	9,418.89	sq.yd.	$207,464
	2023	1,243.33	sq.yd.	$28,208
	2024	5,140.67	sq.yd.	$120,127
	2025	1,209.44	sq.yd.	$29,110
	2027	9,451.11	sq.yd.	$241,330
	2028	5,769.78	sq.yd.	$151,748
	2029	4,053.33	sq.yd.	$109,803
	2030	7,103.56	sq.yd.	$198,205
	2031	7,696.22	sq.yd.	$221,186
	2032	24,951.33	sq.yd.	$738,596
	2034	7,099.22	sq.yd.	$222,946
	2036	910	sq.yd.	$30,319
	Total	84,046.89		$2,299,042
SLURRY SEAL	2017	22,338.44	sq.yd.	$55,850
	2018	8,441.89	sq.yd.	$21,739
	2019	8,980.11	sq.yd.	$23,819
	2020	6,578.22	sq.yd.	$17,971
	2021	19,574	sq.yd.	$55,078
	2022	16,151.89	sq.yd.	$46,812
	2023	4,761.11	sq.yd.	$14,214
	2024	14,113.67	sq.yd.	$43,397
	2025	25,886.89	sq.yd.	$81,988
	2026	46,376.78	sq.yd.	$151,287
	2027	14,322.33	sq.yd.	$48,122
	2028	19,598.44	sq.yd.	$67,823
	2029	1,211.56	sq.yd.	$4,319
	2030	16,151.89	sq.yd.	$59,301
	2031	28,293.67	sq.yd.	$106,997
	2032	1,243.33	sq.yd.	$4,843
	2033	5,140.67	sq.yd.	$20,624
	2034	46,247.89	sq.yd.	$191,111
	2036	9,451.11	sq.yd.	$41,433
	Total	314,863.89		$1,056,728
	Total Quantity	398,910.78		$3,355,770

Needs - Rehabilitation Treatment/Cost Summary

This report summarizes each rehabilitation treatment type, quantity of pavement affected, and total costs over the twenty-year period. It also summarizes the total quantities and costs over the next twenty years.

COLUMN	DESCRIPTION
Treatment	Type of rehabilitation treatments needed.
Year	Year in the analysis period (i.e. 2017, 2018, … and 2036).
Area Treated	Quantities in square yard.
Cost	Rehabilitation treatment cost.

Needs - Rehabilitation
Treatment/Cost Summary

Inflation Rate = 3.00 % Printed: 04/19/2017

Treatment	Year		Area Treated		Cost
2" AC OVERLAY W/ DIGOUTS	2017		48,086.78	sq.yd.	$1,923,477
		Total	48,086.78	sq.yd.	$1,923,477
SLURRY SEAL W/ DIGOUTS	2017		19,274.22	sq.yd.	$79,976
	2018		6,478	sq.yd.	$29,972
	2019		2,056.44	sq.yd.	$10,909
	2022		2,876.44	sq.yd.	$16,673
	2025		847	sq.yd.	$5,365
	2026		7,608.44	sq.yd.	$39,710
	2027		3,294.11	sq.yd.	$17,710
		Total	42,434.67	sq.yd.	$200,315
SURFACE TREATMENT (CAPE OR SLURRY)	2017		17,012.33	sq.yd.	$170,126
	2020		7,478.33	sq.yd.	$81,718
	2022		5,140.67	sq.yd.	$59,596
	2025		9,451.11	sq.yd.	$119,725
	2026		2,893.33	sq.yd.	$37,752
		Total	41,975.78	sq.yd.	$468,917
THICK AC OVERLAY(2.5 INCHES)	2017		11,065.33	sq.yd.	$630,724
		Total	11,065.33	sq.yd.	$630,724

Total Cost $3,223,433

Scenarios 1 - 3

Scenario 1: Increase PCI to 70
($5.9 million over twenty years)
Cost Summary Report
Network Condition Summary Report

Target-Driven Scenarios - Cost Summary

Interest: 3% Inflation: 3% Printed: 04/19/2017

Scenario: Ferndale - Increase PCI to 70

Objective: Minimum Network Average PCI Target: By Year

Year	Value	Year	Value	Year	Value	Year	Value
Year 1	52	Year 2	55	Year 3	56	Year 4	58
Year 5	60	Year 6	62	Year 7	62	Year 8	63
Year 9	64	Year 10	70	Year 11	70	Year 12	70
Year 13	70	Year 14	70	Year 15	70	Year 16	70
Year 17	70	Year 18	70	Year 19	70	Year 20	70

Year	Rehabilitation		Preventive Maintenance		Total Cost	Deferred
2017	II	$0	Non-Project	$23,636	$23,636	$2,836,503
	III	$0				
	IV	$0	Project	$0		
	V	$0				
	Total	**$0**				
	Project	$0				
2018	II	$42,195	Non-Project	$54,920	$431,149	$2,584,177
	III	$14,814				
	IV	$125,592	Project	$0		
	V	$193,628				
	Total	**$376,229**				
	Project	$0				
2019	II	$0	Non-Project	$23,819	$351,520	$2,338,495
	III	$4,493				
	IV	$0	Project	$0		
	V	$323,208				
	Total	**$327,701**				
	Project	$0				
2020	II	$0	Non-Project	$17,971	$297,783	$2,128,840
	III	$0				
	IV	$0	Project	$0		
	V	$279,812				
	Total	**$279,812**				
	Project	$0				
2021	II	$0	Non-Project	$55,078	$328,288	$2,237,529
	III	$0				
	IV	$0	Project	$0		
	V	$273,210				
	Total	**$273,210**				
	Project	$0				

Year	Rehabilitation		Preventive Maintenance		Total Cost	Deferred
2022	II	$0	Non-Project	$46,812	$585,577	$1,765,889
	III	$0				
	IV	$0	Project	$0		
	V	$538,765				
	Total	$538,765				
	Project	$0				
2023	II	$0	Non-Project	$0	$0	$1,850,252
	III	$0				
	IV	$0	Project	$0		
	V	$0				
	Total	$0				
	Project	$0				
2024	II	$0	Non-Project	$14,641	$225,766	$1,915,543
	III	$17,689				
	IV	$0	Project	$0		
	V	$193,436				
	Total	$211,125				
	Project	$0				
2025	II	$0	Non-Project	$62,093	$590,989	$1,449,479
	III	$5,365				
	IV	$0	Project	$0		
	V	$523,531				
	Total	$528,896				
	Project	$0				
2026	II	$0	Non-Project	$30,734	$632,907	$984,019
	III	$8,134				
	IV	$0	Project	$0		
	V	$594,039				
	Total	$602,173				
	Project	$0				
2027	II	$0	Non-Project	$0	$0	$1,168,742
	III	$0				
	IV	$0	Project	$0		
	V	$0				
	Total	$0				
	Project	$0				
2028	II	$0	Non-Project	$115,166	$115,166	$1,586,389
	III	$0				
	IV	$0	Project	$0		
	V	$0				
	Total	$0				
	Project	$0				

Year		Rehabilitation	Preventive Maintenance		Total Cost	Deferred
2029	II	$50,742	Non-Project	$54,287	$307,551	$1,381,750
	III	$0				
	IV	$0	Project	$0		
	V	$202,522				
	Total	$253,264				
	Project	$0				
2030	II	$0	Non-Project	$66,426	$66,426	$1,438,357
	III	$0				
	IV	$0	Project	$0		
	V	$0				
	Total	$0				
	Project	$0				
2031	II	$0	Non-Project	$59,547	$416,519	$1,108,927
	III	$0				
	IV	$0	Project	$0		
	V	$356,972				
	Total	$356,972				
	Project	$0				
2032	II	$0	Non-Project	$16,696	$16,696	$1,155,918
	III	$0				
	IV	$0	Project	$0		
	V	$0				
	Total	$0				
	Project	$0				
2033	II	$0	Non-Project	$29,911	$356,453	$849,920
	III	$0				
	IV	$0	Project	$0		
	V	$326,542				
	Total	$326,542				
	Project	$0				
2034	II	$0	Non-Project	$42,694	$392,411	$525,701
	III	$0				
	IV	$0	Project	$0		
	V	$349,717				
	Total	$349,717				
	Project	$0				
2035	II	$0	Non-Project	$48,444	$245,473	$492,215
	III	$0				
	IV	$0	Project	$0		
	V	$197,029				
	Total	$197,029				
	Project	$0				

Year		Rehabilitation	Preventive Maintenance		Total Cost	Deferred
2036	II	$0	Non-Project	$20,605	$518,851	$506,982
	III	$0				
	IV	$498,246	Project	$0		
	V	$0				
	Total	$498,246				
	Project	$0				

Summary

Functional Class	Rehabilitation	Prev. Maint.	
Collector	$1,330,564	$192,124	
Residential/Local	$3,789,117	$591,356	
Total:	$5,119,681	$783,480	Grand Total: $5,903,161

Target-Driven Scenarios
Network Condition Summary

Interest: 3% Inflation: 3% Printed: 04/19/2017

Scenario: Ferndale - Increase PCI to 70

Objective: Minimum Network Average PCI Target: By Year

Year	Value	Year	Value	Year	Value	Year	Value
Year 1	52	Year 2	55	Year 3	56	Year 4	58
Year 5	60	Year 6	62	Year 7	62	Year 8	63
Year 9	64	Year 10	70	Year 11	70	Year 12	70
Year 13	70	Year 14	70	Year 15	70	Year 16	70
Year 17	70	Year 18	70	Year 19	70	Year 20	70

Projected Network Average PCI by year

Year	Never Treated	With Selected Treatment
2017	52	52
2018	49	55
2019	47	57
2020	46	59
2021	44	61
2022	42	65
2023	40	63
2024	39	63
2025	37	68
2026	35	73
2027	33	70
2028	32	70
2029	30	71
2030	28	70
2031	27	72
2032	25	70
2033	23	70
2034	21	71
2035	19	70
2036	17	71

Percent Network Area by Functional Classification and Condition Class

Condition in base year 2017, prior to applying treatments.

Condition Class	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	16.5%	32.3%	0.0%	48.8%
II / III	0.0%	0.0%	10.3%	0.0%	10.3%
IV	0.0%	1.6%	9.1%	0.0%	10.8%
V	0.0%	5.9%	24.2%	0.0%	30.1%
Total	0.0%	24.1%	75.9%	0.0%	100.0%

Condition in year 2017 after schedulable treatments applied.

Condition Class	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	16.5%	32.3%	0.0%	48.8%
II / III	0.0%	0.0%	10.3%	0.0%	10.3%

IV	0.0%	1.6%	9.1%	0.0%	10.8%
V	0.0%	5.9%	24.2%	0.0%	30.1%
Total	0.0%	24.1%	75.9%	0.0%	100.0%

Condition in year 2036 after schedulable treatments applied.

Condition Class	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	9.4%	63.1%	0.0%	72.4%
II / III	0.0%	12.7%	6.9%	0.0%	19.6%
IV	0.0%	0.0%	5.9%	0.0%	5.9%
V	0.0%	2.0%	0.0%	0.0%	2.0%
Total	0.0%	24.1%	75.9%	0.0%	100.0%

Scenario 2: Maintain Current PCI
($3.25 million over twenty years)
Cost Summary Report
Network Condition Summary Report

Target-Driven Scenarios - Cost Summary

Interest: 3% Inflation: 3% Printed: 04/19/2017

Scenario: Ferndale - Maintain Current PCI (52)

Objective: Minimum Network Average PCI Target: Overall 52

Year	Rehabilitation		Preventive Maintenance		Total Cost	Deferred
2017	II	$0	Non-Project	$23,636	$23,636	$2,836,503
	III	$0	Project	$0		
	IV	$0				
	V	**$0**				
	Total	**$0**				
	Project	$0				
2018	II	$42,195	Non-Project	$54,920	$237,521	$2,777,803
	III	$14,814	Project	$0		
	IV	$125,592				
	V	**$0**				
	Total	**$182,601**				
	Project	$0				
2019	II	$0	Non-Project	$23,819	$125,294	$2,764,157
	III	$4,493	Project	$0		
	IV	$0				
	V	**$96,982**				
	Total	**$101,475**				
	Project	$0				
2020	II	$0	Non-Project	$17,971	$186,325	$2,678,730
	III	$0	Project	$0		
	IV	$0				
	V	**$168,354**				
	Total	**$168,354**				
	Project	$0				
2021	II	$0	Non-Project	$55,078	$128,712	$3,003,491
	III	$0	Project	$0		
	IV	$0				
	V	**$73,634**				
	Total	**$73,634**				
	Project	$0				
2022	II	$0	Non-Project	$46,812	$136,798	$3,003,608
	III	$0	Project	$0		
	IV	$0				
	V	**$89,986**				
	Total	**$89,986**				
	Project	$0				

Year	Rehabilitation		Preventive Maintenance		Total Cost	Deferred
2023	II	$0	Non-Project	$14,214	$126,674	$2,998,431
	III	$17,174	Project	$0		
	IV	$0				
	V	$95,286				
	Total	$112,460				
	Project	$0				
2024	II	$0	Non-Project	$0	$193,436	$3,130,496
	III	$0	Project	$0		
	IV	$0				
	V	$193,436				
	Total	$193,436				
	Project	$0				
2025	II	$0	Non-Project	$62,093	$191,703	$3,100,164
	III	$5,365	Project	$0		
	IV	$0				
	V	$124,245				
	Total	$129,610				
	Project	$0				
2026	II	$0	Non-Project	$30,734	$101,991	$3,215,139
	III	$8,134	Project	$0		
	IV	$0				
	V	$63,123				
	Total	$71,257				
	Project	$0				
2027	II	$36,822	Non-Project	$48,122	$221,940	$3,229,074
	III	$0	Project	$0		
	IV	$0				
	V	$136,996				
	Total	$173,818				
	Project	$0				
2028	II	$0	Non-Project	$67,823	$67,823	$3,726,331
	III	$0	Project	$0		
	IV	$0				
	V	$0				
	Total	$0				
	Project	$0				
2029	II	$0	Non-Project	$26,197	$177,423	$3,678,746
	III	$0	Project	$0		
	IV	$0				
	V	$151,226				
	Total	$151,226				
	Project	$0				

Year	Rehabilitation		Preventive Maintenance		Total Cost	Deferred
2030	II	$0	Non-Project	$65,306	$65,306	$3,789,107
	III	$0				
	IV	$0	Project	$0		
	V	$0				
	Total	$0				
	Project	$0				
2031	II	$0	Non-Project	$25,345	$240,200	$3,687,929
	III	$0				
	IV	$0	Project	$0		
	V	$214,855				
	Total	$214,855				
	Project	$0				
2032	II	$0	Non-Project	$19,645	$253,341	$3,564,871
	III	$0				
	IV	$0	Project	$0		
	V	$233,696				
	Total	$233,696				
	Project	$0				
2033	II	$0	Non-Project	$15,775	$280,745	$3,406,850
	III	$0				
	IV	$0	Project	$0		
	V	$264,970				
	Total	$264,970				
	Project	$0				
2034	II	$0	Non-Project	$10,132	$10,132	$3,509,053
	III	$0				
	IV	$0	Project	$0		
	V	$0				
	Total	$0				
	Project	$0				
2035	II	$0	Non-Project	$5,148	$484,116	$3,283,129
	III	$0				
	IV	$0	Project	$0		
	V	$478,968				
	Total	$478,968				
	Project	$0				
2036	II	$0	Non-Project	$0	$0	$3,891,039
	III	$0				
	IV	$0	Project	$0		
	V	$0				
	Total	$0				
	Project	$0				

Year	Rehabilitation	Preventive Maintenance	Total Cost	Deferred

Summary

Functional Class	Rehabilitation	Prev. Maint.	
Collector	$125,592	$210,073	
Residential/Local	$2,514,754	$402,697	
Total:	$2,640,346	$612,770	Grand Total: $3,253,116

Scenario: Ferndale - Maintain Current PCI (52)

Objective: Minimum Network Average PCI Target: Overall 52

Projected Network Average PCI by year

Year	Never Treated	With Selected Treatment
2017	52	52
2018	49	53
2019	47	52
2020	46	53
2021	44	53
2022	42	52
2023	40	52
2024	39	52
2025	37	53
2026	35	52
2027	33	53
2028	32	52
2029	30	53
2030	28	52
2031	27	52
2032	25	53
2033	23	54
2034	21	52
2035	19	54
2036	17	52

Percent Network Area by Functional Classification and Condition Class

Condition in base year 2017, prior to applying treatments.

Condition Class	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	16.5%	32.3%	0.0%	48.8%
II / III	0.0%	0.0%	10.3%	0.0%	10.3%
IV	0.0%	1.6%	9.1%	0.0%	10.8%
V	0.0%	5.9%	24.2%	0.0%	30.1%
Total	0.0%	24.1%	75.9%	0.0%	100.0%

Condition in year 2017 after schedulable treatments applied.

Condition Class	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	16.5%	32.3%	0.0%	48.8%
II / III	0.0%	0.0%	10.3%	0.0%	10.3%
IV	0.0%	1.6%	9.1%	0.0%	10.8%
V	0.0%	5.9%	24.2%	0.0%	30.1%
Total	0.0%	24.1%	75.9%	0.0%	100.0%

Condition in year 2036 after schedulable treatments applied.

Condition Class	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	1.6%	46.2%	0.0%	47.9%
II / III	0.0%	12.7%	5.0%	0.0%	17.7%
IV	0.0%	3.8%	7.8%	0.0%	11.7%
V	0.0%	5.9%	16.9%	0.0%	22.8%
Total	0.0%	24.1%	75.9%	0.0%	100.0%

Scenario 3: RMRA Funding
($440,000 over twenty years)
Cost Summary Report
Network Condition Summary Report

Scenarios - Cost Summary

Interest: 3.00% Inflation: 3.00% Printed: 10/04/2017

Scenario: Ferndale - RMRA Funding

Year	PM	Budget		Rehabilitation		Preventative Maintenance	Surplus PM	Deferred		Stop Gap
2017	50%	$0	II	$0	Non-Project	$0	$0	$2,860,138	Funded	$0
			III	$0					Unmet	$50,279
			IV	$0	Project	$0				
			V	$0						
			Total	$0						
			Project	$0						
2018	10%	$8,162	II	$5,963	Non-Project	$0	$816	$3,033,697	Funded	$0
			III	$0					Unmet	$247
			IV	$0	Project	$0				
			V	$0						
			Total	$5,963						
			Project	$0						
2019	20%	$24,305	II	$7,839	Non-Project	$10,683	$0	$3,148,424	Funded	$0
			III	$4,493					Unmet	$0
			IV	$0	Project	$0				
			V	$0						
			Total	$12,332						
			Project	$0						
2020	20%	$24,305	II	$15,540	Non-Project	$8,130	$0	$3,243,006	Funded	$0
			III	$0					Unmet	$0
			IV	$0	Project	$0				
			V	$0						
			Total	$15,540						
			Project	$0						
2021	20%	$24,305	II	$0	Non-Project	$15,032	$0	$3,738,424	Funded	$0
			III	$7,016					Unmet	$0
			IV	$0	Project	$0				
			V	$0						
			Total	$7,016						
			Project	$0						
2022	20%	$24,305	II	$5,007	Non-Project	$18,916	$0	$3,947,774	Funded	$0
			III	$0					Unmet	$69,304
			IV	$0	Project	$0				
			V	$0						
			Total	$5,007						
			Project	$0						

Year	PM	Budget	Rehabilitation		Preventative Maintenance	Surplus PM	Deferred		Stop Gap
2023	20%	$24,305	II	$13,030	Non-Project $11,115	$0	$4,070,988	Funded	$0
			III	$0				Unmet	$511
			IV	$0	Project $0				
			V	$0					
			Total	$13,030					
			Project	$0					
2024	20%	$24,305	II	$0	Non-Project $24,188	$0	$4,404,476	Funded	$0
			III	$0				Unmet	$0
			IV	$0	Project $0				
			V	$0					
			Total	$0					
			Project	$0					
2025	20%	$24,305	II	$0	Non-Project $12,810	$0	$4,558,692	Funded	$0
			III	$5,365				Unmet	$3,024
			IV	$0	Project $0				
			V	$0					
			Total	$5,365					
			Project	$0					
2026	20%	$24,305	II	$0	Non-Project $22,136	$0	$4,720,659	Funded	$0
			III	$0				Unmet	$0
			IV	$0	Project $0				
			V	$0					
			Total	$0					
			Project	$0					
2027	20%	$24,305	II	$7,780	Non-Project $5,574	$0	$4,870,236	Funded	$0
			III	$8,378				Unmet	$86,261
			IV	$0	Project $0				
			V	$0					
			Total	$16,158					
			Project	$0					
2028	20%	$24,305	II	$10,228	Non-Project $10,298	$0	$5,461,180	Funded	$0
			III	$0				Unmet	$1,873
			IV	$0	Project $0				
			V	$0					
			Total	$10,228					
			Project	$0					
2029	20%	$24,305	II	$0	Non-Project $8,442	$0	$6,125,212	Funded	$0
			III	$0				Unmet	$659
			IV	$0	Project $0				
			V	$0					
			Total	$0					
			Project	$0					

Year	PM	Budget		Rehabilitation		Preventative Maintenance	Surplus PM	Deferred		Stop Gap
2030	20%	$24,305	II	$0	Non-Project	$23,961	$0	$6,340,293	Funded	$0
			III	$0					Unmet	$3,506
			IV	$0	Project	$0				
			V	$0						
			Total	$0						
			Project	$0						
2031	20%	$24,305	II	$6,533	Non-Project	$14,080	$0	$7,963,866	Funded	$0
			III	$0					Unmet	$0
			IV	$0	Project	$0				
			V	$0						
			Total	$6,533						
			Project	$0						
2032	20%	$24,305	II	$17,001	Non-Project	$2,791	$2,070	$8,108,049	Funded	$0
			III	$0					Unmet	$118,192
			IV	$0	Project	$0				
			V	$0						
			Total	$17,001						
			Project	$0						
2033	20%	$24,305	II	$0	Non-Project	$16,228	$0	$8,389,300	Funded	$0
			III	$0					Unmet	$2,171
			IV	$0	Project	$0				
			V	$0						
			Total	$0						
			Project	$0						
2034	20%	$24,305	II	$0	Non-Project	$0	$4,861	$9,167,592	Funded	$0
			III	$0					Unmet	$2,930
			IV	$0	Project	$0				
			V	$0						
			Total	$0						
			Project	$0						
2035	20%	$24,305	II	$0	Non-Project	$0	$4,861	$9,565,784	Funded	$0
			III	$0					Unmet	$6,252
			IV	$0	Project	$0				
			V	$0						
			Total	$0						
			Project	$0						
2036	20%	$24,305	II	$0	Non-Project	$0	$4,861	$9,725,899	Funded	$0
			III	$0					Unmet	$0
			IV	$0	Project	$0				
			V	$0						
			Total	$0						
			Project	$0						

Summary

Functional Class	Rehabilitation	Prev. Maint.	Funded Stop Gap	Unmet Stop Gap
Collector	$0	$15,032	$0	$73,331
Residential/Local	$114,173	$189,352	$0	$271,878
Grand Total:	$114,173	$204,384	$0	$345,209

Scenarios - Network Condition Summary

Interest: 3% Inflation: 3% Printed: 10/04/2017

Scenario: Ferndale - RMRA Funding

Year	Budget	PM	Year	Budget	PM	Year	Budget	PM
2017	$0	50%	2024	$24,305	20%	2031	$24,305	20%
2018	$8,162	10%	2025	$24,305	20%	2032	$24,305	20%
2019	$24,305	20%	2026	$24,305	20%	2033	$24,305	20%
2020	$24,305	20%	2027	$24,305	20%	2034	$24,305	20%
2021	$24,305	20%	2028	$24,305	20%	2035	$24,305	20%
2022	$24,305	20%	2029	$24,305	20%	2036	$24,305	20%
2023	$24,305	20%	2030	$24,305	20%			

Projected Network Average PCI by year

Year	Never Treated	With Selected Treatment	Treated Centerline Miles	Treated Lane Miles
2017	52	52	0	0
2018	49	50	0.07	0.13
2019	47	48	0.40	0.79
2020	46	46	0.34	0.68
2021	44	45	0.53	1.05
2022	42	44	0.33	0.67
2023	40	42	0.31	0.61
2024	39	41	0.46	0.91
2025	37	40	0.28	0.56
2026	35	38	0.33	0.66
2027	33	37	0.24	0.48
2028	32	35	0.29	0.58
2029	30	34	0.12	0.23
2030	28	33	0.29	0.58
2031	27	31	0.25	0.49
2032	25	30	0.18	0.36
2033	23	28	0.21	0.42
2034	21	27	0	0
2035	19	25	0	0
2036	17	23	0	0

Percent Network Area by Functional Class and Condition Category

Condition in base year 2017, prior to applying treatments.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	16.5%	32.3%	0.0%	48.8%
II / III	0.0%	0.0%	10.3%	0.0%	10.3%
IV	0.0%	1.6%	9.1%	0.0%	10.8%
V	0.0%	5.9%	24.2%	0.0%	30.1%
Total	0.0%	24.1%	75.9%	0.0%	100.0%

Condition in year 2017 after schedulable treatments applied.

Condition	Arterial	Collector	Res/Loc	Other	Total

I	0.0%	16.5%	32.3%	0.0%	48.8%
II / III	0.0%	0.0%	10.3%	0.0%	10.3%
IV	0.0%	1.6%	9.1%	0.0%	10.8%
V	0.0%	5.9%	24.2%	0.0%	30.1%
Total	0.0%	24.1%	75.9%	0.0%	100.0%

Condition in year 2036 after schedulable treatments applied.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	0.0%	19.3%	0.0%	19.3%
II / III	0.0%	0.0%	7.1%	0.0%	7.1%
IV	0.0%	12.7%	5.9%	0.0%	18.6%
V	0.0%	11.4%	43.6%	0.0%	55.0%
Total	0.0%	24.1%	75.9%	0.0%	100.0%

APPENDIX D

Sections Selected for Treatment:
RMRA Funding (Scenario 3)

Scenarios - Sections Selected for Treatment

Interest: 3.00% Inflation: 3.00% Printed: 10/04/2017

Scenario: Ferndale - RMRA Funding

Year	Budget	PM	Year	Budget	PM	Year	Budget	PM
2017	$0	50%	2024	$24,305	20%	2031	$24,305	20%
2018	$8,162	10%	2025	$24,305	20%	2032	$24,305	20%
2019	$24,305	20%	2026	$24,305	20%	2033	$24,305	20%
2020	$24,305	20%	2027	$24,305	20%	2034	$24,305	20%
2021	$24,305	20%	2028	$24,305	20%	2035	$24,305	20%
2022	$24,305	20%	2029	$24,305	20%	2036	$24,305	20%
2023	$24,305	20%	2030	$24,305	20%			

Year: 2018

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
CLEVELAND STREET	BERDING ST	HARRISON ST	F-CLEVST	010	352	37	13,024	12/5/2016	63	R	AC	70	$5,963	23,932	SLURRY SEAL W/ DIGOUTS
									Treatment Total				$5,963		
				Year 2018 Area Total			13,024		Year 2018 Total				$5,963		

Year: 2019

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
DEWEY AVENUE	HERBERT ST	E CDS	F-DEWAVE	010	363	21	7,623	12/5/2016	64	R	AC	69	$4,493	18,460	SLURRY SEAL W/ DIGOUTS
FRANCIS STREET	S END	SW BRIDGE	F-FRANST	010	221	24	5,304	12/5/2016	63	R	AC	69	$2,501	22,900	SLURRY SEAL W/ DIGOUTS
LEWIS AVENUE	MAIN ST	BERDING ST	F-LEWAVE	010	343	33	11,319	12/5/2016	63	R	AC	69	$5,338	22,900	SLURRY SEAL W/ DIGOUTS
									Treatment Total				$12,332		
BERDING STREET	FRANCIS ST	CLEVELAND ST	F-BERDST	010	553	27	14,931	12/5/2016	78	R	AC	82	$4,401	40,221	SLURRY SEAL
CREAM COURT	W CDS	JACOBSEN WAY	F-CREACT	010	609	35	21,315	12/5/2016	78	R	AC	82	$6,282	40,221	SLURRY SEAL
									Treatment Total				$10,683		
				Year 2019 Area Total			60,492		Year 2019 Total				$23,015		

Year: 2020

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
FERN AVENUE	N END	MAIN ST	F-FERAVE	010	842	38	31,996	12/5/2016	65	R	AC	69	$15,540	22,261	SLURRY SEAL W/ DIGOUTS
									Treatment Total				$15,540		

Scenarios - Sections Selected for Treatment

Interest: 3.00% Inflation: 3.00% Printed: 10/04/2017

Scenario: Ferndale - RMRA Funding

Year: 2020

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
DEWEY EXTENSION AVENUE	W CDS	JACOBSEN WAY	F-DEEAVE	010	508	36	18,288	12/5/2016	78	R	AC	80	$5,552	39,042	SLURRY SEAL
EMERSON LANE	S CDS	WASHINGTON ST	F-EMERLN	010	447	19	8,493	12/5/2016	80	R	AC	82	$2,578	38,967	SLURRY SEAL
											Treatment Total		$8,130		
				Year 2020 Area Total			58,777				Year 2020 Total		$23,670		

Year: 2021

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
BROWN STREET	MAIN ST	BERDING ST	F-BROWST	010	374	30	11,220	12/5/2016	67	R	AC	69	$7,016	17,320	SLURRY SEAL W/ DIGOUTS
											Treatment Total		$7,016		
BLUFF STREET	CRAIG ST	E CITY LIMIT	F-BLUFST	010	2,404	20	48,080	12/5/2016	87	RMaC	AC	85	$15,032	41,473	SLURRY SEAL
											Treatment Total		$15,032		
				Year 2021 Area Total			59,300				Year 2021 Total		$22,048		

Year: 2022

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
VANSTON AVENUE	MAIN ST	W END	F-VANAVE	010	237	41	9,717	12/5/2016	70	R	AC	70	$5,007	21,251	SLURRY SEAL W/ DIGOUTS
											Treatment Total		$5,007		
BERDING STREET	CLEVELAND ST	EUGENE ST	F-BERDST	020	232	47	10,904	12/5/2016	86	R	AC	85	$3,512	36,072	SLURRY SEAL
EUGENE STREET	FRANCIS ST	BERDING ST	F-EUGEST	010	383	43	16,469	12/5/2016	84	R	AC	83	$5,304	36,675	SLURRY SEAL
FERN AVENUE	MAIN ST	BERDING ST	F-FERAVE	020	365	33	12,045	12/5/2016	82	R	AC	81	$3,879	36,817	SLURRY SEAL
HARRISON AVENUE	CLEVELAND ST	CLEVELAND ST	F-HARAVE	010	234	35	8,190	12/5/2016	74	R	AC	74	$2,638	35,234	SLURRY SEAL
SHAMSI COURT	3RD ST	N CDS	F-SHAMCT	010	309	36	11,124	12/5/2016	85	R	AC	84	$3,583	36,376	SLURRY SEAL
											Treatment Total		$18,916		
				Year 2022 Area Total			68,449				Year 2022 Total		$23,923		

Scenarios - Sections Selected for Treatment

Interest: 3.00% Inflation: 3.00% Printed: 10/04/2017

Scenario: Ferndale - RMRA Funding

Year: 2023

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
4TH STREET	PIXLEY	A ST	F-4THST	010	558	44	24,552	12/5/2016	71	R	AC	69	$13,030	20,505	SLURRY SEAL W/ DIGOUTS
									Treatment Total				$13,030		
EUGENE STREET	BERDING ST	HARRISON ST	F-EUGEST	020	348	31	10,788	12/5/2016	88	R	AC	85	$3,579	34,905	SLURRY SEAL
JACOBSEN WAY	S CDS	N CDS	F-JACWAY	010	710	32	22,720	12/5/2016	76	R	AC	74	$7,536	34,346	SLURRY SEAL
									Treatment Total				$11,115		
				Year 2023 Area Total			58,060		Year 2023 Total				$24,145		

Year: 2024

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
LINCOLN AVENUE	CROWLEY AVE	GRANT AVE	F-LINAVE	010	403	16	6,448	12/5/2016	90	R	AC	85	$2,203	33,849	SLURRY SEAL
SHAW AVENUE	OCEAN AVE	MAIN ST	F-SHAAVE	010	2,011	32	64,352	12/5/2016	84	R	AC	80	$21,985	34,705	SLURRY SEAL
									Treatment Total				$24,188		
				Year 2024 Area Total			70,800		Year 2024 Total				$24,188		

Year: 2025

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
DEWEY AVENUE	HERBERT ST	E CDS	F-DEWAVE	010	363	21	7,623	12/5/2016	64	R	AC	70	$5,365	15,469	SLURRY SEAL W/ DIGOUTS
									Treatment Total				$5,365		
HERBERT STREET	DEWEY AVE	FERN AVE	F-HERBST	020	197	37	7,289	12/5/2016	90	R	AC	84	$2,565	33,371	SLURRY SEAL
HERBERT STREET	FERN AVE	MAIN ST	F-HERBST	030	660	37	24,420	12/5/2016	90	R	AC	84	$8,593	33,371	SLURRY SEAL
SHAW LANE	W CDS	SHAW AVE	F-SHAWLN	010	247	19	4,693	12/5/2016	90	R	AC	84	$1,652	33,371	SLURRY SEAL
									Treatment Total				$12,810		
				Year 2025 Area Total			44,025		Year 2025 Total				$18,175		

Year: 2026

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
ARLINGTON AVE	5TH ST	MAIN ST	F-ARLAVE	020	1,745	35	61,075	12/5/2016	88	R	AC	81	$22,136	32,675	SLURRY SEAL

													Treatment Total		$22,136	
				Year 2026 Area Total		61,075							Year 2026 Total		$22,136	

Year: 2027

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
BROWN STREET	MAIN ST	BERDING ST	F-BROWST	010	374	30	11,220	12/5/2016	67	R	AC	69	$8,378	14,519	SLURRY SEAL W/ DIGOUTS
CLEVELAND STREET	BERDING ST	HARRISON ST	F-CLEVST	010	352	37	13,024	12/5/2016	63	R	AC	66	$7,780	17,569	SLURRY SEAL W/ DIGOUTS
													Treatment Total		$16,158	
BERDING STREET	FRANCIS ST	CLEVELAND ST	F-BERDST	010	553	27	14,931	12/5/2016	78	R	AC	78	$5,574	31,448	SLURRY SEAL
													Treatment Total		$5,574	
				Year 2027 Area Total		39,175							Year 2027 Total		$21,732	

Year: 2028

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
FRANCIS STREET	S END	SW BRIDGE	F-FRANST	010	221	24	5,304	12/5/2016	63	R	AC	64	$3,264	16,829	SLURRY SEAL W/ DIGOUTS
LEWIS AVENUE	MAIN ST	BERDING ST	F-LEWAVE	010	343	33	11,319	12/5/2016	63	R	AC	64	$6,964	16,829	SLURRY SEAL W/ DIGOUTS
													Treatment Total		$10,228	
DEWEY EXTENSION AVENUE	W CDS	JACOBSEN WAY	F-DEEAVE	010	508	36	18,288	12/5/2016	78	R	AC	77	$7,032	30,278	SLURRY SEAL
EMERSON LANE	S CDS	WASHINGTON ST	F-EMERLN	010	447	19	8,493	12/5/2016	80	R	AC	78	$3,266	30,624	SLURRY SEAL
													Treatment Total		$10,298	
				Year 2028 Area Total		43,404							Year 2028 Total		$20,526	

Year: 2029

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
CREAM COURT	W CDS	JACOBSEN WAY	F-CREACT	010	609	35	21,315	12/5/2016	78	R	AC	75	$8,442	29,008	SLURRY SEAL
													Treatment Total		$8,442	

				Year 2029 Area Total			21,315					Year 2029 Total		$8,442		

Year: 2030

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
BERDING STREET	CLEVELAND ST	EUGENE ST	F-BERDST	020	232	47	10,904	12/5/2016	86	R	AC	81	$4,449	29,033	SLURRY SEAL
EUGENE STREET	FRANCIS ST	BERDING ST	F-EUGEST	010	383	43	16,469	12/5/2016	84	R	AC	79	$6,719	28,911	SLURRY SEAL
FERN AVENUE	MAIN ST	BERDING ST	F-FERAVE	020	365	33	12,045	12/5/2016	82	R	AC	78	$4,914	28,669	SLURRY SEAL
HARRISON AVENUE	CLEVELAND ST	CLEVELAND ST	F-HARAVE	010	234	35	8,190	12/5/2016	74	R	AC	70	$3,341	26,933	SLURRY SEAL
SHAMSI COURT	3RD ST	N CDS	F-SHAMCT	010	309	36	11,124	12/5/2016	85	R	AC	80	$4,538	29,039	SLURRY SEAL
											Treatment Total		$23,961		
				Year 2030 Area Total			58,732				Year 2030 Total		$23,961		

Year: 2031

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
VANSTON AVENUE	MAIN ST	W END	F-VANAVE	010	237	41	9,717	12/5/2016	70	R	AC	66	$6,533	15,605	SLURRY SEAL W/ DIGOUTS
											Treatment Total		$6,533		
EUGENE STREET	BERDING ST	HARRISON ST	F-EUGEST	020	348	31	10,788	12/5/2016	88	R	AC	81	$4,533	28,182	SLURRY SEAL
JACOBSEN WAY	S CDS	N CDS	F-JACWAY	010	710	32	22,720	12/5/2016	76	R	AC	71	$9,547	26,242	SLURRY SEAL
											Treatment Total		$14,080		
				Year 2031 Area Total			43,225				Year 2031 Total		$20,613		

Year: 2032

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
4TH STREET	PIXLEY	A ST	F-4THST	010	558	44	24,552	12/5/2016	71	R	AC	65	$17,001	15,087	SLURRY SEAL W/ DIGOUTS
											Treatment Total		$17,001		
LINCOLN AVENUE	CROWLEY AVE	GRANT AVE	F-LINAVE	010	403	16	6,448	12/5/2016	90	R	AC	81	$2,791	27,368	SLURRY SEAL
											Treatment Total		$2,791		
				Year 2032 Area Total			31,000				Year 2032 Total		$19,792		

Scenarios - Sections Selected for Treatment

Interest: 3.00% Inflation: 3.00% Printed: 10/04/2017

Scenario: Ferndale - RMRA Funding

Year: 2033

Road Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	Last Insp	Last Insp PCI	FC	Surf Type	PCI	Cost	Rating	Treatment
HERBERT STREET	DEWEY AVE	FERN AVE	F-HERBST	020	197	37	7,289	12/5/2016	90	R	AC	80	$3,250	26,540	SLURRY SEAL
HERBERT STREET	FERN AVE	MAIN ST	F-HERBST	030	660	37	24,420	12/5/2016	90	R	AC	80	$10,886	26,540	SLURRY SEAL
SHAW LANE	W CDS	SHAW AVE	F-SHAWLN	010	247	19	4,693	12/5/2016	90	R	AC	80	$2,092	26,540	SLURRY SEAL
													Treatment Total		$16,228
				Year 2033 Area Total			36,402						Year 2033 Total		$16,228
				Total Section Area:			767,255						Grand Total		$318,557

APPENDIX E

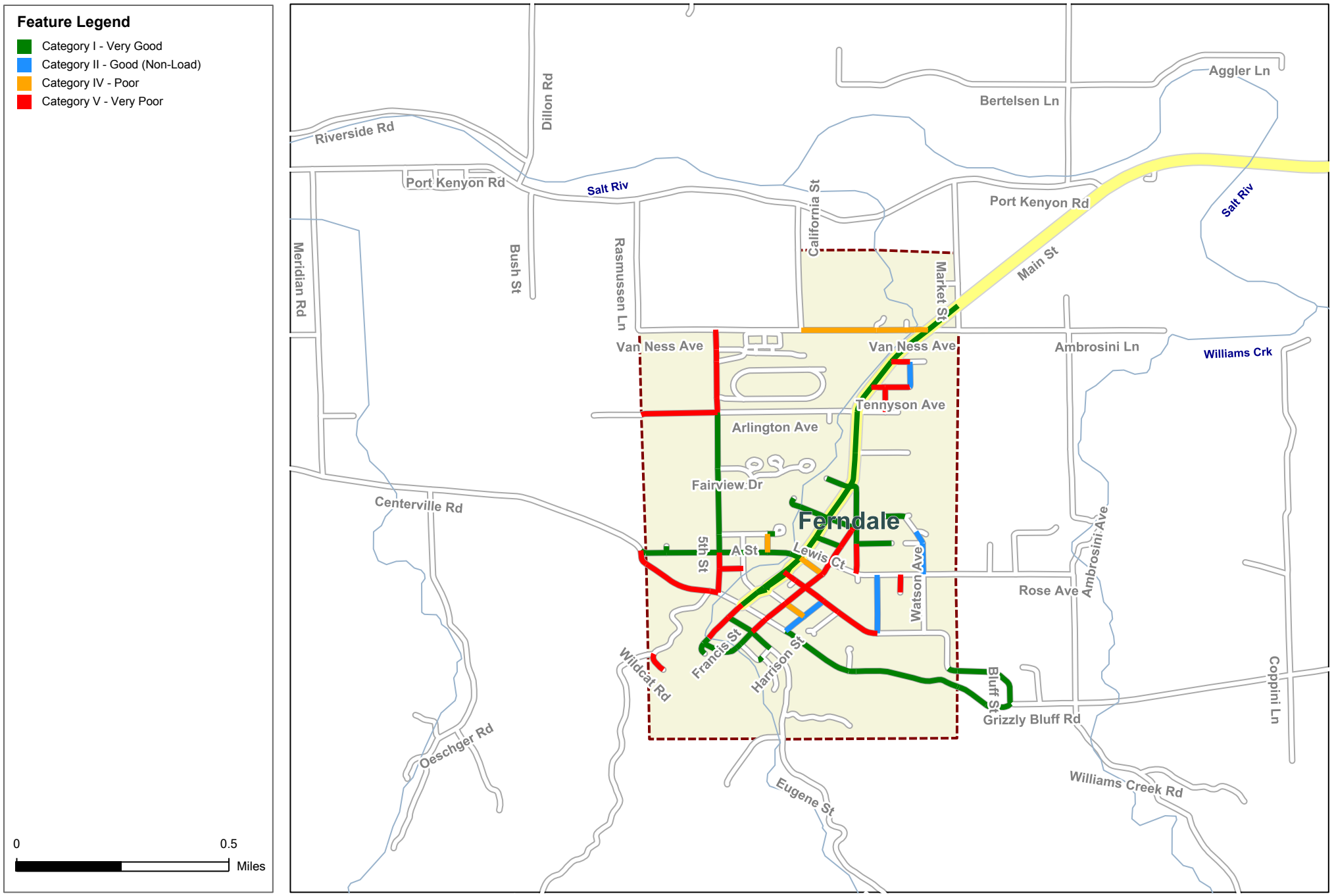
PCI GIS Maps

PCI GIS Map
Current Pavement Conditions
(2017)

HCAOG

Current PCI Condition

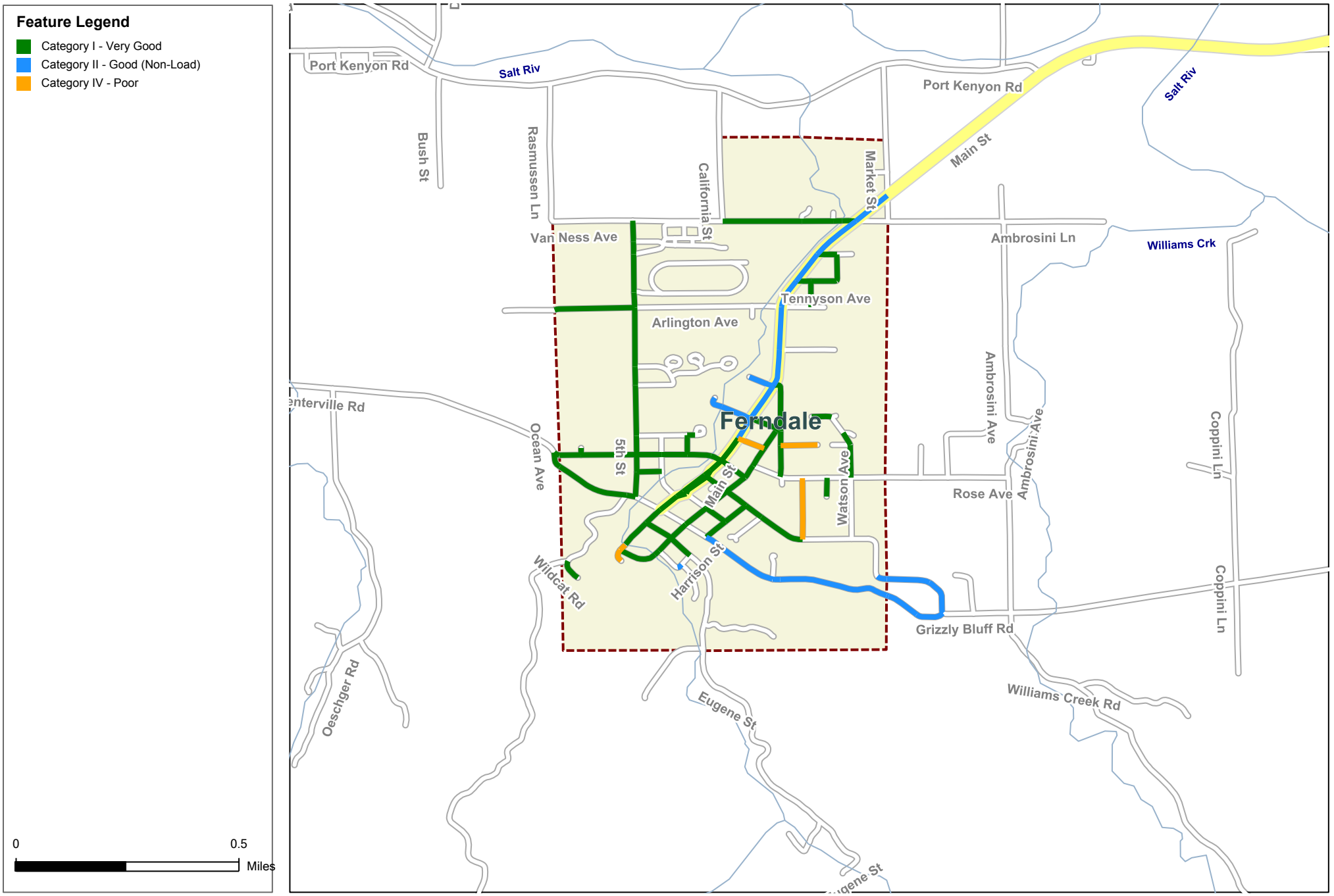
Printed: 4/18/2017



PCI GIS Map
Scenario 1: Increase PCI to 70
(2036)

HCAOG Target-Driven Scenario PCI Condition

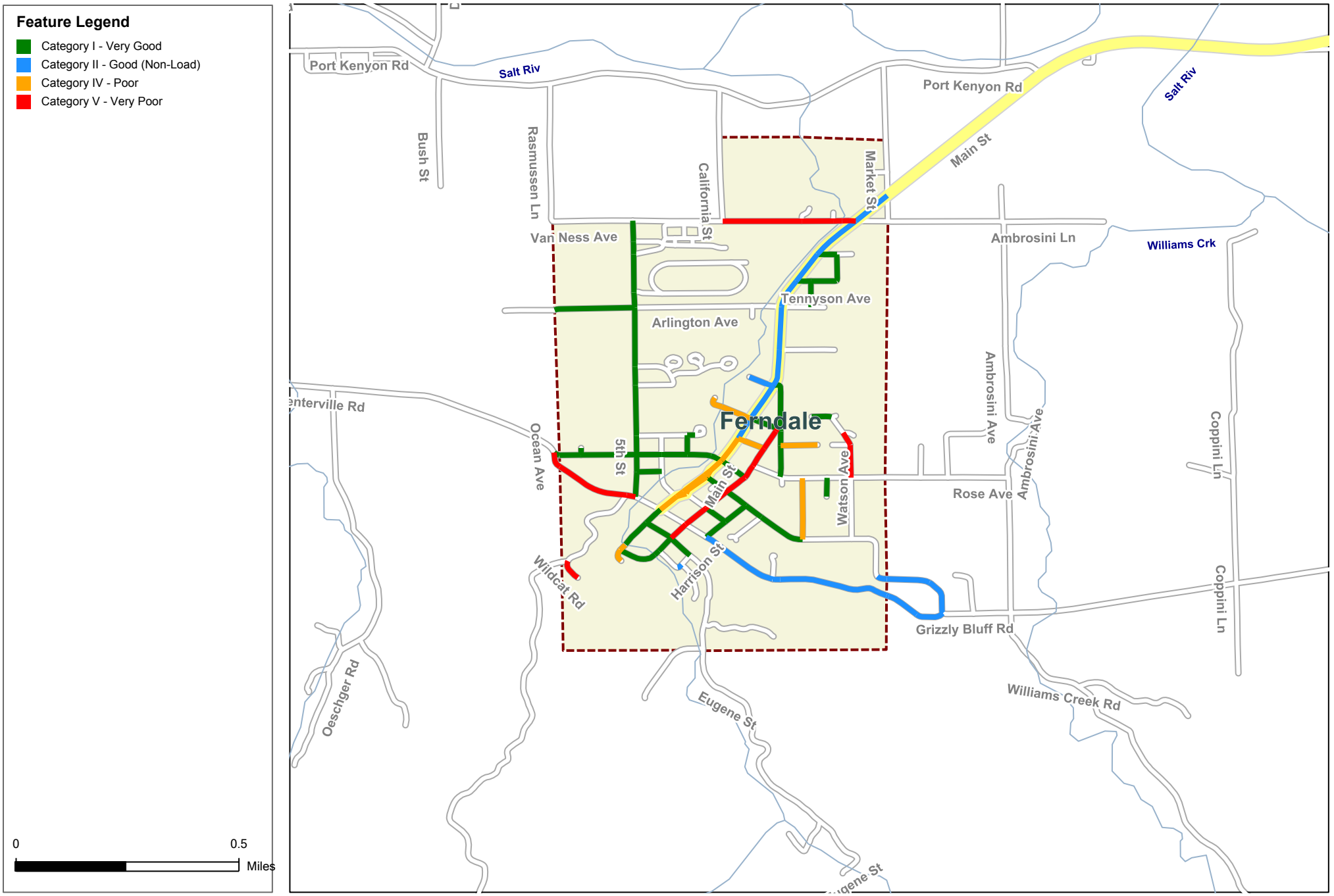
Ferndale - Increase PCI to 70 - 2036 Project Period - Total Rehab: $498,246 - Printed: 4/19/2017



PCI GIS Map
Scenario 2: Maintain Current PCI
(2036)

HCAOG Target-Driven Scenario PCI Condition

Ferndale - Maintain Current PCI (52) - 2036 Project Period - Total Rehab: $0 - Printed: 4/19/2017



PCI GIS Map
Scenario 3: RMRA Funding
(2036)

HCAOG

Scenario PCI Condition

Ferndale - RMRA Funding - 2036 Project Period - Total Rehab: $0 - Printed: 10/4/2017