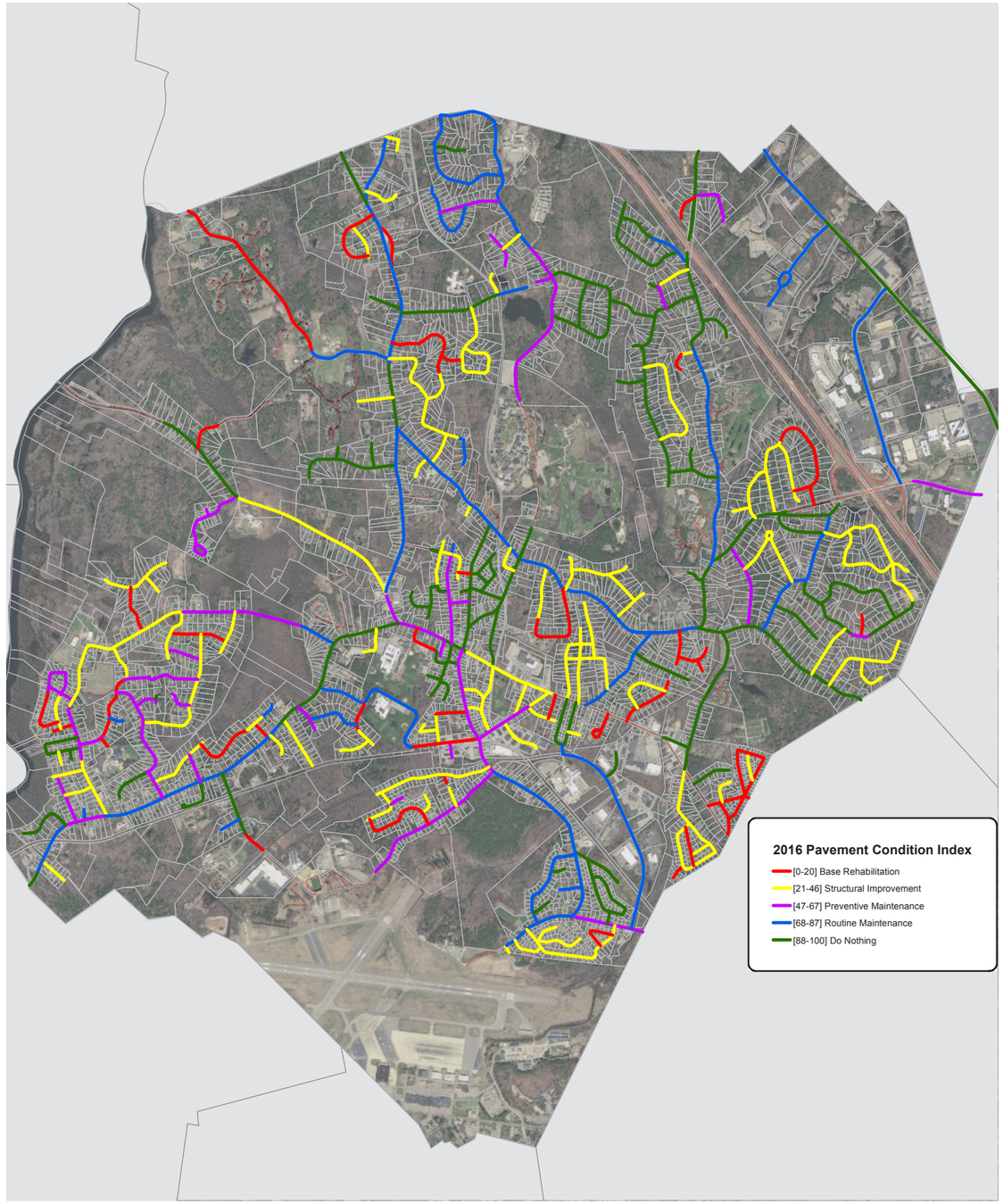

Stantec

FY 2016 Pavement Management Summary

April 2016

PREPARED FOR:
Town of Bedford
Department of Public Works

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Public Works Engineer

TOWN OF BEDFORD
Incorporated September 23 1729

PREPARED BY:
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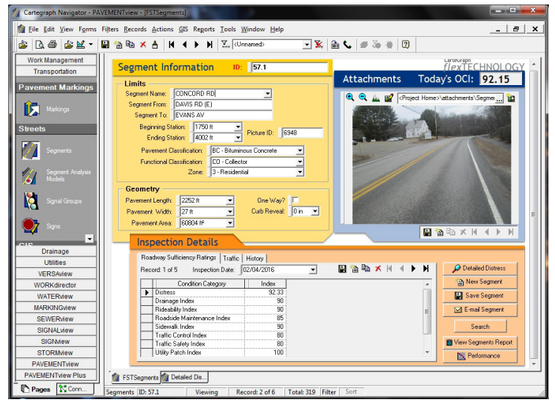
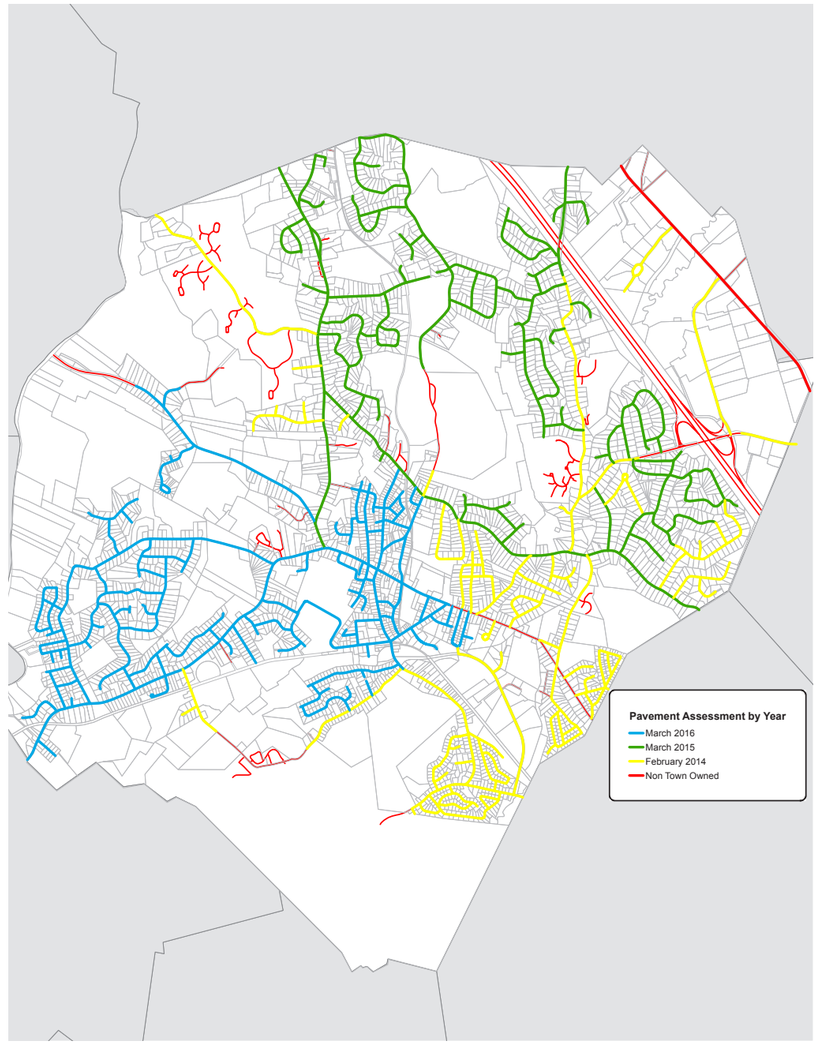


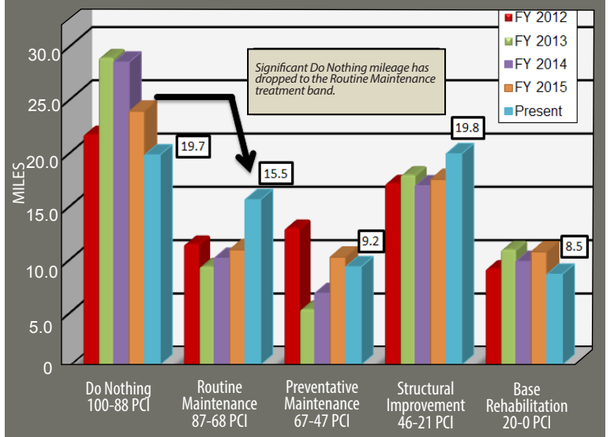


EXISTING CONDITIONS

Bedford's roadway network is comprised of 7.7 state highway miles, 7.5 private road miles, and 72.7 public miles. Stantec Consulting Services. has worked with the Town implementing and updating its Pavement Management System since 2006. In February of 2016, Stantec completed a 33% 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 future funding scenarios.

Stantec identified 297 pavement segments and determined the Town's average road network PCI in April 2016 was a 62.3. This average PCI places Bedford's typical road conditions in the top of the Preventive Maintenance treatment band (PCI range from 47 to 67), as seen to the right and represents a roadway in "fair" condition.

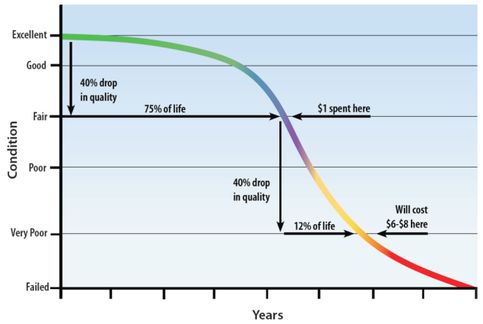
PCI Distribution in Miles by Treatment Band



Current Backlog of Outstanding Repairs ($16,467,516)

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 "snapshot" or relative measure of outstanding repair work. The backlog not only represents how far behind the Bedford 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. 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. Bedford's backlog as of April 2016 is $16,467,516. The figure above summarizes the backlog repair miles by PCI treatment bands for the last five years. Unfortunately, nine miles throughout the Town have fallen out of the Do Nothing treatment band over the last two years. Another alarming fact is more than 50% of the Town's current backlog is in need of Structural Improvement.

Pavement Deterioration Curve

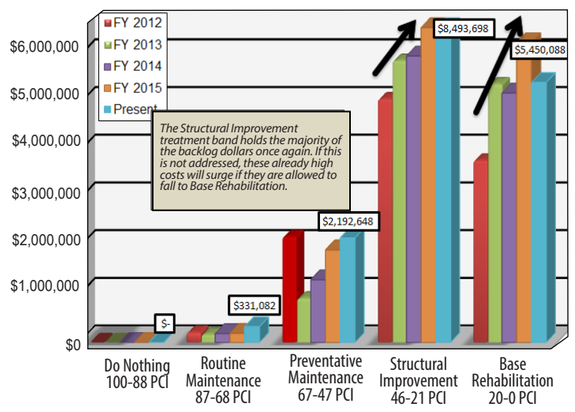


(PCI) Treatment Band Ranges

DO NOTHING PCI Band #1(100 – 88 PCI)	**Excellent Condition** - in need of no immediate maintenance.
ROUTINE MAINTENANCE PCI Band #2 (87 - 68 PCI)	**Good Condition** - may be in need of crack sealing or minor localized repair.
PREVENTIVE MAINTENANCE PCI Band #3 (67 - 47 PCI)	**Fair Condition** - pavement surface in need of surface sealing or thin overlay.
STRUCTURAL IMPROVEMENT PCI Band #4 (46 - 21 PCI)	**Poor Condition** - pavement structure in need of additional thickness to resist traffic loading.
BASE REHABILITATION PCI Band #5 (20 - 0 PCI)	**Failed Condition** - in need of full depth reconstruction/reclamation.

[1] The PCI ranges given in this table are general averages. The actual treatment band threshold numbers depend on pavement surface type and functional classification.

Davis Rd. from Redcoat Rd. to 100' W Patricia Cir.



BUDGET ANALYSIS

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 the Town 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 estimated bid prices for roadway construction.

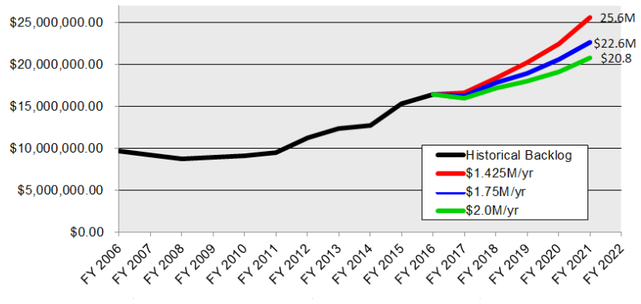
Using the Town's pavement management software, Stantec modeled three, five-year future funding scenarios. Each scenario utilizes certain allotments to address various repair types throughout the Town dependent on current conditions. A cracksealing program is built into year one and four of the projection. Each scenario, as depicted in the line charts below, results in a projected average network PCI and backlog. Also, all scenarios incorporate a 3.5% annual inflation rate. Therefore, due to the impact of inflation, a net budget may in fact remain level where the annual road appropriation appears to increase.

The first scenario incorporates the Town's 2016 anticipated roadway repair budget of $1.425M per year. It shows the backlog growing to $25,589,651 while the network average PCI decreases slightly to 60 by FY 2021. This projection is displayed below by the red line.

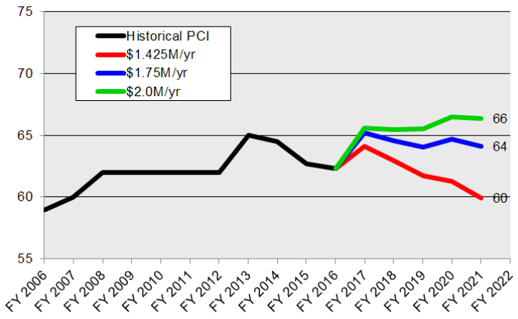
The blue line in the figure displays the projected conditions for a roadway repair budget of $1.75M per year. Here the backlog increases to $22,603,645 while the network average PCI increases to 64 in FY 2021. Obviously, this scenario is not quite sufficient to maintain the current backlog.

An aggressive funding approach of $2.0M per year and is depicted by the green line. The backlog rises slightly to $20,774,585 and the network average PCI increases to 66 in FY 2021. Stantec recommends the Town strive to implement this scenario to improve the average network PCI and attempt to limit the ever increasing backlog.

Town of Bedford's Future Backlog Projection



Town of Bedford's Future PCI Projection



CONCLUDING REMARKS

The black line in the PCI figure above shows the network PCI since 2006 when Bedford started working with Stantec. Over this ten year period, it is evident the Town has succeeded in maintaining their overall network PCI by adhering to their pavement management strategy. The graph here shows the PCI at the same level as it was back in 2008. However, it also displays a steady increase in the Town's backlog. As mentioned earlier, a portion of this can be attributed to inflation, but the longer the backlog increases, the more difficult it will be to overcome.

Due to another increase in Structural Improvement mileage, it is recommended to address roadways in the capital construction categories. The funding analyses herein illustrate current funding levels of $1.425M will not sustain expected roadway expenditures causing an ever increasing backlog. It is recommended that the town should strive to fund an annual budget of $2.0M to continue its commitment to their pavement management plan and to maintain a healthy distribution of treatment band miles.

Historical Backlog	Avg. PCI	Avg. Mile Roadway Cost
$9,645,283	59	$132,672
$9,221,053	60	$126,837
$8,796,822	62	$121,002
$8,974,435	62	$123,445
$9,152,048	62	$125,888
$9,450,298	62	$129,990
$11,271,957	62	$155,048
$12,351,757	65	$169,900
$12,738,530	6	$175,220
$15,311,996	62.7	$210,619
$16,467,516	62.3	$226,513