



# Town of Middleborough Department of Public Works

## ASSET MANAGEMENT PROGRAM OVERVIEW AND SUMMARY OF FINDINGS



August 25, 2014

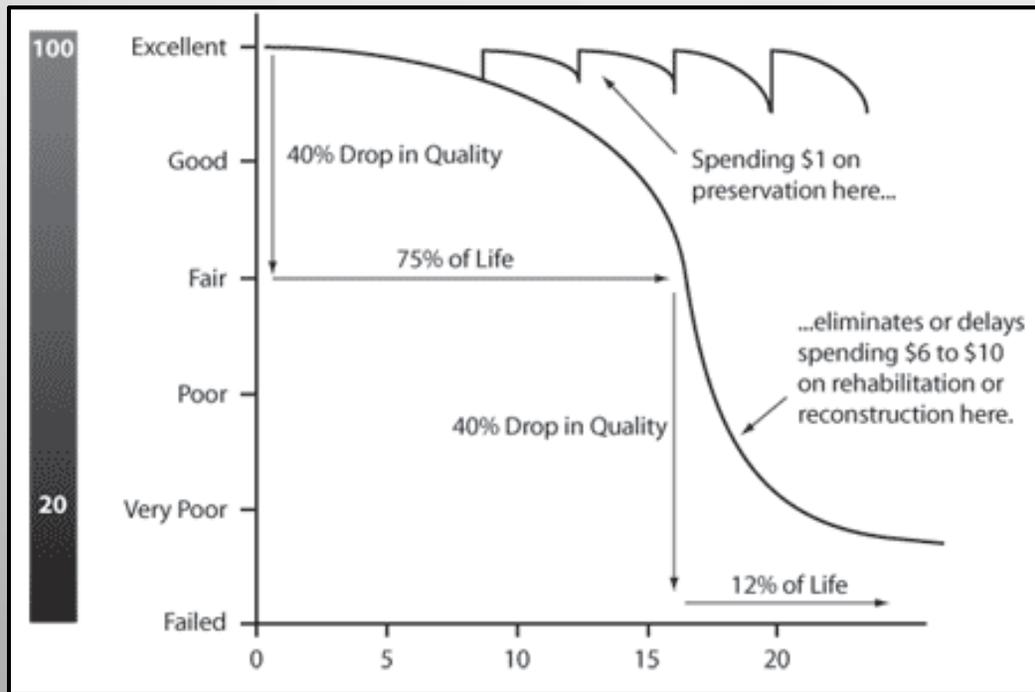
# Pavement Management



- 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

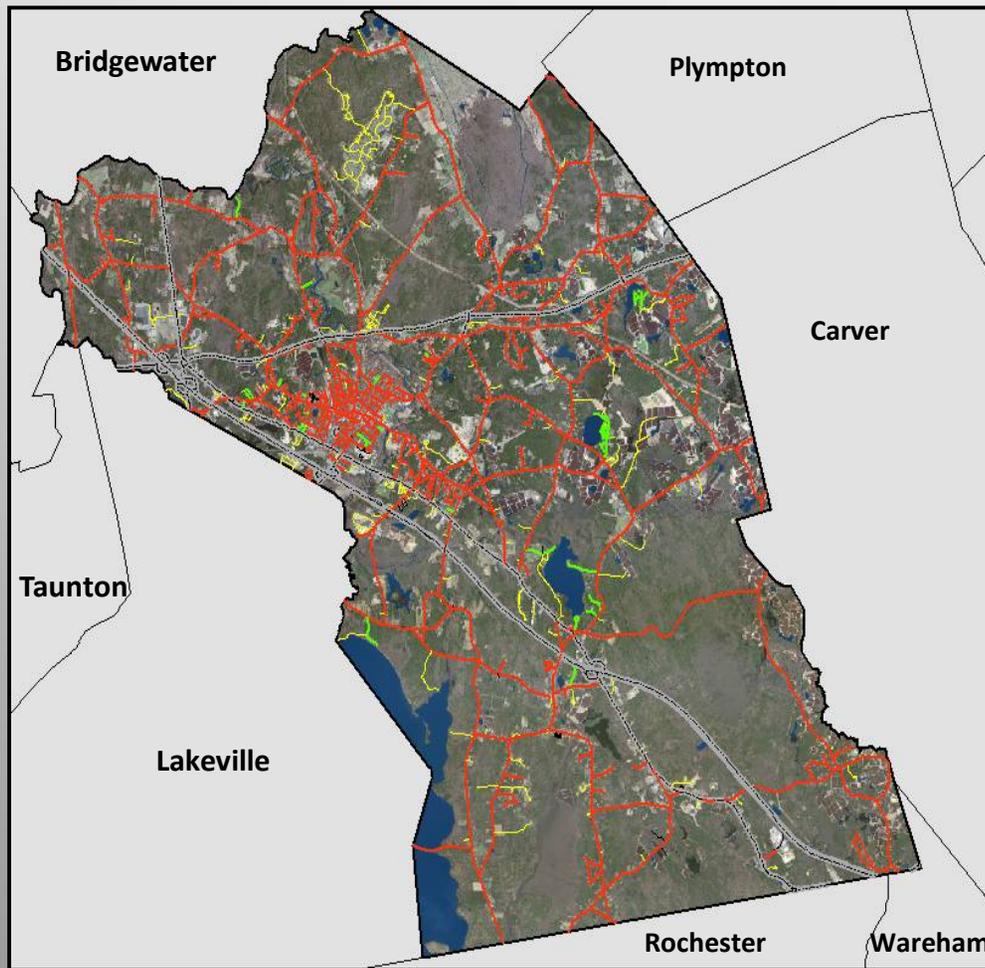
Capital Improvement Planning

System Maintenance



# Roadway Inventory and GIS

## Middleborough Roadway Profile



Type	Miles
Town – Accepted*	163.72
State	64.38
Private	24.72
<b>Total</b>	<b>252.82</b>

FY2015 Ch. 90 Roadway Acceptance = 155.81 Road Miles

\*Includes 3.39 Miles of Gravel Roads



# System Interface (MS Access & GIS)

## ESRI ArcMap/ArcReader

Non-Proprietary System

The screenshot displays the Microsoft Access database interface for the 'Middleborough Pavement Management Database'. The main window shows a navigation pane on the left with the following menu items: 'Town of Middleborough Pavement Management Program', 'Inventory and Inspection Form', 'Inventory and Inspection Reports', 'Street Maintenance History', 'Capital Planning', 'Pavement System Settings', 'RSR Forecasting Worksheet', and 'Exit Pavement Management Program'. Below the navigation pane is a 'BETA' logo and the text 'Version 7.0 May 2014 BETA Group, Inc'. The main workspace is divided into two panes: 'Layers' and 'Reports'. The 'Layers' pane shows a list of map layers including 'Master Pavement', 'Road Surface Rating and Suggested Rep', 'Defer Maintenance', 'Crack Seal', 'Surface Treatment', 'Mill and Overlay', 'Reclamation', 'Reconstruction', and 'Roadway Owner'. The 'Reports' pane is titled 'Inventory and Inspection Reports' and contains a list of report titles such as 'Roadway Ownership Summary', 'DOT Acceptance Review', 'Street Name and Owner and Acceptance', 'Repair Methods', 'Repair Method Description', 'Backlog Summary Accepted Streets', 'Backlog Summary by Functional Classification', 'Accepted 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', 'Sidewalk Location and Length Summary', and 'Streets With Sidewalks'. The 'Reports' pane also displays a preview of the 'Inventory and Inspection Reports' document, which includes a title page and a table of contents. The title page is titled 'Town of Middleborough, Massachusetts Pavement Management Program Backlog Summary by Functional Classification'. The table of contents lists various report sections and their corresponding page numbers. The 'Layers' pane also shows a map view of the town of Middleborough, Massachusetts, with various road segments highlighted in different colors corresponding to the layers. The 'Reports' pane also displays a preview of the 'Inventory and Inspection Reports' document, which includes a title page and a table of contents. The title page is titled 'Town of Middleborough, Massachusetts Pavement Management Program Backlog Summary by Functional Classification'. The table of contents lists various report sections and their corresponding page numbers.



# Road Surface Rating

## Pavement Inspection Form

Roadway Inventory

### Inventory and Inspection Form

<b>Street Name</b> GIS ID: 199 Street: BONNIE WAY Segment Name: BONNIE WY From Street: WAREHAM ST To Street: CUL DE SAC	<b>Ownership</b> Town Owner: Town Town Owner: Accepted MassDOT Owner: Town MassDOT Accepted: Accepted Inspection Area: 5 Priority Area: 0	<b>Existing Data</b> Linear Joint: No Existing Crack Seal: No																																				
<b>Inspection Data</b> Inspector: BETA Inspection Date: 4/14/2014 Pavement Material: BC Length Feet: 988.17 Length Miles: 0.19 Width: 22.00	<b>Distress Data</b> <table border="1"><thead><tr><th>Distress</th><th>Severity</th><th>Extent (%)</th><th>Notes</th></tr></thead><tbody><tr><td>Edge Cracking:</td><td>None</td><td>0</td><td></td></tr><tr><td>Alligator Cracking:</td><td>Moderate</td><td>20</td><td></td></tr><tr><td>Linear Cracking:</td><td>Moderate</td><td>30</td><td></td></tr><tr><td>Potholes:</td><td>None</td><td>0</td><td></td></tr><tr><td>Patching:</td><td>Moderate</td><td>10</td><td></td></tr><tr><td>Rutting:</td><td>None</td><td>0</td><td></td></tr><tr><td>Depressions:</td><td>Moderate</td><td>10</td><td></td></tr><tr><td>Drainage:</td><td>Moderate</td><td>10</td><td></td></tr></tbody></table> General Notes: 0	Distress	Severity	Extent (%)	Notes	Edge Cracking:	None	0		Alligator Cracking:	Moderate	20		Linear Cracking:	Moderate	30		Potholes:	None	0		Patching:	Moderate	10		Rutting:	None	0		Depressions:	Moderate	10		Drainage:	Moderate	10		<b>Curb Data</b> Odd Curb Type: CC Berm Even Curb Type: CC Berm Avg. Reveal: 6
Distress	Severity	Extent (%)	Notes																																			
Edge Cracking:	None	0																																				
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Rutting:	None	0																																				
Depressions:	Moderate	10																																				
Drainage:	Moderate	10																																				
		<b>Sidewalk Data</b> Sidewalk Odd: Yes Sidewalk Even: No Sidewalk Material Odd: Asphalt Sidewalk Material Even: None																																				
		<b>Striping Data</b> Center Line: No Edge Line Odd: No Edge Line Even: No																																				
		<b>Functional Class</b> Class Number: 6 Class Short: LO/CS/DE Class Long: Local Cul De Sac/Dead End Adjusted ADT: 250																																				

RSR: 72  
Refresh RSR

Record: 118 of 1472 Unfiltered Search

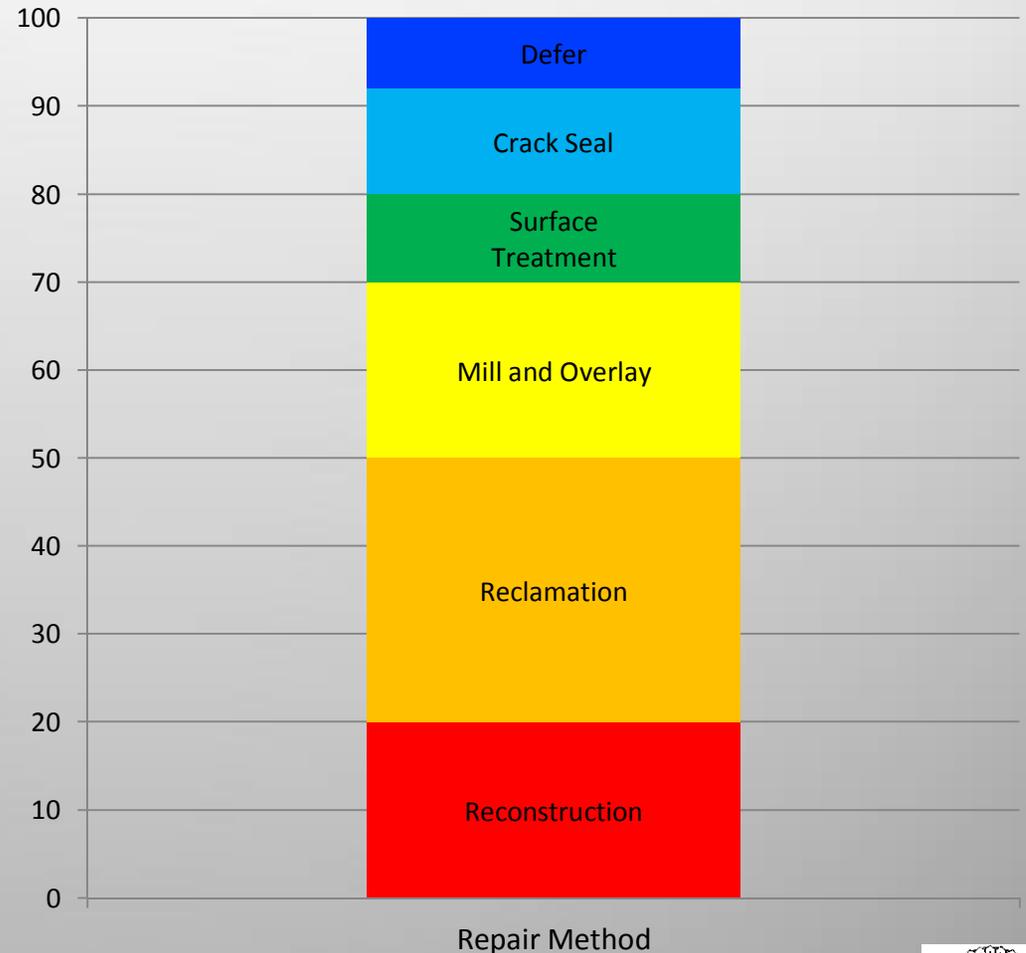
- Calculate Road Surface Rating (RSR) based on existing distresses
- Ratings are 0 to 100 (Worst to Best)
- Line striping and curb information identified



# Maintenance & Repair Methods

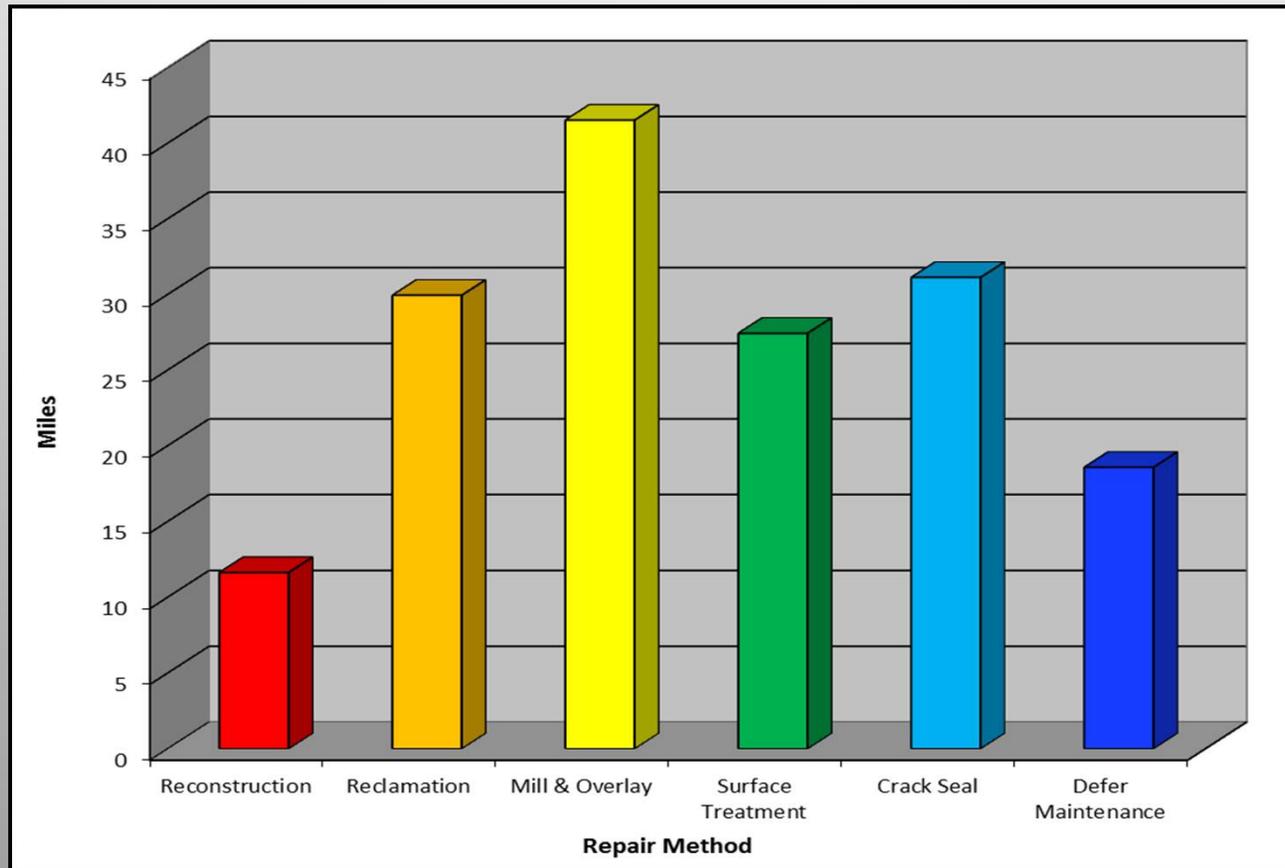
- Defer Maintenance - \$0 SY
- Routine Maintenance - \$0.40 SY
  - Crack Sealing
  - Patching
- Surface Treatment - \$8.00 SY
- Mill & Overlay - \$16.00 SY
- Reclamation - \$24.00 SY
- Reconstruction - \$38.00 SY

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



# Existing Conditions Summary

## General Rating by Mile\*



**Approx. 160  
Road Miles  
RSR = 67.04**

**\*Town Accepted Paved Roadways Only**



# Field Inspection Program

## Representative Conditions



*RSR = 85*

*Grade = B*



*RSR = 95*

*Grade = A*



# Field Inspection Program

## Representative Conditions



*Holly Tree Lane - 01*

*RSR = 64*

*Grade = D*



*Forest Street - 02*

*RSR = 80*

*Grade = C*



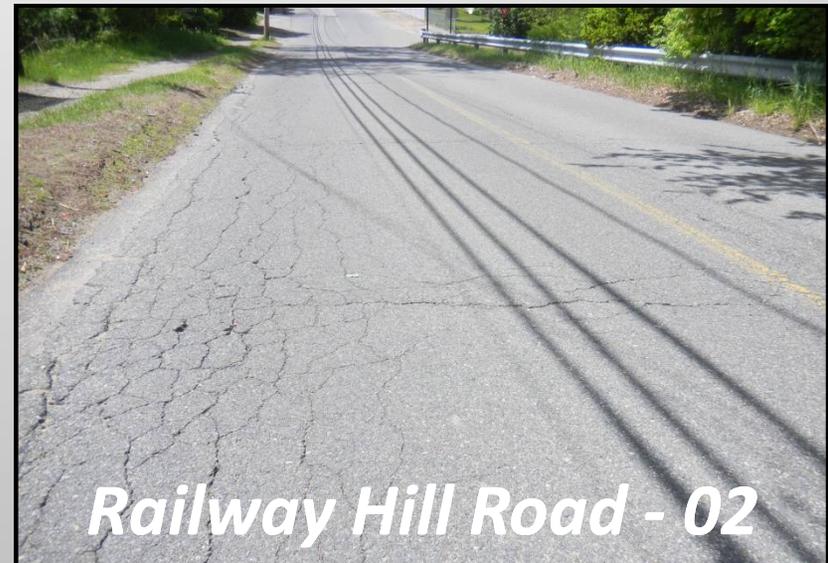
# Field Inspection Program

## Representative Conditions



*RSR = 15*

*Grade = F*



*RSR = 47*

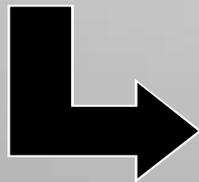
*Grade = F*



# Existing Conditions Summary

## Breakdown by Repair Method\*

Repair Method	Length (Miles)	Est. Cost	% By Repair
Reconstruction	11.63	\$4,876,724	7.3%
Reclamation	29.94	\$9,191,651	18.7%
Mill and Overlay	41.52	\$8,830,039	25.9%
Surface Treatment	27.43	\$2,984,626	17.1%
Crack Seal	31.12	\$166,959	19.4%
Defer Maintenance	18.57	\$0	11.6%
<b>TOTAL:</b>	<b>160.21</b>	<b>\$26,049,999</b>	<b>100.0%</b>



**Backlog = Approx. \$26 Million**

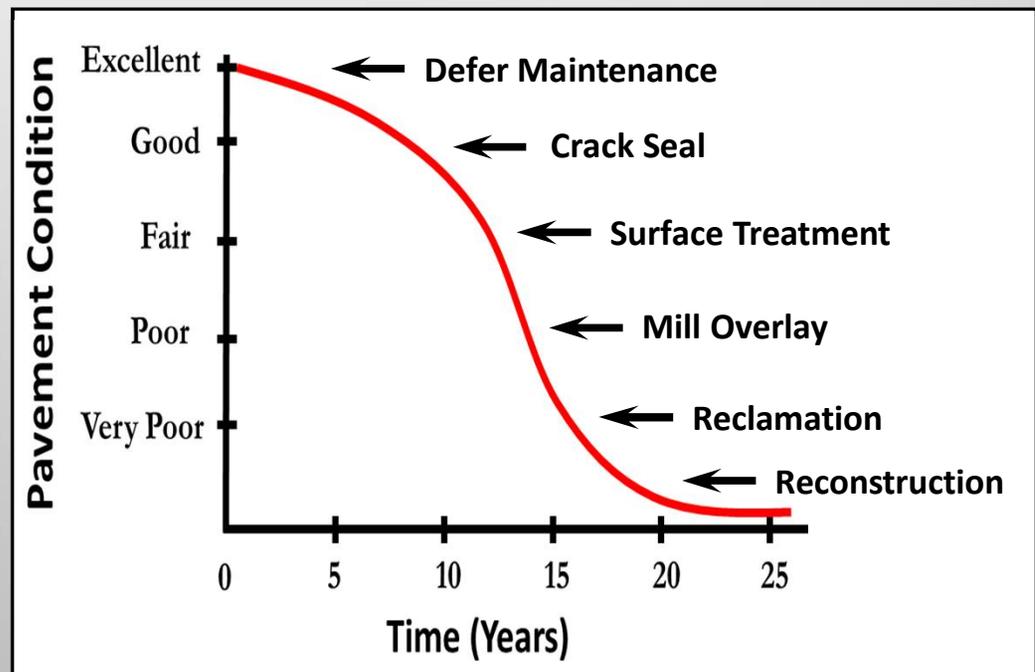
\*Curb to Curb Improvements Only  
Does Not Include Drainage, Sidewalks, Ramps



# CIP Development

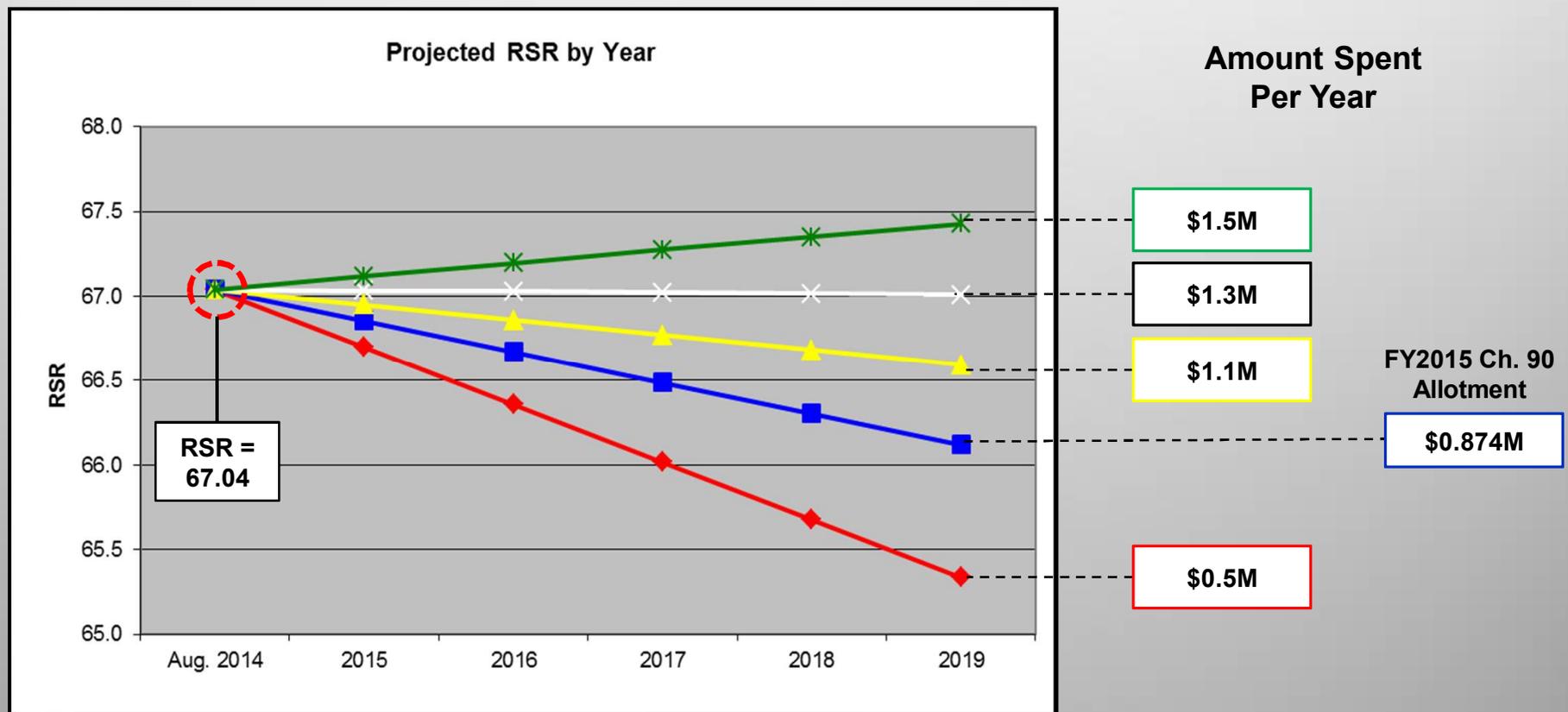
## Repair Methods and Forecasting

- Budget Requirements
- Refine Repair Methods  
Unit Costs
- Prioritization Strategies
- Utility Coordination
- Deterioration Rates



# Pavement Management Program

## RSR Forecast (5 Years)



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



# CIP Development

## Cost Benefit Value – Top 10 Roadways

Street Name	Avg. RSR	Length (Miles)	Est. Cost*	Repair Type
Maple Avenue	26	0.21	\$71,239	Reclamation
South Main Street	79	0.61	\$120,100	Surface Treatment
Centre Street	78	1.38	\$174,954	Surface Treatment
Vaughan Street	72	1.21	\$96,592	Surface Treatment
Anderson Avenue	70	1.12	\$136,635	Surface Treatment
Oak Street	69	0.87	\$220,537	Mill and Overlay
Sachem Street	47	1.88	\$521,420	Reclamation
Everett Street	61	2.17	\$513,381	Mill and Overlay
South Street	32	0.43	\$89,842	Reclamation
Spruce Street	76	2.82	\$264,823	Surface Treatment
<b>TOTAL:</b>	<b>N/A</b>	<b>12.70</b>	<b>\$2,209,523</b>	<b>N/A</b>

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



# Sign Inventory Program

## MUTCD Retro Requirements as set forth by Federal Highway

- All communities must establish a sign inventory and maintenance program to address new minimum retroreflectivity requirements by June 13, 2014



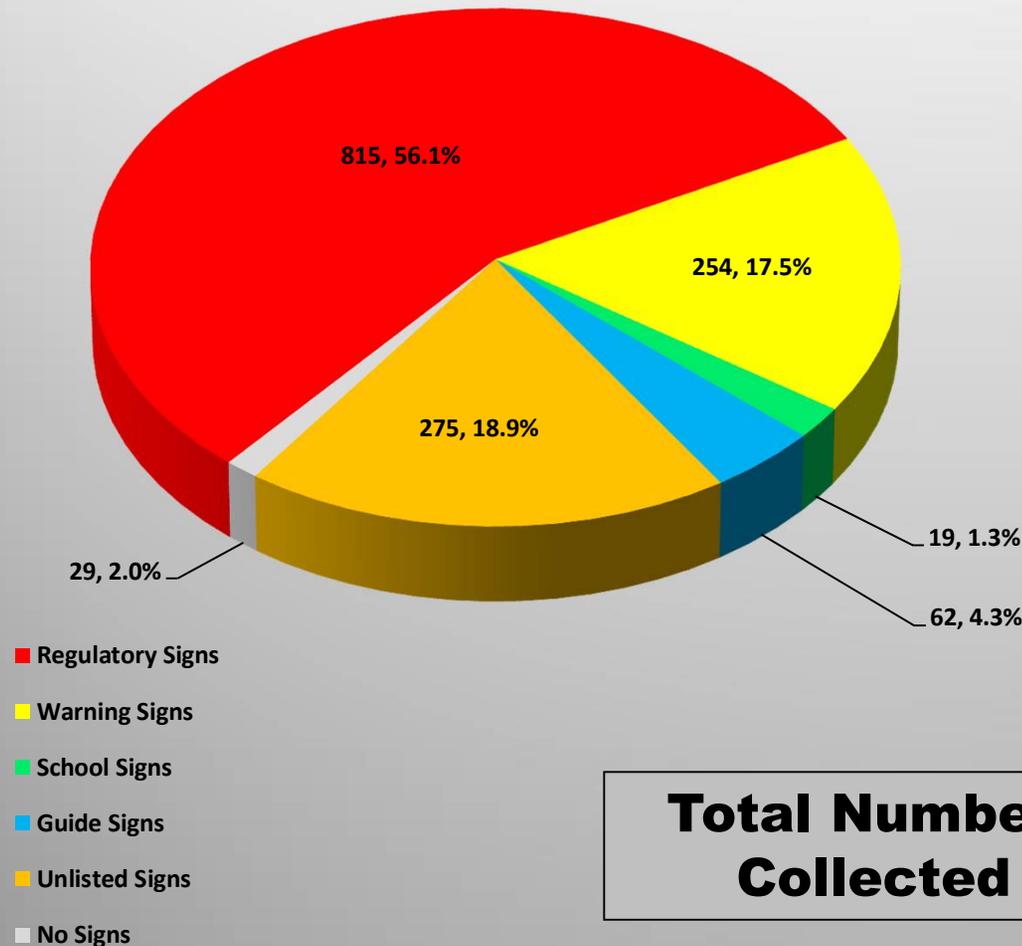
# Field Data Collection

- GIS-Based Approach
- Tablet Field Laptop
- Inventory Attributes
  - Sign Type
  - Sign Size
  - Sign Material
  - Sign Condition
  - Post Type and Condition
  - Retroreflectivity Rating
  - Stop Line Presence



# Summary of Findings

## Sign Type



## Sign Quantity Analysis (Top 3)

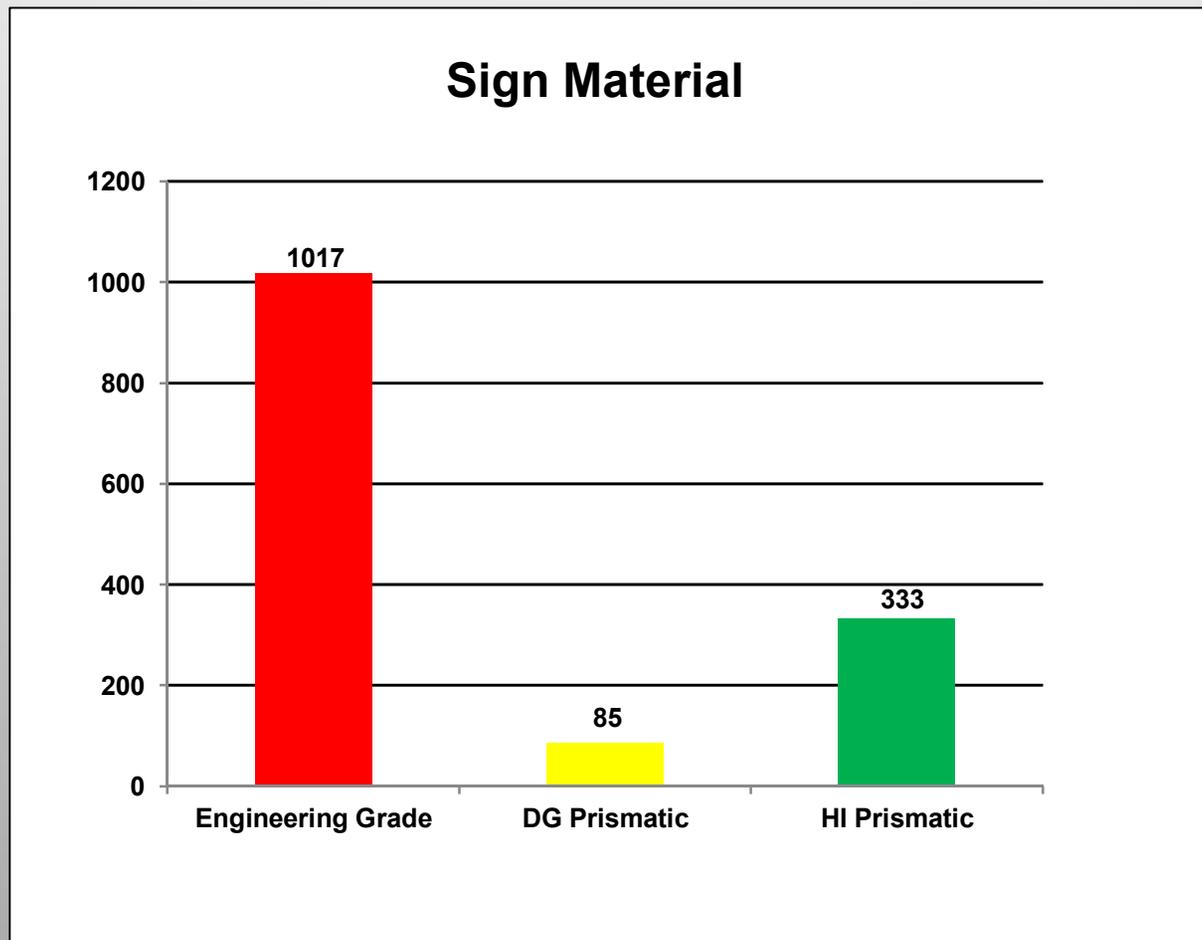
- Stop - 294
- Speed Limit - 178
- Children- 100

**Total Number of Signs  
Collected = 1,454**



# Summary of Findings

## Sign Material



# Sign Replacement Plan Options

## Option 1: Vendor Purchased, Vendor Installed

Year	Proposed Budget
2014	\$48,120
2015	\$20,160
2016	\$10,200
2017	\$11,760
2018	\$25,800
<b>Total</b>	<b>\$116,040</b>

## Option 2: Vendor Purchased, Town Installed

Year	Proposed Budget
2014	\$30,075
2015	\$12,600
2016	\$6,150
2017	\$7,350
2018	\$16,125
<b>Total</b>	<b>\$72,300</b>



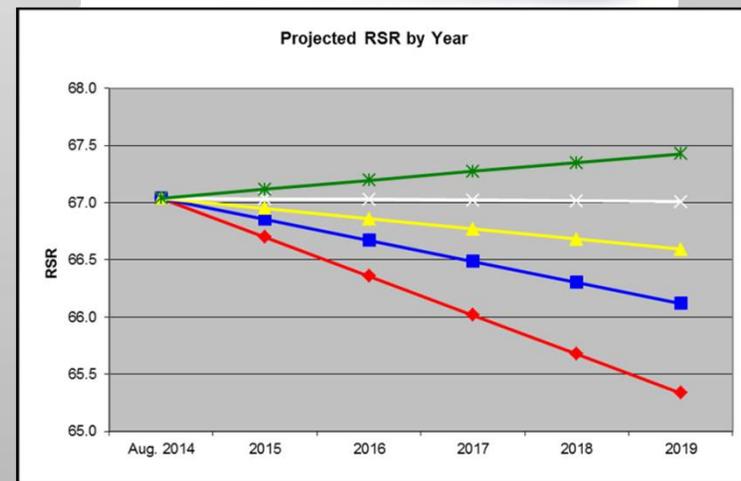
# System Maintenance

- Update data as improvements are completed
- Monitor and update actual costs
- Re-assess assets periodically
- Add new subdivisions and newly accepted roads to database



# Next Steps

- Determine target funding levels
- Identify funding sources
- Develop 5 Year Plan for FY2015-FY2019
- 5 Year Plan allows us to coordinate with utilities and future development plans
- Unaccepted Roadway Evaluation
- Sidewalk/Ramp Condition Assessment





# Town of Middleborough Department of Public Works

## ASSET MANAGEMENT PROGRAM OVERVIEW AND SUMMARY OF FINDINGS

Thank You

August 25, 2014

