



MONTACHUSETT REGIONAL PAVEMENT PROFILE

*Monitoring Federal Aid Eligible Pavement
Infrastructure in the Montachusett Region*

September 2021

Prepared in cooperation with the Massachusetts Department of Transportation and the U.S. Department of Transportation. The views and opinions of the Montachusett Regional Planning Commission expressed herein do not necessarily state or reflect those of the Massachusetts Department of Transportation or the U.S. Department of Transportation.

The Montachusett MPO and the MRPC fully complies with Title VI of the Civil Rights Act of 1964 and related statutes and regulations in all programs and activities. The Montachusett MPO operates without regard to race, color, national origin, English Proficiency, ancestry, creed, income, gender, age and/or disability. Any person who believes him/herself or any specific class of persons, to be subject to discrimination prohibited by Title VI may by him/herself or by representative file a written complaint with the MRPC or the MMPO. Complaints are to be filed no later than 180 days from the date of the alleged discrimination. Please contact Glenn Eaton at 978-345-7376 ext. 310 for more information.



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Additional Information

To request additional information regarding Title VI and related federal and state nondiscrimination obligations, please contact:

Montachusett Metropolitan Planning Organization (MMPO)
and Montachusett Regional Planning Commission (MRPC)

Title VI Coordinator
MRPC
464 Abbott Ave.
Leominster, MA 01453
(978) 345-7376
geaton@mrpc.org

Complaint Filing

To file a complaint alleging a violation of Title VI or related federal nondiscrimination law, contact the Title VI Specialist (above) within 180 days of the alleged discriminatory conduct.

To file a complaint alleging a violation of the state's Public Accommodation Law, contact the Massachusetts Commission Against Discrimination within 300 days of the alleged discriminatory conduct at:

Massachusetts Commission Against Discrimination (MCAD)
One Ashburton Place, 6th Floor
Boston, MA 02109
617-994-6000 ~ TTY: 617-994-6196

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Massachusetts Department of Transportation (MassDOT) Secretary	Jamey L. Tesler
MassDOT Highway Division Administrator	Jonathan L. Gulliver
Montachusett Regional Planning Commission (MRPC) Chairman	Guy Corbosiero
Montachusett Regional Transit Authority (MART) Chairman/Mayor City of Fitchburg	Mayor Stephen DiNatale
Mayor City of Gardner	Mayor Michael J.
Nicholson	
Mayor City of Leominster	Mayor Dean Mazzearella
Winchendon Board of Selectmen <i>Subregion 1</i>	Barbara Anderson
Ashburnham Board of Selectmen <i>Subregion 2</i>	Rosemarie Meissner
Lunenburg Board of Selectmen <i>Subregion 3</i>	Michael-Ray Jeffreys
Lancaster Board of Selectmen <i>Subregion 4</i>	Jason Allison

MPO SUB-SIGNATORY COMMITTEE MEMBERS

David Mohler, Director OTP, MassDOT, for Secretary Jamey L. Tesler
Arthur Frost, Project Development Engineer for Administrator Jonathan L. Gulliver
Glenn Eaton, Executive Director, MRPC, for Chairman Guy Corbosiero
Bruno Fisher, Administrator, MART, for Chairman Mayor Stephen DiNatale

EXOFFICIO MEMBERS

Jeffrey H. McEwen, Administrator	Federal Highway
Administration	
Peter Butler, Acting Administrator	Federal Transit
Administration	

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Guy Corbosiero, Chairman	Winchendon
John Telepciak, Vice Chairman	Phillipston
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Roger Hoyt, Vice Treasurer	Ashburnham
Shaun Copeland, Secretary	Ayer

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Nicolas Bosonetto, P.E., Chairman	Fitchburg
Dick Kilhart, Vice Chairman	Athol
Guy Corbosiero, Secretary	Winchendon

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Holly Ford, Administrative Manager
Linda Quinlivan, Fiscal Director
Christopher McNamara, Fiscal Assistant
Brad Harris, Transportation Project Director
George Snow, Principal Transportation Planner
Sheri Bean, Principal Planner
Brian Doherty, AICP, Principal Transportation Planner
Karen Chapman, Planning and Development Director
Jonathan Vos, Regional Planner
Christopher McDermott, Economic Development Manager
Jennifer Burney, Senior Planner
Blair Haney, Senior Planner
Meagen Donoghue, Senior Planner
Bruce Hughes, Senior Planner
Jason Stanton, GIS & IT Director
Kayla Kress, GIS & IT Analyst

2021-2022 APPOINTMENT LIST

MONTACHUSETT JOINT TRANSPORTATION COMMITTEE

<u>COMMUNITY</u>	<u>APPOINTED BY SELECTMEN/MAYOR</u>	<u>APPOINTED BY PLANNING BOARD</u>
Ashburnham	Rosemarie Meissner	Roger Hoyt
Ashby		Alan Pease
Athol	Dick Kilhart	
Ayer	Shaun Copeland	Mark Archambault
Clinton	Phil Duffy	
Fitchburg	Nicolas Bosonetto	Paula Caron
Gardner	Trevor Beauregard	Robert Swartz
Groton		Russell Burke
Harvard	Tim Kilhart	Stacia Donahue
Hubbardston	Travis Brown	Alice Livdahl
Lancaster		Roy Mirabito
Leominster	David DiGiovanni	Peter Latchis
Lunenburg	Todd Dwyer	Matthew Brenner
Petersham	Nancy Allen	
Phillipston	Gordon Robertson	
Royalston	Roland Hamel	
Shirley		Janet Tice
Sterling	Richard Maki	Kirsten Newman
Templeton		Charles Carroll II
Townsend	Veronica Kell	Beth Faxon
Westminster		Gregg Buckman
Winchendon	Brian Croteau	Guy Corbosiero

EXOFFICIO MEMBERS

	Office of Transportation Planning (OTP), Massachusetts Department of Transportation
(MassDOT)	
Jeffrey H. McEwen	Federal Highway Administration (FHWA), Administrator
Peter Butler	Federal Transit Administration (FTA), Acting Administrator
	Department of Environmental Protection (DEP)
Paula Simmons	MassDOT Highway Division - District 2
Arthur Frost	MassDOT Highway Division - District 3
	Montachusett Regional Planning Commission (MRPC)
Bruno Fisher	Montachusett Regional Transit Authority (MART)

ORGANIZATION MEMBERS

Al Futterman	Nashua River Watershed Association (NRWA)
	Amalgamated Transit Union #690 (ATU 690)
Richard Liberatore	Fitchburg Airport Commission
Roy M. Nascimento	North Central MA Chamber of Commerce
Joan Goodwin	Fitchburg Council on Aging
Jessica Strunkin	Mass Development
Peter Lowitt	Devens Enterprise Commission (DEC)
	Montachusett Opportunity Council, Inc.
Joshua Preville	The ARC of Opportunity

As of September 2021

EXECUTIVE SUMMARY

The following is the 2021 annual update of Montachusett Regional Planning Commission's (MRPC) Regional Pavement Profile. During the program year staff updated conditions on federal aid eligible roadways from Massachusetts Department of Transportation (MassDOT) pavement data throughout the region and MRPC pavement surveys in Leominster, Sterling, Athol, Lancaster and Shirley. Among items included in this year's reports is...

- A Full data report on pavement conditions of all Federal Aid Eligible roads in the Montachusett Region
- Town by town breakdowns
- Recommendations to make improvements

INTRODUCTION

The *Pavement Management Program* at MRPC consists of surveying all federal aid eligible roadways in the region for the purpose of collecting, maintaining and evaluating pavement condition data for use in transportation plan and project decision making.

There are approximately 667 miles of federal aid eligible roads in the Montachusett region, of which 159 miles are National Highway System (NHS) roads, and 508 miles are Surface Transportation Program (STP) roads. NHS roadways represent all Interstate roadways such as I-190, and I-495 along with a systematic network of principal arterials such as Route 2 and parts of Routes 12, 140 and 2A; NHS roads are regularly surveyed by MassDOT. STP roadways, which include all other numbered routes as well as all urban arterials, urban collectors and rural arterials, are surveyed mostly by the MRPC, MassDOT also regularly collects data on all numbered routes.

The maps at the end of this section show all federal aid eligible miles in the Montachusett region. All roads shown on these maps are surveyed as part of the Montachusett Regional Pavement Management Program.

PAVEMENT MANAGEMENT AT MRPC

The principal intention of having a pavement management program at MRPC is for the purpose of including the data in our transportation evaluation criteria (TEC). TEC is a data driven process that is used when putting together documents such as the Transportation Improvement Program (TIP), an annual prioritized listing of transportation and transit projects proposed for implementation during future federal fiscal years for the region. In the Montachusett region the pavement management program will help, along with other programs and data, to develop a more accurate prioritization of transportation needs, and to balance those needs with available funding.

Pavement management systems (PMS) can be viewed at both network and project levels. In a network level PMS an entire network is analyzed to determine which maintenance tasks should be funded. In a project level PMS, individual projects are studied to determine to what extent the roadway needs attention. The MRPC's approach reflects some aspects of each of these levels. Pavement data from the entire federal aid network in the Montachusett region is maintained; this data is gathered along with other evaluation criteria and considered when looking at project level programs such as the TIP. Although both levels will be involved and the same data will be collected and analyzed, the MRPC's use of a PMS may differ from a typical municipality's because it will take more of a project level approach as opposed to a municipality's network level approach. While a city or town Department of Public Works plays the role of a road manager, the MRPC's desire is to better understand the transportation system of the region and its needs.

THE ROADWAY SYSTEM

Of the approximately 2,094 miles of roads in the Montachusett region, approximately 508 miles are Surface Transportation Program (STP) eligible roadways and 159 miles are National Highway System (NHS) eligible roadways. This represents 31% of the regions road miles. The remaining 1,427 miles (69%) are state and local aid eligible roads.

They are defined as follows:

National Highway System (NHS) – all interstate roadways and a systematic network of principal arterials spanning the state. In addition, roads connecting the NHS roadways to military bases (known as the Strategic Highway Network) are also considered part of the NHS network. NHS passenger and freight terminals are connected by roadways called NHS connectors.

Surface Transportation Program (STP) – comprised of any functionally classified roadway not part of the NHS network. STP funded roadways include all urban arterials, urban collectors and rural arterials. According to previous funding legislation, rural collectors are STP eligible, but have a limitation on the STP funding amount.

State and Local Aid – includes Chapter 90 and other non-Federal Aid categories. Roadways that fall under this category are comprised of roads functionally classified as local roads.

As stated above, rural collectors are STP eligible but have a funding limitation. The following table provides a breakdown of roads by community by their aid eligibility, NHS, STP or State Aid/Local. The State Aid/Local figures include those rural collector miles that may also be STP eligible

Regional Road Mileage

CENTERLINE MILES					
	NHS	STP	Total Fed-Aid	Local	Total
Ashburnham	0.00	20.33	20.33	77.27	97.61
Ashby	0.00	14.21	14.21	49.89	64.09
Athol	11.53	20.86	32.39	80.69	113.08
Ayer	7.25	9.73	16.98	34.27	51.25
Clinton	4.97	12.58	17.54	35.53	53.07
Fitchburg	18.35	47.36	65.72	136.48	202.20
Gardner	10.98	30.69	41.66	75.19	116.86
Groton	13.11	20.88	33.99	74.46	108.44
Harvard	8.84	10.17	19.01	60.48	79.50
Hubbardston	0.00	21.30	21.30	64.47	85.78
Lancaster	12.10	19.30	31.40	39.92	71.32
Leominster	19.18	42.62	61.80	116.99	178.79
Lunenburg	8.81	25.04	33.85	57.72	91.57
Petersham	0.00	19.61	19.61	59.61	79.21
Phillipston	2.97	8.23	11.20	41.31	52.51
Royalston	0.00	20.99	20.99	51.49	72.49
Shirley	1.05	18.89	19.94	31.72	51.66
Sterling	12.03	31.53	43.56	62.56	106.21
Templeton	5.68	35.09	40.78	58.91	99.69
Townsend	4.05	21.64	25.68	67.78	93.46
Westminster	9.28	33.98	43.26	65.29	108.55
Winchendon	8.92	22.86	31.78	85.01	116.80
TOTAL	159.10	507.89	666.98	1427.04	2094.14

REGIONAL PAVEMENT CONDITIONS

The structural conditions of the majority of the Federal Aid eligible roads are determined by MassDOT and MRPC pavement surveys. The condition is expressed by assigning either a Pavement Serviceability Index (PSI) number from 0 to 5 or a Pavement Condition Index number from 0 – 100 (PCI) to segments along the roadway. PSI (MassDOT method) and PCI (MRPC method) is an overall rating of the pavements condition. Conditions are rated as Excellent, Good, Fair and Poor. The following table shows a general correlation between PSI and PCI, condition, repair strategies and associated cost. This average cost has been determined from consultation with MassDOT and other Regional Planning Agencies throughout the State.

Pavement Condition – Cost Breakdown

PSI	PCI	Condition	Associated Repair	Repair Cost Per. Sq. Yard
0 - 2.29	0 - 64	Poor	Reconstruction	\$45
2.3 - 2.79	65 - 84	Fair	Rehabilitation (Mill/Overlay)	\$18
2.8 - 3.49	85 - 94	Good	Preventative Maintenance	\$8.50
3.5 - 5	95 - 100	Excellent	Routine Maintenance	\$0.75

Utilizing this information, a general condition of the Montachusett Region's federal aid eligible roadway network can be developed. The following lists pavement condition on federal aid eligible roads by town in the region. These federal aid miles are further broken down by local and state jurisdiction. Please note that due to the time frame between data collection and report preparation, conditions of the roadways may change. Additionally, mileage listed in the following charts may not reflect mileage listed on the "Total Fed-Aid Miles" column of the Centerline Miles table as a small percentage of roads not eligible for federal aid are included. Therefore, this information should be viewed in general terms regarding needs and condition.

2021 Pavement Conditions on Fed-Aid Roads by Municipality

Ashburnham	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	5.17	72766	\$54,575	2.32	32670	\$24,502	Routine Maintenance	7.49	105436	\$79,077
Ashby	Good	2.37	33328	\$283,291	5.35	75297	\$640,021	Preventative Maintenance	7.71	108625	\$923,312
	Fair	0.99	14005	\$252,089	1.73	24294	\$437,289	Rehabilitation	2.72	38299	\$689,378
	Poor	0.30	4200	\$188,998	1.83	25795	\$1,160,760	Reconstruction	2.13	29995	\$1,349,758
	Total	8.83		\$778,952	11.23		\$2,262,572	Total	20.05		\$3,041,525
	Condition	Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
Athol	Excellent	4.80	67583.76	\$50,688	0.00	0	\$0	Routine Maintenance	4.80	67584	\$50,688
	Good	2.88	40518.86	\$344,410	0.00	0	\$0	Preventative Maintenance	2.88	40519	\$344,410
	Fair	3.23	45547.45	\$819,854	1.05	14800.58	\$266,410	Rehabilitation	4.29	60348	\$1,086,264
	Poor	0.65	9083.73	\$408,768	1.47	20661.46	\$929,766	Reconstruction	2.11	29745	\$1,338,534
	Total	11.56		\$1,623,720	2.52		\$1,196,176	Total	14.08		\$2,819,896
Ashburnham	Condition	Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	4.20	59131.44	\$44,349	11.02	155155.14	\$116,366	Routine Maintenance	15.22	214287	\$160,715
	Good	6.15	86600.73	\$736,106	2.86	40254.61	\$342,164	Preventative Maintenance	9.01	126855	\$1,078,270
	Fair	4.72	66482.06	\$1,196,677	2.86	40199.20	\$723,586	Rehabilitation	7.58	106681	\$1,920,263
	Poor	1.31	18467.28	\$831,028	3.48	48951.43	\$2,202,814	Reconstruction	4.79	67419	\$3,033,842
	Total	16.38		\$2,808,159	20.21		\$3,384,931	Total	36.59		\$6,193,090

Ayer	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	1.75	24618.35	\$18,464	3.41	47968.89	\$35,977	Routine Maintenance	5.16	72587	\$54,440
Clinton	Good	1.36	19142.37	\$162,710	3.05	42955.48	\$365,122	Preventative Maintenance	4.41	62098	\$527,832
	Fair	0.55	7689.68	\$138,414	1.61	22732.32	\$409,182	Rehabilitation	2.16	30422	\$547,596
	Poor	0.35	4964.64	\$223,409	4.33	61026.72	\$2,746,202	Reconstruction	4.69	65991	\$2,969,611
	Total	4.01		\$542,997	12.41		\$3,556,483	Total	16.41		\$4,099,479
	Condition	Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
Fitchburg	Excellent	0.79	11176.39	\$8,382	2.78	39133.55	\$29,350	Routine Maintenance	3.57	50310	\$37,732
	Good	0.32	4531.24	\$38,516	2.59	36456.63	\$309,881	Preventative Maintenance	2.91	40988	\$348,397
	Fair	0.22	3115.28	\$56,075	2.24	31574.04	\$568,333	Rehabilitation	2.46	34689	\$624,408
	Poor	0.16	2192.87	\$98,679	8.79	123710.28	\$5,566,962	Reconstruction	8.94	125903	\$5,665,642
	Total	1.49		\$201,652	16.40		\$6,474,527	Total	17.89		\$6,676,179
Gardner	Condition	Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	3.49	49167.48	\$36,876	9.80	137935.47	\$103,452	Routine Maintenance	13.29	187103	\$140,327
	Good	6.10	85897.91	\$730,132	6.42	90333.22	\$767,832	Preventative Maintenance	12.52	176231	\$1,497,965
	Fair	2.38	33499.22	\$602,986	6.79	95602.88	\$1,720,852	Rehabilitation	9.17	129102	\$2,323,838
	Poor	0.88	12358.18	\$556,118	34.53	486162.26	\$21,877,302	Reconstruction	35.41	498520	\$22,433,420
Groton	Total	12.85		\$1,926,112	57.53		\$24,469,437	Total	70.38		\$26,395,549
	Condition	Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	5.24	73722.15	\$55,292	7.56	106405.09	\$79,804	Routine Maintenance	12.79	180127	\$135,095
	Good	7.16	100855.57	\$857,272	5.13	72217.09	\$613,845	Preventative Maintenance	12.29	173073	\$1,471,118
	Fair	3.22	45374.76	\$816,746	5.19	73014.04	\$1,314,253	Rehabilitation	8.41	118389	\$2,130,998
Harvard	Poor	1.21	17012.34	\$765,555	11.44	161075.42	\$7,248,394	Reconstruction	12.65	178088	\$8,013,949
	Total	16.83		\$2,494,865	29.31		\$9,256,295	Total	46.14		\$11,751,160
	Condition	Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	3.00	42187.98	\$31,641	7.99	112551.15	\$84,413	Routine Maintenance	10.99	154739	\$116,054
	Good	1.78	25076.17	\$213,147	11.43	160927.60	\$1,367,885	Preventative Maintenance	13.21	186004	\$1,581,032
Harvard	Fair	0.47	6569.26	\$118,247	2.57	36206.53	\$651,717	Rehabilitation	3.04	42776	\$769,964
	Poor	0.21	2913.51	\$131,108	6.42	90366.08	\$4,066,473	Reconstruction	6.62	93280	\$4,197,581
	Total	5.45		\$494,143	28.41		\$6,170,489	Total	33.86		\$6,664,632
	Condition	Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	8.02	112974.69	\$84,731	0.69	9755.47	\$7,317	Routine Maintenance	8.72	122730	\$92,048
Harvard	Good	6.59	92732.57	\$788,227	4.63	65200.33	\$554,203	Preventative Maintenance	11.22	157933	\$1,342,430
	Fair	1.89	26567.32	\$478,212	2.05	28811.75	\$518,611	Rehabilitation	3.93	55379	\$996,823
	Poor	0.34	4755.68	\$214,005	1.65	23190.19	\$1,043,558	Reconstruction	1.98	27946	\$1,257,564
	Total	16.83		\$1,565,175	9.02		\$2,123,689	Total	25.85		\$3,688,864

Hubbardston	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	0.01	177.45	\$133	5.86	82523.01	\$61,892	Routine Maintenance	5.87	82700	\$62,025
	Good	0.00	0	\$0	0.00	0	\$0	Preventative Maintenance	0.00	0	\$0
	Fair	0.00	0	\$0	1.86	26149.24	\$470,686	Rehabilitation	1.86	26149	\$470,686
	Poor	0.00	0	\$0	13.34	187859.83	\$8,453,692	Reconstruction	13.34	187860	\$8,453,692
	Total	0.01		\$133	21.06		\$8,986,271	Total	21.07		\$8,986,404
Lancaster	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	4.66	65639.14	\$49,229	3.90	54855.78	\$41,142	Routine Maintenance	8.56	120495	\$90,371
	Good	6.05	85132.05	\$723,622	4.01	56465.41	\$479,956	Preventative Maintenance	10.06	141597	\$1,203,578
	Fair	1.03	14453.10	\$260,156	6.31	88828.42	\$1,598,911	Rehabilitation	7.34	103282	\$1,859,067
	Poor	0.32	4508.23	\$202,870	10.41	146579.53	\$6,596,079	Reconstruction	10.73	151088	\$6,798,949
	Total	12.05		\$1,235,878	24.63		\$8,716,088	Total	36.68		\$9,951,966
Leominster	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	8.60	121022.06	\$90,767	6.86	96646.61	\$72,485	Routine Maintenance	15.46	217669	\$163,252
	Good	8.28	116648.78	\$991,515	9.84	138597.39	\$1,178,078	Preventative Maintenance	18.13	255246	\$2,169,592
	Fair	2.14	30167.98	\$543,024	11.43	160938.38	\$2,896,891	Rehabilitation	13.57	191106	\$3,439,914
	Poor	1.24	17409.93	\$783,447	21.64	304659.35	\$13,709,671	Reconstruction	22.87	322069	\$14,493,118
	Total	20.26		\$2,408,752	49.78		\$17,857,124	Total	70.03		\$20,265,876
Lunenburg	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	2.31	32461.81	\$24,346	13.59	191339.48	\$143,505	Routine Maintenance	15.89	223801	\$167,851
	Good	3.28	46227.86	\$392,937	6.39	90001.47	\$765,013	Preventative Maintenance	9.68	136229	\$1,157,949
	Fair	0.20	2791.96	\$50,255	1.55	21867.07	\$393,607	Rehabilitation	1.75	24659	\$443,862
	Poor	0.10	1395.98	\$62,819	5.83	82018.17	\$3,690,818	Reconstruction	5.92	83414	\$3,753,637
	Total	5.89		\$530,357	27.36		\$4,992,942	Total	33.25		\$5,523,299
Petersham	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	9.01	126910.35	\$95,183	0.60	8439.68	\$6,330	Routine Maintenance	9.61	135350	\$101,513
	Good	3.35	47146.69	\$400,747	2.66	37448.43	\$318,312	Preventative Maintenance	6.01	84595	\$719,059
	Fair	0.10	1397.80	\$25,160	2.57	36170.22	\$651,064	Rehabilitation	2.67	37568	\$676,224
	Poor	0.00	0	\$0	1.19	16718.67	\$752,340	Reconstruction	1.19	16719	\$752,340
	Total	12.46		\$521,090	7.02		\$1,728,045	Total	19.48		\$2,249,136
Phillipston	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	4.16	58559.36	\$43,920	1.50	21103.44	\$15,828	Routine Maintenance	5.66	79663	\$59,747
	Good	2.64	37134.50	\$315,643	0.20	2820.22	\$23,972	Preventative Maintenance	2.84	39955	\$339,615
	Fair	2.40	33768.89	\$607,840	0.78	11038.66	\$198,696	Rehabilitation	3.18	44808	\$806,536
	Poor	0.24	3438.58	\$154,736	3.28	46185.66	\$2,078,355	Reconstruction	3.52	49624	\$2,233,091
	Total	9.44		\$1,122,139	5.76		\$2,316,850	Total	15.20		\$3,438,989

Royalston	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	0.00	0	\$0	5.81	81848.80	\$61,387	Routine Maintenance	5.81	81849	\$61,387
	Good	0.00	0	\$0	5.10	71803.85	\$610,333	Preventative Maintenance	5.10	71804	\$610,333
	Fair	0.00	0	\$0	4.56	64228.00	\$1,156,104	Rehabilitation	4.56	64228	\$1,156,104
	Poor	0.00	0	\$0	5.39	75872.13	\$3,414,246	Reconstruction	5.39	75872	\$3,414,246
	Total	0.00		\$0	20.86		\$5,242,069	Total	20.86		\$5,242,069
Shirley	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	0.40	5583.91	\$4,188	4.50	63310.10	\$47,483	Routine Maintenance	4.89	68894	\$51,671
	Good	2.54	35698.67	\$303,439	0.76	10759.53	\$91,456	Preventative Maintenance	3.30	46458	\$394,895
	Fair	0.59	8375.86	\$150,766	1.46	20549.22	\$369,886	Rehabilitation	2.05	28925	\$520,651
	Poor	0.01	110.79	\$4,986	9.57	134754.54	\$6,063,954	Reconstruction	9.58	134865	\$6,068,940
	Total	3.53		\$463,378	16.29		\$6,572,779	Total	19.83		\$7,036,157
Sterling	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	16.33	229928.96	\$172,447	5.00	70357.51	\$52,768	Routine Maintenance	21.33	300286	\$225,215
	Good	3.47	48868.91	\$415,386	3.17	44613.91	\$379,218	Preventative Maintenance	6.64	93483	\$794,604
	Fair	3.10	43616.57	\$785,098	6.01	84608.09	\$1,522,946	Rehabilitation	9.11	128225	\$2,308,044
	Poor	2.27	31928.70	\$1,436,791	9.90	139323.67	\$6,269,565	Reconstruction	12.16	171252	\$7,706,357
	Total	25.17		\$2,809,722	24.07		\$8,224,497	Total	49.24		\$11,034,219
Templeton	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	3.14	44146.66	\$33,110	6.13	86271.19	\$64,703	Routine Maintenance	9.26	130418	\$97,813
	Good	6.96	98002.62	\$833,022	2.40	33759.83	\$286,959	Preventative Maintenance	9.36	131762	\$1,119,981
	Fair	11.11	156396.76	\$2,815,142	2.34	32884.34	\$591,918	Rehabilitation	13.44	189281	\$3,407,060
	Poor	2.23	31430.27	\$1,414,362	11.75	165381.52	\$7,442,168	Reconstruction	13.98	196812	\$8,856,530
	Total	23.44		\$5,095,636	22.61		\$8,385,749	Total	46.04		\$13,481,385
Townsend	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	1.62	22794.25	\$17,096	1.84	25931.86	\$19,449	Routine Maintenance	3.46	48726	\$36,545
	Good	2.20	30941.23	\$263,000	6.16	86743.52	\$737,320	Preventative Maintenance	8.36	117685	\$1,000,320
	Fair	1.42	19991.14	\$359,840	2.94	41440.59	\$745,931	Rehabilitation	4.36	61432	\$1,105,771
	Poor	1.29	18172.04	\$817,742	7.61	107100.62	\$4,819,528	Reconstruction	8.90	125273	\$5,637,270
	Total	6.53		\$1,457,678	18.55		\$6,322,227	Total	25.08		\$7,779,905
Westminster	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	7.39	103988.07	\$77,991	5.18	72903.70	\$54,678	Routine Maintenance	12.56	176892	\$132,669
	Good	10.47	147426.56	\$1,253,126	6.33	89101.57	\$757,363	Preventative Maintenance	16.80	236528	\$2,010,489
	Fair	3.36	47314.97	\$851,669	2.67	37590.94	\$676,637	Rehabilitation	6.03	84906	\$1,528,306
	Poor	0.76	10699.48	\$481,477	12.95	182367.30	\$8,206,528	Reconstruction	13.71	193067	\$8,688,005
	Total	21.98		\$2,664,263	27.13		\$9,695,206	Total	49.10		\$12,359,469

Winchendon	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	5.60	78909.18	\$59,182	4.74	66715.94	\$50,037	Routine Maintenance	10.34	145625	\$109,219
	Good	3.09	43506.22	\$369,803	1.04	14648.77	\$124,515	Preventative Maintenance	4.13	58155	\$494,317
	Fair	1.54	21728.60	\$391,115	4.82	67897.86	\$1,222,161	Rehabilitation	6.37	89626	\$1,613,276
	Poor	1.14	15995.05	\$719,777	8.96	126196.31	\$5,678,834	Reconstruction	10.10	142191	\$6,398,611
	Total	11.37		\$1,539,877	19.56		\$7,075,547	Total	30.94		\$8,615,424

REGIONWIDE	Condition	State			Local			Combined			
		Miles	Sq. Yards	Cost	Miles	Sq. Yards	Cost	Repair Category	Miles	Sq. Yards	Total
	Excellent	99.68	1403449	\$1,052,587	111.07	1563822	\$1,172,866	Routine Maintenance	210.74	2967271	\$2,225,453
	Good	87.03	1225418	\$10,416,052	89.52	1260405	\$10,713,446	Preventative Maintenance	176.55	2485823	\$21,129,498
	Fair	44.66	628854	\$11,319,365	75.39	1061426	\$19,105,671	Rehabilitation	120.05	1690280	\$30,425,036
	Poor	14.99	211037	\$9,496,675	195.74	2755956	\$124,018,011	Reconstruction	210.72	2966993	\$133,514,686
	Total	246.36		\$32,284,679	471.71		\$155,009,995	Total	718.07		\$187,294,673

CHARTING CHANGES IN THE NETWORK

In comparing current regionwide network conditions to those from 2017, it would appear that the overall condition of federal aid eligible roads has shifted over the years. As highlighted at the conclusion of this report, MRPC has stated a Goal in its 2016 Regional Transportation Plan to 'Improve System Preservation and Maintenance of All Modes'. To monitor progress of that Goal, a Performance Measure was set to 'Increase the percent of categorized "good" to "excellent" federal aid eligible roadway miles within the region over a 10-year period'. The 2021 condition change charts below would indicate that this performance measure is currently being met. These conditions will continue to be monitored and reported on, on an annual basis.

It should be noted that the mileage of state jurisdiction roads has increased significantly this year. The reason for this is that divided highways have been accounted for in only one direction in previous surveys but will now be considering both ways. For example, Route 2 is a divided highway in the Montachusett region. Previous surveys only reflected condition data on one direction of the highway, current practice is to count both east and west directions. It is also normal to have a small difference in surveyed roads year to year due to the surveys available from either MRPC or MassDOT in a given year.

2021 and 2017 Regionwide Percentage Comparisons

2021	Condition	State		Local		Combined	
		Miles	%	Miles	%	Miles	%
	Excellent	99.68	40%	111.07	24%	210.74	29%
	Good	87.03	35%	89.52	19%	176.55	25%
	Fair	44.66	18%	75.39	16%	120.05	17%
	Poor	14.99	6%	195.74	41%	210.72	29%
	Total	246.36		471.71		718.07	

2017	Condition	State		Local		Combined	
		Miles	%	Miles	%	Miles	%
	Excellent	80.24	42%	75.06	16%	155.30	23%
	Good	52.72	27%	93.84	19%	146.56	22%
	Fair	32.36	17%	155.03	32%	187.39	28%
	Poor	27.11	14%	158.84	33%	185.95	28%
	Total	192.43		482.77		675.20	

2017 - 2021 Condition Percentage Change

% Change 2017 - 2021	Condition	State	Local	Combined
		% Change	% Change	% Change
	Excellent	-1%	8%	6%
	Good	8%	0%	3%
	Fair	1%	-16%	-11%
	Poor	-8%	9%	2%

FUNDING PROJECTS REGIONWIDE

The difference in condition between local and state jurisdiction federal aid roads may mainly be a combination of two factors, the first being that federal aid roads that are state jurisdiction are typically a higher Functional Classification than those that are local jurisdiction, giving them higher importance when prioritizing projects for funding. The second factor being the State funding available to Municipalities for roadway maintenance (Chapter 90) lagging behind the rising price of such maintenance. Below is a chart showing the Chapter 90 allocations each community in the region received from 2016 to 2022 along with the roadway mileage that that money must maintain.

Chapter 90 Apportionment

CHAPTER 90 FUNDS									
	Local Jurisdiction Miles (Fed Aid and Non- Fed Aid eligible)	FY 2016 Ch. 90 Apportion ment	FY 2017 Ch. 90 Apportion ment	FY 2018 Ch. 90 Apportion ment	FY 2019 Ch. 90 Apportion ment	FY 2020 Ch. 90 Apportion ment	FY 2021 Ch. 90 Apportion ment	FY 2022 Ch. 90 Apportion ment	% Change (2016 - 2022)
Ashburnham	74	\$346,340	\$345,504	\$343,472	\$343,284	\$341,939	\$340,885	\$339,560	-2.00%
Ashby	52	\$230,201	\$229,619	\$226,417	\$225,760	\$225,811	\$225,418	\$224,988	-2.32%
Athol	96	\$499,325	\$500,196	\$502,804	\$508,214	\$507,704	\$508,650	\$510,547	2.20%
Ayer	38	\$239,164	\$242,879	\$244,654	\$243,513	\$242,505	\$252,599	\$256,834	6.88%
Clinton	48	\$331,397	\$329,236	\$327,069	\$325,436	\$325,749	\$325,072	\$322,921	-2.62%
Fitchburg	180	\$1,122,369	\$1,127,480	\$1,122,926	\$1,120,288	\$1,119,259	\$1,118,592	\$1,116,380	-0.54%
Gardner	98	\$604,325	\$604,221	\$600,789	\$599,292	\$615,579	\$612,961	\$612,492	1.33%
Groton	104	\$505,608	\$505,008	\$504,132	\$502,295	\$501,734	\$501,403	\$517,100	2.22%
Harvard	64	\$347,705	\$346,663	\$347,438	\$349,551	\$350,767	\$350,285	\$350,825	0.89%
Hubbardston	82	\$361,498	\$360,591	\$355,944	\$356,673	\$355,135	\$354,416	\$354,012	-2.11%
Lancaster	64	\$311,414	\$310,688	\$311,911	\$311,633	\$327,042	\$326,952	\$326,751	4.69%
Leominster	160	\$1,082,285	\$1,084,741	\$1,085,399	\$1,119,490	\$1,127,677	\$1,125,956	\$1,116,678	3.08%
Lunenburg	82	\$419,626	\$419,625	\$415,877	\$415,087	\$414,649	\$415,929	\$414,966	-1.12%
Petersham	62	\$255,951	\$255,744	\$252,089	\$251,354	\$250,869	\$250,313	\$249,957	-2.40%
Phillipston	45	\$189,823	\$189,594	\$186,873	\$189,780	\$189,271	\$188,654	\$187,895	-1.03%
Royalston	70	\$284,882	\$284,356	\$283,409	\$282,680	\$281,623	\$280,874	\$280,465	-1.57%
Shirley	43	\$253,904	\$253,372	\$252,029	\$252,036	\$252,072	\$253,231	\$253,275	-0.25%
Sterling	85	\$417,596	\$416,765	\$413,796	\$411,575	\$410,022	\$410,493	\$410,666	-1.69%
Templeton	75	\$338,351	\$335,950	\$333,245	\$333,029	\$335,718	\$334,835	\$362,341	6.62%
Townsend	85	\$424,556	\$423,919	\$414,296	\$416,674	\$415,776	\$414,576	\$413,828	-2.59%
Westminster	88	\$419,830	\$418,675	\$414,252	\$410,852	\$419,901	\$419,470	\$421,591	0.42%
Winchendon	95	\$447,484	\$447,566	\$443,871	\$450,917	\$458,158	\$456,901	\$456,922	2.07%
TOTAL	1790	\$9,433,634	\$9,432,392	\$9,382,692	\$9,419,413	\$9,468,960	\$9,468,465	\$9,500,994	0.71%

Chapter 90 has been level funded at \$200,000,000 Statewide since 2016. The State calculates how much funding communities receive in Chapter 90 through a formula which considers **population** within the community, **employment** within the community, and the number of community **accepted roadway mileage** within the community. The region, as a whole, has received slightly more money in 2022 Chapter 90 funds than in 2016 (0.71%). However, some communities such as Ashburnham, Ashby, Clinton, Hubbardston, Petersham and Townsend (all over -2.0%) have seen a decrease during that period. One action a community can take to ensure proper Chapter 90 funding is reporting all accepted

roads to MassDOT. If your community has not updated its accepted road information in a while, or has roads which have been recently accepted by the town but not submitted to MassDOT, it is probable that you are not receiving as much as you should in Chapter 90 funds. Many communities in the region have not updated their accepted roads with MassDOT in years, or in some cases decades. It is recommended that communities regularly update accepted roads by following the process found here:

<https://www.mass.gov/how-to/submit-road-inventory-updates> . MRPC is willing to assist communities in this process if requested.

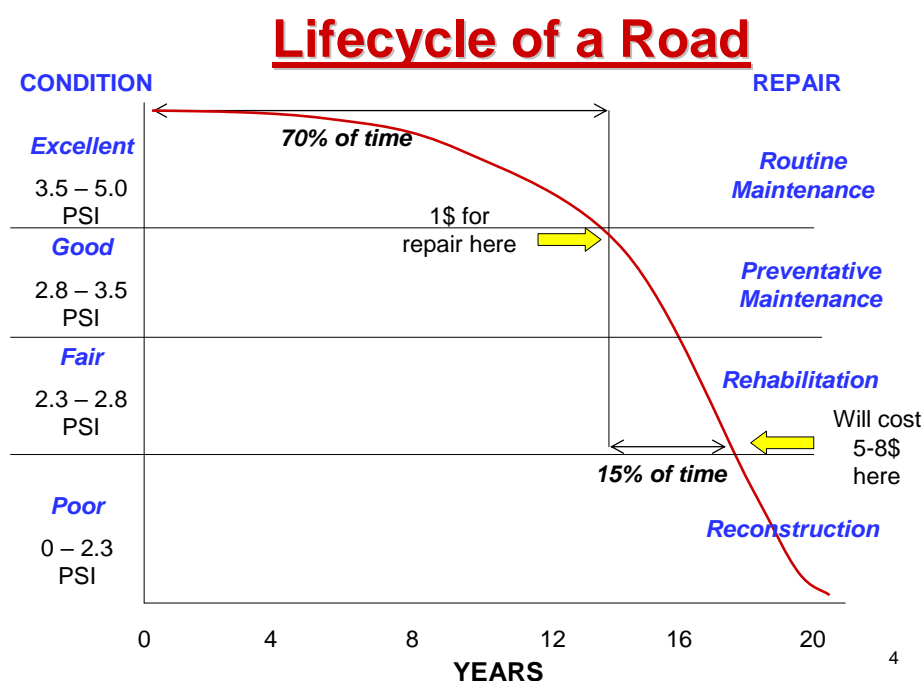
Pavements are often the single largest expense in any municipal road maintenance budget. Chapter 90 allocations often do not provide sufficient funding to maintain local roads at the current condition let alone make major improvements. Due to inadequate funding, it is recommended that communities routinely target funding for local jurisdiction federal aid eligible roadways through the Transportation Improvement Program (TIP). It is also encouraged that a Pavement Management Plan be implemented by communities to keep track of maintenance needs and schedules to contribute to a cost-effective approach to maintaining roadways.

CONCLUSION AND PAVEMENT PERFORMANCE MEASURES IN THE MONTACHUSETT REGION

The transportation system in the Montachusett region largely consists of roads and bridges. Maintaining these assets are a challenge, however, we must understand the importance of a properly functioning and safe system. Maintaining a state of good repair is a main priority and in our best interest in order to stretch our investments to the greatest benefits. Ultimately, it is recommended that communities in the region utilize the principals of pavement management to maintain and improve upon their roads.

The figure below displays the concept of lifecycle cost. A pavements lifecycle is the time between reconstruction periods. Lifecycle cost is the total cost spent on maintenance and repairs for a particular pavement section during its lifecycle. One of the main focuses of pavement management is to keep lifecycle cost low to stretch the dollar in what is commonly an ever-decreasing maintenance budget.

Pavement Lifecycle



Due to the rising cost of improvements and the declining funds for preserving existing infrastructure it is challenging to make improvements to the pavement network. Building a historical and measurable database of conditions in the Montachusett region allows for a snapshot of overall conditions which will allow us to determine how the network changes over time.

Below are applicable Goals, Objectives and Performance Measures, originally stated in the 2016 Regional Transportation Plan, which are related to the region's pavements.

Goal 4 – Improve System Preservation and Maintenance of All Modes

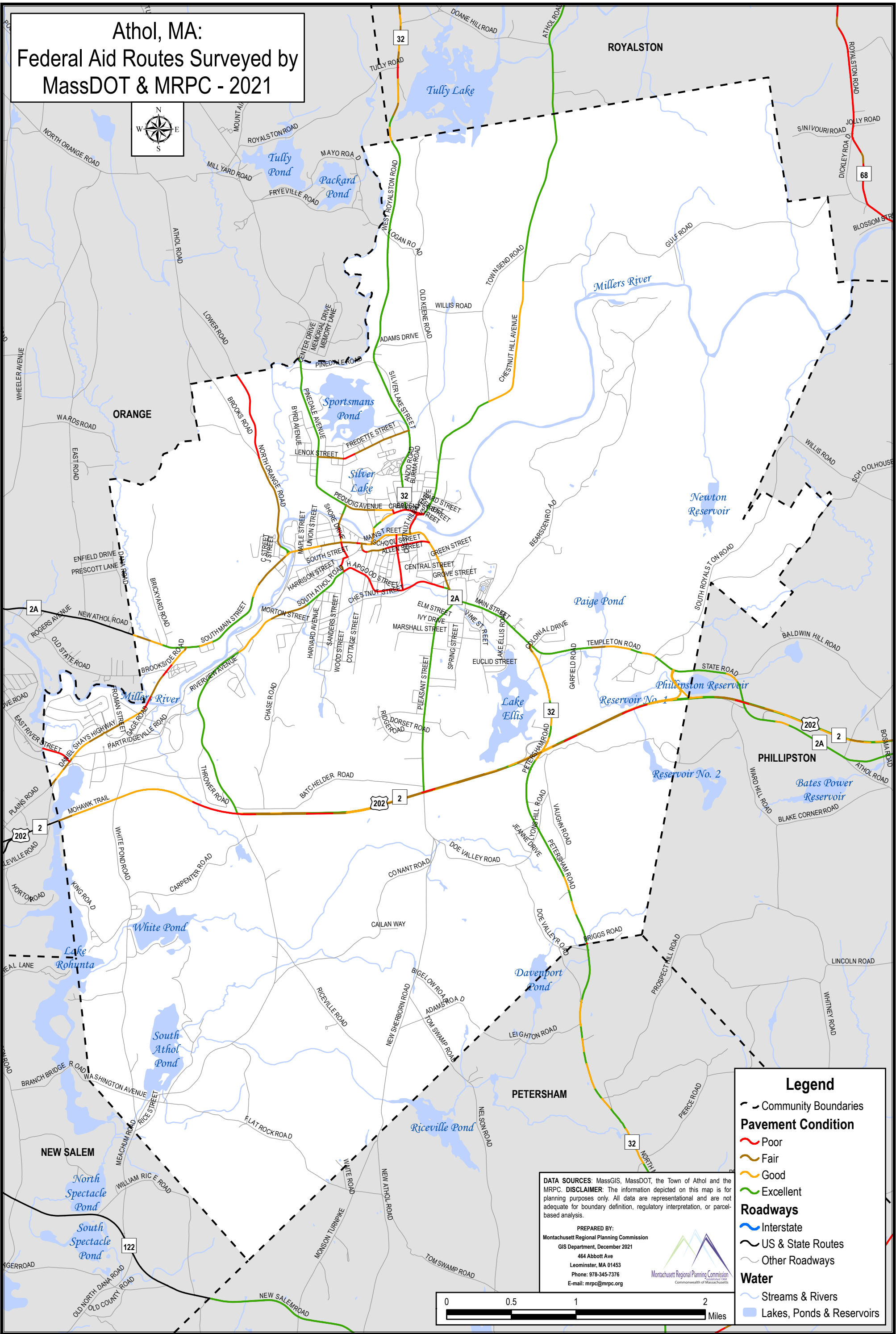
Objectives

- Seek to encourage and prioritize preservation projects within communities in order to maintain a state of good repair for all modes.
- Continue to monitor, and revise as needed, the Transportation Evaluation Criteria (TEC) to encourage those projects that help to maintain a state of good repair.
- Seek to encourage additional funds for maintenance as well as the development of a potential federal/state funded preservation program.
- Encourage communities with viable preservation projects to seek funding and implementation through and in collaboration with the Transportation Improvement Program (TIP) process.

Performance Measures – Goal 4	
1	Continue pavement management data collection and analysis efforts on an annual basis through a rotating 4-year schedule of federal aid eligible roadways.
2	Increase the percentage of categorized “Good” to “Excellent” federal aid eligible roadway miles within the region over a 10-year period.

APPENDIX – MAPS

Athol, MA:
Federal Aid Routes Surveyed by
MassDOT & MRPC - 2021



Legend

Community Boundaries

Pavement Condition

Poor

Fair

Good

Excellent

Roadways

Interstate

US & State Routes

Other Roadways


Water

Streams & Rivers

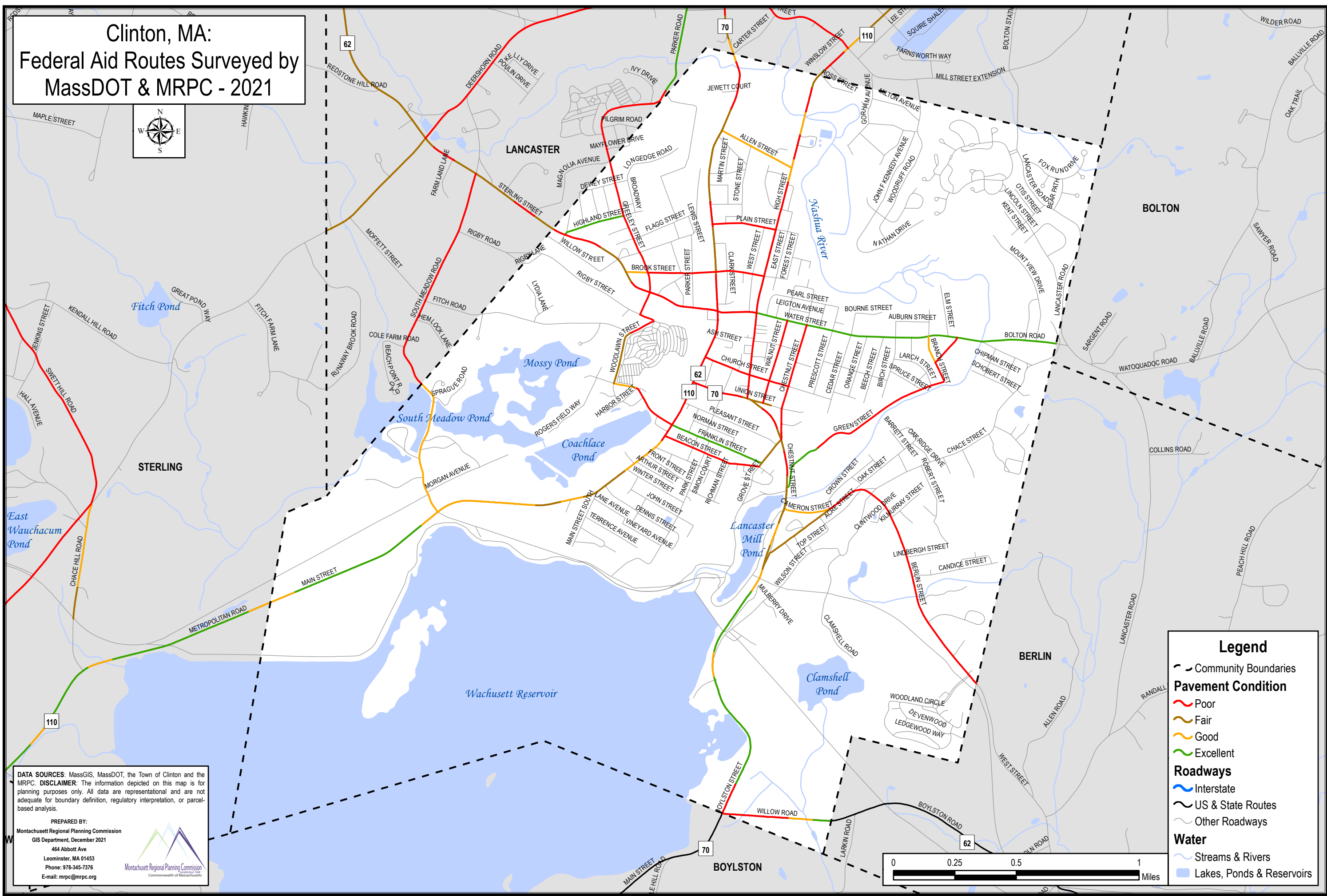
Lakes, Ponds & Reservoirs

DATA SOURCES: MassGIS, MassDOT, the Town of Athol and the MRPC. **DISCLAIMER:** The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

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Clinton, MA: Federal Aid Routes Surveyed by MassDOT & MRPC - 2021

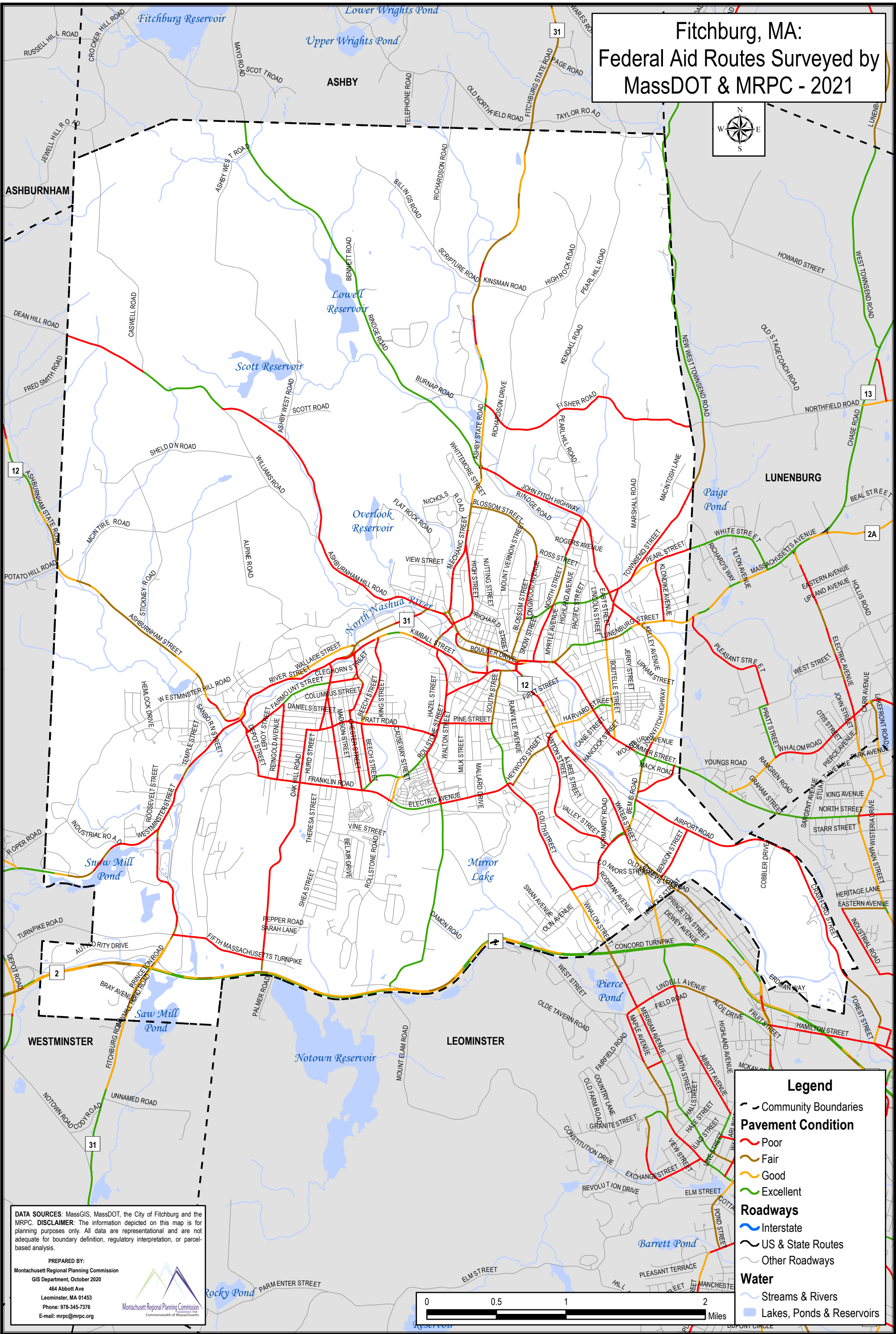


DATA SOURCES: MassGIS, MassDOT, the Town of Clinton and the MRPC. **DISCLAIMER:** The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

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Fitchburg, MA:
Federal Aid Routes Surveyed by
MassDOT & MRPC - 2021



DATA SOURCES: MassGIS, MassDOT, the City of Fitchburg and the MRPC. DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

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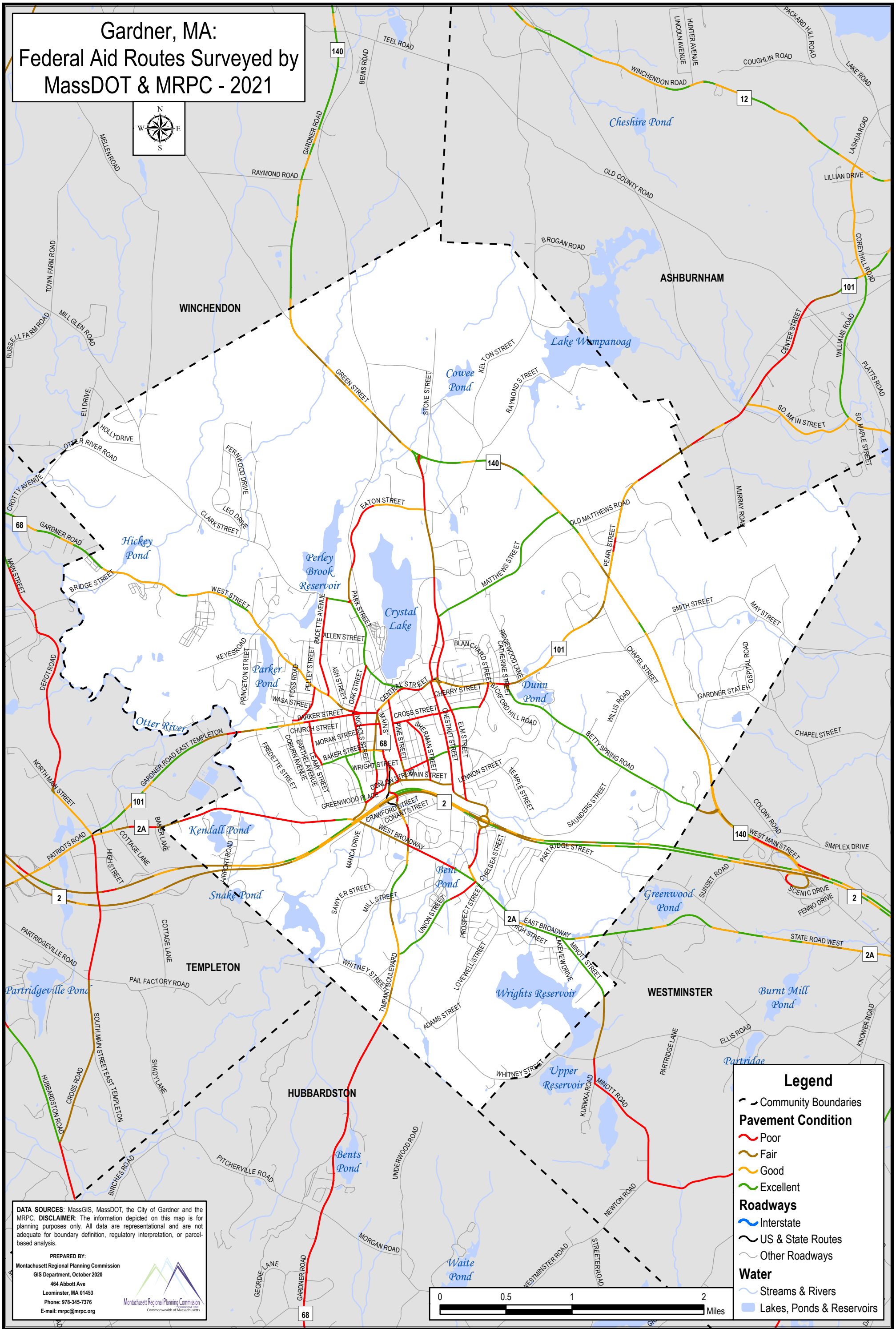


Legend

- Community Boundaries
- Pavement Condition**
 - Poor
 - Fair
 - Good
 - Excellent
- Roadways**
 - Interstate
 - US & State Routes
 - Other Roadways
- Water**
 - Streams & Rivers
 - Lakes, Ponds & Reservoirs

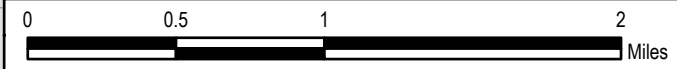



Gardner, MA: Federal Aid Routes Surveyed by MassDOT & MRPC - 2021



DATA SOURCES: MassGIS, MassDOT, the City of Gardner and the MRPC. **DISCLAIMER:** The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

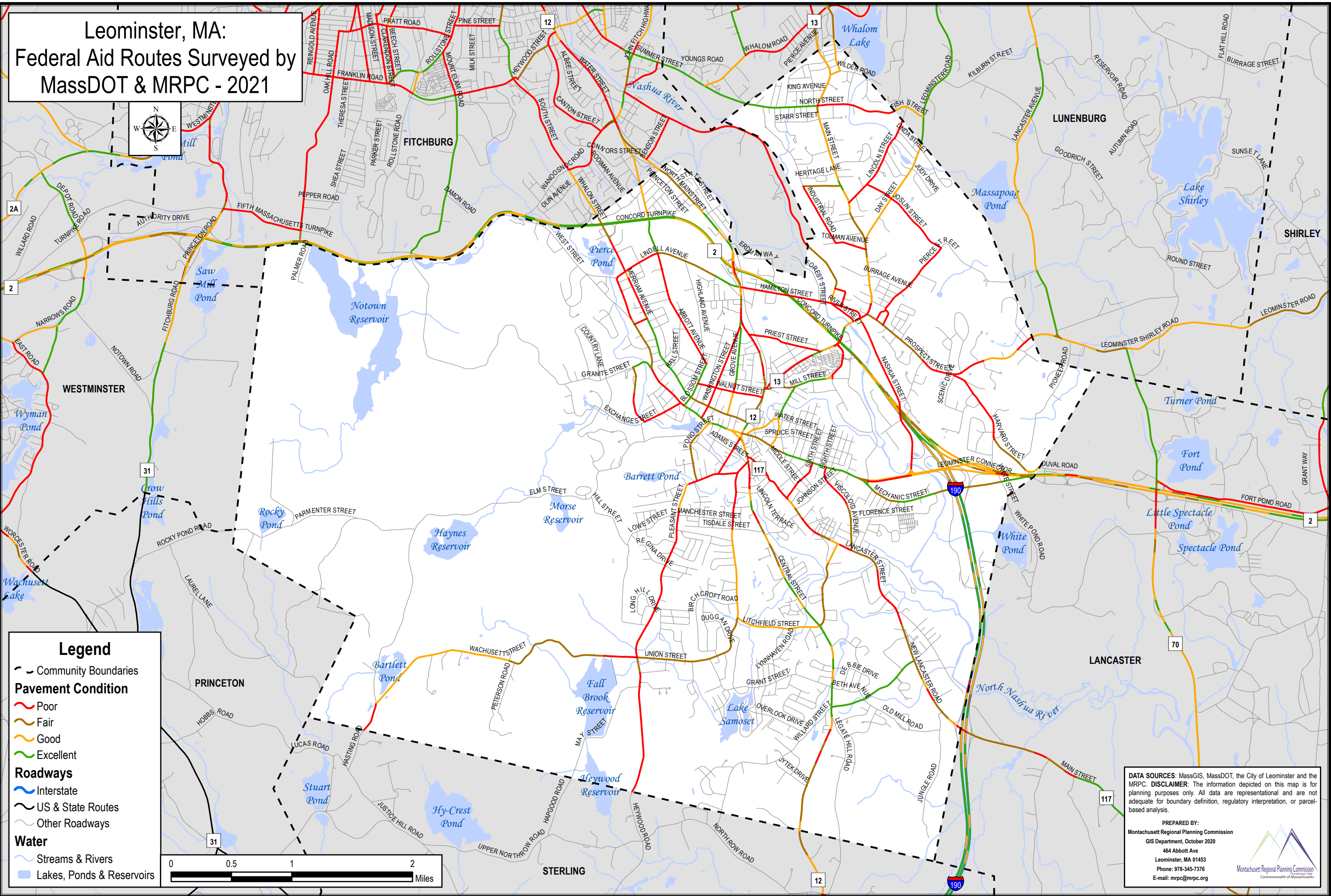
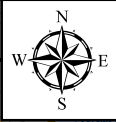
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Legend

- Community Boundaries
- Pavement Condition**
 - Poor
 - Fair
 - Good
 - Excellent
- Roadways**
 - Interstate
 - US & State Routes
 - Other Roadways
- Water**
 - Streams & Rivers
 - Lakes, Ponds & Reservoirs

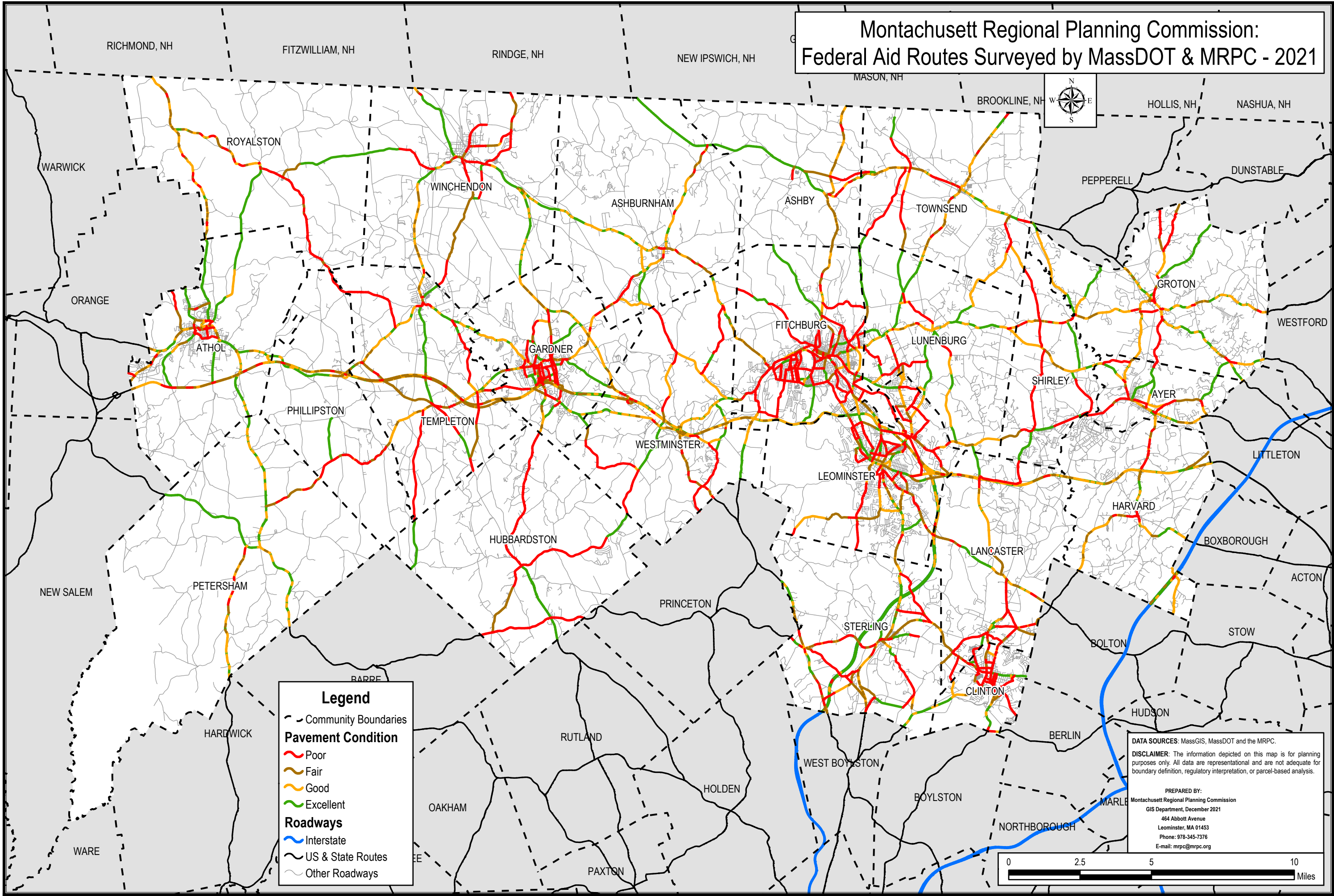
Leominster, MA:
Federal Aid Routes Surveyed by
MassDOT & MRPC - 2021



DATA SOURCES: MassGIS, MassDOT, the City of Leominster and the MRPC. **DISCLAIMER:** The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

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Montachusett Regional Planning Commission: Federal Aid Routes Surveyed by MassDOT & MRPC - 2021



Legend

Community Boundaries

Pavement Condition

Poor

Fair

Good

Excellent

Roadways

Interstate

US & State Routes

Other Roadways

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