

FY 2025

# Pavement Management Summary



Prepared for:  
**Town of Douglas  
Highway  
Department**

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## Existing Conditions

**Douglas's roadway network is comprised of 83.6 public road miles.**

Since implementing its Pavement Management System (PMS) in 2020, Stantec has continued working with the Town in maintaining its PMS. In the Fall of 2024, Stantec completed a re-survey of the Town's public roadway network, determined today's average road network Pavement Condition Index (PCI), roadway repair backlog, and investigated three (3) future funding scenarios based on today's construction cost.

Stantec identified 193 pavement segments and determined the Town's average road network PCI in November 2024 was a 58.5, placing Douglas's road conditions at the middle of the Preventive Maintenance treatment band as seen on the right. In addition to Town highway funds, the town of Douglas has resurfaced additional roads utilizing water project funding. It should be noted that this PCI without these water project(s) would be 56.6. While the average PCI value represents a roadway in "fair" condition, it would be prudent for the town to remain diligent in its pavement management investments to ensure all treatment bands are addressed properly to prevent an unsustainable future backlog.

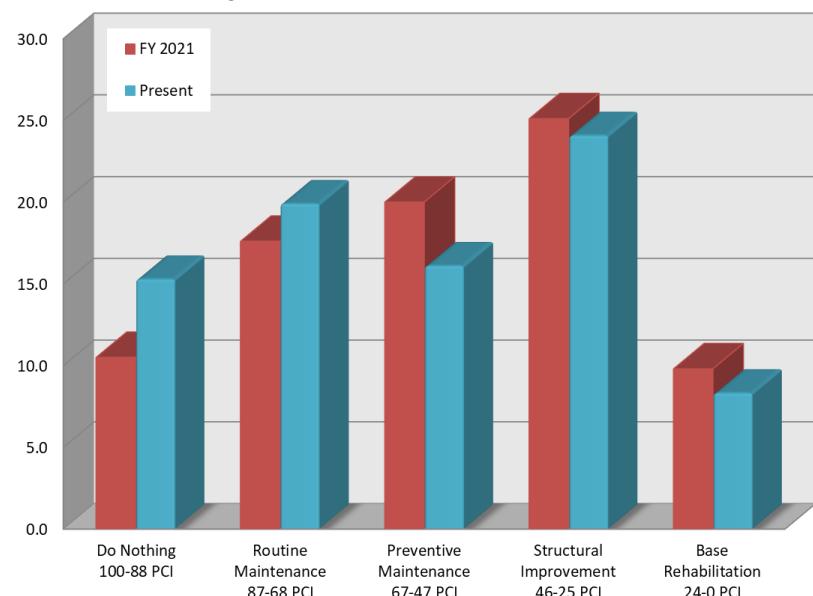


## Current Backlog of Outstanding Repairs (\$18,092,354)

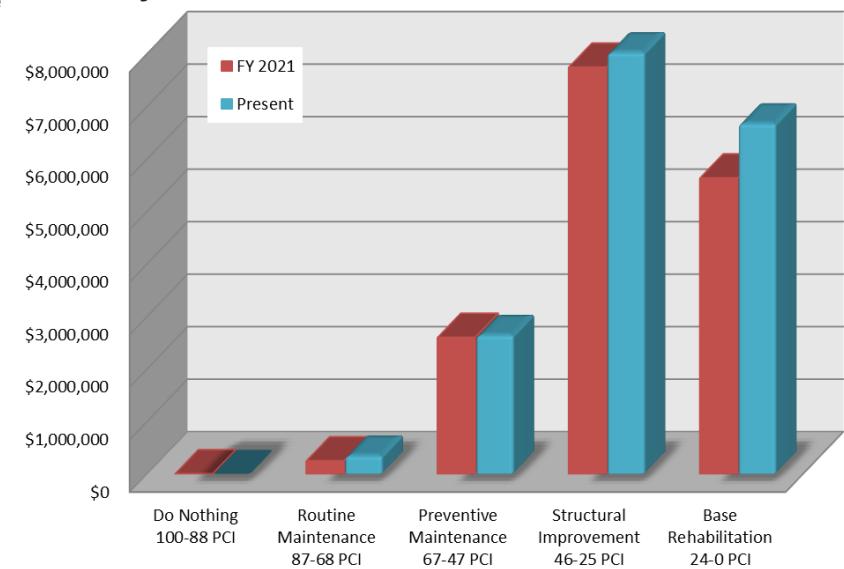
The backlog is defined as the cost of repairing all the roads within one year and bringing the average PCI to a near perfect 100. Backlog is a handy "snapshot" or relative measure of outstanding repair work. The backlog not only represents how far behind the Douglas roadway network is in terms of its present physical condition, but also its cost value serves as a benchmark to measure the impact of various funding scenarios with the objective to shrink the backlog to a point where the town's roads are all in a suitable condition and can be treated through maintenance. The current backlog offers a basis for comparison to future and/or past year's backlog(s). Backlog dollars represent the pavement structure only; it does not include related repair cost for drainage, sidewalk, curbing, signals, or signs. Douglas's backlog as of November 2024 is \$18,092,354. It should be noted that this backlog without water project(s) funds would be \$19,458,001, which is a difference of \$1,365,647. The figure to the right summarizes the current backlog repair costs by PCI treatment bands for this year compared to FY 2021, showing an increase in the 'Structural Improvement' and 'Base Rehabilitation' treatment bands and a slight decrease in the 'Preventive Maintenance' band. It is important to regularly resurface and reconstruct roads to not only improve the overall network conditions but also keep the backlog under control. In addition, repairs such as crack sealing should be done to prevent roads from deteriorating too quickly.



### Current PCI Distribution in Miles By Treatment Band



### Current Backlog Distribution By Treatment Dollars





# Budget Analysis

Using the Town's pavement management data, Stantec modeled three, 5-year future funding scenarios

The analysis software of the PMS is where financial determinations and projections are made. Consideration is given to the required budget, by repair type, based on the supplied information from meetings with Highway Department and Stantec, for overall desired roadway network conditions. Various scenarios were analyzed to measure the effects of alternative funding levels and to determine the funding needed to avoid deteriorating pavement conditions. Today's backlog cost and future funding scenarios are based on Douglas's current unit bid prices for roadway construction and projected liquid asphalt prices.

Using the Stantec's pavement management modeling software, Stantec modeled three, five-year future funding scenarios:

1. \$750,000 per year
2. \$1,000,000 per year
3. \$1,500,000 per year

These scenarios incorporate certain exclusions based on projected upcoming work. The exclusions are: (1) Depot Street, (2) Johnson Court, and (3) South Street (except the portion that was paved recently). These exclusions are reflective of the resulting average PCI and backlog on the line charts to the right.

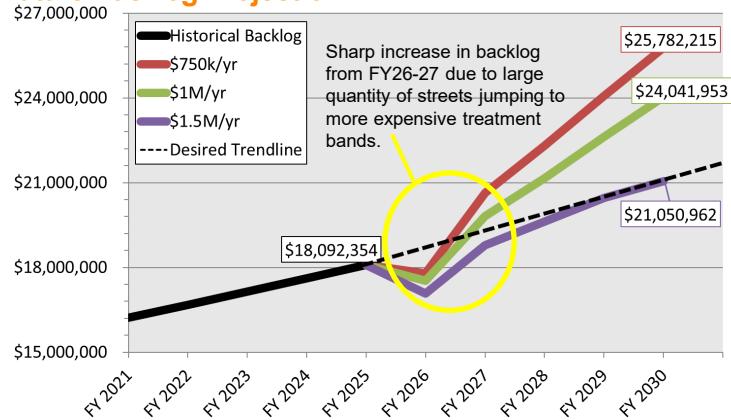
Each scenario, as depicted in the line charts, result in a projected average network PCI and backlog. All scenarios incorporate an annual inflation rate of 3.5%. Where the annual road appropriation appears to remain level, it in fact represents a net budget decrease due to impact of inflation.

The five-year \$750,000 per year scenario, as seen by the red line, shows the backlog increases to \$25,782,215 while the network average PCI drops to 51.8, in FY 2030. This scenario shows a sharp downward trend in PCI, indicating that this budget is insufficient to maintain the roadway network. This results in unsustainable backlog and lower PCI since the Town's onset of pavement management in 2020.

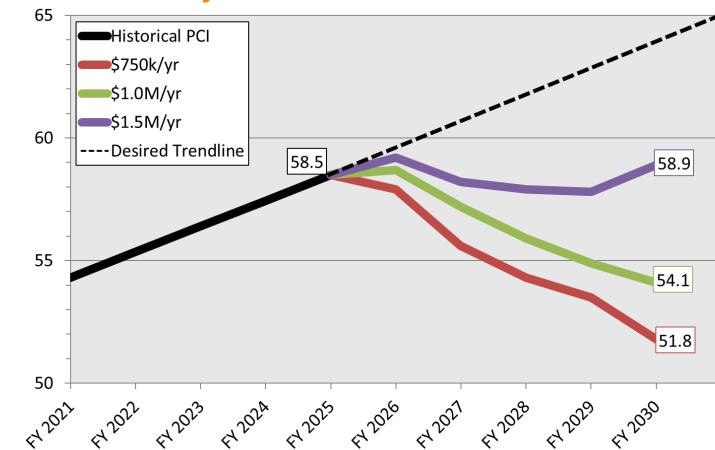
Stantec next investigated a five-year \$1,000,000 per year scenario. As seen by the green line, in this scenario backlog grows to \$24,041,953 while the network average PCI decreases to 54.1 by FY 2030. This scenario shows a downward trend in PCI, and a backlog that is steadily regressive.

Lastly, an equilibrium scenario was created to maintain network conditions. In this five-year \$1,500,000 per year scenario, as shown by the purple line, the PCI is maintained by slightly increasing to 58.9, while the backlog increases to \$21,050,962 by FY 2030. This budget allows the Town to maintain the existing overall network conditions.

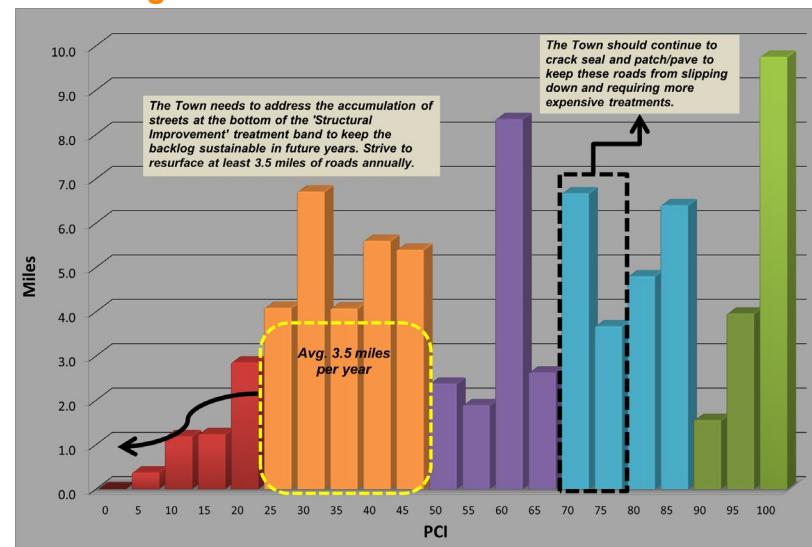
## Future Backlog Projection



## Future PCI Projection



## PCI Histogram





## Concluding Remarks

Pavement management simultaneously utilizes a balanced approach of various treatments across all treatment band ranges. The Town has historically done well focusing on pavement reclamation of the worst streets in Town and crack sealing of streets to slow down system-wide deterioration.

As historical data from previous line charts depict, the Town has been slowly improving system-wide conditions and keeping the backlog at a sustainable rate give inflation. This is credit to a combination of water and highway projects throughout Town over the last 3 years.

However, there remains an extremely, large capital backlog of Structural Improvement and Base Rehabilitation streets versus Maintenance repairs which require a significant annual investment if the Town wants to maintain this trend.

The three (3) future funding scenarios modeled herein help to illustrate the impact of key metrics – average PCI and backlog costs - based on Douglas's current and past roadway budgets.

The current funding of \$750k/year is insufficient to deal with large backlog of capital repairs throughout the 5-year model.

While the funding of \$1.0M/year is an improvement of the previous funding model, the network conditions are maintained for the first year then worsen over the remaining years, and the backlog continues to rapidly grow.

Lastly, the funding of \$1.5M/year maintains the overall network conditions throughout the model. While in the middle of the model it struggles, losing PCI yet sustains the incoming capital backlog that is due and returns the PCI to today's level in the last year.

To continue to maintain the Highway Department's goal of following the current trendlines - slowly improving network conditions, the funding analysis herin concludes that the Town should strive to spend at least \$1,500,000 annually on its roadways.

At a minimum, in 2025 the Town should invest \$1,000,000 on its roadways, then \$1,500,000 annually for the following 4 years. If any of this cannot be achieved, focus should be shifted from expensive base rehabilitation type repairs such as full depth reclamation towards improving pavement quality through means of lower cost treatments such as thin-lift overlays and surface treatments.

New treatments could allow for alternative future funding models. Piloting these options on specific road candidates would provide valuable data for department buy-in.

### 2024 PCI Treatment Conditions

