



Borough of Naugatuck Department of Public Works

PAVEMENT MANAGEMENT PROGRAM OVERVIEW AND SUMMARY OF FINDINGS



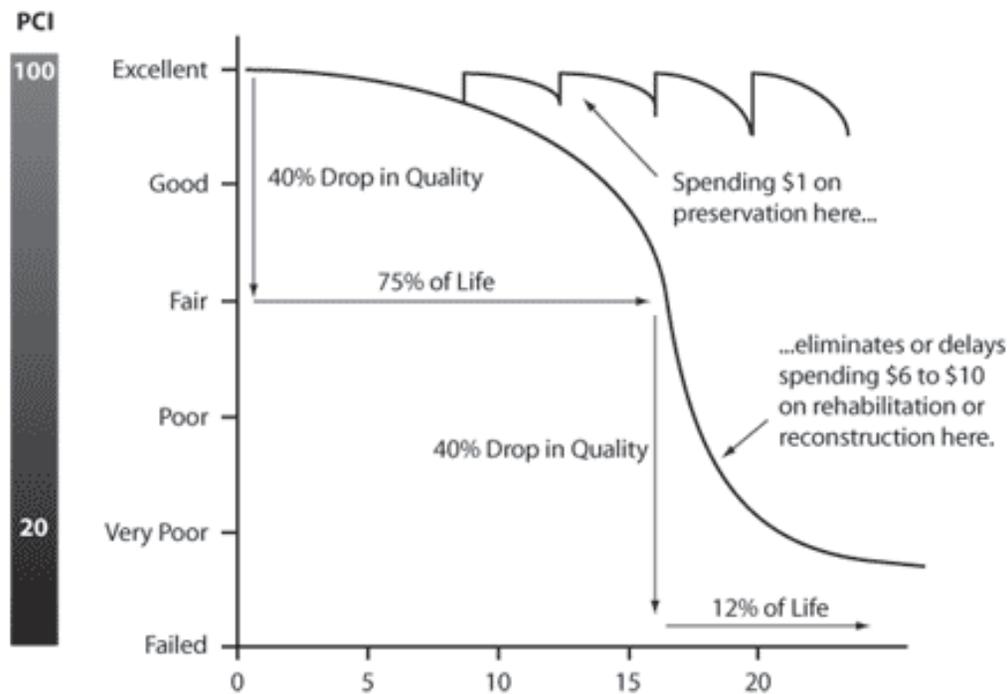
March 18, 2014

Pavement Management



- The practice of planning for pavement maintenance and rehabilitation with the goal of maximizing the value and life of a pavement network
- ***The right repair at the right time!***

Pavement Management



Source: Federal Highway Administration

- Asset Management & Forecasting Tool
- It is more cost effective to keep good roads in good condition



Pavement Management



Maintenance

- Crack Seal
- Pothole/Utility Patching

Surface Treatment

- Chip Seal
- Microsurfacing
- Hot-In-Place

Structural Repair

- Mill and Overlay
- Reclamation
- Reconstruction

Scope of Work

Roadway Inventory & GIS Mapping

Field Inspection Program

Existing Conditions Summary

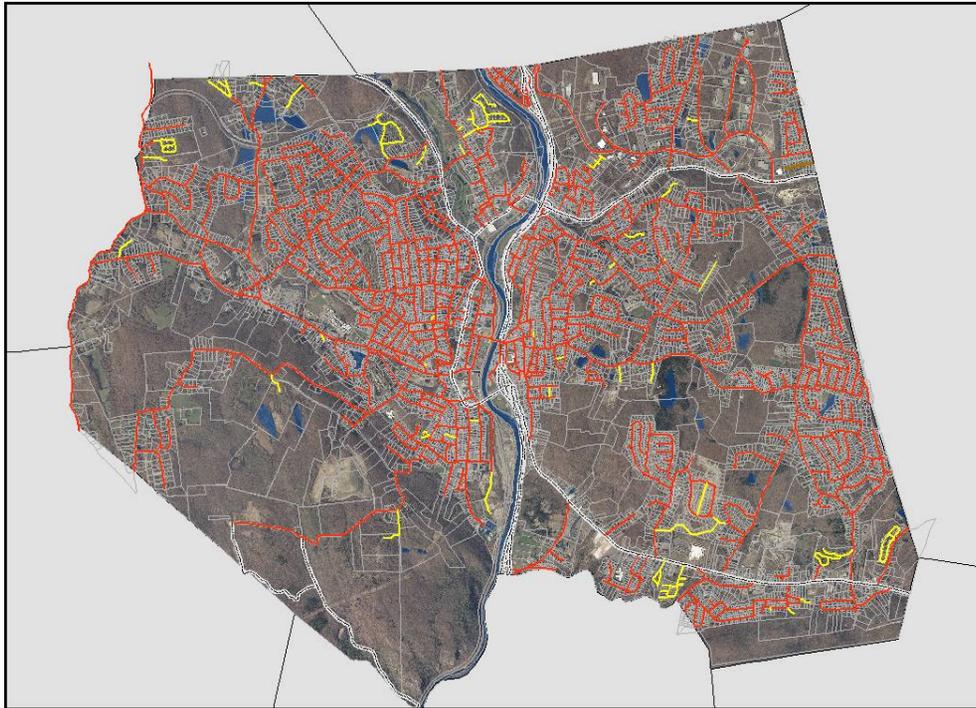
Capital Improvement Planning

System Maintenance



Roadway Inventory and GIS

Naugatuck Roadway Profile



Type	Miles
Borough Accepted	113.44
Private	3.88
State	20.96
Total	138.28



System Interface (MS Access)

ESRI ArcMap/ArcReader

Non-Proprietary System

Borough of Naugatuck

Pavement Management Program

- Inventory and Inspection Form
- Inventory and Inspection Reports**
- Street Maintenance History
- Capital Planning
- Pavement System Settings
- RSR Forecasting Worksheet

[Exit Pavement Management Program](#)

BETA

Version 7.0

February 2014

BETA Group, Inc

Inventory and Inspection Reports

<ul style="list-style-type: none"> Roadway Ownership Summary Street Name and Owner and Acceptance Repair Methods Backlog Summary Overall Backlog Summary Accepted Streets Backlog Summary Unaccepted Streets Backlog Summary By Functional Classification Accepted Streets and Street Segment Ratings Unaccepted Streets and Street Segment Ratings Streets and Averages Sorted Alphabetically Streets and Averages Sorted by RSR Streets and Averages Sorted by Class Streets and Averages Sorted by CBV Streets Sorted by CBV With Cumulative Total Streets Sorted by CBV Average With Cumulative Total Private Streets Gravel Streets Street Striping 	<ul style="list-style-type: none"> Borough Roadway Ownership Summary - File Street Ownership and Acceptance Pavement Repair Methods and Banding Street Segment Based Repair Summary and Accepted Street Segment Based Repair Sum Unaccepted Street Segment Based Repair Su Street Segment Based Repair Summary Func Accepted Streets and Street Segments Sorte Unaccepted Streets and Street Segments Soi Streets Sorted by Average RSR and Street Al Streets Sorted by Average RSR Descending O Streets Sorted by Functional Class and Avera Streets Sorted by Cost Benefit Value Streets Sorted by Cost Benefit Value Value C Streets and Street Segements Sorted by Cos List of Private Streets List of Gravel Streets By Acceptance Street Striping Summary
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Capital Improvement Planning

<ul style="list-style-type: none"> Proposed Crack Seal Improvement Plan Summary Proposed Crack Seal Improvement Plan Proposed Roadway Improvement Plan Summary Proposed Roadway Improvement Plan Proposed Roadway Improvement Plan Year Select Crack Seal List No Dollars Roadway Improvement Plan No Dollars 	<ul style="list-style-type: none"> Crack Seal CIP Project Summary Crack Seal CIP Project List Roadway CIP Project Summary Roadway CIP Project List Roadway CIP Project List By Selected Year
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[Capital Planning Worksheet](#) [Year Select](#)

Street Repair Backlog Summary By Function

Borough of Naugatuck, Connecticut
Pavement Management Program

Backlog Summary By Functional Classification

Repair Method	Length	Cost	Average RSR by Segment
Principal Arterial			
Surface Treatment	0.44 Miles	\$76,094.14	
Totals for Class:	0.44 Miles	\$76,094.14	Average RSR by Segment: 72.98
Minor Arterial			
Reclamation	0.67 Miles	\$328,707.84	
Mill and Overlay	1.40 Miles	\$405,951.42	
Surface Treatment	0.08 Miles	\$16,846.42	
Crack Seal	0.28 Miles	\$2,809.82	
Defer Maintenance	0.22 Miles	\$0.00	
Totals for Class:	2.71 Miles	\$756,815.70	Average RSR by Segment: 65.99
Major Collector			
Reclamation	2.54 Miles	\$1,023,810.42	
Mill and Overlay	12.00 Miles	\$2,088,379.43	
Surface Treatment	4.01 Miles	\$498,276.46	
Crack Seal	2.01 Miles	\$12,833.41	
Defer Maintenance	2.75 Miles	\$0.00	
Totals for Class:	23.41 Miles	\$4,626,299.72	Average RSR by Segment: 71.23
Local			
Reconstruction	0.85 Miles	\$438,648.22	
Reclamation	7.06 Miles	\$1,072,213.87	
Mill and Overlay	33.77 Miles	\$8,848,597.45	
Surface Treatment	15.86 Miles	\$2,033,879.08	
Crack Seal	9.08 Miles	\$571,798.85	
Defer Maintenance	4.89 Miles	\$0.00	
Totals for Class:	71.69 Miles	\$14,432,361.26	Average RSR by Segment: 70.16
Local Cul De Sac/Dead End			
Reclamation	2.88 Miles	\$1,020,071.92	
Mill and Overlay	6.87 Miles	\$1,632,742.79	
Surface Treatment	4.48 Miles	\$587,398.89	
Crack Seal	2.49 Miles	\$35,446.81	
Defer Maintenance	2.40 Miles	\$0.00	
Totals for Class:	18.12 Miles	\$3,238,660.51	Average RSR by Segment: 72.88
Overall Totals:	116.37 Miles	\$23,148,613.83	Average RSR by Segment: 70.72

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System Interface (GIS)

ESRI ArcMap/ArcReader

Non-Proprietary System

Borough of Naugatuck
Pavement Management Program

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[Exit Pavement Management Program](#)

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Version 7.0
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Layers:
 Street Label
 Road Surface Rating and Suggested Repair (RSR)
Repair Method:
- Reconstruction
- Reclamation
- Mill and Overlay
- Surface Treatment
- Crack Seal
- Defer Maintenance
 Roadway Owner
 Gravel Roads
 Naugatuck Parcels
 Surround Town
 Hydrology
 2012 Ortho

Map Labels: GONRAD STREET, PEARL ROAD, PINE STREET, CLEARVIEW CIRCLE, HOODLEY STREET, DAYTON ROAD, SUMMIT ROAD, MILVILLE AVENUE, PARK AVENUE, DUNN AVENUE, SEITH DRIVE.



Road Surface Rating (RSR)

Pavement Inspection Form

Street Name
GIS ID: 538
Street: ALLERTON ROAD
Segment Name: ALLERTON RD-01
From Street: FIELD ST
To Street: ASH RD

Ownership
Borough Owner: Town
Borough Owner: Accepted
CTDOT Owner: N/A
CTDOT Accepted: N/A
Inspection Area: 4

Existing Data
Linear Joint: Yes
Existing Crack Seal: No

Inspection Data
Inspector: BETA
Inspection Date: 11/8/2013
Pavement Material: BC
Length Feet: 1,329.73
Length Miles: 0.25
Width: #Name?

Distress Data

	Severity	Extent (%)	Notes
Edge Cracking:	Moderate	30	
Alligator Cracking:	High	30	
Linear Cracking:	High	20	
Potholes:	Low	10	
Patching:	Moderate	10	
Rutting:	None	0	
Depressions:	Moderate	10	
Drainage:	None	0	

General Notes: 0

Curb Data
Odd Curb Type: Asphalt
Even Curb Type: Asphalt
Avg. Reveal: 4

Sidewalk Data
Sidewalk Odd: No
Sidewalk Even: No
Sidewalk Material Odd: None
Sidewalk Material Even: None

Striping Data
Center Line: Yes
Edge Line Odd: No
Edge Line Even: No

Functional Class
Class Number: 4
Class Short: LO
Class Long: Local
Adjusted ADT: 500

RSR: 63
Refresh RSR

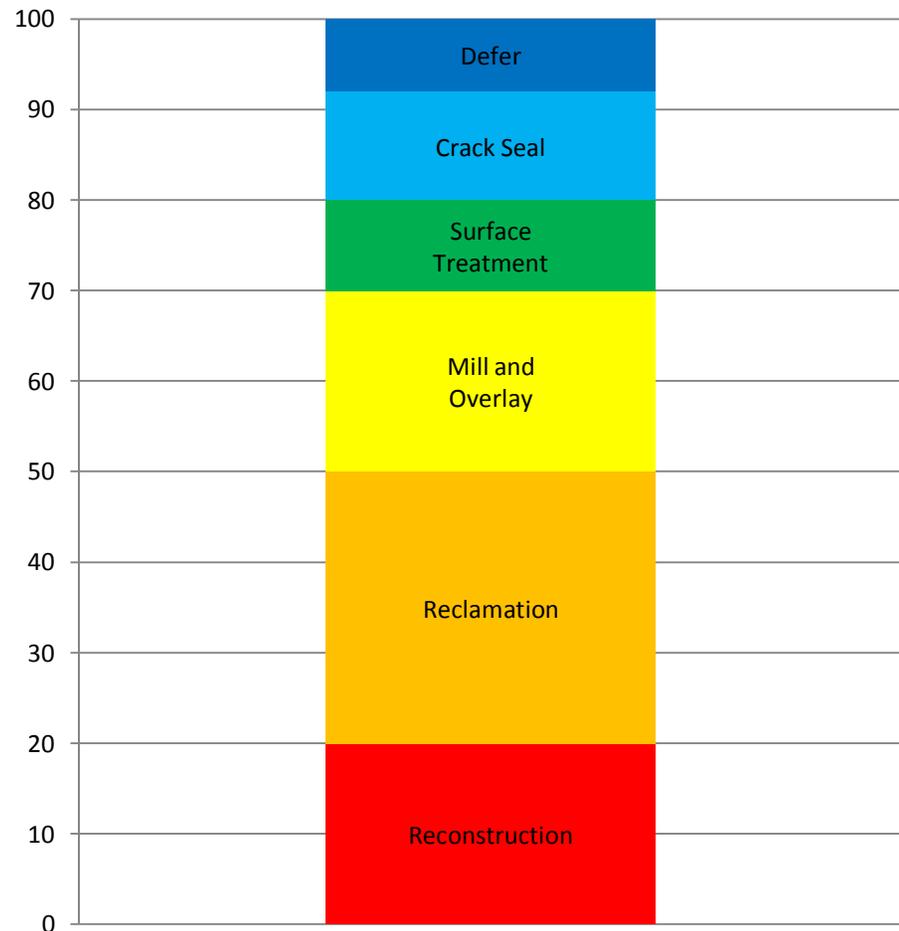
- Calculate Road Surface Rating (RSR) based on existing distresses
- Ratings are 0 to 100 (Worst to Best)
- Add newly accepted streets accordingly



Maintenance and Repair Methods

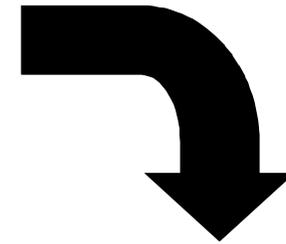
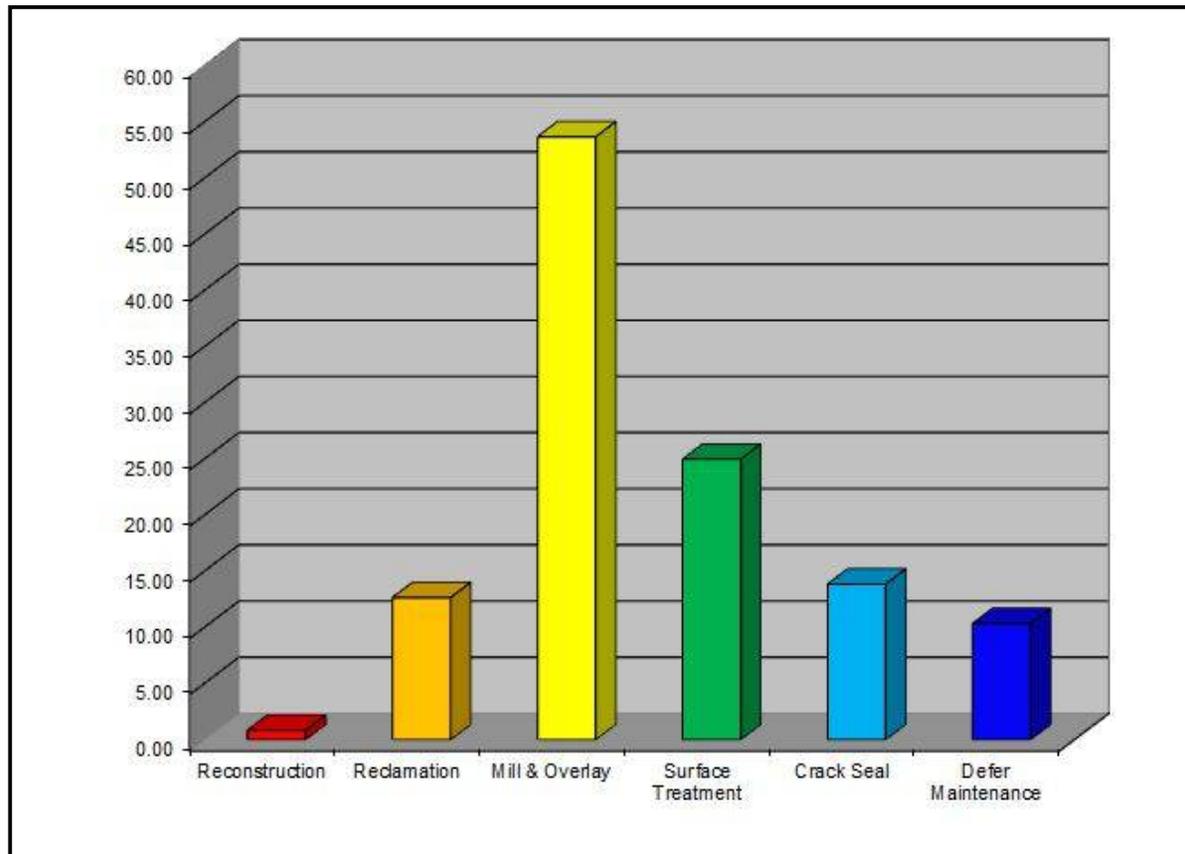
- Defer Maintenance - \$0 SY
- Routine Maintenance - \$0.40 SY
 - Crack Sealing
 - Patching
- Surface Treatment - \$8.00 SY
- Mill & Overlay - \$16.50 SY
- Reclamation - \$28.00 SY
- Reconstruction - \$38.00 SY

* Please note that unit prices reflect curb to curb improvements only



Existing Conditions Summary

General Rating by Mile*



**Approx. 113.44
Road Miles
RSR = 70.65**

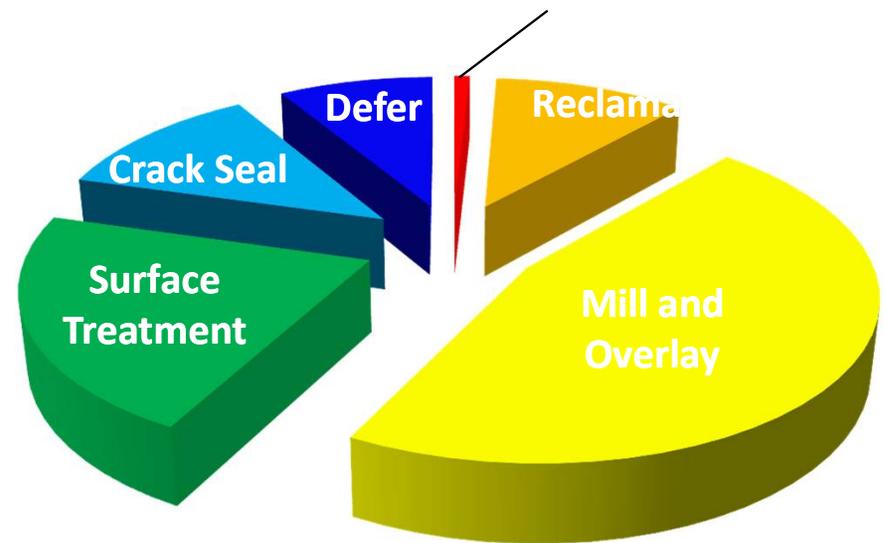
Borough Accepted Paved Roadways Only



Existing Conditions Summary

Breakdown by Repair Method*

- Defer Maintenance (8.7%)
- Crack Seal (11.9%)
- Surface Treatment (21.7%)
- Mill & Overlay (46.2%)
- Reclamation (10.8%)
- Reconstruction (0.8%)



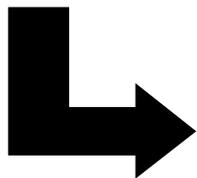
Borough Accepted Paved Roadways Only



Existing Conditions Summary

Breakdown by Repair Method*

Repair Method	Length (Miles)	Est. Cost	% By Repair
Reconstruction	0.85	\$419,649	0.8%
Reclamation	12.22	\$5,238,703	10.8%
Mill and Overlay	52.37	\$13,760,269	46.2%
Surface Treatment	24.61	\$3,187,506	21.7%
Crack Seal	13.57	\$87,822	11.9%
Defer Maintenance	9.82	\$0	8.7%
TOTAL:	113.44	\$22,693,952	100 %



Backlog = Approx. \$22.7 Million

*Curb to Curb Improvements Only
Does Not Include Drainage, Sidewalks, Ramps

Borough Accepted Paved Roadways Only



Existing Condition Photos



Existing Conditions Summary

Top 10 Cost Benefit Value Streets (CBV)*

Street Name	Length (Miles)	RSR	Repair Method	Est. Cost	CBV
North Main Street	0.78	65	Mill and Overlay	\$287,968	169.48
Union City Road	0.88	71	Surface Treatment	\$106,855	125.42
South Main Street (Waterbury)	0.44	73	Surface Treatment	\$84,220	120.67
Church Street	0.58	71	Surface Treatment	\$96,860	113.36
Cross Street	0.69	66	Mill and Overlay	\$207,947	96.05
Rubber Avenue	1.44	66	Mill and Overlay	\$479,762	83.18
Field Street	1.66	65	Mill and Overlay	\$401,135	66.47
Spring Street	1.05	53	Mill and Overlay	\$274,192	59.73
North Hoadley Street	0.71	63	Mill and Overlay	\$177,565	46.14
Hill Street	0.32	67	Mill and Overlay	\$67,929	44.21

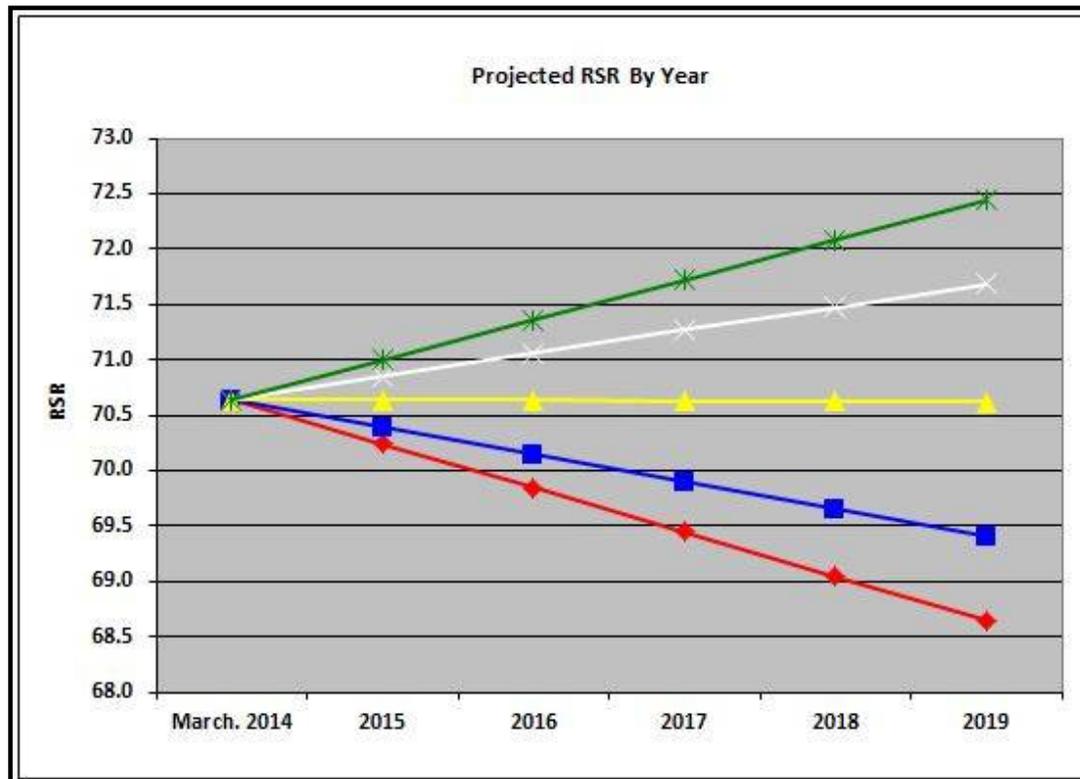
*List Does Not Include Streets Recommended for Crack Sealing

Borough Accepted Paved Roadways Only

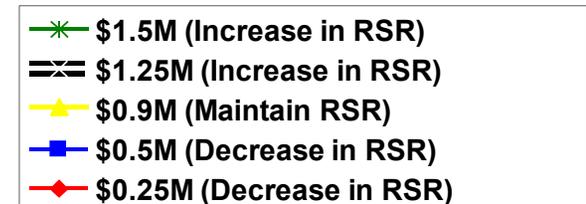


CIP Development

RSR Forecast



Dollars Spent Per Year

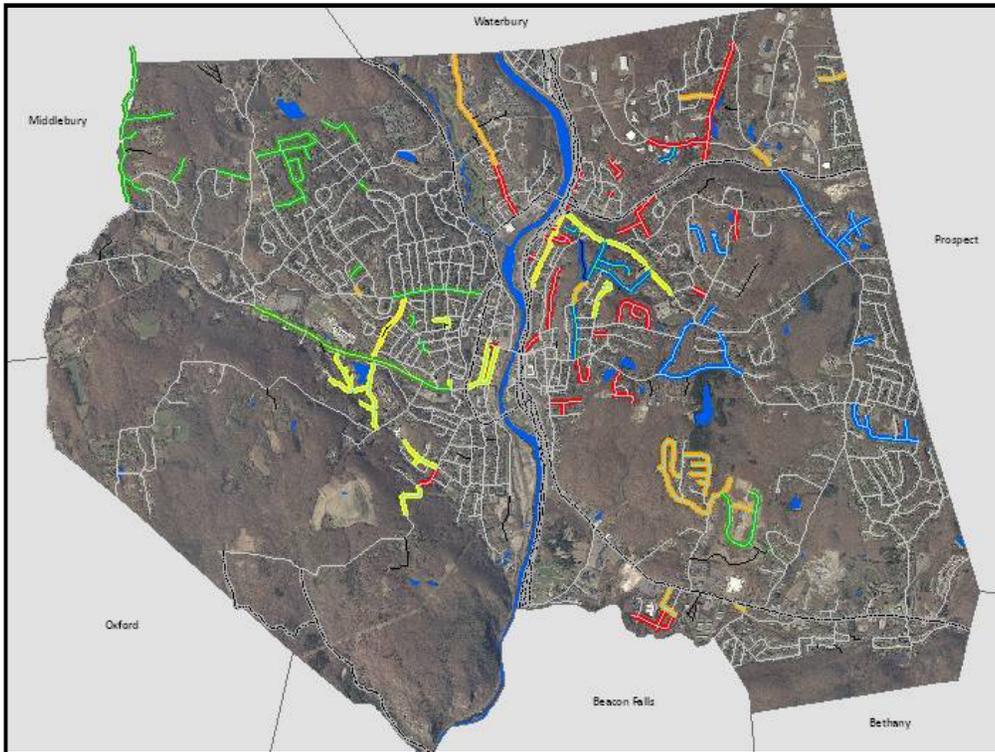


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Does Not Include Drainage, Sidewalks, Ramps



CIP Development

Summary of Planned Improvements 2014-2018



<u>Type</u>	<u>Miles</u>
Crack Seal	19.44
Surface Treatment	1.43
Mill and Overlay	4.15
Reclamation	0.36
Estimated Total	25.38

**Approximately 19% of Borough
Accepted Road Miles Targeted
For Improvements**



Ramp Inventory

<i>Asphalt</i>	<i>Number of Ramps</i>	<i>Ramp Condition</i>
	11	Excellent
	37	Fair
	2	Good
	18	Poor

<i>Concrete</i>	<i>Number of Ramps</i>	<i>Ramp Condition</i>
	251	Excellent
	94	Fair
	4	Good
	41	Poor

<i>Mix</i>	<i>Number of Ramps</i>	<i>Ramp Condition</i>
	7	Fair
	2	Poor



Total Number of Ramps = 467
 Detectable Warning Panel = 88



Sidewalk Inventory

Sidewalk Summary - Asphalt

Repair Method	Length (Miles)	Estimated Cost
Replace	0.46	\$61,316.67
Poor	0.37	\$37,705.56
Fair	1.18	\$59,972.22
Good	1.86	\$63,165.00
Excellent	0.58	\$0.00
Total	4.46	\$222,159.44

Sidewalk Summary - Concrete

Repair Method	Length (Miles)	Estimated Cost
Replace	1.19	\$367,800.00
Poor	6.25	\$1,074,258.33
Fair	13.34	\$1,531,755.56
Good	8.35	\$288,740.00
Excellent	14.93	\$0.00
Total	44.05	\$3,262,553.89

Sidewalk Summary - Mix

Repair Method	Length (Miles)	Estimated Cost
Replace	1.36	\$240,133.33
Poor	2.45	\$279,905.56
Fair	4.53	\$262,311.11
Good	2.98	\$100,315.00
Excellent	0.51	\$0.00
Total	11.84	\$882,665.00



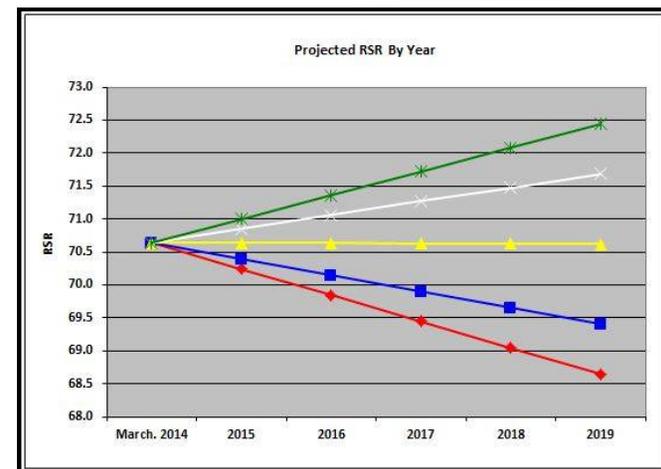
System Maintenance

- Update data as repairs are completed
- Monitor and update actual repair costs
- Re-inspect roadways periodically
- Add new roads and newly accepted roads



Next Steps

- Determine target funding levels
- Identify funding sources
- Develop 5 Year Plan for 2014-2018
- 5 Year Plan allows us to coordinate with utilities and future development plans
- Plan can be adjusted as needed





Borough of Naugatuck Department of Public Works

PAVEMENT MANAGEMENT PROGRAM OVERVIEW AND SUMMARY OF FINDINGS

Thank You

March 18, 2014

