Safety and Security Planning Assistance Program

Regional Emergency Response Road Network

Fall 2008

Prepared by:
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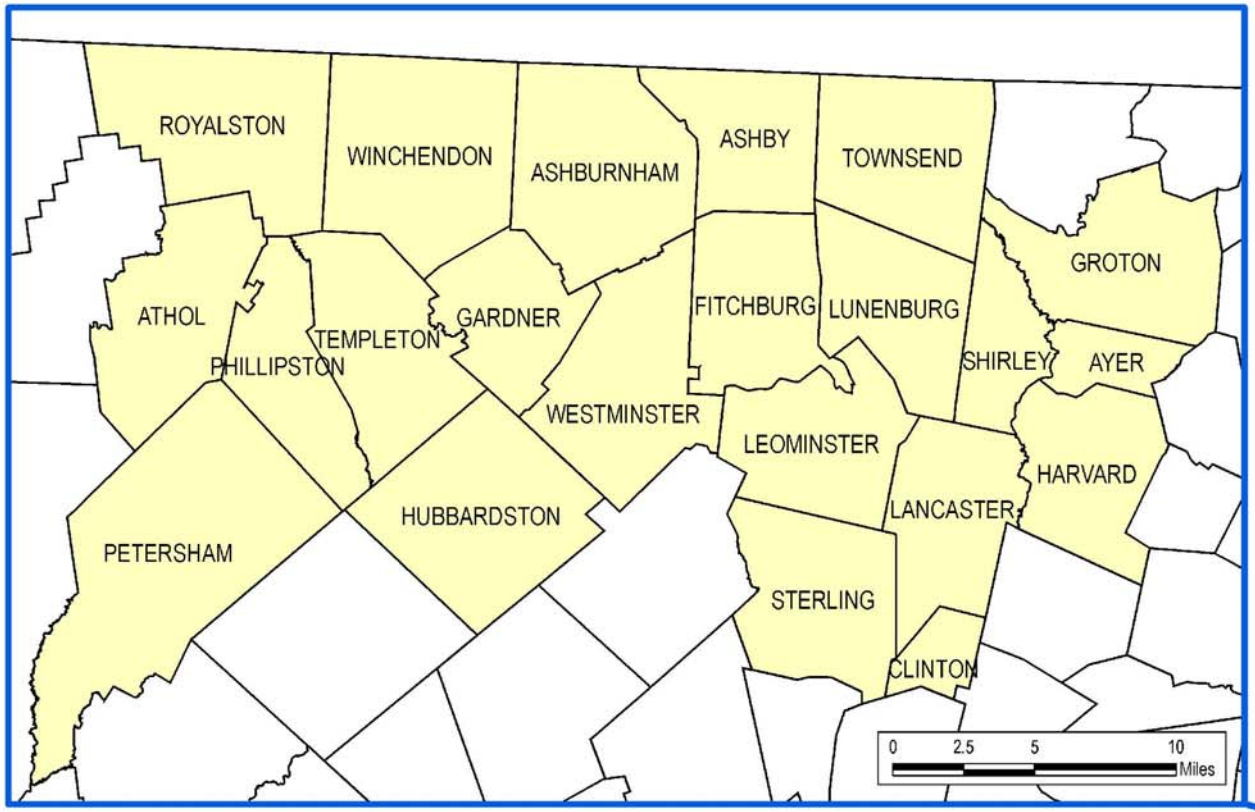
Fall 2008

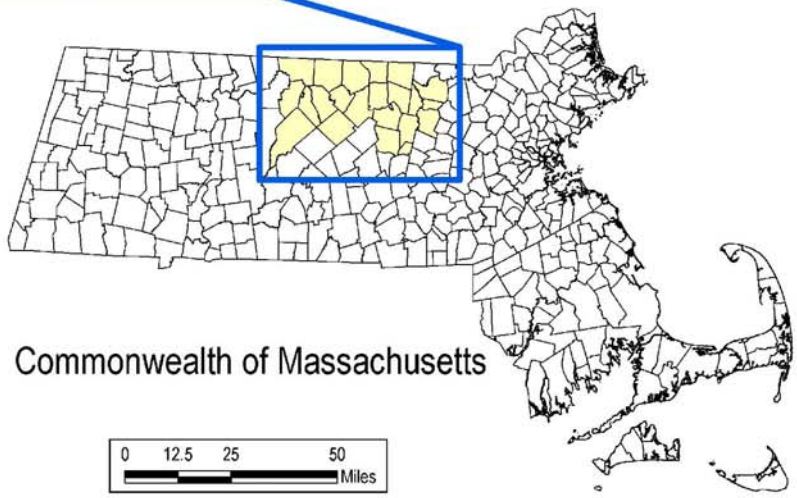
Regional Emergency Response Road Network

A Report on the Emergency Response Network in the Montachusett Region

Including the Communities of:
Ashburnham, Ashby, Athol, Ayer, Clinton, Fitchburg, Gardner, Groton, Harvard, Hubbardston, Lancaster, Leominster, Lunenburg, Petersham, Phillipston, Royalston, Shirley, Sterling, Templeton, Townsend, Westminster, and Winchendon

Montachusett Regional Planning Commission (MRPC) Locus Map





Legend

- Massachusetts Communities
- MRPC Communities

DATA SOURCES: MassGIS 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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Ashby	Mary Krapf	Wayne Stacy
Athol	Doug Walsh	
Ayer	Pauline Hamel	Jim Lucchesi
Clinton		
Fitchburg		Paula Caron
Gardner		Daniel Keeney
Groton	Anna Eliot	Joshua Degen
Harvard	Lucy Wallace	Joseph Sudol, Jr.
Hubbardston	Lyn Gauthier	James Crystoff
Lancaster		Noreen Piazza
Leominster	Mary Charpentier	Andrew Taylor
Lunenburg		Robert Saia
Petersham	Roy Nilson	
Phillipston	Ronald Recos	Kevin Flynn
Royalston	Andrew West	
Shirley	Joseph Lynch	John Oelfke/Charles
Colburn		
Sterling		Charles Hadjju
Templeton	Chantell Wead/Bud Chase	Gerald White
Townsend	Edward Kukkula	Nicholas E. Thalheimer
Westminster		Andrew J. Sears
Winchendon		John White

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Richard Montuori	Mass Development
Peter Lowitt	Devens Enterprise Commission (DEC)

CONTENTS

ACTIVITIES OF THE 2008 S&SPA PROGRAM

The Safety and Security Planning Assistance (S&SPA) program at the Montachusett Regional Planning Commission (MRPC) features a diverse scope of work originating from many different sources. Along with offering support to developing local, regional, state, or federal emergency management plans, this year's program provided Geographic Information Systems (GIS) outreach and technical assistance to the Montachusett Regional Emergency Planning Committee (MREPC). In addition to mapping assistance related to emergency plans and assistance to local emergency planning committees, the MRPC began to study emergency response routes that service communities in the region.

EMERGENCY RESPONSE ROAD NETWORK

The 2008 Montachusett S&SPA program Emergency Response Road Network report is the first phase of a broader report on emergency transportation infrastructure in the region. During the program year the MRPC contacted emergency responders to address concerns in the transportation system affecting their ability to rapidly access area hospitals. Future efforts will be made to document additional routes and concerns and address any problems in the network of routes heavily traveled by emergency personnel.

Two main goals of this preliminary report are to recognize routes in the Montachusett region which are heavily traveled by emergency response and transport vehicles and to assess the conditions along these routes which link responders to emergencies and municipalities to the hospitals that typically serve them. As a result of our efforts we hope to learn of common concerns along these routes and recognize these concerns when considering improvements to our network of roads. The principal intention of assessing these emergency routes as part of the S&SPA program at MRPC is for the purpose of including the data in our transportation evaluation criteria (TEC). TEC is data that is considered when putting together documents such as the Transportation Improvement Program (TIP), an annual prioritized listing of transportation and transit projects in the region proposed for implementation during future federal fiscal years.

WHY STUDY EMERGENCY RESPONSE ROUTES

It was brought to attention during the development of the 2007 Regional Transportation Plan that several communities expressed concern with emergency vehicle routes and the affect problems with local infrastructure, i.e. bridges, pavement conditions, etc. which can impact response times. The 2008 S&SPA Emergency Response Road Network report aims to address these concerns and give guidance to future studies and reports on this issue.

EMERGENCY RESPONDER SURVEY

During the spring of 2008, and again during the late summer, emergency responders from each member community were contacted in relation to the efforts of this report. A letter introducing the S&SPA program and the intentions of studying emergency response

routes was sent along with a questionnaire. In the questionnaire emergency responders were asked to identify the following

- Emergency response hospitals used and ambulance services used for transport.
- Preferred or typical routes to these hospitals.
- Concerns with these routes, ex. load/height restrictions, restrictions on bridges, dangerous intersections, traffic delays, etc.
- Efforts underway to mitigate these or other concerns.
- Suggestions to expedite emergency response times on these or other routes.
- The amount of emergencies that require emergency transportation to hospitals on an annual basis.

The results of the questionnaire are provided below in Table 1.

TABLE 1: Questionnaire results

City/Town	Hospitals	Ambulance services	Concerns	Suggestions	Emergency Transports Per Year
Ashburnham	H, L	Town Ambulance, Woods, Westminster/Winchendon as backups	Rte. 12 Fitchburg/Leominster congested/ Rte. 2 preferred Rte.	no response	about 360 patients per year
Ashby	L, N, H	no response	Construction @ Rte. 12	no response	no response
Athol	A	Athol Fire, Orange Fire, Woods	Road blockage in certain areas delaying times.	no response	1,500 per year (Athol) 800 per year (Orange) maybe 300 from Phillipston,Petersham & Royalston
Ayer	N, L, E	Ayer ambulance service	Nashoba: Dangerous intersection @ Washington/Groton Harvard Rd.; Emerson & Leominster: Traffic different times of day	none	1100 from Ayer
Clinton	NO RESPONSE				

City/Town	Hospitals	Ambulance services	Concerns	Suggestions	Emergency Transports Per Year
Fitchburg	No Response	Fitchburg Fire/Fitchburg EMS/MedStar	Rte. 12 construction	no response	3000+
Gardner	H	Woods	Dangerous intersections: Rte. 101/Rte. 140 ; Rte. 68/Rte. 2A	no response	no response
Groton	NO RESPONSE				
Harvard	NO RESPONSE				
Hubbardston	NO RESPONSE				
Lancaster	NO RESPONSE				
Leominster	L, C, N, UC	Leominster Fire (primary)/Med-Star	no	Traffic light control	about 3500
Lunenburg	L, N	Fire Dept. Ambulances	Traffic Delays, road construction	Construction during non-peak traffic hours	1000-1200
Petersham	A	Athol Fire-primary ambulance, Athol requester by 911 at S.P. in New Braintree	no	no	See Athol
Phillipston	NO RESPONSE				
Royalston	NO RESPONSE				
Shirley	N, E, L, W	Towns of Shirley, Ayer, Devens, Lunenburg, Leominster, Groton, and Lancaster Ambulance	no	no	460
Sterling	C, L, W	Sterling has 2 ambulances; they also use West Boylston, Princeton, Lancaster, Clinton, Leominster & Medstar as backups.	Dangerous intersections in Worcester, high traffic volume in Worcester	Sterling is currently standardizing traffic control signals utilizing opticom	Approx. 700
Templeton	NO RESPONSE				

City/Town	Hospitals	Ambulance services	Concerns	Suggestions	Emergency Transports Per Year
Townsend	N, L	Primarily Townsend Fire/EMS	no	Make all traffic signals compatible with opticom	>1000
Westminster	L, H, W	Westminster Fire; Mutual Aid Ambulance	not all intersections have opticom preemption controls	add opticom preemption to all lighted intersections	600
Winchendon	H, L, W	Winchendon Fire Department	no	no	Approx. 800

Codes for the hospital listings are as follows: A=Athol Memorial Hosp.; C=Clinton Hosp.; E=Emerson Hosp., Concord, MA.; H=Heywood Hosp., Gardner, MA.; L=Leominster Hosp.; N=Nashoba Hosp., Ayer, MA.; S=Saint Vincent Hosp., Worcester, MA.; UC=UMass University Campus Hosp., Worcester; UM=UMass Memorial Hosp., Worcester; W=All Worcester Hospitals.

From the questionnaires we can begin to see a profile of the emergency transportation system of our region. Using the information attained we can begin to focus on shortfalls in the system and make improvements where possible. The following maps represent information received from these surveys.

Montachusett Regional Planning Commission: Emergency Transports per Year and Areas of Concern

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE
MASON, NH
BROOKLINE, NH
HOLLIS, NH
NASHUA, NH
WARWICK
ROYALSTON
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
GARDNER
Rte. 140/ Rte. 101
Rte. 68/ Rte. 2A
FITCHBURG
LUNENBURG
GROTON
WESTFORD
Washington St./ Groton-Harvard Rd.
SHIRLEY
AYER
PHILLIPSTON
TEMPLETON
Gardner Municipal Airport
Fitchburg Municipal Airport
WESTMINSTER
LEOMINSTER
HARVARD
LITTLETON
HUBBARDSTON
LANCASTER
BOXBOROUGH
ACTON
NEW SALEM
PETERSHAM
PRINCETON
STERLING
Sterling Airport
CLINTON
BOLTON
STOW
HUDSON
BARRE
HARD
WEST BOYLSTON
BERLIN
BOYLSTON
NORTHBOROUGH
MARLE
WARE

Legend

- Community Boundaries
- Airports

Roadways
- Interstate Routes
- US & State Routes
- Heavily Traveled Routes Leading To Hospitals
- Areas of Concern from Surveys

Water
- Streams & Rivers
- Lakes, Ponds & Reservoirs

Public Safety Buildings
- Fire Stations
- Police Stations
- Public Safety Complexes
- Hospitals

Emergency Transports per Year
- No Data
- 0-250 per Year
- 250-500 per Year
- 500-1000 per Year
- 1000-1500 per Year
- 3000-3500 per Year

DATA SOURCES: MassGIS, MHD and the MRPC.

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0 2.5 5 10 Miles

/Safety_SecurityPlanningAssistanceMaps/EmergencyTransports_PerYearMap_11x17L.mxd [1:190,000] 09_30_08

Montachusett Regional Planning Commission: Heavily Traveled Emergency Routes from Survey

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE, NH
MASON, NH
BROOKLINE, NH
HOLLIS, NH
NASHUA, NH
WARWICK
ROYALSTON
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
GARDNER
FITCHBURG
LUNENBURG
GROTON
WESTFORD
SHIRLEY
AYER
LITTLETON
PHILLIPSTON
TEMPLETON
Gardner Municipal Airport
Fitchburg Municipal Airport
WESTMINSTER
LEOMINSTER
HARVARD
BOXBOROUGH
ACTON
HUBBARDSTON
LANCASTER
NEW SALEM
PETERSHAM
PRINCETON
STERLING
Sterling Airport
CLINTON
BOLTON
STOW
BARRE
HARDWICK
RUTLAND
HOLDEN
WEST BOYLSTON
BOYLSTON
OAKHAM
NEW BRAINTREE
PAXTON
WARE

DATA SOURCES: MassGIS, MHD and the MRPC.

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Legend

- Community Boundaries
- Airports

Roadways
- Interstate Routes
- US & State Routes
- Heavily Traveled Routes

Water
- Streams & Rivers
- Lakes, Ponds & Reservoirs

Public Safety Buildings
- Fire Stations
- Police Stations
- Public Safety Complexes
- Hospitals

0 2.5 5 10 Miles

/Safety_SecurityPlanningAssistanceMaps/Heavily_Traveled_EmergencyRoutesMap_11x17L.mxd [1:190,000] 09_29_08

Although the feedback from the surveys was received by only 14 of 22 communities, areas of concern can still be seen. Along with predictable concerns such as delays along Rte. 12 leading to Leominster Hospital (currently under construction until 2009), there are also less predictable concerns such as at the Washington St. /Groton-Harvard Rd. intersection in Ayer and even more notably, concerns with the lack of preemption devices, which will be the concentration of an upcoming section of this report. Along with this input from emergency responders, characteristics of the roadway should also be considered.

ADDITIONAL DATA TO CONSIDER

Emergency Access Routes

Emergency access routes would be routes commonly used by all emergency responders, i.e. police, ambulance, fire, etc. to access locations of emergencies. We considered these routes to be pipelines which provide access to many different neighborhoods or pockets of population. In more technical terms these access routes are comprised of all Interstate roadways such as I190, and I495 and all other numbered routes as well as all urban arterials, urban collectors and rural arterials in the Montachusett region. These roads are also known as the Federal Aid Eligible network. A list of all emergency access routes is provided in the appendix of this report. The following map "Emergency Access Routes" shows these emergency access routes throughout the region.

Emergency Transport Routes

Emergency transport routes contain many of the above mentioned emergency access routes, however, focus primarily on where emergency transport vehicles, i.e. ambulances, are most common. These routes are main arteries which emergency transport vehicles would use specifically to access hospitals in the Montachusett region. Many times these routes form a bottleneck of emergency response and transport activities around hospitals, making it even more important to have the finest quality and functioning transportation infrastructure possible. A list of all emergency transport routes can be found in the appendix. The following map "Heavily Traveled Emergency Routes Leading to Hospitals" shows these routes throughout the region.

Bridge Condition Along Routes

The condition of bridges throughout the emergency access network can greatly effect access and travel times. Bridge closings and weight restrictions alter traffic patterns by forcing vehicles to find alternate routes frequently leading through residential streets. Although feedback from emergency responders did not express concern with bridges, as an essential part of the infrastructure of the transportation system it is still important to look at possible problems and obstacles relating to bridges before they occur. Future bridge closings due to inadequate conditions or repair work pose as obstacles for emergency responders not only on heavily traveled emergency routes but throughout the

whole network of roads in the region. Additionally, the development of key evacuation routes throughout the region can be impacted by the location and status of these bridges.

Within the 22 communities of the Montachusett region, some 317 bridges are identified and rated by the Massachusetts Highway Department (MassHighway) as part of their inventory system. The "Montachusett Region Functionally Obsolete and Structurally Deficient Bridges" map shows information MassHighway and the Executive Office of Transportation (EOT) has provided the MRPC relating to bridges of concern in our region.

According to the Massachusetts Highway Project Development and Design Guidebook, a structurally deficient bridge is defined as "a bridge structure that has a defect requiring corrective action." Functionally obsolete bridges are defined as "a bridge which has no structural deficiencies but does not meet standards to adequately serve current user demands (Massachusetts)." The "Functionally Obsolete and Structurally Deficient Bridges Along Emergency Transport Routes" map shows 27 functionally Obsolete and 28 structurally deficient bridges along these routes, and 1 bridge that is classified as both, meaning that the bridge has structural defects and inadequately serves the needs of the road. A listing of all bridges shown on the map can be found in the appendix.

Pavement Condition Along Routes

The MRPC uses pavement data gathered by MRPC and MassHighway surveys for our pavement management program to include in the TEC. While the condition of the pavement would probably not cause a road closing, it could certainly effect the timeliness and quality of an emergency response or transport. A rough road can cause an emergency responder to slow down or a patient being transported discomfort, especially if medical attention is being administered during the transport. As a main characteristic of our transportation system, pavement quality should be considered to have a direct effect on the quality of transportation and the data should be considered when looking at emergency access and transport in the region.

The "Pavement Condition on Emergency Access Routes" map shows emergency access routes (federal aid routes) surveyed by MassHighway in 2006 through 2007 as part of their pavement management program, and the pavement serviceability index (PSI) results from these surveys throughout the region. PSI is an overall measure of the quality of the pavement. Ranging from a 0 (poor) to a 5 (excellent), PSI gives a numerical description of a pavement's condition.

Dangerous Intersections and Interchanges Along Routes

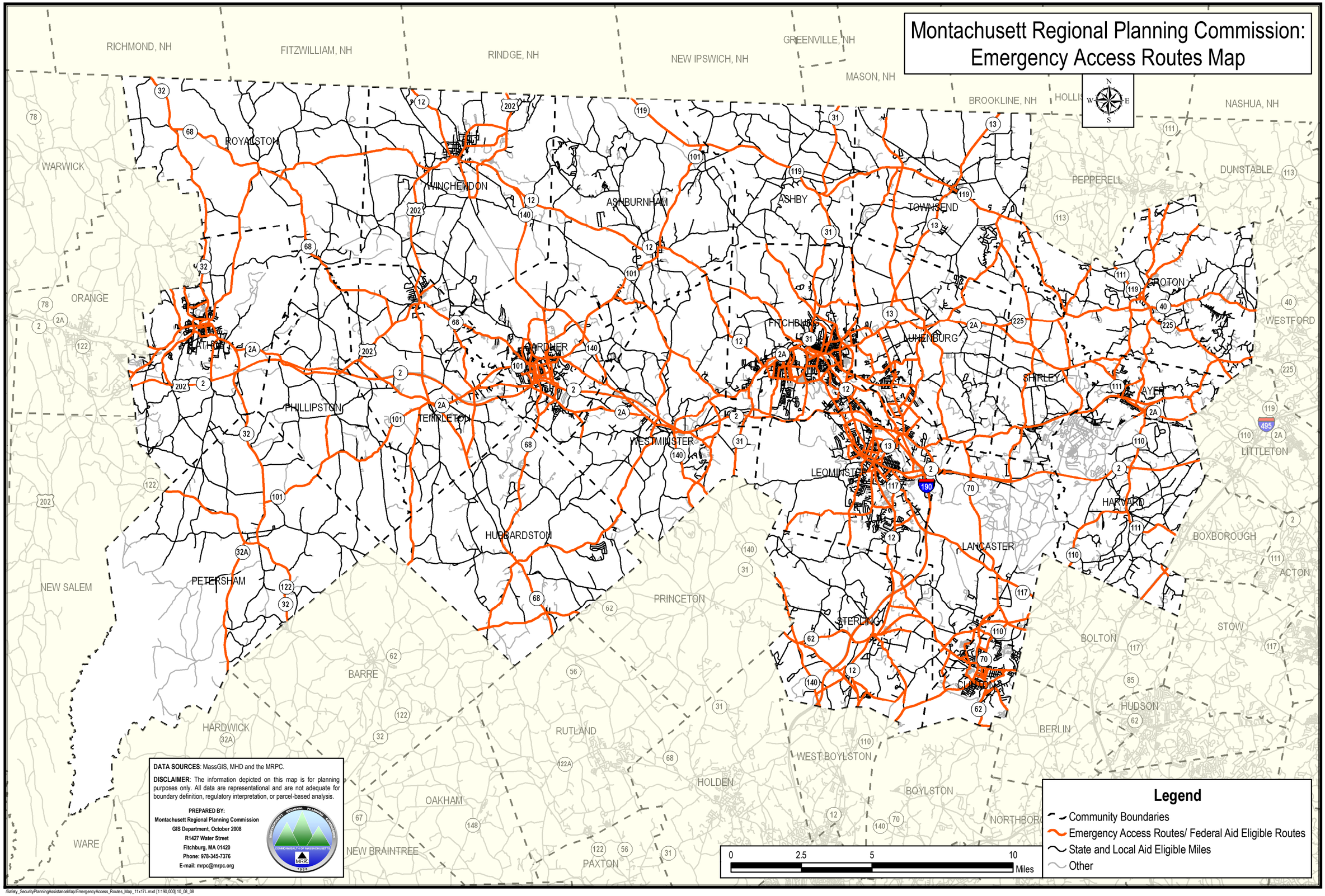
Using data that MassHighway obtains from the Massachusetts Registry of Motor Vehicles (RMV) to create crash tables for each community in Massachusetts, the transportation department at MRPC has been developing a crash database for the purpose of gathering crash statistics on the region. Phase I of the "Roadway Safety Conditions in the Montachusett Region" report (Spring 2008) reported on the most dangerous

intersections and interchanges throughout the region. Using the most up to date data available at the time of the analysis, which was from 2005, a list was compiled of the most dangerous intersections and interchanges in the region in a three year period (2002-2005).

The Equivalent Property Damage Only (EPDO) crash severity rating system was used to determine which intersections and interchanges should be in this list of dangerous intersections and interchanges. EPDO rates a crash based on crash severity that gives one (1) point to a property damage only (PDO) crash, which is a crash that resulted in no injuries but property damage of at least $1000 or more; five (5) points for a crash involving at least one Non-fatal Injury; and ten (10) points to a crash that involves at least one Fatal Injury.

Intersections and interchanges were first ranked by EPDO and then on total number of crashes that occurred at the intersection or interchange. The following map "Dangerous Intersections and Interchanges Along Emergency Response Routes" shows intersections and interchanges listed in the 50 most dangerous in the region, and also located along emergency transport routes. Of the 50 most dangerous intersections and interchanges in the region, 49 are located along emergency transport routes. These intersections and interchanges are numbered on the map from 1 (most dangerous in the region) to 50 (50th most dangerous in the region). A list of all intersections and interchanges on this map can be found in the appendix.

Montachusett Regional Planning Commission: Emergency Access Routes Map



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Legend

- Community Boundaries
- Emergency Access Routes/ Federal Aid Eligible Routes
- State and Local Aid Eligible Miles
- Other

/Safety_SecurityPlanningAssistanceMap/EmergencyAccess_Routes_Map_11x17Lmxd [1:190,000] 10_08_08

Montachusett Regional Planning Commission: Heavily Traveled Routes Leading to Hospitals

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE, NH
MASON, NH
BROOKLINE, NH
HOLLIS, NH
NASHUA, NH
WARWICK
ROYALSTON
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
GROTON
WESTFORD
ORANGE
ATHOL
GARDNER
FITCHBURG
LUNENBURG
SHIRLEY
AYER
LITTLETON
PHILLIPSTON
TEMPLETON
Gardner Municipal Airport
WESTMINSTER
Fitchburg Municipal Airport
LEOMINSTER
HARVARD
BOXBOROUGH
ACTON
HUBBARDSTON
LANCASTER
NEW SALEM
PETERSHAM
PRINCETON
STERLING
Sterling Airport
CLINTON
STOW
BOLTON
HUDSON
BARRE
HARDWICK
BERLIN
WEST BOYLSTON
BOYLSTON
NORTHBOROUGH
MARLBOROUGH
WARE

Legend

- Community Boundaries
- Airports

Roadways
- Interstate Routes
- US & State Routes
- Heavily Traveled Routes Leading To Hospitals

Water
- Streams & Rivers
- Lakes, Ponds & Reservoirs

Public Safety Buildings
- Fire Stations
- Police Stations
- Public Safety Complexes
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DATA SOURCES: MassGIS, MHD and the MRPC.

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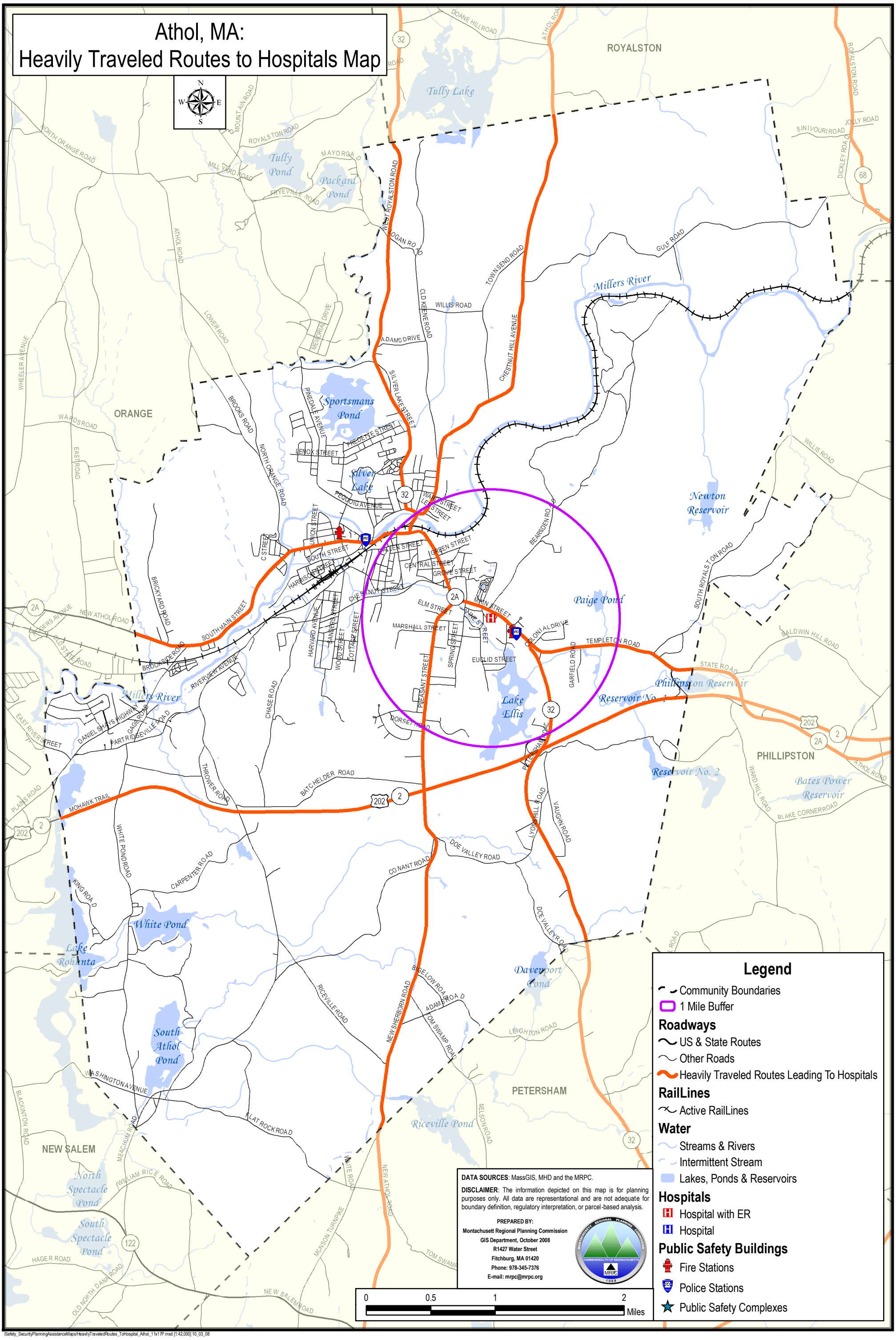
0 2.5 5 10 Miles

/Safety_SecurityPlanningAssistanceMaps/Heavily_Traveled_HospitalRoutesMap_11x17L.mxd [1:190,000] 09_29_08

Athol, MA:
Heavily Traveled Routes to Hospitals Map



Legend

- Community Boundaries
- 1 Mile Buffer

Roadways

- US & State Routes
- Other Roads
- Heavily Traveled Routes Leading To Hospitals

RailLines

- Active RailLines

Water

- Streams & Rivers
- Intermittent Stream
- Lakes, Ponds & Reservoirs

Hospitals

- Hospital with ER
- Hospital

Public Safety Buildings

- Fire Stations
- Police Stations
- Public Safety Complexes

DATA SOURCES: MassGIS, MHD and the MRPC.

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0 0.5 1 2 Miles

/Safety_SecurityPlanningAssistanceMaps/HeavilyTraveledRoutes_ToHospital_Athol_11x17P.mxd [1:42,000] 10_03_08

Ayer, MA:
Heavily Traveled Routes to Hospitals Map

SHIRLEY
GROTON
DEVENS
HARVARD

Squannacook River
Nashua River
Groton School Pond
Long Pond
Sandy Pond
Flannagan Pond
Plow Shop Pond
Grove Pond
Spectacle Pond
Robbins Pond

JOY LANE
SHIRLEY ROAD
GROTON SHIRLEY ROAD
KITTREDGE ROAD
GREAT ROAD
WALKER ROAD
FITCHBURG ROAD
ROSEWOOD AVENUE
VERNON STREET
MARK STREET
DOUG ROAD
GROTON SCHOOL ROAD
BISHOP ROAD
PARK STREET
BROOK STREET
TAFT STREET
PEARL STREET
JACKSON STREET
PRESCOTT STREET
WASHINGTON STREET
MASHUA STREET
HIGHLAND AVENUE
WILLIAM STREET
HIGH STREET
CAMBRIDGE STREET
MAIN STREET
SHIRLEY STREET
CENTRAL AVENUE
GROVE STREET
BLIGH STREET
FLETCHER STREET
EAST MAIN STREET
THIRD STREET
WEST MAIN STREET
MARY HEBRON ROAD
BAKER BLUFF STREET
SHERMAN AVENUE
KYLE AVENUE
ANTIETAM STREET
COOKE STREET
BUENA VISTA STREET
CAREY STREET
SAINT MIHIEL STREET
FARMERS ROW
MOORS ROAD
SMITH STREET
OLD LANE DRIVE
DALE LANE
OLD AYER ROAD
INDIAN HILL ROAD
NATE NUTTING ROAD
OLD GROTON ROAD
RATTLESNAKE DRIVE
MOORE DRIVE
GROTON HARVARD ROAD
OAKRIDGE DRIVE
BARNUM ROAD
HARVARD ROAD
CORPLAND DRIVE
MYRICK STREET
HILLARD STREET
LITTLETON ROAD
SNAKE HILL ROAD
SHAKER ROAD
SAN JUAN STREET
AYER ROAD
MYRICK LANE
ANN LEE ROAD
BABBIT LANE
OLD MILL ROAD
SHAKER ROAD
SANDY POND ROAD
BIRCH STREET
PATRICIA DRIVE
WILLOW ROAD
PIERCE ROAD
CALVIN STREET
WRIGHT ROAD
HEDGEWAY
STANDISH AVENUE
LINDLEY DRIVE
NEMCO WAY
NEW ENGLAND WAY
WESTFORD ROAD
MADISON DRIVE
SPECTACLE ROAD
BAR ONWAY
NICKLE LANE
CRICKET LANE
AUGUSTINE ROAD
OLD LANTERN LANE
ROBIN LANE
HUBBARD LANE
LAUREL LANE
NEW POND ROAD
WHALEY ROAD
SANDY POND ROAD
BOSTON ROAD
FORGE VILLAGE ROAD
SUNSET RAYBERRY ROAD
GREAT ROAD
BRUCE STREET

111
2A
119
225
110

DATA SOURCES: MassGIS, MHD and the MRPC.

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0 0.25 0.5 1 Miles

Legend

- Devens Boundary
- Community Boundaries
- 1 Mile Buffer

Roadways
- US & State Routes
- Other Roads
- Heavily Traveled Routes Leading To Hospitals

RailLines
- Active RailLines

Water
- Streams & Rivers
- Intermittent Stream
- Lakes, Ponds & Reservoirs

Hospitals
- Hospital with ER
- Hospital

Public Safety Buildings
- Fire Stations
- Police Stations
- Public Safety Complexes

Clinton, MA:
Heavily Traveled Routes to Hospitals Map

N
W E
S

LANCASTER
BOLTON
BERLIN
Nashua River
Mossy Pond
South Meadow Pond
Coachlace Pond
Lancaster Mill Pond
Wachusett Reservoir
Clamshell Pond

REDSTONE HILL
REDSTONE HILL ROAD
HAWKINS LANE
DEERSHORN ROAD
POWLIN DRIVE
IVY DRIVE
PARKER ROAD
CARTER STREET
WINSLOW STREET
MILL STREET
GORHAM AVENUE
PILGRIM ROAD
MAYFLOWER DRIVE
LONGEDGE ROAD
MAGNOLIA AVENUE
DEWEY STREET
BROADWAY
GREENLEY STREET
HIGHLAND STREET
FLAGG STREET
ALLEN STREET
MARTIN STREET
STONE STREET
HIGH STREET
PLAIN STREET
WOODRUFF ROAD
OTIS STREET
LINCOLN STREET
KENT STREET
MOUNT VIEW DRIVE
LANCASTER ROAD
SAWYER ROAD
SARGENT ROAD
WATOQUADOC ROAD
KELLVILLE ROAD
STERLING STREET
FARM LANE
MOFFETT STREET
RIGBY ROAD
WILLOW STREET
BROOK STREET
PARKER STREET
CLARK STREET
WEST STREET
EAST STREET
FOREST STREET
SOUTH MEADOW ROAD
FITCH ROAD
FITCH FARM LANE
COLE FARM ROAD
PEARL STREET
LEIGHTON AVENUE
WATER STREET
BOURNE STREET
AUBURN STREET
ELM STREET
BOLTON ROAD
ASH STREET
WOODLAWN STREET
CHURCH STREET
WALNUT STREET
CHESTNUT STREET
PRESCOTT STREET
CEDAR STREET
ORANGE STREET
BEECH STREET
BIRCH STREET
LARCH STREET
PRUCE STREET
BRANCH STREET
CHIPMAN STREET
SCHOBERT STREET
UNION STREET
HARBOR STREET
SPRAGUE ROAD
PINE STREET EXTENSION
PLEASANT STREET
NORMAN STREET
FRANKLIN STREET
BEACON STREET
ARTHUR STREET
WINTER STREET
PARK STREET
SIMON COURT
RICHMAN STREET
GROVE STREET
GREEN STREET
BARRETT STREET
CAMBRIDGE DRIVE
CHACE STREET
ROBERT STREET
CROWN STREET
OAK STREET
ACRE STREET
CAMERON STREET
MAIN STREET SOUTH
LANE AVENUE
TERRENCE AVENUE
DENNIS STREET
VINEYARD AVENUE
JOHN STREET
MORGAN AVENUE
MAIN STREET
METROPOLITAN ROAD
TOP STREET
WILSON STREET
MULBERRY DRIVE
CLAMSHELL ROAD
CHANTWOOD DRIVE
KILMURRAY STREET
LINDBERGH STREET
CANDICE STREET
BERLIN STREET
PEACH HILL ROAD
ALLEN ROAD
WEST STREET
BOYLSTON STREET
WILLOW ROAD
BOYLSTON ROAD
62
70
110
H
PD

DATA SOURCES: MassGIS, MHD and the MRPC.

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0 0.25 0.5 1 Miles

Legend

- Community Boundaries
- 1 Mile Buffer

Roadways
- US & State Routes
- Other Roads
- Heavily Traveled Routes Leading To Hospitals

RailLines
- Active RailLines

Water
- Streams & Rivers
- Intermittent Stream
- Lakes, Ponds & Reservoirs
- Hospital with ER
- Hospital

Public Safety Buildings
- Fire Stations
- Police Stations
- Public Safety Complexes

/Safety_SecurityPlanningAssistaceMaps/HeavilyTraveledRoutes_ToHospitals_Clinton_11x17L.mxd [1:22,000] 10_07_08

Fitchburg, MA:
Heavily Traveled Routes to Hospitals Map

N
W E
S

ASHBURNHAM
ASHBY
LUNENBURG
WESTMINSTER
LEOMINSTER

Fitchburg Reservoir
Lower Wrights Pond
Upper Wrights Pond
Lowell Reservoir
Scott Reservoir
Overlook Reservoir
North Nashua River
Paige Pond
Snow Mill Pond
Mirror Lake
Saw Mill Pond
Notown Reservoir
Pierce Pond
Barrett Pond

RUSSELL HILL ROAD
CROCKER HILL ROAD
MAYO ROAD
TELEPHONE ROAD
FITCHBURG STREET
TAYLOR ROAD
WARES ROAD
BILLINGS ROAD
RICHARDSON ROAD
SCRIPTURE ROAD
KINSMAN ROAD
HIGH ROCK ROAD
BENNETT ROAD
RINDGE ROAD
CASWELL ROAD
DEAN HILL ROAD
FRED SMITH ROAD
HOWARD STREET
WEST TOWNSEND ROAD
OLD STAGECOACH ROAD
NEW WEST TOWNSEND ROAD
KENDALL ROAD
ASHBY WEST ROAD
BURNAP ROAD
FISHER ROAD
NORTHFIELD ROAD
CHASE ROAD
SHELDON ROAD
WILLIAMS ROAD
ASHBY STATE ROAD
RICHARDSON DRIVE
WHITTEMORE STREET
PEARL HILL ROAD
JOHN FITCH HIGHWAY
BLOSSOM STREET
RINDGE ROAD
MCINTIRE ROAD
ASHBURNHAM STATE ROAD
FLAT ROCK ROAD
MECHANIC STREET
VIEW STREET
ALPINE ROAD
STICKNEY ROAD
POTATO HILL ROAD
ASHBURNHAM HILL ROAD
ROSS STREET
TOWNSEND STREET
PEARL STREET
BEAN STREET
WHITE STREET
TILTON AVENUE
MASSACHUSETTS AVENUE
EASTERN AVENUE
UPLAND AVENUE
HIGH STREET
NUTTING STREET
BIRCHARD STREET
SOUTH STREET
BOUNDER DRIVE
LUNENBURG STREET
HENLEY AVENUE
JERRY STREET
BOUTELLE STREET
UPHAM STREET
FIRST STREET
HARVARD STREET
PLEASANT STREET
WEST STREET
ELECTRIC AVENUE
HOLLIS ROAD
CARR AVENUE
JOHN FITCH HIGHWAY
PRATT STREET
WHALOM ROAD
YOUNGS ROAD
RAMGREN ROAD
GRAHAM STREET
KING AVENUE
NORTH STREET
STARR STREET
WISTERIA DRIVE
MAIN STREET
HERITAGE LANE
EASTERN AVENUE
CRANFORD STREET
INDUSTRIAL ROAD
WOODSOME AVENUE
STUART AVENUE
WEST STREET
WATER STREET
AIRPORT ROAD
BEMIS ROAD
BENSON STREET
CONNORS STREET
NORTHMAN AVENUE
SWAN AVENUE
VALLEY STREET
NORMANDY ROAD
SUMMER STREET
MACK ROAD
CONCORD TURNPIKE
ERDMAN WAY
Fitchburg Municipal Airport
LINDELL AVENUE
ALOE DRIVE
HIGHLAND AVENUE
MERRIAM AVENUE
MAPLE AVENUE
ABBOTT AVENUE
MCKAY STREET
HAMILTON STREET
FOREST STREET
PRIEST STREET
PALMER ROAD
MOUNT ELAM ROAD
OLD FARM ROAD
HELENA STREET
GRANITE STREET
EXCHANGE STREET
POND STREET
PLEASANT TERRACE
SYLVAN AVENUE
WALLACE STREET
RIVER STREET
CLEGHORN STREET
FAIRMOUNT STREET
COLUMBUS STREET
DANIELS STREET
PRATT ROAD
WESTMINSTER HILL ROAD
HEMLOCK DRIVE
SANBORN STREET
TEMPLE STREET
DEPOT STREET
KING STREET
HAZEL STREET
ROLLSTONE STREET
WALTON STREET
PINE STREET
SOUTH BARRE
MILK STREET
MALLARD DRIVE
CAUSEWAY STREET
PAIN VILLE AVENUE
HEYWOOD STREET
CARTON STREET
ALBEE STREET
PARK STREET
ELM STREET
ARLINGTON STREET
HAZEL STREET
OAK HILL ROAD
REMINGTON AVENUE
HURD STREET
MADISON STREET
CHESTER STREET
BEECH STREET
FRANKLIN ROAD
ELECTRIC AVENUE
THERESA STREET
VINE STREET
BEAR HILL DRIVE
ROLLSTONE ROAD
SHEA STREET
HEPPER ROAD
DAMION ROAD
INDUSTRIAL ROAD
ROOSEVELT STREET
WESTMINSTER STREET
TURNPIKE ROAD
AUTHORITY DRIVE
PRINCETON ROAD
FITCHBURG MASSACHUSETTS TURNPIKE

12
31
2
2A
13
117

Legend

- Community Boundaries
- 1 Mile Buffer
- Airports

Roadways
- US & State Routes
- Other Roads
- Heavily Traveled Routes Leading To Hospitals

RailLines
- Active RailLines

Water
- Streams & Rivers
- Intermittent Stream
- Lakes, Ponds & Reservoirs

Hospitals
- Hospital with ER
- Hospital

Public Safety Buildings
- Fire Stations
- Police Stations
- Public Safety Complexes

DATA SOURCES: MassGIS, MHD and the MRPC.

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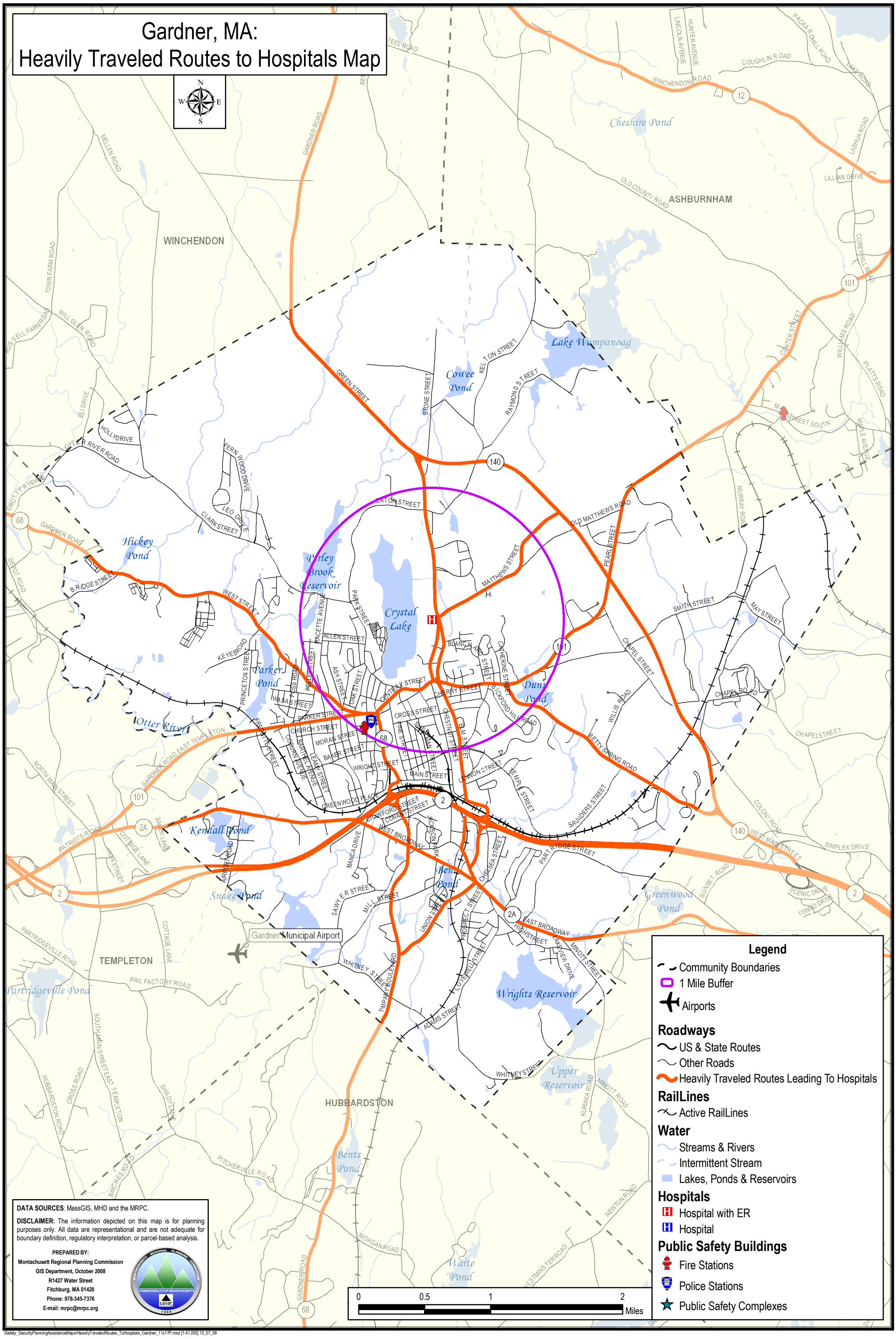
0 0.4 0.8 1.6 Miles

/Safety_SecurityPlanningAssistanceMaps/HeavilyTraveledRoutes_ToHospitals_Fitchburg_11x17P.mxd [1:39,000] 10_07_08

Gardner, MA:
Heavily Traveled Routes to Hospitals Map



DATA SOURCES: MassGIS, MHD and the MRPC.

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/Safety_SecurityPlanningAssistanceMaps/HeavilyTraveledRoutes_ToHospitals_Gardner_11x17P.mxd [1:41,000] 10_07_08

Leominster, MA:
Heavily Traveled Routes to Hospitals Map

FITCHBURG
LUNENBURG
SHIRLEY
WESTMINSTER
PRINCETON
STERLING
Fitchburg Municipal Airport
Whalom Lake
Nashua River
Massapoag Pond
Lake Shirley
Snow Mill Pond
Saw Mill Pond
Notown Reservoir
Pierce Pond
Wyman Pond
Crow Hills Pond
Rocky Pond
Morse Reservoir
Haynes Reservoir
Barrett Pond
Turner Pond
Fort Pond
White Pond
Wachusett Lake
Bartlett Pond
Fall Brook Reservoir
Lake Samoset
Stuart Pond
Hy-Crest Pond
Heywood Reservoir
North Nashua River
STATE ROAD EAST
DEPOT ROAD
TURNPIKE ROAD
WILLARD ROAD
AUTHORITY DRIVE
PRINCE ROAD
FIFTH MASSACHUSETTS TURNPIKE
PEPPER ROAD
DAMON ROAD
PALMER ROAD
NARROWS ROAD
FITCHBURG ROAD
EAST ROAD
NOTOWN ROAD
WORCESTER ROAD
LAUREL LANE
ROCKY POND ROAD
PARMENTER STREET
ELM STREET
HILL STREET
WACHUSETT STREET
PETERSON ROAD
MAY STREET
HASTING ROAD
HOBBS ROAD
LUCAS ROAD
AUSTINE HILL ROAD
HARGOOD ROAD
UPPER NORTH ROW ROAD
HEYWOOD ROAD
NORTH ROW ROAD
JUNGLE ROAD
OAK HILL ROAD
MILK STREET
ROLSTON STREET
BEECH STREET
THERESA STREET
SHEA STREET
PARK STREET
ROLLSTONE ROAD
WATT ROAD
PINE STREET
OAK STREET
SOUTH STREET
ALBERT STREET
WATER STREET
PLEASANT STREET
SUMMER STREET
YOUNGS ROAD
WHALOM ROAD
PIERCE AVENUE
VILDER ROAD
KING AVENUE
NORTH STREET
STARR STREET
MAIN STREET
HERITAGE LANE
INDUSTRIAL ROAD
LINCOLN STREET
DAYS STREET
JOSLIN STREET
JUDY DRIVE
OLIVIAN AVENUE
PIERCE STREET
BURRAGE AVENUE
KILBURN STREET
RESERVOIR ROAD
LANCASTER AVENUE
AUTUMN ROAD
GOODRICH STREET
FLAT HILL ROAD
BURRAGE STREET
SUNSET LANE
ROUND STREET
LEOMINSTER ROAD
LEOMINSTER-SHIRLEY ROAD
PIONEER ROAD
DUVOL ROAD
WHITE STREET
WHITE COURT
CONCORD TURNPIKE
WEST STREET
LINDELL AVENUE
MERRIAM AVENUE
HIGHLAND AVENUE
ABBOTT AVENUE
GROVE AVENUE
WESTMINSTER STREET
COUNTRY LANE
GRANITE STREET
EXCHANGE STREET
BLOSSOM STREET
WALNUT STREET
MILL STREET
WATER STREET
SPRUCE STREET
PRIEST STREET
HAMILTON STREET
FOREST STREET
RIVER STREET
VIRGINIA STREET
PROSPECT STREET
SCENIC DRIVE
HARVARD STREET
MECHANIC STREET
FLORENCE STREET
LANCASTER STREET
CENTRAL STREET
MANCHESTER STREET
TISDALE STREET
LOWELL STREET
REGINA DRIVE
LONG HILL DRIVE
BIRCHCROFT ROAD
DUGGAN DRIVE
LITCHFIELD STREET
UNION STREET
LINNHAVEN ROAD
GRANT STREET
BETH AVE
DE BOBIE DRIVE
WEST LANCASTER ROAD
OLD MILL ROAD
OVERLOOK DRIVE
WILLARD STREET
EAGLE HILL ROAD
WYTEN DRIVE
JOHNSON STREET
LOCUST STREET
PLEASANT STREET
HAGAN TERRACE
JOHNSON TERRACE
2A
2
31
12
13
117
140
190

Legend

- Community Boundaries
- 1 Mile Buffer
- Airports

Roadways

- Interstate Routes
- US & State Routes
- Other Roads
- Heavily Traveled Routes Leading To Hospitals

RailLines

- Active RailLines

Water

- Streams & Rivers
- Intermittent Streams
- Lakes, Ponds & Reservoirs

Hospitals

- Hospital with ER
- Hospital

Public Safety Buildings

- Fire Stations
- Police Stations
- Public Safety Complexes

0 0.5 1 2 Miles

DATA SOURCES: MassGIS, MHD and the MRPC.

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/Safety_SecurityPlanningAssistanceMaps/HeavilyTraveledRoutes_ToHospitals_Leominster_11x17L.mxd [1:45,000] 10_07_08

Montachusett Regional Planning Commission:
Pavement Condition On Emergency Access Routes Map

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE
MASON, NH
BROOKLINE, NH
NASHUA, NH
WARWICK
ROYALSTON
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
GARDNER
FITCHBURG
LUNENBURG
GROTON
WESTFORD
SHIRLEY
AYER
LITTLETON
PHILLIPSTON
TEMPLETON
WESTMINSTER
LEOMINSTER
HARVARD
BOXBOROUGH
ACTON
HUBBARDSTON
PETERSHAM
NEW SALEM
PRINCETON
STERLING
LANCASTER
BOLTON
STOW
BARRE
CLINTON
HARDWICK
RUTLAND
BERLIN
WEST BOYLSTON
HOLDEN
BOYLSTON
OAKHAM
NORTHBOROUGH
WARE
NEW BRAINTREE
PAXTON

DATA SOURCES: MassGIS, MHD and the MRPC.

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Legend

- Community Boundaries

Roadways

- Interstate Routes
- US & State Routes

MassHighway Data '06-'07

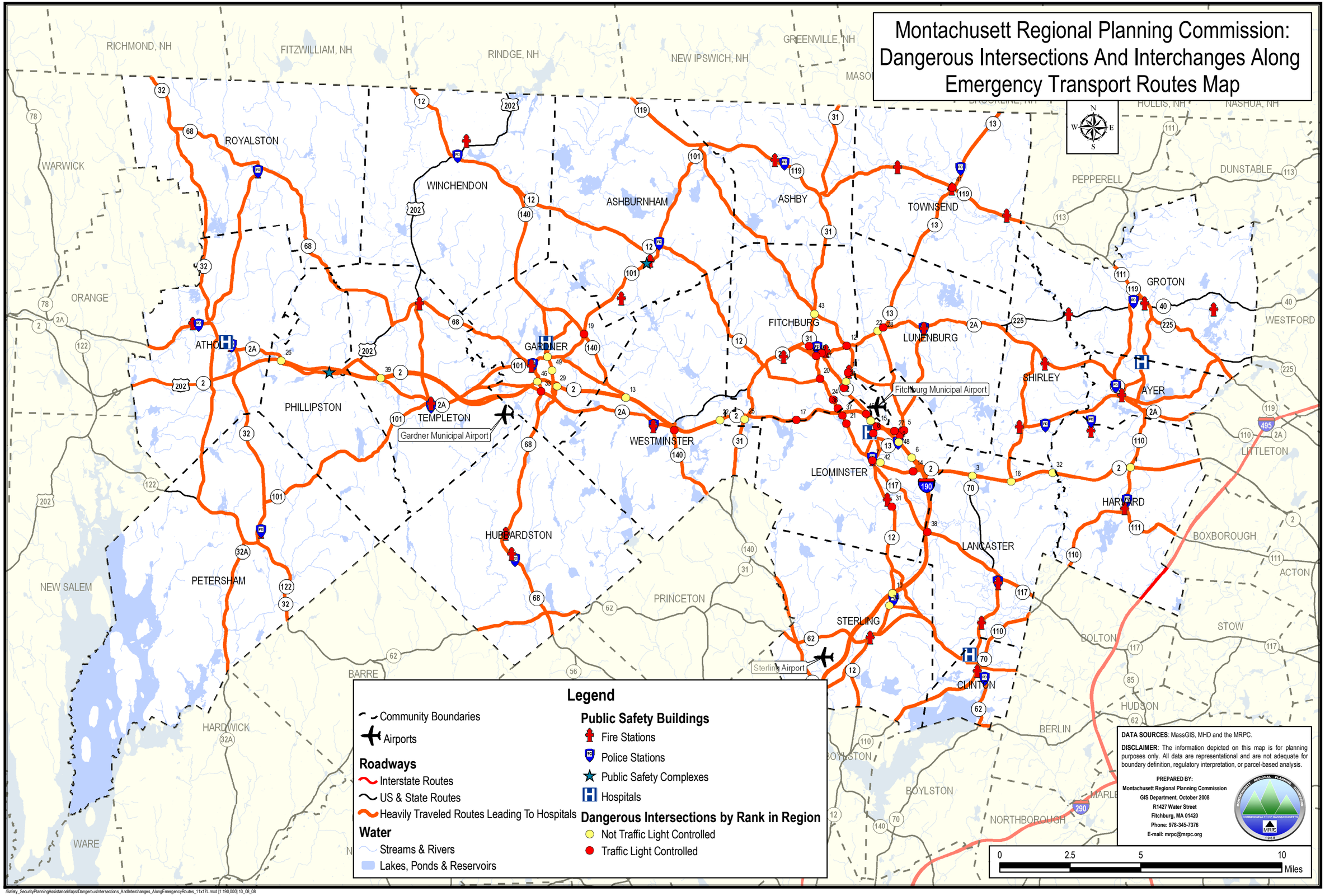
Pavement Serviceability Index (PSI)

0-2.3	Poor	Total Miles= 50.5
2.3-2.8	Fair	Total Miles= 98.1
2.8-3.5	Good	Total Miles= 136.7
3.5-4.5	Excellent	Total Miles= 86.5

0 2.5 5 10 Miles

/Safety_SecurityPlanningAssistanceMaps/PavementCondition_OnEmergencyAccessRoutes_Map_11x17L.mxd [1:190,000] 10_07_08

Montachusett Regional Planning Commission: Dangerous Intersections And Interchanges Along Emergency Transport Routes Map



Legend

- Community Boundaries
- Airports

Roadways
- Interstate Routes
- US & State Routes
- Heavily Traveled Routes Leading To Hospitals

Water
- Streams & Rivers
- Lakes, Ponds & Reservoirs

Public Safety Buildings
- Fire Stations
- Police Stations
- Public Safety Complexes
- Hospitals

Dangerous Intersections by Rank in Region
- Not Traffic Light Controlled
- Traffic Light Controlled

DATA SOURCES: MassGIS, MHD and the MRPC.

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/Safety_SecurityPlanningAssistanceMaps/DangerousIntersections_AndInterchanges_AlongEmergencyRoutes_11x17L.mxd [1:190,000] 10_08_08

Montachusett Regional Planning Commission: Functionally Obsolete And Structurally Deficient Bridges Along Emergency Transport Routes

RICHMOND, NH
FITZWILLIAM, NH
RINDGE, NH
NEW IPSWICH, NH
GREENVILLE, NH
MASON, NH
BROOKLINE, NH
HOLLIS, NH
NASHUA, NH
WARWICK
ROYALSTON
WINCHENDON
ASHBURNHAM
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
ORANGE
ATHOL
GARDNER
FITCHBURG
LUNENBURG
GROTON
WESTFORD
SHIRLEY
AYER
LITTLETON
PHILLIPSTON
TEMPLETON
Gardner Municipal Airport
WESTMINSTER
Fitchburg Municipal Airport
LEOMINSTER
HARVARD
BOXBOROUGH
ACTON
LANCASTER
HUBBARDSTON
NEW SALEM
PETERSHAM
PRINCETON
STERLING
Sterling Airport
CLINTON
BOLTON
STOW
HUDSON
BERLIN
BARRE
HARDWICK
WEST BOYLSTON
BOYLSTON
NORTHBOROUGH
MARLBOROUGH
WARE

Legend

- Community Boundaries
- Airports

Roadways
- Interstate Routes
- US & State Routes
- Heavily Traveled Routes Leading To Hospitals

Water
- Streams & Rivers
- Lakes, Ponds & Reservoirs

Public Safety Buildings
- Fire Stations
- Police Stations
- Public Safety Complexes
- Hospitals

EOT Bridges
- Functionally Obsolete
- Structurally Deficient
- Functionally Obsolete & Structurally Deficient

DATA SOURCES: MassGIS, MHD and the MRPC.

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0 2.5 5 10 Miles

/Safety_SecurityPlanningAssistanceMaps/Bridges_Along_EmergencyRoutesMap_11x17L.mxd [1:190,000] 10_09_08

WHAT IS IMPORTANT TO OUR EMERGENCY RESPONSE NETWORK

Taking a look at the conditions of the emergency response road network allow for a better understanding of the characteristics of the system and its ability to function. While it is important to take this information into account, a concern that is expressed directly from emergency responders in the region stands out as one of, if not the key issue when taking steps to improve emergency response. Among ever increasing technology improving transportation and more importantly safety are the preemption devices mentioned multiple times in the survey feedback.

With an ongoing effort to expedite emergency response and transports to hospitals, the ability of an intersection, especially a lighted intersection to function properly is pivotal. A properly functioning intersection decreases congestion throughout the vicinity and provides for easy and rapid access to destinations. For emergency responders well functioning intersections are important, however, being able to control a traffic signal queue and limit, or even avoid any hold ups may make the single largest impact on an emergency situation. The amount of delay experienced at lighted intersections on route to an emergency or a hospital can dramatically influence response and transport times and ultimately the effectiveness of the operation.

The preemption device hardware and inventory process will be a large part of the 2009 S&SPA program at MRPC. Provided in the following section is a detailed review of these devices, what they do, and why they are so important to emergency responders in the Montachusett region.

PREEMPTION DEVICE REVIEW

Preemption devices fall into the category of an ITS, or Intelligent Transportation System. An ITS utilizes advance technology to improve different aspects of the transportation network such as safety, mobility, efficiency and productivity. Preemption controls in traffic signals allow normal operation of traffic lights to be altered, and is used both for transit orientated vehicles and more commonly for emergency response vehicles.

Upon approaching the lighted intersection a vehicle with preemption privileges would trigger a response from a sensor that would adjust the normal phase of the signal and provide a green phase favoring the vehicles direction of travel. Typically the sensor is located next to or near the actual traffic signal and the vehicle with preemption privileges would have a unit attached which would emit visible flashes of light or invisible infrared pulses at a specified frequency to trigger the sensor. After the unit has been detected, the signal would turn green after going through the normal procedure of yellow to red in other directions as well as for pedestrians crossing on a crosswalk. Once the vehicle passes through the intersection normal operation would resume.

A common implementation of signal preemption systems is a method of communicating to the emergency vehicle operator as well as civilian drivers that a traffic signal is under control of a preemption device. Known as a notifier, this device is almost always an

additional light located near the traffic signals. The notifier light might flash or stay on to warn that the light is being preempted and there is an emergency or transit vehicle approaching.

Some systems can be implemented with varying frequencies assigned to specific types of uses, which would then allow an intersection's preemption equipment to differentiate between a fire engine and a bus sending a signal simultaneously, and then grant priority access first to the fire engine. In the case where two fire engines approach a signal, priority would be granted to the first engine detected.

Shown above is a preemption control device located at a newly installed light at the intersection of Rte. 12 and Nichols St. on the Fitchburg/Leominster city line. From left to right are the traffic signal; the notifier; and the preemption sensor.

Emergency Preemption

According to the American Heart Association, “a person under cardiac arrest’s survival chances are reduced 7-10% with every minute not attended to, after 8 minutes there is little chance of survival (American Heart Association)”, making a rapid emergency response time crucial. In a study done by the Federal Highway Administration (FHWA) in Fairfax County, Virginia on the effect of preemption controls it is proven that the use of preemption improves response times dramatically, “the system permits vehicles along

U.S. 1 to pass through high volume intersections more quickly with fewer conflicts, saving 30 to 45 seconds per intersection (Traffic Signal Preemption for Emergency Vehicles)."

As mentioned earlier in this report, response times for emergency responders and transport times for emergency transporters can be the single largest impact on the outcome of the situation. With the improved travel times due to use of preemption devices, people needing immediate medical attention from an EMS or being rush transported to hospitals have a higher chance of living, police and fire fighters can access and service the community as promptly as possible and the overall effective service radius of a single station would greatly increase in area.

Transit Preemption

Applying preemption controls for transit oriented applications can improve schedule adherence and reliability and reduce time for transit vehicles, leading to increased quality of service.

> Potential negative impacts consist primarily of delays to non-priority traffic, and these delays have proven to be minimal. Experiences from prior deployments generally indicate bus travel time savings on the order of 15% (depending on the exiting signal delay) with very minor impacts on the overall intersection operations. (Transit Signal Priority; U.S. Department of Transportation)

As previously stated, although sharing the same preemption device system with emergency responders, a transit vehicle would not affect emergency response in systems that use the technology for both entities. Among known use of preemption devices related to transit are systems for light rail, bus transit, and at railroad grade crossings. However, most transit orientated preemption activities occur and are most effective in larger metropolitan areas.

Preemption Use in Massachusetts

The U.S. Department of Transportation (USDOT) ITS Deployment Statistics website tracks ITS deployment in the countries largest metropolitan areas. According to a 2006 DOT poll in which 106 metropolitan areas throughout the U.S. were surveyed, 98 were using preemption devices. The poll states that out of 151,198 lighted intersections in these metro areas, 31,559 (21%) had preemption controls of which 2,891 of the 151,198 (2%) included transit signal preemption.

In Massachusetts the Boston metropolitan area had reported 96 of 2,428 (4%) lighted intersections with emergency vehicle preemption of which only 22 (1%) included transit signal preemption. Springfield, the only other region of Massachusetts represented in the survey, reported 19 of 45 (42%) lighted intersections with emergency vehicle preemption and did not report any which included transit signal preemption. (U.S. DOT)

Preemption Devices and the Montachusett Region

Although preemption devices are in use in the Montachusett region, the amount and location of these are currently undocumented. The 2009 S&SPA program will work to collect an inventory and create a database for preemption use throughout the region. As a critical piece to the quality and effectiveness of the emergency response road network of the region, this data should prove important when considering improvements in the transportation system.

CONCLUSION

The two main goals mentioned earlier in this report of recognizing routes heavily traveled by emergency responders and to assess conditions along these routes which link responders to emergencies and municipalities to the hospitals that typically serve them were met. Information attained for this report will be maintained, updated and involved in next years S&SPA report on emergency transportation infrastructure in the region.

The Regional Emergency Response Road Network Report along with future similar reports will prove useful reference when evaluating and re-evaluating the needs and characteristics of the transportation network throughout the region. The importance and value of reports such as this one to citizens of the region and users of the regions network of roads is great as these efforts ensure the inclusion of safety and security factors when considering transportation improvements.

American Heart Association Website (2008). http://www.americanheart.org

Massachusetts Highway Project Development and Design Handbook. (January 2006): Massachusetts Highway Department; Executive Office of Transportation

Traffic Signal Preemption for Emergency Vehicles: A Cross-Cutting Study. January 2006: Federal Highway Administration, et al.

Transit Signal Priority (TSP): A Planning and Implementation Handbook. May 2005: Smith, Hemily, Ivanovic for Intelligent Transportation Society of America

U.S. Department of Transportation ITS Deployment Statistics Website (2008). http://www.itsdeployment.its.dot.gov

APPENDIX A

The following tables display common emergency routes which are displayed in the maps of this report. TABLE A lists heavily traveled routes leading to hospitals, TABLE B lists heavily traveled emergency routes from the emergency responder surveys and TABLE C lists emergency access routes.

TABLE A

CITY/TOWN	ROUTE/ROAD
Multiple	**Rte. 2**
Multiple	**Rte. I190**
Multiple	**Rte. 2A** From Orange TL to Exit 25 on Rte. 2 in Westminster From Rte. 31 in Fitchburg to Littleton TL
Multiple	**Rte. 12**
Multiple	**Rte. 13**
Multiple	**Rte. 31**
Multiple	**Rte. 32**
Multiple	**Rte. 32A**
Multiple	**Rte. 62** From Princeton TL to Berlin TL
Multiple	**Rte. 68** From Royalston Center to Rutland TL
Multiple	**Rte. 70** From Rte. 117 in Lancaster to Boylston TL
Multiple	**Rte. 101**
Multiple	**Rte. 110**
Multiple	**Rte. 111**
Multiple	**Rte. 117**
Multiple	**Rte. 119** From Ashburnham Center to Littleton TL
Multiple	**Rte. 122** From Petersham Center to New Athol Rd.
Multiple	**Rte. 140**
Ashburnham	Rindge Turnpike
Ashby	Rindge Rd.
Athol	New Sherborn Rd.
Athol	Pleasant St.
Athol	Chestnut Hill Ave.
Ayer	Washington St.
Ayer	Groton Rd.
Ayer	Central Ave
Ayer	Sand Pond Rd. from Central Ave to Westford Rd.
Ayer	Westford Rd.
Ayer	West Main St.
Ayer	Groton St.
Clinton	Water St.
Clinton	Bolton Rd.
Clinton	Highland St.
Clinton	Greeley St. from Rte. 62 to Highland St.
Fitchburg	Rindge Rd. from Ashby TL to Rte. 31
Fitchburg	John Fitch HWY
Fitchburg	Bemis Rd.
Fitchburg	South St.
Fitchburg	Depot St.
Fitchburg	Franklin Rd. from Depot St. to Electric Ave.
Fitchburg	Electric Ave.
Fitchburg	Boulder Dr.
Fitchburg	Main St. from Rte. 31 to Rte. 2A
Gardner	Green St.
Gardner	Woodland Ave.
Gardner	Matthews St.

CITY/TOWN	ROUTE/ROAD
Gardner	Elm St.
Gardner	Pearson Blvd.
Gardner	South Main St.
Gardner	Union St.
Gardner	Betty Spring Rd.
Groton	Old Ayer Rd.
Lancaster	Shirley Rd. from Shirley TL to Rte. 2
Leominster	Priest St.
Leominster	Hamilton St.
Leominster	North St. from Fitchburg TL to Rte. 13
Leominster	Day St.
Leominster	Prospect St.
Leominster	Mechanic St. from Main St. to Leominster Connector
Leominster	Washington St. from Merriam Ave. to Rte. 12
Leominster	Merriam Ave
Leominster	Leominster Connector
Lunenburg	Leominster Rd.
Petersham	New Athol Rd.
Royalston	Athol Rd.
Shirley	Main St.
Shirley	Front St.
Shirley	Lancaster Rd.
Shirley	Center Rd.
Sterling	Dana Hill Rd.
Sterling	Muddy Pond Rd.
Sterling	Greenland Rd. from Rte. 12 to Muddy Pond Rd.
Sterling	Pratts Junction Rd.
Sterling	Chocksett Rd.
Templeton	Baldwinville Rd.

TABLE B

CITY/TOWN	ROUTE/ROAD
MULTIPLE	**Rte. 2** From Rte. 31 in Fitchburg going east
MULTIPLE	**Rte. 190**
MULTIPLE	**Rte. 2A** Through Athol from Phillipston TL to Orange TL From Rte. 31 in Fitchburg to Rte. 12 From Rte. 13 in Lunenburg to Washington St. in Ayer
MULTIPLE	**Rte. 12** From Winchendon Center to Rte. 117 in Leominster From Sterling Center to I190 exit 6
MULTIPLE	**Rte. 13** From Townsend Center to Rte. 12 in Leominster
MULTIPLE	**Rte. 31** From Ashby Center to John Fitch HWY. From Rte. 2A in Fitchburg to Rte. 2
MULTIPLE	**Rte. 32** From Petersham Center to Rte. 2A in Athol
MULTIPLE	**Rte. 62** From Sterling Center to Clinton
MULTIPLE	**Rte. 101** From Rte. 119 in Ashburnham to Green St. in Gardner
MULTIPLE	**Rte. 119** From Rte. 101 in Ashburnham to Old Ayer Rd. in Groton
MULTIPLE	**Rte. 122** From Petersham Center to New Athol Rd.
MULTIPLE	**Rte. 140** From Winchendon Center to Rte. 2
Ashburnham	Rindge Turnpike
Ashby	Rindge Rd.

CITY/TOWN	ROUTE/ROAD
Athol	New Sherborn Rd.
Athol	Pleasant St.
Ayer	Washington St.
Ayer	Groton Rd.
Fitchburg	Rindge Rd. from Ashby TL to Rte. 31
Fitchburg	John Fitch HWY
Fitchburg	Bemis Rd.
Fitchburg	South St.
Gardner	Green St.
Gardner	Woodland Ave.
Gardner	Matthews St.
Groton	Old Ayer Rd.
Lancaster	Shirley Rd. from Shirley TL to Rte. 2
Leominster	Priest St.
Leominster	Hamilton St.
Petersham	New Athol Rd.
Shirley	Main St.
Shirley	Front St.
Shirley	Lancaster Rd.

TABLE C

CITY/TOWN	ROUTE/ROAD
Multiple	Rte. 2 East & West
Multiple	Rte. 2A
Multiple	Rte. 12
Multiple	Rte. 13
Multiple	Rte. 31
Multiple	Rte. 32
Multiple	Rte. 32A
Multiple	Rte. 62
Multiple	Rte. 68
Multiple	Rte. 70
Multiple	Rte. 101
Multiple	Rte. 110
Multiple	Rte. 111
Multiple	Rte. 117
Multiple	Rte. 119
Multiple	Rte. 122
Multiple	Rte. 140
Multiple	Rte. 190 North & South
Multiple	Rte. 495 North & South
Ashburnham	South Main St.
Ashburnham	Westminster St.
Athol	Daniel Shays HWY
Athol	Partridgeville Rd. (from Orange TL to Eagleville Rd.)
Athol	Eagleville Rd.
Athol	South Athol Rd.
Athol	Carbon St.
Athol	Exchange St.
Athol	Hapgood St.
Athol	Chestnut St. (from Main St. to Hapgood St.)
Athol	Riverbend St.
Athol	School St.
Athol	Traverse St.
Athol	Pleasant St.
Athol	Bridge St.
Athol	Chestnut Hill Ave.
Athol	North Orange Rd.
Athol	Pinedale Ave.
Athol	Pequoig Ave.
Athol	Wellington St. (from Crescent St. to Pequoig Ave)
Athol	Lenox St. (from Pinedale Ave. to Silver Lake St.

CITY/TOWN	ROUTE/ROAD
Groton	Townsend Rd.
Groton	Pepperell Rd.
Groton	Broadmeadow Rd.
Groton	Old Ayer Rd.
Groton	School St.
Groton	Hollis St.
Groton	Chicopee Row Rd.
Groton	Longley Rd.
Groton	Nashua Rd.
Groton	Sandy Pond Rd.
Harvard	Stow Rd. (from Eldridge Rd. to Codman hill Rd.)
Hubbardston	Barre Rd.
Hubbardston	Elm St.
Hubbardston	Brigham St.
Hubbardston	New Westminster Rd.
Hubbardston	Williamsville Rd. (from Barre TL to Burnshirt Rd.)
Hubbardston	Burnshirt Rd.
Lancaster	Bolton Rd.
Lancaster	Center Bridge Rd.
Lancaster	Old Common Rd.
Lancaster	Mill St.
Lancaster	Chace Hill Rd.
Lancaster	Deershorn Rd.
Lancaster	Sterling Rd. (from Deershorn Rd. to Main St.)
Lancaster	South Meadow Rd. (from Clinton TL to Sterling St.)
Lancaster	Parker Rd.
Lancaster	Shirley Rd. (from Shirley TL to Fort Pond Rd.)
Lancaster	Fort Pond Rd.
Lancaster	George Hill Rd. (from Main St. to Bolton Rd.)
Leominster	North St.
Leominster	Lincoln St.
Leominster	Eastern Ave
Leominster	Industrial Rd. (from Eastern Ave to Tolman Ave.)
Leominster	Tolman Ave. (from Main St. [Rte. 13] to Industrial Rd.)
Leominster	Day St.
Leominster	Joslin St.
Leominster	Pierce St. (from Joslin St. to Vista Ave./Haskell Ave.)
Leominster	Vista Ave
Leominster	Haskell Ave.
Leominster	Prospect St.

CITY/TOWN	ROUTE/ROAD
	[Rte. 32])
Athol	Mt. Pleasant St. (from Main St. [Rte. 2A] to North Orange Rd.)
Ayer	Groton Shirley Rd.
Ayer	Washington St.
Ayer	West Main St.
Ayer	Central Ave.
Ayer	Sandy Pond Rd.
Ayer	Westford Rd.
Ayer	Willow Rd. (from Commuter Rail tracks to Westford Rd.)
Ayer	Groton Harvard Rd.
Ayer	Old Groton Rd.
Ayer	Columbia St. (from Main St. to Central Ave.)
Clinton	Greeley St.
Clinton	Woodlawn St. (from Rigby St. to Pine St.)
Clinton	Pine St. (from Woodlawn St. to New Harbor Rd.)
Clinton	New Harbor Rd.
Clinton	Franklin St.
Clinton	Beacon St.
Clinton	South Meadow Rd.
Clinton	Brook St.
Clinton	Grove St. (from Beacon St. to Chestnut St.)
Clinton	High St.
Clinton	Walnut St. (from Union St. to Water St.)
Clinton	Church St. (from Main St. to Chestnut St.)
Clinton	Cameron St.
Clinton	Oak St. (from Boylston St. to Berlin St.)
Clinton	Berlin St.
Clinton	Water St.
Clinton	Bolton Rd.
Clinton	Branch St.
Clinton	Vale St. (from Branch St. to Water St.)
Clinton	Allen St.
Clinton	Plain St. (from Main St. to High St.)
Clinton	Highland St. (from Sterling St. to Greeley St.)
Clinton	Green St.
Clinton	Rigby St. (from Greeley St. to Woodlawn St.)
Fitchburg	Pearl St.
Fitchburg	Coolidge Ave.
Fitchburg	Klondike Ave.
Fitchburg	Boutelle St.
Fitchburg	North St.
Fitchburg	Blossom St.
Fitchburg	Academy St. (from Main St. to High St.)
Fitchburg	High St. (from Academy St. to Mechanic St.)
Fitchburg	Boulder Dr. (from Main St./Snow St. intersection to Cushing St.)
Fitchburg	Summer St.
Fitchburg	Harvard St.
Fitchburg	Bemis Rd.
Fitchburg	Wanoosnoc Rd. (from Bemis Rd. to South St.)
Fitchburg	Intervale Rd.
Fitchburg	Airport Rd.
Fitchburg	Crawford St.
Fitchburg	Benson St.
Fitchburg	Abbott Ave.
Fitchburg	Whalon St.
Fitchburg	South St. (from Whalon St. to Laurel St.)
Fitchburg	Birch St. (from Water St. to Heywood St.)
Fitchburg	Canton St.
Fitchburg	Heywood St. (from Old South St. to Birch St.)
Fitchburg	Old South St. (from Heywood St. to Electric Ave./South St. intersection)
Fitchburg	Electric Ave.
Fitchburg	Franklin Rd. (from Depot St. to Rollstone St.)
Fitchburg	Depot St.
Fitchburg	Oak Hill Rd.
Fitchburg	Mt. Elam Rd.

CITY/TOWN	ROUTE/ROAD
Leominster	Harvard St.
Leominster	Nashua St.
Leominster	Crawford St.
Leominster	Beacon St.
Leominster	Fairmont St.
Leominster	Mill St.
Leominster	Priest St.
Leominster	Lindell Ave. (from Rte. 12 [N. Main St.] to Maple St.)
Leominster	Grove Ave.
Leominster	Washington St.
Leominster	Walnut St.
Leominster	Abbot Ave.
Leominster	Blossom St.
Leominster	Merriam Ave.
Leominster	Granite St. (from West St. to Kingman Dr.)
Leominster	Kingman Dr.
Leominster	Exchange St. (from Kingman Dr. to West St.)
Leominster	Orchard St. (from Merriam Ave to West St.)
Leominster	Pond St.
Leominster	Pleasant St.
Leominster	Franklin St.
Leominster	Union St.
Leominster	Litchfield St.
Leominster	Willard St. (from Central St. to Lancaster St.)
Leominster	Watchusett St.
Leominster	Elm St. (from Wachusett St. to Sterling TL)
Leominster	Viscoloid Ave.
Leominster	Sixth St. (from Lancaster St. to Mechanic St.)
Leominster	Mechanic St.
Leominster	Leominster Connector
Leominster	Whitney St.
Leominster	Water St. (from Main St. to Whitney St.)
Leominster	West St. (from Main St. to Maple Ave.)
Leominster	Maple Ave.
Lunenburg	Townsend Harbor Rd.
Lunenburg	Leominster Rd.
Lunenburg	Lancaster Ave.
Lunenburg	Leominster-Shirley Rd.
Lunenburg	Fort Pond Rd.
Lunenburg	Prospect St.
Lunenburg	Whalom Rd.
Lunenburg	Summer St.
Lunenburg	Lakefront Ave.
Lunenburg	Pratt St.
Lunenburg	West St. (from Pratt St. to Pleasant St.)
Lunenburg	Pleasant St.
Lunenburg	White St.
Lunenburg	West Townsend Rd.
Lunenburg	New West Townsend Rd.
Lunenburg	Northfield Rd. (from Chase Rd. to Highland St.)
Lunenburg	Highland St.
Lunenburg	Main St.
Lunenburg	Fish St.
Phillipston	Petersham Rd.
Royalston	Winchendon Rd.
Royalston	Athol Rd.
Shirley	Townsend Rd.
Shirley	Lawton Rd.
Shirley	Parker Rd.
Shirley	Center Rd.
Shirley	Leominster Rd.
Shirley	Main St.
Shirley	Front St.
Shirley	Lancaster Rd.

CITY/TOWN	ROUTE/ROAD
Fitchburg	Rollstone St.
Fitchburg	Pine St.
Fitchburg	Pratt Rd.
Fitchburg	St. Joseph Ave.
Fitchburg	Fairmount St.
Fitchburg	Fairmount Pl.
Fitchburg	Beech St.
Fitchburg	River St. (from Oak Hill Rd. to Daniels St.)
Fitchburg	Daniels St. (from Clarendon St. to Kimball St.)
Fitchburg	Reingold Ave.
Fitchburg	Laurel St.
Fitchburg	Putnam St.
Fitchburg	Fifth Mass. TPK (from Oak Hill Rd. to Princeton Rd.)
Fitchburg	Ashburnham St.
Fitchburg	Ashburnham Hill Rd.
Fitchburg	Wallace St.
Fitchburg	Main St. (from Ashburnham Hill Rd. to River St.)
Fitchburg	Richardson Rd. (from Fisher Rd. to Ashby State Rd. [Rte. 31])
Gardner	Matthews St.
Gardner	Betty Springs Rd.
Gardner	Green St. (from Rte. 140 to Elm St.)
Gardner	Elm St.
Gardner	Woodland Ave.
Gardner	Chestnut St.
Gardner	Cross St.
Gardner	Cross St. EXT.
Gardner	Lawrence St. (from Pearl St. to Cross St. EXT.)
Gardner	Pine St.
Gardner	Logan St.
Gardner	Sherman St.
Gardner	Main St. (from Pearson BLVD. to Rte. 68)
Gardner	Pearson BLVD.
Gardner	VFW Circle
Gardner	South Main St.
Gardner	Union St.
Gardner	Minott St.
Gardner	Emerald St.
Gardner	Pleasant St.
Gardner	Baker St. (from Pleasant St. to Waterford St.)
Gardner	Waterford St. (from Rte. 101 to Baker St.)
Gardner	City Hall Ave.
Gardner	Greenwood St. (from Pleasant St. to Baker St.)
Gardner	Elm St.
Gardner	Park St.
Gardner	Eaton St.
Gardner	Oak St.
Gardner	Racette Ave.
Gardner	Sand St.
Gardner	Coleman St.
Gardner	Clark St. (from Park St. to Racette Ave.)
Gardner	Nichols St. (from Parker St. [Rte. 101] to Baker St.)
Gardner	Temple St.
Gardner	Union Sq.
Gardner	Willow St.

CITY/TOWN	ROUTE/ROAD
Shirley	Walker Rd.
Sterling	Greenland Rd.
Sterling	Dana Hill Rd.
Sterling	Muddy Pond Rd.
Sterling	Boutelle Rd.
Sterling	Campground Rd.
Sterling	Gates Rd.
Sterling	Squareshire Rd. (from Campground Rd. to Chace Hill Rd.)
Sterling	Chace Hill Rd. (from Rte 110 to Swett Hill Rd.)
Sterling	Swett Hill Rd.
Sterling	Kendall Hill Rd. (from Maple St. to Swett Hill Rd.)
Sterling	Maple St. (from Main St. to Kendall Hill Rd.)
Sterling	Redstone Hill Rd. (from Clinton Rd. to Rugg Rd.)
Sterling	Meetinghouse Hill Rd. (from Main St. to Rowley Hill Rd.)
Sterling	Rowley Hill Rd. (from Meetinghouse Hill Rd. to Rte. 190 overpass)
Sterling	Pratts Junction Rd.
Sterling	Chocksett Rd.
Templeton	North Main St. (from Rte 101/2A intersection to Depot Rd.)
Templeton	Depot Rd.
Templeton	Baldwinville Rd.
Templeton	Hubbardston Rd.
Templeton	South Main St. (from Rte. 101/2A intersection to Cross St.)
Templeton	Cross Rd.
Templeton	Barre Rd.
Templeton	Bridge St.
Templeton	Main St.
Townsend	Lunenburg Rd.
Townsend	West Elm St.
Townsend	Canal St.
Townsend	Mason Rd.
Townsend	New Fitchburg Rd. (from Rte. 119 to Vinton Pond Rd./Bayberry Hill Rd. intersection)
Townsend	Warren Rd.
Townsend	South St.
Townsend	Shirley Rd.
Westminster	South Ashburnham Rd.
Westminster	Bacon St.
Westminster	North Common Rd. (from Bacon St. to Oakmont Ave.)
Westminster	Oakmont Ave.
Westminster	Minott Rd. (from Gardner CL to intersection of Whitney St./Ellis Rd.)
Westminster	South St.
Westminster	Mile Hill Rd.
Westminster	Gatehouse Rd.
Westminster	East Rd.
Westminster	Stonehill Rd.
Westminster	Narrows Rd.
Westminster	Depot Rd.
Winchendon	Glenallan St. (from Spring St. to Rte. 202 to the New Hampshire SL)
Winchendon	Elmwood Rd. (from Central St. to Glenallan St.)
Winchendon	Central St. (from Maple St. to Elmwood Rd.)
Winchendon	Hall Rd.
Winchendon	High St. (from Central St. to Teel Rd.)
Winchendon	Teel Rd. (from High St. to Hall Rd.)
Winchendon	River St.

APPENDIX B

TABLE D corresponds with the map "Dangerous Intersections and Interchanges Along Emergency Transport Routes" and lists intersections and interchanges listed in the 50 most dangerous in the region from a recent MRPC study that are located along emergency transport routes. Of the 50 most dangerous intersections and interchanges in the region, 49 were located along emergency transport routes. Those listed in **BOLD** signify there was at least one fatality at that location; listed in RED signify that the intersection or interchange is controlled by a traffic light.

TABLE E corresponds with the map "Functionally Obsolete and Structurally Deficient Bridges Along Emergency Transport Routes" and lists the bridges that appear on the map. The information source for the bridges was derived from MassHighway's bridge inventory listing.

TABLE D

City/Town	*Community Rank*	*Region Rank*	*Intersections and Interchanges*	*EPDO Total*	*Total Crashes*	*Comments*
Leominster	**1**	**1**	**Rte. 2 (Exit 31)/N Main St. (Rte. 12)**	**384**	**192**	**Needs study**
Leominster	**2**	**2**	**Rte. 2 (Exit 32)/Main St. (Rte. 13)**	**240**	**120**	**Study completed, further study needed**
Lancaster	**1**	**3**	**Rte. 2 (Exit 35)/Lunenburg Rd. (Rte. 70)/Old Union Tnpk./Fort Pond Rd.**	**234**	**106**	**Study completed, further study needed**
Harvard	**1**	**4**	**Rte. 2 (Exit 38)/Ayer Rd. (Rte. 110;Rte. 111)**	**231**	**111**	**Needs study**
Leominster	3	5	Main St (Rt 13)/Nashua St/Hamilton St	208	108	Needs study
Leominster	4	6	Rte 2/Rte 190	206	74	Needs study
Leominster	5	7	Monument Square (Main St/Mechanic St)	198	98	Needs study
Leominster	6	8	N Main St. (Rte 12)/Nelson St./Water Tower Pl./Fruit St.	188	96	Study completed, improvements recommended
Westminster	**1**	**9**	**Rte. 2/140 (Exit 25)/State Rd. East (Rte 2A)/Hagar Park Rd.**	**180**	**70**	**Needs study**
Sterling	**1**	**10**	**Rte. 190 (Exit 6)/Leominster Rd. (Rte. 12)**	**167**	**70**	**Needs study**
Fitchburg	1	11	Bemis Rd./John Fitch HWY./Summer St.	166	82	Improvements completed, needs follow up
Fitchburg	2	12	John Fitch HWY/Lunenburg St. (Rte.2A)	165	81	Safety audit completed
Westminster	**2**	**13**	**Rte. 2 (Exit 24)/W Main St. (Rte. 140)**	**163**	**82**	**Improvements completed, needs follow up**
Leominster	7	14	Leominster Connector/Nashua St.	161	73	Improvements completed, needs follow up
Leominster	8	15	N Main St (Rte 12)/Lindell Ave./Hamilton St	155	75	Study completed, improvements recommended
Lancaster	**2**	**16**	**Rte. 2 (Exit 36)/Shirley Rd/Fort Pond Rd./Old Union Tnpk**	**133**	**61**	**Needs study**
Fitchburg	3	17	Rte. 2/Mount Elam Rd.	119	51	Study completed, improvements recommended
Fitchburg	4	18	Water St. (Rte. 12)/Wanoosnoc Rd./Bemis Rd.	113	57	Construction
Gardner	1	19	Pearl St. (Rte. 101)/Rte. 140	110	42	Improvements completed, needs follow up

City/Town	Community Rank	Region Rank	Intersections and Interchanges	EPDO Total	Total Crashes	Comments
Fitchburg	5	20	South St./Electric Ave./ Old South St.	105	41	Needs study
Leominster	9	21	Merriam Ave./Lindell Ave.	97	45	Study completed, improvements recommended
Lunenburg	1	22	Massachusetts Ave. (Rte. 2A;Rte. 13)/Electric Ave. (Rte. 13)	96	40	Needs study
Westminster	**3**	**22**	**Rte. 2 (Exit 27)/Depot Rd./Narrows Rd.** (Exit also in Fitchburg)	**96**	**40**	**Needs study**
Fitchburg	6	24	South St./Wanoosnoc Rd./Whalon St.	96	52	Needs study
Fitchburg	**7**	**25**	**Rte. 2 (Exit 28)/Princeton Rd. (Rte. 31)**	**93**	**53**	**Needs study**
Phillipston	**1**	**26**	**Rte. 2 (Exit 19)/Rte. 2A/Rte. 202** (Exit also in Templeton)	**91**	**31**	**Needs study**
Leominster	10	27	Hamilton St./Crawford St./River St.	90	43	Improvements completed, needs follow up
Lunenburg	2	28	Massachusetts Ave. (Rte. 2A;Rte. 13)/Chase Rd. (Rte. 13)	89	33	Needs study
Gardner	**2**	**29**	**Rte. 2 (Exit 22)/Pearson BLVD.**	**89**	**49**	**Improvements completed, needs follow up**
Gardner	3	30	Elm St./Central St.(Rte.101)/Pearl St.(Rte.101)/Green St.	88	40	Needs study
Leominster	11	31	Central St. (Rte 12)/Litchfield St.	87	39	Needs study
Lancaster	**3**	**32**	**Rte. 2 (Exit 37)/Jackson Rd.**	**87**	**43**	**Improvements completed, needs follow up**
Gardner	4	33	West Broadway (Rte.2A)/Timpany BLVD. (Rte.68)	84	40	Needs study
Fitchburg	8	34	Bemis Rd./Airport Rd. *	82	30	Needs study
Sterling	2	34	Leominster Rd. (Rte. 12)/Chocksett Rd.	82	30	Design
Leominster	**12**	**36**	**Rte. 2 (Exit 30)/Merriam Ave./Whalon St.** (exit also in Fitchburg)	**80**	**36**	**Needs study**
Fitchburg	**9**	**37**	**Rte.2 (Exit 30)/Whalon St./Merriam Ave.** (Exit also in Leominster)	**80**	**40**	**Study completed, further study needed**
Lancaster	**4**	**38**	**Rte. 190 (Exit 7)/N Main St (Rte. 117)**	**79**	**30**	**Improvements completed, needs follow up**
Templeton	**1**	**39**	**Rte. 2 (Exit 21)/Patriots Rd. (Rte. 2A)**	**79**	**31**	**Needs study**
Fitchburg	10	40	Kimble St. (Rte.12)/Laurel St./Cross St./Putnam St.	78	38	Needs study
Townsend	1	41	Main St. (Rte. 119)/Elm St. (Rte. 13)	78	46	Needs study
Leominster	13	42	Mechanic St./ Water St. (Depot Sq.)	77	37	Needs study
Fitchburg	11	43	Mechanic St. (Rte.31)/John Fitch Hwy/ Rindge Rd./Ashby State. Rd.	76	36	Design
Fitchburg	12	44	Main St. (Rte. 2A)/Rollstone St./Academy St.	75	32	Needs study
Leominster	14	45	N Main St (Rte 12)/Erdman Way	74	38	Improvements in progress
Gardner	**5**	**46**	**Rte. 2 (Exit 23)/Timpany BLVD.**	**73**	**28**	**Improvements completed, needs follow up**
Fitchburg	13	47	Water St. (Rte. 12)/Main St. (Rte. 2A)/Day St.	70	34	Needs study
Leominster	15	48	Main St (Rte 13)/River St	70	42	Improvements completed, needs follow up
Gardner	6	49	Elm St./Temple St.	69	28	Needs study
Sterling	**3**	**50**	**Rte. 190 (Exit 5)/Redemption Rock Tr (Rte. 140)** (also in Holdon)	**69**	**29**	**Needs study**

* Bemis Rd./Airport Rd intersection in Fitchburg is not shown on the map and is not located on an emergency transport route, but is located on an emergency access route.

TABLE E

PrimaryRou	STREETNAME	TOWN	OVER	UNDER	Year Built	Year Reconstructed	FO = Functionally Obsolete; SD = Structurally Defecient
	RINDGE ROAD	ASHBY	HWY RINDGE RD	WATER FALULAH BROOK	1997	n/a	FO
SR31 NB	GREENVILLE ROAD	ASHBY	ST 31 GREENVLLE RD	WATER TRAPFALL BROOK	1981	n/a	FO
SR32 NB	CHESTNUT HILL AVENUE	ATHOL	ST 32 CHSTNT HILL	RR BMRR	1995	n/a	FO
US202 NB	MOHAWK TRAIL	ATHOL	ST 2	HWY WHITE POND RD	1954	n/a	SD
US202 NB	MOHAWK TRAIL	ATHOL	ST 2	HWY S ATHOL RD	1954	n/a	SD
US202 NB	MOHAWK TRAIL	ATHOL	ST 2	WATER LAKE ROHUNTA	1955	n/a	SD
SR2A EB	MAIN STREET	ATHOL	ST 2 A/MAIN ST	RR BMRR	1938	n/a	SD
SR32 NB	CHESTNUT HILL AVENUE	ATHOL	ST 32 CHESNT HL AV	WATER MILLERS RIVER	1850	1921	SD
SR2A EB	SOUTH MAIN STREET	ATHOL	ST 2 A/S MAIN ST	WATER WEST BROOK	1930	n/a	SD
SR2A EB	MAIN STREET	ATHOL	ST 2 A/S MAIN ST	WATER MILLERS RIVER	1922	n/a	SD
SR2A EB	MAIN STREET	AYER	ST 2 A/E MAIN ST	RR MBTA/BMRR	1949	n/a	FO
	WATER STREET	CLINTON	HWY WATER ST	WATER NASHUA RIVER	1919	n/a	SD
SR62 EB	CHESTNUT STREET	CLINTON	ST 62 /ST70/CHESNT	WATER NASHUA RIVER	1936	1965	SD
SR31 NB	ASHBY STATE ROAD	FITCHBURG	ST 31 ASHBY RD	WATER FALLULAH BROOK	1904	1934	FO
SR31 NB	PRINCETON ROAD	FITCHBURG	ST 31 PRINCETON RD	WATER WHITMANS RIVER	1929	n/a	FO
SR31 NB	RIVER STREET	FITCHBURG	ST 31 RIVER ST	WATER N NASHUA RIVER	1900	1952	SD
SR31 NB	RIVER STREET	FITCHBURG	ST 31 RIVER ST	WATER N NASHUA RIVER	1947	n/a	SD
SR2A EB	KIMBALL STREET	FITCHBURG	ST 2 A/ST12/KIMBL	WATER N NASHUA RIVER	1930	n/a	SD
	UNION STREET	GARDNER	HWY UNION ST	RR PWRR	1908	1986	FO
SR2 EB	ROUTE 2	GARDNER	ST 2 EB	HWY AIRPORT RD	1969	n/a	FO
SR2 WB	ROUTE 2	GARDNER	ST 2 WB	ST 2 A/W BROADWAY	1969	n/a	SD
SR2 WB	CONCORD TURNPIKE	HARVARD	ST 2	HWY CAMP RD	1951	n/a	FO
SR2 WB	CONCORD TURNPIKE	HARVARD	ST 2	HWY DEPOT ST	1951	n/a	FO
SR62 EB	OLD BOSTON TURNPIKE	HUBBARDSTON	ST 62 OLD BSTN TPK	WATER W BR WARE RIVER	1950	n/a	SD
SR117 EB	SEVEN BRIDGE ROAD	LANCASTER	ST117 SEVEN BRG RD	WATER NASHUA RIVER	1927	n/a	FO
I190 SB	INTERSTATE 190	LANCASTER	I 190	WATER WEKEPEKE BROOK	1978	n/a	FO
SR13 NB	MAIN STREET	LEOMINSTER	ST 13 MAIN ST	ST 2	1949	n/a	FO
	HAMILTON STREET	LEOMINSTER	HWY HAMILTON ST	ST 2	1949	n/a	FO
	HAMILTON STREET	LEOMINSTER	HWY HAMILTON ST	WATER N NASHUA RIVER	1955	n/a	FO
SR12	NORTH MAIN STREET	LEOMINSTER	ST 12 N MAIN ST	ST 2	1949	n/a	SD

PrimaryRou	STREETNAME	TOWN	OVER	UNDER	Year Built	Year Reconstructed	FO = Functionally Obsolete; SD = Structurally Defecient
NB							
SR32 NB	BARRE ROAD	PETERSHAM	ST 32 /ST122/BARRE	WATER E BR SWIFT RIVER	1937	1940	SD
US202 SB	MOHAWK TRAIL	PHILLIPSTON	ST 2 WB	US202 /ST2 A	1969	n/a	SD
US202 NB	MOHAWK TRAIL	PHILLIPSTON	US202 /ST2	ST 2 A/STATE RD	1959	n/a	SD
I190 SB	INTERSTATE 190	STERLING	I 190	HWY AGRICLTRL UNDRPS	1979	n/a	FO
I190 SB	INTERSTATE 190	STERLING	I 190 SB	ST140 REDEMPTION ROCK TR	1979	n/a	FO
I190 SB	INTERSTATE 190	STERLING	I 190 SB	HWY ROWLEY HILL RD	1980	n/a	FO
I190 SB	INTERSTATE 190	STERLING	I 190 SB & RAMP C	RR CSX	1978	n/a	FO
I190 NB	INTERSTATE 190	STERLING	I 190 NB	ST140 REDEMPTION ROCK TR	1979	n/a	FO
I190 SB	INTERSTATE 190	STERLING	I 190	HWY AGRICLTRL UNDRPS	1979	n/a	FO
I190 NB	INTERSTATE 190	STERLING	I 190 NB	HWY GREENLAND RD	1979	n/a	SD
SR62 EB	PRINCETON ROAD	STERLING	ST 62 PRINCETON RD	WATER STILLWATER RIVER	1929	n/a	SD
I190 SB	INTERSTATE 190	STERLING	I 190 SB	HWY JOHN DEE RD	1979	n/a	SD
SR2 EB	ROUTE 2	TEMPLETON	ST 2 EB	ST 2 A/PATRIOTS RD	1969	n/a	FO
SR119 EB	MAIN STREET	TOWNSEND	ST119 MAIN ST	WATER SQUANNACOOK RIVER	1950	n/a	FO
SR119 EB	MAIN STREET	TOWNSEND	ST119 RIVER RD	WATER WILLARD BROOK	1908	1931	FO
SR119 EB	MAIN STREET	TOWNSEND	ST119 MAIN ST	WATER PEARL HILL BROOK	1907	1931	FO
SR119 EB	MAIN STREET	TOWNSEND	ST119 RIVER RD	WATER WILLARD BROOK	1908	1931	SD
SR2A EB	STATE ROAD EAST	WESTMINSTER	ST 2 A/STATE RD E	ST 2	1965	n/a	FO/SD
SR12 NB	ASHBURNHAM STATE ROAD	WESTMINSTER	ST 12 ASHBURNHM ST	WATER PHILLIPS BROOK	1926	n/a	SD
SR12 NB	ASHBURNHAM STATE ROAD	WESTMINSTER	ST 12 ASHBURNHM ST	WATER PHILLIPS BROOK	1926	n/a	SD
SR2 WB	ROUTE 2	WESTMINSTER	ST 2 WB	HWY BACON ST	1965	n/a	SD
SR2 WB	ROUTE 2	WESTMINSTER	ST 2 WB	HWY W MAIN ST	1961	n/a	SD
SR2 EB	ROUTE 2	WESTMINSTER	ST 2 EB	HWY BACON ST	1965	n/a	SD
SR2 EB	ROUTE 2	WESTMINSTER	ST 2 EB	HWY W MAIN ST	1961	n/a	SD
SR12 NB	SPRING STREET	WINCHENDON	ST 12 SPRING ST	WATER MILLERS RIVER	1927	n/a	FO