

Town of East Haddam, Connecticut

Pavement Management Program

Summary of Findings

February 4th, 2025

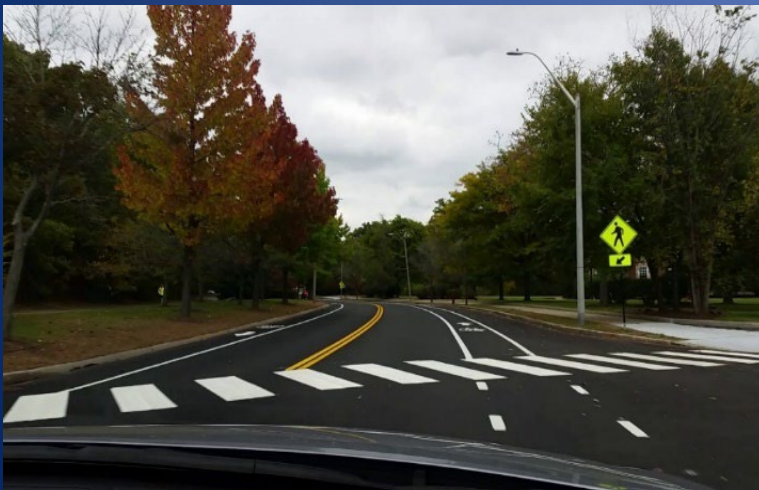


Introduction

About BETA Group Inc.

Our integrated approach to projects means that our team works together to provide smart solutions to our clients' needs, *improving the communities where we live and work.*

- Established in 1982
- Employee Owned
- More than 170 employees in six offices
- Multi-disciplined engineering firm servicing over 160 communities and agencies, primarily across New England
- We strive to offer our clients cost-effective pavement management solutions
- *We value our clients and our communities!*



Benefits of Pavement Management

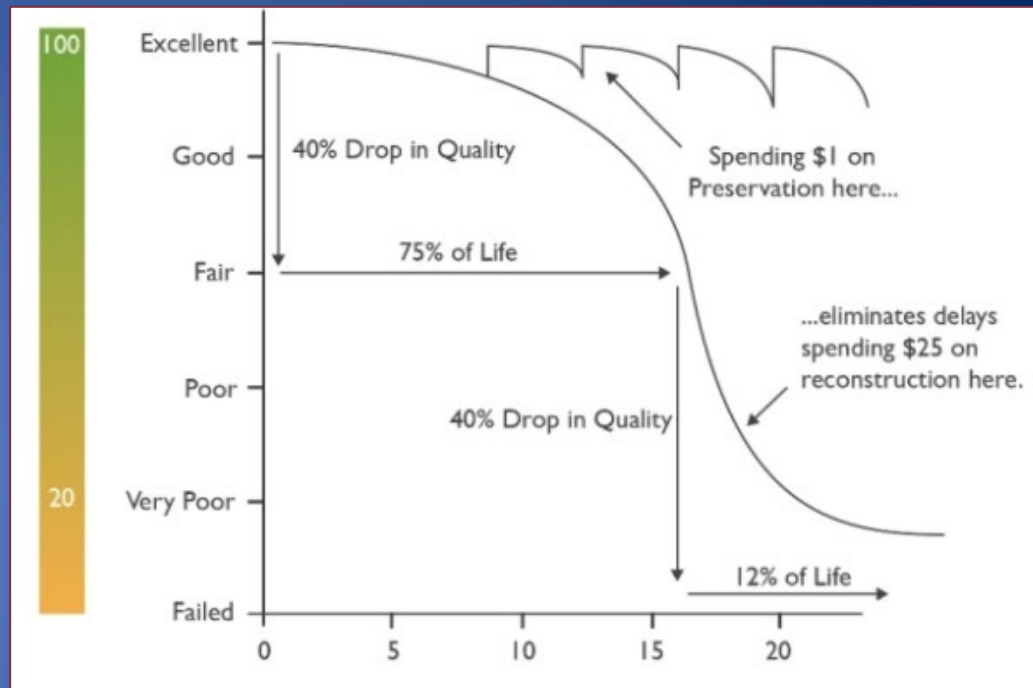


- Protects a community's investment by maximizing the life span of the roadway network
- Provides the ability to plan-ahead and predict budgetary needs (minimize costs while maximizing value)
- Apply the appropriate treatment at the correct location and time
- *Provides foundation for decision making*

Proactive vs. Reactive

Program Goals & Objectives

- ✓ Conduct Pavement Condition Assessment
- ✓ Understand Roadway Conditions & Needs
- ✓ Evaluate Repair Strategies & Benefits
- ✓ Establish Estimated Backlog of Improvements
- ✓ *Develop Prioritized Plan*



CIP Tool

Five-Step Project Approach

1. System Set-up & GIS Mapping

2. Pavement Inspection Program

3. Existing Conditions Analysis

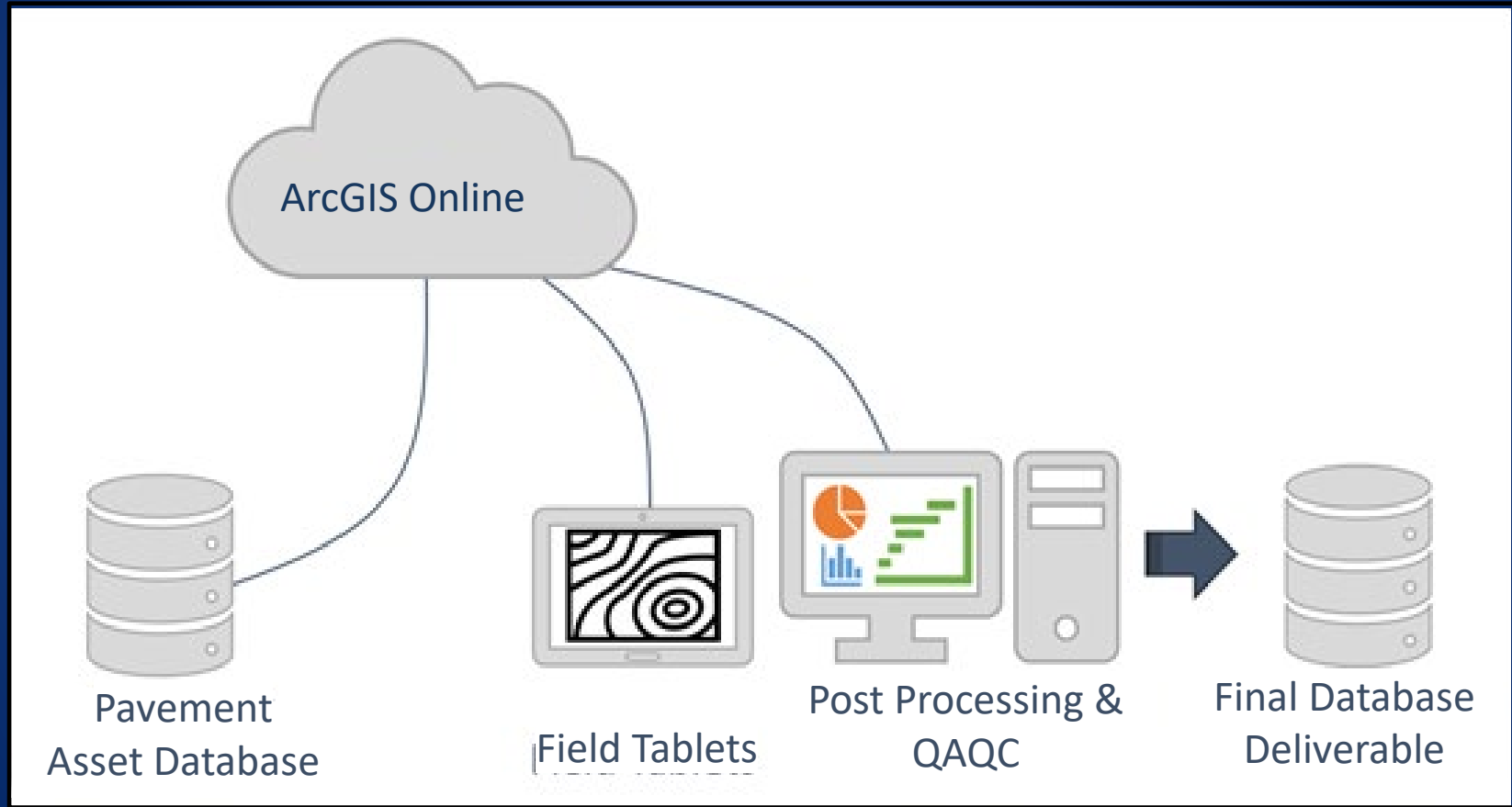
4. Planning & Prioritization

5. System Deployment & Training



System Configuration & Mapping

GIS Centric Approach



Pavement Inspection Program

Automated Approach (Image-Based)

- Utilizes a smart-phone camera mounted inside the vehicles windshield to capture imagery at 10' – 20' intervals.
- These images are then analyzed using machine learning technology to identify pavement surface damages such as cracks, potholes and patching. The data is then scored at either a 1-5 rating (best to worst) or the standard 0-100 score based on preference.
- Benefit to image-based approach is the leveraging of point data to generate “hot-spot” mapping of worst roadway sections



Pavement Inspection Program

Automated Approach (Image-Based)

Automated Data Analysis: Overall > Segment > Point

1

Roads Scored at 10 to 20 foot intervals with corresponding image file attached



Main St-01



Main St-02



Main St-03

2

Roads Scored at Street Segment Level (Intersection to Intersection)



Main St-01



Main St-02



Main St-03

3

Road Scored for Entire Street



Main Street (End to End)

Roadside features can also be processed such as sidewalks, curb ramps, signs and street trees

System Configuration & Mapping

Roadway Profile

Roadway Type	Miles
Town Accepted	Asphalt: 68.98
	Chip Seal: 33.39
	Gravel: 17.44
Private	Asphalt: 5.78
	Gravel: 1.87
	Unknown: 7.44
State	Asphalt: 33.85
Total	168.74

Paved
Roadways
Inspected
By BETA

Pavement Inspection Program

Repair Bands & Conditions

Repair Band	RSR Range	Repair Band Description	Repair Method Examples
No Maintenance Required	92 – 100	Excellent Condition – Pavement needs no immediate repairs or maintenance.	- N/A
Routine Maintenance	80 – 92	Good Condition – Pavement may need crack sealing/fog sealing or minor localized repairs.	- Crack Sealing - Fog Sealing - Rejuvenators - Chip Seals/Micro
Preventative Maintenance	65 – 80	Fair Condition – Pavement surface needs a surface seal or thin overlay	- Ultra Thin Bonded Wearing Course - Chip Seals/Micro - Shim & Overlay
Minor Rehabilitation	50 – 65	Poor Condition – Pavement surface structure needs added strength for existing traffic. Typically, an overlay or mill & overlay for these roads.	- Mill & Overlay - Cold In-Place Recycling (CIR) - Hot In-Place Recycling (HIR) - Shim/Level & Overlay
Major Rehabilitation	0 – 50	Deficient Condition – Typically, the base layers of the pavement need to be rebuilt. The implementation of a reclamation or full depth reconstruction is needed.	- Reclamation - Reconstruction - Full Depth Reclamation (FDR)

Roadway RSR– Representative Examples (Good)



Roadway RSR– Representative Examples

(Fair)



Roadway RSR– Representative Examples (Poor)



RSR: 40



RSR: 26

Existing Conditions Analysis

Estimated Costs of Improvements (Accepted)

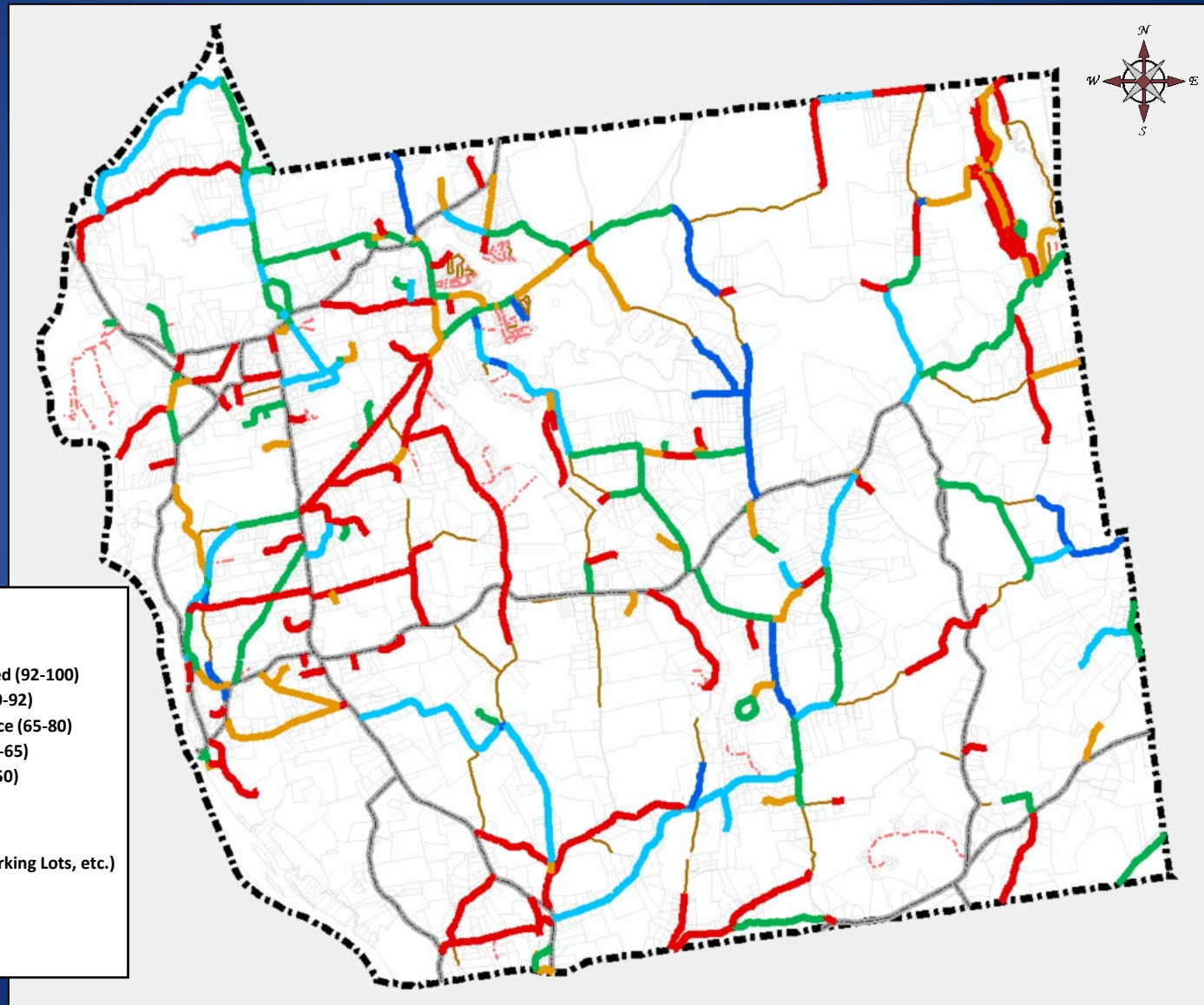
<i>Repair Method</i>	<i>Average Unit Cost (\$/SY)</i>	<i>Length (Miles)</i>	<i>Square Yards</i>	<i>Percent Repair</i>	<i>Estimated Cost</i>
Major Rehabilitation	\$48.00	38.46	411,809.19	37.57%	\$19,766,841.11
Minor Rehabilitation	\$18.00	14.12	154,046.09	13.79%	\$2,772,829.61
Preventative Maintenance	\$9.50	24.80	265,857.84	24.23%	\$2,525,649.44
Routine Maintenance	\$1.00	17.39	171,795.75	16.99%	\$171,975.75
No Maintenance Required	\$0.00	7.59	78,608.97	7.42%	\$0.00
Total		44.37	1,082,297.84	100%	*\$25,237,295.91

Network Rating = 59.27

*Based on curb-to-curb improvements only, does not include sidewalk, curb ramp or utility improvements. Estimated costs as shown are for planning purposes only and do not reflect fluctuations in liquid asphalt or other pavement mix components

Existing Conditions Analysis

Pavement Condition Map



Legend

Repair Category

- No Maintenance Required (92-100)
- Routine Maintenance (80-92)
- Preventative Maintenance (65-80)
- Minor Rehabilitation (50-65)
- Major Rehabilitation (0-50)

Non-Inspected Roadways

- State
- Other (Private Roads, Parking Lots, etc.)

Other

- Open Space
- Waterbodies

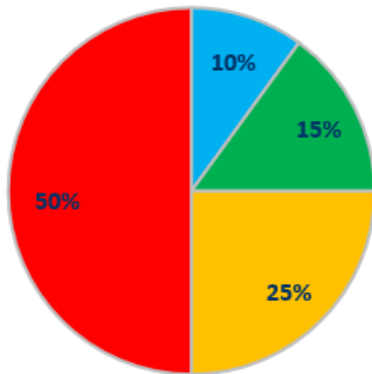
Existing Conditions Analysis

5-year Forecast – Balanced Model

Roadway Forecast Model East Haddam, CT

ManageMyRoads by BETA

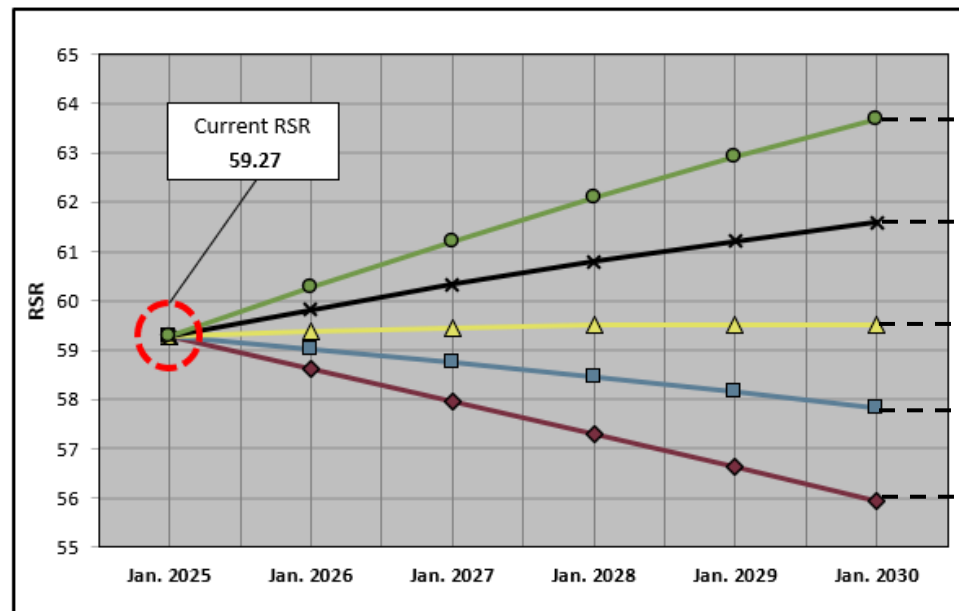
Funding Distribution by
Repair Type



- Routine Maintenance
- Preventative Maintenance
- Minor Rehabilitation
- Major Rehabilitation

Community Profile

Road Miles = 102.36



Estimated
Amount
Per Year*

\$2.25M

\$1.75M

\$1.25M

\$850K

\$400K

Funding Scenarios

Scenario 1*	\$400,000
Scenario 2	\$850,000
Scenario 3	\$1,250,000
Scenario 4	\$1,750,000
Scenario 5	\$2,250,000

*Please Note: Unit pricing accounts for curb-to-curb improvements only; does not include any drainage, sidewalk, ADA, gravel sub-base or utility improvements.

ManageMyRoads Platform

Example of ManageMyRoads Platform that the Town will receive as part of final deliverable once all gravel roads have been inspected:

Est. Cost of Improvements

7.70M

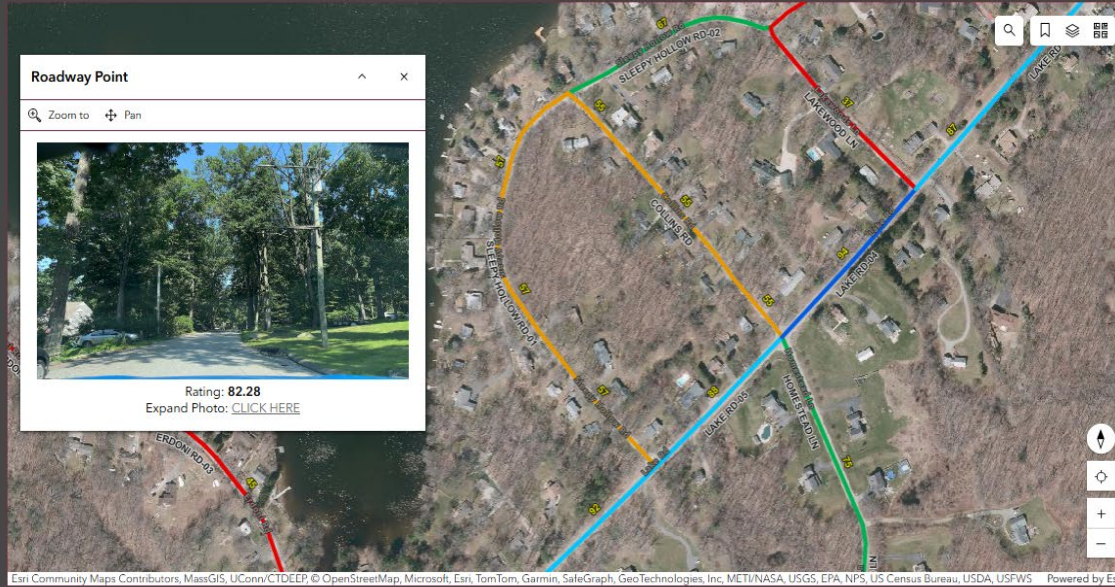
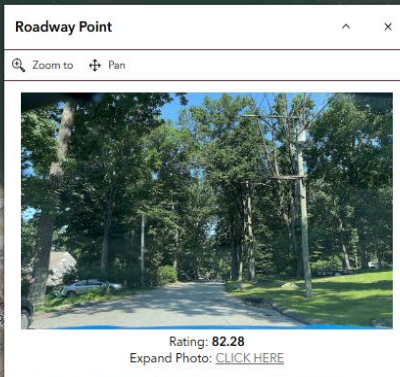
Centerline Miles

44.37

Square Yards

608.77k

Roadway Repair
Categories (Miles)



Street Segments Sorted Alphabetically

StreetName	StreetSegment	FromStreet	ToStreet	Length	Miles	Width	RepairMethod_1	AdjustedRSR	BenefitValue	Cost	PavementTypeLong	Cl...
BAKER HILL ROAD	BAKER HILL RD	CARDS MILL ROAD	LEBANON TL	1,328.65	0.25	25.00	Minor Rehabilitation	64	6.51	66,432.58	Asphalt	Local
BASKET SHOP ROAD	BASKET SHOP RD	HEBRON TL	WEST ST	2,281.32	0.43	21.00	Preventative Maintenance	72	5.12	50,569.21	Asphalt	Local
BEACH ROAD	BEACH RD	LAKE RD	DEAD END	430.25	0.08	21.00	Routine Maintenance	87	3.45	1,003.93	Asphalt	Lo...
BEARS DEN WAY	BEARS DEN WAY-01	LAKE RIDGE DR	DEER RUN	1,142.37	0.22	21.00	Routine Maintenance	85	17.65	2,665.53	Asphalt	Local
BEARS DEN WAY	BEARS DEN WAY-02	DEER RUN	CUL DE SAC	522.41	0.10	22.00	Routine Maintenance	81	3.70	1,895.66	Asphalt	Lo...
BEAUDET TERRACE	BEAUDET TER	DOUBLEDAY RD	CUL DE SAC	2,010.11	0.38	26.00	Preventative Maintenance	73	1.01	58,279.12	Asphalt	Lo...
BRENDI TRAIL	BRENDI TRAIL	PINE ST	TIMBER TR	1,984.68	0.38	30.00	Preventative Maintenance	72	5.12	62,848.06	Asphalt	Local
CARDS MILL ROAD	CARDS MILL RD-01	RT 66	COMMERCE DR	183.40	0.03	22.00	No Maintenance Required	97		0.00	Asphalt	Local
CARDS MILL ROAD	CARDS MILL RD-02	COMMERCE DR	OLD WILLMANTIC RD	1,993.95	0.38	21.00	No Maintenance Required	95		0.00	Asphalt	Local

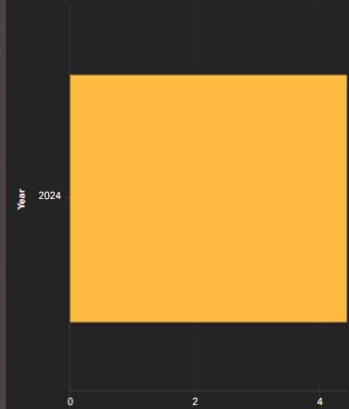
Alphabetical RSR (Worst to Best) CBV

Road Network Rating

71.42

Last Updated: 10/3/2024

Repair History by Year
(Miles)



Repair History Chart Map Legend

ManageMyRoads Web Links:



Next Steps

Capital Planning & Prioritization



Capital Improvement Planning Timeline



Next Steps

Capital Planning & Prioritization

Analysis Considerations



Roadway Condition (Good, Fair, Poor)

Roadway Functional Classification

Cost Benefit Value (CBV)

Repair Costs

Life Improvement

Sub-Surface Utilities (Gas, Water, Sewer)

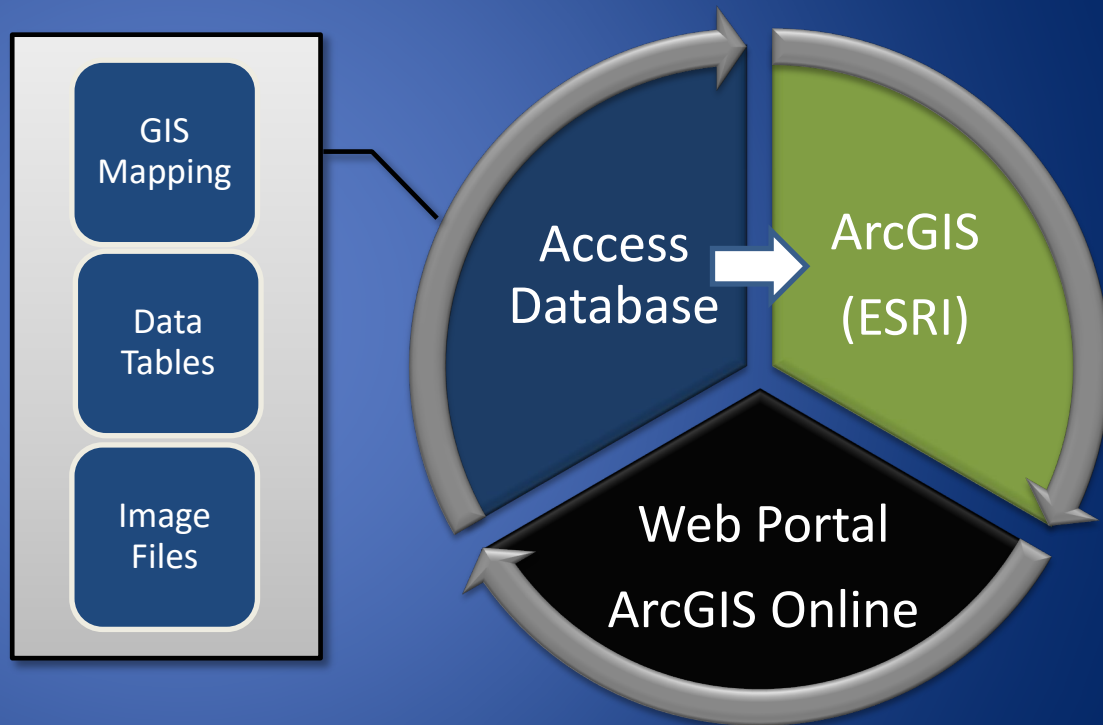
Sidewalks & Curb Ramps

Geographic Location/Proximity

Next Steps

System Deployment & Maintenance

- Training Program
- Update data as improvements are completed
- Monitor and update actual costs
- Re-assess roadways every 3-5 years
- **System Support**



ManageMyRoads Platform
(For Town Use Only)

Concluding Remarks

1. Comprehensive Inventory has been created for Town Accepted roads, their condition, & the most effective way to prioritize maintenance and repairs.
2. Designed to better manage limited dollars allocated to road work in Town
3. Capable of assessing the different types of repair strategies necessary to maximize the lifecycle of the roads

Town of East Haddam, Connecticut

Thank You!

Summary of Findings

February 4th, 2025

