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## ATTACHMENTS

1. Roadway Classification Map And Pavement Management Maps
2. Traffic Count Locations Map
3. Crash Data Map
4. MassDOT Bridge Data Map

# **DRAFT TRANSPORTATION/CIRCULATION ELEMENT UPDATE SHIRLEY MASTER PLAN**

## **1. Introduction**

This element of the Master Plan discusses Transportation/Circulation in Shirley, including private automobiles, public transportation, bicycling, and pedestrian modes of travel. The ability to move people and goods is essential to the economic vitality and quality of life in the region. The existing conditions of the roadway system are reviewed by looking at such data as traffic counts and crash incidents. Proposals and recommendations will then be made taking into consideration other interrelated issues such as open space for an interconnected bicycle and pathway system within the Town and connections to other adjoining towns and the region.

## **2. Role of the Regional Planning Agency**

The Montachusett Regional Planning Commission (MRPC) acts as staff to the Montachusett Metropolitan Planning Organization (MPO) that has the responsibility of prioritizing transportation projects within the Montachusett Region. This presents municipalities with greater chances for input in setting local priorities. This shift in priority setting is intended to give municipalities a stronger role in planning transportation improvements that directly affect them. It is important to note that transportation projects and plans must be included in a regional transportation plan in order to receive federal funding for implementation.

### **Regional Transportation Plan**

The Regional Transportation Plan (RTP) outlines the transportation priority needs and policies for the region. Before projects receive federal funding, they must be identified and incorporated into the policy goals and visions of the RTP. The RTP is developed through studies, discussions with local officials, boards and commissions and public comment. Each MPO in the Commonwealth of Massachusetts develops a RTP to provide guidance to local and state officials in deciding how to spend federal and state transportation funds. The RTP for the Montachusett Region identifies both short and long range projects for local roads, highways, bridges, rail, transit, bike and pedestrian trails, freight and airports as well as priorities, goals, visions and strategies.

The RTP is updated every four years and the MRPC is working on the 2016 update currently. Information on the development of the RTP can be found on the MRPC website at [www.mrpc.org](http://www.mrpc.org).

## **Transportation Improvement Program**

The Transportation Improvement Program (TIP) is a federally required, annually updated, prioritized listing of short-range highway construction and transit projects proposed for implementation during a four federal fiscal year cycle. It is a means of allocating scarce federal and state monetary resources across the state to projects that each region deems to be its highest priorities. The TIP must be financially constrained to projections of available federal aid. The Massachusetts Department of Transportation (MassDOT) Highway Division, moreover, is committed to funding those projects that will be ready for advertisement in Federal Fiscal Year (FFY) 2015 and beyond. To this end the regional TIP contains a financial plan showing the revenue source or sources, current or proposed, for each project, for each anticipated FFY of advertisement.

To receive Federal or State funding, a transportation project must be included in the TIP. Projects listed in the TIP must also conform to the State Implementation Plan (SIP) for Air Quality Conformity in accordance with the Clean Air Act Amendments (CAAA), giving special consideration to "regionally significant" projects. Transportation projects funded with Federal funds from other Federal agencies, or with local or private resources, should be identified in the document to reflect the integrated and intermodal nature of the metropolitan transportation planning process.

The TIP must also be consistent with the current RTP for the Montachusett Region. In addition the TIP estimates future funding sources for operating and maintaining the current transportation network as well as the costs of capital improvements. The agency responsible for implementing highway projects in the TIP, unless otherwise noted, is the MassDOT Highway Division and, for transit projects, the Franklin County or Montachusett Regional Transit Authorities.

The Montachusett TIP is the product of a comprehensive, continuing and cooperative effort (the 3C Process) to improve the regional transportation system by local officials, the Montachusett Joint Transportation Committee (MJTC), the Montachusett Regional Transit Authority (MART), the MRPC and the MassDOT. Together these organizations along with local officials comprise the signatories representing the MPO.

### **Project Development Summary**

Project Development is the process that takes a transportation improvement from concept through construction.

Every year the Montachusett Region receives federal and state funds for projects to improve the transportation network in local communities. These funds and projects are prioritized through the MPO, a regional advisory group that annually develops the Montachusett TIP.

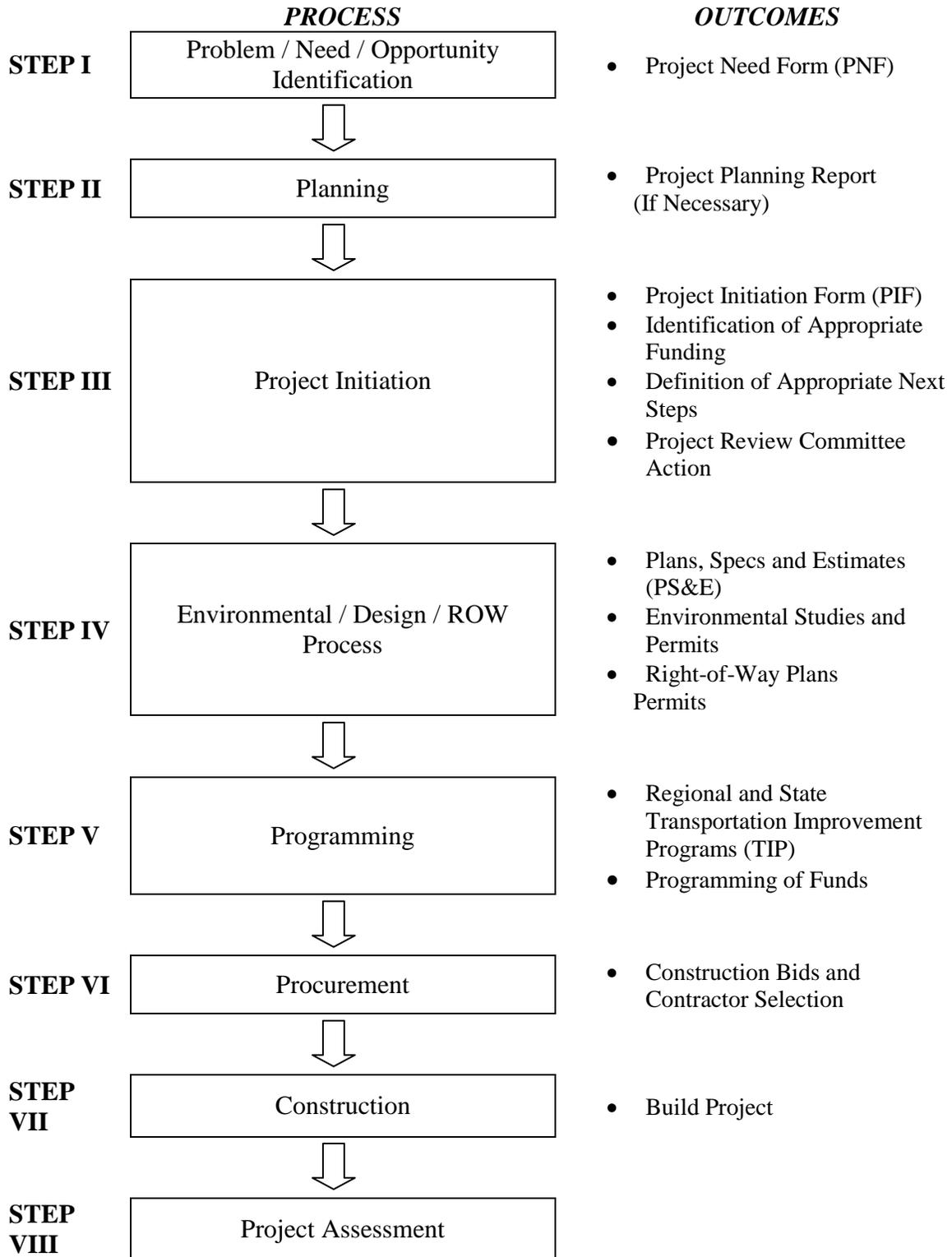
For a community to receive funds, the project must follow a multi-step review and approval process required by the MassDOT (MassDOT) Highway Division. This process is summarized in the figure below.

Project proponents are required to follow this process whenever MassDOT Highway Division is involved in the decision-making process. The project development procedures are, therefore, applicable to any of the following situations:

- When MassDOT is the proponent; or
- When MassDOT is responsible for project funding (state or federal-aid projects); or
- When MassDOT controls the infrastructure (projects on state highways).

Projects with local jurisdiction and local funding sources are not required to go through this review process unless the project is located on the National Highway or Federal-Aid Systems.

### **Project Development Process**



Source: MassDOT Highway Division

The project development process is designed to progressively narrow the projects focus in order to develop a project to addresses identified needs at that location. There should be opportunities for public participation throughout.

The eight steps in the above figure are described in detail in Chapter 2, Project Development Guide of the MassDOT Highway Division Design Guidebook (<http://www.mhd.state.ma.us/default.asp?pgid=content/designGuide&sid=about>).

## **Summary**

In summary, to get a project constructed, a community should:

1. Meet with the District Office of the MassDOT Highway Division to review and discuss the potential project. The District office can provide the community with information and feedback about the possible project's scope, cost, issues, etc.
2. Submit a Project Need Form (PNF), along with any support materials, on the potential project to the District office.
3. After review and feedback from MassDOT Highway Division on the PNF, a Project Initiation Form (PIF), again with any supporting materials, is prepared and submitted to the District office.
4. MassDOT and the Project Review Committee (PRC) act upon the PIF. If the project is approved by the PRC, the community is notified and, if applicable, initiates the design process for the project.
5. The municipality hires a design consultant and also begins work on the right of way plans as well as any permits, local approvals, etc.
6. During this phase the project is incorporated into the regional Transportation Improvement Program (TIP). Placement and prioritization of the project is based upon available funds, evaluation criteria scoring, design status and public support and comments.
7. Design public hearing is held at the 25% design phase.
8. Design progresses to 100% and all plans, specifications and estimates (PS&E) are completed. Project is then ready for advertisement by MassDOT.

## **3. Journey to Work**

According to the American Community Survey, 2013 estimates 95.3% of Shirley's workforce worked in Massachusetts and 65.9% worked in Middlesex County. Using data from the 2000 Census and 2013 ACS Estimates, a comparison can also be made as to how Shirley's workforce gets to work and how its commuting patterns have changed during the past thirteen years.

	<b><u>2000</u></b>	<b><u>2013</u></b>
Drove Alone	87.0%	83.6%
Car-Pooled	7.9%	4.8%
Walk/Bike	0.1%	0.4%
Public Transit	1.1%	5.4%
Worked at Home	2.6%	4.8%
Other Means	1.4%	1.0%

Reviewing the figures above, it should be noted that the “Driving to Work Alone” and “Car-Pooled” categories decreased in Shirley over the past thirteen years while “Public Transit” and “Worked at Home” showed notable increases. “Walk/Biking to Work” showed a very slight increase from 0.1% in the year 2000 to 0.4% in 2013. The town should perhaps focus more attention on walkability/connectivity issues.

As indicated in the Table below, the mean travel time to work for Shirley’s residents is 33.7 minutes, significantly higher than the Massachusetts average (28), and the national average of 25.5 minutes.

**Table -----  
Travel to Work**

<b>Mean Travel Time to Work</b>	
<b>Community</b>	<b>Minutes</b>
Shirley	33.7
Massachusetts	28
U.S.	25.5

*Source: US Census 2009-2013 Five Year Estimates*

Of notable interest, the mean travel time to work by total means of transportation increased in every community in the Montachusett Region from 1990 to 2000 and Shirley was no exception as travel time increased substantially from 24 minutes to 30.9 minutes which is a 28.8% increase. This could be attributed, at least in part, to the dramatic increase in real estate prices during this time span, widening the gap between income and purchase price. Historically, the average house price in Central Massachusetts, where Shirley is located, has been lower than state averages so that housing stock remained relatively affordable. This, along with the town’s scenic beauty and attractive quality of life, brought homebuyers who were willing to travel greater distances to work.

## 4. Roadway System

### Existing Network

State Route 2, or the Old Mohawk Trail, is the most important roadway to the Town and the region, running east/west through the entire region. This limited access roadway provides the area with a direct link to Boston and to the western half of the state. Route 2 connects Shirley to all of the region's major urban communities including Fitchburg, Leominster, and Gardner.

The completion of I-190 in the early 1980's provided good access from Shirley to Worcester, I-290 and the Massachusetts Turnpike. A second new limited access roadway was added to the region's highway network with the completion of the Route 140 Bypass in Westminister and Gardner providing better access to Winchendon and other destinations to the north. Route 2A (the former Route 2) is another east-west roadway that runs parallel to Route 2 through much of the Montachusett Region.

Interstate-495 is also located within close proximity to Shirley and runs north/south across the state. This route is highly traveled and is a major connection northward into New Hampshire and south to Cape Cod. It also makes a connection to other major routes such as I-90, I-93 and Rt. 2 and Rt. 3.

### Functional Classification

Functional classification identifies a roadway's purpose and use as part of the highway network. The highway network consists of a hierarchy of streets and highways designed to channel traffic from location to location in a safe and efficient manner. In urban areas, streets and highways are classified into four functional highway systems: Principal Arterials, Minor Arterials, Collector Streets and Local Streets. Shirley can compete for limited federal aid funding to repair their Federal-Aid eligible roads listed below through the annual TIP process. A Roadway Classification Map can be located in Attachment 1. Roads classified as "local" are not eligible for Federal-Aid and are maintained solely by the municipalities. Local roads are eligible for State Highway funds under Chapter 90.

Highways and roads are grouped into classes according to the type of service they are intended to provide. Classification is divided into principal arterials, minor arterials, major collector roads, minor collector roads, and local roads and streets.

**Principal Arterials:** The principal arterials are multi-lane roadways that connect major activity centers. These arterials carry the highest volumes of traffic at high speed and are often entirely or partially controlled-access facilities with interchanges or grade separations at major crossings. Principal arterials not only carry a major portion of trips entering and leaving a community; they also carry a significant amount of traffic passing through the community.

Principal arterials generally carry the highest traffic volumes. In Massachusetts, traffic volumes on principal arterials usually exceed 25,000 vehicles per day. Because the function of principal arterials is mostly to

provide mobility at a high level of service, service to abutting land is of secondary importance. Parking along principal arterials is usually forbidden or discouraged; driveway access onto principal arterials is also discouraged. In Shirley, just one road fits the principal arterial classification: Route 2. Principal Arterials are eligible for Federal Aid.

**Minor Arterials:** Minor arterials feed into principal arterials and serve the dual function of carrying high traffic volumes and providing access to adjacent land uses. Minor arterials place more emphasis on land access; on-street parking is generally permitted but is heavily regulated in order to maximize the street's traffic-carrying capacity during peak travel periods. Minor arterials generally have four travel lanes during peak travel periods (on-street parking may occupy one or more lanes during non-peak hours), but a minor arterial may also have two travel lanes and widen out at signalized intersections. Minor arterials generally carry traffic volumes in the range of 10,000-40,000 average daily trips (ADT). Minor arterials serve as a distribution network to geographic areas smaller than the principal arterials. Trip lengths associated with minor arterials are of a moderate length and travel is at a lower speed than on principal arterials. In Shirley, six roads fit the minor arterial classification: Rte. 202 from Winchendon Town Line to West Rd.; Rte. 68 from Gardner City Line to Gavin Rd.; Rte. 2A from Gardner City Line to Baldwinville Rd.; Rte. 101 from Gardner City Line to Wellington Rd.; Baldwinville Rd.; Rte. 101 from Gardner City Line to Wellington Rd. Minor Arterials are eligible for Federal Aid.

**Collector Streets:** Collector streets collect traffic from local streets and channel it into the arterial street system. The focus of collectors is more on land access than on mobility. Collector streets provide traffic circulation within neighborhoods and commercial and industrial areas. Travel speeds are generally lower and parking restrictions fewer than on minor arterial streets.

Collectors are usually two-lane roadways with minor widening at intersections with arterial streets. Collectors carry traffic volumes in the range of 3,000 to 20,000 ADT. The higher flows are associated with collectors that are over two miles in length and where some element of through traffic between arterials is present. In Shirley, North Main St. (from Rte 101/2A Intersection to Depot Road), Depot Road, Hubbardston Road, South Main Street (from Rte. 101/2A intersection to Cross Street), Cross Road, Bridge Street, and Main Street are all classified as a Major Collector. Minor Collectors are Rte. 202 from West Rd. to Phillipston Town Line, Rte. 68 from Gavin Rd. to Phillipston Town Line; Rte. 2A from Baldwinville Rd. to Phillipston Town Line, and Rte. 101 from Wellington Road to Phillipston Town Line. Major Collector roads are eligible for Federal Aid and Minor Collectors may be eligible for Federal Aid in some cases.

**Local Road and Streets:** The local streets include all the remaining streets that are not included in one of the higher systems. Local streets could be residential or industrial in character or could be access roads to recreation areas or parks. Traffic volumes on local streets are generally 4,000 ADT or less. A great majority of residential streets have volumes of 500 ADT or less. The high volume local streets are very long residential roadways (over one mile in length) with access to subdivisions.

Local roads' and streets' main function is to provide access to land. Travel speeds on local streets are generally the lowest and parking restrictions generally do not apply. Through travel on residential streets is often discouraged through traffic calming mechanisms. Although local streets carry relatively low traffic volumes overall, they constitute by far the greatest road mileage, accounting for 65% to 80% of roadway mileage in a typical community. Local roads and streets are NOT eligible for Federal Aid, but they are eligible for State Highway funds under Chapter 90.

The Functional Classification of roadways in the region have changed due to expanded Urban Boundaries on the MassDOT Road Inventory File (RIF). In 2013 MassDOT had expanded certain Urban Boundaries into the Town of Shirley and many roads have been changed from a “Rural” classification to an “Urban” classification. Because of this some roads have been changed from being classified as a collector road to an arterial. The current mileage in each Functional Classification category is displayed in the table below. Maps will be created once this updated information is further analyzed.

SHIRLEY	Rural - Collector	0.41
SHIRLEY	Rural - Local	0.48
SHIRLEY	Urban - Arterial	17.72
SHIRLEY	Urban - Collector	1.80
SHIRLEY	Urban - Local	56.59

## 5. Average Daily Traffic (ADT)

For many years the MRPC and MassDOT Highway Division have taken traffic counts at numerous locations in Shirley, as part of its regional traffic count program. **Table #** below lists the traffic counts taken along major routes over the past 10 years by location. These locations can be seen on the map in Attachment 2. The locations mentioned in the table will be shown in Red on the map and have been conducted regularly for volume comparison purposes. Other locations will be shown in Green.

The counts consist of data collected during a period of at least 24 weekday hours. To reflect seasonal differences in traffic volumes, MassDOT produces seasonal adjustment factors based on data collected at more than 200 statewide locations where traffic volume data is collected 365 days of the year. The seasonal adjustment factors are then applied to the 24 hour count volume to produce an Average Annual Daily Traffic (AADT) volume for the location. These factors were applied to all counts listed in the table below with the exception of counts listed on Route 2. The counts on Route 2 are permanent count stations and collect data continuously throughout the year.

**Table # – Shirley Traffic Volumes**

Street/Route	Location	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Center Road	North of Main Street			2000			2200		1900			
Center Road	Southwest of Common Road				1800		2100		2600			
Front Street	West of Mill				6400					6200		
Front Street	At Harvard Town Line						7000					7200
Great Road (Rt. 2A)	At Ayer Town Line			6600				6700				6400
Great Road (Rt. 2A)	At Lunenburg Town Line			4700		4300	4600				4500	
Lancaster Road	South of Elementary School						4400			4600		
Lancaster Road	South of School Street				4800		4700					
Leominster Road	At Lunenburg Town Line		2900		2900				3800			
Parker Road	North of Center Road						3100		2600			
Parker Road	South of Great Road (Rt. 2A)					2300				2400		
Townsend Road	At Townsend Town Line				900						1700	
Townsend Road	South of Groton Road (Rt. 225)	1600				1300				1900		
Walker Road	South of Hazen Road				1000							1200

From this available data, a key finding can be made: Traffic gradually increased at the beginning of the last decade and then starts to drop in 2008. In most cases, this is likely to be a direct result of the recession and higher energy costs. The cost of driving more than likely kept some people at home and pushed others toward public transportation. It should be noted that a similar decline has been seen throughout the Montachusett Region. If the Town of Shirley is interested in having traffic counts conducted for certain street(s) or intersection(s), the Board of Selectmen should forward a written request to MRPC’s Transportation Department.

## 6. Roadway Safety

Traffic crashes are often unpredictable, unavoidable events. Most traffic crashes are the result of driver error; however, driver error can be magnified by poor roadway or intersection design, or by inadequate traffic control measures. When crashes occur in high numbers at a particular location, there is probably a common reason for the crashes related to the design and/or signage of the road. These crashes can be predictable and the conditions that increase the chances for crashes are often correctable. Detailed study of crash records can identify these high-crash locations and lead to design improvements that will reduce the numbers and severity of future crashes.

MassDOT obtains crash data from the Registry of Motor Vehicles (RMV) to create crash tables for each community in Massachusetts for use in traffic engineering studies, safety planning activities, and distribution to government agencies and the public. The MRPC Transportation Department has been developing a crash database for the purpose of gathering crash statistics on the Region using historical and the most recent MassDOT crash tables available that currently exist from 2010-2012. To develop crash statistics from the database, MRPC staff has analyzed information such as number of crashes, crash location, and crash severity. Crash severity states the types of harm or the most serious outcome of a crash. There are essentially three possible outcomes:

1. Fatal Injury crash: Is the worst type of harm that involves at least one fatality or death of a person.
2. Non-fatal Injury crash: Is the second worst type of harm that involves at least one injury to a person.
3. Property Damage Only (PDO) crash: Is the third worst type of harm that involves damage to property of any type.

### Crash Statistics

The Region saw a total of 12,713 crashes occur between the years of 2010 – 2012 and 122 (1%) of those crashes occurred in Shirley. Of these crashes 0 (0%) were fatal injury crashes, 31 (24%) were non-fatal injury crashes, and 91 (75%) were property damage only crashes. A map depicting crash data locations for Shirley has been attached (See Attachment 3).

Crash cluster locations are locations where 2 or more crashes occur in a 3-year period. The table below provides the crash cluster locations that occurred within Shirley between years 2010-2012. There were 18 crash cluster locations in Shirley which accounted for 51 (42% of Shirley total crashes) of the crashes that occurred in Shirley. The crashes are analyzed further based on the Equivalent Property Damage Only (EPDO) crash severity rating system. EPDO rates a crash based on crash severity that gives one (1) point to a Property Damage Only (PDO) crash; 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. In other words, one Fatal Injury crash equals two Non-fatal Injury crashes or ten Property Damage-Only crashes. After determining each crash EPDO rate, the ratings of the crashes

for each location are totaled. A high EPDO total indicates a dangerous location where crashes have the most severe consequences.

The most significant crash cluster locations in Shirley occurred at or near the Townsend Road and Groton Road intersection. A total of 11 crashes occurred within 2 crash clusters. Further study of these locations is recommended.

STREET	RT #	STREET	RT #	CRASH COUNT	FATAL	INJURY	PDO	EPDO	INVESTIGATE FURTHER?
GROTON RD	225	TOWNSEND RD		5	0	2	3	13	Recommend
TOWNSEND RD		GROTON RD	225	6	0	1	5	10	
LITTLE TURNPIKE RD		PARKER RD		3	0	2	1	11	
GROTON RD	225	LAWTON RD		3	0	2	1	11	
GREAT RD	2A	TOWNSEND RD		4	0	1	3	8	
PHOENIX ST		FRONT ST		4	0	1	3	8	
GREAT RD	2A	WALKER RD		2	0	1	1	6	
CENTER RD				2	0	1	1	6	
GROTON RD	225			2	0	1	1	6	
MAIN ST		LANCASTER RD		2	0	1	1	6	
GROTON RD	225	LONGLEY RD		2	0	1	1	6	
GREAT RD	2A	PARKER RD		3	0	0	3	3	
GREAT RD	2A			3	0	0	3	3	
GREAT RD	2A			2	0	0	2	2	
LANCASTER RD				2	0	0	2	2	
GREAT RD	2A	LAWTON RD		2	0	0	2	2	
GROTON RD	225	SQUANNACOOK RD		2	0	0	2	2	
GREAT RD	2A	LONGLEY RD		2	0	0	2	2	
TOTALS				51	0	14	37		

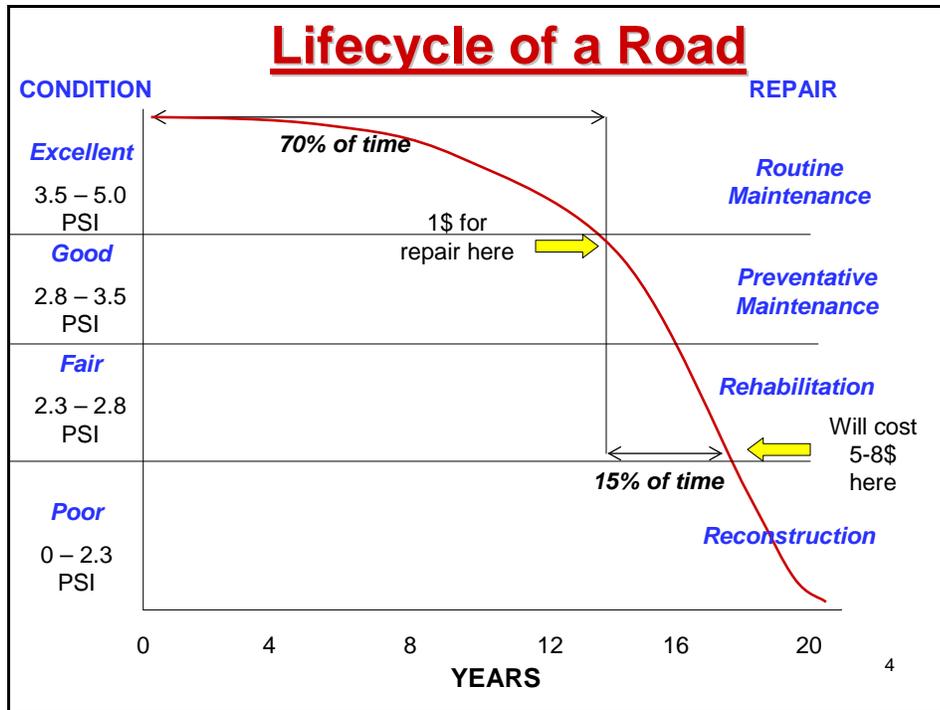
The remaining 71 crashes (58% of Shirley total crashes) were dispersed at 71 different locations throughout Shirley.

## 7. Pavement Condition

In most municipalities throughout the United States, road and street surfaces are the largest single cost of building and maintaining a transportation system. Forty to fifty percent of public funds spent on roadway systems are for the road surface. For smaller communities such as Shirley the percentage can be much higher. The role of a pavement management system is to provide an opportunity to improve roadway conditions while making cost effective decisions on maintenance priorities and schedules. The following list some faulty but common techniques for tending to a road network.

- Worst First - The roads in the worst condition get the first priority, which makes a noticeable difference in the worst roads, but often does not stretch funds to address many general maintenance tasks, resulting in a rapidly deteriorating network of roads.
- Fighting Fires - Respond to concerns as they arise. Ignoring preventative maintenance tasks that would save money in the long run.
- Scheduled Repairs - Attend to roads based on periodic maintenance, such as seal coats every five years and overlays every 10 years.
- Political Pressure - Establish maintenance repairs and schedules based on political considerations.

Unlike many maintenance methods which often rely on faulty practices such as these, a pavement management system relies heavily on pavement preservation early and often for the purpose of preventing an increasing deterioration of pavement structure. By maintaining an accurate database with up to date road conditions, the needs of a road network are better diagnosed.



The figure above, “Lifecycle of a Road”, represents the relationship between repair cost and time, it shows that it is far more economical to preserve roads than to delay repairs and reconstruct roads. 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 life cycle. One of the main focuses of pavement management is to keep a pavements lifecycle long while lifecycle cost is low to stretch the dollar in what is commonly an ever decreasing maintenance budget.

While it is important to preserve a pavements condition in good standing for as long as possible by implementing various preventative and routine maintenance techniques throughout its lifecycle to keep lifecycle cost low, it is a reality that budgets often do not allow for this. It is encouraged that a pavement management plan be implemented to keep on track of maintenance needs and schedules to contribute to a cost effective approach to maintaining roadways.

Each year the MRPC surveys communities in the Montachusett region about their involvement in municipal Pavement Management System activities. Local municipal programs range from non-existent to basic annually maintained spreadsheets to ongoing contracts with consultants utilizing the latest Pavement Management software to analyze town roadways. Although a pavement management program does involve additional costs on top of maintenance budgets, many communities are realizing there potential to save money by making well informed decisions in the long run. The costs and benefits of utilizing a Pavement Management System in Shirley should be weighed and discussed with the appropriate decision makers.

Local Conditions

The structural conditions of the majority of the Federal Aid eligible roads in Shirley are determined by MassDOT and MRPC pavement surveys. The condition is expressed by assigning a Pavement Serviceability Index (PSI) number from 0 to 5 to segments along the roadway. PSI is an overall rating of the pavements condition. Conditions are rated as Excellent, Good, Fair and Poor.

The table below shows a general correlation between PSI, condition, repair strategies and associated cost. The estimated repair cost was derived from conversations with a Pavement Management Users Group (PMUG) comprised of other Regional Planning Agencies, the MassDOT and the Federal Highway Administration (FHWA) and reflects the estimated cost to bring the pavement condition to “excellent.”

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

One of the maps in Attachment 1 of this document shows pavement conditions of *Federal Aid Eligible* roadways in Shirley. Federal Aid Eligible roads are comprised of all functionally classified as Interstate, Urban and Rural Arterial, Urban Collector and Rural Major Collector roads. These roads include all roads which are State maintained (State Jurisdiction) as well as a select number of roads which are maintained by the town of Shirley (Local Jurisdiction). The Map “*Pavement Conditions on Surveyed Roads*” shows all Federal Aid Eligible roads which have been surveyed. “*Available Pavement Conditions on Local Jurisdiction Fed-Aid Eligible Roads 2011*” shows those surveyed roads that are Local Jurisdiction. Please note that due to the time frame between data collection and report preparation, conditions of the roadways may change. Therefore, this information should be viewed in general terms regarding needs and condition.

## Challenges

A major concern to communities is funding available for roadway maintenance (Chapter 90) lagging behind the rising price of such maintenance. Below is a chart showing the Chapter 90 allocations Shirley will receive in FY 2015 along with the roadway mileage that that money must maintain.

Municipality	Local Jurisdiction Miles (Fed Aid and Non-Fed Aid eligible)	Other Jurisdiction Miles	FY 2014 Ch. 90 Apportionment	FY 2015 Ch. 90 Apportionment	% Change
ASHBURNHAM	74.47	9.60	\$347,094	\$346,948	-0.04%
ASHBY	51.97	0.00	\$229,864	\$230,019	0.07%
ATHOL	96.41	18.19	\$501,524	\$500,869	-0.13%
AYER	33.38	12.62	\$273,808	\$244,618	-10.66%
CLINTON	47.24	15.98	\$331,865	\$329,768	-0.63%
FITCHBURG	179.68	50.07	\$1,132,263	\$1,129,125	-0.28%
GARDNER	92.57	22.82	\$601,894	\$603,714	0.30%
GROTON	99.76	28.28	\$504,768	\$506,686	0.38%
HARVARD	64.43	0.00	\$309,298	\$340,137	9.97%
HUBBARDSTON	82.98	21.51	\$363,965	\$362,808	-0.32%
LANCASTER	59.21	11.04	\$313,136	\$312,248	-0.28%
LEOMINSTER	150.54	38.55	\$1,088,720	\$1,081,766	-0.64%
LUNENBURG	83.02	27.44	\$422,130	\$420,461	-0.40%
PETERSHAM	62.25	6.75	\$256,680	\$256,048	-0.25%
PHILLIPSTON	44.76	2.72	\$190,959	\$189,796	-0.61%
ROYALSTON	69.56	20.90	\$285,922	\$285,121	-0.28%
<b>SHIRLEY</b>	<b>43.68</b>	<b>15.98</b>	<b>\$252,643</b>	<b>\$252,873</b>	<b>0.09%</b>
STERLING	84.87	12.33	\$418,357	\$418,121	-0.06%
TEMPLETON	67.73	13.45	\$342,945	\$339,865	-0.90%
TOWNSEND	86.89	16.88	\$426,174	\$425,690	-0.11%
WESTMINSTER	84.33	11.49	\$413,641	\$419,624	1.45%
WINCHENDON	91.00	27.74	\$448,188	\$447,670	-0.12%
<b>REGIONWIDE</b>	<b>1,750.75</b>	<b>384.34</b>	<b>\$9,455,838</b>	<b>\$9,443,975</b>	<b>-0.13%</b>

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 federal aid eligible Local roadways through the Transportation Improvement Program (TIP). It is also encouraged that a Pavement Management Plan be

implemented by communities to keep on track of maintenance needs and schedules to contribute to a cost effective approach to maintaining roadways. The map located in Attachment 5 Local Jurisdiction Fed-Aid Eligible Roads highlights all roadways maintained by the Town of Shirley and eligible to receive TIP funding.

### **Recommendations for Pavement Activities**

- Shirley should consider the merits of applying the principals of Pavement Management when going forward with future maintenance schedules
- In an effort to reduce the strain on Chapter 90 funds Shirley should continue to seek funding for infrastructure projects on Local Jurisdiction Federal Aid eligible roads through the TIP process.

## **8. Bridges**

Throughout the Montachusett region, many of its roads travel over numerous brooks, rivers and water bodies. Within the 22 communities of the Montachusett planning area, some 324 bridges are identified and rated by MassDOT as part of their inventory system. MassDOT provided a Bridge Rating Table to the MRPC. This table includes the town where the bridge is located, the road name the bridge is located on, the bridge identification number, functional classification of the road, year built, historical significance, rebuilt date (if applicable), AASHTO (American Association of State Highway and Transportation Officials) rating, and the deficiency status of each bridge, i.e. structurally deficient or functionally obsolete.

According to the MassDOT Project Development and Design Guidebook (January 2006), structurally deficient 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.”

As of October 2014, there are 53 bridges listed as functionally obsolete and 39 as structurally deficient throughout the MRPC region (See map Attachment 4). There are two functionally obsolete bridges in Shirley and there is one structurally deficient bridge at the following locations:

#### Functionally Obsolete

- Main Street over Catacunemaug Brook (Municipally owned, Bridge #S-13-006)
- Lovell Street over Catacunemaug Brook (State owned, Bridge #S-13-017)

#### Structurally Deficient

- Great Road over Mulpus Brook (State owned, Bridge #S-13-005)

## **9. Public Transit System**

### **MART Service**

There is no fixed route bus service provided in Shirley. However the Montachusett Area Regional Transit Authority (MART) runs a bus service in portions of the neighboring community of Lunenburg as well as a Boston shuttle service that runs three times daily through Devens (MWCC Campus).

### **Intercity Bus Service**

There is currently no intercity bus service in the town of Shirley.

### **Commuter Rail**

Shirley is fortunate that there is an existing commuter rail station from Fitchburg to Boston right in the town center. This station currently has thirteen stops at Shirley (in bound) during the week and six on weekends. The parking is free at this station making it one of the most desired location to board the train within the region, but spaces are limited (## spaces) and fill up fast.

## **10. Other Transportation Systems**

### **Freight Railroads**

There are three railroad companies currently operating freight lines in the Montachusett region:

1. Pan Am Railways, formerly Guilford Transportation Industries (GTI) is the largest operator of freight rail lines in the Montachusett Region. It operates on a number of lines including those connecting the Moran Terminal in Charlestown to Mechanicville, New York. With the purchase of the B&M in 1983, GTI was handed control of the Springfield Terminal Railway (STR), a B&M subsidiary. In addition, GTI has controlling interest in both the Vermont and Massachusetts Railroad (V&M) and the Stony Brook Railroad (SBRR). The V&M and SBRR own one track each and they are leased to B&M. In Westminster, the Freight Main Line (Ex Fitchburg Route) is owned by the V&M with the freight operator being STR.
2. The Providence and Worcester Railroad Company (P&W) is an independent operator of freight lines. One line operates in the area from Gardner (providing a connection to the GTI system) to Hubbardston to Worcester.

3. CSX Transportation purchased Consolidated Rail Corporation (Conrail) in 1997. Conrail was previously established to acquire bankrupt railroad company lines. CSX operates one line running from Fitchburg to Clinton in the Montachusett Region.

### **Aviation**

Within the Montachusett Region, there are three general aviation municipal airports, the Fitchburg Municipal Airport located in Fitchburg on the Leominster City line; the Gardner Airport in Templeton near the Gardner City Line; and the Sterling Airport in Sterling. Each of these is classified as a general aviation airport. The former Shirley Airport is no longer a public use facility. According to the Massachusetts Aeronautics Commission website ([www.massaeronautics.org](http://www.massaeronautics.org)), “The owner/operator of Shirley Airport has decided to change the airport’s status from Privately-Owned/Public-use airport to Private Restricted Landing Area, which means that effective immediately, the airport is closed to public use. Pilots must receive prior permission from the owner/operator to use the airport.” This location, located both in Shirley and Lancaster, has recently been turned into a solar farm where the electricity generated is supplied to the Town of Billerica, Ma.

The largest of the municipal airports, by far, is the Fitchburg Municipal Airport. Approximately 515 flights per day are handled on its two-runway system. The airport handles the general aviation needs for the greater Fitchburg area and provides facilities for personal, corporate and air taxi services. Access to the Fitchburg Municipal Airport is through Falulah Road, which provides indirect access to Route 2 (via Hamilton Street and Routes 12 and 13), and downtown Fitchburg (via Bemis Road, Route 12 and Summer Street). Improvements to the existing highway network would benefit the airport. In addition, commuter rail service is available at the North Leominster Train Station on Route 13 approximately one mile from the airport.

## **11. Bicycles and Pedestrians**

### **Bicycle Travel**

There has been a noticeable increase in the number of bicycles around population centers and on the highways. Bicycles have found a place on the highway network by default, as have pedestrians. Bicycles mixed with motor vehicle traffic can be dangerous and create traffic delays. Safety problems have increased as evidenced by the number of bicycle-automobile accidents. It was reported in the MassDOT crash files for the 10-year period of 2002-2012 that 250 bicycle related crashes occurred in the Montachusett Region resulting in 176 injuries and no fatalities.

There is a strong support from the regional communities for designated bikeways for recreational and commuting traffic. Individual bikeway projects are being implemented in some towns within the region. Construction of bikeways will encourage cycle commuting by providing a direct, separate, and safe route between communities. Also, increasing concern for air quality and energy

conservation is leading to renewed interest in development of adequate facilities for bicycles throughout the Montachusett region.

Bikeways are special routes and/or facilities established to facilitate the movement of bicycles as an energy efficient transportation and/or recreation mode of travel. There are three types of bikeways: bike paths, bike lanes, and bike routes. These have been categorized as Class I, II and III bikeways respectively. Class I bike paths are routes totally separated from automobile or pedestrian traffic. Class II bike lanes are lanes at the edge of streets marked for exclusive use of bicyclists. Class III bike routes are roadways that bikes share with cars.

Legally, a bicycle has been recognized as a vehicle in Massachusetts since 1973; subject to basically all the rights and responsibilities of an automobile. Bikeways are public rights-of-way, maintained by a responsible state or local agency, just as a municipality's streets are owned and maintained. Where the land for a proposed bike path is privately owned, an easement to permit public passage may be obtained, or the right-of-way may be purchased outright. Bikeways which parallel roads may be located within the existing publicly owned right-of-way, extending beyond the roadway itself.

### **Pedestrian Access**

Pedestrian activity is generally limited to small areas within town (i.e. schools, libraries, senior center, town hall, parks, etc.). Some residential streets abutting these areas do not currently have sidewalks. Sidewalks should be included in new roadway construction, roadway improvements, and residential and non-residential subdivision development. Along major arterial roadways, land should be secured for sidewalks or pathways as development occurs. Pedestrian actuated signals should be in place in densely populated areas where warranted to allow safer movement of pedestrians.

### **Safe Routes to School**

In 2009 the MRPC conducted a Safe Routes to School analysis for the Shirley Middle School and the Lura White Elementary School. This study analyzed the major routes to school and the accessibility those routes provide for bicyclists and walkers. Sidewalk inventory, traffic counts that included speed data, crash data, and site walks were all included in the study.

The following Recommendations resulted from this study:

#### 1. Sidewalk Improvements

- Install sidewalks along all major routes (Benjamin Road, Center Road, Front Street, etc.)
- Install a crosswalk or another safe way for students to cross the Railroad tracks
- Prevent delivery trucks from blocking sidewalks and crosswalks
- Clear away vegetation to prevent cracks along sidewalks



Railroad tracks at Phoenix Street



Main Street – Delivery truck blocking sidewalk & crosswalk



Front Street at Benjamin Road –extend sidewalk

## 2. Traffic

- Speeding during school hours along school zone should continue to be monitored and enforced
- Warning signs should be placed in the town center area to warn all drivers of pedestrians, cyclists and children. Placement of all regulatory and guidance signs should conform to guidelines established by Massachusetts Highway Department and the Manual on Uniform Traffic Control Devices (MUTCD).

## 3. Continue to work with the Safe Routes to School Program

By continuing your efforts with the Safe Routes to School Program, you will not only promote healthy alternatives for children and parents in their travel to and from school but you will also educate students, parents and community members to the value of walking and bicycling for travel to and from school. This program aims to reduce congestion, air pollution, and traffic congestion near

participating schools, while increasing health, safety, and physical activity of elementary and middle school students.

“Safe Routes to School utilizes five major strategies of implementation – the 5 E’s:

- **Education:** Walking safety training for young children, classroom lessons and community presentations.
- **Encouragement:** Creating fun activities and events that draw children to walk to school
- **Enforcement:** Enforcing existing laws to curb traffic violations that endanger young walkers on their way to school
- **Evaluation:** Monitoring outcomes and documenting travel trends through data collection before and after Safe Routes to School activities.
- **Engineering:** Assessing and improving the built environment to increase safety.

By participating in this program your community could be eligible for engineering funds. Safe Routes to School efforts focus first on addressing and changing the elements of the environment that are most practical and affordable. In some districts, more generous programs have allowed significant new facilities such as trails or traffic signals to be installed. Some of the elements of the built environment to consider are described below.

- School drop-off and pick-up procedures – the congestion caused by cars, buses and other traffic arriving at schools can be hazardous to walkers.
- Crosswalks are often the simplest and least expensive signal to drivers and pedestrians about how an intersection works – and they can improve safety for both. Creating a new crosswalk in the right place can alleviate many of the daily aggravations between walkers and drivers
- Speed warnings and reminders – Drivers are less likely to ignore school zones when there are new, clear and reflective signs. Signs that monitor speed making it easier to track speeds near schools.
- Curb painting – can improve safety by signaling to drivers where they can and cannot drive, drop or pick up children, or idle when parked
- Removing snow and debris – Snowy and icy sidewalks pose a challenge to Massachusetts pedestrians. Most cities and towns hold property owners responsible for clearing sidewalks next to their property, yet sidewalks often remain blocked and dangerous days after a storm.” ([www.walkboston.com](http://www.walkboston.com))

## 12. **Recommendations**

# **ATTACHMENT 1 – Roadway Classification Map and Pavement Management Maps**

## **ATTACHMENT 2 – Traffic Count Locations Map**

## **ATTACHMENT 3 – Crash Data Map**

## **ATTACHMENT 4 – Mass DOT Bridge Data Map**