

# Pavement Management Budget Options Report



March, 2019

City of Donald

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## Executive Summary

Capitol Asset & Pavement Services, Inc. was contracted by the City of Donald Public Works to perform visual inspections of all of the paved streets maintained by the City of Donald (City). All 2.19 centerline miles of paved streets maintained by the City were evaluated in accordance with MTC standards and the Streetsaver Online 9.0 database was updated with the inspection data. Inspections were completed in January, 2019.

The maintenance decision tree treatments and costs were reviewed and updated to reflect current pavement maintenance treatment prices. A budgetary needs analysis was performed based on the updated inspections and treatment costs and four budget scenarios were evaluated to compare the effects of various funding levels.

The City's street network consists of 2.19 centerline miles of streets. A detailed visual inspection of the City's streets resulted in a calculated average PCI of 72. Using a 0-100 PCI scale, with 100 being the most favorable, a rating of 72 places the City's street network in the 'Good' condition category.

Four scenarios were analyzed for various street maintenance funding levels. The budgets include preventative maintenance and rehabilitation work for existing paved street surfaces. The City's current strategy of street maintenance, along with current prices for the treatments, is represented in the Streetsaver decision tree matrix. This matrix defines what treatments need to be applied to streets in varying PCI conditions. Utilizing this decision matrix, it was determined that the City will need to spend \$442,462 over the next five years to bring the street network into 'optimal' condition, or an overall street network PCI of 84. Comparing this with the current funding level of \$30,000 over the next five years shows that the average network PCI decreases by five points, to 67 by 2023. Scenarios were also run to determine the funding levels required to maintain the current overall network PCI of 72 as well as increase the overall network PCI by 5 points over the next five years. Scenario analyses show that at current funding levels, the overall street condition will likely decline. Table 1 summarizes the findings of the Scenarios.

**Table 1 – Summary of outcome of different funding levels (Scenarios)**

<b>Average yearly budget</b>	\$88,492 (1-Unconstrained)	\$6,000 (2-Current Funding)	\$16,868 (3-Maintain Current PCI)	\$49,750 (4-Increase PCI 5 points)
<b>Total budget for 5 years</b>	\$442,462	\$30,000	\$84,342	\$248,751
<b>Current PCI</b>	72	72	72	72
<b>Current % in 'Good' condition</b>	65.0%	65.0%	65.0%	65.0%
<b>PCI after 5 years (change)</b>	84 (+12)	67 (-5)	72 (0)	77 (+5)
<b>Backlog after 5 years</b>	\$0	\$288,716	\$230,481	\$58,798
<b>% 'Good' in 5 years</b>	94.8%	73.0%	76.9%	84.7%
<b>% 'Fair' in 5 years</b>	5.2%	7.0%	7.0%	7.0%
<b>% 'Poor' in 5 years</b>	0.0%	15.4%	11.5%	8.3%
<b>% 'Very Poor' in 5 years</b>	0.0%	4.5%	4.5%	0.0%

## Purpose

This report is intended to assist the City of Donald with identifying street maintenance priorities specific to the City.

The report examines the overall condition of the street network and highlights the impacts of various funding levels on the network pavement condition and deferred maintenance funding shortfalls. The Metropolitan Transportation Commission, MTC, Streetsaver Pavement Management Program (PMP) was used for this evaluation. The intent of this program is to develop a maintenance strategy that will improve the overall condition of the street network to an optimal Pavement Condition Index (PCI) in the low to mid 80's and also to maintain it at that level.

The MTC Streetsaver program maximizes the cost-effectiveness of the maintenance treatment plan by recommending a multi-year street maintenance and rehabilitation plan based on the most cost-effective repairs available. A comprehensive preventative maintenance program is a critical component of this plan, as these treatments extend the life of good pavements at a much lower cost than rehabilitation overlay or reconstruction treatments. To this end, various 'what-if' analyses (scenarios) were conducted to determine the most cost-effective plan for maintaining the City's street network over five years and at various funding levels.

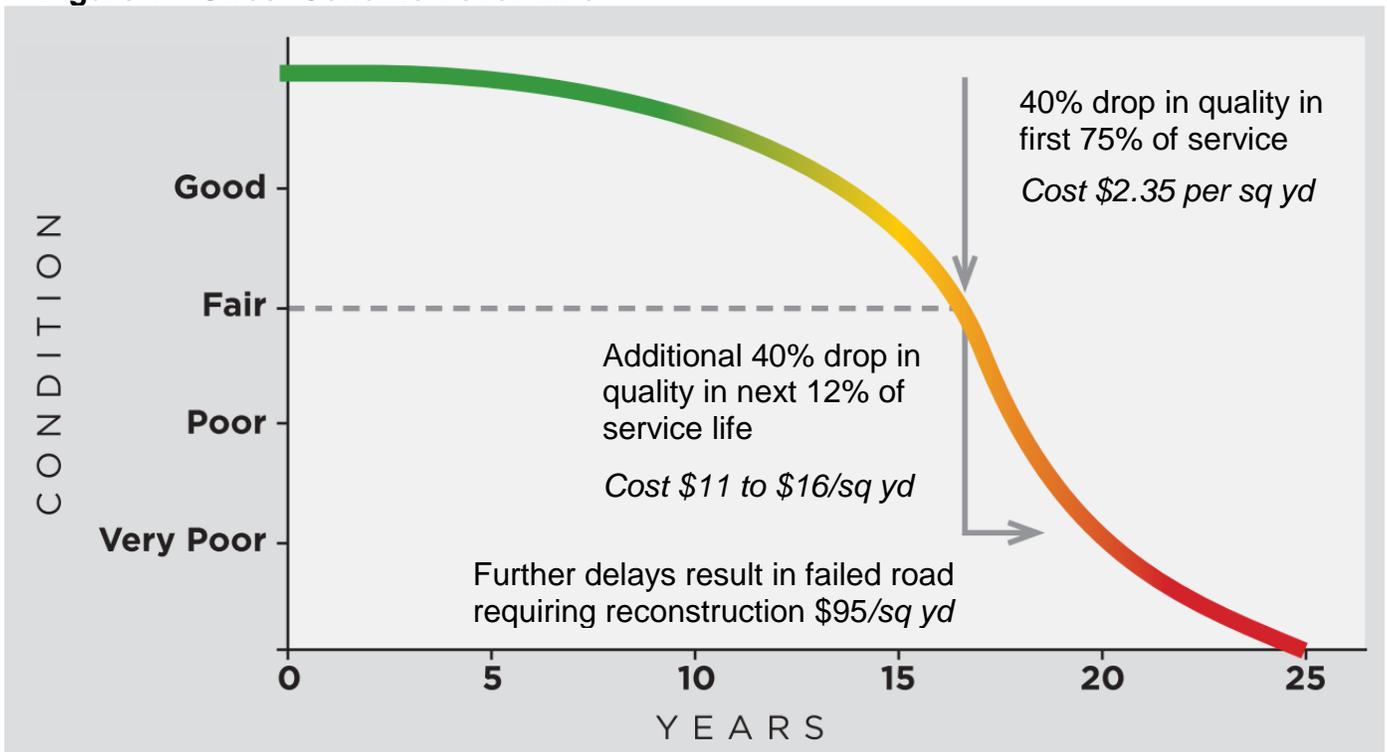
# Pavement Management Strategy

Pavement Management is a set of tools and philosophies designed to manage the maintenance activities of asphalt concrete and Portland concrete pavements. A Pavement Management System consists of a module to keep track of existing and historical pavement condition data and a decision making process to help choose the most cost-effective maintenance strategies and which streets to treat when.

Conventional wisdom of most public works and street department agencies has been to treat streets in a “worst-first” philosophy. Under this “worst-first” policy, streets are allowed to deteriorate to a nearly failed condition before any rehabilitation (such as overlays or reconstructions), are applied. This can also be called the “don’t fix if it isn’t broke” mentality.

Pavement management systems are designed with a more cost-effective, “best-first” approach. The reasoning behind this philosophy, is that it is better to treat streets with lower-cost, preventative maintenance treatments, such as slurry seals, microsurfacing, and crack seals, and extend their life cycle before the street condition deteriorates to a state where it requires more costly rehabilitation and reconstruction treatments. Generally, paved streets spend about three-quarters of their life-cycle in fair to good condition, where the street shows little sign of deterioration and has a high service level. After this time, the street condition begins to deteriorate at a rapid rate and, if not maintained properly, will soon reach a condition where it will require costly overlays and reconstructions. If treated with a surface seal and other preventative measures, the street condition will remain at a good level for a longer period of time. Figure 1 shows a typical condition deterioration curve for a street.

**Figure 1 – Street Condition over time**



## Existing Pavement Condition

The City is responsible for the repair and maintenance of 2.19 centerline miles of paved streets. The City’s street network replacement value is estimated at \$3.0 million.<sup>1</sup> This asset valuation assumes replacement of the entire street network in present day dollars (street base and surface only, not curbs or sidewalk). This represents a significant asset for City officials to manage.

The average overall network Pavement Condition Index (PCI) of the City’s street network is 72, which indicates that the street network is in ‘Good’ condition. The PCI is a measurement of pavement condition that ranges from 0 to 100. A newly constructed or overlaid street would have a PCI of 100, while a failed street (requiring complete reconstruction) would have a PCI under 25. Appendix B contains a report detailing the PCI information for each street.

Table 2 details the network statistics and pavement condition by functional class.

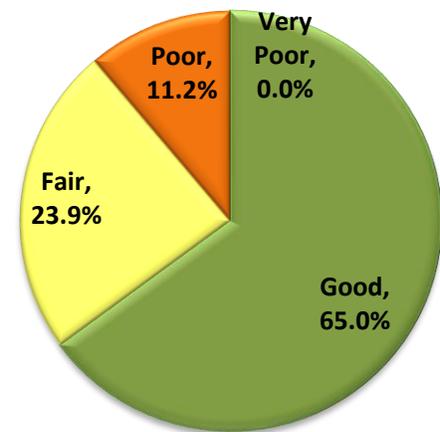
**Table 2 – Street Network Statistics and Average PCI by Functional Class**

Functional Class	# of Sections	Centerline Miles	Lane Miles	Average PCI
Collector	7	0.42	0.83	69
Residential	28	1.77	3.54	73
<b>Totals</b>	<b>35</b>	<b>2.19</b>	<b>4.38</b>	<b>72</b>

Table 3 and Figure 2 details the percentage of the street network area by each PCI range or condition category.

**Table 3 and Figure 2 – Percent Network Area by Functional Class and Condition**

Condition Class	PCI Range	Collector	Residential	Total
<b>Good (I)</b>	70-100	8.6%	56.3%	65.0%
<b>Fair (II/III)</b>	50-70	6.1%	17.8%	23.9%
<b>Poor (IV)</b>	25-50	1.9%	9.3%	11.2%
<b>Very Poor (V)</b>	0-25	0.0%	0.0%	0.0%
<b>Totals</b>		<b>16.6%</b>	<b>83.4%</b>	



<sup>1</sup> Replacement value is calculated as the current cost to reconstruct each street in the network, based on the values in the Streetsaver decision tree. This does not include sidewalks or curb.

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## Present Cost to Repair the Street Network

The MTC Pavement Management Program (PMP) is designed to achieve an optimal network PCI somewhere between the low and mid 80's, which is in the middle of the good condition category. In other words, the system will recommend maintenance treatments in an attempt to bring all of the streets in the City to a 'Good' condition, with the majority of the streets falling in the low to mid 80's PCI range. Streets will remain in the 'Good' condition category for a longer period of time if relatively inexpensive preventive maintenance treatments are used. Once the PCI falls below 70, more expensive rehabilitation treatments will be needed.

The Budget Needs module of the PMP estimates a necessary funding level for the City's pavement preservation and rehabilitation program of \$442,462<sup>2</sup> over the next five-year period (2019– 2023) in order to improve and maintain the street network PCI at an optimal level in the lower to mid 80's. The five-year cost of \$442,462 exceeds the City's planned five-year funding level of \$30,000 by approximately \$412,462.

As mentioned earlier, the average PCI for the City's streets is 72, which is in the 'Good' condition category. Why then, does it cost so much to repair the City's streets, and why bother improving them?

The cost to repair and maintain a pavement depends on its current PCI. In the 'Good' category, it costs very little to apply preventive maintenance treatments such as crack and surface seals (slurry seal or chip seal), which can extend the life of a pavement by correcting minor faults and reducing further deterioration. Minor treatments are applied before pavement deterioration has become severe and usually costs \$2.35 per square yard<sup>3</sup>. 65.0% of the City's street network would benefit from these relatively inexpensive, life-extending treatments.

23.9% of the City's street network falls into the 'Fair' condition category. Pavements in this range show some form of distress caused by traffic load related activity or environmental distress that requires more than a life-extending treatment. At this point, a well-designed pavement will have served at least 75 percent of its life, with the quality of the pavement dropping approximately 40 percent. The street surface may require a slurry seal or thin AC Overlay (1.5") (depending on functional class, and the extent of load related distresses), at a cost of \$2.35 to \$11/sq yd.

11.2% of the City's street network falls into the 'Poor' condition category. These pavements are near the end of their service lives, and often exhibit major forms of distress such as potholes, extensive cracking, etc. At this stage, a street usually requires a Medium AC Overlay (2"), at a cost of \$16 /sq yd.

Streets in the 'Very Poor' condition category indicate that the street has failed. These pavements are at the end of their service lives and have major distresses, often indicating the failure of the sub base. Streets at this stage require major rehabilitation, usually the complete reconstruction of the street surface or street surface and subgrade structure. Another option is a full depth reclamation, which is a process where the asphalt surface is milled and then added to the base. The FDR

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<sup>2</sup> Treatment costs are based on this year's average costs per square yard, with future years including a 3% inflation adjustment per year after 2019.

<sup>3</sup> For detailed treatments and costs used in analysis for this report, see appendix C – Decision Tree report

procedure pulverizes the existing failed asphalt and blends it with the underlying base, sub base, and/or underlying materials. These materials would then be mixed together with the portland cement and compacted to provide a new thicker and stabilized base. A 2-inch asphalt concrete overlay then would be applied which would complete the FDR process. This would provide a new stronger, longer-lasting street structure using recycled materials from the previously failed street. Estimated costs to perform an FDR to reconstruct the street surface is approximately \$85.45/sq yd.

One of the key elements of a pavement repair strategy is to keep streets that are in the 'Good' or 'Fair' categories from deteriorating. This is particularly true for streets in the 'Fair' range, because they are at the point where pavement deterioration accelerates if left untreated. However, the deterioration rate for pavements in the 'Poor' to 'Very Poor' range is relatively flat and the condition of these streets will not decline significantly if repairs are delayed. As more 'Good' streets deteriorate into the 'Fair', 'Poor', and 'Very Poor' categories, the cost of deferred maintenance will continue to increase. The cost of the deferred maintenance backlog will stop increasing only when enough funds are provided to prevent streets from deteriorating into a worse condition category, or the whole network falls into the 'Very Poor' category (i.e. cannot deteriorate any further). The deferred maintenance backlog refers to the dollar amount of maintenance and rehabilitation work that should have been completed to maintain the street in 'Good' condition, but had to be deferred due to funding deficiencies for preventative maintenance and/or pavement rehabilitation programs. The actual repairs that are being deferred are often referred to as a "backlog."

## Future Expenditures for Pavement Maintenance

Assuming projected funding is allocated for pavement maintenance; we anticipate that the City will spend \$30,000 on pavement maintenance rehabilitation during the next five years (2019- 2023) as detailed on Table 4.

**Table 4. Projected Pavement Budget for 2019 to 2023**

2019	2020	2021	2022	2023	Total
\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	<b>\$30,000</b>

## Budget Needs

Based on the principle that it costs less to maintain streets in good condition than bad, the MTC PMP strives to develop a maintenance strategy that will first improve the overall condition of the network to an optimal PCI somewhere between the low and mid 80's, and then sustain it at that level. The average PCI for the City is 72, which is in the 'Good' condition category. Current funding strategies demonstrate there is a \$149,118 deferred maintenance backlog<sup>4</sup> in the first year of the scenario. If these issues are not addressed, the quality of the street network will inevitably decline. In order to correct these deficiencies, cost-effective funding and street maintenance strategies must be implemented.

The first step in developing a cost-effective maintenance and rehabilitation strategy is to determine, assuming unlimited revenues, the maintenance "needs" of the City's street network. Using the PMP budget needs module; street maintenance needs are estimated at \$442,462 over the next five years. If the City follows the strategy recommended by the program, the average network PCI will

<sup>4</sup> Definition of deferred maintenance backlog can be found in Appendix A

increase to 84. If, however, current pavement maintenance funding is exhausted and little or no maintenance is applied over the next five years, already distressed streets will continue to deteriorate, and the network PCI will drop to 64. The results of the budget needs analysis are summarized in Table 5.<sup>5</sup>

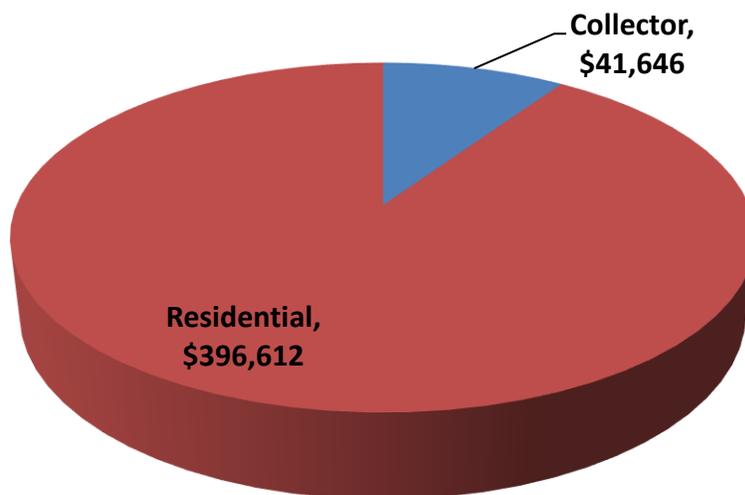
**Table 5. Summary of Results from Needs Analysis**

<i>Fiscal Years</i>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>Total</b>
<b>PCI with Treatment</b>	79	79	77	80	84	---
<b>PCI, no Treatment</b>	71	70	68	66	64	---
<b>Budget Needs Total</b>	\$78,996	\$27,969	\$0	\$154,294	\$181,203	<b>\$442,462</b>
<b>Rehabilitation Portion</b>	\$17,056	\$27,045	\$0	\$154,294	\$22,378	<b>\$220,773</b>
<b>Preventative Maintenance Portion</b>	\$57,731	\$924	\$0	\$0	\$158,830	<b>\$217,485</b>

Table 5 shows the level of expenditure required to raise the City’s pavement condition to an optimal network PCI of 84 and eliminate the current maintenance and rehabilitation backlog. The results of the budget needs analysis represent the ideal funding strategy recommended by the MTC PMP. Of the \$442,462 in maintenance and rehabilitation needs shown, approximately \$217,485 or 49.2% is earmarked for preventative maintenance or life-extending treatments, while \$220,773 or 49.9% is allocated for the more costly rehabilitation and reconstruction treatments.

Figure 4 is based on the budget needs predictive module. The pavement management program is recommending a funding level of \$442,462 over a five-year period. Figure 4 illustrates the funding distribution by street functional classification.

**Figure 4. Budget Needs Funding Distribution by Functional Classification**



<sup>5</sup> Actual program outputs are included in Appendixes B through F

## Budget Scenarios

Having determined the maintenance and rehabilitation needs of the City’s street network, the next step in developing a cost-effective maintenance and rehabilitation strategy is to conduct ‘what-if’ analyses. Using the PMP budget scenarios module, the impact of various budget scenarios can be evaluated. The program projects the effects of the different scenarios on pavement condition PCI and deferred maintenance (backlog). By examining the effects on these indicators, the advantages and disadvantages of different funding levels and maintenance strategies become clear. For the purpose of this report, the following scenarios were run for five (5)-year periods (2019-2023). The results are summarized in Table 6.

1. *Unconstrained (zero “deferred maintenance”)* — The annual amounts, as identified in the budget needs analysis totaling \$442,462, were input into the scenarios module. This scenario shows the effects of implementing the ideal investment strategy (as recommended by the MTC PMP Needs module).
2. *Current Investment Level* — An average annual budget of \$6,000 was evaluated over five years, for a total of \$30,000, to determine the effects of continuing pavement maintenance at the current budget level. The overall network PCI decreases by five points, to 67, under this funding level.
3. *Maintain Current PCI* — An annual funding level of \$16,868 per year, for a five year total of \$84,342, should maintain the overall network PCI at the current level of 72 through . The overall network PCI remains the same, at 72 through 2023.
4. *Increase PCI 5 points* — An annual funding level of \$49,750 per year, for a five year total of \$248,751, should increase the overall network PCI by five points, to 77 over the duration of the five-year analysis period.

**Table 6. Scenario Summary**

Scenario Name	5 Year Budget	2023 PCI (change)	2023 Deferred Maintenance	2023 % Good	2023 % Very Poor
1 – Unconstrained	\$442,462	84 (+12)	\$0	94.8%	0.0%
2 – Current Investment	\$30,000	67 (-5)	\$288,716	73.0%	4.5%
3 – Maintain Current PCI	\$84,342	72 (0)	\$230,481	76.9%	4.5%
4 – Increase PCI 5 points	\$248,751	77 (+5)	\$58,798	84.7%	0.0%

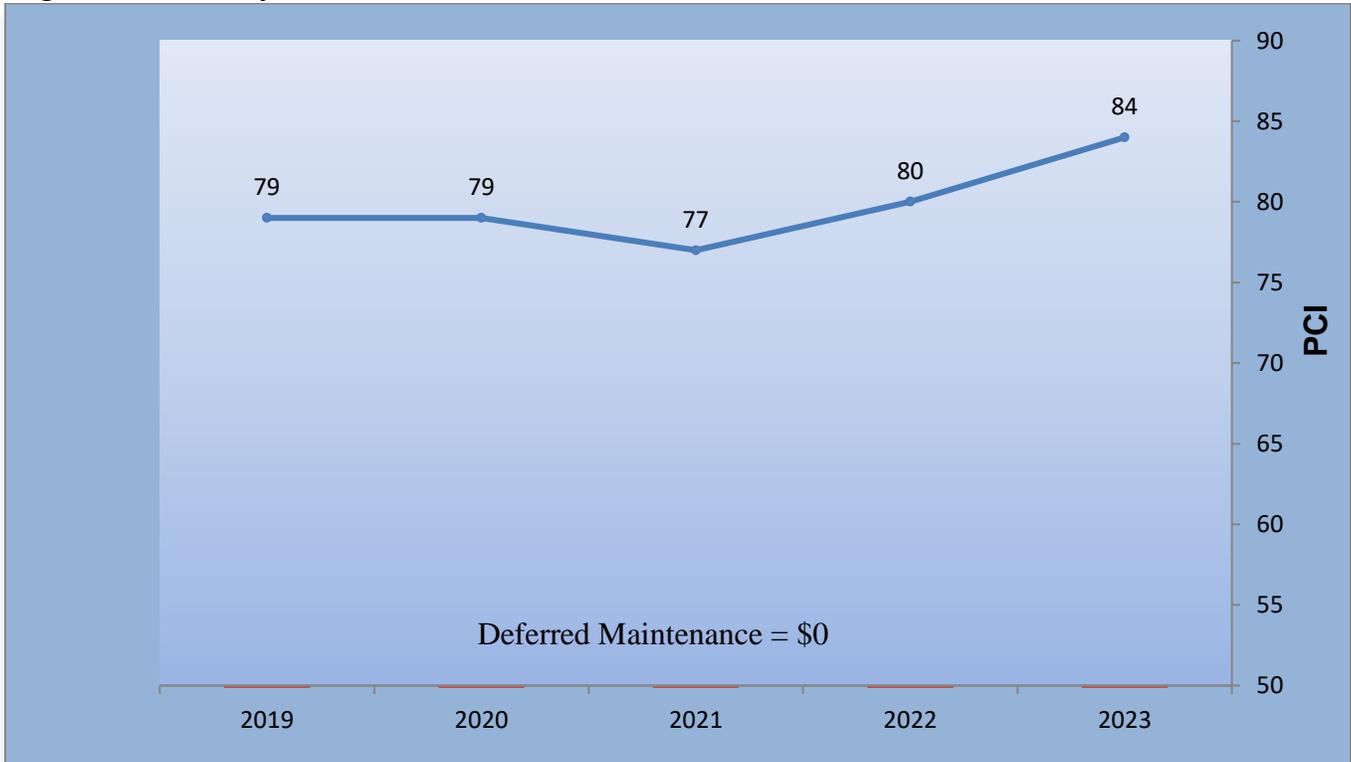
**Scenario 1 — Unconstrained Needs (zero deferred maintenance)**

This scenario shows the effects of implementing the ideal investment strategy (as recommended by the MTC PMP needs module). Because it is more cost-effective to eliminate the deferred maintenance backlog as quickly as possible, the bulk of the deferred maintenance needs are addressed in the first year of the five-year program, raising the overall average network PCI to 79. By 2023, 94.8% of the network improves into the 'Good' condition category, a significant increase from the current level of 65.0% in 'Good' condition. These results are shown in both Table 7 and Figure 5.

**Table 7. Summary of Results from Scenario 1 — Unconstrained Needs**

	2019	2020	2021	2022	2023	Total
<b>Budget Total</b>	\$78,996	\$27,969	\$0	\$154,294	\$181,203	<b>\$442,462</b>
<b>Rehabilitation budget</b>	\$17,056	\$27,045	\$0	\$154,294	\$22,378	<b>\$220,773</b>
<b>Preventative Maintenance budget</b>	\$57,731	\$924	\$0	\$0	\$158,830	<b>\$217,485</b>
<b>Deferred Maintenance</b>	\$0	\$0	\$0	\$0	\$0	<b>--</b>
<b>PCI</b>	79	79	77	80	84	

**Figure 5. Summary of Results from Scenario 1 — Unconstrained Needs**



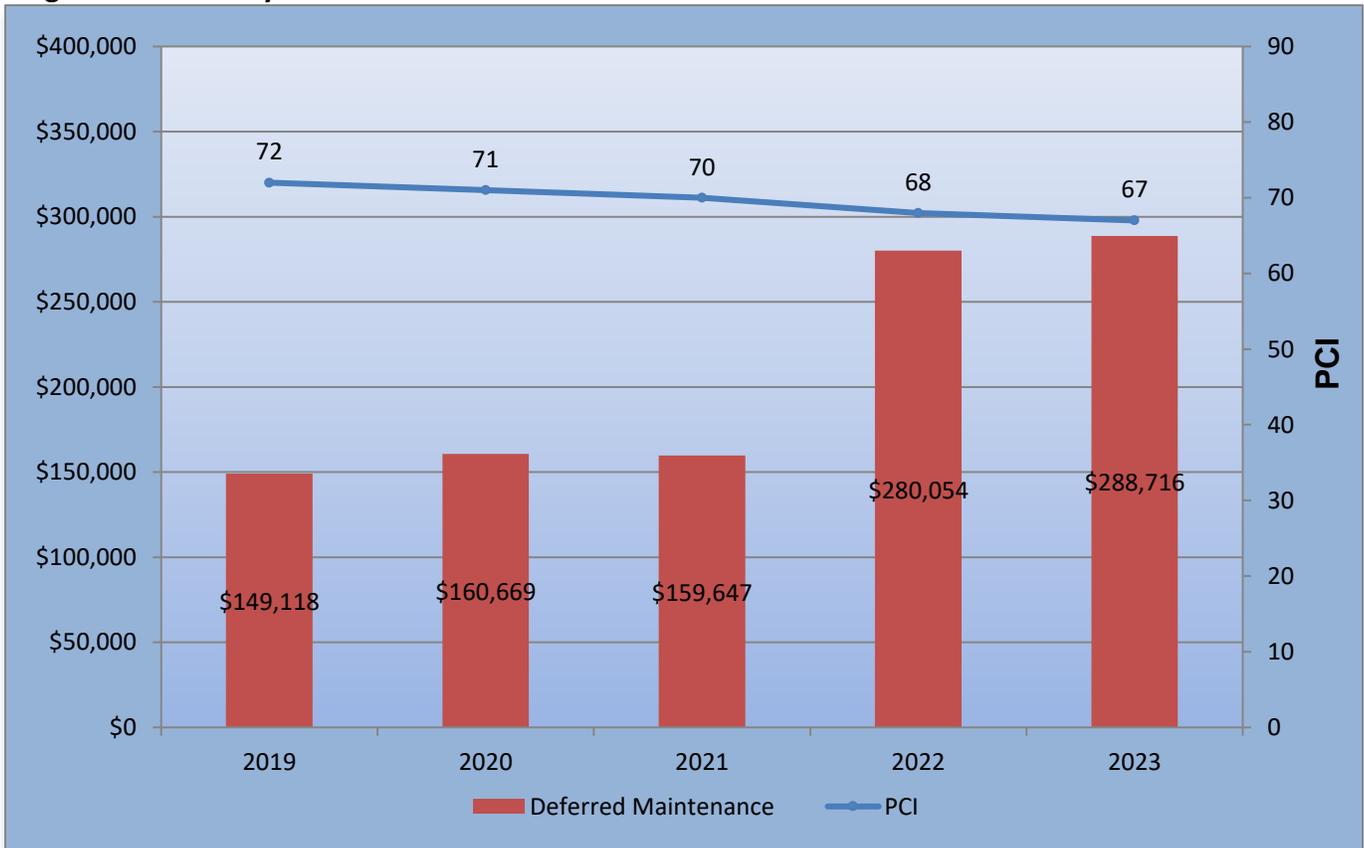
## Scenario 2 — Current Investment Level

This scenario shows the effects of the City’s current budget for street maintenance of \$30,000 over five years. Under this scenario, the overall network PCI decreases by five points, from 72 currently, to 67 by 2023. Under this investment level, the deferred maintenance backlog increases from \$149,118 in 2019, to \$288,716 in 2023. The street network in ‘Very Poor’ condition increases from 0.0% currently, to 4.5% in 2023. The percentage of the street network in 'Good' condition improves, from 65.0% currently, to 73.0% in 2023. Results are illustrated in Table 8 and Figure 6.

**Table 8. Summary of Results from Scenario 2 — Current Investment Level**

	2019	2020	2021	2022	2023	Total
<b>Budget Total</b>	\$5,486	\$5,675	\$5,843	\$5,529	\$7,500	<b>\$30,000</b>
<b>Rehabilitation budget</b>	\$5,486	\$4,801	\$2,950	\$1,935	\$5,951	<b>\$21,123</b>
<b>Preventative Maintenance budget</b>	\$0	\$874	\$2,893	\$3,594	\$940	<b>\$8,301</b>
<b>Deferred Maintenance</b>	\$149,118	\$160,669	\$159,647	\$280,054	\$288,716	---
<b>PCI</b>	72	71	70	68	67	

**Figure 6. Summary of Results from Scenario 2 — Current Investment Level**



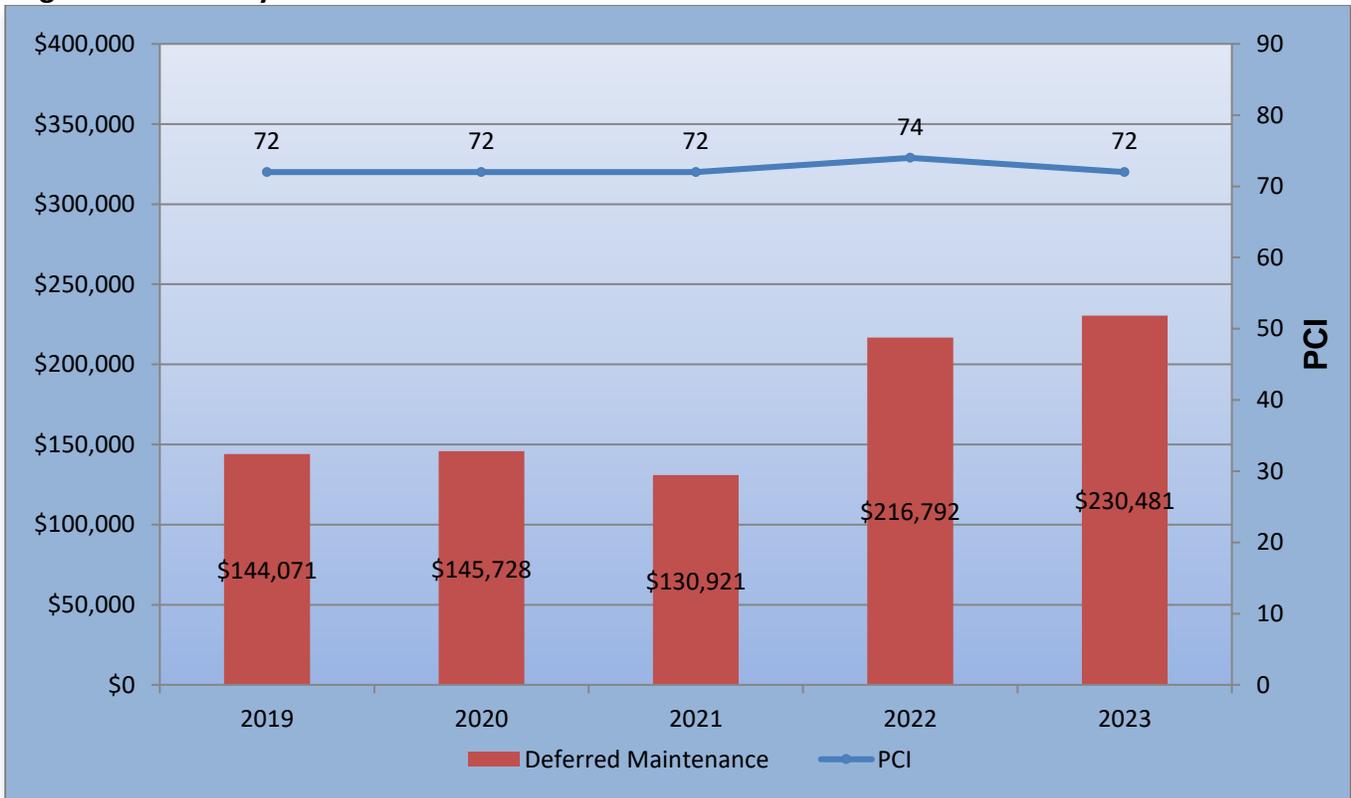
### Scenario 3 — Maintain Current PCI

This scenario analyzes the funding level that would be required to maintain the current network PCI of 72 over the next five years. An annual investment level of \$16,868, for a total of \$84,342 over five years, would be needed. Under this scenario, the PCI remains at the current level of 72 through 2023. Even though the PCI remains level, the deferred maintenance backlog increases from \$144,071 in 2019, to \$230,481 by 2023. The street network in ‘Very Poor’ condition increases from 0.0% currently, to 4.5% in 2023. The percentage of the street network in the ‘Good’ condition category increases to 76.9% in 2023, from the current level of 65.0%. These results are illustrated in Table 9 and Figure 7.

**Table 9. Summary of Results, Scenario 3 — Maintain Current PCI**

	2019	2020	2021	2022	2023	Total
<b>Budget Total</b>	\$10,534	\$15,419	\$19,183	\$39,206	\$0	<b>\$84,342</b>
<b>Rehabilitation budget</b>	\$0	\$2,230	\$6,591	\$26,638	\$0	<b>\$35,459</b>
<b>Preventative Maintenance budget</b>	\$10,534	\$13,189	\$12,592	\$12,568	\$0	<b>\$48,883</b>
<b>Deferred Maintenance</b>	\$144,071	\$145,728	\$130,921	\$216,792	\$230,481	---
<b>PCI</b>	72	72	72	74	72	

**Figure 7. Summary of Results from Scenario 3 — Maintain Current PCI**



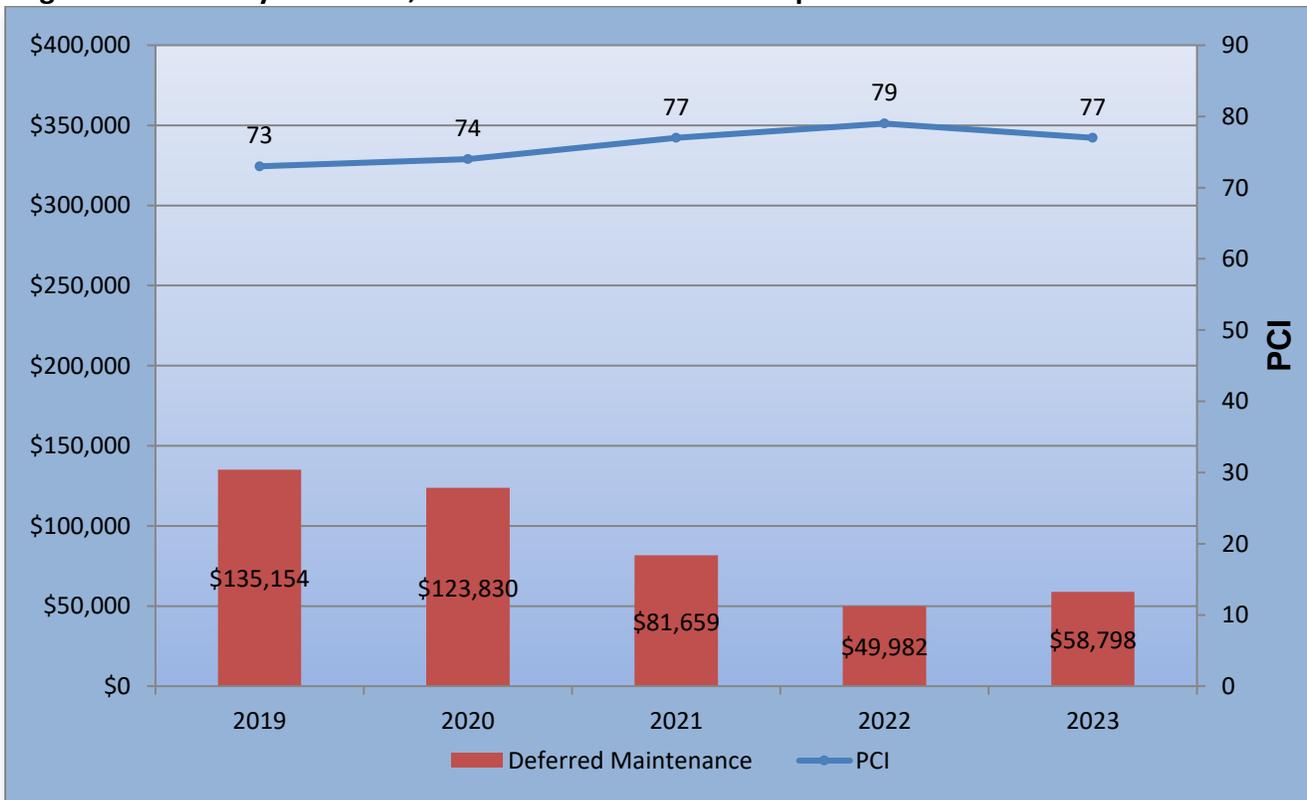
### Scenario 4 — Increase PCI 5 points

This scenario analyzes the funding level required to increase the overall network PCI by 5 points over the next five years. An annual funding level of \$49,750 would be required to achieve this goal. Even at this funding level the deferred maintenance backlog decreases, from \$135,154 in 2019, to \$58,798 in 2023. The percentage of the street network in the ‘Good’ condition category increases to 84.7% in 2023, from the current level of 65.0%. The street network in ‘Very Poor’ condition remain the same at 0.0% through 2023. These results are illustrated in Table 10 and Figure 8.

**Table 10. Summary of Results, Scenario 4 — Increase PCI 5 points**

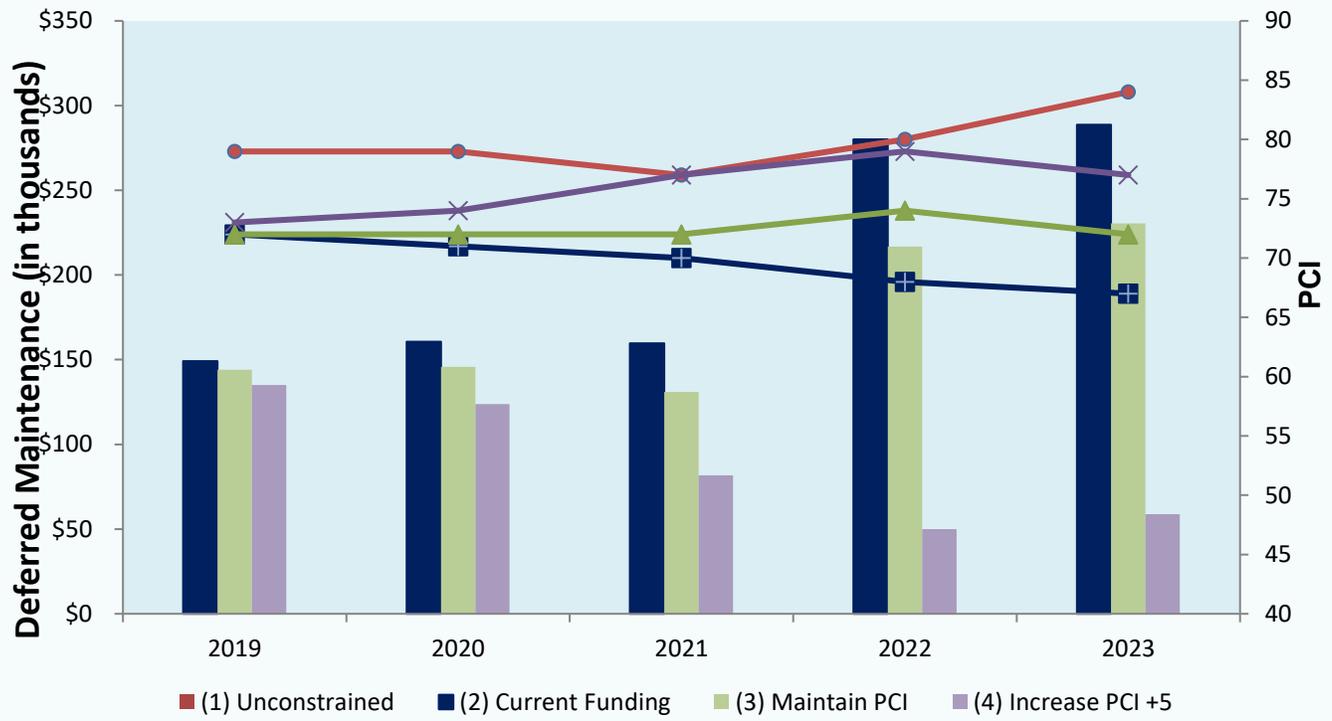
	2019	2020	2021	2022	2023	Total
<b>Budget Total</b>	\$19,455	\$28,133	\$45,889	\$155,274	\$0	<b>\$248,751</b>
<b>Rehabilitation budget</b>	\$2,165	\$6,399	\$37,063	\$154,294	\$0	<b>\$199,921</b>
<b>Preventative Maintenance budget</b>	\$17,290	\$21,734	\$8,826	\$980	\$0	<b>\$48,830</b>
<b>Deferred Maintenance</b>	\$135,154	\$123,830	\$81,659	\$49,982	\$58,798	---
<b>PCI</b>	73	74	77	79	77	

**Figure 8. Summary of Results, Scenario 4 — Increase PCI 5 points**



A comparison of the four scenarios is summarized in Figures 9 and 10. Figure 9 depicts the deferred maintenance costs as they relate to PCI for the four scenarios evaluated. Figure 10 depicts the percent of the street network in the various condition categories for the four scenarios evaluated.

**Figure 9 - Deferred Maintenance and PCI of Scenarios 1-4**



**Figure 10 – Pavement Condition Category Percentages in 2023 – Scenarios 1-4**



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## Recommendations

Of the various maintenance and funding options considered, the *ideal* strategy for the City is presented in Scenario 1, with a five-year expenditure total of \$442,462. Not only does this surface management plan improve the network to an optimal level of 84, it also eliminates the entire deferred maintenance backlog in the first year. As examined scenarios deviate from this strategy, the cost to the City will increase in the long term. However, the amount of funds required may make this strategy unrealistic for the City. This scenario can, however, be used as a base line for comparing other scenarios.

Under current five-year funding level (\$30,000 over five years) the current network PCI of 72 will decline by five point over the course of five years. The deferred maintenance price tag will increase, from \$149,118 in 2019, to \$288,716 in 2023. By following this strategy through 2023, 73.0% of the City's street will be in the 'Good' condition category, an increase from the current level of 65.0% in 'Good' condition. The street network in 'Very Poor' condition increases from 0.0% currently, to 4.5% in 2023. At the City's current funding level, the street network condition will decline over the foreseeable future.

Scenario and Needs analyses assume that the City will follow a good pavement management philosophy of prioritizing preventative maintenance over rehabilitation. By first ensuring that Good streets stay Good, through the use of a cost-effective slurry/chip and crack seal program, the City will save money in the long run. The use thin AC overlays to rehabilitate streets in Fair condition should be the second priority, followed by thick overlays on Poor streets. Failed streets should be the lowest priority, as the reconstruction that would be required to rehabilitate them are very expensive, and the money is better used on more cost-effective treatments to maintain and rehabilitate better streets.

The PMP Budget Needs Module is recommending \$209,475 for streets in the 'Poor' to 'Very Poor' condition. Because these categories require extensive rehabilitation and reconstruction work, the work will consume approximately 47.3% of the planned costs, as estimated by the PMP. This places the City in a challenging position of trying to avoid increasing future street rehabilitation costs coupled with the risk of a substantial increase in an already significant shortfall projection. Currently, 11.2% of the street network is in 'Poor' to 'Very Poor' condition. This is likely to increase to 19.9% in five years if current funding levels continue. This conclusion is noteworthy to the City Council. Many of the City's streets are in failed conditions, and this will continue to get worse unless increased funding is allocated for street maintenance and rehabilitation. The City should seek to increase funding for street maintenance.

One strategy to increase funding for street maintenance may be to implement a local fee dedicated solely to street maintenance and rehabilitation, such as a Transportation Utility Fee. A Transportation Utility Fee (sometimes known as a Street Maintenance Fee, Street User Fee, or Street Utility Fee) is a monthly fee based on use of the transportation system that is collected from residences and businesses within the City limits. The fee is based on the number of trips a particular land use generates and is collected through the City's regular utility bill. Adjustments can also be made for certain business types based on the nature of the traffic they create. The fee is designated for use in the maintenance and repair of the City's transportation system. Users of the street system share the costs of the rehabilitative and preventive maintenance needed to keep the street system operating at an adequate level.

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As demonstrated in the different scenarios, the City needs to invest a significant amount of money on expensive rehabilitation and reconstruction projects. This will reduce the deferred maintenance backlog, increase the network PCI, and allow money to be spent for less capital-intensive treatments such as crack sealing and thin overlays in the future.

Preparation of a budget options report is just one step in using the MTC PMP to build an effective street maintenance program. Recommendations for further steps are:

- Obtain detailed subsurface information on selected sections before major rehabilitation projects are contracted. Costs for large rehabilitation projects are extremely variable and estimates can sometimes be reduced following project-level engineering analysis. It is possible that only a portion of a street recommended for reconstruction actually requires such heavy-duty repair.
- Evaluate the specific treatments and costs recommended by the PMP, and modify them to reflect the actual repairs and unit costs that are expected to be used.
- Test other budget options with varying revenues and preventive maintenance and rehabilitation splits.

In addition to performing cyclic pavement condition inspections, unit cost information for the applications of various maintenance and rehabilitation treatments should be updated annually in the PMP 'Decision Tree Module'. If this data is not kept current, the City runs the risk of understating actual funding requirements to adequately maintain the street network. A pavement inspection cycle that would allow for the inspection of arterial and collector streets every two years and residential streets every three to four years is recommended.

The City has completed the foundation work necessary to execute a successful pavement management plan. At the current investment level, the overall street condition will likely decline, and the deferred maintenance backlog will likely increase as more streets fall into 'Poor' and 'Very Poor' condition. To reduce the deferred maintenance backlog, additional revenues and support from various decision-making bodies are required.

As more 'Fair' streets deteriorate into the 'Poor' and 'Very Poor' categories, the cost of deferred maintenance will continue to increase. The cost of the deferred maintenance backlog will stop increasing only when enough funds are provided to prevent streets from deteriorating into a worse condition category, or when the whole network falls into the 'Very Poor' category (i.e. cannot deteriorate any further). At that time, the network would have to be replaced at a cost of \$3.0 million.

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## **Appendix A**

### Definitions

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The *Pavement Condition Index*, or PCI, is a measurement of the health of the pavement network or condition and ranges from 0 to 100. A newly constructed street would have a PCI of 100, while a failed street would have a PCI of 10 or less. The PCI is calculated based on pavement distresses identified in the field.

*Network* is defined as a complete inventory of all streets and other pavement facilities in which the City has jurisdiction and maintenance responsibilities. To facilitate the management of streets, they are subdivided into management sections identified as a segment of street, which has the same characteristics.

*Urban Arterial street* system carries the major portion of trips entering and leaving the urban area, as well as the majority of through movements desiring to bypass the central City. In addition, significant intra-area-travel such as between central business districts and outlying residential areas exists.

*Urban Collector Street* provides land access service and traffic circulation within residential neighborhoods, commercial, and industrial areas. It differs from the arterial system in that facilities on a collector system may penetrate residential neighborhoods.

*Urban Local Street* system comprises all facilities not one of the higher systems. It serves primarily to provide direct access to abutting land and access to the higher systems.

*Preventive Maintenance* refers to repairs applied while the pavement is in “good” condition. Such repairs extend the life of the pavement at relatively low costs, and prevent the pavement from deteriorating into conditions requiring more expensive treatments. Preventive maintenance treatments include slurry seals, crack sealing, and deep patching. Treatments of this sort are applied before pavement deterioration has become severe and usually cost less than \$3.00/sq. yd.

*Deferred Maintenance* refers to the dollar amount of maintenance and rehabilitation work that should have been completed to maintain the street in “good” condition, but had to be deferred due to funding deficiencies for preventative maintenance and/or pavement rehabilitation programs. The actual repairs that are being deferred are often referred to as a “backlog.”

*Stop Gap* refers to the dollar amount of repairs applied to maintain the pavement in a serviceable condition (e.g. pothole patching). These repairs are a temporary measure to stop resident complaints, and do not extend the pavement life. Stopgap repairs are directly proportional to the amount of deferred maintenance.

*Surface Types* – AC is an Asphalt Concrete street that has one year’s asphalt, for example a street that has been newly constructed or reconstructed. In contrast AC/AC (in reports marked as O – AC/AC) is a street that has an overlay treatment over the original asphalt construction. Streets marked as ST do not have an asphalt concrete layer, only a surface composed of layers of oil and rock (macadam or chip seal). Portland Concrete Cement streets (PCC) are a mix of Portland cement, coarse aggregate, and sand.

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*'Good' Condition Category*

Streets in 'Good' condition have no to little distresses found on them. These streets may have some minor surface weathering or light cracking, but can generally be maintained with cost-effective preventative maintenance treatments (surface seals and crack seals).



Pavement is stable. New or lightly worn appearance. Minor cracking may be present, but cracks are generally less than ¼" wide or are well sealed. May have sporadic cracking in the wheel paths with no or only a few interconnecting cracks and no spalling or pumping. Minor patching and possibly some minor deformation evident. Good riding qualities. Rutting may be present but is generally less than ½".



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*'Fair' Condition Category*

Streets in 'Fair' condition show some form of distress caused by traffic load related activity or environmental distress that requires more than a life-extending treatment. The MTC Streetsaver program separates these into two condition categories for the purposes of the analysis. Category II – 'non-load' and Category III – 'load-related', based on whether a majority of the distresses found had load or environmental related causes



Pavement structure is generally stable with only minor areas of structural weakness or pavement deterioration evident. Cracks, if present, have widths generally less than ¾". Wheel paths may have widespread, but not continuous, cracking with no or only a few interconnecting cracks and no spalling or pumping. Interconnected cracks forming complete patterns, or with spalling, are very small localized areas and are not representative of the rest of the section. The pavement may be patched but not excessively. Rutting may be present but is less than ¾".



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*'Poor' Condition Category*

Streets in 'Poor' condition are near the end of their service lives and often exhibit major forms of distress such as potholes, extensive alligator cracking, and/or pavement depressions.

Areas of instability, structural deficiency, or advanced pavement deterioration present in small areas (generally <10% of total pavement area). Continuous, interconnected cracking often present (mostly in wheel paths). Wheel paths may have widespread, and continuous, cracking with some interconnecting cracks and/or spalling (none or isolated areas of pumping). Medium severity patches. Deformation is somewhat noticeable.



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*'Very Poor' Condition Category*

Streets in the 'Very Poor' condition category indicate that the street has failed. These pavements are at the end of their service lives and have major distresses, often indicating the failure of the sub base

Areas of instability, structural deficiency, or advanced pavement deterioration are frequent. Large crack patterns

(alligatoring), heavy and numerous patches, potholes, or deformation is very noticeable. Riding qualities range from acceptable to poor. Rutting, if present, is generally greater than 3/4".



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*Load related distress* - Load related distresses, such as alligator cracking, rutting, and depressions are usually a sign of a sub-base issue, caused by repeated traffic loads.

*Non-load related distress* - Non-load (or environmental), distresses typically have environmental causes related to the pavement becoming older and less elastic (brittle). Typical non-load distresses are longitudinal or transverse cracking, block cracking, and surface weathering and raveling.

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## **Appendix B**

Network Summary Statistics

Network Replacement Cost

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# Network Summary Statistics

Printed: 03/05/2019

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	Total Sections	Total Center Miles	Total Lane Miles	PCI
Collector	7	0.42	0.83	69
Residential/Local	28	1.77	3.54	73
Total	35	2.19	4.38	
Overall Network PCI as of 3/5/2019:				72

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Functional Class	Surface Type	Lane Miles	Unit Cost/ Square Foot	Pavement Area/ Square Feet	Cost To Replace (in thousands)
Collector	AC	0.8	\$9.61	51,156	\$491
Residential/Local	AC	2.0	\$9.61	143,842	\$1,382
	AC/AC	1.5	\$9.61	113,044	\$1,086
	Grand Total:	4.4		308,042	\$2,959

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## **Appendix C**

### Decision Tree

# Decision Tree

Printed: 03/05/2019

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	SEAL CRACKS	\$1.08	4				
			Surface Treatment	SLURRY & CRACK SEAL	\$2.35		7			
			Restoration Treatment	MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	\$16.30			3		
				II - Good, Non-Load Related		SLURRY & CRACK SEAL	\$2.35		7	
				III - Good, Load Related		THIN AC OVERLAY(1.5 INCHES)	\$11.15			
				IV - Poor		MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	\$16.30			
				V - Very Poor		FULL DEPTH RECLAMATION	\$86.45			
		AC/AC	I - Very Good	Crack Treatment	Crack Treatment	SEAL CRACKS	\$1.08	4		
					Surface Treatment	SLURRY & CRACK SEAL	\$2.35		7	
					Restoration Treatment	MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	\$16.30			3
				II - Good, Non-Load Related		SLURRY & CRACK SEAL	\$2.35		7	
				III - Good, Load Related		THIN AC OVERLAY(1.5 INCHES)	\$11.15			
				IV - Poor		MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	\$16.30			
				V - Very Poor		FULL DEPTH RECLAMATION	\$86.45			
AC/PCC	I - Very Good			Crack Treatment	Crack Treatment	SEAL CRACKS	\$1.08	4		
					Surface Treatment	SINGLE CHIP SEAL	\$0.74		7	
					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)	\$11.38			

 Functional Class and Surface combination not used

# Decision Tree

Printed: 03/05/2019

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	SEAL CRACKS	\$1.08	4		
			Surface Treatment	SLURRY & CRACK SEAL	\$2.35		8	
			Restoration Treatment	MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	\$16.30			3
		II - Good, Non-Load Related	SLURRY & CRACK SEAL	\$2.35		8		
		III - Good, Load Related	THIN AC OVERLAY(1.5 INCHES)	\$11.15				
	IV - Poor	MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	\$16.30					
	V - Very Poor	FULL DEPTH RECLAMATION	\$86.45					
	AC/AC	I - Very Good	Crack Treatment	SEAL CRACKS	\$1.08	4		
			Surface Treatment	SLURRY & CRACK SEAL	\$2.35		8	
			Restoration Treatment	MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	\$16.30			3
II - Good, Non-Load Related		SLURRY & CRACK SEAL	\$2.35		8			
III - Good, Load Related		THIN AC OVERLAY(1.5 INCHES)	\$11.15					
IV - Poor		MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	\$16.30					
V - Very Poor		FULL DEPTH RECLAMATION	\$86.45					
AC/PCC	I - Very Good	Crack Treatment	SEAL CRACKS	\$1.08	4			
		Surface Treatment	SINGLE CHIP SEAL	\$0.74		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)	\$8.25					

 Functional Class and Surface combination not used

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## **Appendix D**

### Scenario Analysis Reports

# Scenarios - Network Condition Summary

Interest: 3%

Inflation: 3%

Printed: 03/05/2019

Scenario: (1) Unconstrained Needs

Year	Budget	PM	Year	Budget	PM	Year	Budget	PM
2019	\$78,996	0%	2021	\$0	5%	2023	\$181,203	0%
2020	\$27,969	0%	2022	\$154,294	0%			

## Projected Network Average PCI by year

Year	Never Treated	With Selected Treatment	Treated Centerline Miles	Treated Lane Miles
2019	71	79	1.62	3.25
2020	70	79	0.22	0.44
2021	68	77	0	0
2022	66	80	0.12	0.25
2023	64	84	1.62	3.24

## Percent Network Area by Functional Class and Condition Category

Condition in base year 2019, prior to applying treatments.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	8.6%	56.3%	0.0%	65.0%
II / III	0.0%	6.1%	17.8%	0.0%	23.9%
IV	0.0%	1.9%	9.3%	0.0%	11.2%
Total	0.0%	16.6%	83.4%	0.0%	100.0%

Condition in year 2019 after schedulable treatments applied.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	12.7%	69.2%	0.0%	82.0%
II / III	0.0%	3.9%	4.9%	0.0%	8.8%
IV	0.0%	0.0%	9.3%	0.0%	9.3%
Total	0.0%	16.6%	83.4%	0.0%	100.0%

Condition in year 2023 after schedulable treatments applied.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	14.4%	80.4%	0.0%	94.8%
II / III	0.0%	2.2%	3.0%	0.0%	5.2%
Total	0.0%	16.6%	83.4%	0.0%	100.0%

Interest: 3.00%

Inflation: 3.00%

Printed: 03/05/2019

Scenario: (1) Unconstrained Needs

Year	PM	Budget	Rehabilitation	Preventative Maintenance	Surplus PM	Deferred	Stop Gap		
2019	0%	\$78,996	II	\$6,497	Non-Project	\$46,712	\$0	Funded	\$0
			III	\$0				Unmet	\$0
			IV	\$10,559	Project	\$11,019			
			V	\$0					
			Total	\$17,056					
Project	\$0								
2020	0%	\$27,969	II	\$4,801	Non-Project	\$924	\$0	Funded	\$0
			III	\$0				Unmet	\$0
			IV	\$22,244	Project	\$0			
			V	\$0					
			Total	\$27,045					
Project	\$0								
2021	5%	\$0	II	\$0	Non-Project	\$0	\$0	Funded	\$0
			III	\$0				Unmet	\$0
			IV	\$0	Project	\$0			
			V	\$0					
			Total	\$0					
Project	\$0								
2022	0%	\$154,294	II	\$0	Non-Project	\$0	\$0	Funded	\$0
			III	\$0				Unmet	\$0
			IV	\$8,186	Project	\$0			
			V	\$146,108					
			Total	\$154,294					
Project	\$0								
2023	0%	\$181,203	II	\$0	Non-Project	\$663	\$0	Funded	\$0
			III	\$0				Unmet	\$0
			IV	\$22,378	Project	\$158,167			
			V	\$0					
			Total	\$22,378					
Project	\$0								

<b>Summary</b>				
Functional Class	Rehabilitation	Prev. Maint.	Funded Stop Gap	Unmet Stop Gap
Collector	\$32,803	\$8,843	\$0	\$0
Residential/Local	\$187,970	\$208,642	\$0	\$0
<b>Grand Total:</b>	<b>\$220,773</b>	<b>\$217,485</b>	<b>\$0</b>	<b>\$0</b>

# Scenarios - Network Condition Summary

Interest: 3%

Inflation: 3%

Printed: 03/05/2019

Scenario: (2) Current Funding (\$6k per year)

Year	Budget	PM	Year	Budget	PM	Year	Budget	PM
2019	\$5,486	0%	2021	\$5,843	0%	2023	\$7,500	5%
2020	\$5,675	0%	2022	\$5,529	0%			

## Projected Network Average PCI by year

Year	Never Treated	With Selected Treatment	Treated Centerline Miles	Treated Lane Miles
2019	71	72	0.16	0.32
2020	70	71	0.12	0.24
2021	68	70	0.16	0.32
2022	66	68	0.09	0.18
2023	64	67	0.27	0.54

## Percent Network Area by Functional Class and Condition Category

Condition in base year 2019, prior to applying treatments.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	8.6%	56.3%	0.0%	65.0%
II / III	0.0%	6.1%	17.8%	0.0%	23.9%
IV	0.0%	1.9%	9.3%	0.0%	11.2%
Total	0.0%	16.6%	83.4%	0.0%	100.0%

Condition in year 2019 after schedulable treatments applied.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	10.8%	60.9%	0.0%	71.8%
II / III	0.0%	3.9%	13.2%	0.0%	17.1%
IV	0.0%	1.9%	9.3%	0.0%	11.2%
Total	0.0%	16.6%	83.4%	0.0%	100.0%

Condition in year 2023 after schedulable treatments applied.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	8.6%	64.4%	0.0%	73.0%
II / III	0.0%	2.2%	4.8%	0.0%	7.0%
IV	0.0%	5.8%	9.7%	0.0%	15.4%
V	0.0%	0.0%	4.5%	0.0%	4.5%
Total	0.0%	16.6%	83.4%	0.0%	100.0%

Interest: 3.00%

Inflation: 3.00%

Printed: 03/05/2019

Scenario: (2) Current Funding (\$6k per year)

Year	PM	Budget	Rehabilitation	Preventative Maintenance	Surplus PM	Deferred	Stop Gap		
2019	0%	\$5,486	II	\$5,486	Non-Project	\$0	\$149,118	Funded \$0	
			III	\$0	Project	\$0		Unmet \$1,523	
			IV	\$0					
			V	\$0					
			Total	\$5,486					
			Project	\$0					
2020	0%	\$5,675	II	\$4,801	Non-Project	\$874	\$0	\$160,669	Funded \$0
			III	\$0	Project	\$0		Unmet \$0	
			IV	\$0					
			V	\$0					
			Total	\$4,801					
			Project	\$0					
2021	0%	\$5,843	II	\$2,950	Non-Project	\$2,893	\$0	\$159,647	Funded \$0
			III	\$0	Project	\$0		Unmet \$0	
			IV	\$0					
			V	\$0					
			Total	\$2,950					
			Project	\$0					
2022	0%	\$5,529	II	\$1,935	Non-Project	\$3,594	\$0	\$280,054	Funded \$0
			III	\$0	Project	\$0		Unmet \$0	
			IV	\$0					
			V	\$0					
			Total	\$1,935					
			Project	\$0					
2023	5%	\$7,500	II	\$5,951	Non-Project	\$940	\$0	\$288,716	Funded \$0
			III	\$0	Project	\$0		Unmet \$0	
			IV	\$0					
			V	\$0					
			Total	\$5,951					
			Project	\$0					

Summary				
Functional Class	Rehabilitation	Prev. Maint.	Funded Stop Gap	Unmet Stop Gap
Collector	\$7,721	\$0	\$0	\$302
Residential/Local	\$13,402	\$8,301	\$0	\$1,221
<b>Grand Total:</b>	<b>\$21,123</b>	<b>\$8,301</b>	<b>\$0</b>	<b>\$1,523</b>

# Scenarios - Network Condition Summary

Interest: 3%

Inflation: 3%

Printed: 03/05/2019

Scenario: (3) Maintain Current PCI

Year	Budget	PM	Year	Budget	PM	Year	Budget	PM
2019	\$10,534	\$10,534	2021	\$19,183	\$12,592	2023	\$0	\$0
2020	\$15,419	\$13,189	2022	\$39,206	\$12,568			

## Projected Network Average PCI by year

Year	Never Treated	With Selected Treatment	Treated Centerline Miles	Treated Lane Miles
2019	71	72	0.28	0.55
2020	70	72	0.37	0.74
2021	68	72	0.43	0.85
2022	66	74	0.53	1.07
2023	64	72	0	0

## Percent Network Area by Functional Class and Condition Category

Condition in base year 2019, prior to applying treatments.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	8.6%	56.3%	0.0%	65.0%
II / III	0.0%	6.1%	17.8%	0.0%	23.9%
IV	0.0%	1.9%	9.3%	0.0%	11.2%
Total	0.0%	16.6%	83.4%	0.0%	100.0%

Condition in year 2019 after schedulable treatments applied.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	8.6%	56.3%	0.0%	65.0%
II / III	0.0%	6.1%	17.8%	0.0%	23.9%
IV	0.0%	1.9%	9.3%	0.0%	11.2%
Total	0.0%	16.6%	83.4%	0.0%	100.0%

Condition in year 2023 after schedulable treatments applied.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	12.5%	64.4%	0.0%	76.9%
II / III	0.0%	2.2%	4.8%	0.0%	7.0%
IV	0.0%	1.9%	9.7%	0.0%	11.5%
V	0.0%	0.0%	4.5%	0.0%	4.5%
Total	0.0%	16.6%	83.4%	0.0%	100.0%

Interest: 3.00%

Inflation: 3.00%

Printed: 03/05/2019

Scenario: (3) Maintain Current PCI

Year	PM	Budget	Rehabilitation		Preventative Maintenance	Surplus PM	Deferred	Stop Gap		
2019	\$10,534	\$10,534	II	\$0	Non-Project	\$10,534	\$0	\$144,071	Funded	\$0
			III	\$0					Unmet	\$1,826
			IV	\$0	Project	\$0				
			V	\$0						
			Total	\$0						
			Project	\$0						
2020	\$13,189	\$15,419	II	\$2,230	Non-Project	\$13,189	\$0	\$145,728	Funded	\$0
			III	\$0					Unmet	\$266
			IV	\$0	Project	\$0				
			V	\$0						
			Total	\$2,230						
			Project	\$0						
2021	\$12,592	\$19,183	II	\$6,591	Non-Project	\$12,592	\$0	\$130,921	Funded	\$0
			III	\$0					Unmet	\$0
			IV	\$0	Project	\$0				
			V	\$0						
			Total	\$6,591						
			Project	\$0						
2022	\$12,568	\$39,206	II	\$3,039	Non-Project	\$12,568	\$0	\$216,792	Funded	\$0
			III	\$0					Unmet	\$0
			IV	\$23,599	Project	\$0				
			V	\$0						
			Total	\$26,638						
			Project	\$0						
2023	\$0	\$0	II	\$0	Non-Project	\$0	\$0	\$230,481	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	\$23,599	\$7,414	\$0	\$400
Residential/Local	\$11,860	\$41,469	\$0	\$1,692
<b>Grand Total:</b>	<b>\$35,459</b>	<b>\$48,883</b>	<b>\$0</b>	<b>\$2,092</b>

# Scenarios - Network Condition Summary

Interest: 3%

Inflation: 3%

Printed: 03/05/2019

Scenario: (4) Increase PCI 5 points (to 77)

Year	Budget	PM	Year	Budget	PM	Year	Budget	PM
2019	\$19,455	\$17,290	2021	\$45,889	\$8,826	2023	\$0	\$0
2020	\$28,133	\$21,734	2022	\$155,274	\$980			

## Projected Network Average PCI by year

Year	Never Treated	With Selected Treatment	Treated Centerline Miles	Treated Lane Miles
2019	71	73	0.50	0.99
2020	70	74	0.68	1.37
2021	68	77	0.48	0.96
2022	66	79	0.14	0.29
2023	64	77	0	0

## Percent Network Area by Functional Class and Condition Category

Condition in base year 2019, prior to applying treatments.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	8.6%	56.3%	0.0%	65.0%
II / III	0.0%	6.1%	17.8%	0.0%	23.9%
IV	0.0%	1.9%	9.3%	0.0%	11.2%
Total	0.0%	16.6%	83.4%	0.0%	100.0%

Condition in year 2019 after schedulable treatments applied.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	8.6%	59.0%	0.0%	67.7%
II / III	0.0%	6.1%	15.1%	0.0%	21.2%
IV	0.0%	1.9%	9.3%	0.0%	11.2%
Total	0.0%	16.6%	83.4%	0.0%	100.0%

Condition in year 2023 after schedulable treatments applied.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	0.0%	14.4%	70.3%	0.0%	84.7%
II / III	0.0%	2.2%	4.8%	0.0%	7.0%
IV	0.0%	0.0%	8.3%	0.0%	8.3%
Total	0.0%	16.6%	83.4%	0.0%	100.0%

Interest: 3.00%

Inflation: 3.00%

Printed: 03/05/2019

Scenario: (4) Increase PCI 5 points (to 77)

Year	PM	Budget	Rehabilitation	Preventative Maintenance	Surplus PM	Deferred	Stop Gap		
2019	\$17,290	\$19,455	II	\$2,165	Non-Project	\$17,290	\$0	Funded	\$0
			III	\$0				Unmet	\$1,706
			IV	\$0	Project	\$0			
			V	\$0					
			Total	\$2,165					
			Project	\$0					
2020	\$21,734	\$28,133	II	\$6,399	Non-Project	\$21,734	\$0	Funded	\$0
			III	\$0				Unmet	\$0
			IV	\$0	Project	\$0			
			V	\$0					
			Total	\$6,399					
			Project	\$0					
2021	\$8,826	\$45,889	II	\$2,950	Non-Project	\$8,826	\$0	Funded	\$0
			III	\$0				Unmet	\$0
			IV	\$34,113	Project	\$0			
			V	\$0					
			Total	\$37,063					
			Project	\$0					
2022	\$980	\$155,274	II	\$0	Non-Project	\$980	\$0	Funded	\$0
			III	\$0				Unmet	\$0
			IV	\$8,186	Project	\$0			
			V	\$146,108					
			Total	\$154,294					
			Project	\$0					
2023	\$0	\$0	II	\$0	Non-Project	\$0	\$0	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	\$34,113	\$7,100	\$0	\$400
Residential/Local	\$165,808	\$41,730	\$0	\$1,307
<b>Grand Total:</b>	<b>\$199,921</b>	<b>\$48,830</b>	<b>\$0</b>	<b>\$1,706</b>

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## **Appendix E**

### Section PCI/RSL Listing Report

Street ID	Section ID	Street Name	From	To	Length	Width	Area	Functional Class	Surface Type	Current PCI	Remaining Life
BLAKEC	010	BLAKE CT.	MATTHIEU ST.	CUL-DE-SAC	464	30	13,920	R - Residential/Local	A - AC	34	3.02
CHANCT	010	CHANTAL CT.	KALYCA ST.	CUL-DE-SAC	399	29	11,571	R - Residential/Local	A - AC	81	30.31
CHANTA	010	CHANTAL ST.	REES CT.	KALYCA ST.	799	29	23,171	R - Residential/Local	A - AC	81	30.31
CONEST	010	CONE ST.	ERNST ST.	BUTTEVILLE RD.	237	34	8,058	C - Collector	A - AC	78	16.01
CONEST	020	CONE ST.	BUTTEVILLE RD.	CRISELL ST.	308	22	6,776	C - Collector	A - AC	67	10.85
CONEST	030	CONE ST.	CRISELL ST.	FELLER ST.	292	22	6,424	C - Collector	A - AC	80	15.6
CONEST	040	CONE ST.	FELLER ST.	WILLIAMS ST.	290	22	6,380	C - Collector	A - AC	85	18
CRISEL	010	CRISELL ST.	CONE ST.	MAIN ST.	484	22	10,648	R - Residential/Local	O - AC/AC	68	21.65
CRISEL	020	CRISELL ST.	MAIN ST.	OAK ST.	229	24	5,496	R - Residential/Local	O - AC/AC	60	15.41
EHLENS	010	EHLEN ST.	MAIN ST.	OAK ST.	268	25	6,700	R - Residential/Local	O - AC/AC	84	32.19
EHLENS	020	EHLEN ST.	OAK ST.	REES ST.	227	24	5,448	R - Residential/Local	O - AC/AC	84	32.19
EHLENS	030	EHLEN ST.	REES ST.	N. DEAD END	268	24	6,432	R - Residential/Local	O - AC/AC	89	44.93
ERNSTS	010	ERNST ST.	S. DEAD END	DEAD END N. OF CONE ST.	525	34	17,850	R - Residential/Local	O - AC/AC	72	24.71
FELLER	010	FELLER ST.	CONE ST.	MAIN ST.	486	29	14,094	R - Residential/Local	O - AC/AC	81	30.09
FELLER	020	FELLER ST.	MAIN ST.	OAK ST.	226	30	6,780	R - Residential/Local	O - AC/AC	73	27.67
HUCKLE	010	HUCKLEBERRY LN.	100 FT N. OF SCARLET CT.	REES ST.	101	29	2,929	R - Residential/Local	A - AC	79	27.84
KALYCA	010	KALYCA ST.	REES ST.	CHANTAL CT.	215	29	6,235	R - Residential/Local	A - AC	81	30.31
KALYCA	020	KALYCA ST.	CHANTAL ST.	N. BARRICADE	112	29	3,248	R - Residential/Local	A - AC	85	36.09
MATTHI	010	MATTHIEU ST.	BEG. OF PAVEMENT	BLAKE CT.	665	22	14,630	R - Residential/Local	A - AC	40	5.21
MATTHI	020	MATTHIEU ST.	BLAKE CT.	MAIN ST.	542	22	11,924	C - Collector	A - AC	54	6.37
MATTHI	030	MATTHIEU ST.	MAIN ST.	OAK ST.	262	22	5,764	C - Collector	A - AC	80	15.6
MATTHI	040	MATTHIEU ST.	OAK ST.	REES ST.	265	22	5,830	C - Collector	A - AC	50	5.5
OAKST	010	OAK ST.	BUTTEVILLE RD.	CRISELL ST.	346	27	9,342	R - Residential/Local	O - AC/AC	62	17.36
OAKST	020	OAK ST.	CRISELL ST.	FELLER ST.	307	27	8,289	R - Residential/Local	O - AC/AC	68	23.51
OAKST	030	OAK ST.	FELLER ST.	104 FT W. OF WILLIAMS	220	27	5,940	R - Residential/Local	O - AC/AC	66	21.75
OAKST	040	OAK ST.	104 FT W. OF WILLIAMS ST.	WILLIAMS ST.	104	33	3,432	R - Residential/Local	O - AC/AC	93	37.45
OAKST	050	OAK ST.	MATTHIEU ST.	EHLEN ST.	255	22	5,610	R - Residential/Local	A - AC	82	27.28
REESST	060	REES CT.	CHANTAL ST.	E. BARRICADE	125	29	3,625	R - Residential/Local	A - AC	83	33.04
REESST	010	REES ST.	MATTHIEU ST.	EHLEN ST.	188	22	4,136	R - Residential/Local	A - AC	56	12.55
REESST	020	REES ST.	EHLEN ST.	230 FT W. OF KALYCA ST.	764	26	19,864	R - Residential/Local	A - AC	83	33.04

Street ID	Section ID	Street Name	From	To	Length	Width	Area	Functional Class	Surface Type	Current PCI	Remaining Life
REESST	030	REES ST.	230 FT W. OF KALYCA ST.	KALYCA ST.	230	29	6,670	R - Residential/Local	A - AC	79	27.84
REESST	040	REES ST.	KALYCA ST.	HUCKLEBERRY LN.	235	29	6,815	R - Residential/Local	A - AC	83	33.04
REESST	050	REES ST.	HUCKLEBERRY LN.	CHANTAL ST.	360	29	10,440	R - Residential/Local	A - AC	80	29.04
WILLIA	010	WILLIAMS ST.	CONE ST.	MAIN ST.	499	22	10,978	R - Residential/Local	A - AC	59	12.98
WILLIA	020	WILLIAMS ST.	MAIN ST.	OAK ST.	257	49	12,593	R - Residential/Local	O - AC/AC	90	48.87

Total Section Length:	11,554
Total Section Area:	308,042

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## **Appendix F**

### Scenarios -Sections Selected for Treatment

*Scenario 1 - Unconstrained Needs*

*Scenario 2 - Current Budget Scenario*

*Scenario 3 - Maintain Current PCI*

*Scenario 4 - Increase PCI 5 points*

# Scenarios - Sections Selected for Treatment

Interest: 3.00%

Inflation: 3.00%

Printed: 03/05/2019

Scenario: (1) Unconstrained Needs

Year	Budget	PM	Year	Budget	PM	Year	Budget	PM
2019	\$78,996	0%	2021	\$0	5%	2023	\$181,203	0%
2020	\$27,969	0%	2022	\$154,294	0%			

## Year: 2019

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment		
												PCI Before	PCI After					
CHANTAL CT.	KALYCA ST.	CUL-DE-SAC	CHANCT	010	399	29	11,571	R	AC		80	80	88	\$3,022	56,987	SLURRY & CRACK SEAL		
CHANTAL ST.	REES CT.	KALYCA ST.	CHANTA	010	799	29	23,171	R	AC		80	80	88	\$6,051	56,987	SLURRY & CRACK SEAL		
CONE ST.	ERNST ST.	BUTTEVILLE RD.	CONEST	010	237	34	8,058	C	AC		77	77	85	\$2,105	59,489	SLURRY & CRACK SEAL		
**CONE ST.	BUTTEVILLE RD.	CRISELL ST.	CONEST	020	308	22	6,776	C	AC		66	65	75	\$1,770	44,623	SLURRY & CRACK SEAL		
CONE ST.	CRISELL ST.	FELLER ST.	CONEST	030	292	22	6,424	C	AC		79	78	86	\$1,678	50,388	SLURRY & CRACK SEAL		
CONE ST.	FELLER ST.	WILLIAMS ST.	CONEST	040	290	22	6,380	C	AC		84	84	90	\$1,666	49,745	SLURRY & CRACK SEAL		
CRISELL ST.	CONE ST.	MAIN ST.	CRISEL	010	484	22	10,648	R	AC/AC		67	67	76	\$2,781	49,122	SLURRY & CRACK SEAL		
EHLEN ST.	MAIN ST.	OAK ST.	EHLENS	010	268	25	6,700	R	AC/AC		83	83	90	\$1,750	39,216	SLURRY & CRACK SEAL		
EHLEN ST.	OAK ST.	REES ST.	EHLENS	020	227	24	5,448	R	AC/AC		83	83	90	\$1,423	39,216	SLURRY & CRACK SEAL		
EHLEN ST.	REES ST.	N. DEAD END	EHLENS	030	268	24	6,432	R	AC/AC		88	88	94	\$1,680	47,599	SLURRY & CRACK SEAL		
FELLER ST.	CONE ST.	MAIN ST.	FELLER	010	486	29	14,094	R	AC/AC		80	80	87	\$3,681	44,045	SLURRY & CRACK SEAL		
FELLER ST.	MAIN ST.	OAK ST.	FELLER	020	226	30	6,780	R	AC/AC		72	72	81	\$1,771	60,796	SLURRY & CRACK SEAL		
HUCKLEBERRY LN.	100 FT N. OF SCARLET CT.	REES ST.	HUCKLE	010	101	29	2,929	R	AC		78	78	86	\$765	53,876	SLURRY & CRACK SEAL		
KALYCA ST.	REES ST.	CHANTAL CT.	KALYCA	010	215	29	6,235	R	AC		80	80	88	\$1,629	56,987	SLURRY & CRACK SEAL		
KALYCA ST.	CHANTAL ST.	N. BARRICADE	KALYCA	020	112	29	3,248	R	AC		84	84	91	\$849	63,105	SLURRY & CRACK SEAL		
MATTHIEU ST.	MAIN ST.	OAK ST.	MATTHI	030	262	22	5,764	C	AC		79	78	86	\$1,506	50,388	SLURRY & CRACK SEAL		
**OAK ST.	BUTTEVILLE RD.	CRISELL ST.	OAKST	010	346	27	9,342	R	AC/AC		61	61	71	\$2,440	45,381	SLURRY & CRACK SEAL		
OAK ST.	CRISELL ST.	FELLER ST.	OAKST	020	307	27	8,289	R	AC/AC		67	67	76	\$2,165	57,361	SLURRY & CRACK SEAL		
OAK ST.	FELLER ST.	104 FT W. OF WILLIAMS	OAKST	030	220	27	5,940	R	AC/AC		65	65	75	\$1,551	54,769	SLURRY & CRACK SEAL		
OAK ST.	MATTHIEU ST.	EHLEN ST.	OAKST	050	255	22	5,610	R	AC		81	81	88	\$1,465	40,588	SLURRY & CRACK SEAL		
REES ST.	EHLEN ST.	230 FT W. OF KALYCA ST.	REESST	020	764	26	19,864	R	AC		82	82	89	\$5,187	60,004	SLURRY & CRACK SEAL		
REES ST.	230 FT W. OF KALYCA ST.	KALYCA ST.	REESST	030	230	29	6,670	R	AC		78	78	86	\$1,742	53,876	SLURRY & CRACK SEAL		
REES ST.	KALYCA ST.	HUCKLEBERRY LN.	REESST	040	235	29	6,815	R	AC		82	82	89	\$1,780	60,004	SLURRY & CRACK SEAL		
REES ST.	HUCKLEBERRY LN.	CHANTAL ST.	REESST	050	360	29	10,440	R	AC		79	79	87	\$2,726	55,438	SLURRY & CRACK SEAL		
REES CT.	CHANTAL ST.	E. BARRICADE	REESST	060	125	29	3,625	R	AC		82	82	89	\$947	60,004	SLURRY & CRACK SEAL		
WILLIAMS ST.	MAIN ST.	OAK ST.	WILLIA	020	257	49	12,593	R	AC/AC		89	89	94	\$3,289	51,905	SLURRY & CRACK SEAL		
												<b>Treatment Total</b>		<b>\$57,419</b>				
MATTHIEU ST.	OAK ST.	REES ST.	MATTHI	040	265	22	5,830	C	AC		49	48	100	\$10,559	31,583	MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS		

\*\* - Treatment from Project Selection

Scenarios Criteria:

# Scenarios - Sections Selected for Treatment

Interest: 3.00%

Inflation: 3.00%

Printed: 03/05/2019

Scenario: (1) Unconstrained Needs

											Treatment Total			\$10,559			
**CRISELL ST.	MAIN ST.	OAK ST.	CRISEL	020	229	24	5,496	R	AC/AC		59	59	100	\$6,809	34,456	THIN AC OVERLAY(1.5 INCHES)	
											Treatment Total			\$6,809			
					Year 2019 Area Total		231,172					Year 2019 Total			\$74,787		

## Year: 2020

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment	
												PCI Before	PCI After				
ERNST ST.	S. DEAD END	DEAD END N. OF CONE ST.	ERNSTS	010	525	34	17,850	R	AC/AC		71	69	79	\$4,801	49,485	SLURRY & CRACK SEAL	
OAK ST.	104 FT W. OF WILLIAMS ST.	WILLIAMS ST.	OAKST	040	104	33	3,432	R	AC/AC		92	89	95	\$924	18,932	SLURRY & CRACK SEAL	
											Treatment Total			\$5,725			
MATTHIEU ST.	BLAKE CT.	MAIN ST.	MATTHI	020	542	22	11,924	C	AC		53	48	100	\$22,244	30,713	MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	
											Treatment Total			\$22,244			
					Year 2020 Area Total		33,206					Year 2020 Total			\$27,969		

## Year: 2022

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment	
												PCI Before	PCI After				
BLAKE CT.	MATTHIEU ST.	CUL-DE-SAC	BLAKEC	010	464	30	13,920	R	AC		33	24	100	\$146,108	4,701	FULL DEPTH RECLAMATION	
											Treatment Total			\$146,108			
REES ST.	MATTHIEU ST.	EHLEN ST.	REESST	010	188	22	4,136	R	AC		55	48	100	\$8,186	24,431	MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	
											Treatment Total			\$8,186			
					Year 2022 Area Total		18,056					Year 2022 Total			\$154,294		

## Year: 2023

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment	
												PCI Before	PCI After				
**MATTHIEU ST.	BEG. OF PAVEMENT	BLAKE CT.	MATTHI	010	665	22	14,630	R	AC		39	27	100	\$158,167	4,555	FULL DEPTH RECLAMATION	
											Treatment Total			\$158,167			
WILLIAMS ST.	CONE ST.	MAIN ST.	WILLIA	010	499	22	10,978	R	AC		58	48	100	\$22,378	23,858	MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	
											Treatment Total			\$22,378			

\*\* - Treatment from Project Selection

Scenarios Criteria:

# Scenarios - Sections Selected for Treatment

Interest: 3.00%

Inflation: 3.00%

Printed: 03/05/2019

Scenario: (1) Unconstrained Needs

Year: 2023

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment	
												PCI Before	PCI After				
CHANTAL CT.	KALYCA ST.	CUL-DE-SAC	CHANCT	010	399	29	11,571	R	AC		80	83	85	\$35	923,666	SEAL CRACKS	
CHANTAL ST.	REES CT.	KALYCA ST.	CHANTA	010	799	29	23,171	R	AC		80	83	85	\$70	923,666	SEAL CRACKS	
CONE ST.	ERNST ST.	BUTTEVILLE RD.	CONEST	010	237	34	8,058	C	AC		77	78	80	\$34	835,571	SEAL CRACKS	
CONE ST.	CRISELL ST.	FELLER ST.	CONEST	030	292	22	6,424	C	AC		79	78	80	\$27	709,504	SEAL CRACKS	
CONE ST.	FELLER ST.	WILLIAMS ST.	CONEST	040	290	22	6,380	C	AC		84	83	84	\$20	797,188	SEAL CRACKS	
CRISELL ST.	CONE ST.	MAIN ST.	CRISEL	010	484	22	10,648	R	AC/AC		67	71	73	\$59	678,384	SEAL CRACKS	
CRISELL ST.	MAIN ST.	OAK ST.	CRISEL	020	229	24	5,496	R	AC/AC		59	87	88	\$5	1,701,049	SEAL CRACKS	
EHLEN ST.	MAIN ST.	OAK ST.	EHLENS	010	268	25	6,700	R	AC/AC		83	84	85	\$16	884,203	SEAL CRACKS	
EHLEN ST.	OAK ST.	REES ST.	EHLENS	020	227	24	5,448	R	AC/AC		83	84	85	\$13	884,203	SEAL CRACKS	
FELLER ST.	CONE ST.	MAIN ST.	FELLER	010	486	29	14,094	R	AC/AC		80	82	83	\$44	781,322	SEAL CRACKS	
FELLER ST.	MAIN ST.	OAK ST.	FELLER	020	226	30	6,780	R	AC/AC		72	77	79	\$31	891,632	SEAL CRACKS	
HUCKLEBERRY LN.	100 FT N. OF SCARLET CT.	REES ST.	HUCKLE	010	101	29	2,929	R	AC		78	81	83	\$11	847,051	SEAL CRACKS	
KALYCA ST.	REES ST.	CHANTAL CT.	KALYCA	010	215	29	6,235	R	AC		80	83	85	\$19	923,666	SEAL CRACKS	
KALYCA ST.	CHANTAL ST.	N. BARRICADE	KALYCA	020	112	29	3,248	R	AC		84	87	88	\$7	1,084,531	SEAL CRACKS	
MATTHIEU ST.	MAIN ST.	OAK ST.	MATTHI	030	262	22	5,764	C	AC		79	78	80	\$25	709,504	SEAL CRACKS	
MATTHIEU ST.	OAK ST.	REES ST.	MATTHI	040	265	22	5,830	C	AC		49	84	86	\$12	1,160,096	SEAL CRACKS	
OAK ST.	CRISELL ST.	FELLER ST.	OAKST	020	307	27	8,289	R	AC/AC		67	72	74	\$45	810,268	SEAL CRACKS	
OAK ST.	FELLER ST.	104 FT W. OF WILLIAMS	OAKST	030	220	27	5,940	R	AC/AC		65	70	73	\$34	766,411	SEAL CRACKS	
OAK ST.	MATTHIEU ST.	EHLEN ST.	OAKST	050	255	22	5,610	R	AC		81	82	83	\$19	680,306	SEAL CRACKS	
REES ST.	EHLEN ST.	230 FT W. OF KALYCA ST.	REESST	020	764	26	19,864	R	AC		82	85	86	\$51	1,010,176	SEAL CRACKS	
REES ST.	230 FT W. OF KALYCA ST.	KALYCA ST.	REESST	030	230	29	6,670	R	AC		78	81	83	\$24	847,051	SEAL CRACKS	
REES ST.	KALYCA ST.	HUCKLEBERRY LN.	REESST	040	235	29	6,815	R	AC		82	85	86	\$18	1,010,176	SEAL CRACKS	
REES ST.	HUCKLEBERRY LN.	CHANTAL ST.	REESST	050	360	29	10,440	R	AC		79	82	84	\$34	884,214	SEAL CRACKS	
REES CT.	CHANTAL ST.	E. BARRICADE	REESST	060	125	29	3,625	R	AC		82	85	86	\$10	1,010,176	SEAL CRACKS	
												<b>Treatment Total</b>		<b>\$663</b>			
<b>Year 2023 Area Total</b>										<b>221,637</b>		<b>Year 2023 Total</b>		<b>\$181,208</b>			
<b>Total Section Area:</b>										<b>504,071</b>		<b>Grand Total</b>		<b>\$438,258</b>			

\*\* - Treatment from Project Selection

Scenarios Criteria:

# Scenarios - Sections Selected for Treatment

Interest: 3.00%

Inflation: 3.00%

Printed: 03/05/2019

Scenario: (2) Current Funding (\$6k per year)

Year	Budget	PM	Year	Budget	PM	Year	Budget	PM
2019	\$5,486	0%	2021	\$5,843	0%	2023	\$7,500	5%
2020	\$5,675	0%	2022	\$5,529	0%			

## Year: 2019

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment
												PCI Before	PCI After			
CONE ST.	BUTTEVILLE RD.	CRISELL ST.	CONEST	020	308	22	6,776	C	AC		66	65	75	\$1,770	44,623	SLURRY & CRACK SEAL
OAK ST.	CRISELL ST.	FELLER ST.	OAKST	020	307	27	8,289	R	AC/AC		67	67	76	\$2,165	57,361	SLURRY & CRACK SEAL
OAK ST.	FELLER ST.	104 FT W. OF WILLIAMS	OAKST	030	220	27	5,940	R	AC/AC		65	65	75	\$1,551	54,769	SLURRY & CRACK SEAL
													<b>Treatment Total</b>	<b>\$5,486</b>		
<b>Year 2019 Area Total</b>										<b>21,005</b>	<b>Year 2019 Total</b>		<b>\$5,486</b>			

## Year: 2020

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment
												PCI Before	PCI After			
ERNST ST.	S. DEAD END	DEAD END N. OF CONE ST.	ERNSTS	010	525	34	17,850	R	AC/AC		71	69	79	\$4,801	49,485	SLURRY & CRACK SEAL
KALYCA ST.	CHANTAL ST.	N. BARRICADE	KALYCA	020	112	29	3,248	R	AC		84	83	90	\$874	62,547	SLURRY & CRACK SEAL
													<b>Treatment Total</b>	<b>\$5,675</b>		
<b>Year 2020 Area Total</b>										<b>21,098</b>	<b>Year 2020 Total</b>		<b>\$5,675</b>			

## Year: 2021

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment
												PCI Before	PCI After			
CRISELL ST.	CONE ST.	MAIN ST.	CRISEL	010	484	22	10,648	R	AC/AC		67	64	74	\$2,950	45,329	SLURRY & CRACK SEAL
REES ST.	KALYCA ST.	HUCKLEBERRY LN.	REESST	040	235	29	6,815	R	AC		82	80	88	\$1,888	57,984	SLURRY & CRACK SEAL
REES CT.	CHANTAL ST.	E. BARRICADE	REESST	060	125	29	3,625	R	AC		82	80	88	\$1,005	57,984	SLURRY & CRACK SEAL
													<b>Treatment Total</b>	<b>\$5,843</b>		
<b>Year 2021 Area Total</b>										<b>21,088</b>	<b>Year 2021 Total</b>		<b>\$5,843</b>			

## Year: 2022

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment
												PCI Before	PCI After			
FELLER ST.	MAIN ST.	OAK ST.	FELLER	020	226	30	6,780	R	AC/AC		72	68	78	\$1,935	53,517	SLURRY & CRACK SEAL
WILLIAMS ST.	MAIN ST.	OAK ST.	WILLIA	020	257	49	12,593	R	AC/AC		89	87	93	\$3,594	55,924	SLURRY & CRACK SEAL
													<b>Treatment Total</b>	<b>\$5,529</b>		
<b>Year 2022 Area Total</b>										<b>19,373</b>	<b>Year 2022 Total</b>		<b>\$5,529</b>			

\*\* - Treatment from Project Selection

Scenarios Criteria:

# Scenarios - Sections Selected for Treatment

Interest: 3.00%

Inflation: 3.00%

Printed: 03/05/2019

Scenario: (2) Current Funding (\$6k per year)

## Year: 2023

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment	
												PCI Before	PCI After				
CONE ST.	ERNST ST.	BUTTEVILLE RD.	CONEST	010	237	34	8,058	C	AC		77	68	77	\$2,369	43,502	SLURRY & CRACK SEAL	
CONE ST.	CRISELL ST.	FELLER ST.	CONEST	030	292	22	6,424	C	AC		79	69	78	\$1,888	38,824	SLURRY & CRACK SEAL	
HUCKLEBERRY LN.	100 FT N. OF SCARLET CT.	REES ST.	HUCKLE	010	101	29	2,929	R	AC		78	73	81	\$861	47,540	SLURRY & CRACK SEAL	
MATTHIEU ST.	MAIN ST.	OAK ST.	MATTHI	030	262	22	5,764	C	AC		79	69	78	\$1,694	38,824	SLURRY & CRACK SEAL	
													<b>Treatment Total</b>		<b>\$6,812</b>		
OAK ST.	CRISELL ST.	FELLER ST.	OAKST	020	307	27	8,289	R	AC/AC		67	72	74	\$45	810,268	SEAL CRACKS	
OAK ST.	FELLER ST.	104 FT W. OF WILLIAMS	OAKST	030	220	27	5,940	R	AC/AC		65	70	73	\$34	766,411	SEAL CRACKS	
													<b>Treatment Total</b>		<b>\$79</b>		
<b>Year 2023 Area Total</b>										<b>37,404</b>		<b>Year 2023 Total</b>		<b>\$6,891</b>			
<b>Total Section Area:</b>										<b>119,968</b>		<b>Grand Total</b>		<b>\$29,424</b>			

# Scenarios - Sections Selected for Treatment

Interest: 3.00%

Inflation: 3.00%

Printed: 03/05/2019

Scenario: (3) Maintain Current PCI

Year	Budget	PM	Year	Budget	PM	Year	Budget	PM
2019	\$10,534	\$10,534	2021	\$19,183	\$12,592	2023	\$0	\$0
2020	\$15,419	\$13,189	2022	\$39,206	\$12,568			

## Year: 2019

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment			
												PCI Before	PCI After						
FELLER ST.	MAIN ST.	OAK ST.	FELLER	020	226	30	6,780	R	AC/AC		72	72	81	\$1,771	60,796	SLURRY & CRACK SEAL			
KALYCA ST.	CHANTAL ST.	N. BARRICADE	KALYCA	020	112	29	3,248	R	AC		84	84	91	\$849	63,105	SLURRY & CRACK SEAL			
REES ST.	EHLEN ST.	230 FT W. OF KALYCA ST.	REESST	020	764	26	19,864	R	AC		82	82	89	\$5,187	60,004	SLURRY & CRACK SEAL			
REES ST.	KALYCA ST.	HUCKLEBERRY LN.	REESST	040	235	29	6,815	R	AC		82	82	89	\$1,780	60,004	SLURRY & CRACK SEAL			
REES CT.	CHANTAL ST.	E. BARRICADE	REESST	060	125	29	3,625	R	AC		82	82	89	\$947	60,004	SLURRY & CRACK SEAL			
													<b>Treatment Total</b>		<b>\$10,534</b>				
<b>Year 2019 Area Total</b>										<b>40,332</b>		<b>Year 2019 Total</b>		<b>\$10,534</b>					

## Year: 2020

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment			
												PCI Before	PCI After						
CHANTAL CT.	KALYCA ST.	CUL-DE-SAC	CHANCT	010	399	29	11,571	R	AC		80	79	87	\$3,112	55,853	SLURRY & CRACK SEAL			
CHANTAL ST.	REES CT.	KALYCA ST.	CHANTA	010	799	29	23,171	R	AC		80	79	87	\$6,232	55,853	SLURRY & CRACK SEAL			
CONE ST.	ERNST ST.	BUTTEVILLE RD.	CONEST	010	237	34	8,058	C	AC		77	75	83	\$2,168	55,434	SLURRY & CRACK SEAL			
KALYCA ST.	REES ST.	CHANTAL CT.	KALYCA	010	215	29	6,235	R	AC		80	79	87	\$1,677	55,853	SLURRY & CRACK SEAL			
OAK ST.	CRISELL ST.	FELLER ST.	OAKST	020	307	27	8,289	R	AC/AC		67	66	75	\$2,230	54,816	SLURRY & CRACK SEAL			
													<b>Treatment Total</b>		<b>\$15,419</b>				
<b>Year 2020 Area Total</b>										<b>57,324</b>		<b>Year 2020 Total</b>		<b>\$15,419</b>					

## Year: 2021

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment
												PCI Before	PCI After			
CONE ST.	FELLER ST.	WILLIAMS ST.	CONEST	040	290	22	6,380	C	AC		84	79	87	\$1,768	47,829	SLURRY & CRACK SEAL
EHLEN ST.	REES ST.	N. DEAD END	EHLENS	030	268	24	6,432	R	AC/AC		88	86	93	\$1,782	50,962	SLURRY & CRACK SEAL
ERNST ST.	S. DEAD END	DEAD END N. OF CONE ST.	ERNSTS	010	525	34	17,850	R	AC/AC		71	68	77	\$4,945	47,639	SLURRY & CRACK SEAL
HUCKLEBERRY LN.	100 FT N. OF SCARLET CT.	REES ST.	HUCKLE	010	101	29	2,929	R	AC		78	75	84	\$812	51,062	SLURRY & CRACK SEAL
OAK ST.	FELLER ST.	104 FT W. OF WILLIAMS	OAKST	030	220	27	5,940	R	AC/AC		65	62	72	\$1,646	50,030	SLURRY & CRACK SEAL
REES ST.	230 FT W. OF KALYCA ST.	KALYCA ST.	REESST	030	230	29	6,670	R	AC		78	75	84	\$1,848	51,062	SLURRY & CRACK SEAL

\*\* - Treatment from Project Selection

Scenarios Criteria:

# Scenarios - Sections Selected for Treatment

Interest: 3.00%

Inflation: 3.00%

Printed: 03/05/2019

Scenario: (3) Maintain Current PCI

## Year: 2021

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment
												PCI Before	PCI After			
REES ST.	HUCKLEBERRY LN.	CHANTAL ST.	REESST	050	360	29	10,440	R	AC		79	76	85	\$2,893	52,755	SLURRY & CRACK SEAL
WILLIAMS ST.	MAIN ST.	OAK ST.	WILLIA	020	257	49	12,593	R	AC/AC		89	88	93	\$3,489	55,062	SLURRY & CRACK SEAL
												<b>Treatment Total</b>	<b>\$19,183</b>			
<b>Year 2021 Area Total</b>										<b>69,234</b>	<b>Year 2021 Total</b>		<b>\$19,183</b>			

## Year: 2022

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment
												PCI Before	PCI After			
CONE ST.	CRISELL ST.	FELLER ST.	CONEST	030	292	22	6,424	C	AC		79	71	80	\$1,833	41,886	SLURRY & CRACK SEAL
CRISELL ST.	CONE ST.	MAIN ST.	CRISEL	010	484	22	10,648	R	AC/AC		67	62	72	\$3,039	43,509	SLURRY & CRACK SEAL
EHLEN ST.	MAIN ST.	OAK ST.	EHLENS	010	268	25	6,700	R	AC/AC		83	79	86	\$1,912	41,611	SLURRY & CRACK SEAL
EHLEN ST.	OAK ST.	REES ST.	EHLENS	020	227	24	5,448	R	AC/AC		83	79	86	\$1,555	41,611	SLURRY & CRACK SEAL
FELLER ST.	CONE ST.	MAIN ST.	FELLER	010	486	29	14,094	R	AC/AC		80	76	84	\$4,022	43,448	SLURRY & CRACK SEAL
MATTHIEU ST.	MAIN ST.	OAK ST.	MATTHI	030	262	22	5,764	C	AC		79	71	80	\$1,645	41,886	SLURRY & CRACK SEAL
OAK ST.	MATTHIEU ST.	EHLEN ST.	OAKST	050	255	22	5,610	R	AC		81	76	84	\$1,601	40,922	SLURRY & CRACK SEAL
												<b>Treatment Total</b>	<b>\$15,607</b>			
MATTHIEU ST.	BLAKE CT.	MAIN ST.	MATTHI	020	542	22	11,924	C	AC		53	40	100	\$23,599	29,972	MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS
												<b>Treatment Total</b>	<b>\$23,599</b>			
<b>Year 2022 Area Total</b>										<b>66,612</b>	<b>Year 2022 Total</b>		<b>\$39,206</b>			
<b>Total Section Area:</b>										<b>233,502</b>	<b>Grand Total</b>		<b>\$84,342</b>			

# Scenarios - Sections Selected for Treatment

Interest: 3.00%

Inflation: 3.00%

Printed: 03/05/2019

Scenario: (4) Increase PCI 5 points (to 77)

Year	Budget	PM	Year	Budget	PM	Year	Budget	PM
2019	\$19,455	\$17,290	2021	\$45,889	\$8,826	2023	\$0	\$0
2020	\$28,133	\$21,734	2022	\$155,274	\$980			

## Year: 2019

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment
												PCI Before	PCI After			
CHANTAL CT.	KALYCA ST.	CUL-DE-SAC	CHANCT	010	399	29	11,571	R	AC		80	80	88	\$3,022	56,987	SLURRY & CRACK SEAL
CONE ST.	ERNST ST.	BUTTEVILLE RD.	CONEST	010	237	34	8,058	C	AC		77	77	85	\$2,105	59,489	SLURRY & CRACK SEAL
FELLER ST.	MAIN ST.	OAK ST.	FELLER	020	226	30	6,780	R	AC/AC		72	72	81	\$1,771	60,796	SLURRY & CRACK SEAL
KALYCA ST.	REES ST.	CHANTAL CT.	KALYCA	010	215	29	6,235	R	AC		80	80	88	\$1,629	56,987	SLURRY & CRACK SEAL
KALYCA ST.	CHANTAL ST.	N. BARRICADE	KALYCA	020	112	29	3,248	R	AC		84	84	91	\$849	63,105	SLURRY & CRACK SEAL
OAK ST.	CRISELL ST.	FELLER ST.	OAKST	020	307	27	8,289	R	AC/AC		67	67	76	\$2,165	57,361	SLURRY & CRACK SEAL
REES ST.	EHLEN ST.	230 FT W. OF KALYCA ST.	REESST	020	764	26	19,864	R	AC		82	82	89	\$5,187	60,004	SLURRY & CRACK SEAL
REES ST.	KALYCA ST.	HUCKLEBERRY LN.	REESST	040	235	29	6,815	R	AC		82	82	89	\$1,780	60,004	SLURRY & CRACK SEAL
REES CT.	CHANTAL ST.	E. BARRICADE	REESST	060	125	29	3,625	R	AC		82	82	89	\$947	60,004	SLURRY & CRACK SEAL
													<b>Treatment Total</b>	<b>\$19,455</b>		
<b>Year 2019 Area Total</b>										<b>74,485</b>	<b>Year 2019 Total</b>		<b>\$19,455</b>			

## Year: 2020

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment		Cost	Rating	Treatment
												PCI Before	PCI After			
CHANTAL ST.	REES CT.	KALYCA ST.	CHANTA	010	799	29	23,171	R	AC		80	79	87	\$6,232	55,853	SLURRY & CRACK SEAL
CONE ST.	CRISELL ST.	FELLER ST.	CONEST	030	292	22	6,424	C	AC		79	76	84	\$1,728	47,880	SLURRY & CRACK SEAL
CONE ST.	FELLER ST.	WILLIAMS ST.	CONEST	040	290	22	6,380	C	AC		84	82	89	\$1,716	49,283	SLURRY & CRACK SEAL
EHLEN ST.	REES ST.	N. DEAD END	EHLENS	030	268	24	6,432	R	AC/AC		88	87	93	\$1,730	49,545	SLURRY & CRACK SEAL
ERNST ST.	S. DEAD END	DEAD END N. OF CONE ST.	ERNSTS	010	525	34	17,850	R	AC/AC		71	69	79	\$4,801	49,485	SLURRY & CRACK SEAL
HUCKLEBERRY LN.	100 FT N. OF SCARLET CT.	REES ST.	HUCKLE	010	101	29	2,929	R	AC		78	77	85	\$788	52,584	SLURRY & CRACK SEAL
MATTHIEU ST.	MAIN ST.	OAK ST.	MATTHI	030	262	22	5,764	C	AC		79	76	84	\$1,551	47,880	SLURRY & CRACK SEAL
OAK ST.	FELLER ST.	104 FT W. OF WILLIAMS	OAKST	030	220	27	5,940	R	AC/AC		65	63	73	\$1,598	52,350	SLURRY & CRACK SEAL
REES ST.	230 FT W. OF KALYCA ST.	KALYCA ST.	REESST	030	230	29	6,670	R	AC		78	77	85	\$1,794	52,584	SLURRY & CRACK SEAL
REES ST.	HUCKLEBERRY LN.	CHANTAL ST.	REESST	050	360	29	10,440	R	AC		79	78	86	\$2,808	54,227	SLURRY & CRACK SEAL
WILLIAMS ST.	MAIN ST.	OAK ST.	WILLIA	020	257	49	12,593	R	AC/AC		89	88	94	\$3,387	53,736	SLURRY & CRACK SEAL
													<b>Treatment Total</b>	<b>\$28,133</b>		
<b>Year 2020 Area Total</b>										<b>104,593</b>	<b>Year 2020 Total</b>		<b>\$28,133</b>			

\*\* - Treatment from Project Selection

Scenarios Criteria:

# Scenarios - Sections Selected for Treatment

Interest: 3.00%

Inflation: 3.00%

Printed: 03/05/2019

Scenario: (4) Increase PCI 5 points (to 77)

## Year: 2021

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment			Cost	Rating	Treatment
												PCI Before	PCI After				
CRISELL ST.	CONE ST.	MAIN ST.	CRISEL	010	484	22	10,648	R	AC/AC		67	64	74	\$2,950	45,329	SLURRY & CRACK SEAL	
EHLEN ST.	MAIN ST.	OAK ST.	EHLENS	010	268	25	6,700	R	AC/AC		83	80	88	\$1,856	41,346	SLURRY & CRACK SEAL	
EHLEN ST.	OAK ST.	REES ST.	EHLENS	020	227	24	5,448	R	AC/AC		83	80	88	\$1,510	41,346	SLURRY & CRACK SEAL	
FELLER ST.	CONE ST.	MAIN ST.	FELLER	010	486	29	14,094	R	AC/AC		80	77	85	\$3,905	44,035	SLURRY & CRACK SEAL	
OAK ST.	MATTHIEU ST.	EHLEN ST.	OAKST	050	255	22	5,610	R	AC		81	78	86	\$1,555	41,284	SLURRY & CRACK SEAL	
<b>Treatment Total</b>													<b>\$11,776</b>				
MATTHIEU ST.	BLAKE CT.	MAIN ST.	MATTHI	020	542	22	11,924	C	AC		53	44	100	\$22,911	30,402	MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	
MATTHIEU ST.	OAK ST.	REES ST.	MATTHI	040	265	22	5,830	C	AC		49	40	100	\$11,202	30,824	MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	
<b>Treatment Total</b>													<b>\$34,113</b>				
<b>Year 2021 Area Total</b>										<b>60,254</b>	<b>Year 2021 Total</b>		<b>\$45,889</b>				

## Year: 2022

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment			Cost	Rating	Treatment
												PCI Before	PCI After				
OAK ST.	104 FT W. OF WILLIAMS ST.	WILLIAMS ST.	OAKST	040	104	33	3,432	R	AC/AC		92	86	92	\$980	28,139	SLURRY & CRACK SEAL	
<b>Treatment Total</b>													<b>\$980</b>				
BLAKE CT.	MATTHIEU ST.	CUL-DE-SAC	BLAKEC	010	464	30	13,920	R	AC		33	24	100	\$146,108	4,701	FULL DEPTH RECLAMATION	
<b>Treatment Total</b>													<b>\$146,108</b>				
REES ST.	MATTHIEU ST.	EHLEN ST.	REESST	010	188	22	4,136	R	AC		55	48	100	\$8,186	24,431	MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS	
<b>Treatment Total</b>													<b>\$8,186</b>				
<b>Year 2022 Area Total</b>										<b>21,488</b>	<b>Year 2022 Total</b>		<b>\$155,274</b>				
<b>Total Section Area:</b>										<b>260,820</b>	<b>Grand Total</b>		<b>\$248,751</b>				

\*\* - Treatment from Project Selection

Scenarios Criteria:

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## Appendix G

### Maps

*Map – Current PCI*

*Scenario Maps – PCI Condition after Treatments in 2023 (all Scenarios)*

*Scenario Maps – Section Selected for Treatment (Scenarios 1-4)*

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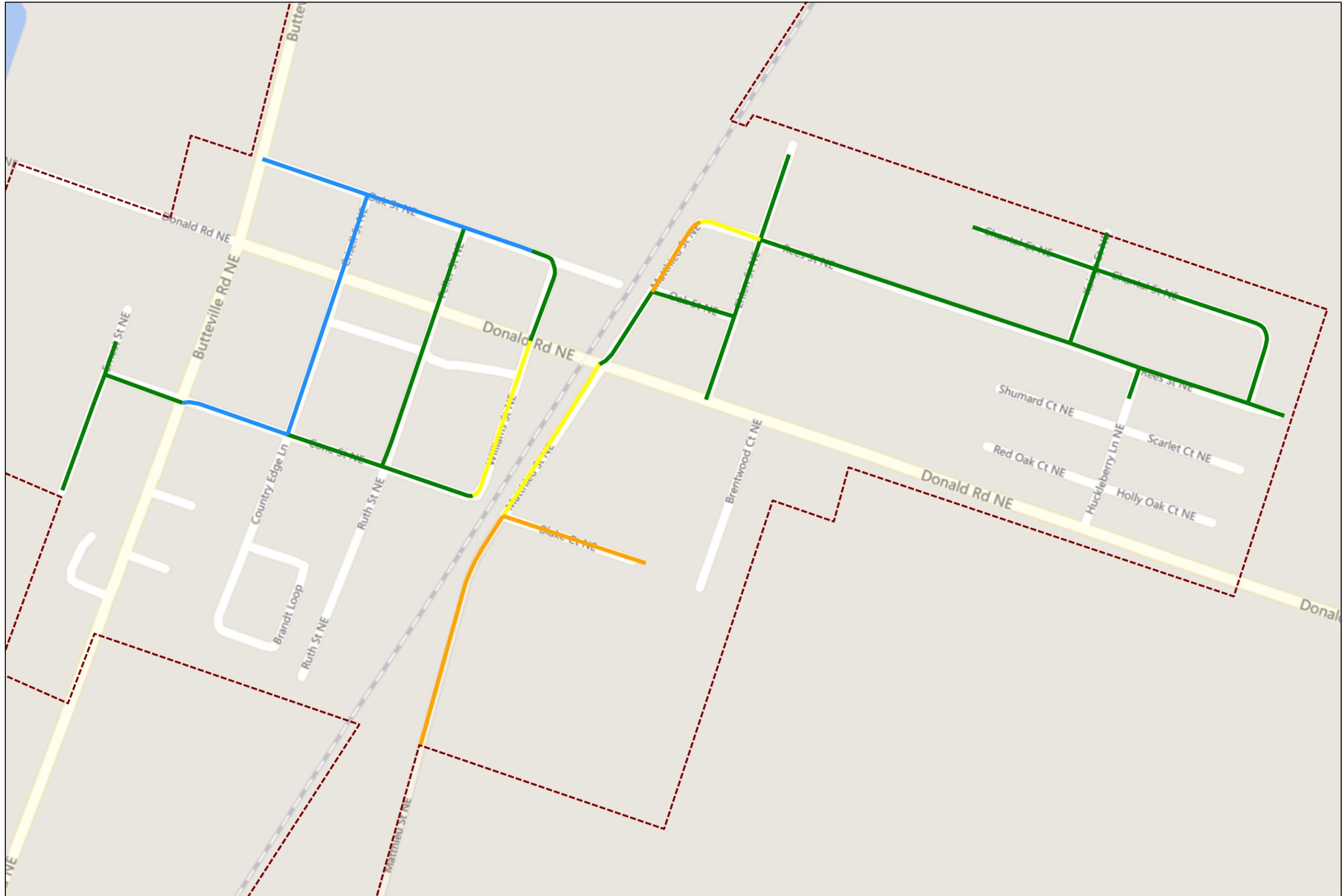


City of Donald

# Current PCI Condition

Printed: 3/5/2019

- Feature Legend**
- Category I - Very Good
  - Category II - Good (Non-Load)
  - Category III - Good (Load)
  - Category IV - Poor





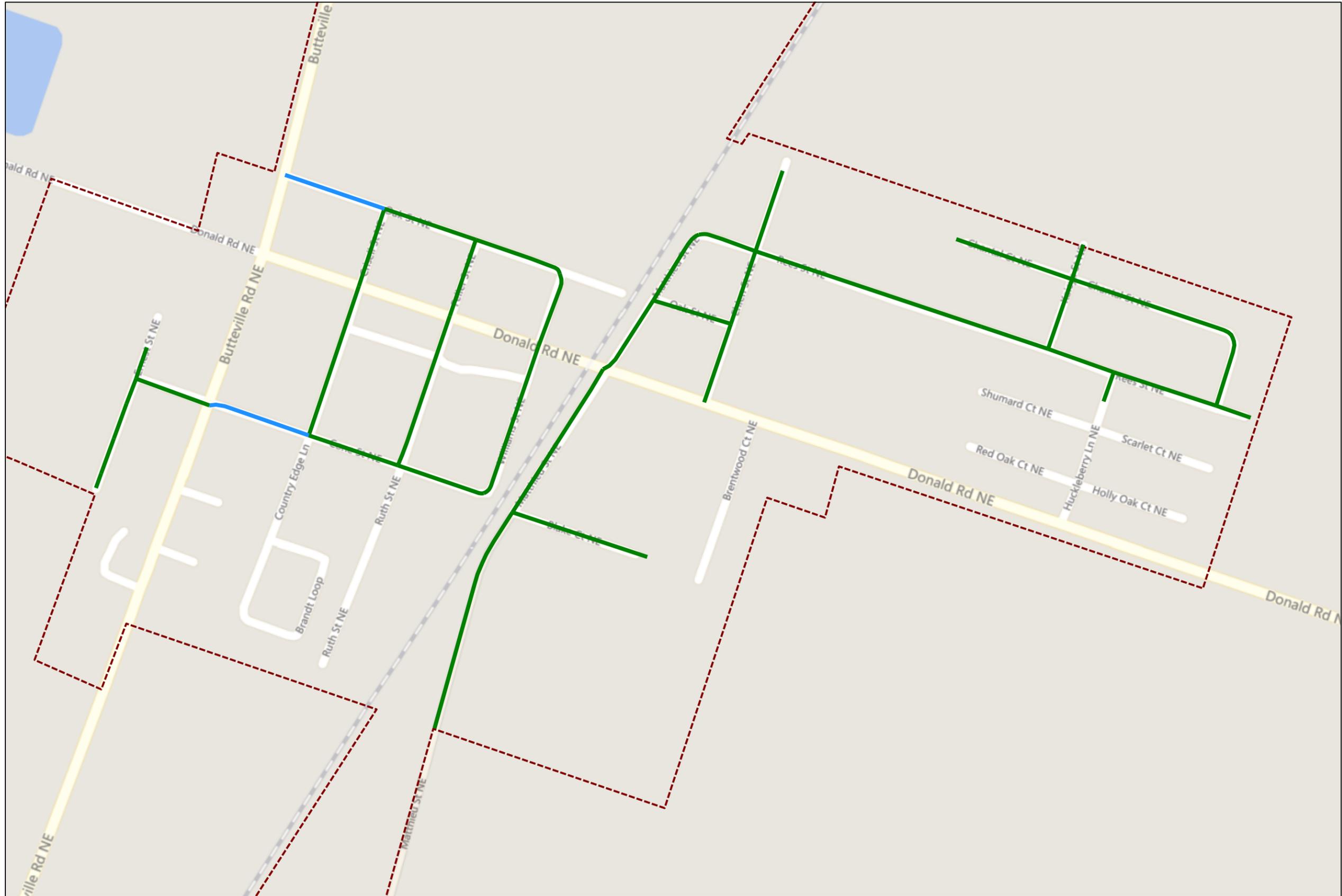
City of Donald

# Scenario PCI Condition

(1) Unconstrained Needs - 2023 Project Period - Printed: 3/5/2019

**Feature Legend**

- Category I - Very Good
- Category II - Good (Non-Load)



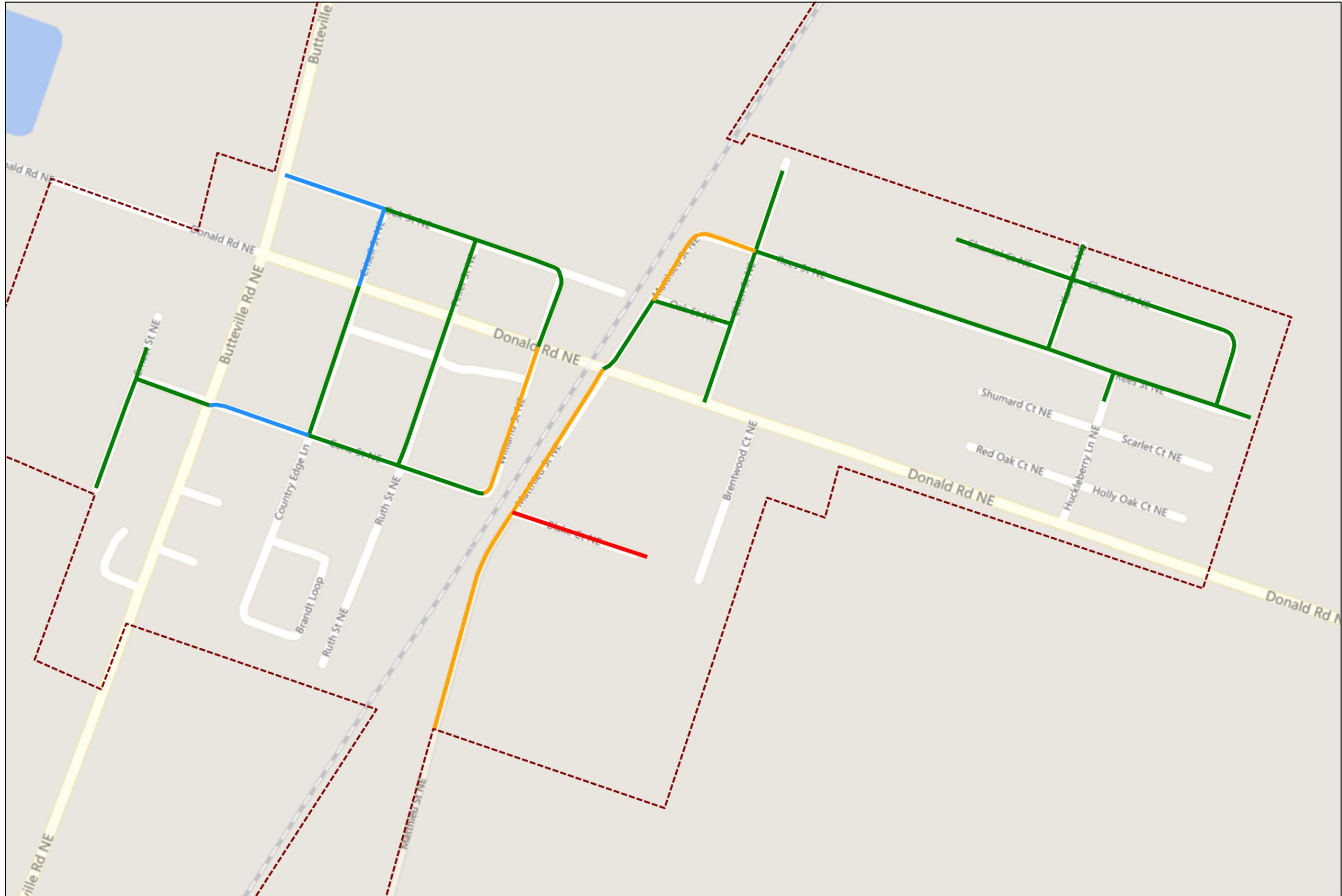


City of Donald

# Scenario PCI Condition

(2) Current Funding (\$6k per year) - 2023 Project Period - Printed: 3/5/2019

- Feature Legend**
- Category I - Very Good
  - Category II - Good (Non-Load)
  - Category IV - Poor
  - Category V - Very Poor



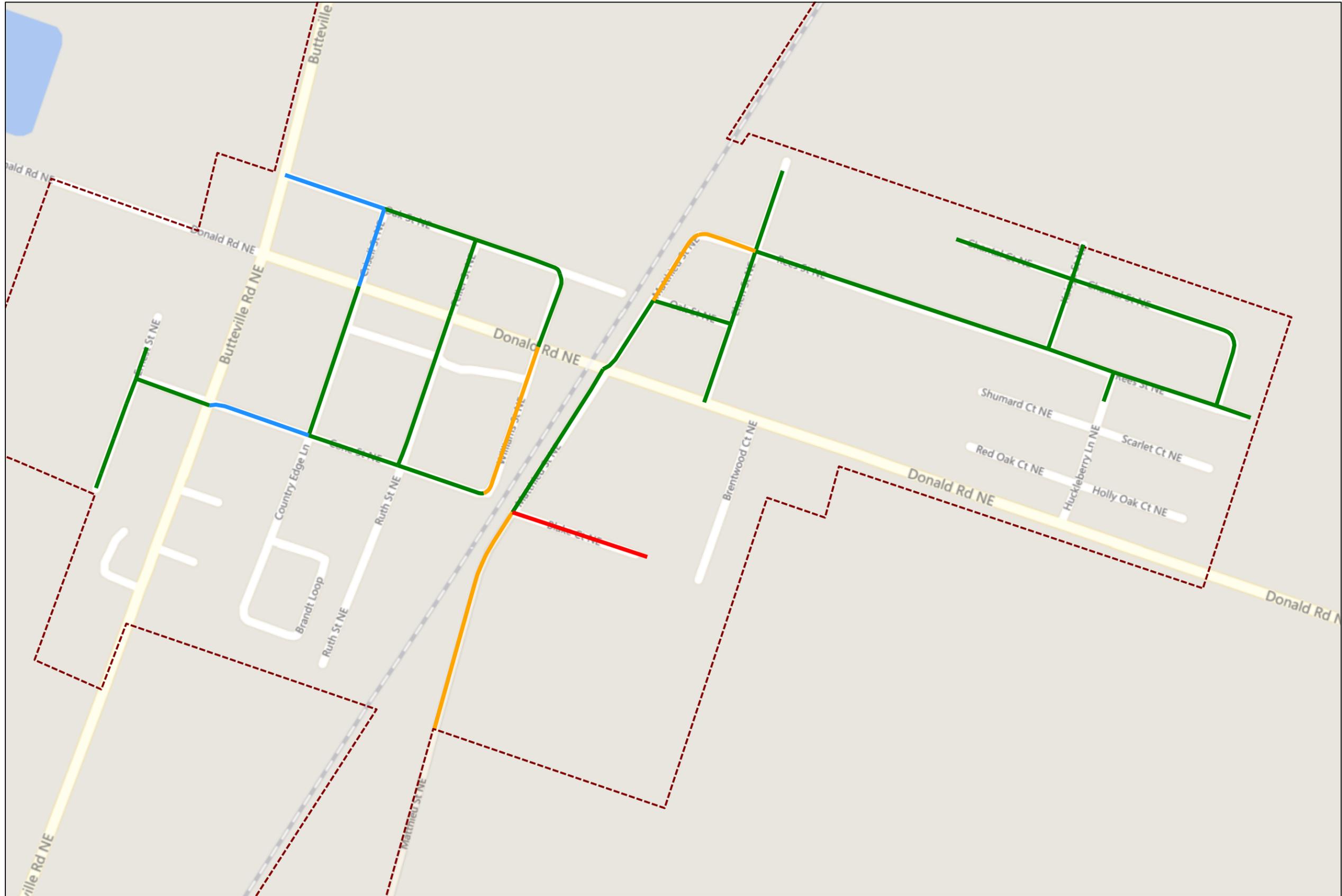


City of Donald

# Scenario PCI Condition

(3) Maintain Current PCI - 2023 Project Period - Printed: 3/5/2019

- Feature Legend**
- Category I - Very Good
  - Category II - Good (Non-Load)
  - Category IV - Poor
  - Category V - Very Poor



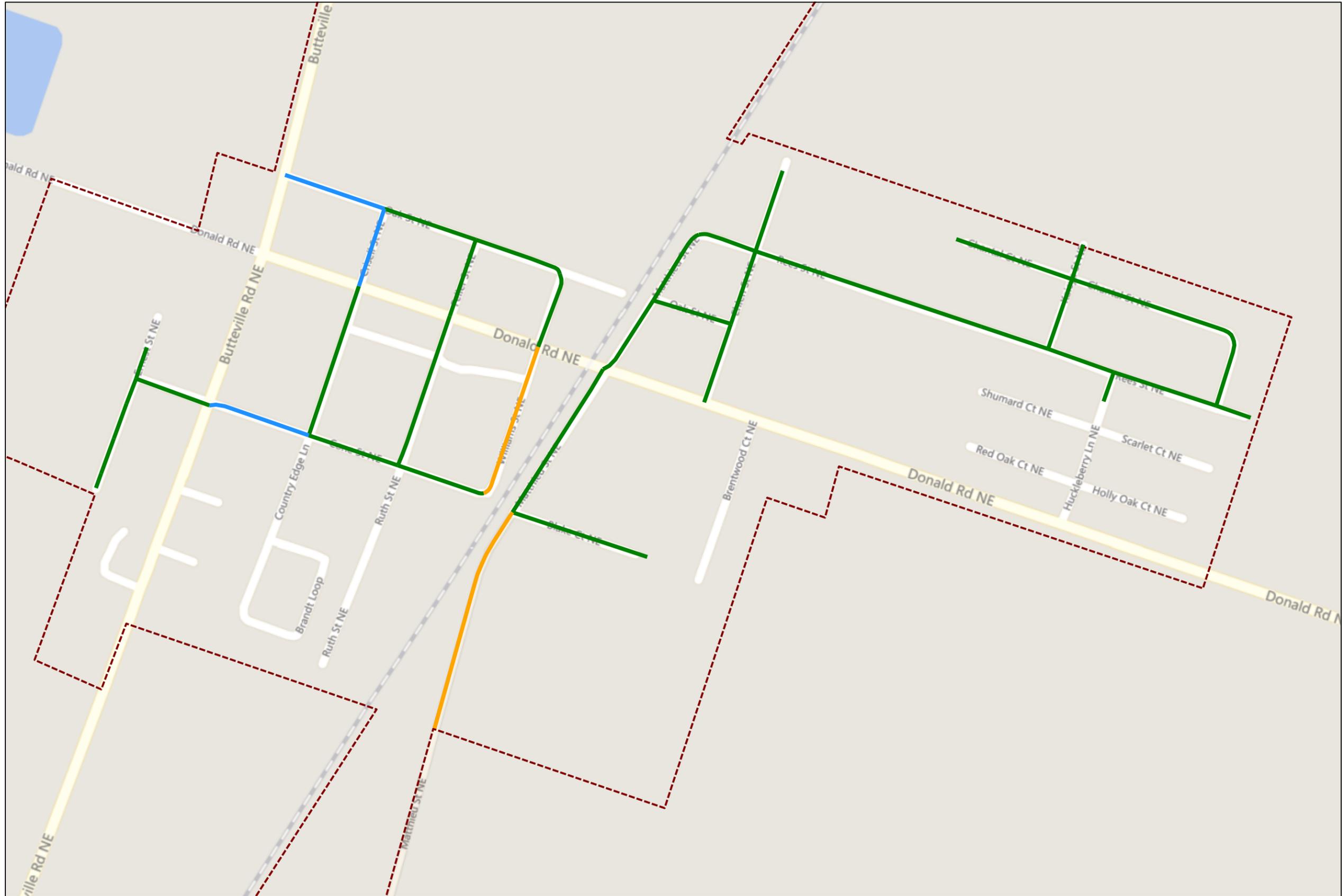


City of Donald

# Scenario PCI Condition

(4) Increase PCI 5 points (to 77) - 2023 Project Period - Printed: 3/5/2019

- Feature Legend**
- Category I - Very Good
  - Category II - Good (Non-Load)
  - Category IV - Poor





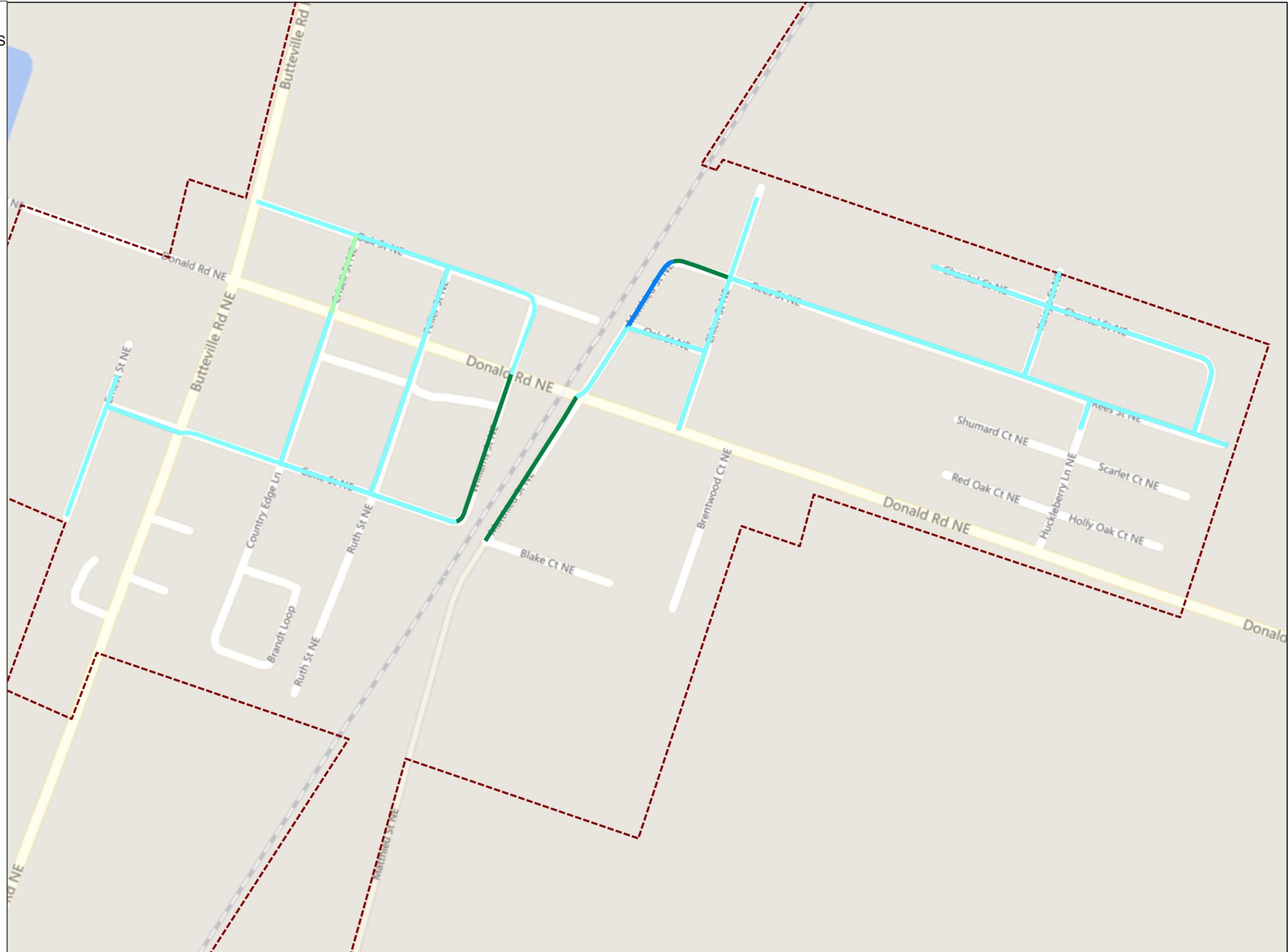
City of Donald

# Scenario Treatments

(1) Unconstrained Needs - All Project Periods - Printed: 3/5/2019

### Feature Legend

- MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS
- SEAL CRACKS
- SLURRY & CRACK SEAL
- THIN AC OVERLAY(1.5 INCHES)





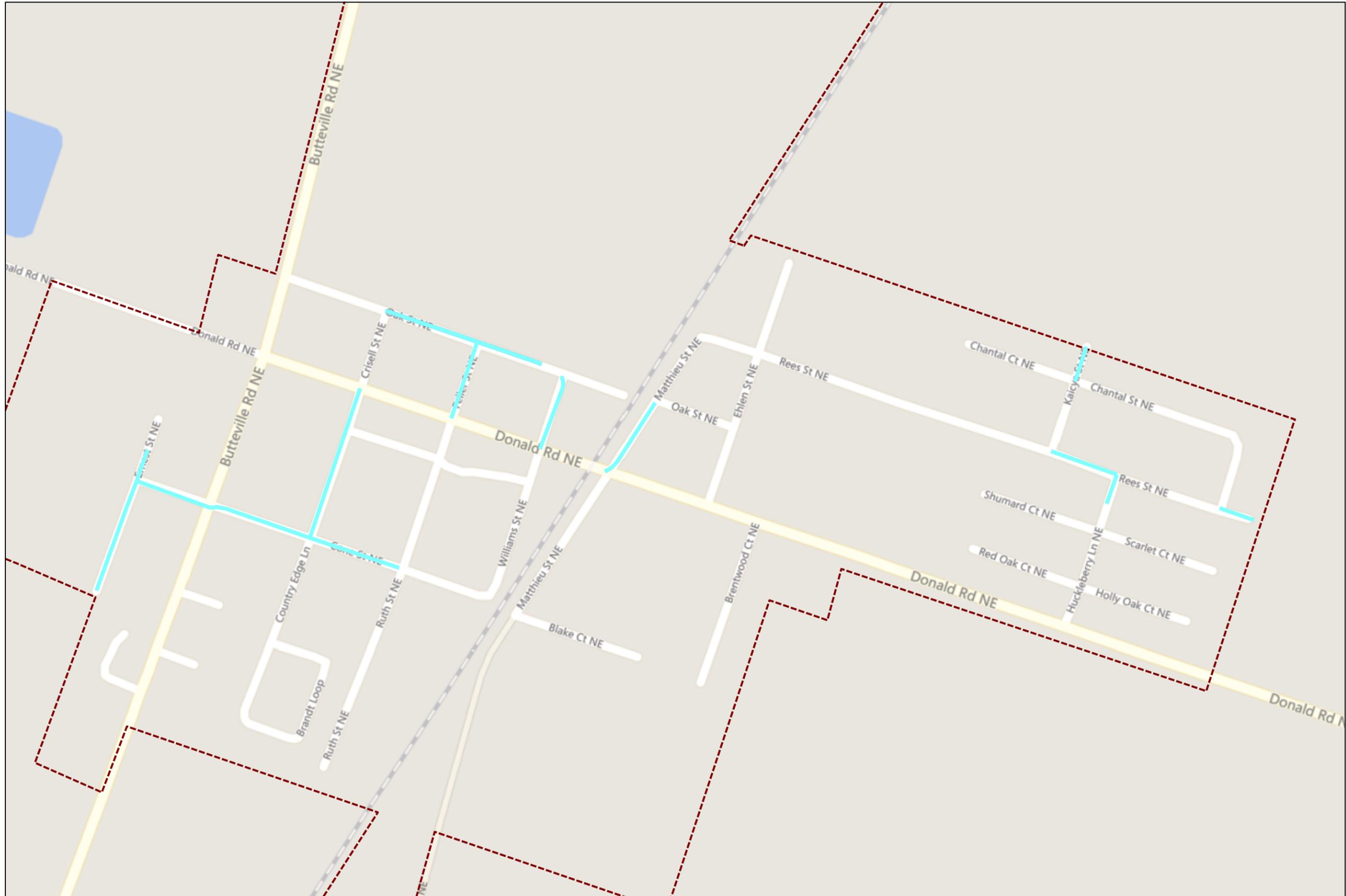
City of Donald

# Scenario Treatments

(2) Current Funding (\$6k per year) - All Project Periods - Printed: 3/5/2019

**Feature Legend**

- SEAL CRACKS
- SLURRY & CRACK SEAL





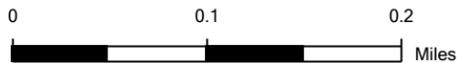
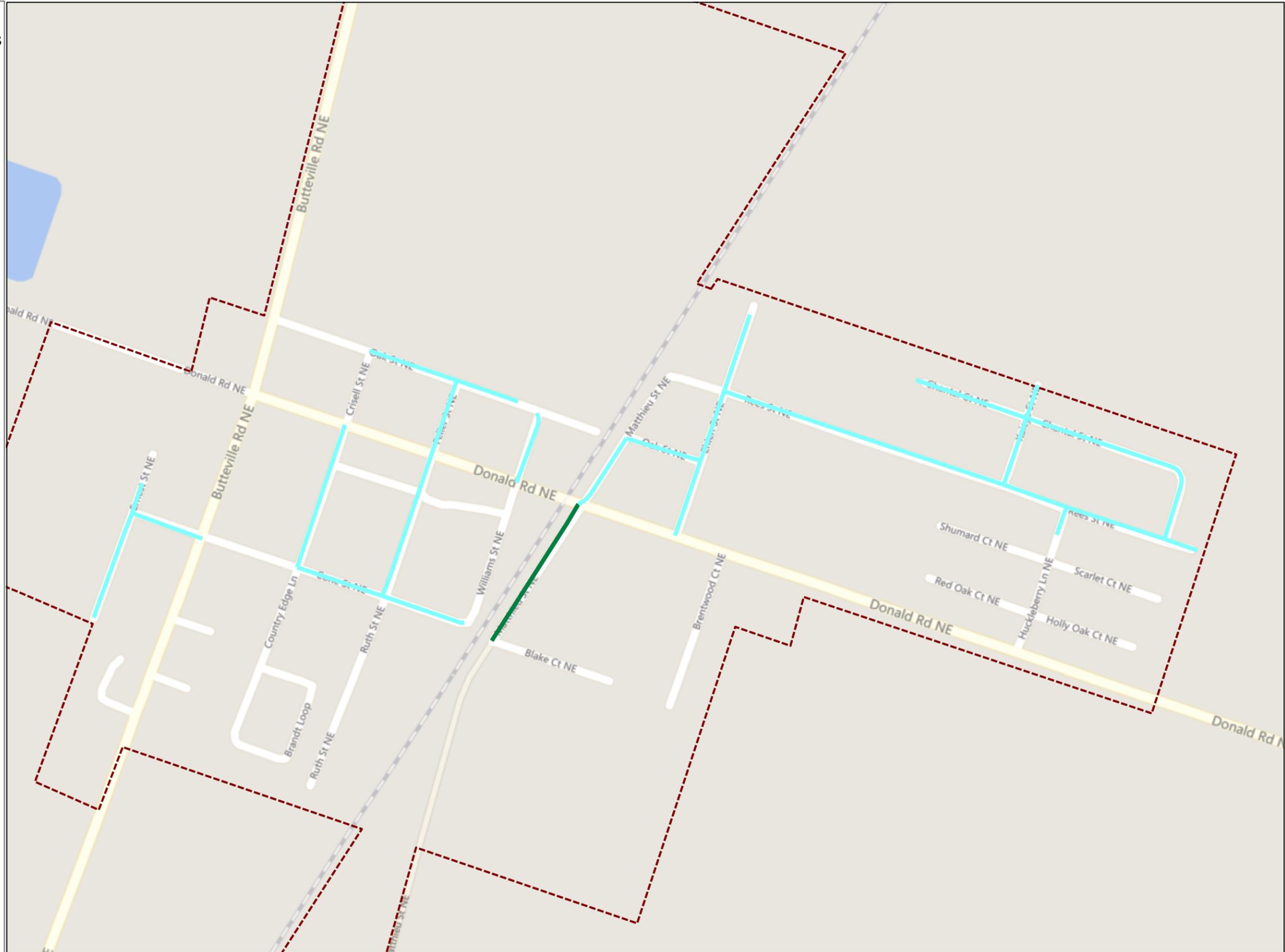
City of Donald

# Scenario Treatments

(3) Maintain Current PCI - All Project Periods - Printed: 3/5/2019

### Feature Legend

- MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS
- SLURRY & CRACK SEAL





City of Donald

# Scenario Treatments

(4) Increase PCI 5 points (to 77) - All Project Periods - Printed: 3/5/2019

### Feature Legend

- FULL DEPTH RECLAMATION
- MEDIUM AC OVERLAY (2 IN) WITH LOCALIZED DIGOUTS
- SLURRY & CRACK SEAL

