



# MEMORANDUM

**TO:** Rebecca Tilden, DPW Director  
 Meghan Davis, Engineering Manager  
 Town of Marion DPW

**DATE:** 01/31/2025

**FROM:** Jared Duval, P.E.  
 Theo Shuxho, EIT

**PROJECT NO.:** T1417.01

**RE:** Pavement Management Budget Analysis Update

**Purpose:**

At the request of the DPW this memorandum serves to present an updated analysis of various budget scenarios originally presented in TEC's 2024 Pavement Management Report dated May 23, 2024, accounting for the roadway repair work that was performed by the DPW during the 2024 construction season. The goal of this memorandum is to present updated funding scenarios necessary to achieve desired performance outcomes on a network level, to help the Town with capital planning and budgeting for future roadway repair work.

**Methodology:**

The Marion DPW completed the following work during the 2024 construction season:

**Table 1: 2024 Roadway Construction Summary**

Street			Length		Treatment Alternative	Construction Cost (Including Police Details)
Name	From	To	FT	Miles		
Allen Street	Front Street	Converse Road	1,135	0.21	Mill & Overlay	\$233,894
Cove Street	House #29	Cul De Sac	115	0.02	Mill & Overlay	
Hermitage Road	Wareham Street	Private Drive	879	0.17	Mill & Overlay	
Lewis Street	Converse Road	Waters Way	1,908	0.36	Mill & Overlay	
Zora Road	Front Street	Converse Road	1,355	0.26	Mill & Overlay	
Boxberry Way	Cul De Sac	Jaclyn Raw Drive	363	0.07	Crack seal	\$29,654
Converse Road	Mill Street	Dead End	9,483	1.80	Crack seal	
Cranberry Way	Front Street	Cul De Sac	1,383	0.26	Crack seal	
Tucker Lane	Town Line	Cul De Sac	1,031	0.20	Crack Seal	
County Road	Town Line	Front Street	8,065	1.53	Fog seal	\$36,943
Pleasant Street	Main Street	Converse Road	2,110	0.40	Fog seal	
<b>TOTAL:</b>			<b>27,827</b>	<b>5.27</b>		<b>\$300,491</b>



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TEC updated the DPW’s roadway inventory database with the work summarized above to recalculate the Town’s network Pavement Condition Index (PCI) and estimated total value of backlog work. Before recalculating the network PCI and total backlog, the database was also updated to account for 1-year of deterioration across all roadways in Town that had no work performed on them in 2024. TEC’s findings upon updating the database and recalculating network PCI and backlog are summarized in the following section.

## Findings:

Upon updating the Town’s roadway inventory and database with work completed last year and recalculating network PCI and backlog the network PCI was found to have *decreased* approximately **1.4 points from 71.8 to 70.4**, while total backlog *increased* slightly **from \$5,934,374 to \$5,956,420**.

The decrease in network PCI can largely be attributed to the following:

- Approximately **\$275,810** was spent on roadwork (excluding police detail costs) last year, the cost of which is broken down as follows in terms of capital vs. preventive maintenance project types:
  - **85%±** of funds allocated to capital investments (e.g., mill & overlay).
  - **15%±** of funds allocated to preventative maintenance (PM) (e.g., crack sealing & fog sealing).
  - This disproportionate allocation of funds between PM and capital work resulted in less overall roadway miles repaired compared to TEC’s original Year 1 plan presented to the Town in May 2024. Since capital improvement work is more costly on a unit-cost basis, less roadway repairs in terms of overall length can be performed. A more balanced investment plan between PM and capital work will yield better performance outcomes in terms of Network PCI.

While counterintuitive, the slight increase (\$22k±) in backlog despite the Town’s investment of approximately \$276k in roadway construction in 2024 can largely be attributed to the fact that while approximately 5.27-miles of roadways received some form of treatment, the balance of the Town’s pavement network (22.56-miles) was left untouched and deteriorated accordingly. Some of these untouched roadways may also have fallen into lower, more costly treatment bands than when evaluated last year (i.e. preventive maintenance to minor rehab, etc.). A summary of backlog conditions is provided in Table 2 below. Construction cost escalation was also considered when recalculating the Town’s total backlog, therefore costs for all roadway work, whether a roadway segment dropped to a lower treatment band or not, are higher than last year.

Table 2

Current Backlog Summary						
Repair Method	Cost/Square yards	P.C.I.	Length (Miles)	Area (Square Yards)	Estimated Cost	Current Town P.C.I.
No Maintenance	\$0	94 to 100	5.09	81,827.00	\$ -	<b>70.4</b>
Routine Maintenance	\$2	80 to 94	5.43	101,785.88	\$ 209,678.91	
Preventative Maintenance	\$8	65 to 80	9.42	159,875.00	\$ 1,317,370.00	
Minor Rehabilitation	\$36	45 to 65	6.66	94,741.00	\$ 3,415,413.05	
Major Rehabilitation	\$67	0 to 45	1.24	15,145.00	\$ 1,013,957.75	
<b>Total</b>			<b>27.83</b>	<b>453,374</b>	<b>\$ 5,956,419.71</b>	



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## Updated Budget Analysis & Network PCI Projections:

As per the Town's request, TEC evaluated the following budget scenarios to assess projected network PCI, in consideration of the Year 1 work performed in 2024. The following assessment considers the work performed last year, and associated costs, as year 1 of the 5-year analysis, thus the network PCI is projected out to 2028.

### Budget Scenario #1: Ch. 90 Town Match:

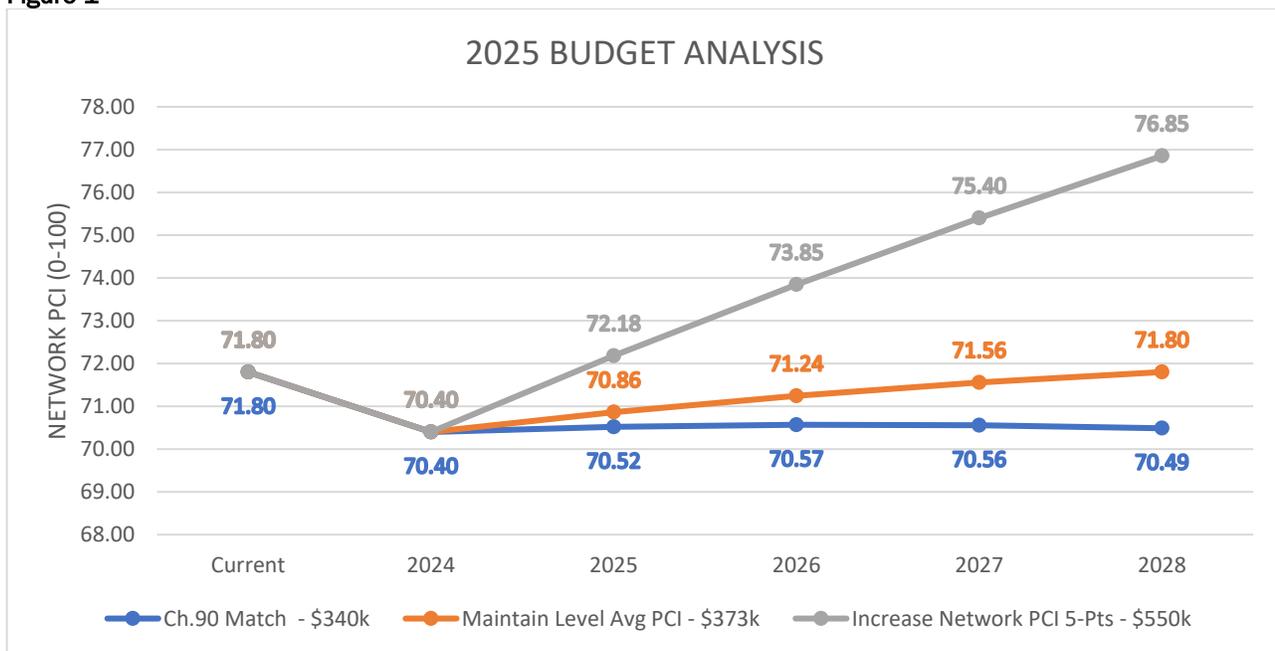
The Town's current Ch.90 allotment is approximately \$170,000. If the Town were to match their Ch. 90 allotment with local funds, thus doubling their annual budget to \$340,000, the projected PCI would stabilize at **70.49** after 5-years (2028). This finding aligns with TEC's projections from our budget analysis in May 2024 that an estimated \$325,000 annual budget is necessary to maintain network conditions over a 5-year period. Since the PCI dipped slightly last year, a slight increase in the amount of funding (\$325k to \$340k), after accounting for cost escalation, is estimated to maintain and stabilize network conditions. An estimated **\$373,000** annual budget would be required to return to, and maintain, the Town's previous network PCI (71.8) by 2028.

### Budget Scenario #2: 5-Point Network PCI Increase:

After accounting for roadway work performed in 2024, an estimated **\$550,000** annual budget is necessary to increase Marion's PCI by 5-points to the same target PCI (77±) presented in TEC's report dated May 2024, compared to the \$525,000 projected annual budget originally presented. With the slight estimated dip in network PCI after Year 1 and increase in construction costs due to roadways falling to lower treatment bands and/or general cost escalation, approximately \$25,000 more annually is estimated to attain the same target PCI increase of 5-points.

The results of the updated budget analysis are further demonstrated in the graph below.

Figure 1





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### Conclusions & Recommendations:

Upon reevaluating the Town's network PCI and backlog after accounting for completed roadway construction in 2024 (Year 1), the Town of Marion's network PCI was estimated to have *decreased* slightly from 71.8 to 70.4, and the Town's backlog of roadway construction work was estimated to have *increased* approximately \$22,000 to \$5,956,420. Given the 2024 budget allocation between capital and preventive maintenance work, TEC's findings presented herein upon reevaluation of each budget scenario generally align with our projections from 2024 in terms of estimated annual budget to maintain network conditions and/or improve by approximately 1 PCI point per year (5-point improvement by 2028).

TEC offers the following recommendations as the Town continues to prioritize a comprehensive, data-driven approach to managing its pavement network:

#### 1. Rebalance Roadway Repair Budget Allocations:

- A sound pavement management plan strikes a healthy balance between capital work and preventive maintenance work, the latter category of which being most crucial to spread the Town's resources as far as possible. A paradigm shift is often needed to transition from a capital-heavy plan, or 'worst-first' approach, to a more PM-heavy plan that ensures the Town is keeping its good roads in good condition, thereby protecting prior years' investments in its network and avoiding more costly repairs in the future.

Ultimately, the more resources committed towards PM work, the more roadway miles are repaired on an annual basis, which has a greater impact on network PCI.

- At minimum, aim to allocate **50%** of future budgets to capital investments and **50%** to preventative maintenance to minimize further PCI declines and achieve long-term network stability.

#### 2. Continue Tracking Progress and Reassessing:

- Periodically reassess and reinspect roadway conditions and adjust budget allocations based on updated PCI projections to ensure optimization of the Town's resources.