Final Report

Pavement Management Study

North Castle, New York

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Introduction

The Town of North Castle New York retained the firm of VHB Engineering, Surveying and Landscape Architecture, P.C. (VHB) to perform pavement management services. A comprehensive study was undertaken to evaluate pavement conditions in North Castle and to allow for the analysis of various funding scenarios.

Under the scope of this project, VHB performed a detailed inspection of the condition of the pavement on 92.5 miles of Town maintained roads and entered this information into a customized pavement management database. The collected data was also linked to the town's Geographic Information System (GIS), so that thematic maps could be created to display any of the information in the town's new database.

This report describes the steps taken in this project, the results of the field evaluations, and also compares the results of some potential roadway funding scenarios.

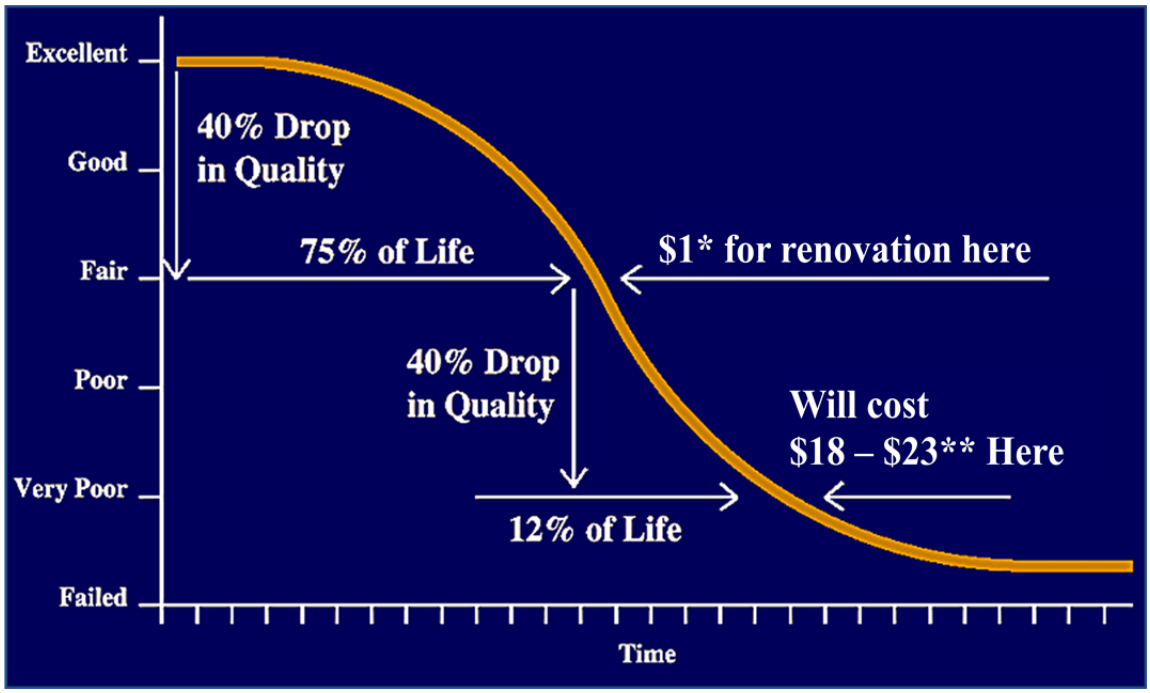
Theory of Pavement Management

Pavement management is the practice of planning for pavement repairs and maintenance with the goal of maximizing the value and life of a pavement network.

To accomplish this, a community needs to have several repair techniques in its arsenal and the knowledge of when to apply them. This is where pavement management comes into play. With a comprehensive database of road conditions, the pavement management software can model when to perform which repairs on a road network. Of course, engineering judgment is required to finalize any list of street repairs, as no computer model can take every variable analyzed in making a repair decision into account. The computer system is a great springboard to help a community start its repair program for each year and is an excellent method of storing the repair data.

The Pavement Deterioration Curve

Below is a model of how a street's pavement deteriorates over time. Interpreting the curve, a street starts out in excellent condition when it is newly constructed. Midway through its life, a low cost repair such as crack seal and full depth patch will cost approximately $1 per square yard. It takes only a few years for the window of opportunity to perform this low cost maintenance to pass after which the road would need an overlay costing $18-23 per square yard. By performing timely maintenance, road conditions can be improved today thereby extending the life of the road.



* assumes crack sealing

** assumes Mill & Overlay with no drainage or curbing improvements

Figure 1 - Typical Pavement Deterioration Curve

To expand a bit on the theory described in the chart above; a typical, low traffic, hot-mix asphalt road has an approximate useful life span of 20 years before needing to be rebuilt, if no preventative maintenance is performed. As will be discussed later in this report, it costs the Town of North Castle as much as $41 per square yard to reclaim a road. This rigorous restoration to the road equates to $2.05/square yard/year as it typically lasts for 20 years. However, it can cost the Town as little as $1.00 per square yard to seal cracks, which can add 5 years of life to a road, or $0.20/square yard/year.

Capital repair only vs. Maintenance Approach

Below is a sample life-cycle chart for a typical roadway that uses two different methods of repair. One method is coined here as "capital repair only". This assumes a rehabilitation method of overlaying a roadway approximately every 12 years at a cost of $23 per square yard. The second method uses pavement management theory and applies a crackseal as a maintenance repair when the road begins to show cracking. As this repair deteriorates in 3 – 5 years, the crackseal is reapplied until the roadway has more cracking than can be addressed with cracksealing at a cost of $1 per square yard. At this point, the road receives a mill and overlay and the maintenance process renews.

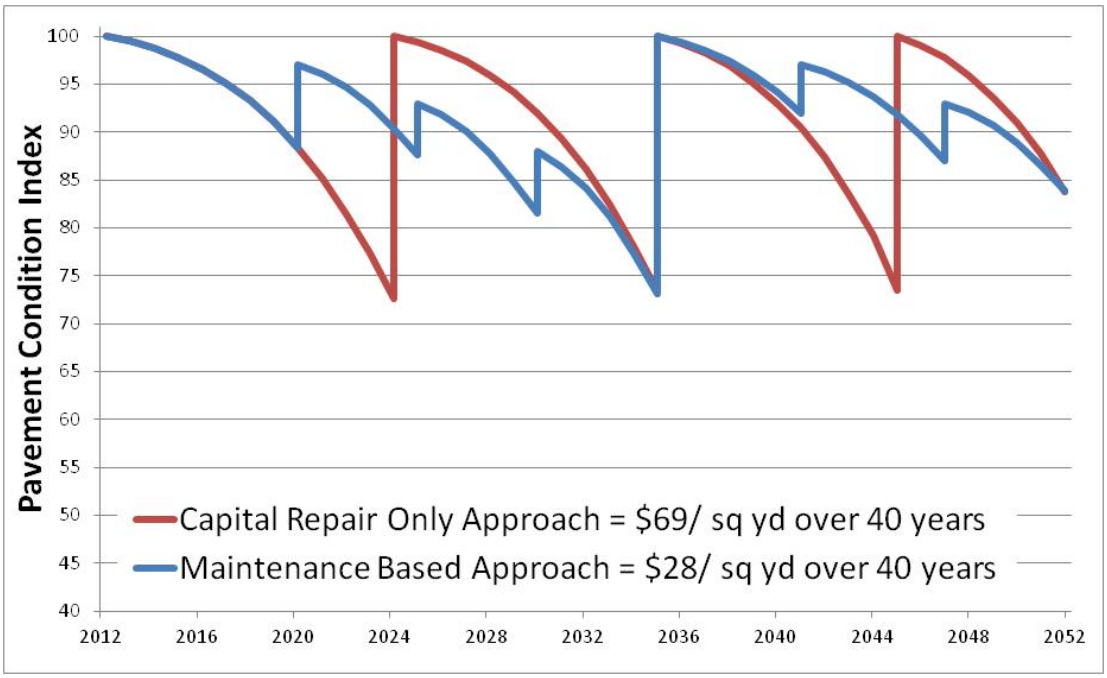


Figure 2 - 40-year Repair Approach Cost Comparison

The chart above estimates that in today's dollars, the pavement management approach will **save the Town 59%** over a capital repair only strategy.

2

Methodology

VHB performed a detailed condition evaluation on North Castle's 92.5 miles of Town maintained roads to build the pavement management system. The first step was to identify the Town maintained streets, thereby comprising the roadway network. The second step was to further break each street in the roadway network into pavement management sections. The third step was to carefully categorize, measure, and record the individual pavement distresses within each pavement management section. Finally, the fourth step was to customize the road repair unit costs within the pavement management software through discussions with Town officials. All these steps were performed prior to the study of future funding scenarios.

Network Identification

Network Identification builds an inventory of streets that describe the municipality's complete roadway network. The direction of travel, street length, width, ownership, classification, zone and pavement type are among the items identified at this initial phase in the pavement management process. This integral step ensures the streets surveyed are the definitive set to be analyzed.

Pavement Management Section Identification

Once the Network Identification is complete, the field work begins. Each street contains one or more pavement management sections. A pavement management section defines the limits of previous construction or maintenance activities within each street. Sections are defined by having the same width, typical distresses, functional class, etc. The goal is to set up homogenous areas of pavement to aid in assigning the appropriate repair. A street may be one section, or it may be comprised of several pavement management sections, depending on its construction history.

Surface Distress Assessment

For each pavement management section, the severity and extent of nine major pavement distresses are recorded, then entered into a weighted formula to arrive at a Pavement Condition Index (PCI). The distresses are categorized as base related or surface related distresses. Base related distresses indicate that the pavement base layer strength is inadequate for the existing traffic load. Streets that show significant base related distresses may need to have the pavement base layer strengthened or the street may need a thicker layer of pavement. Surface related distresses are caused by age and weathering of the pavement. Streets that have predominantly surface related distresses are excellent candidates for maintenance sealing to inhibit further pavement oxidization (the main effect of aging). Streets with more of the base related distresses will most likely need some full depth patching, structural overlays or reclamation.

The four base related distresses are:
- potholing or non-utility patching
- alligator cracking
- distortion
- rutting

The five surface related distresses are:
- block cracking
- transverse or longitudinal cracking
- bleeding or polished aggregate
- surface wear or raveling
- shoving, slippage or corrugation

PCI Defined

A PCI was generated for each inventoried pavement management section in North Castle using the surface distress data collected by VHB. PCI is measured on a scale of zero to one hundred, with one hundred representing a pavement in perfect condition and zero describing a road in impassable condition. Each type of observed pavement distress is assigned a deduct value based on the type, severity and extent of the distress.

PCI Calculation

A weighted sum of the deduct points is subtracted from the perfect "one hundred" road in order to generate a PCI for each pavement management section. In general, base related (pavement foundation) distresses are weighted more heavily than surface related distresses. For example, if 15% of a road section had medium severity "Alligator Cracking" it would receive a deduct of 40 points. Whereas the same area of "Block Cracking" would only receive a deduct of 15 points. The actual PCI calculation follows:

PCI = 100 – (Highest Deduct Value) – (25% of remaining base related deduct values) – (10% of remaining surface related deduct values)

The Five Treatment Bands

VHB uses broad ranges to group the individual repair types into five major treatment bands. Treatment bands are a useful tool to summarize data on a Town-wide basis. An individual road segment will fall into a particular category based on the strategy table's output of repair types and will vary due to functional classification. The goal is to gain a broad understanding of the existing conditions in simple yet meaningful terms.

Table 1 - Treatment Band Descriptions

TREATMENT BAND	PCI	Description
DO NOTHING	93-100	Excellent condition - in need of no maintenance.
ROUTINE MAINTENANCE	86-92	Good condition – may be in need of crack sealing or minor localized repair.
PREVENTIVE MAINTENANCE	73-85	Fair condition – pavement surface may be in need of surface sealing, full depth patch and/or crack sealing.
STRUCTURAL IMPROVEMENT	51-72	Deficient condition – pavement surface structure in need of added strength for existing traffic. Typical repairs are mill & overlay.
BASE REHABILITATION	0-50	Poor condition – in need of base improvement. Typical repairs are reclamation or full depth reconstruction.

Do Nothing

The Do Nothing category exhibits roads which are in need of no maintenance. These roads are in excellent condition and existing distresses generally do not need addressing.

Example of Do Nothing Treatment Band
Birch Grove Drive

Routine Maintenance

Routine maintenance activities are those which are taken to correct a specific pavement failure or area distress. Routine maintenance usually addresses localized pavement defects and includes activities such as:

- Full depth patching;
- Crack sealing.

Example of Routine Maintenance Treatment Band
Hallock Place

Preventive Maintenance

Preventive maintenance activities are those which are performed at planned intervals to protect and seal the pavement. Seals are designed to provide one or more of the following benefits:

- Prevent the intrusion of air and moisture;
- Fill small cracks and voids;
- Rejuvenate an oxidized binder;
- Provide a new wearing surface.

In addition to the current crackseal and patch repair technique, for this treatment band, the Town should consider using one or more of the following surface sealing treatments:

- Rubberized Chip Seal
- Cape Seal
- Microsurface
- Thin Overlay

Example of Preventive Maintenance Treatment Band
Thornwood Drive

Structural Improvement

Structural Improvement includes the work necessary to restore the pavement to a condition that will allow it to perform satisfactorily for several years. Generally a structural improvement will consist of milling the existing pavement down and applying a new Hot-mix Asphalt Overlay allowing existing grades to be maintained.

Structural improvements also include the work necessary to prepare the pavement for a mill & overlay. The major activities involved in the mill & overlay process are:

- Full depth patching and/or crack sealing.
- Grinding and milling
- Hot-mix Asphalt leveling courses.

Example of Structural Improvement Treatment Band
Evergreen Row

Base Rehabilitation

Base rehabilitation utilizes one of two methods:

- Reclamation;
- Reconstruction.

Reclamation is the process of rehabilitating existing deteriorated pavements. The existing pavement and base/subbase are pulverized and blended to create a homogenous pavement base. This reclaimed pavement base is then paved with a new hot-mix asphalt surface.

Reconstruction is the complete removal and replacement of a failed pavement, and might also involve widening, realignment, traffic control devices, safety hardware, and major base and drainage work.

Example of Base Rehabilitation Treatment Band
Woodcrest Drive

Customizing Repair Strategies

VHB met with the Town staff to review VHB's typical repair strategies, and to learn how to customize these strategies to meet the Town's specific needs. VHB also refined repair unit costs. VHB's goal was to understand North Castle's decision-making process and simulate that process in the budget analysis software based on the pavement condition and other criteria of each pavement section.

Preparing Budget Scenarios

Once the roadway conditions are inventoried and analyzed, and the repair strategies are defined, the impact of various spending programs on the roadway network is assessed. These studies can range from 1 to 20 years; however, for the purpose of this report 10-year studies are used. The purpose of the budget planning process is to determine the impact of various spending levels to find a funding level that will best meet North

Castle's needs. The budget module uses deterioration curves, unit costs, and the strategy tables developed in the repair strategy definition phase to assign each street a repair type and associated cost for each year of the study. The module also assigns each street a benefit value that is used to prioritize which streets the software will select for repair each year. **It is important to understand that the results of this study are based on a network-wide assessment, and are not intended to give definitive, final street-by-street repair recommendations. Field verification and testing are recommended to confirm any street repair list generated.**

The results of the budget analysis are two-fold. Pavement management deals with the life cycle of pavement structures and the various repair treatments to maintain the condition of the pavement. The pavement management system and the various repair types utilized in the study do not directly address other physical improvements associated with a roadway. Some of the items, which might be encountered on a roadway project, include the storm drainage system, traffic signals, sidewalks and utility adjustments. In an attempt to develop a reasonable cost of various improvements, the overall scope of a typical project associated with the various repair types was estimated to develop a network level unit cost for the work. **The actual scope of work and costs will vary for each individual roadway. Actual repair costs will need to be developed at the project level and may differ from costs utilized in this study.**

Deterioration Curves

In order to properly plan for future repairs, the budget analysis feature of the pavement management software utilizes deterioration curves. The deterioration curves estimate the rate at which the pavement condition decreases over time. These pavement deterioration curves depict two major categories of functional class - arterials and collectors in one curve and local roads in the other.

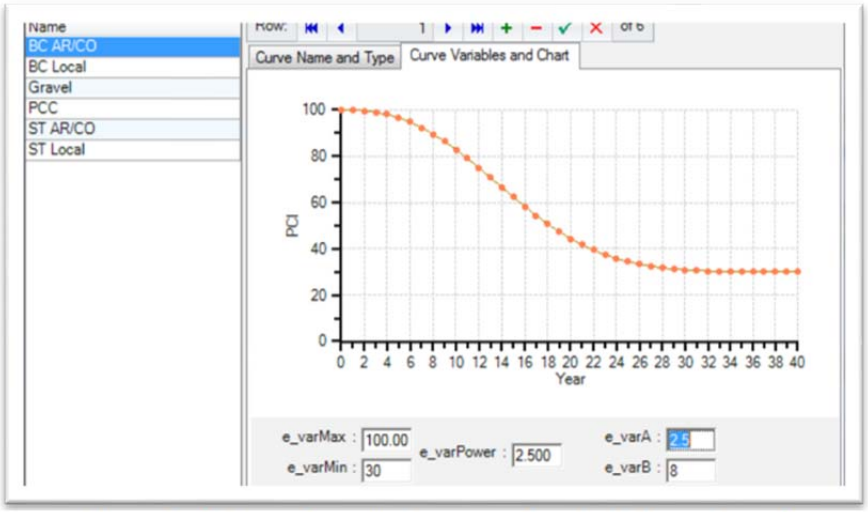


Figure 3 - Hot-mix Asphalt Concrete – Arterial/Collector Road

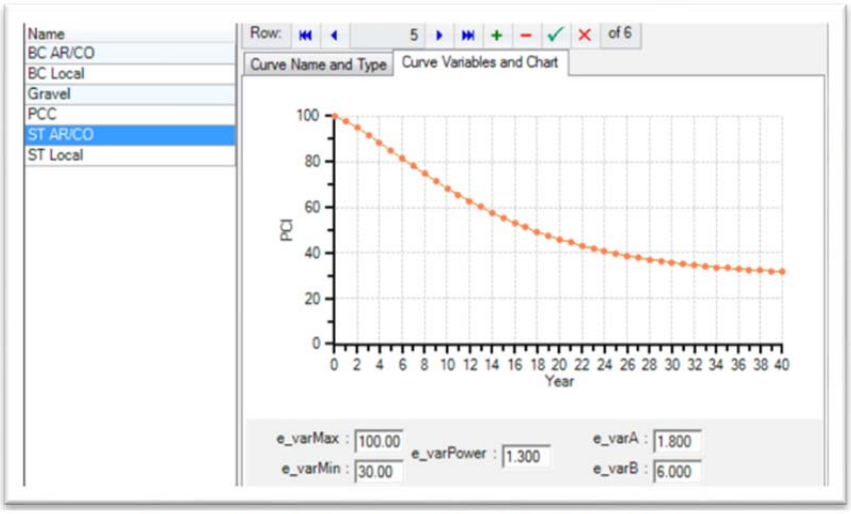


Figure 4 – Surface Treated – Arterial/Collector

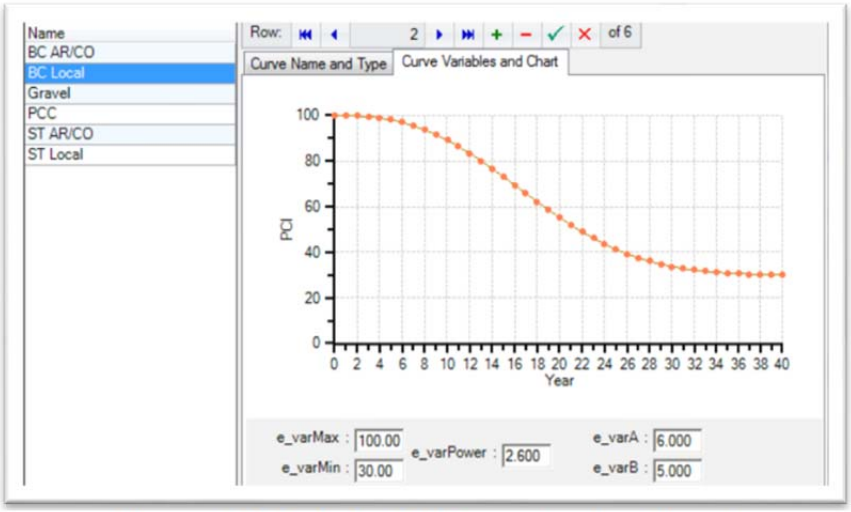


Figure 5 - Hot-mix Asphalt Concrete – Local Road

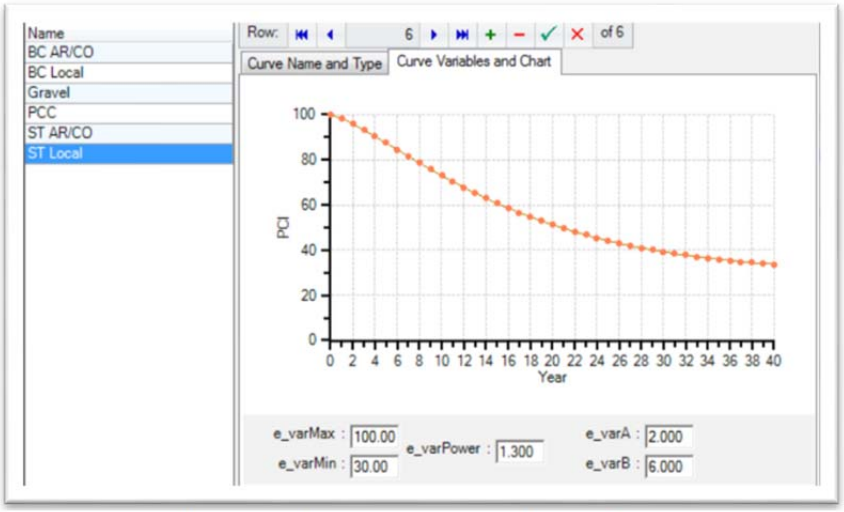


Figure 6 – Surface Treated – Local Road

Strategy Table

The pavement management software uses a table of repair strategies to assign specific road repair types to individual roadway segments. The repair strategy table incorporates PCI ranges as well as functional class and pavement type to simulate decisions consistent with North Castle's repair practices and procedures. Below is a summary of the tables currently in use.

Table 2 – Strategy Table Trigger Summary Table

PCI Range	Surface Type	Repair
93-100	HMA, Composite, Surface Treated	Do Nothing
86-92	HMA, Composite, Surface Treated	Routine Maintenance
73-85	HMA, Composite, Surface Treated	Thin Overlay
51-72	HMA, Composite, Surface Treated	Mill & Overlay
0-50	HMA, Composite, Surface Treated	Base Rehabilitation

Due to funding constraints, the Town has sometimes found it necessary to use stop gap "band-aid" treatments for roads in need of repair. For instance, it has often been necessary for Town Forces to place a leveling course and thin overlay on roads in poor condition (PCI's less than 72) in order to provide a passable surface rather than performing the recommended mill and overlay or base rehabilitation with drainage improvements.

Project Prioritization

The Budget Analysis module prioritizes needed system repairs based on the estimated "Benefit Value". The Benefit Value formula is calculated using variables representing traffic volume, repair service life, PCI, and unit repair costs for each pavement management section. For each plan year, the software prepares a future roadway condition projection, exhausts the assigned budget, and then produces an annual list of roads included in the repair program. The system also allows the user to enter an inflation rate to account for estimated increases in future year construction costs. A 4% inflation rate was used in this analysis.

The Benefit Value prioritization process generally favors cost effective maintenance alternatives. Repair actions are typically delayed on those sections that require reconstruction or major rehabilitation because the benefits for dollars spent are generally lower than maintenance candidates. After the relatively good roads are "saved", improvements are directed towards the poorer arterial and collector roads, and then to the local roads in need of major rehabilitation.

3

Existing Conditions

Town Roads Pavement Conditions

Based on the field evaluation of pavement conditions conducted by VHB, it was determined that the average PCI for North Castle's road network is a 65. It should be noted that even though there are a large number of road miles in need of major repair, the number of roads with a PCI between 71 and 90 (shown in the green and cyan) in Figure 7 shows the Town's need for maintenance program as well. In a few years, these streets will slip into the more expensive structural improvement categories. By performing a low cost maintenance treatment to these roads now, more expensive capital repairs can be significantly delayed.

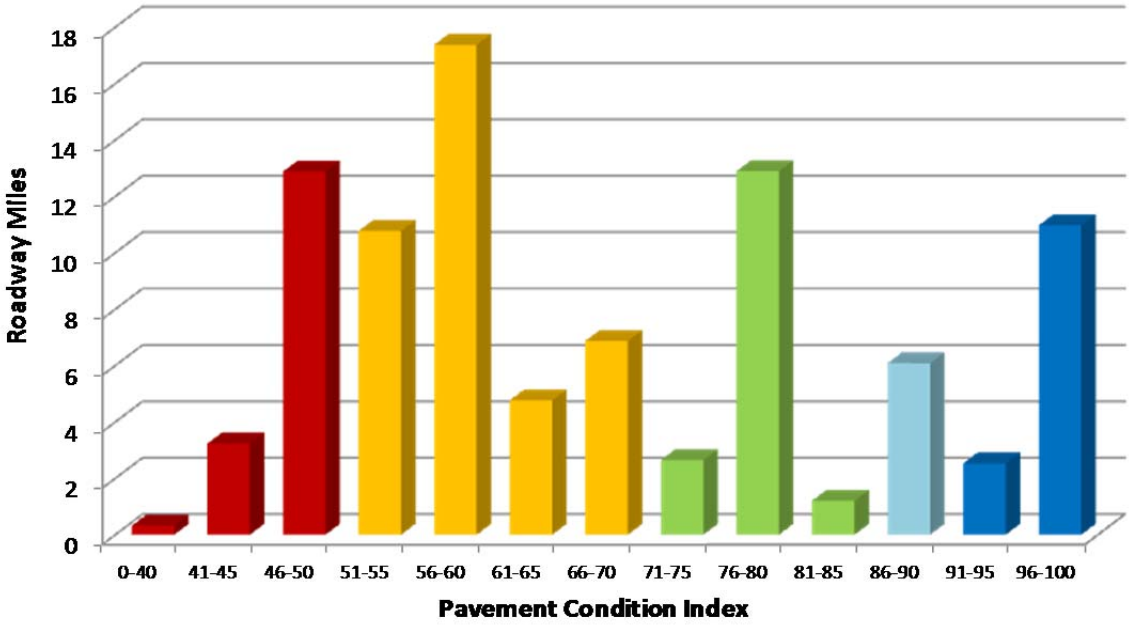


Figure 7 - PCI Distribution of All Town Roads

Backlog of Work

Applying the five treatment bands shown in Table 1 and unit costs referenced in Appendix B to North Castle's road network, a summary of outstanding work was

developed. The following table gives the miles and dollars associated with each treatment band for the conditions at the time of the evaluation.

Table 3 - Summary of Miles and Dollars of Outstanding Work

Treatment band	Miles	Cost
Do Nothing	12.6	$0
Routine Maintenance	4.7	$69,000
Preventive Maintenance	14.4	$1,469,000
Structural Improvement	38.8	$13,270,000
Base Rehabilitation	21.7	$10,978,000
Totals:	92.2	$25,786,000

The following two figures present the above information graphically.

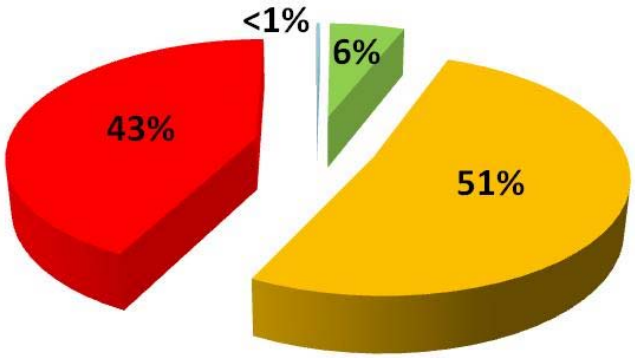


Figure 8 – Current Backlog Cost by Treatment Band

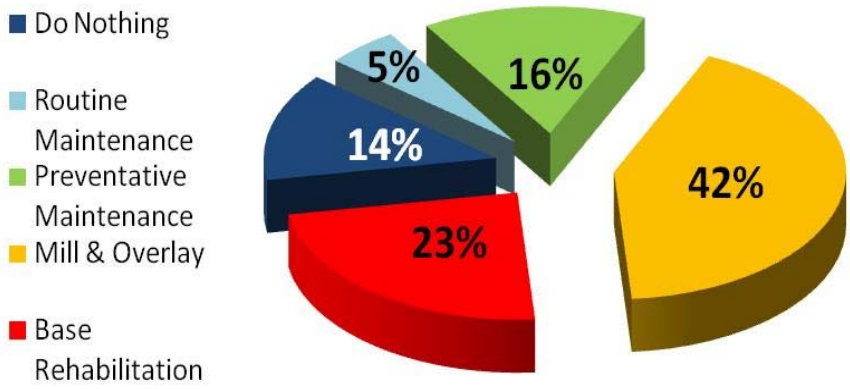


Figure 9 – Current Backlog Mileage by Treatment Band

Figures 8 and 9 show that while base rehabilitation represents 23% of the streets in miles, it represents 44% of the total cost. Base rehabilitation is the most expensive category of repair. Conversely, the routine maintenance repair band encompasses 5% of the miles and <1% of the total cost. **It makes good fiscal sense to spend the relatively small amount of funds to extend the lives of the roads in need of maintenance.**

GIS Map of Current Pavement Conditions

By linking the Town's pavement database to a GIS roadway centerline, VHB is able to create thematic maps to help in the analysis and presentation of the information within the database. The following map, which displays current pavement condition, is an example of the possible types of maps that can be generated.

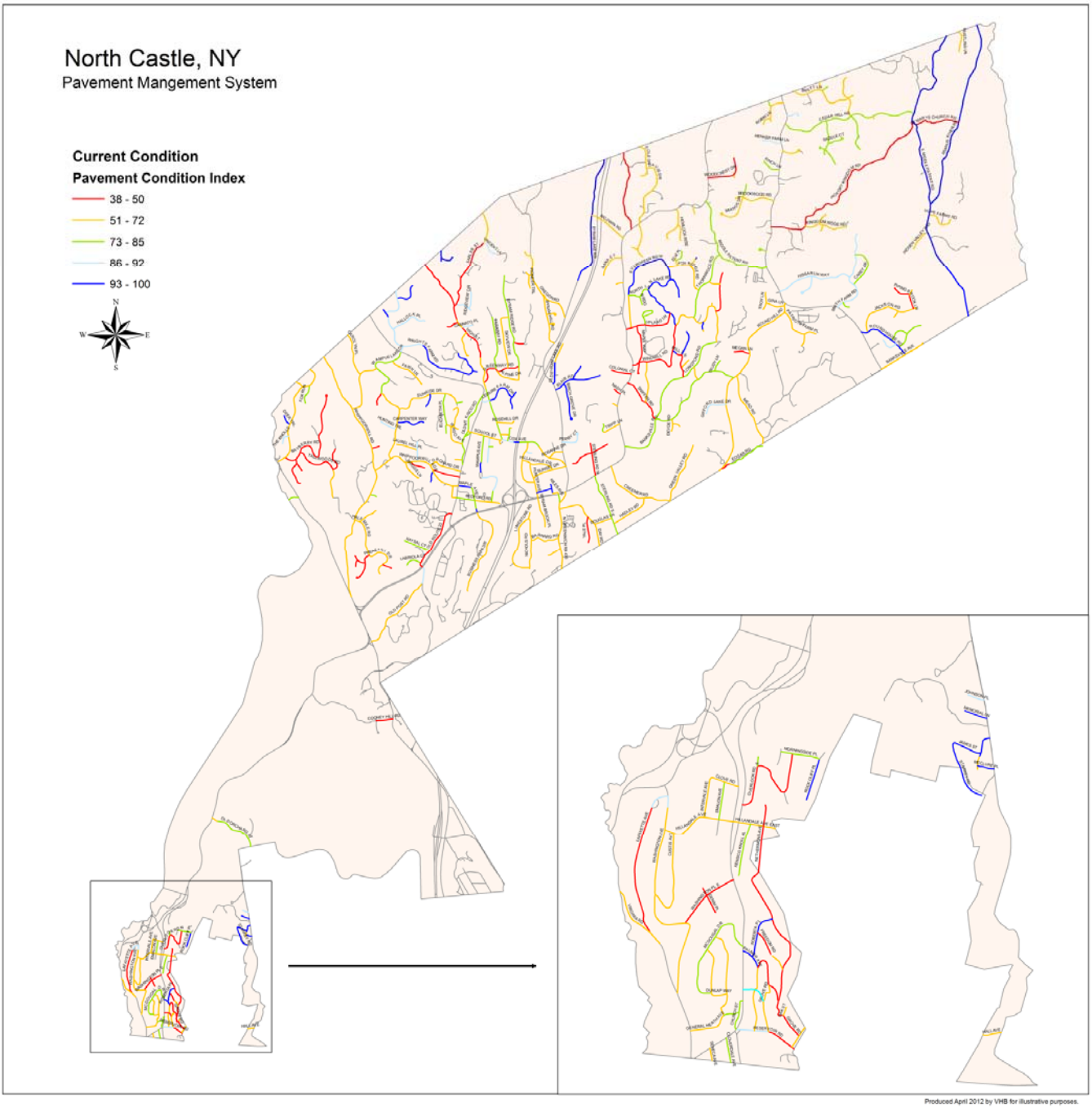


Figure 10 – Town-wide Pavement Condition Map

4

Budget Analysis

North Castle has a major investment in its 92.2 miles of Town-maintained roads. It is easy to forget that roadways are a community's single largest investment. Based on the unit cost established for reconstruction of North Castle's roads, without considering drainage, signs, signals, curbing, or sidewalks, it would cost North Castle at least $55 million in today's dollars to replace the existing Town accepted roadway infrastructure. The final phase of the pavement management process that VHB undertook for this report was the examination of various annual spending levels for pavement improvements.

"Fix it Right" vs "Band-aid" Strategies

The North Castle Highway Department has been resourceful and has stretched the number of road miles treated each year with the available funding by placing stop gap thin overlay treatments on roads in need of more substantial structural overlays and base rehabilitation. While these treatments improve the pavement surface for a short period of time, and in the case of severely distressed pavements can be necessary to correct an unsafe condition, they do not typically last long enough to make them a sustainable approach to maintaining a road network.

While the initial investment required for a "Fix it Right" approach is greater than the stop gap "Band Aid" approach, the cost per year of service will typically be less over time. With proper improvements to the roadway drainage system and base materials, the Town of North Castle roadway network could reach a condition in which a series of periodic maintenance and resurfacing treatments would maintain the roadway network in comparatively good condition at a relatively low cost.

Funding Scenarios Explored

VHB analyzed the effects of four different funding scenarios on the projected future overall pavement condition in Town:

Table 4 – Budget Scenario Funding Amounts

Year	Current Funding	Maintain PCI	Improve PCI 10 Pts	Improve PCI 18 Pts
2013	$350,000	$1,300,000	$2,300,000	$3,000,000
2014	$350,000	$1,300,000	$2,300,000	$3,000,000
2015	$350,000	$1,300,000	$2,300,000	$3,000,000
2016-22	$350,000	$1,300,000	$2,300,000	$3,000,000
Total	**$3.5M over 10 Years**	**$13.0M over 10 Years**	**$23.0M over 10 Years**	**$30M over 10 Years**

Budget Scenario Analysis Results

The following chart illustrates the predicted trend of the Town-wide pavement conditions over a ten year period given four funding scenarios.

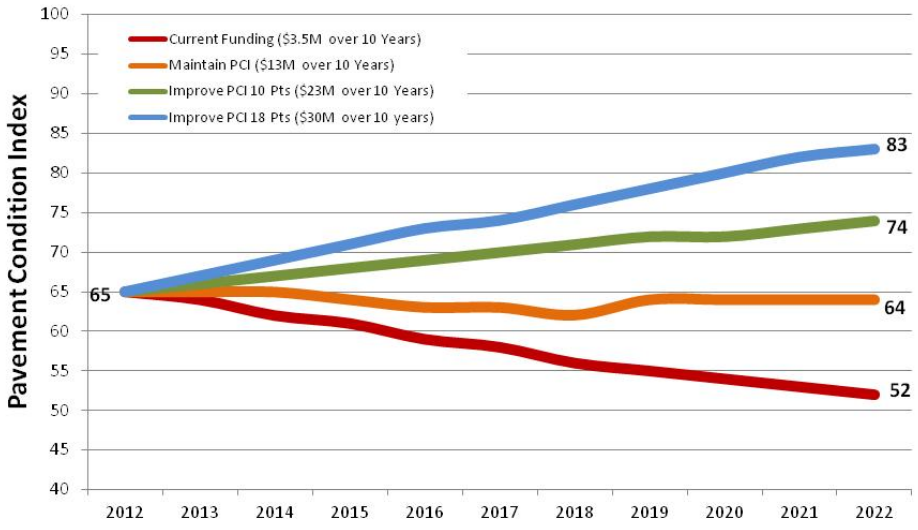


Figure 11 – Projected Pavement Condition Summary

It is up to the Town's decision makers to determine whether the Town's goal should be to maintain or improve the current PCI. At a minimum, **VHB recommends that the Town consider increasing the roadway budget from today's level** to avert further deterioration of the overall pavement conditions in the Town of North Castle.

5

Concluding Remarks

The Town of North Castle now has a pavement management system based on road condition data and descriptive information. The Town is urged to fully utilize the data that it possesses. The North Castle pavement management system gives Town decision-makers a picture of existing roadway infrastructure conditions and a dollar estimate to improve streets in poor condition while protecting those pavements already in good condition.

The findings of this study reveal a street network in fair condition with a significant backlog of work. North Castle should implement a routine and preventive maintenance program to prevent roads in good and fair condition today from deteriorating into the more expensive repair bands. Given that a large portion of the town's roadway network is in need of capital repair, the Town should consider implementing a larger capital improvement program over several years to address those roads in need of significant structural repairs. North Castle will benefit most from a balanced attack of maintenance, overlays, and base rehabilitation.

Recommendations

- **Budget adequate funds to achieve pavement condition goals**
- Make timely maintenance repairs
- Repair localized base problems before applying an overlay
- Address major rehabilitation needs as funding allows
- Develop multi-year road programs
- Coordinate with local utilities to perform upgrades and repairs in advance of projected construction projects
- Perform project level testing prior to major rehabilitation projects to ensure proper life of new pavement
- Provide for construction inspection at the plant and in the field to ensure quality material is provided and quality work is being performed
- Update database to reflect work that is done (maintains accuracy of system)
- Update pavement conditions at a minimum of every 4 years or 25% per year
- Track specific and overall conditions periodically
- Evaluate funding levels periodically

PLAN → ENGINEER → CONSTRUCT → MAINTAIN

6

Appendices

Appendix A – Street List

The following pages list each road segment included in this study with a description of the limits of the segment and the current pavement condition index deteriorated by the RoadManagerGPMS model to 10/2012 from the time of the field evaluation.

Name	Beginning Cross Street	Ending Cross Street	From Station	To Station	Length	Width	Pavement Class	Alternative	Cost	PCI
ALPINE DR	GREENWAY RD W	GREENWAY RD E	0	1791	1791	18	Local	Mill & Overlay Local	$46,982	52
ANNADALE ST	WHIPPERWILL RD E	MAIN ST	0	1336	1336	18	Local	Reclaim (Local)	$105,243	48
ANTHONY CT	SCHOOL ST	CUL DE SAC	0	195	195	20	Local	Mill & Overlay Local	$10,677	53
APPLE ORCHARD LN	SMITH FARM RD	CUL DE SAC	0	406	406	24	Local	Preventive Maintenance	$9,614	78
ARMONK HEIGHTS RD	SJKYVIEW DR	BYRAM RIDGE RD	0	372	372	20	Local	Mill & Overlay Local	$10,843	54
ARROWHEAD LN	WHIPPERWILL RD	CUL DE SAC	0	321	321	22	Local	Preventive Maintenance	$5,284	75
BALDWIN RD	ROUTE 22	BYRAM LAKE RD	0	1882	1882	26	Local	Mill & Overlay Local	$71,311	52
BANKS FARM RD	BEDFORD-BANKSVILLE RD	CUL DE SAC LOOP	0	1034	1034	26	Local	Mill & Overlay Local	$39,179	55
BANKSVILLE AVE	BEDFORD-BANKSVILLE RD	TOWN LINE	0	2374	2374	20	Local	Reclaim (Local)	$207,790	48
BANKSVILLE RD	ROUTE 22	SNIFFEN RD	0	2520	2520	22	Arterials	Preventive Maintenance	$41,481	75
BANKSVILLE RD	SNIFFEN RD	ROUND HILL RD	2520	7701	5181	24	Arterials	Mill & Overlay A/C	$304,778	72
BARNARD RD	NICHOLS RD	N GREENWICH RD	0	1409	1409	24	Local	Mill & Overlay Local	$49,282	55
BAYBERRY RD	WHIPPORWILL XING	CUL DE SAC LOOP	0	5533	5533	20	Local	Reclaim (Local)	$484,264	45
BEAL PL	GENERAL HEATH AV	CHURCH ST	0	264	264	20	Local	Preventive Maintenance	$3,950	77
BEDFORD RD	MAIN ST	MAPLE AV	0	878	878	29	Arterials	Mill & Overlay A/C	$62,429	71
BEDFORD RD	MAPLE AV	DEAD END	878	2079	1201	32	Collector	Mill & Overlay A/C	$94,192	61
BIRCH GROVE DR	BLAIR RD	CUL DE SAC LOOP	0	1957	1957	24	Local	Do Nothing	$0	97
BLAIR RD	BYRAM LAKE RD	CUL DE SAC	0	2334	2334	24	Local	Do Nothing	$0	98
BONNIE HILL LN	ROUTE 22	CUL DE SAC	0	337	337	21	Local	Mill & Overlay Local	$10,314	57
BRETT LN	TOWN LINE	CUL DE SAC	0	3346	3346	24	Local	Mill & Overlay Local	$121,558	55
BRIGGS LN	WHIPPERWILL RD E	CUL DE SAC	0	996	996	24	Local	Mill & Overlay Local	$34,836	56
BROOKWOOD RD	BEDFORD-BANKSVILLE RD	CUL DE SAC	0	1966	1966	24	Local	Mill & Overlay Local	$68,764	55
BRUNDAGE ST	HUNTER AV	NILES AV	0	738	738	20	Local	Do Nothing	$0	93
BUSINESS PARK DR	ROUTE 22	2635' S OF ROUTE 22	0	2635	2635	36	Collector	Mill & Overlay A/C	$232,530	63
BUSINESS PARK DR	2635' S OF ROUTE 22	DEAD END	2635	4556	1921	32	Collector	Mill & Overlay A/C	$150,673	57
BYRAM BROOK PL	ROUTE 22	CUL DE SAC	0	1470	1470	24	Local	Mill & Overlay Local	$56,712	54
BYRAM HILL RD	BYRAM LAKE RD	OREGON RD	0	2522	2522	20	Local	Mill & Overlay Local	$73,509	57
BYRAM LAKE RD	TOWN LINE	OREGON RD	0	6248	6248	30	Arterials	Do Nothing	$0	100
BYRAM RIDGE RD	GREENWAY RD	ARMONK HEIGHTS RD	0	2517	2517	20	Local	Preventive Maintenance	$37,664	74
BYRAM RIDGE RD	ARMONK HEIGHTS RD	CUL DE SAC	2517	4513	1996	20	Local	Preventive Maintenance	$30,819	76
BYRAM RIDGE RD SOUTH	COX AV	CLIFF PL	0	624	624	221	Local	Preventive Maintenance	$103,175	76
CANNATO PL	HIGH ST	DEAD END	0	508	508	20	Local	Routine Maintenance	$1,100	86
CAREY DR	SMITH FARM RD N	SMITH FARM RD S	0	2118	2118	24	Local	Preventive Maintenance	$38,031	76
CAROLYN PL	MEADOW HILL PL	TOWN LINE	0	2069	2069	24	Local	Mill & Overlay Local	$72,366	52

Name	Beginning Cross Street	Ending Cross Street	From Station	To Station	Length	Width	Pavement Class	Alternative	Cost	PCI
CARPENTER WAY	WAMPUS LAKE DR	CUL DE SAC	0	1349	1349	24	Local	Routine Maintenance	$3,505	92
CASTLE HEIGHTS PL	N BROADWAY	GROVE RD	0	453	453	20	Local	Reclaim (Local)	$39,650	46
CATS ROCK RD	HISSARLIK WAY	CUL DE SAC LOOP	0	1246	1246	24	Local	Routine Maintenance	$3,237	87
CEDAR HILL RD	BEDFORD-BANKSVILLE RD	HICKORY PASS	0	3548	3548	24	Local	Preventive Maintenance	$63,702	75
CEDAR HILL RD	HICKORY PASS	E MIDDLE PATENT RD	3548	6767	3219	24	Local	Preventive Maintenance	$57,804	74
CHESTNUT RIDGE RD	ROUTE 22	TOWN LINE	0	3912	3912	20	Local	Reclaim (Local)	$342,408	44
CHURCH ST	N BROADWAY	N BROADWAY	0	529	529	18	Local	Mill & Overlay Local	$13,877	72
CLIFF PL	BYRAM RIDGE RD S	DEAD END	0	69	69	22	Local	Mill & Overlay Local	$2,212	53
CLOVE RD	INTERVALE AV	MT KISCO RD	0	502	502	24	Local	Reclaim (Local)	$52,727	49
CLOVERDALE AVE	TOWN LINE	N BROADWAY	0	418	418	28	Local	Preventive Maintenance	$8,757	74
COBBLERS LN	HIGH ST	CUL DE SAC	0	1287	1287	24	Local	Mill & Overlay Local	$49,542	65
COLE DR	TOWN LINE	CUL DE SAC	0	1740	1740	22	Local	Mill & Overlay Local	$60,548	55
COLONIAL CT	ROUTE 22	CUL DE SAC	0	974	974	24	Local	Reclaim (Local)	$102,302	48
COONEY HILL RD	CUL DE SAC \ GATE	ROUTE 120	3744	4559	815	20	Local	Reclaim (Local)	$86,340	37
COX AVE	50' N OF BYRAM LAKE RD	593' E OF MARYLAND AV	1322	2961	1639	24	Arterials	Mill & Overlay A/C	$96,418	63
COX AVE	593' E OF MARYLAND AV	400' W OF MARYLAND AV	2961	3941	980	28	Arterials	Preventive Maintenance	$20,521	73
COX AVE	400' W OF MARYLAND AV	275' E OF BYRAM RIDGE RD S	3941	4259	318	30	Arterials	Do Nothing	$0	99
COX AVE	SCHOOL ST	275' E OF BYRAM RIDGE RD S	4259	4812	554	34	Arterials	Routine Maintenance	$2,038	86
COX AVE	275' E OF BYRAM RIDGE RD S	HIGH ST	4812	7387	2575	22	Arterials	Preventive Maintenance	$42,376	74
CREEMER RD	CT STATE LINE	ROUTE 22	0	3692	3692	22	Arterials	Mill & Overlay A/C	$199,104	56
CREST CT	WOODCREST DR	CUL DE SAC	0	151	151	25	Local	Mill & Overlay Local	$11,494	57
CROSS RD N	OLD MY KISCO RD	MAIN ST	0	183	183	18	Local	Mill & Overlay Local	$4,801	52
CROSS RD S	OLD MT KISCO RD	MAIN ST	0	346	346	22	Local	Preventive Maintenance	$5,695	75
CUSTIS AVE	WASHINGTON AV	HILLANDALE AV	0	1614	1614	22	Local	Reclaim (Local)	$155,396	49
DAVIS DR	ROUTE 22	COLE DR	0	3316	3316	24	Local	Mill & Overlay Local	$115,982	65
DAY RD	N GREENWICH RD	CT STATE LINE	0	3234	3234	20	Local	Mill & Overlay Local	$94,261	56
DEER RIDGE LA	SUNRISE DR	DEAD END	0	631	631	15	Local	Do Nothing	$0	93
DEER TRL	WHIPPORWILL XING	CUL DE SAC	0	512	512	24	Local	Do Nothing	$0	97
DELLWOOD FARM WAY	HAMMOND RIDGE RD	CUL DE SAC	0	1562	1562	24	Local	Do Nothing	$0	97
DENIM PL	DEAD END N	DEAD END S	0	459	459	19	Local	Reclaim (Local)	$38,166	46
DEVOE RD	SNIFFEN RD	CUL DE SAC	0	585	585	23	Local	Mill & Overlay Local	$22,871	57
DOGWOOD DR	FOX RIDGE RD	100' S OF CUL DE SAC	0	445	445	24	Local	Mill & Overlay Local	$15,554	57

Name	Beginning Cross Street	Ending Cross Street	From Station	To Station	Length	Width	Pavement Class	Alternative	Cost	PCI
DOGWOOD DR	100' S OF CUL DE SAC	CUL DE SAC	439	539	100	24	Local	Routine Maintenance	$715	92
DOUGLAS LN	DAY RD	STERLING RD S	0	875	875	23	Local	Mill & Overlay Local	$29,329	67
DUNLAP WAY	SMALLWOOD PL	GENERAL HEALTH AV	0	281	281	17	Local	Mill & Overlay Local	$6,962	54
E MIDDLE PATENT RD	STATE LINE	1257' N OF STATE LINE	0	1258	1258	20	Local	Do Nothing	$0	100
E MIDDLE PATENT RD	1257' N OF STATE LINE	1732' N OF STATE LINE	1258	1733	475	20	Local	Do Nothing	$0	100
E MIDDLE PATENT RD	1732' N OF STATE LINE	2192' N OF STATE LINE	1733	2193	460	20	Local	Do Nothing	$0	100
E MIDDLE PATENT RD	2192' N OF STATE LINE	2701' N OF STATE LINE	2193	2701	509	20	Local	Do Nothing	$0	100
E MIDDLE PATENT RD	2701' N OF STATE LINE	3007' N OF STATE LINE	2701	3007	306	20	Local	Do Nothing	$0	100
E MIDDLE PATENT RD	3007' N OF STATE LINE	3171' N OF STATE LINE	3007	3172	165	20	Local	Do Nothing	$0	100
E MIDDLE PATENT RD	3171' N OF STATE LINE	3426' N OF STATE LINE	3172	3426	254	20	Local	Do Nothing	$0	100
E MIDDLE PATENT RD	3426' N OF STATE LINE	3693' N OF STATE LINE	3426	3694	267	20	Local	Do Nothing	$0	100
E MIDDLE PATENT RD	3693' N OF STATE LINE	4164' N OF STATE LINE	3694	4165	471	20	Local	Do Nothing	$0	100
E MIDDLE PATENT RD	4164' N OF STATE LINE	85' N OF HIDDEN VALLEY WAY	4165	4680	515	20	Local	Do Nothing	$0	100
E MIDDLE PATENT RD	85' N OF HIDDEN VALLEY WAY	250' N OF HOPE FARMS RD	4680	5741	1061	20	Local	Do Nothing	$0	100
E MIDDLE PATENT RD	250' N OF HOPE FARMS RD	CEDAR HILL RD	5741	10605	4864	20	Local	Do Nothing	$0	100
E MIDDLE PATENT RD	CEDAR HILL RD	TOWN LINE	10605	15230	4625	20	Local	Do Nothing	$0	100
EDEN HUNT PL	OLD MT KISCO RD	CUL DE SAC	0	349	349	20	Local	Mill & Overlay Local	$15,166	65
EDGAR RD	STATE LINE	475' E OF ROUND HILL RD	0	1839	1839	15	Local	Preventive Maintenance	$20,635	74
EDGAR RD	475' E OF ROUND HILL RD	ROUND HILL RD	1839	2312	473	15	Local	Reclaim (Local)	$31,070	45
EIGHTH MILE ROAD	QUARTER MILES RD	CUL DE SAC	0	323	323	20	Local	Reclaim (Local)	$29,419	40
ELIZABETH PL	SUNRISE DR	DEAD END	0	1957	1957	24	Local	Preventive Maintenance	$35,140	75
ELM PL	FOX RIDGE CT	CUL DE SAC	0	613	613	22	Local	Preventive Maintenance	$12,161	76
EMALON AVE	CLOVE RD	HILLANDALE AV	0	635	635	25	Local	Preventive Maintenance	$11,877	82
EMBASSY CT	ROUTE 22	CUL DE SAC	0	345	345	24	Local	Mill & Overlay Local	$12,067	55
EVANS PL	BYRAM HILL PL	CUL DE SAC LOOP	0	672	672	24	Local	Mill & Overlay Local	$23,504	54
EVERGREEN ROW	UPLAND LA	NORTH LA	0	1578	1578	22	Local	Mill & Overlay Local	$50,581	58
EVERGREEN ROW	NORTH LA	N LAKE RD	1578	5452	3874	22	Local	Do Nothing	$0	100
FARAWAY RD	GREENWAY RD	1652' N OF GREENWAY RD	0	1653	1653	18	Local	Preventive Maintenance	$22,254	76
FARAWAY RD	1652' N OF GREENWAY RD	GATE/PRIVATE PROPERTY	1653	2523	870	20	Local	Preventive Maintenance	$13,020	75
FAWN LN	WAMPUS LAKE DR	CUL DE SAC	0	1844	1844	20	Local	Mill & Overlay Local	$59,539	64
FERRIS LN	BRETT LA	TOWN LINE	0	375	375	24	Local	Mill & Overlay Local	$13,116	56
FINCH LN	BEDFORD-BANKSVILLE	CUL DE SAC	0	903	903	24	Local	Preventive Maintenance	$18,538	76

Name	Beginning Cross Street	Ending Cross Street	From Station	To Station	Length	Width	Pavement Class	Alternative	Cost	PCI
	RD									
FOX RIDGE CT	FOX RIDGE RD	CUL DE SAC	0	408	408	24	Local	Mill & Overlay Local	$19,567	67
FOX RIDGE RD	THORNWOOD RD	EVERGREEN ROW	0	2422	2422	22	Local	Mill & Overlay Local	$77,653	58
FOX RUN	WHIPPORWILL XING	DEAD END	0	901	901	24	Local	Preventive Maintenance	$16,178	75
FREEDOM RD	ROBERTA PL	DEAD END	0	424	424	21	Local	Reclaim (Local)	$38,967	48
FREEDON RD SOUTH	NETHERMONT AV	DEAD END	0	291	291	19	Local	Reclaim (Local)	$24,197	48
FROG ROCK RD	WHIPPORWILL XING	TOWN LINE	0	403	403	25	Local	Mill & Overlay Local	$14,683	55
GENE CURRY DR	BEDFORD-BANKSVILLE RD	CUL DE SAC	0	665	665	24	Local	Routine Maintenance	$2,183	86
GENERAL HEATH AVE	VIRGINIA RD	DUNLAP WAY	0	1095	1095	24	Local	Mill & Overlay Local	$38,296	52
GENERAL HEATH AVE	DUNLAP WAY	MCDOUGAL DR	1095	2138	1043	20	Local	Mill & Overlay Local	$30,403	61
GEORGE SMITH	OLD ROUTE 22	GATE	0	116	116	20	Local	Routine Maintenance	$252	86
GIFFORD LAKE DR	ROUND HILL RD	CUL DE SAC	0	1235	1235	24	Local	Routine Maintenance	$3,664	87
GINA LN	ROUND HILL RD	TROY LA	0	923	923	24	Local	Mill & Overlay Local	$32,283	57
GLENDALE AVE	SCHOOL ST	CUL DE SAC	0	1190	1190	20	Local	Routine Maintenance	$2,577	86
GREEN VALLEY RD	CREEMER RD	CUL DE SAC	0	2973	2973	22	Local	Mill & Overlay Local	$95,319	63
GREENWAY RD	HIGH ST	ALPINE DR	0	1304	1304	24	Local	Reclaim (Local)	$136,932	46
GREENWAY RD	ALPINE DR	BYRAM RIDGE RD	1304	2357	1053	24	Local	Reclaim (Local)	$110,612	44
GRESSEL PL	DEAD END	N GREENWICH RD	0	596	596	24	Local	Mill & Overlay Local	$20,846	63
GROVE RD	GROVE RD	ROCKLEDGE RD	0	329	329	19	Local	Reclaim (Local)	$27,357	49
GROVE RD	PALMER AV	LAKEVIEW DR N	0	1712	1712	18	Local	Reclaim (Local)	$134,862	44
HADLEY RD	STERLING RD S	CREEMER RD	0	2006	2006	24	Local	Mill & Overlay Local	$70,163	56
HALF MILE RD	WHIPPORWILL RD	PHEASANT DR	0	2025	2025	24	Local	Mill & Overlay Local	$70,831	56
HALF MILE RD	PHEASANT DR	CUL DE SAC LOOP	2025	3539	1514	20	Local	Reclaim (Local)	$132,508	48
HALL AVE	TOWN LINE	TOWN LINE	0	315	315	16	Local	Mill & Overlay Local	$7,345	55
HALLOCK PL	WRIGHTS FARM RD	CUL DE SAC	0	1764	1764	23	Local	Preventive Maintenance	$33,565	85
HAMMOND RIDGE RD	TOWN LINE	CUL DE SAC	0	513	513	24	Local	Do Nothing	$0	97
HARDSCRABBLE CIR	UPLAND RD	CUL DE SAC LOOP	0	1629	1629	24	Local	Preventive Maintenance	$29,250	75
HEMLOCK HOLLOW	ROUTE 22	HEMLOCK HOLLOW PL	0	1503	1503	27	Local	Mill & Overlay Local	$59,141	55
HEMLOCK HOLLOW PL	HEMLOCK HOLLOW	CUL DE SAC	0	230	230	24	Local	Mill & Overlay Local	$13,341	58
HEMLOCK RISE	HEMLOCK HOLLOW	CUL DE SAC	0	825	825	24	Local	Mill & Overlay Local	$28,856	55
HENKER FARM LN	BEDFORD-BANKSVILLE RD	CUL DE SAC	0	941	941	24	Local	Preventive Maintenance	$20,040	83
HERGENHAN CT	WINTER FARM RD	CUL DE SAC	0	304	304	22	Local	Preventive Maintenance	$5,004	75
HICKORY KINGDOM RD	BEDFORD-BANKSVILLE RD	HOUSE 108	0	5276	5276	20	Local	Reclaim (Local)	$461,795	48
HICKORY KINGDOM RD	HOUSE 108	E MIDDLE PATENT RD	5276	9818	4542	20	Local	Reclaim (Local)	$397,509	48
HICKORY PASS	TOWN LINE	CEDAR HILL RD	0	2119	2119	24	Local	Mill & Overlay Local	$74,108	65

Name	Beginning Cross Street	Ending Cross Street	From Station	To Station	Length	Width	Pavement Class	Alternative	Cost	PCI
HICKORY PASS	CEDAR HILL RD	CUL DE SAC	2119	3950	1831	24	Local	Preventive Maintenance	$35,600	74
HIDDEN OAK LN	HIDDEN OAK RD	DEAD END	0	440	440	20	Local	Reclaim (Local)	$38,512	46
HIDDEN OAK RD	STONE HOLLOW WAY	DEAD END	0	1393	1393	15	Local	Reclaim (Local)	$91,444	48
HIDDEN VALLEY WAY	E MIDDLE PATENT RD	CUL DE SAC	0	1064	1064	24	Local	Mill & Overlay Local	$37,215	57
HIGH ST	COX AV	1206' N OF GREENWAY RD	0	1556	1556	22	Local	Mill & Overlay Local	$49,888	53
HIGH ST	1206' N OF GREENWAY RD	CANNATO PL	1556	3370	1814	18	Local	Reclaim (Local)	$142,929	44
HIGH ST	CANNATO PL	150' N OF WAYNE VALLEY RD	3370	3800	430	20	Local	Mill & Overlay Local	$12,522	67
HIGH ST	150' N OF WAYNE VALLEY RD	TOWN LINE	3800	7013	3213	20	Local	Reclaim (Local)	$281,217	45
HILLANDALE AVE	WASHINGTON AV	ROUTE 22	0	1373	1373	24	Local	Mill & Overlay Local	$48,023	52
HILLANDALE AVE EAST	MT KISCO RD	DEAD END	0	621	621	23	Local	Mill & Overlay Local	$20,815	52
HILLANDALE DR	SUNSET DR	MARYLAND AV	0	1607	1607	20	Local	Mill & Overlay Local	$46,839	57
HILLVIEW CT	WRIGHTS FARM RD	CUL DE SAC	0	226	226	24	Local	Do Nothing	$0	97
HISSARLIK WAY	BEDFORD-BANKSVILLE RD	1567' W OF SMITH FARM RD	0	2124	2124	26	Local	Routine Maintenance	$5,978	86
HISSARLIK WAY	1567' W OF SMITH FARM RD	SMITH FARM RD	2124	3691	1567	26	Local	Routine Maintenance	$4,412	86
HOBBY FARMS DR	ROUND HOUSE RD	CUL DE SAC	0	1578	1578	26	Local	Preventive Maintenance	$33,705	76
HOBBY LN	ROUND HOUSE RD	HOBBY FARM DR	0	1027	1027	24	Local	Preventive Maintenance	$18,441	76
HOLLOW RIDGE RD	WRIGHTS FARM RD	TOWN LINE	0	1586	1586	24	Local	Routine Maintenance	$4,121	86
HOPE FARMS RD	E MIDDLE PATENT RD	CUL DE SAC	0	1393	1393	24	Local	Mill & Overlay Local	$54,019	63
HUNTER AVE	ROUTE 22	HILLANDALE DR	0	1655	1655	22	Local	Mill & Overlay Local	$53,062	55
HUNTER DR	BYRAM RIDGE DR	CUL DE SAC	0	474	474	20	Local	Reclaim (Local)	$41,488	42
HUNTING TRL	WUMPUS LAKE DR	CUL DE SAC	0	823	823	24	Local	Routine Maintenance	$2,139	86
ILANA CT	ROUTE 22	CUL DE SAC	0	1415	1415	26	Local	Mill & Overlay Local	$61,273	57
INTERVALE AVE	HILLANDALE AV	CLOVE RD	0	654	654	24	Local	Mill & Overlay Local	$22,875	51
JACKSON RD	ROUND HOUSE RD	CUL DE SAC	0	3316	3316	21	Local	Reclaim (Local)	$319,399	49
JAMES ST	WILLIAM ST	STARKEY RD	0	492	492	19	Local	Do Nothing	$0	100
JEANNE PL	GLENDALE AV	CUL DE SAC	0	197	197	25	Local	Preventive Maintenance	$7,690	74
JOHNSON PL	ORCHARD ST	DEAD END	0	285	285	14	Local	Routine Maintenance	$432	87
KAVEY LN	WAGO RD	KAVEY PL	0	1086	1086	24	Local	Mill & Overlay Local	$37,984	53
KAVEY PL	KAVEY LA	CUL DE SAC	0	234	234	23	Local	Mill & Overlay Local	$11,768	58
KAYSAL CT	OLD ROUTE 22	CUL DE SAC	0	1319	1319	27	Local	Preventive Maintenance	$31,002	75
KENSICO KNOLL PL	HILLANDALE AVE EAST	CUL DE SAC	0	894	894	24	Local	Preventive Maintenance	$17,368	77
KENT PL	MAIN ST	MAPLE AV	0	774	774	28	Local	Mill & Overlay Local	$31,584	51

Name	Beginning Cross Street	Ending Cross Street	From Station	To Station	Length	Width	Pavement Class	Alternative	Cost	PCI
KINGDOM RIDGE RD	HICKORY KINGDOM RD	CUL DE SAC	0	2109	2109	24	Local	Mill & Overlay Local	$78,293	56
LABRIOLA CT	OLD ROUTE 22	CUL DE SAC	0	789	789	28	Local	Mill & Overlay Local	$41,557	72
LAFAYETTE AVE	VIRGINIA RD	372' S OF WASHINGTON AV	0	2180	2180	25	Arterials	Reclaim	$238,491	46
LAKEVIEW DR N	RESERVOIR RD	DEAD END	0	394	394	20	Local	Reclaim (Local)	$34,486	49
LANDER PL	MARYLAND AV	DEAD END	0	313	313	22	Local	Routine Maintenance	$746	87
LAUREL HILL PL	STONY BROOK PL	CUL DE SAC	0	1036	1036	24	Local	Mill & Overlay Local	$42,359	65
LEATHERMANS CT	PHEASANT DR	CUL DE SAC	0	446	446	24	Local	Reclaim (Local)	$46,845	46
LEDGEWOOD PL	HWIPPERWILL RD	CUL DE SAC	0	370	370	20	Local	Reclaim (Local)	$43,101	39
LEISURE FARM DR	MAIN ST	COX AV	0	383	383	24	Local	Preventive Maintenance	$6,879	85
LEISURE FARM DR	COX AV	QUAKER MEETING HOUSE RD	383	2014	1631	24	Local	Routine Maintenance	$4,238	91
LIMESTONE RD	DEAD END N	NICHOLS RD S	0	3648	3648	24	Local	Mill & Overlay Local	$127,594	55
LONG POND CT	WINDMILL RD	100' N OF CUL DE SAC	0	348	348	20	Local	Do Nothing	$0	100
LONG POND CT	100' N OF CUL DE SAC	CUL DE SAC	348	449	101	20	Local	Mill & Overlay Local	$9,583	54
LONG POND RD	WINDMILL RD	BANKSVILLE RD	0	5171	5171	22	Local	Preventive Maintenance	$85,113	80
LYONS CT	LYONS RD	CUL DE SAC	0	304	304	24	Local	Mill & Overlay Local	$10,633	57
LYONS RD	ROUTE 22	CUL DE SAC	0	1738	1738	24	Local	Mill & Overlay Local	$66,912	57
MACDONALD AVE	BEDFORD RD	530' N OF BEDFORD RD	0	530	530	24	Arterials	Preventive Maintenance	$9,513	75
MACDONALD AVE	530' N OF BEDFORD RD	730' E OF SCHOOL PARKING	530	1211	681	24	Arterials	Preventive Maintenance	$12,226	83
MACDONALD AVE	730' E OF SCHOOL PARKING	SCHOOL PARKING	1211	1940	729	27	Arterials	Preventive Maintenance	$14,727	85
MAPLE AVE	MAIN ST	641' E OF MAIN ST	0	642	642	26	Arterials	Do Nothing	$0	100
MAPLE AVE	641' E OF MAIN ST	BEDFORD RD	642	1284	642	25	Arterials	Preventive Maintenance	$12,008	73
MAPLE AVE	BEDFORD RD	176' N OF ROUTE 22	1284	1671	387	36	Arterials	Mill & Overlay A/C	$34,160	70
MAPLE AVE	176' N OF ROUTE 22	ROUTE 22	1671	1847	176	36	Arterials	Do Nothing	$0	97
MAPLE WAY	WINDMILL RD	UPLAND LA	0	1841	1841	22	Local	Reclaim (Local)	$177,252	46
MARYLAND AVE	COX AV	HUNTER AV	0	2441	2441	24	Local	Mill & Overlay Local	$85,377	55
MCCLURE PL	WILLIAMS ST	ORCHARD ST	0	285	285	12	Local	Do Nothing	$0	100
MCDOUGAL DR	SMALLWOOD PL	N BROADWAY	0	2033	2033	19	Local	Mill & Overlay Local	$56,293	72
MEAD RD	ROUND HILL RD	STATE LINE	0	3603	3603	20	Local	Mill & Overlay Local	$105,017	65
MEADOW DR	COX RD	BYRAM RIDGE RD S	0	425	425	20	Local	Mill & Overlay Local	$12,387	65
MEADOW HILL PL	WHIPPERWILL RD	WAMPUS LAKE DR	0	2845	2845	214	Local	Mill & Overlay Local	$887,278	52
MEADOW LARK LN	BEDFORD-BANKSVILLE RD	CUL DE SAC LOOP	0	539	539	26	Local	Preventive Maintenance	$10,485	73
MEGAN LN	ROUND HILL RD	CUL DE SAC	0	772	772	24	Local	Reclaim (Local)	$81,086	47
MEMORIAL LN	ORCHARD ST	DEAD END	0	388	388	14	Local	Do Nothing	$0	93

Name	Beginning Cross Street	Ending Cross Street	From Station	To Station	Length	Width	Pavement Class	Alternative	Cost	PCI
MIANUS DR	CUL DE SAC N	BROOKWOOD RD	0	634	634	24	Local	Preventive Maintenance	$11,379	74
MIANUS DR	BROOKWOOD RD	CUL DE SAC LOOP (S)	634	2554	1920	24	Local	Mill & Overlay Local	$67,165	54
MIANUS RIVER RD	E MIDDLE PATENT RD	2731' S OF TOWN LINE	0	6500	6500	20	Local	Do Nothing	$0	100
MIANUS RIVER RD	2731' S OF TOWN LINE	2090' S OF TOWN LINE	6500	7141	641	20	Local	Do Nothing	$0	100
MIANUS RIVER RD	2090' S OF TOWN LINE	TOWN LINE	7141	9231	2090	23	Local	Do Nothing	$0	100
MICA PL	KINGDOM RIDGE RD	CUL DE SAC	0	321	321	24	Local	Mill & Overlay Local	$14,388	55
MIDDLE PATENT RD	ROUTE 22	BEDFORD-BANKVILLE RD	0	5233	5233	20	Arterials	Mill & Overlay A/C	$256,552	72
MILL LN	WINDMILL RD	265' E OF WINDMILL RD	0	265	265	22	Local	Do Nothing	$0	100
MILL LN	265' E OF WINDMILL RD	LONG POND RD	265	1605	1340	22	Local	Reclaim (Local)	$129,039	48
MORNINGSIDE PL	VALHALLA PL	ROCK CLIFF PL	0	655	655	24	Local	Preventive Maintenance	$11,761	73
MUSKETT CT	BRETT LA	CUL DE SAC	0	340	340	26	Local	Mill & Overlay Local	$18,744	72
N GREENWICH RD 433	ROUTE 22	GRESSEL PL	0	359	359	26	Collector	Preventive Maintenance	$6,991	73
N GREENWICH RD 433	GRESSEL PL	CT STATE LINE	359	3666	3307	23	Arterials	Reclaim	$332,831	50
N LAKE RD	WINDMILL RD	600' N OF UPLAND RD	0	1264	1264	24	Local	Do Nothing	$0	100
N LAKE RD	600' N OF UPLAND RD	50' S OF NORTH LA	1264	2261	997	24	Local	Routine Maintenance	$2,591	92
N LAKE RD	50' S OF NORTH LA	CUL DE SAC	2261	4839	2578	24	Local	Do Nothing	$0	100
N RDG	NORTH LA	CUL DE SAC	0	405	405	20	Local	Preventive Maintenance	$9,473	76
NANNAHAGAN RD	TOWN LINE	ROUTE 120	0	507	507	24	Collector	Mill & Overlay A/C	$29,827	71
NASH PL	ROUTE 22	CUL DE SAC	0	373	373	24	Local	Reclaim (Local)	$52,773	48
NETHERMONT AVE	GROVE RD	DEAD END	0	3575	3575	19	Local	Reclaim (Local)	$297,265	39
NICHOLS RD	LIMESTONE RD N	LIMESTONE RD S	0	2430	2430	24	Local	Mill & Overlay Local	$84,993	66
NILES AVE	ROUTE 22	330' W OF ROUTE 22	0	331	331	22	Local	Mill & Overlay Local	$10,600	66
NILES AVE	330' W OF ROUTE 22	DEAD END	331	774	443	22	Local	Do Nothing	$0	93
NORMAN PL	NORMAN PL	CUL DE SAC LOOP	0	443	443	24	Local	Mill & Overlay Local	$15,495	56
NORTH LN	EVERGREEN ROW	N LAKE RD	0	1130	1130	24	Local	Mill & Overlay Local	$39,523	71
OAK RIDGE CT	MILL LA	CUL DE SAC	0	497	497	20	Local	Mill & Overlay Local	$17,427	57
OAK ST	GROVE ST	DEAD END	0	150	150	18	Local	Mill & Overlay Local	$3,935	56
OLD BYRAM LAKE RD	BYRAM LAKE RD	1072' N OF BYRAM LAKE RD	0	1072	1072	25	Local	Do Nothing	$0	93
OLD BYRAM LAKE RD	1072' N OF BYRAM LAKE RD	DEAD END	1072	2015	943	26	Local	Mill & Overlay Local	$35,731	61
OLD MT KISCO RD	MAIN ST N	CROSS RD S	0	2236	2236	22	Local	Mill & Overlay Local	$71,677	71
OLD MT KISCO RD	CROSS RD S	MAIN ST S	2236	3653	1417	22	Local	Mill & Overlay Local	$45,444	71
OLD ORCHARD ST	RT 22	280' E OF ROUTE 22	0	280	280	22	Local	Mill & Overlay Local	$8,987	51
OLD ORCHARD ST	280' E OF ROUTE 22	TOWN LINE	280	2510	2230	22	Local	Mill & Overlay Local	$71,484	71
OLD POST RD	ROUTE 128	830' S OF ROUTE 22	0	3880	3880	21	Local	Reclaim (Local)	$356,596	50
OLD POST RD	830' S OF ROUTE 22	ROUTE 22	3880	4711	830	28	Local	Preventive Maintenance	$17,397	84

Name	Beginning Cross Street	Ending Cross Street	From Station	To Station	Length	Width	Pavement Class	Alternative	Cost	PCI
OLD ROUTE 22	ROUTE 22	MAIN ST	0	3227	3227	32	Local	Reclaim (Local)	$451,922	44
ORCHARD DR	WHIPPERWILL RD E	MAIN ST	0	1634	1634	20	Local	Reclaim (Local)	$143,020	49
OREGON HOLLOW	OREGON RD	CUL DE SAC	0	374	374	24	Local	Mill & Overlay Local	$19,194	55
OREGON RD	BYRAM LAKE RD	OREGON HOLLOW RD	0	3738	3738	21	Local	Mill & Overlay Local	$114,384	55
OVERLOOK CT	OVERLOOK CT	CUL DE SAC	0	151	151	24	Local	Preventive Maintenance	$5,855	82
OVERLOOK RD N	MY KISCO RD	MORNINGSIDE PL	0	2112	2112	24	Local	Reclaim (Local)	$221,830	42
PALMER AVE	RESERVIOR RD	GROVE RD	0	1095	1095	20	Local	Reclaim (Local)	$95,843	49
PALMER AVE	GROVE RD	N BROADWAY	1095	1481	386	20	Local	Do Nothing	$0	93
PALMER PL	N GREENWICH RD	CUL DE SAC	0	693	693	23	Local	Mill & Overlay Local	$27,153	54
PATRIOTS FARM CT	PATRIOTS FARM PL	CUL DE SAC	0	607	607	24	Local	Mill & Overlay Local	$27,354	63
PATRIOTS FARM PL	ROUND HILL RD	CUL DE SAC	0	2141	2141	24	Local	Mill & Overlay Local	$74,884	54
PEPPERCORN PL	JACKSON RD	CUL DE SAC	0	348	348	24	Local	Mill & Overlay Local	$17,469	55
PERRY CT	BYRAM LAKE RD	CUL DE SAC LOOP	0	1291	1291	26	Local	Preventive Maintenance	$25,113	84
PHEASANT DR	HALF MILE RD	CUL DE SAC	0	2034	2034	24	Local	Mill & Overlay Local	$71,142	66
PIONEER PL	OREGON RD	CUL DE SAC	0	343	343	24	Local	Mill & Overlay Local	$18,120	66
PIONEER TRL	PIONEER PL	CUL DE SAC	0	622	622	24	Local	Mill & Overlay Local	$27,879	65
PIPING BROOK LN	JACKSON RD	CUL DE SAC	0	1522	1522	24	Local	Reclaim (Local)	$178,249	43
POND LN	MILL LA	CUL DE SAC	0	1226	1226	23	Local	Do Nothing	$0	100
QUAKER MEETING HOUSE RD	CUL DE SAC S	CUL DE SAC N	0	905	905	24	Local	Routine Maintenance	$3,393	91
QUARTER MILE RD	HALF MILE RD	DEAD END	0	643	643	20	Local	Reclaim (Local)	$56,280	48
QUARTZ LEDGE	KINGDOM RIDGE RD	CUL DE SAC	0	593	593	23	Local	Mill & Overlay Local	$24,521	54
QUINBY RIDGE RD	WAMPUS LAKE RD	CUL DE SAC	0	614	614	22	Local	Reclaim (Local)	$73,412	42
REDBROOKE PL	CUL DE SAC	ROUTE 22	0	253	253	24	Local	Mill & Overlay Local	$13,376	63
RESERVOIR RD	N BROADWAY	ROCKLEDGE RD	0	542	542	20	Arterials	Routine Maintenance	$1,173	87
RESERVOIR RD	ROCKLEDGE RD	TOWN LINE	542	1065	523	20	Collector	Reclaim	$45,803	46
RIDGEVIEW CIR	RIDGEVIEW DR	CUL DE SAC	0	805	805	24	Local	Routine Maintenance	$2,547	86
RIDGEVIEW DR	SARLES ST	CUL DE SAC	0	789	789	24	Local	Routine Maintenance	$2,505	87
ROBERTA PL	PALMER AV	NETHERMONT AV	0	796	796	22	Local	Do Nothing	$0	93
ROBIN LN	WINTER FARM RD	CUL DE SAC	0	531	531	24	Local	Mill & Overlay Local	$23,100	63
ROCK CLIFF PL	MORNINGSIDE PL	DEAD END	0	715	715	20	Local	Do Nothing	$0	98
ROCK HILL RD	WHIPPERWILL RD E	DEAD END	0	499	499	22	Local	Do Nothing	$0	100
ROCKLEDGE RD	RESERVOIR RD	GROVE RD	0	520	520	19	Local	Mill & Overlay Local	$14,399	51
ROCKWOOD PL	WHIPPERWILL RD E	CUL DE SAC	0	726	726	20	Local	Reclaim (Local)	$78,541	47
ROSANNE DR	COX AV	BRRAM LAKE RD	0	759	759	24	Local	Mill & Overlay Local	$26,547	58
ROSEHILL DR	COX AV	DEAD END	0	874	874	23	Local	Mill & Overlay Local	$29,296	52
ROUND HILL RD	STATE LINE	MEAD RD	0	5004	5004	24	Collector	Mill & Overlay A/C	$294,379	59
ROUND HILL RD	MEAD RD	BEDFORD-BANKSVILLE	5004	9590	4586	24	Arterials	Reclaim	$481,670	49

Name	Beginning Cross Street	Ending Cross Street	From Station	To Station	Length	Width	Pavement Class	Alternative	Cost	PCI
		RD								
ROUND HOUSE CT	ROUND HOUSE RD	CUL DE SAC	0	835	835	24	Local	Routine Maintenance	$2,170	86
ROUND HOUSE RD	BEDFORD-BANKSVILLE RD	BANKSVILLE AV	0	2646	2646	20	Local	Do Nothing	$0	100
RUSTLING LN	TOWN LINE	CUL DE SAC	0	1029	1029	24	Local	Mill & Overlay Local	$35,991	55
SADDLE CT	WOODLAND RD	CUL DE SAC LOOP	0	946	946	27	Local	Preventive Maintenance	$19,110	74
SARLES ST	HIGH ST	VINCENT LA	0	3583	3583	18	Local	Reclaim (Local)	$282,250	46
SARLES ST	VINCENT LA	TOWN LINE	3583	5107	1524	22	Local	Mill & Overlay Local	$48,862	66
SCHOOL ST	MAIN ST	COX AV	0	1552	1552	24	Arterials	Mill & Overlay A/C	$91,306	50
SENECA AVE	N BROADWAY	TOWN LINE	0	208	208	25	Local	Mill & Overlay Local	$7,578	64
SEYMOUR PL E	STERLING RD N	CUL DE SAC	0	862	862	22	Local	Reclaim (Local)	$95,107	47
SEYMOUR PL W	CUL DE SAC	STERLING RD N	0	1103	1103	27	Local	Reclaim (Local)	$145,123	47
SHIPPEN RD	HALF MILE RD	CUL DE SAC	0	948	948	18	Local	Mill & Overlay Local	$24,868	53
SKYVIEW DR	GREENWAY RD	ARMONK HEIGHTS RD	0	2400	2400	20	Local	Mill & Overlay Local	$69,953	54
SMALLWOOD PL	DUNLAP WAY	MCDOUGAL DR	0	777	777	20	Local	Mill & Overlay Local	$22,647	55
SMITH FARM RD	BEDFORD-BANKSVILLE RD	HISSARLIK WAY	0	2158	2158	26	Local	Preventive Maintenance	$41,986	85
SMITH FARM RD	HISSARLIK WAY	CUL DE SAC	2158	4433	2274	24	Local	Preventive Maintenance	$43,164	85
SNIFFEN RD	BANKSVILLE RD	ROUTE 22	0	2340	2340	20	Local	Reclaim (Local)	$204,814	48
SPRUCE HILL RD	SNIFFIN RD	WINDMILL RD	0	1967	1967	23	Local	Reclaim (Local)	$197,992	50
SPRUCE HOLW	WINDMILL RD	CUL DE SAC LOOP	0	647	647	22	Local	Reclaim (Local)	$62,293	44
ST MARYS CHURCH RD	E MIDDLE PATENT RD	MANUS RIVER RD	0	2210	2210	16	Local	Reclaim (Local)	$154,749	48
STARKEY RD	OLD ORCHARD ST	JAMES ST	0	1065	1065	21	Local	Do Nothing	$0	100
STERLING RD N	ROUTE 22	DEAD END	0	1554	1554	22	Local	Reclaim (Local)	$149,620	46
STERLING RD S	CT STATE LINE	ROUTE 22	0	3048	3048	22	Local	Preventive Maintenance	$50,169	76
STILL WATER PL	PIPING BROOK LA	DEAD END	0	263	263	24	Local	Mill & Overlay Local	$9,199	56
STONE HOLLOW WAY	TALLWODDS RD	CUL DE SAC	0	1401	1401	20	Local	Mill & Overlay Local	$46,627	55
STONEHEDGE CIR	CEDAR HILL RD	CUL DE SAC	0	117	117	24	Local	Mill & Overlay Local	$10,216	55
STONY BROOK PL	WHIPPERWILL RD E	CUL DE SAC	0	926	926	25	Local	Routine Maintenance	$2,507	86
SUNRISE DR	WUMPUS LAKE DR	1009' E OF WUMPUS LAKE DR	0	1009	1009	24	Local	Mill & Overlay Local	$35,291	52
SUNRISE DR	1009' E OF WUMPUS LAKE DR	DEAD END	1009	3330	2321	24	Local	Mill & Overlay Local	$81,180	62
SUNRISE PL	KAVEY LA	CUL DE SAC	0	286	286	20	Local	Mill & Overlay Local	$9,342	56
SUNSET DR	HUNTER AV	BYRAM LAKE RD	0	1687	1687	24	Local	Mill & Overlay Local	$59,005	57
TALLWOODS RD	BAYBERRY RD	CUL DE SAC	0	3248	3248	24	Local	Reclaim (Local)	$359,483	46
TERRACE CIR	HOLLOW RIDGE RD	CUL DE SAC	0	1272	1272	24	Local	Do Nothing	$0	93
THE KNOLLS	WHIPPORWILL XING	CUL DE SAC	0	522	522	22	Local	Routine Maintenance	$1,243	87

Name	Beginning Cross Street	Ending Cross Street	From Station	To Station	Length	Width	Pavement Class	Alternative	Cost	PCI
THORN LN	THORNWOOD RD	WINDMILL PL	0	547	547	20	Local	Mill & Overlay Local	$15,943	53
THORNWOOD RD	WINDMILL RD	MIDDLE PATENT RD	0	3512	3512	24	Local	Preventive Maintenance	$63,067	74
TOWNSEND CT	SUNRISE DR	CUL DE SAC	0	284	284	24	Local	Preventive Maintenance	$8,243	74
TRIPP LN	SCHOOL PARKING LOT	375' S OF SCHOOL PARKING LOT	0	376	376	24	Local	Preventive Maintenance	$6,746	74
TRIPP LN	375' S OF SCHOOL PARKING LOT	ROUTE 22	376	1292	916	24	Local	Reclaim (Local)	$96,242	50
TROY LN	CUL DE SAC	CUL DE SAC	0	839	839	125	Local	Mill & Overlay Local	$152,839	57
TRUDY LN	BANKSVILLE RD	CUL DE SAC	0	578	578	24	Local	Preventive Maintenance	$10,379	74
UPLAND LN	ROUTE 22	N LAKE RD	0	2540	2540	24	Local	Reclaim (Local)	$266,784	47
VALLEY LN	BANKSVILLE RD	LONG POND RD	0	647	647	23	Local	Mill & Overlay Local	$21,687	56
VINCENT LA	SARLES ST	CUL DE SAC	0	909	909	24	Local	Routine Maintenance	$2,818	87
VIRGINIA RD	BRONX RIVER PARKWAY	250' S OF LAFAYETTE AV	0	1133	1133	24	Arterials	Reclaim	$119,002	49
WAGO AVE	ELIZABETH PL	MAIN ST	0	1377	1377	24	Local	Mill & Overlay Local	$48,162	65
WAMPUS AVE	SCHOOL PARKING	1263' S OF SCHOOL ST	0	497	497	27	Arterials	Do Nothing	$0	100
WAMPUS AVE	1263' S OF SCHOOL ST	SCHOOL ST	497	1761	1264	22	Arterials	Mill & Overlay A/C	$68,152	72
WAMPUS LAKE DR	WHIPPERWILL RD E	QUIMBY RIDGE RD	0	3662	3662	24	Local	Mill & Overlay Local	$128,090	52
WAMPUS LAKE DR	QUIMBY RIDGE RD	PRIVATE RD	3662	4617	955	24	Local	Preventive Maintenance	$17,148	74
WAMPUS LAKE DR	PRIVATE RD	FAWN LA	4617	6433	1816	24	Local	Preventive Maintenance	$32,610	73
WAMPUS LAKE DR	FAWN LA	ROUTE 128	6433	7084	650	24	Local	Preventive Maintenance	$11,677	75
WARREN PL	DEVOE RD	CUL DE SAC	0	374	374	24	Local	Mill & Overlay Local	$13,081	55
WASHINGTON AVE	VIRGINIA RD	WASHINGTON PL E	0	1252	1252	20	Collector	Mill & Overlay A/C	$61,380	64
WASHINGTON AVE	WASHINGTON PL E	200' S OF LAFAYETTE AVE	1252	3652	2400	20	Local	Mill & Overlay Local	$69,953	61
WASHINGTON AVE	200' S OF LAFAYETTE AV	LAFAYETTE AV	3652	3853	201	28	Local	Routine Maintenance	$610	86
WASHINGTON PL E	N BROADWAY	WASHINGTON AV	0	1106	1106	20	Collector	Reclaim	$96,805	45
WAYNE VALLEY RD	HIGH ST	CUL DE SAC	0	558	558	24	Local	Reclaim (Local)	$58,608	45
WHIPPOORWILL RD	ROUTE 120	HALF MILE RD	0	3930	3930	20	Collector	Mill & Overlay A/C	$192,647	53
WHIPPOORWILL RD	HALF MILE RD	WIHPPERWILL RD E	3930	6629	2700	20	Collector	Mill & Overlay A/C	$132,365	58
WHIPPOORWILL RD	WIHPPERWILL RD E	MEADOWHILL PL	6629	9835	3206	20	Collector	Mill & Overlay A/C	$157,162	52
WHIPPOORWILL RD	MEADOWHILL PL	TOWN LINE	9835	12735	2900	20	Collector	Mill & Overlay A/C	$142,170	52
WHIPPOORWILL RD E	WHIPPOORWILL RD	MAIN ST	0	4868	4868	22	Collector	Mill & Overlay A/C	$262,524	59
WHIPPOORWILL XING	KING ST	TOWN LINE	0	5390	5390	20	Collector	Mill & Overlay A/C	$264,249	51
WILLIAM ST	ORCHARD ST	50' S OF JAMES ST	0	385	385	20	Local	Do Nothing	$0	98
WILLIAM ST	50' S OF JAMES ST	DEAD END	385	615	230	14	Local	Mill & Overlay Local	$4,693	56
WILLOW POND LN	BLAIR RD	CUL DE SAC	0	738	738	24	Local	Do Nothing	$0	97
WINDMILL CT	WINDMILL RD	CUL DE SAC	0	134	134	24	Local	Reclaim (Local)	$27,670	49

Name	Beginning Cross Street	Ending Cross Street	From Station	To Station	Length	Width	Pavement Class	Alternative	Cost	PCI
WINDMILL PL	WINDMILL RD	THORN LA	0	1462	1462	20	Local	Reclaim (Local)	$127,930	46
WINDMILL PL	THORN LA	CUL DE SAC	1462	2001	539	20	Local	Reclaim (Local)	$47,181	39
WINDMILL RD	LONG POND RD	N LAKE RD	0	4597	4597	22	Local	Mill & Overlay Local	$147,391	55
WINDMILL RD	N LAKE RD	ROUTE 22	4597	8623	4026	24	Local	Reclaim (Local)	$422,822	47
WINKLER FARM RD	BEDFORD-BANKSVILLE RD	CUL DE SAC	0	1350	1350	24	Local	Mill & Overlay Local	$50,378	64
WOODCREST DR	ROUTE 22	CUL DE SAC	0	2092	2092	27	Local	Reclaim (Local)	$264,402	44
WOODLAND CT	WOODLAND RD	CUL DE SAC LOOP	0	432	432	24	Local	Preventive Maintenance	$7,757	76
WOODLAND CT S	WOODLAND RD	CUL DE SAC	0	862	862	23	Local	Preventive Maintenance	$17,217	76
WOODLAND RD	CEDAR HILL RD	CUL DE SAC	0	1699	1699	24	Local	Preventive Maintenance	$32,831	76
WRIGHTS FARM RD	CUL DE SAC	WRIGHTS FARM RD #3	0	1687	1687	24	Local	Do Nothing	$0	100
WRIGHTS FARM RD	ROUTE 128	WRIGHTS FARM RD	0	257	257	26	Local	Routine Maintenance	$723	86
WRIGHTS FARM RD	WRIGHTS FARM RD #3	907' S OF WRIGHT FARM RD	1687	4343	2655	26	Local	Do Nothing	$0	93
WRIGHTS FARM RD	907' S OF WRIGHT FARM RD	50' E OF WRIGHTS FARM RD	4343	5250	908	26	Local	Preventive Maintenance	$17,653	85
WRIGHTS FARM RD	50' E OF WRIGHTS FARM RD	200' S OF HOLLOW RIDGE RD	5250	7038	1788	26	Local	Routine Maintenance	$5,032	86
WRIGHTS FARM RD	200' S OF HOLLOW RIDGE RD	CUL DE SAC	7038	7452	415	24	Local	Do Nothing	$0	98
YALE PL	DAY RD	CUL DE SAC	0	1242	1242	22	Local	Reclaim (Local)	$127,844	48

Appendix B – Unit Costs

Pavement Repair Types and Unit Costs

Repair Alternative	Treatment Band	Unit Cost ($/sy)	Expected Life (years)
Routine Maintenance	Routine Maintenance	$0.88	5
Thin Overlay	Preventive Maintenance	$6.91	8
Mill &Overlay local road	Mill &Overlay	$22.46	15
Mill & Overlay arterial/collector road	Mill &Overlay	$22.46	12
Reclamation	Base Rehabilitation	$40.42	20

Assumptions for Unit Costs ($/sy)

Reclaim

3.5"of Bituminous Concrete Pavement Furnished and Laid	$18.07
Reset Existing Structures	$1.08
Reclamation including formation of subbase	$5.00
Drainage Improvements	$4.96
Curbing	$6.04
15% Contingencies & Minor Items	$5.27
	$40.42

Mill & Overlay (Arterial/Collector)

2"of Bituminous Concrete Pavement Furnished and Laid	$10.33
Pavement Removed by Cold Planer	$4.00
White or Yellow Thermoplastic Reflectorized Pavement Stripe (Operating Budget)	$0.00
Drainage Improvements	$4.96
Bituminous Tack Coat	$0.24
15% Contingencies & Minor Items	$2.93
	$22.46

Mill & Overlay (Local Road)

2"of Bituminous Concrete Pavement Furnished and Laid	$10.33
Pavement Removed by Cold Planer	$4.00
White or Yellow Thermoplastic Reflectorized Pavement Stripe (Operating Budget)	$0.00
Drainage Improvements	$4.96
Bituminous Tack Coat	$0.24
15% Contingencies & Minor Items	$2.93
	$22.46

Thin Overlay (Preventive Maintenance)

Localized Full-depth Patching (Operating Budget)	$0.00
1"of Bituminous Concrete Pavement Furnished and Laid	$5.16
Cleaning and Sealing Cracks with Fiber Reinforced Compound	$0.88
Bituminous Tack Coat	$0.24
10% Contingencies & Minor Items	$0.63
	$6.91

Cracksealing (Routine Maintenance)

Cleaning and Sealing Cracks with Fiber Reinforced Compound	$0.88
	$0.88

Appendix C – Glossary of Terms

Definitions

BASE INDEX (BI): is an index derived from controlled measurements and evaluations of condition survey distresses attributed to the underlying unbound base and subbase materials, and is manifested as non-utility patches, alligatoring, cross section, and consolidation. It is a rating established as an indicator of asphalt materials quality and performance on a scale from 0 to 100, with 100 being excellent.

BENEFIT VALUE (BV): The benefit value is computed by RoadManager™ at the time it determines the most beneficial recommended repair for a particular road section. The benefit value formula is:

$$\frac{\text{ADT x Estimated Repair Life}}{\text{Unit Cost x Pavement Condition Index}}$$

Where BV = benefit value, ADT = average daily traffic, and Condition Index = the condition index for the particular road section for the type of work being done.

CAPITAL REPAIRS: Capital repairs are extensive and costly repairs such aa Structural Improvement and Base Rehabilitation work.

DEDUCT VALUES: Deduct values represent the penalty assessed for each identified distress and is used in the calculation of the Pavement Condition Index. Each distress has multiple severity and extent levels, with a specific deduct value at each level. Deduct values may be modified for all nine pavement distress types. The deduct value is ultimately subtracted from a perfect pavement condition of 100.

DEFICIENCY: is any indication of poor or unfavorable pavement performance or signs of impending failure; or any unsatisfactory performance of a pavement short of failure.

DETERIORATION RATE: is a prediction of the anticipated change in a roadway's condition over time.

DISTRESS: Distresses are the physical defects in a pavement system which can be observed and quantified through visual inspection of the roadway surface. Broad categories include cracking, patching, depressions, and surface wear.

FUNCTIONAL CLASSIFICATION: Road functional classification places all streets and roads in the network into one of three general categories - arterial, collector, or local - according to vehicular volume, roadway geometry, and traffic characteristics.

GRADE: is a measure of the steepness of a slope, expressed as a percentage. One percent slope has one foot of elevation change in one hundred feet of horizontal distance.

MAINTENANCE: is anything done to the pavement after original construction short of complete reconstruction, excluding shoulders and bridges.

NETWORK LEVEL: is an assessment of conditions and/or program needs across the entire roadway system encompassed by the roadway management study.

PAVEMENT CONDITION INDEX (PCI): is an index derived from established measurements of pavement surface condition distress or deficiencies. It is a serviceability rating established under controlled conditions having a scale of 0 to 100, with 100 being excellent.

PAVEMENT MANAGEMENT (PM): Pavement Management is the effective and efficient directing of the various activities involved in providing and sustaining pavements in a condition acceptable to the traveling public at the lowest life-cycle cost.

PAVEMENT MANAGEMENT SYSTEM (PMS): is an established, documented procedure treating many or all of the Pavement Management activities in a systematic and coordinated manner. It consists of five essential elements structured to serve decision-making responsibilities at various management levels.
1. Pavement surveys related to condition and serviceability;
2. Database containing all pavement-related information;
3. Analysis scheme;
4. Decision criteria;
5. Implementation procedures.

PAVEMENT PERFORMANCE: is the assessment of how well the pavement served the user over time. The engineer often associates pavement condition with an arbitrary, but quantifiable, value relating to pavement roughness, pavement distress, or pavement strength. Performance is the measured change of condition and/or serviceability over increments of time.

PAVEMENT TYPES: The RoadManager™ assigns an unlimited number of pavement types, including bituminous concrete, surface treated, gravel, portland cement concrete, and composite, to the streets and roads. Pavement types serve to inform pavement engineers of the operating condition of the street, and provide a meaningful communication tool when engineering judgment is required to select possible rehabilitation alternatives. "Surface treated" designates a road surface and pavement structure that evolved over time. Generally, this type of surface starts as a dirt road, then is built up over time with a series of sand seals and stone seals. Conversely, a "bituminous concrete" roadway is typically engineered with a pavement structure designed to withstand predicted traffic volumes. The roadway usually has a gravel base, a binder course, and an asphalt wearing surface. The "composite" surface type is used to describe a bituminous concrete roadway that has received a preventive maintenance surface treatment, such as microsurfacing.

PRESERVATION MAINTENANCE: Preservation maintenance is used to describe the routine and preventive maintenance repair categories.

PREVENTIVE MAINTENANCE: Preventive maintenance activities are those which are performed at planned intervals to protect and seal the pavement. Seals are designed to provide one or more of the following benefits:
1. Prevent the intrusion of air and moisture;
2. Fill small cracks and voids;
3. Rejuvenate an oxidized binder;
4. Provide a new wearing surface.

PROJECT LEVEL: is a detailed assessment or identification of needs relative to a specific roadway, or a section thereof, as opposed to network level applications. It may include on site pavement testing, lab evaluation, life cycle cost analysis, and treatment recommendation for the particular pavement section.

RECONSTRUCTION: Reconstruction is the complete removal and replacement of a failed pavement, and might also involve widening, realignment, traffic control devices, safety hardware, and major base and drainage work.

REHABILITATION: The rehabilitation of pavements includes the work necessary to restore the pavement to a condition that will allow it to perform satisfactorily for several years. Rehabilitation also includes the work necessary to prepare the pavement for an overlay. The major activities involved in the rehabilitation process are:
1. Full depth patching;
2. Joint and crack sealing.
3. Grinding and milling (removal of high spots in the pavement.)
4. Overlays.

REPAIR STRATEGIES: The RoadManager™ represents repair strategies in a table of user defined "if, then" statements. The recommended repairs are based on seven decision factors: PCI range, Base Index, Surface Index, Functional Classification, Surface Type, Utility Index, and Drainage Index. These input conditions to the repair strategy table represent the various conditions for each decision factor.

REPAIR TYPES: are the various choices of treatment available for providing a solution to a pavement deficiency or problem. The associated repair type cost is based on a locality's past experience.

ROADWAY MANAGEMENT SYSTEM: A roadway management system has all the database attributes of a pavement management system as defined above, along with recording additional inventory and condition data on a range of roadside elements. These additions to the management system database may include drainage features, utilities, traffic signs, pavement markings, sidewalks, pedestrian ramps and other road related elements within the right of way. Because the roadway management system has common locating and identifying fields for each roadside element, the database can be comprehensively evaluated for system wide planning and management.

ROUTINE MAINTENANCE: Routine maintenance activities are those which are taken to correct a specific pavement failure or area distress. Routine maintenance usually addresses localized pavement defects and includes activities such as:
1. Full depth patching;
2. Crack sealing.

SURFACE INDEX (SI): is an index derived from controlled measurements and evaluations of the pavement condition survey distresses attributed to such asphalt mixture and material components as: surface wear/raveling, mix characteristics, and polished aggregate. It is a rating established as an indicator of asphalt materials quality and performance on a scale from 0 to 100, with 100 being excellent.

THRESHOLDS: The thresholds define various condition index ranges used in the determination of recommended repairs. These thresholds identify PCI ranges from 1 to 5, with 5 representing optimal conditions and 1 representing complete reconstruction.