



Town of Townsend Highway Department

Pavement Management Program



April 18, 2019

Pavement Management



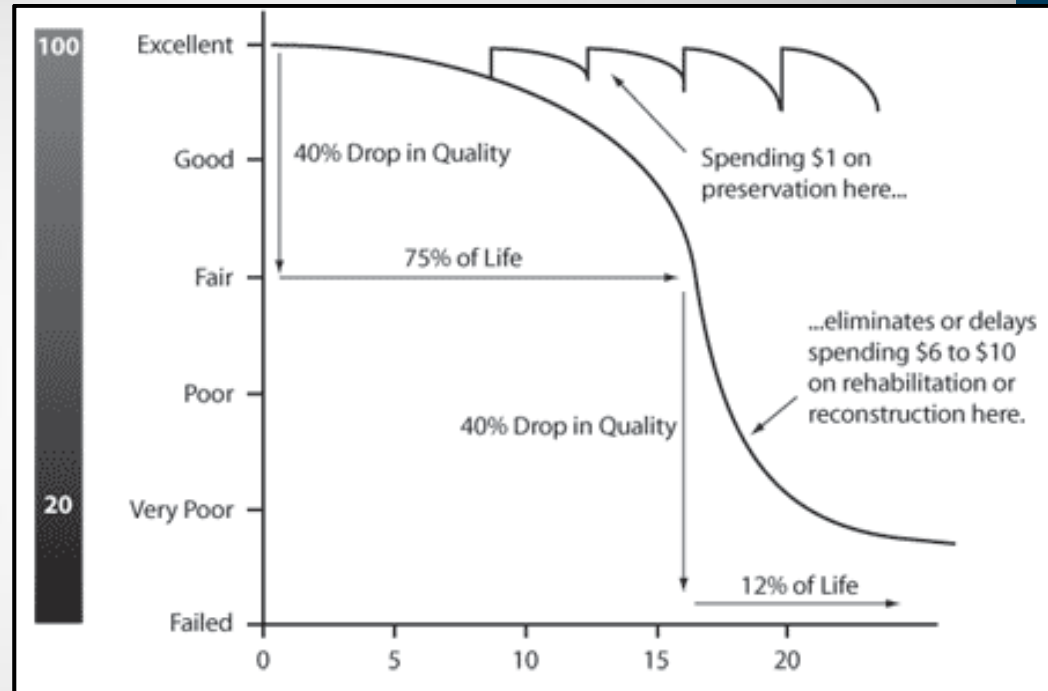
- i The practice of planning for pavement maintenance and rehabilitation with the goal of maximizing the value and life of a pavement network

*Perform the right repair
at the right time!*



Pavement Management

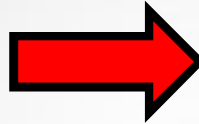
- ž Asset Management & Forecasting Tool
- ž It is more cost effective to keep good roads in good condition



Source: Federal Highway Administration



Pavement Management



Maintenance

- Crack Seal
- Fog Seal
- Pothole/Utility Patching

Surface Treatment

- Chip Seal
- Microsurfacing
- HMA Overlay

Structural Repair

- Mill and Overlay
- Reclamation
- Reconstruction



Comprehensive 5-Step Approach

1. Roadway Inventory & GIS Mapping

2. Field Inspection Program

3. Existing Conditions Summary

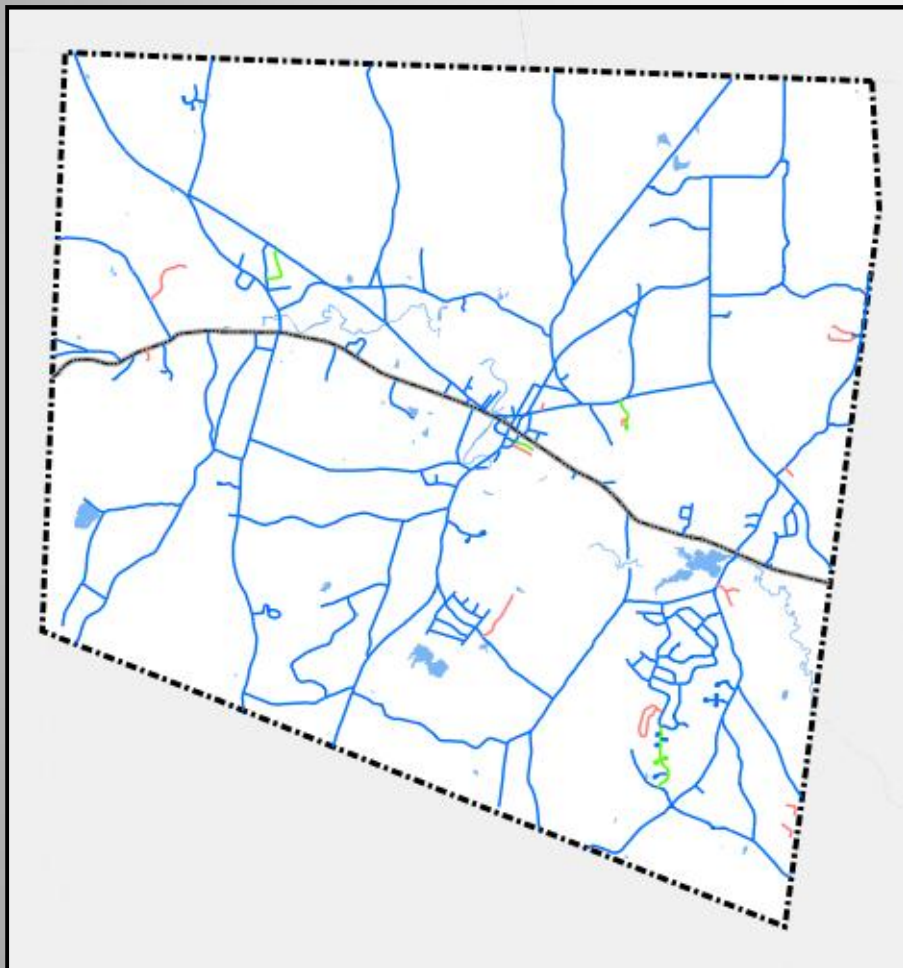
4. Capital Improvement Planning

5. System Maintenance



Roadway Inventory & GIS Mapping

Townsend Roadway Profile



Type	Miles
Accepted	85.82
Unaccepted	1.48
Private	2.98
State	6.52
Total	96.80

* Inspected road miles does not include gravel roads



System Interface

MS Access

BETA

Pavement Management Program

Forms

Roadway Inspection

Inspection/Inventory Table

Roadway Status

Capital Planning Worksheet

Roadway Repair History

Reports

Inspection

Inventory

Status

Capital Planning

Roadway Repair History

Analysis

Cost Benefit Value (CBV) Reports

RSR Forecasting Worksheet

Settings

Repair Categories - Banding - Costs

Distress Weighting

Repair Category Descriptions

Func. Class. Description

GIS

Asset Inventory Mapping

Town of Townsend, Massachusetts
Roadway Repair Backlog Summary - Accepted

Repair Method	Length (Miles)	Square Yards	Percent Repair	Estimated Cost
Reclamation	32.48	464,295.68	40.23%	\$11,143,096.26
Mill and Overlay	15.48	205,101.51	19.17%	\$3,281,624.22
Preventative Maintenance	4.48	64,202.29	5.55%	\$513,618.30
Crack Seal	23.79	338,757.88	29.47%	\$169,378.94
Defer Maintenance	4.50	59,585.35	5.57%	\$0.00
Total:	80.73	1,131,942.71	100.00%	\$15,107,717.72

Average RSR By Segment: 57.10

Inspection Reports

Roadway Repair Categories and Banding

Roadway Repair Backlog Summary - Accepted

Roadway Repair Backlog Summary - Functional Classification

Roadway Repairs With Segment Description - Accepted

Roadways Sorted - Alphabetically

Roadways Sorted - Road Surface Rating (RSR)

Roadways Sorted - Functional Classification

Overview of Current PMP Roadway Repair Methods and Banding

Accepted Roadway Network Rating Shown By Repair Type

Roadway Network Rating Shown By Functional Classification

Accepted Roadway Network With Detailed Segment Description

Roadway Network With Overall Roadway Description Sorted Alphabetically

Roadway Network With Overall Roadway Description Sorted By (RSR) Worst to Best

Roadway Network With Overall Roadway Description Sorted By Func. Class Worst to Best

BETA Group, Inc.

3/21/2019 This Report Is Intended For General Planning and Informational Purposes Only Page 1 of 1

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Non-Proprietary
System



Road Surface Rating

Pavement Inspection Form

Roadway Inspection

Inspection Form

Location

GIS ID: 93

Street Search: BARKER HILL ROAD

Segment Name: BARKER HILL RD-02

From Street: DUDLEY RD

To Street: NEW HAMPSHIRE SL

Status

Owner: Town

Acceptance Status: Accepted

DOT Owner: Town

DOT Acceptance Status: Accepted

Inspection Area: 1

RSR

RSR: 64

Refresh RSR

Historic RSR

Roadway Inspection

Inspector: BETA

Inspection Date: 8/14/2014

Pavement Material: BC

Length Feet: 9,359.40

Length Miles: 1.77

Width: 18.00

Other Data

Utility Cuts: No

Existing Crack Seal: No

Delamination: No

Longitudinal Joint: No

Striping Data

Centerline: No

Edgeline Odd: No

Edgeline Even: No

Distress Data

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

Curb Data

Odd Curb Type: CC Berm

Even Curb Type: CC Berm

Avg. Reveal: 6

Sidewalk Data

Exists Odd Side: No

Exists Even Side: No

Material Odd Side: None

Material Even Side: None

Notes

0

Record: 14 of 392



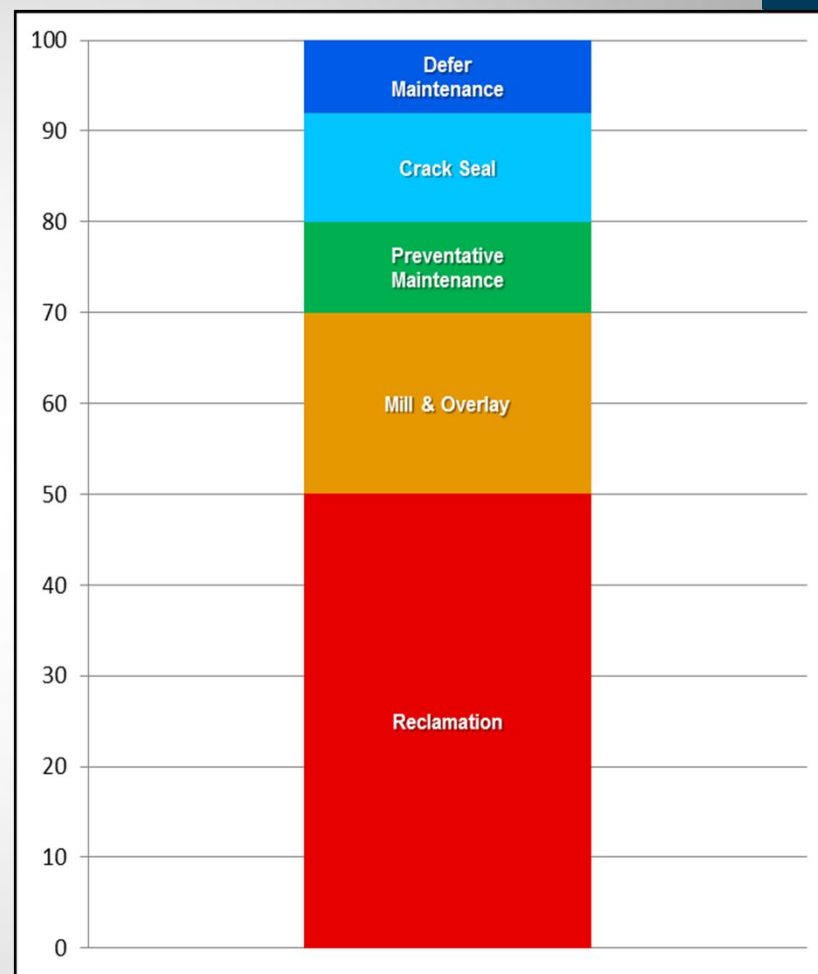
- Calculate Road Surface Rating (RSR) based on existing distresses
- Ratings are 0 to 100 (Worst to Best)
- Line striping, curb and sidewalk information identified



Repair Methods & Unit Costs

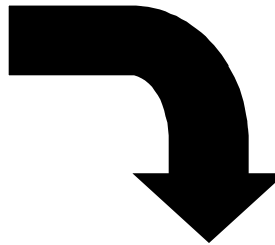
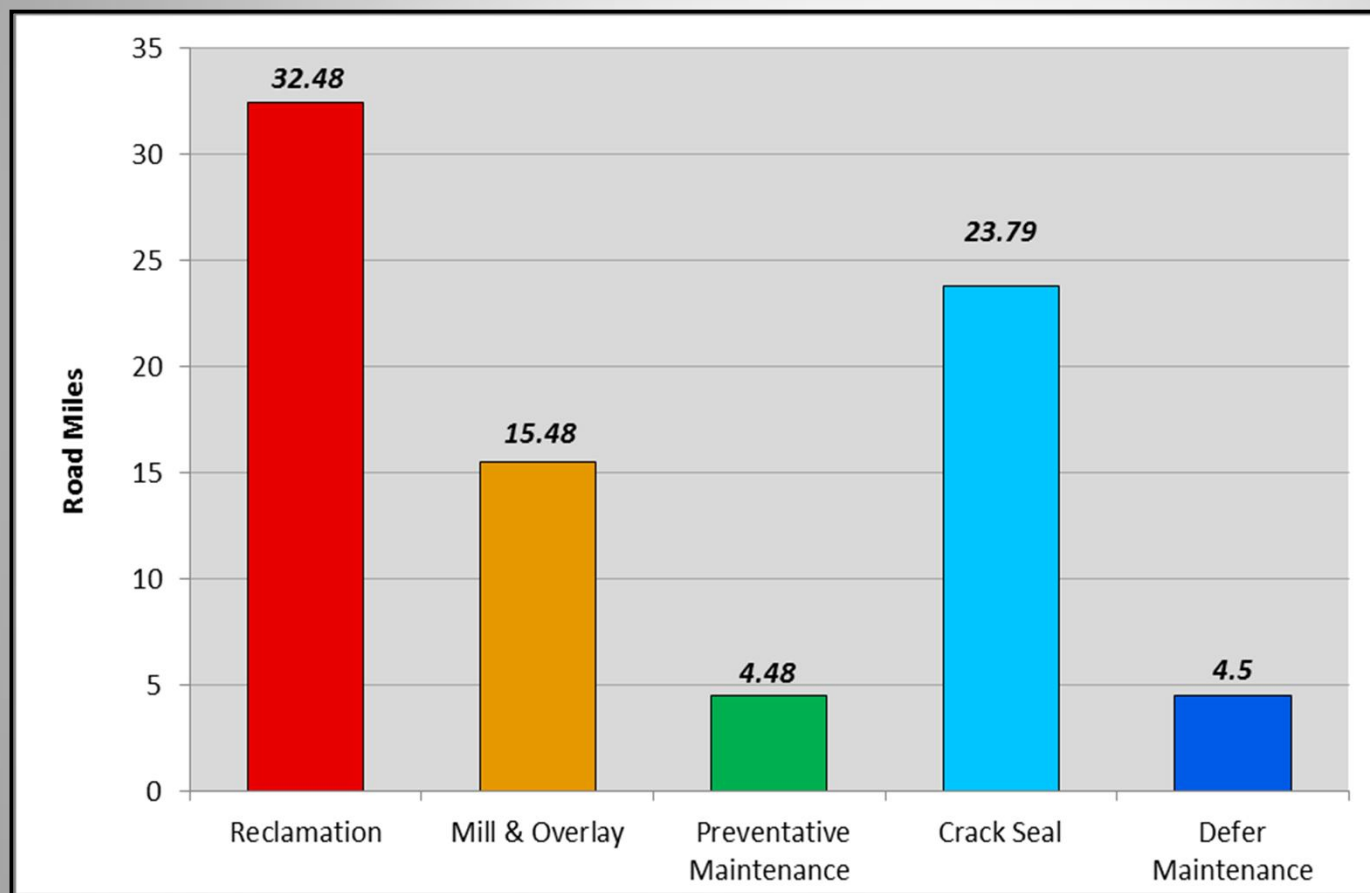
- ž Defer Maintenance- \$0 SY
- ž Crack Seal - \$0.50 SY
- ž Preventative Maintenance - \$6.00 SY
 - i Chip Seal
 - i Microsurfacing
 - i HMA Overlay
- ž Mill & Overlay - \$16.00 SY
- ž Reclamation - \$24.00 SY

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



Existing Conditions Summary

General Rating By Mile*



Approx. 80.73
Road Miles
RSR = 57.10

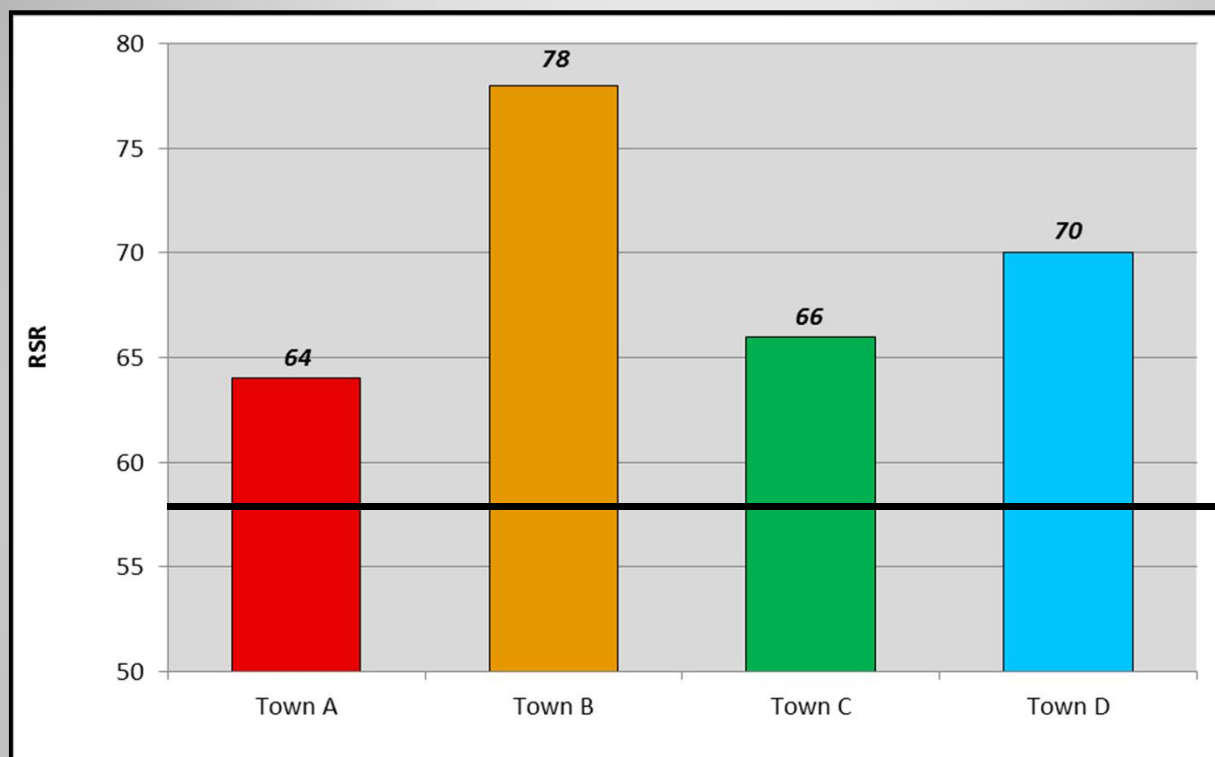


*Town Accepted Paved Roadways Only



Existing Conditions Summary

Similar Communities in the Area



Townsend's
RSR = 57.10

Community Information			
Town	Inspection Year	Miles	AVG. RSR
A	2018	40.21	64
B	2016	151.87	78
C	2018	63.26	66
D	2017	69.54	70
Average			69.5
Townsend	2014	80.73	57.10



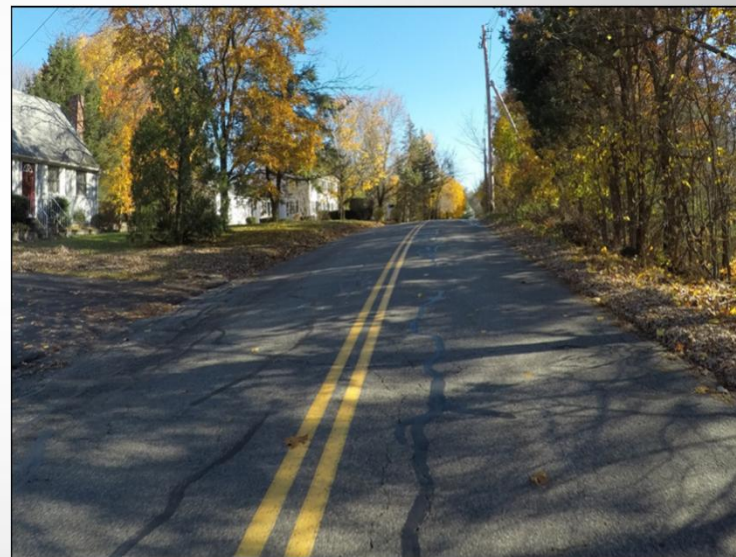
Field Inspection Program

Representative Conditions



Kendrick St

RSR = 20



May St - 03

RSR = 45



Field Inspection Program

Representative Conditions



Creek St - 02

RSR = 73



Elysium St - 01

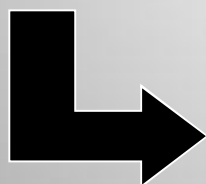
RSR = 95



Existing Conditions Summary

Breakdown By Repair Method

Backlog Summary				
Repair Method	Length (Miles)	Square Yards	Percent Repair	Estimated Cost
Major Rehabilitation	32.48	464,296	40.23%	\$11,143,096.26
Minor Rehabilitation	15.48	205,102	19.17%	\$3,281,624.22
Preventative Maintenance	4.48	64,202	5.55%	\$513,618.30
Routine Maintenance	23.79	338,758	29.47%	\$169,378.94
No Maintenance Required	4.5	59,585	5.57%	\$0.00
Total	80.73	1,131,943	100%	\$ 15,107,717.72
Network Level RSR	57.10			



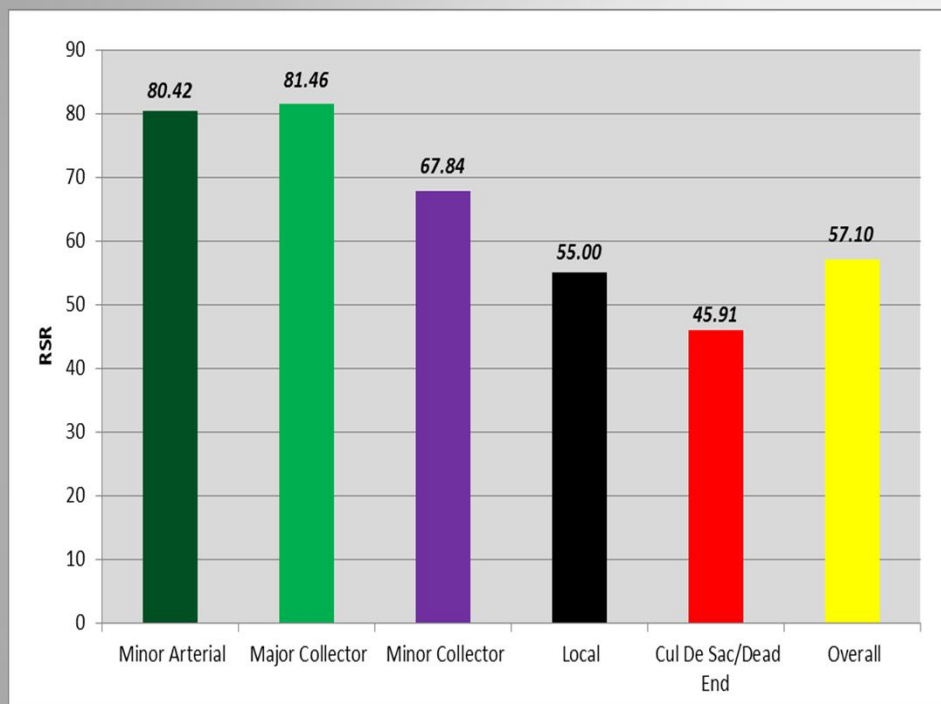
Backlog = Approx. \$15.1 Million

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



Existing Conditions Summary

RSR Breakdown By Functional Class



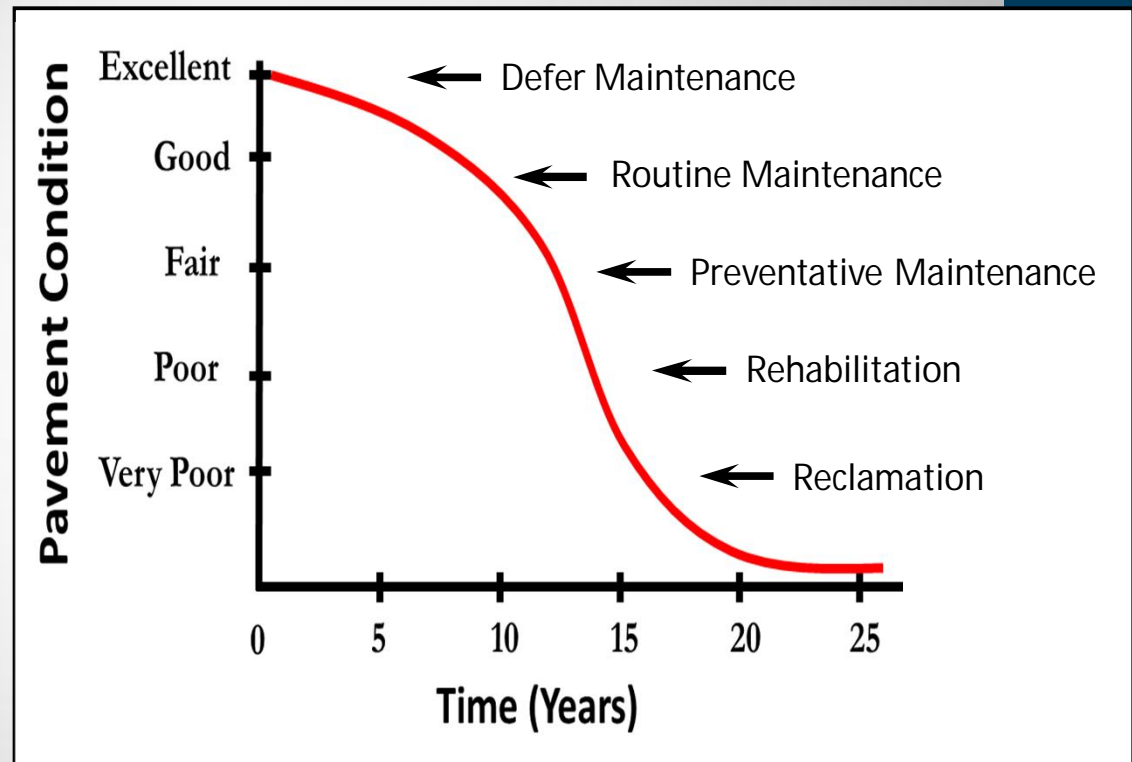
RSR by Functional Class			
Description	Functional Class	AVG. RSR	Total Miles
Most Traveled Roads, used by residents and non-residents to get through/around the town	Minor Arterial	80.42	6.18
	Major Collector	81.46	6.96
	Minor Collector	67.84	7.08
Roads used by residents of the town.	Local	55.00	46.77
Roads only used by residents of those roads.	Cul De Sac/Dead End	45.91	13.74
	Overall	57.10	80.73

Functional classification defines the character of services that a particular roadway is intended to provide.



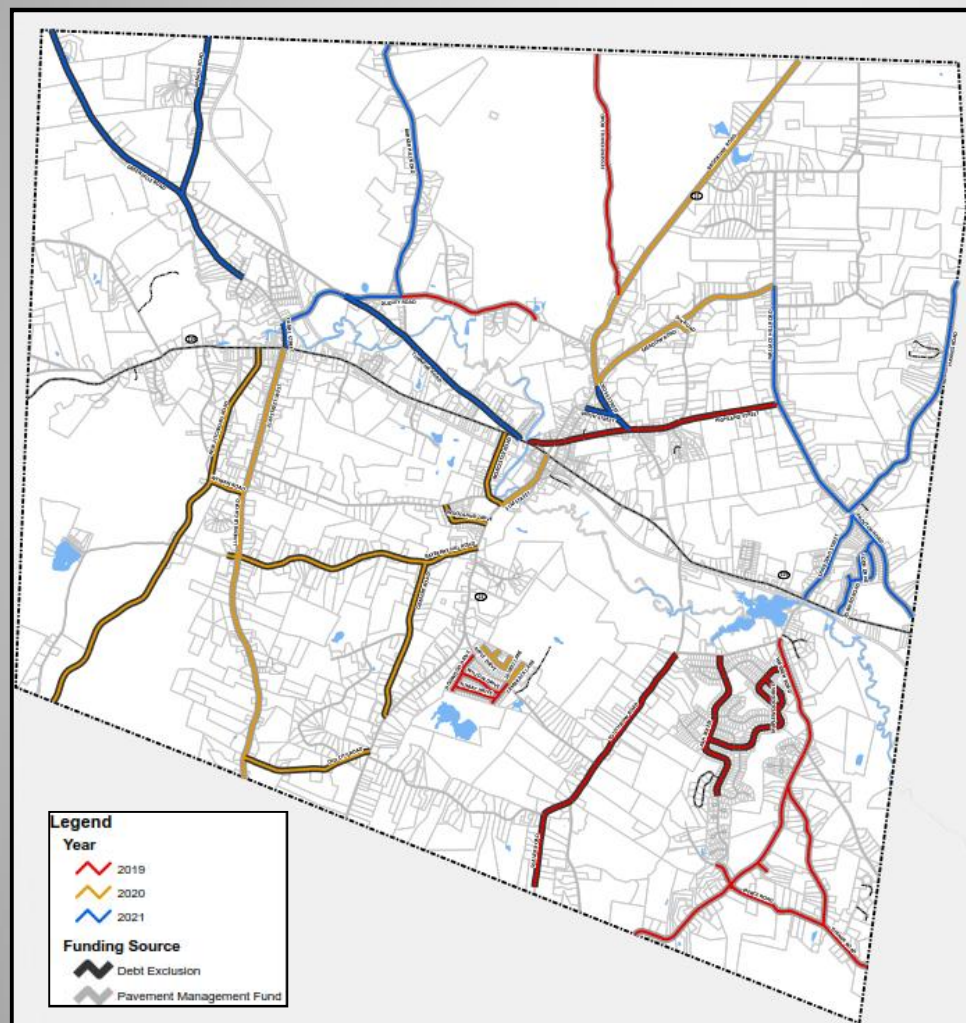
CIP Development

- ž Target RSR & Budget Requirements
- ž Refine Repair Methods Unit Costs
- ž Prioritization Strategies (CBV)
- ž ADA & Utility Coordination
- ž Deterioration Rates



CIP Development

Proposed 3-Year Plan



Debt Exclusion		
Year	Miles	Cost
2019	6.12	\$1,572,855
2020	7.75	\$2,014,966
2021	5.54	\$1,576,578
Total	19.41	\$5,164,578
Pavement Management Fund		
Year	Miles	Cost
2019	8.75	\$705,322
2020	8.24	\$847,471
2021	8.56	\$977,873
Total	25.55	\$2,530,666



CIP Development

Priority Roads

- ✂ Ash Street
- ✂ Beech Street
- ✂ Highland Street
- ✂ Maplewood Drive
- ✂ Seaver Road
- ✂ South Row Road
- ✂ Bayberry Hill Road
- ✂ Clement Road
- ✂ New Fitchburg Road
- ✂ Woodland Drive
- ✂ Worcester Road
- ✂ Old City Road
- ✂ Wyman Road
- ✂ Canal Street
- ✂ Greenville Road
- ✂ Mason Road
- ✂ Turnpike Road
- ✂ Cross Street
- ✂ Smith Street

Estimated Cost
\$5.16 Million

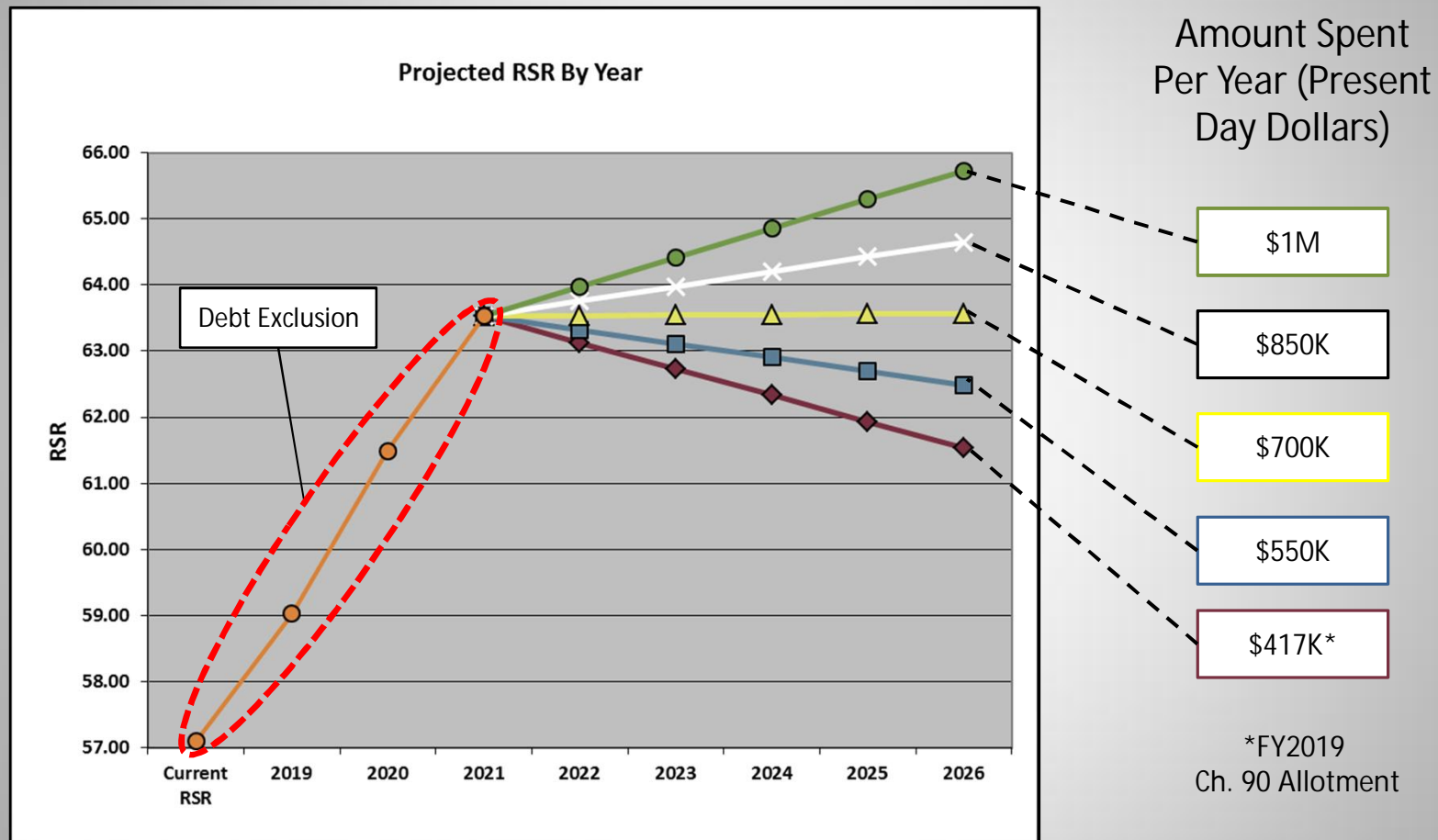


*Town Accepted Paved Roadways Only



CIP Development

RSR Forecasting – 5 Years (Standard Model)



Roadway Forecast Model Percentage Breakdown:

- Routine Maintenance – 10%
- Preventative Maintenance– 25%
- Minor Rehabilitation– 40%
- Major Rehabilitation – 25%

*Town Accepted Paved Roadways Only



System Maintenance

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





Town of Townsend Highway Department

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