Transportation Resources

CHAPTER 6

Connecticut River Scenic Byway

Introduction

The Transportation Resources Chapter contains an overview of the transportation infrastructure on the Connecticut River Scenic Byway in the Towns of Northfield, Erving, Montague, Sunderland, Hadley, and South Hadley. The chapter includes descriptions of the roadway infrastructure, bridges, public transportation services, railway, bicycle, and pedestrian facilities. It also contains a detailed discussion of the operations of the transportation systems and recommends needed improvements.

The information in this chapter is based on a thorough review of the data from state and regional sources including the Massachusetts Geographical Information System (MassGIS), the Massachusetts Department of Transportation (MassDOT), and the MassDOT Registry of Motor Vehicles (RMV). Additionally, the regional planning agencies completing this project, the Franklin Regional Council of Governments (FRCOG) and the Pioneer Valley Planning Commission (PVPC), reviewed previously collected data and also completed site assessments in order to supplement and provide complete transportation information.

Overall, this evaluation of the transportation system considered the safety and efficiency of travel on the Byway while also seeking to maintain or enhance the character and resources of the Byway. The descriptions of the Byway are documented from north to south.

Inventory of the Road Characteristics and Conditions

The Byway follows the eastern shore of the Connecticut River along state-numbered highways Route 63 and Route 47. The total length of the Byway is 37.85 miles and the mileage within each town is: Northfield, 8.79 miles; Erving, 2.16 miles; Montague, 5.82 miles; Sunderland, 7.03 miles; Hadley, 11.25 miles; South Hadley, 2.80 miles. From the New Hampshire state border in Northfield the Byway runs south on Route 63 to the junction with Route 47 in Montague. The Byway continues south on Route 47 to its southern terminus at the junction with Route 116 in the center of South Hadley.

Hatfield has expressed interest in joining the byway, therefore this chapter will also evaluate Main Street in Hatfield from the Whately town line to Maple Street as part of the this report.

Franklin County

The Franklin County section of the Byway is approximately 24 miles long, and travels through varied landscapes and roadway features from the New Hampshire state line to Hadley town line. The Byway passes through rural scenic landscapes as it undulates through wooded areas and working scenic farmland. The corridor also passes through quaint villages with activities and attractions such as antique shops, small retail establishments, and coffee shops.

The Byway connects with three other major routes in Franklin County. Route 63 runs concurrent with Route 10 in Northfield, from Wanamaker Road to the junction 2.45 miles south, where Route 10 continues west into the Town of Gill. The Byway also crosses Route 2, which is the historic Mohawk Trail Scenic Byway and the primary east-west route in Franklin County. A bridge carries Route 2 over Route 63 in Erving, with connecting access between the two routes via local roads Forest Street or Gateway Drive (also know as Semb Drive). The Byway also crosses Route 116 in Sunderland Center. Route 116 travels east and west. To the west of Sunderland Center, Route 116 is a scenic byway.

Hampshire County

The Route 47 Corridor through Hampshire County in the towns of Hadley and South Hadley is approximately 14 miles in length. The majority of the Corridor traverses a mixture of residential, forested, historic districts (villages), and open farmland, providing an almost unlimited opportunity for scenic views. The two major intersections along the byway Route 47 at Route 116 in South Hadley where Route 47 ends at the South Hadley Commons and at Route 9 in Hadley (the town center) are the exceptions; these two locations are commerce centers along the corridor. Route 9 is a major east/west roadway through the pioneer Valley. 2 miles to the west on Route 9 is Interstate 91 exit 18.

Main Street in Hatfield begins at the Whately town line as a winding road traversing farmland with occasional farmhouses along the road. Approximately a mile south from Whately is the Broad Street Historic District with its quaint village feel. From Broad Street Historic district south Main Street winds through more farmland down to just north of King Street where the Hatfield Center Historic district starts. From here to Elm Street Hatfield has the New England village feel, with house built much closer together with similar setbacks from the road.

Ownership and Maintenance

Franklin County

The Route 63 section of the Byway is primarily maintained by MassDOT, with one segment that is maintained by local municipalities. From Forest Street in Erving, south through the village of Millers Falls, Montague, to the intersection of West Main Street and Federal Street, the roadway is under local jurisdiction, although the bridge over the Millers River is inspected and maintained by MassDOT. State maintenance of Route 63

resumes on Federal Street in Montague. The Route 47 portion of the Byway is maintained locally in Franklin County.

Hampshire County

Route 47 in the Hampshire County towns of Hadley and South Hadley are under the jurisdiction of the towns. Main Street in Hatfield is under the jurisdiction of the town.

Functional Classification

Functional classification is the categorization of roadway segments in terms of the service (primarily access and mobility) they provide within the regional network. Functional classification was mandated under the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. This categorization has a hierarchy beginning with the highest level at interstates, then arterials, collectors, and local roads.

Franklin County

In Franklin County, the Byway consists of four (4) different functional classifications: Urban Principal Arterial, Urban Minor Arterial, Rural Minor Arterial and Rural Major Collectors. Arterials primarily allow mobility through a corridor, typically serving long-distance trips between activity centers (e.g. town centers). Collectors provide the connection between local streets serving residential neighborhoods and the arterial system. The functional classifications of the sections of Route 116 along the Byway are defined in Table 7.1. Route 63 is a Rural Major Collector at the New Hampshire State Line in Northfield and becomes a Rural Minor Arterial where it meets Route 10 at Wanamaker Road. Route 63 continues in Erving and the classification changes to Urban Principal Arterial from Louis Grueling Circle to Swamp Road in Montague. At Swamp Road in Montague it is a Rural Minor Arterial again. The classification of the Byway changes to Rural Major Collector when it joins Route 47 at North Leverett Road in Montague and again to Urban Minor Arterial at the Montague/Sunderland Town Line, and remains an Urban Minor Arterial through Sunderland into Hampshire County.

Hampshire County

Route 47 in Hadley has two classifications; River Drive is classified as an urban minor arterial, Middle Street, Bay Road, Lawrence Plain Road, and Hockanum Road are all classified as urban principal arterials. In South Hadley, Hadley Street is classified as an urban principal arterial. Main Street in Hatfield is classified as an urban minor arterial.

General Description and Characteristics of the Roadway by County

The primary source of information is the MassDOT Road Inventory File (RIF) database which was verified and supplemented with information collected during site assessments. The layout, character, geometry and road use of the Byway varies along the length. The local street names for the roadway also vary between and within each town.

Franklin County

The Connecticut River Scenic Byway is a two-way, two-lane undivided roadway that runs north-to-south, with intermittent passing zones in each direction. The roadway is generally level with gentle, large-radius curves between straight tangent sections.

Traveling southerly, the Byway begins in Northfield on Route 63 at the New Hampshire border and continues for 0.64 miles before joining Route 10. This segment of the Byway is wooded, with a large farm and several houses alongside the road. The travel lanes are approximately 12 feet wide, with a shoulder up to 10 feet wide on the east side. The speed limit is 50 mph until it drops to 25 mph at the approach to Route 10. This is the lowest-volume segment of the Byway, carrying an average of 1,260 vehicles daily in 2008.

The Route 10/63 section, in contrast, carries the highest volume of traffic on the Byway in Franklin County as it passes through the center of Northfield. North of Moody Street the volume was 5,200 vehicles per day in 2006. In the center of the village the volume was 7,700 vehicles per day south of Parker Avenue in 2008. The roadway in this section consists of 12-foot travel lanes with shoulders up to 6 feet wide. Recently constructed concrete sidewalks are set back from the edge of the roadway, extending from Moody Street to the southern Route 10/63 junction on the west side of the roadway, and from Dickinson Street to Maple Street on the east side. There are multiple marked crosswalks across Route 10/63 within Northfield Center, including locations at: Moody Street, Mill Street, Dickinson Street (library), Northfield Elementary School, between School Street and Parker Avenue, Parker Avenue, and Maple Street. There are also crossings across each side street at the sidewalks. The 40 mph speed limit is reduced to 35 mph approaching the center of town. The speed limit increases to 40 mph south of Maple Street approaching the southern junction of Route 10/63.

Between the Route 10/63 junction and Pine Meadow Road, roadside development decreases and the Byway resumes a rural farm character. Route 63 widens to feature 12-foot lanes and shoulders up to 10 feet wide on both sides, with no sidewalk. South of Pine Meadow Road, the pavement narrows and there is no shoulder. The speed limit varies in this section from 45 to 55 mph. The average daily traffic on this section was 2,600 vehicles per day in 2008.

Entering Erving the speed limit drops from 50 mph to 40 mph. At the Northfield/Erving Town Line, the average daily traffic was 2,400 vehicles per day in 2012. At this location the roadway width is the same as the preceding section, with 11-to-12 foot lanes and little to no shoulder. There are sidewalks on the west side of the roadway from Erving Elementary School, and on the east side from Park Street to the Montague town line. This section of the Byway is a residential area. The intersections of Route 63 and Forest Street and Route 63 and Gateway Drive (also known as Semb Drive) provide access to Route 2 eastbound and westbound, respectively. There are crosswalks at Forest Street, at Veteran's Field, at Central Street, and at Bridge Street. At Gunn Street, the Byway (Route

63) turns to the left, and crosses over the Millers River Bridge into the Town of Montague in the Village of Millers Falls.

The first Byway segments in Montague pass through the village of Millers Falls, also a residential and commercial area with closely-spaced buildings. Between the Erving/Montague Town Line and Bangs Street, there is ornamental street lighting and concrete sidewalks on both sides of the roadway; the sidewalk on the east side ends at Bangs Street while the sidewalk on the west side continues further south until Green Pond Road. There are crosswalks across Route 63 at Newton Street, Crescent Street, East/West Main Street, Church Street, and Federal Street. There are also crosswalks on each side street approaching the Byway. This section of the roadway is approximately 24 feet wide, with 12-foot travel lanes, no shoulders, and granite curbs; the paved width of Bridge Street is wider to provide on-street parallel parking. The speed limit is 20 mph on the Bridge Street and West Main Street segments, increasing to 35 mph on Federal Street.

The Federal Street section of the Byway becomes more rural heading south, with houses spaced further apart. The roadway widens slightly to accommodate 12-foot lanes and shoulders up to 10 feet wide south of South Lyman Street and across the bridge over the New England Central Railroad and Pan Am Southern Railroads. South of this bridge, the roadway narrows until there is no shoulder south of Highland Street. There is a sidewalk segment on the west side of the road from north of South Lyman Street (across from the Route 63 Roadhouse), across the bridge, ending at Highland Street. South of Highland Street, the speed limit increases to 40 mph, then 50 mph. The roadway crosses over the New England Central Railroad again about ½ mile south, heading through the village of Lake Pleasant into the village of Montague Center. In this vicinity south of Swamp Road, pavement is even narrower, with lane widths of approximately 11 feet in each direction.

At North Leverett Road, the Byway turns off of Route 63; North Leverett Road connects the Byway to Route 47. The most recent traffic count on this street was in 2002, when the volume was 2,600 vehicles per day. There is no posted speed limit on North Leverett Road, nor is there on the Sunderland Road segment of Route 47 between North Leverett Road and the Montague/Sunderland Town Line; the speed limit is 40 mph both north and south of this segment. Traffic counts from 2006 show a volume of 3,100 vehicles per day. This section of the road features multiple large radius curves. The paved roadway remains narrow, with 11 feet lanes and no shoulder entering Sunderland.

The character of the Byway as it enters Sunderland remains rural, with farms and wooded areas and homes spaced far apart. North of Falls Road, the speed limit drops to 35 mph. To the south, the roadway becomes straighter, and the paved width remains narrow. Approaching North Silver Lane, the character becomes more residential, with houses closer together and an asphalt sidewalk separated from the west side of the roadway by a wide tree belt. South of North Silver Lane, there is a sidewalk on both sides of the road, with crosswalks on the side streets. The speed limit drops to 30 mph as the Byway enters the center of town and intersects with Route 116, also a scenic byway and a major north-south route in Franklin County, although it is oriented east-west when it intersects Route 47. The intersection is controlled by a traffic signal and crosswalks are provided on all

four legs. Traffic counts conducted at the Route 47/Route 116 intersection in 2014 showed volumes of 4,700 vehicles per day on Route 47 north of Route 116 and 4,600 vehicles per day on Route 47 south of Route 116.

The residential village center character of the Byway continues south of Route 116, maintaining the asphalt sidewalk and wide tree belt. The sidewalk on the west side of the roadway ends at Old Amherst Road, and from there the sidewalk on the east side is adjacent to the roadway, terminating at Sugarloaf Estates. The paved road width is wider in this segment, allowing for 12-ft lanes and shoulders up to 2 feet wide. From Route 116 past Old Amherst Road the speed limit is 35 mph, then increasing to 45 mph. South of Old Amherst Road, approaching Hadley Road, the roadside features more farms and cultivated fields and fewer homes. The roadway again becomes narrower, with 11-ft lanes and no shoulders. The average traffic volume on the Hadley Road segment of the Byway was 2,500 vehicles per day in 2007. Entering the Town of Hadley, the speed limit is 40 mph.

Hampshire County

Within Hampshire County, the Route 47 Corridor extends 14 miles from the Sunderland/North Hadley Town Line to the intersection of Hadley Street (Route 47) with College Street (Route 116) in South Hadley. All of Route 47 through Hampshire County is under the jurisdiction of the Towns.

Main Street in Hatfield extends approximately 4 miles from the Whately Town Line to Maple Street in Hatfield and is under town jurisdiction.

The AADT of Route 47 varies depending on what part of the corridor you are. The roadway is characterized by its relatively narrow layout (21 to 24 feet from curb to curb), rolling hills, and curving geometry.

Route 47 experiences the highest volumes near Route 9 in the center of Hadley on Bay Road (9,000 AADT). Bay Road is used as a bypass for vehicles traveling to points east and west of Hadley without using Route 9. Coincidently the lowest traffic volumes were also located in the center of Hadley on Middle Street south of Route 9 (2,200 AADT).

For this analysis Route 47 was divided into 5 segments. The first segment is the 5.6 mile River Drive segment which was observed to be relatively flat with some isolated areas of rolling terrain with 12 foot travel lanes and 1 to 2 foot shoulders. River Drive provides one lane of travel in each direction. Traveling from north to south, Route 47 traverses farmland with occasional areas of mixed residential and farm development. Farmland is the dominant fixture on the northern and middle portion of River Drive, while the southern section has more of a residential feel providing occasional river views near its terminus at Middle Street. Speed limits where observed to be 40 mph on the more strait open sections of roadway and as low as 25 mph in the more developed areas and those locations with poor visibility do to roadway alignment. Pavement markings consist of double yellow center lines and single white edge lines and were observed to be in fair

condition. Guardrails where observed on curves and portions of the roadway where steep slopes were present along the shoulder of the roadway. The lack of adequate shoulders on this section of roadway could potentially cause safety concerns with the amount farm equipment using the roadway. However; good site distance and relative low traffic volumes make this less of a concern.

The second segment is Middle Street which is approximately 1.1 miles in length and is almost entirely residential with the exception of the businesses and municipal buildings located at Route 9 in Hadley. The majority of Middle Street can be described as quintessential New England farm town. With equal setbacks for the residential structures and large tree lined front yards. Sidewalks are provided on the east side of Middle Street and Run from the Hadley elementary school all the way to Bay road. The sidewalk also connects the school and Town Center with the Norwottuck rail trail. Speed limits ranged from 30 to 35 mph and lane widths were observed to be 12 feet with 2 to 4 foot shoulders. Double yellow center lines and single white edge lines were observed to be in fair condition. A parking lot on the west side of Middle Street was observed just south of the intersection with Route 9. No markings were present but it appeared to be able to accommodate 10 to 12 vehicles. PVTA Route Blue 43 can be accessed on this segment near the intersection with Route 9. The Blue 43 provides service between Smith College in Northampton and Amherst College in Amherst. Other stops for the Blue 43 are Hampshire Mall and Umass.

The third segment is the Bay Road segment of the corridor which is approximately 0.6 miles in length and is similar to southern portion River Drive with a mix of Residential and Agricultural land uses, the exception being that Bay Road experiences significantly higher traffic volumes (highest volume on Route 47). Bay Road also has the farm town feel with larger tree lined yards and similar setbacks from the road with large agricultural fields behind the houses. 12 foot travel lanes and 2 foot shoulder were present for the majority of this segment. A sidewalk was observed on the north side of Bay Road extending from Middle Street east half way to East Street. Double yellow center line and single white edge lines were in fair condition and speed limit were 30 to 35 mph. A mix of galvanized and loose tension guardrails are provided on either side of the bridge over the Fort River and were observed to be in poor condition. PVTA Route 39 and 39 express buses provide service between Smith College, Hampshire College, and Mount Holyoke College during the school year. This service is not provided when the Colleges are on break.

The fourth segment is the Lawrence Plain/Hockanum Road segment of the corridor which is 3.8 miles in length and provides one lane of travel in each direction. Lane width varies on this section of roadway, the majority of the segment was observed to have 11 foot travel lanes and 1 foot shoulder. The Lawrence Plain section of this segment has a more agricultural feel with some newer homes and sub divisions mixed in. The Hockanum Road section of this segment was observed to be more forested with less development. Traveling southbound the elevation begins to change a mile south of Bay Road. Lawrence Plain becomes increasingly hilly and windy on the southern section near Hockanum Road. Guardrails were present along curved sections of roadway and steep

slopes along the shoulders of the roadway and were in fair condition. Double yellow center lines and single white edge lines were observed to be in fair condition and speed limits were 35 to 45 mph.. Occasional river views were observed on this section as well. PVTA Route 39 and 39 express buses provide service between Smith College in Northampton, Hampshire College in South Amherst, and Mount Holyoke College in South Hadley during the school year. This service is not provided when the Colleges are on break..

The fifth segment is Hadley Street which is approximately 2.7 miles in length. Shoulder and lane width become more uniform on this segment of Route 47 with one 12 foot travel lane provided in each direction and 2 foot shoulders. Hadley Street begins with hills and curves and becomes more flat and residential on the southern section near Route 116. A sidewalk was observed on the east side of the road near the village center, the speed limit drops here from 40 mph to 30mph as well. Double yellow center lines and single white edge lines are provided and were observed to be in fair condition. Galvanized guardrails and curbing are present on much of this segment. The last half mile of Hadley Street has that village feel, with similar setbacks and mature trees. Hadley Street ends at Route 116 (College Street) at the second busiest intersection on the corridor. PVTA Route 39 and 39 express buses provide service between Smith College in Northampton, Hampshire College in South Amherst, and Mount Holyoke College in South Hadley during the school year. This service is not provided when the Colleges are on break.

Main Street in Hatfield was divided into two segments for this analysis. The first segment starts at the Whatley Town Line and runs south for 2.7 miles ending at the Hatfield Center Historic District just north of King Street. This section of road can be characterized as being relatively flat and straight with significant curves near the water treatment facility. Double yellow center lines and single white edge lines were observed and speed limits ranged from 35 to 45 mph. A single 12 foot travel lane is provided for each direction of travel with 2-4 foot shoulders on either side. A mix of galvanized and loose tension guardrails were observed along curves on this section. Agriculture is the theme for of this segment of roadway with the exception of the Broad Street Historic district which has more of a village feel. The segment becomes more residential near the southern end of this segment.

The second Main Street segment consists of the Hatfield Center Historic district and continues south 1.2 miles to Maple Street. This section of roadway traverses the village center of Hatfield. The majority of the houses have equal setbacks from the Road, there are many mature trees along this section of road; and sidewalks are present of both sides of the roadway for the majority of this section. One 12 foot travel lane is provided in each direction, shoulders varied in width from 1 foot at the northern end to 6 feet at the southern end. 14 foot shoulders were observed on both sides on Main Street in front of the town offices providing parking for residents. Double yellow center lines and single white edge lines were observed to be in fair to poor condition.

Table 7-1: Summary of Road Layout Details in Franklin County

Seg #	Route #	Alternative Roadway Name	Town	Segment Length [mi]	From	To	Transit Route	Functional Class	Jurisdiction	Speed Limit	Surface Width [ft]	Right of Way [ft]	Shoulder Width [ft]	Sidewalks	Terrain
1	63	Hinsdale Road	Northfield	0.64	New Hampshire State Line	Route 10 (Wanamaker Road)	No	Rural Major Collector	MassDOT	50	24	60	0-10	no	Level - Rolling
2	10 / 63	Main Street	Northfield	0.54	Hinsdale Road	Moody Street	No	Rural Minor Arterial	MassDOT	40	24	65	2-6	no	Rolling - Level
3	10 / 63	Main Street	Northfield	0.47	Moody Street	Holton Street	No	Rural Minor Arterial	MassDOT	35-40	24	65	2-6	yes	Level
4	10 / 63	Main Street	Northfield	0.37	Holton Street	Dickinson Street	No	Rural Minor Arterial	MassDOT	35	24	135	2-6	yes	Level
5	10 / 63	Main Street	Northfield	0.38	Dickinson Street	Parker Avenue	No	Rural Minor Arterial	MassDOT	35	24	135	6	yes	Level
6	10 / 63	Main Street	Northfield	0.37	Parker Avenue	Maple Street	No	Rural Minor Arterial	MassDOT	35-40	24	135	0 - 6	yes	Level
7	10 / 63	Main Street	Northfield	0.32	Maple Street	Route 10	No	Rural Minor Arterial	MassDOT	40	24	135	0	yes	Level
8	63	Millers Falls Road	Northfield	0.83	Route 10	Upper Farms Road	No	Rural Minor Arterial	MassDOT	40-55	24	135	10	no	Level - Rolling
9	63	Millers Falls Road	Northfield	1.76	Upper Farms Road	Pine Meadow Road	No	Rural Minor Arterial	MassDOT	55	24	80	10	no	Level
10	63	Millers Falls Road	Northfield	2.26	Pine Meadow Road	Lower Farms Road	No	Rural Minor Arterial	MassDOT	45-55	22 - 24	60	0 - 10	no	Level
11	63	Millers Falls Road	Northfield	0.83	Lower Farms Road	Erving Town Line	No	Rural Minor Arterial	MassDOT	45-50	22	60	0	no	Level
12	63	Northfield Road	Erving	0.79	Northfield Town Line	Louis Greuling Circle	No	Rural Minor Arterial	MassDOT	40-50	22	50	0	no	Level
13	63	Northfield Road	Erving	0.53	Louis Greuling Circle	Erving Elementary School	No	Urban Principal Arterial	MassDOT	40	22-24	50	0	no	Level
14	63	Northfield Road	Erving	0.20	Erving Elementary School	Forest Street	No	Urban Principal Arterial	MassDOT	40	24	50	0	yes	Level
15	63	Moore Street	Erving	0.27	Forest Street	Park Street	No	Urban Principal Arterial	Town	35	24	50	0	yes	Level
16	63	Moore Street	Erving	0.12	Park Street	Prospect Street	No	Urban Principal Arterial	Town	35	22	50	0	yes	Level
17	63	Lester Street	Erving	0.19	Prospect Street	Gunn St / Montague Town Line	No	Urban Principal Arterial	Town	25	22 - 24	50	0	yes	Rolling
18	63	Bridge Street	Montague	0.19	Erving Town Line	West Main Street	No	Urban Principal Arterial	Town	20	24	44	0	yes	Level
19	63	West Main Street	Montague	0.08	Bridge Street	Federal Street	No	Urban Principal Arterial	Town	20	24	45	0	yes	Level
20	63	Federal Street	Montague	0.27	West Main Street	South Lyman Street	No	Urban Principal Arterial	MassDOT	35	24	70	0-10	yes	Level
21	63	Federal Street	Montague	0.12	South Lyman Street	Highland Street	FRTA #22 FRTA #23	Urban Principal Arterial	MassDOT	35	24	70	4-10	yes	Level
22	63	Federal Street	Montague	1.88	Highland Street	Lake Pleasant Road	FRTA #22 FRTA #23	Urban Principal Arterial	MassDOT	40-50	24	70	0	no	Level
23	63	Federal Street	Montague	0.41	Lake Pleasant Road	Swamp Road	FRTA #22 FRTA #23	Urban Principal Arterial	MassDOT	45-50	24	70	0	no	Level - Rolling
24	63	Federal Street	Montague	1.09	Swamp Road	South Street	FRTA #22 FRTA #23	Rural Minor Arterial	MassDOT	50	22	70	0	no	Rolling - Level
25	63	Federal Street	Montague	0.91	South Street	North Leverett Road	No	Rural Minor Arterial	MassDOT	50	22 - 24	70	0	no	Level
26	47	North Leverett Road	Montague	0.15	Federal Street	Sunderland Road	No	Rural Major Collector	Town	n/a	22	55	0	no	Level

27	47	Sunderland Road	Montague	0.80	North Leverett Road	Sunderland Town Line	No	Rural Major Collector	Town	40	22	37	0	no	Level
28	47	Montague Road	Sunderland	2.39	Montague Town Line	Falls Road	No	Urban Minor Arterial	Town	35-40	22	45	0	no	Level - Rolling
29	47	North Main Street	Sunderland	0.95	Falls Road	North Silver Lane	No	Urban Minor Arterial	Town	35	22	50	0	no	Level
30	47	North Main Street	Sunderland	0.50	North Silver Lane	Route 116	No	Urban Minor Arterial	Town	30-35	22	50	0	yes	Level
31	47	South Main Street	Sunderland	0.46	Route 116	Old Amherst Road	PVTA #31 PVTA #46	Urban Minor Arterial	Town	35	26	50	1	yes	Level
32	47	River Road	Sunderland	1.49	Old Amherst Road	Hadley Road	PVTA #31 PVTA #46	Urban Minor Arterial	Town	35-45	22 - 26	48	0	no	Level
33	47	Hadley Road	Sunderland	1.24	River Road	Hadley Town Line	No	Urban Minor Arterial	Town	40-45	22	48	0	no	Level

Table 7-2: Summary of Road Layout Details in Hampshire County

Seg #	Route #	Alternative Roadway Name	Town	Segment Length [mi]	From	To	Transit Route	Functional Class	Jurisdiction	Speed Limit	Surface Width [ft]	Right of Way [ft]	Shoulder Width [ft]	Sidewalks	Terrain
1	47	River Drive	Hadley	5.6	Sunderland Town Line	Middle Street	No	Urban Minor Arterial	Town	25-40	24	60	1-2	No	Level
2	47	Middle Street	Hadley	1.1	River Drive	Bay Road	PVTA #B43	Urban Principal Arterials	Town	30-35	24	90	1-2	Yes	Level
3	47	Bay Road	Hadley	0.6	Middle Street	Lawrence Plain Road	PVTA #39, #39X	Urban Principal Arterials	Town	30-35	24	40	1-2	Yes	Level
4	47	Lawrence Plain Road / Hockanum Road	Hadley	3.8	Bay Road	Hadley Street	PVTA #39, #39X	Urban Principal Arterials	Town	35-45	22	60	0-2	No	Rolling
5	47	Hadley Street	South Hadley	2.7	Hockanum road	College Street	PVTA #39, #39X	Urban Principal Arterials	Town	30-40	24	60	2	Yes	Rolling
6		Main Street	Hatfield	2.7	Whatley Town Line	Hatfield Center Historic District	No	Urban Minor Arterial	Town	35-45	24	48	2-4	No	Level
7		Main Street	Hatfield	1.2	Hatfield Center Historic District	Elm Street	No	Urban Minor Arterial	Town	25-35	24	55	1-6	Yes	Level

Sources: MassDOT Road Inventory File (RIF) year end 2013, MassDOT Transportation Planning, and verified by field survey by FRCOG, and PVPC staff.

Roadside Features: Curbing, Guardrails, Retaining Walls and Signs

For the purposes of maintaining and enhancing the scenic qualities of the Byway, roadside features such as curbing, guardrails, retaining walls, and signage were reviewed. These features are important considerations to ensure that the scenic and rural qualities of the Byway corridor are maintained.

Curbs

Curbing is sporadic along the Byway. It is located primarily in the developed areas/town centers. In the locations where it is used in Franklin County, it is generally granite or asphalt curbing installed as part of a sidewalk. There is granite curb along both sides of the roadway in Northfield from the northern junction of Routes 10/63 into the town center.

Guardrails

Guardrails are an important safety feature along the road, preventing or mitigating crashes in dangerous areas alongside the road. There is a limited amount of guardrail along the Byway. It is installed at locations where there are steep slopes past the edge of the road and where culverts pass under the roadway. The guardrail along the Byway appears to be in good condition. All guardrails along the Byway are standard gray galvanized steel rail on steel posts. Future replacement of the existing guardrail should consider using rails more in keeping with the rural character of the Byway while still maintaining the required level of safety, such as weathered steel that has a brown color that blends into the surroundings.

Retaining Walls

Roadside retaining walls are used to restrain the soil from areas that are at a higher elevation than the roadway. They serve an important structural purpose while also contributing to the aesthetic character of the road. There are several stone retaining walls along the Franklin County portion of the Byway. Photo(s)

Signs

Signs are an important tool that can encourage tourism and exploration along the Byway. It is important that travelers can identify their location and navigate to sites along the way. Traffic safety/warning signs serve the important function of keeping the Byway safe. However, signs can also clutter the rural streetscape of the Scenic Byway, and disrupt the view-shed.

The Western Massachusetts Scenic Byway Marketing Project is currently underway and includes the creation and installation of wayfinding signs for each of the seven Scenic Byways in western Massachusetts. The intention of the installation of a system of wayfinding signs for all of the Byways is to create signs that are easily identifiable as part of the Scenic Byway system, and also to help visitors to navigate the Byways and the

attractions along the way. As part of that project a logo has been developed for the Connecticut River Scenic Byway and wayfinding signs will be installed along the route.

As part of the development of this plan, signs were assessed for their condition, location and the number of signs. Most of the signs along the roadway in Franklin County are standard traffic signs that have been installed in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), and approved by MassDOT. There are not an excessive number of signs; however, there may be an opportunity at several intersections to consolidate some of the signs. Warning signs for such things as intersections and sharp curves are appropriately provided, as are speed limit signs. Route markers appear to be provided at all the appropriate decision points, and periodically along the Byway to assure drivers that they are still on the correct route. At the major intersections, there are large sized route number signs to inform drivers of their options and major destinations.

For the most part, the signs along the byway are in good condition, but there are some that appear to be nearing the end of its useable life and should be considered for replacement. Some signs may not have the required level of retroreflectivity to be visible with headlights in the dark. Additionally, in several locations, roadside vegetation was obstructing the signs. A more detailed assessment of the signs could assess the number, positioning and condition of the individual signs in order to determine where improvements could be made.

Pavement Conditions and Pavement Management Analysis

Generally, there are two causes of pavement deterioration: the natural environment and traffic use. It is important to distinguish these distresses because the source of the deterioration helps to determine the solution. Pavement deterioration is influenced by weather, traffic loading, construction quality, materials, and interim maintenance tasks. Effective and timely maintenance will extend the life cycle of pavement.

Pavement Management System (PMS) is a planning method that is used to collect and monitor information on current pavement conditions, and to evaluate and prioritize alternative maintenance, rehabilitation and reconstruction (repair) strategies. It is an effective tool because as pavement deteriorates the cost to restore it to excellent condition increases significantly. It is more cost effective to complete routine or smaller scale repairs than to wait for the roadway to deteriorate to very poor condition. FRCOG and PVPC complete PMS planning programs to monitor the conditions of their regional roadways.

Franklin County

The FRCOG has completed pavement management since the early 1990s. In 1997 the FRCOG concluded a three-year contract with MassDOT (formerly MassHighway) that included the survey and analysis of nearly 500 miles of Federal-Aid and State Transportation Program (STP) funded roads in the 26 towns in Franklin County. FRCOC recently restarted its pavement management program and is currently surveying roadways throughout Franklin County, including those along the Byway. Once windshield surveys

have been completed, pavement condition reports will be produced that will aid the towns in planning for long-term pavement management. Surveys will be conducted on a three-year rotating schedule throughout the county.

Pavement markings are an important part of the pavement infrastructure, delineating the boundaries of the travel lanes and edge of road, indicating where passing is allowed, indicate which movements are allowed at intersections, and marking the locations of pedestrian crossings and bicycle lanes. The pavement markings present on the Byway provide the appropriate information, but the majority of the markings are faded or not sufficiently retro-reflective.

Hampshire County

PVPC has a system in place for managing pavement for all Federal-Aid eligible roadways in the Pioneer Valley region. Route 47 is a functionally classified roadway, which relies on federal funding for much of its pavement maintenance activities.

PVPC staff surveyed the 14 miles that comprises the Route 47 corridor from the Sunderland town line to South Hadley, as well as the 4 miles of Main Street in Hatfield. The study area was divided into 7 roadway segments. Overall Condition Index (OCI) is a measurement of roadway serviceability and is a method to establish performance criteria. The average OCI for Route 47 in February of 2015 was rated at 50 (Fair) in Hadley, 82 (Good) in South Hadley and a 55 (Fair) in Hatfield. The OCI condition survey analysis of roadway segments is broken down as follows for Route 47: 14% of the segments have an OCI greater than 89.5 (excellent), and 27% of the roadway segments have a PCI less than 47.5 (poor). On Main Street in Hatfield 17% was rated as good, 33% as Fair and 50% as Poor. Table 7-3 lists Route 47 corridor and Main Street OCI ratings.

Table 7-3: Summary of OCI Ratings for Hampshire County

Seg #	Route #	Town	Street Name	From	To	OCI	
1	47	Hadley	River Drive	Sunderland Town Line	Middle Street	47	Poor
2	47	Hadley	Middle Street	River Drive	Bay Road	61	Fair
3	47	Hadley	Bay Road	Middle Street	Lawrence Plain Road	52	Fair
4	47	Hadley	Lawrence Plain Road / Hockanum Road	Bay Road	Hadley Street	44	Poor
5	47	South Hadley	Hadley Street	Hockanum road	College Street	83	Good
6		Hatfield	Main Street	Whatley Town Line	Hatfield Center Historic District	61	Fair
7		Hatfield	Main Street	Hatfield Center Historic District	Mpale Street	52	Fair

Traffic Volumes

FRCOG, PVPC, and MassDOT have collected traffic volume data at a number of locations along the Byway in the recent past. The count locations consist of traffic volume data collected during a period of at least two consecutive weekdays, but often encompassing a full seven days. For each location, the collected weekday count data was averaged to calculate an Average Weekday Traffic (AWT) volume, which was then multiplied by a seasonal adjustment factor to produce an Average Annual Daily Traffic (AADT) volume, which is meant to reflect the average daily volume as if the count had been conducted over a full year.

Franklin County

Table 7-4 provides traffic volume data for the Byway in Franklin County that has been collected over the past twelve (12) years. Traffic volumes along the Byway vary from about 1,260 vehicles per day on Route 63 near the New Hampshire State Line in Northfield to 7,700 vehicles per day between Parker Avenue and Maple Street in the center of Northfield. The highest volumes are in this Route 10/63 section of the Byway. On the remainder of the Byway, traffic volumes are relatively consistent, between 2,400 to 3,400 vehicles per day, although the volume at the intersection with Route 116 in Sunderland is notably higher at 4,600 to 4,700 vehicles per day.

Hampshire County

The Pioneer Valley Planning Commission (PVPC) collects daily traffic count information at sample locations across the 43 cities and towns in Hampden and Hampshire Counties under contract with the Massachusetts Department of Transportation (MassDOT). MassDOT requests specific traffic count locations each year as part of PVPC's 3C contract. Additional counts are conducted for member communities on an as requested basis (up to 2 free counts per calendar year) and for private businesses for a nominal fee. The PVPC also selects its own traffic count locations to supplement data collection activities required as part of ongoing corridor studies, the regional congestion management system, the regional pavement management system, and the regional transportation model. In addition, the PVPC houses shared traffic counts performed by a member community.

Table 7-5 provides traffic volumes for the Hampshire County portion of the Byway. As can be seen from the table, volumes along the corridor vary greatly from 9,000 vehicles per day on Bay Road to 2,200 vehicles per day on Middle Street (south of Route 9). On Main Street in Hatfield volumes are higher on the southern portion of the roadway near the Town Center.

Table 7-4: Connecticut River Scenic Byway Traffic Volume Data in Franklin County

Seg #	Route No.	Town	Street Name	From	To	AADT	Count Year
1	63	Northfield	Hinsdale Road	New Hampshire State Line	Route 10 (Wanamaker Road)	1260	2008
2	10 / 63	Northfield	Main Street	Hinsdale Road	Moody Street	5200	2006
6	10 / 63	Northfield	Main Street	Parker Avenue	Maple Street	7700	2008
7	10 / 63	Northfield	Main Street	Maple Street	Route 10	7600	2008
8	63	Northfield	Millers Falls Road	Route 10	Upper Farms Road	2600	2008
12	63	Erving	Northfield Road	Northfield Town Line	Louis Greuling Circle	2400	2012
14	63	Erving	Northfield Road	Erving Elementary School	Forest Street	2400	2007
17	63	Erving	Lester Street	Prospect Street	Montague Town Line	3300	2008
25	63	Montague	Federal Street	South Street	North Leverett Road	3400	2002
26	47	Montague	N. Leverett Road	Federal Street	Sunderland Road	2600	2002
27	47	Montague	Sunderland Road	North Leverett Road	Sunderland Town Line	3100	2006
30	47	Sunderland	North Main Street	North Silver Lane	Route 116	4700	2014
31	47	Sunderland	South Main Street	Route 116	Old Amherst Road	4600	2014
33	47	Sunderland	Hadley Road	River Road	Hadley Town Line	2500	2007

Sources: Data collected by FRCOG and the Transportation Data Management System provided online by MassDOT

Table 7-5: Connecticut River Scenic Byway Traffic Volume Data in Hampshire County

Seg #	Route #	Town	Street Name	From	To	AADT	Count Year
1	47	Hadley	River Drive	Sunderland Town Line	Middle Street	2300	2002
2	47	Hadley	Middle Street	River Drive	Bay Road	2200	2002
3	47	Hadley	Bay Road	Middle Street	Lawrence Plain Road	9000	2001
4	47	Hadley	Lawrence Plain Road / Hockanum Road	Bay Road	Hadley Street	4795	2013
5	47	South Hadley	Hadley Street	Hockanum road	College Street	4394	2014
6		Hatfield	Main Street	Whatley Town Line	Hatfield Center Historic District	1400	2002
7		Hatfield	Main Street	Hatfield Center Historic District	Maple Street	1900	2003

The AADT volume from different years at the same location is used to calculate an average Annual Growth Rate (AGR), which quantifies the percent of traffic volume growth over time. It is important to note that, while the methodology for calculating AADT volumes follows a standard procedure, the seasonal adjustment factors used to calculate it rely on data from over 200 permanent count stations located throughout the State and may not reflect the true seasonal variability of a specific location. To try and minimize the impact of the seasonal adjustment factors, every attempt is made to conduct the counts during the same time period in different years.

As part of the development of the *Franklin County 2012 Regional Transportation Plan*, traffic count data for locations throughout Franklin County was compiled, and a regional average AGR was calculated. This calculation showed an average AGR of negative two percent (-2%) per year for the region between 2005 and 2009. In other words, traffic volumes have declined at a rate of approximately two percent per year.

Level of Service Analysis

Level of Service (LOS) analysis quantifies how well a section of roadway is operating under peak hour traffic volumes based on the driver's expectations. The classification is based on calculating the quality or efficiency of the traffic flow for the motorist. A delay is calculated based on the difference between the travel time actually experienced and the travel time that would have been experienced under ideal road conditions. *The Highway Capacity Manual* (HCM) provides a methodology for calculating the LOS for rural two-lane roadways such as Routes 63 and 47. Overall there are three classes of two-lane highways defined as Class I, Class II and Class III.

The Level of Service calculation analyzes the geometry of the road, peak hour traffic volumes and environmental conditions, including the lane and shoulder widths, amount of available passing, and the mix of vehicle types in order to calculate the performance rating. LOS is based on a scale "A" through "F" (with "A" being the best and "F" being the worst), according to the following general definitions:

- LOS A – Describes the highest quality of service, when drivers are able to drive at their desired speed. The passing frequency required to maintain these speeds has not reached a demanding level with drivers delayed less than 40 percent of the time.
- LOS B – The demand for passing to maintain desired speeds become significant, with drivers being delayed in platoons (multiple vehicles following closely) up to 50% of the time.
- LOS C – Traffic volumes are increasing, resulting in a noticeable increase in platoon formation and size. Passing opportunities begin to become infrequent although traffic flow remains stable, in that reasonable travel speed is maintained. Slow moving and turning traffic may cause congestion. Time spent following other vehicles will likely be up to 65% of the time.
- LOS D – Traffic flow is unstable and the opposing flows begin to operate separately as passing opportunities become very limited. Passing demand is high, but passing

capacity approaches zero. Turning vehicles and roadside distractions cause major interruptions in the traffic stream. Platoon size increases to between five and ten vehicles on average delaying vehicles up to 85% of the time.

- LOS E – Average travel speeds will likely be less than 40 miles per hour and greater than 85% of the time is spent in platoons behind slower or turning vehicles as passing becomes virtually impossible.
- LOS F – Traffic flow is heavily congested as traffic demand exceeds the capacity of the roadway.

In general, it is desirable to maintain traffic conditions at a LOS C or better.

Franklin County

In Franklin County, the Byway is defined as Class II and Class III in different sections. A Class II two-lane highway is defined as a highway where motorists do not necessarily expect to travel at high speeds. A two-lane highway that functions as an access routes to a Class I facility, (Interstate 91 is defined as a Class I facility) serves as scenic or recreational route, or passes through rugged terrain is defined as Class II. Class III two-lane highways are highways that serve moderately developed areas. The Byway is a Class III roadway through the Northfield and Sunderland town centers, the Millers Falls area of Montague and in the southern segment in Erving.

A LOS analysis was completed using the HCM methodology for the Franklin County sections of the Byway with required information readily available. The Byway was split up into segments of similar roadway and traffic characteristics. Table 7-6 provides the results of the LOS analysis for the various segments of the Byway and reflects conditions a driver would experience during the weekday morning peak hour (typically sometime between 7:00 and 9:00 AM) as well as the afternoon peak hour (typically sometime between 4:00 and 6:00 PM) when the highest one-hour volumes were recorded. The analysis shows that, along the majority of the Byway, drivers would experience an acceptable LOS C or better during these peak periods. There are two pairs of segments that would experience LOS D: Northfield town center and Sunderland town center.

In addition to calculating an LOS, the Highway Capacity Software provides a methodology to calculate the capacity of the roadway. The capacity of a roadway is defined as the maximum number of vehicles that can pass a point on a roadway in an hour. To determine how close to capacity a roadway is operating, the peak hour volume is divided by the capacity to produce the volume/capacity or "v/c" ratio of 0 to 1.00. A v/c ratio equal to 1.00 indicates a roadway operating at total capacity, meaning no additional traffic can be added without causing total gridlock. In general, a lower v/c ratio reflects a less congested roadway and therefore a more enjoyable and free-flowing route to drive. Additionally, the lower the v/c ratio, the more traffic that can be added to the roadway before changes would need to be made. The volume/capacity ratio is included in Table 7-6 for each of the analyzed roadway segments. It can be seen from the table that there is plenty of spare capacity available along the Byway, with the majority of the Byway operating between 5% and 25% of capacity during peak travel periods.

There are six intersections along the Byway in Franklin County where drivers would be required to come to a stop or make a left or right turn which may impact the LOS of the Corridor at these intersections. The intersections are:

- Route 63 (Hinsdale Road) / Route 10 (Wanamaker Road) / Route 10/63 (Main Street), Northfield;
- Route 10/63 (Main Street) / Route 10 / Route 63 (Millers Falls Road), Northfield;
- Route 63 (Lester Street) / Route 63 (Bridge Street) / River Street, Erving;
- Route 63 (Federal Street) at Route 47 (North Leverett Road), Montague;
- Route 47 (North Leverett Road) / Route 47 (Sunderland Road) / Main Street, Montague; and
- Route 47 (North & South Main Street) at Route 116 (Amherst Road),Sunderland.

Congestion has been reported as an issue on Route 47 in Sunderland during peak hours and during elementary school dismissal time. The delay is associated with the traffic signal at the intersection of Route 47 and Route 116, where it may take 5 cycles of the signal to clear traffic queues at the intersection. This intersection was the location of a Road Safety Audit (RSA), which is discussed further in the Safety Analysis and Crash Data section of this report.

Hampshire County

For Hampshire County, PVPC utilized the same LOS analysis for Route 47 and Main Street in Hatfield as FRCOG used for its portion of Route 116. The results of the LOS analysis (table 7.7) indicate the roadway is operating at a LOS of "XX". The v/c ratio for the Hampshire County section of Route 47 averages XX indicating the roadway To be added .

MassDOT project 604035 consist of a new signal equipment as well as minor geometric improvements at the intersection of Middle Street (Route 47) and Russell Street (Route 9). This project is expected to result in a net improvement for congestion and safety at the intersection.

Table 7-6: Connecticut River Scenic Byway Level-of-Service (LOS) and Volume-to-Capacity (*v/c*) Ratios, Franklin County

Seg #	Route No.	Town	Street Name	From	To	Peak Period	Class	LOS	v/c
1	63	Northfield	Hinsdale Road	New Hampshire State Line	Route 10 (Wanamaker Road)	PM	II	A	0.05
2	10 / 63	Northfield	Main Street	Hinsdale Road	Moody Street	PM	II	C	0.24
6	10 / 63	Northfield	Main Street	Parker Avenue	Maple Street	PM	III	D	0.26
7	10 / 63	Northfield	Main Street	Maple Street	Route 10	PM	III	D	0.28
8	63	Northfield	Millers Falls Road	Route 10	Upper Farms Road	PM	II	B	0.09
12	63	Erving	Northfield Road	Northfield Town Line	Louis Greuling Circle	PM	II	A	0.09
14	63	Erving	Northfield Road	Erving Elementary School	Forest Street	PM	III	C	0.10
17	63	Erving	Lester Street	Prospect Street	Montague Town Line	PM	III	C	0.18
27	47	Montague	Sunderland Road	North Leverett Road	Sunderland Town Line	PM	II	C	0.12
30	47	Sunderland	North Main Street	North Silver Lane	Route 116	PM	III	D	0.19
31	47	Sunderland	South Main Street	Route 116	Old Amherst Road	PM	III	D	0.18
33	47	Sunderland	Hadley Road	River Road	Hadley Town Line	PM	II	B	0.12

Table 7-7 Connecticut River Scenic Byway Level-of-Service (LOS) and Volume-to-Capacity (*v/c*) Ratios, Hampshire County

Seg #	Route No.	Town	Street Name	From	To	Peak Period	Class	LOS	v/c
1	47	Hadley	River Drive	Sunderland Town Line	Middle Street	Pm			
2	47	Hadley	Middle Street	River Drive	Bay Road	Pm			
3	47	Hadley	Bay Road	Middle Street	Lawrence Plain Road	Pm			
4	47	Hadley	Lawrence Plain Road / Hockanum Road	Bay Road	Hadley Street	Pm			
5	47	South Hadley	Hadley Street	Hockanum road	College Street	Pm			
6		Hatfield	Main Street	Whatley Town Line	Hatfield Center Historic District	Pm			
7		Hatfield	Main Street	Hatfield Center Historic District	Maple Street	Pm			

Safety Analysis and Crash Data

According to the *Highway Safety Manual* (HSM)[1] the term "safety" refers to the crash frequency or crash severity, or both, and collision type for a specified time period, a given location, and a set of geometric and operational conditions. A crash, according to the HSM, is defined as a set of events that result in injury or property damage due to the collision of at least one motorized vehicle and may involve collision with another motorized vehicle, a bicyclist, a pedestrian, or an object. Collisions are inherently random and rare events with a complex number of factors contributing to each crash, making them unique events. The circumstances that lead to a crash in one event will not necessarily lead to a crash in a similar event and this is due to the different factors contributing to crashes, which are grouped into the following three primary categories:

- Human Factors – The behavior of humans including age, judgment, driver skills, attention, fatigue and sobriety;
- Vehicle Factors – The design and maintenance of vehicles; and
- Roadway/Environment Factors – The condition of the roadway and roadside environment including geometric alignment, cross-section, traffic control devices, surface friction, grade, signage, weather, and visibility.

Crash data is available from the Massachusetts Registry of Motor Vehicles (RMV) and also local Police Departments. Massachusetts law requires that all vehicular crashes that result in $1,000 or more of property damage or an injury or a fatality must be reported to the RMV and the local Police Department within five days, using a standardized *Motor Vehicle Crash Operator Report* form. The RMV maintains a database from these crash reports which provides basic details on all crashes reported to them, such as location, severity, weather and road conditions and type of collision. This data is the most readily available data for the Corridor, and was reviewed to determine if there are any locations or sections along the Byway experiencing a high number of crashes.

Below is a summary of the crash data and findings for locations along the Byway in Franklin and Hampshire County based on the RMV data. The most recent three-year period for which RMV crash data was available is the period from 2010 through 2012. An overview of crashes that occurred along the Byway during this period by segment is in Table 7-8 and 7-9. Crashes are summarized according to the Byway segment on which they were reported. The location of some crashes could not be pinpointed to a specific Byway segment with the information provided in the RMV crash data. These crashes are summarized by town in the columns labeled U*.

[1] American Association of State Highway and Transportation Officials (AASHTO), *Highway Safety Manual*, Washington, DC, 2010.

Table 7-8: Connecticut River Scenic Byway Crash Summary, Franklin County (2010-2012)

SEGMENT	1	2-3	4-5	6-7	8	9-10	11	U*	12	13	14-16	17	U*	18-19	20-21	22	23	24	25	26	27	U*	28	29-30	31	32	33	Total	%
TOWN	**Northfield (44 crashes)**								**Erving (12 crashes)**					**Montague (50 crashes)**									**Sunderland (41 crashes)**						
Total Reported Crashes	**3**	**10**	**5**	**11**	**3**	**8**	**1**	**3**	**3**	**2**	**0**	**2**	**5**	**6**	**4**	**4**	**0**	**4**	**8**	**4**	**11**	**9**	**15**	**15**	**2**	**5**	**4**	**147**	
Segment Length (mi)	0.64	1.01	0.75	0.69	0.83	4.02	0.83	8.77	0.79	0.53	0.20	0.19	2.1	0.27	0.39	1.88	0.41	1.09	0.91	0.15	0.80	5.90	2.39	1.45	0.46	1.49	1.24	23.8	
Crashes per Mile	4.7	9.9	6.7	15.9	3.6	2.0	1.2	0.3	3.8	3.8	0.0	10.5	2.4	22.2	10.3	2.1	0.0	3.7	8.8	26.7	13.8	1.5	6.3	10.3	4.3	3.4	3.2	6.2	
% of Crashes at an Intersection	0%	80%	60%	36%	100%	13%	0%	0%	33%	0%	-	0%	0%	50%	75%	0%	-	25%	88%	0%	36%	11%	0%	53%	50%	0%	50%	34%	
Crash Severity																													
Property Damage Only	1	7	3	7	3	4	1	1	2	2	-	1	3	6	3	2	-	3	6	2	8	8	11	12	2	4	3	105	71%
Non-Fatal Injury	2	2	2	2	0	2	0	2	0	0	-	1	2	0	1	0	-	1	2	2	2	1	4	3	0	1	1	33	22%
Unknown	0	1	0	2	0	2	0	0	1	0	-	0	0	0	0	2	-	0	0	0	1	0	0	0	0	0	0	9	6%
Fatality	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0%
Manner of Collision																													
Single Vehicle Crash	3	4	1	6	1	6	1	1	2	2	-	1	4	3	2	4	-	3	1	1	6	6	7	5	0	3	1	74	50%
Rear-End	0	3	1	3	2	0	0	2	1	0	-	0	0	1	2	0	-	0	2	0	2	0	3	5	1	0	1	29	20%
Angle	0	2	3	2	0	0	0	0	0	0	-	0	0	0	0	0	-	0	4	3	1	1	1	2	1	2	2	24	16%
Sideswipe, same direction	0	0	0	0	0	0	0	0	0	0	-	0	1	1	0	0	-	1	0	0	0	0	1	1	0	0	0	5	3%
Sideswipe, opposite direction	0	1	0	0	0	0	0	0	0	0	-	1	0	1	0	0	-	0	1	0	1	0	1	0	0	0	0	6	4%
Head-On	0	0	0	0	0	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	1	2	1	0	0	0	6	4%
Unknown	0	0	0	0	0	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	1	0	0	0	0	0	2	1%
Roadway Condition																													
Dry	1	9	4	10	3	5	0	3	1	0	-	2	3	3	3	4	-	2	5	1	4	5	5	11	1	4	2	91	62%
Snow/Slush/Ice	0	1	0	1	0	2	1	0	0	1	-	0	1	2	1	0	-	2	1	2	4	3	9	2	1	1	1	36	24%
Wet	0	0	1	0	0	1	0	0	2	1	-	0	1	1	0	0	-	0	1	1	3	1	1	2	0	0	1	17	12%
Sand, mud, dirt, oil, gravel	2	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	2	1%
Other/Unknown	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	0	0	0	0	0	1	1%
Lighting Condition																													
Daylight	2	7	3	7	2	5	0	2	1	2	-	2	0	4	2	2	-	1	8	3	7	6	8	10	1	1	2	88	60%
Dark - Roadway not lighted	1	1	0	0	0	3	1	1	1	0	-	0	4	0	0	2	-	1	0	1	3	2	6	3	1	4	2	37	25%
Dark - Roadway lighted	0	1	2	3	1	0	0	0	1	0	-	0	0	2	1	0	-	2	0	0	0	1	0	0	0	0	0	14	10%
Dawn/Dusk	0	1	0	1	0	0	0	0	0	0	-	0	1	0	1	0	-	0	0	0	1	0	1	2	0	0	0	8	5%

Source: Registry of Motor Vehicles Crash Data System
U indicates crashes reported on the Byway for which a precise location could not be determined.*

Table 7-9: Connecticut River Scenic Byway Crash Summary, Hampshire County (2010-2012)

SEGMENT	1 River	2 Middle	3 Bay	4 H/L	5	6
	Hadley (68 total reported crashes)				South Hadley (33 total reported crashes)	Hatfield (13 total reported crashes)
Total Number of Reported Crashes	20	20	13	15	33	13
Segment Length (miles)	6.8	1.1	0.6	3.8	2.7	3.9
Crashes/Mile	2.94	18.18	21.67	3.95	12.22	3.33
Crash Severity						
Property Damage Only	8	12	8	9	23	8
Non-Fatal Injury	11	8	5	6	7	5
Unknown	1	0	0	0	3	0
Fatality	0	0	0	0	0	0
Manner of Collision						
Single Vehicle Crash	9	0	3	5	13	10
Rear-End	5	13	7	4	7	0
Angle	5	5	3	2	10	2
Sideswipe, same direction	0	2	0	2	1	0
Sideswipe, opposite direction	0	0	0	1	0	0
Head-On	1	0	0	1	2	1
Roadway Condition						
Dry	13	17	7	10	20	13
Snow/Slush/Ice	3	1	0	2	8	0
Wet	4	1	6	3	4	0
Other/Unknown	0	1	0	0	1	0
Lighting Condition						
Daylight	16	16	10	10	20	7
Dark – Roadway not lighted	2	0	0	4	0	6
Dark – Roadway lighted	2	4	2	1	10	0
Dawn/Dusk	0	0	1	0	2	0
Other/Unknown	0	0	0	0	1	0

Franklin County

As shown in Table 7-8, there were a total of 147 reported crashes along the Byway in Franklin County between 2010 and 2012. The highest number (34%) of the reported crashes occurring along the Byway took place in Montague, which also had the highest number of crashes per mile (8.47 crashes/mile). A majority (71%) of the crashes resulted in Property Damage Only (PDO). Approximately 22% of the crashes resulted in a non-fatal injury, and no fatal injuries were reported during the three-year period.

The most common type of collision was a single vehicle crash accounting for 50% of reported crashes. Crashes with only a single vehicle typically involve a vehicle that leaves the roadway and crashes into a roadside object, such as a tree or guardrail. This crash type was the most prominent mode for crash types not occurring at an intersection. Most of the remaining crashes were either rear-end (20%) or angle crashes (16%). Rear-end crashes generally involve two vehicles traveling in the same direction, the first vehicle slows to make a turn and the following driver does not react in time and hits the back of the first vehicle. Rear-end crashes were the most common crash type occurring at intersections. Angle type crashes generally involve a turning vehicle (making a left-turn for example) from one direction colliding with or being hit by a vehicle coming from the opposite direction and are most common at intersections. The majority (66%) of crashes occurring along the Byway happened along the roadway and not at an intersection. Additionally, the majority of crashes occurred on dry pavement and in daylight conditions.

The majority of injury crashes reported on the Byway were not at an intersection. Crashes involving vehicles leaving the travel lane at non-intersection locations are known as lane departure crashes. These types of crashes often involve vehicles traveling at higher rates of speed. Lane departure crashes account for a disproportionate number of incapacitating or fatal injuries in Massachusetts. For the period from 2004 to 2011, 24% of incapacitating injuries and 55% of fatalities from roadway crashes resulted from lane departures.[2] Lane departure crashes have been identified as a strategic emphasis area in the 2006 Massachusetts Strategic Highway Safety Plan (SHSP) and in the 2013 update to the SHSP. Statewide strategies to address lane departure crashes include incorporating safety criteria in the highway project selection process, conducting Road Safety Audits, and increasing the quality of crash information in data systems.

The lack of shoulders on much of the Byway may contribute to the high incidence of lane departure crashes. With no paved shoulders, vehicles that depart the travel lane to the right have nowhere to recover before potentially striking roadside objects. There is also nowhere to accommodate rumble strips, which have been shown to reduce the frequency and severity of lane departure crashes.

Road Safety Audits (RSAs) are a formal safety examination of a road or intersection by a multidisciplinary team to identify potential safety issues and make recommendations for

[2] Massachusetts Department of Transportation (MassDOT), *Massachusetts Strategic Highway Safety Plan*, June 2013

roadway safety improvements. They can focus on a particular location with a high incidence of crashes or on a particular crash type within a given study area. In recent years, FRCOG has cooperated with the MassDOT Safety Division to address safety issues at identified high-crash locations. The intersection of Route 47 and Route 116 in Sunderland was identified as a high-crash location in Franklin County for the three-year period 2008-2010 and was the subject of an RSA in July 2014. The RSA identified multiple safety issues, including roadway congestion, sight-distance obstructions, and inadequate pedestrian accommodations; and made recommendations for long-term, mid-term and short-term safety improvements to be implemented by the Town and/or MassDOT.

Hampshire County

Table7-9 shows a total of 114 reported crashes along the Byway in Hampshire County between 2010 and 2012. The vast majority of crashes (67%) were identified as single vehicle or rear end type crashes, (60%) of the crashes occurred during daylight hours, and (70%) of the crashes happened while the roadway surface was dry. The majority of crashes (60%) resulted in Property Damage Only (PDO). Approximately (37%) of the crashes resulted in a non-fatal injury; there were no fatalities reported during this time frame.

A crash involving only one vehicle which typically indicates a lane departure crash, this type of crash was the most common type of crash along the corridor (35%) followed closely by rear end crashes (32%) this indicates that driver error and in some cases roadway geometry influenced crashes along Route 47. Middle Street (Route 47) at Russell Street (Route 9) has been identified as crash cluster with an Equivalent Property Damage Only (EPDO) of 50 based on the 2010-2012 crash data. Route 47 at Route 9 was the only location along the corridor with a crash rate (7.55) higher than the state wide average of 3.35 per million vehicle miles traveled.

Of the 13 crashes identified in the Hatfield 5 (40%) of the crashes were located in the vicinity of the “S” curves near the water treatment plant. All 5 of the where single vehicle crashed indicating lane departure crashes.

Bridge Inventory

Bridges are a critical component of any transportation system. Maintaining the safety and functionality of bridges is a top priority. Bridges are predominantly under the domain of MassDOT. Bridges are inspected by MassDOT and are ranked according to standards established by the American Association of State Highway and Transportation Officials (AASHTO). The purpose of the AASHTO rating is to provide a standard to compare the status of bridges in a region and across the country. The ratings are based on factors such as the bridge’s structural integrity, the road’s functional classification, and the designed purpose of the bridge. The ratings are used to determine eligibility for reconstruction or replacement.

Bridges that have a span of 20 feet or more are part of the National Bridge Inventory (NBI) and are inspected every two years. Bridges that span less than 20 feet but more than 10 feet are not part of the NBI and are inspected less frequently. MassDOT does not typically make AASHTO ratings available for these bridges as they may be based on incomplete or out-of-date information. Bridges that are not in the NBI are generally not eligible for federal aid Bridge Program funds; any non-NBI bridges on the Connecticut River Scenic Byway would be eligible for federal Surface Transportation Program funds due to the roadway functional classification.

Bridges are also further classified as *structurally deficient* or *functionally obsolete*. These classifications can raise the bridges' position on the priority list for repair/replacement. Bridges are determined to be structurally deficient if they fall below specific thresholds. A structurally deficient classification may indicate that a vital, but relatively minor, repair is needed or that a bridge is in need of more serious rehabilitation. Safety concerns are paramount.

A bridge that is classified as functionally obsolete is inadequate to fulfill its current function. An example would be a four-lane road leading to a two-lane bridge. The bridge itself may be structurally sound, but the use is limited in some capacity.

Information regarding whether a bridge has a posted weight or height limit is important in assessing a region's transportation network. These restrictions are important determinants affecting freight routes and should be addressed to improve a region's accessibility to goods, people and economic opportunities. It is also important for local fire departments with heavy fire equipment.

The historic character and design of the bridges within the Byway study area should be taken into consideration during any rehabilitation/reconstruction work. Table 7-9 provides data for each of the bridges located within the Byway study area, as listed in the 2014 MassDOT Bridge Listing. This information includes the condition rating, structural evaluation, and bridge status.

Franklin County

Table 7-10 lists the bridge structure inventory for the seven bridges located along the Byway in Franklin County. Three of these bridges, all in Northfield, span less than 20 feet and as such are not listed in the NBI. The remaining four bridges are NBI structures and are not deficient.

Hampshire County

Table 7-11 provides data for each of the 4 NBI bridges along the Byway in Hampshire County. All of the NBI bridges located within the study area are maintained by MassDOT. Two of the bridges along Route 47 were constructed before 1938. According to the 2014 MassDOT Bridge Listing, none of these bridges are categorized as structurally deficient, one bridge is functionally obsolete. One non NBI bridge (H-01-007) was identified on River Road at the crossing of the Russellville Brook. This structure will be replaced as part of MassDOT resurfacing project 607886. Project

consists of the resurfacing and culvert replacement on River Drive from Comins Road to Old River Drive. Project has an estimated construction year of 2021.

Table 7-10: Bridges Structure Inventory – Franklin County

Town	Bridge Number	Bridge ID	Year Built / Rebuilt	Location	Crossing	Owner	AASHTO Rating*	Deficiency*	Fed Aid Eligible
Northfield	N-22-01	5NV	1929	Rt. 63 (Millers Falls Road)	Four Mile Brook	Town	n/a	n/a	No**
	N-22-05	5P3	1938 / 1954	Rt. 63 (Hinsdale Road)	Perchog Brook	DOT	n/a	n/a	No**
	N-22-16	5NU	1975	Rt. 63 (Millers Falls Road)	Millers Brook	DOT	n/a	n/a	No**
	N-22-21	0W5	1941	Rt. 10/63 (Main Street)	Mill Brook	DOT	96.4	None	Yes
Erving	E-10-02	0W3	1953 / 2007	Rt. 63 (Lester Street)	Millers River	DOT	93.5	None	Yes
Montague	M-28-06	14D	1935 / 1998	Rt. 63 (Federal Street)	RR - BMRR & NECRR	DOT	84.5	None	Yes
	M-28-33	0W4	1935	Rt. 63 (Federal Street)	Sawmill River	DOT	85.5	None	Yes

Table 7-11: Bridges Structure Inventory – Hampshire County

Town	Bridge Number	Bridge ID	Year Built / Rebuilt	Location	Crossing	Owner	AASHTO Rating*	Deficiency*	Fed Aid Eligible
Hadley	H-01-002	AXW	2002	Mt. Warner Road	Mill River	Town	85.9	None	Yes
Hadley	H-01-001	12K	1937	River Drive	Mill River	DOT	94.5	None	Yes
Hadley	H01007	5ML	n/a	River Drive	Russellville Brook	Town	31.1	n/a	No**
Hadley	H-01-005	12J	1935	Bay Road	Fort River	DOT	53.8	Functional Obsolete	Yes
South Hadley	S-18-007	AQG	2008	Hadley Street	Bachelor Brook	DOT	96.5	None	Yes

Source FRCOG, PVPC: 2014 MassDOT National Bridge Listing.
**Current AASHTO rating not provided for bridges not in NBI*
***Bridges on Byway not in NBI are eligible for Surface Transportation Program*

Rail Facilities

Franklin County

There are two rail lines carrying freight within the vicinity of the Byway in Franklin County. The New England Central Railroad (NECR) Central Vermont Line runs north-south to the west of Route 63. The Freight Main Line, also known as the Patriot Corridor, runs along the lines of the former B&M Railroad and is now owned and operated by Pan Am Southern (PAS). It is a major east-west freight line from New York to eastern Massachusetts. In Franklin County, the line crosses under the Byway in Montague and runs along Route 63 to Miller Falls, where it follows the Millers River to points east.

Hampshire County

There are no active rail facilities in the immediate vicinity of the Route 47 Byway in Hampshire County. Located across the Connecticut River from the Byway is the Knowledge corridor rail line. Passenger service was reinstated on this line in December 2014 after a significant investment by Massachusetts to bring the rail infrastructure up to current standards. The closest stop along the Byway would be in Northampton. Currently there is one northbound and one southbound trip a day, additional intercity rail trips are in the planning but additional funding will be needed to implement the additional trips.

The former Central Massachusetts Rail Road Central branch, now known as the Norwottuck Rail Trail crosses Middle Street Just north of Route 9. Three roundtrip passenger trains as well as numerous freight trains utilized this branch in the 1920's until the line was phased out by automobiles and trucks in 1932. The line was dormant until the early 1990's when the rail corridor was converted into the 11 mile Norwottuck Rail Trail.

Public Transportation Services

Franklin County

The Franklin Regional Transit Authority (FRTA) is the primary transit authority serving Franklin County. The FRTA serves 40 towns in Franklin, Hampshire, Hampden and Worcester counties. Twenty-three of the twenty-six Towns in Franklin County (all except Monroe, Sunderland, and Leverett) are members of the FRTA. Sunderland and Leverett are members of the Pioneer Valley Transit Authority (PVTA). Both the FRTA and PVTA provide paratransit service to their respective towns with the level of the service varying significantly by community.

The FRTA operates three fixed routes through the study area. FRTA Route 22 makes eight daily round trips between the FRTA hub at the John W Olver Transit Center in Greenfield and local points in Montague, including Montague Center and Millers Falls, with a fixed stop on Federal Street. FRTA Route 23 provides two daily round trips between the hub in Greenfield and Amherst; it makes the same stops in Montague as

FRTA Route 22. The FRTA Route 32 makes seven round trips per day between Greenfield and Orange, travelling through Montague and Erving with stops in Millers Falls and in Ervingside at the French King Bowling Alley (on Semb Drive). The FRTA does not provide fixed-route service on weekends.

The Pioneer Valley Transit Authority (PVTA) also operates two fixed routes through the Byway study area. PVTA Route 31 provides frequent service throughout the day between South Amherst and Sunderland, making stops on South Main Street and at the Sugarloaf Estates apartment complex on Route 47 in Sunderland every fifteen minutes on weekdays and on a reduced schedule on weekends. PVTA Route 46 provides six weekday-only round trips between UMass Amherst, South Deerfield and the MassDOT Park and Ride lot on Route 5/10 in Whately; five of these trips are express routes but there is one trip leaving UMass at 9:46 p.m. that also stops at Sugarloaf Estates in Sunderland.

Hampshire County

PVTA is the primary transit authority for the Hampshire county portion of the byway. PVTA serves 24 municipalities and currently operates 48 routes through Hampden, Hampshire, and Franklin (Sunderland and Leverett) counties. PVTA also provides door to door paratransit services for all member communities.

PVTA operates 2 fixed routes in the vicinity of Route 47. Route 39/39express on Bay Road between Smith College in Northampton and Mount Holyoke College in South Hadley via Bay Road and Hampshire College. Limited express service is provided directly between Smith College and Mount Holyoke College via Route 47. Both services are offered during the times of year when the colleges are in session. The Blue 43 runs on Route 9 from Smith College in Northampton to Amherst College via Hampshire Mall and Umass is one of the busiest transit routes in the region. Service is offered every 20 minutes during peak periods and is offered year round, though at reduced levels when College is out of session. The Blue 43 can be accessed near the intersection of Route 47 with Route 9.

Park and Ride Lots

Franklin County

There is one formal MassDOT park and ride lot within the Byway corridor, located on North Main Street just north of School Street in Sunderland. It consists of eight perpendicular parking on-street spaces. Intended to provide parking for PVTA Routes 31 and 46, it is approximately 0.15 miles north of the nearest bus stop on South Main Street.

Hampshire County

Park and rides lots are a great tool which help reduce the number of single occupancy vehicle trips per day. Currently there are 4 official park and ride lots in the Pioneer Valley region, the closest of which is located west of the Byway in Northampton where the Norwottuck rail trail intersects with Damon Road.

Transportation of Wide Loads

Interstate 91 and Route 2 are the major freight moving corridors in western Massachusetts. The Byway area crosses Route 2 in Erving. The Commonwealth of Massachusetts Commercial Motor Vehicle Center permits the transportation of non-reducible (or wide) loads that are greater than twelve (12') feet in width. If a freight transporter wishes to move a wide load along the corridor, they must apply for a daily trip permit.

In Franklin County, wide loads are generally permitted on Interstate 91, Route 2, and Route 116. MassDOT District 2, which has jurisdiction over state-maintained roads in the Byway study area, does not recommend moving wide loads over 12 feet wide on Route 63 as the travel lanes are 12 feet wide and have little to no shoulder over much of the route, though they may be permitted with adequate provisions for traffic safety, including an escort of two State Police troopers and a pilot vehicle with flashing lights, flags, and signs. Although Route 47 is not a state highway, the travel lane and shoulder conditions are similar and the same safety provisions are recommended for wide loads.

In Hampshire County, wide loads are not recommended on Route 47. Route 47 is a relatively narrow road that lacks adequate shoulder width to allow wide-loads to traverse the roadway in a safe manner. Rolling hills and curves add to the potential for conflicts between wide-loads and other users of the roadway. Interstate 91 is the most logical option for transporting wide loads north and south through the region.

Pedestrian Access

Franklin County

In Franklin County, the primarily rural nature (low density of development) of the Byway means that there is limited pedestrian infrastructure (ie. sidewalks and crosswalks) for large stretches of the Byway. The pedestrian activities on the Franklin County portion of the Byway are primarily in the town centers, including Northfield center, Ervingside in Erving, Millers Falls in Montague, and Sunderland center.

A streetscape project in Northfield center was completed in 2010. The existing sidewalks were repaired and connections were made to provide continuous sidewalk on both sides of the roadway within the historic town center that met current ADA standards. Safe pedestrian crossings with attendant signage were constructed. The sidewalk is separated from the edge of the road by a wide grass strip and follows the terrain of the adjoining land, in keeping with the historic village character.

In Erving, sidewalks extend on the west side of the roadway from Erving Elementary School and on the east side from Park Street across the Millers River Bridge into Millers Falls, Montague. There is currently a project under design to improve the streetscape in this area, including repairs to existing sidewalks, construction of wheelchair ramps and additional streetscape elements; construction is expected to begin in 2017.

The Millers Falls village center in Montague was also the site of a streetscape project that was completed in 2007. The work included construction of new sidewalks along West and East Main Street, Bridge Street and Federal Street, along with granite curbing, wheelchair ramps, and signage. Ornamental street lighting and brick pavers between the sidewalk and the edge of road also enhanced the downtown character of the area.

In Sunderland, there are sidewalks on both sides of the Byway from North Silver Lane to Old Amherst Road, with the sidewalk on the east side extending to the Sugarloaf Estates apartment complex on South Main Street. A Complete Streets assessment was recently completed that includes recommendations for traffic calming and pedestrian improvements.

Traffic Calming and Complete Streets Initiatives

Traffic calming consists of engineering and other measures that are implemented on roads in order to slow down or reducing motor-vehicle traffic. Traffic calming measures improve safety for pedestrians and bicyclists. Traffic calming techniques are most frequently utilized in residential neighborhoods or village centers where speeding and/or aggressive driving behavior has been documented.

These techniques can be used to slow traffic at the approaches to town centers or villages as the roadside environment changes from a higher speed rural roadway to a lower speed pedestrian oriented area. Traffic calming measures that help retain the character of the Byway should be considered to slow traffic, warn motorists of a changing roadside environment and improve the Byway‘s aesthetic appeal.

Complete streets are designed with all roadway users in mind. They strive to achieve a better balance between the needs of the motor vehicle and other modes of transportation such as bicycles, pedestrians, and transit users.

A Complete Streets assessment was conducted in Sunderland center by FRCOG in 2014. This analysis identified pedestrian improvements at the intersection of Route 47 and Route 116 in order to make it more pedestrian and bicycle friendly. Of particular concern is to make it safer and more comfortable for pedestrians to cross Route 116. The assessment noted that crosswalks at the intersection are faded and pedestrian signals and wheelchair ramps are not ADA-compliant. Sidewalks along Route 47, particularly those on South Main Street, were also noted to be in poor condition.

The recommendations were also intended to better connect the Route 5/10/116 commercial corridor to South Deerfield center. The Complete Streets Plan recommended intersection improvements, the development of a gateway to the village center on Route 116 and improved pedestrian and bicycling infrastructure.

Hampshire County

In Hampshire County, the majority of pedestrian activity and amenities are located near Route 9, from the Hadley Elementary School south to Bay Road including access to the Norwottuck Rail Trail, and in South Hadley at College Street (Route 116). The end of

the byway at College Street (Route 116) has significant pedestrian infrastructure, providing access between the various shops and restaurants and Mount Holyoke College. A short section of sidewalk was noted in north Hadley Center and was noted to be in fair to poor condition. The primarily rural nature (low density of development) of the rest Byway means that there is limited pedestrian infrastructure (ie. sidewalks and crosswalks) for large stretches of the Byway.

In Hatfield the majority of the pedestrian amenities are found on the southern segment of Main Street from King Street to Elm Street. From King south to North Street a sidewalk is provided on the east side of Main Street. From North Street South to Elm Street sidewalks are provided on both sides of the Main Street.

Crosswalks where observed on both the north and south sides of School Street as well as on School Street. Just south of School Street, a mid block crosswalk is provided on Main Street in front of the Town Hall. At the intersection of Billings Way with Main Street a crosswalk was provided on Billings Way. All crosswalk markings where observed to be in fair condition at the time of the survey. A single yellow pedestrian warning sign was observed at each approach to the crosswalks.

Hatfield received a $360,000 MassWorks grant for Main Street Pedestrian improvements. The improvements include but may not be limited to sidewalk replacements, new crosswalks, and bike lane markings.

Bicycle Access

There are many opportunities for bicycling on the Byway and also on routes that connect to the Byway. Generally, the Connecticut River Scenic Byway has gentle terrain that creates opportunities for cyclists to enjoy nature and the rural character of the area. Bicycling can be one of the best ways to experience the solitude of the roadway and the small town neighborhoods of the Byway.

There are some variations in bicycling conditions along the Byway. The traffic volume levels and the road geometry changes along the Byway. Bicycling on some areas of the Byway are more challenging because of the lack of shoulders and higher traffic volumes.

Franklin County

Opportunities for bicycling vary greatly along the 24 miles of the Byway in Franklin County. Route 63 north of Pine Meadow Road in Northfield is part of the Franklin County Bikeway, and also the Connecticut River Bikeway. Route 47 south of Falls Road in Sunderland to the Route 116 intersection is also part of the Franklin County and Connecticut River Bikeways.

The section of Route 47 to the north of the Route 116 intersection was identified in the 2014 Sunderland Master Plan Transportation Chapter for the possible addition of bike lanes to better accommodate the large number of cyclists using this route. From the Route

116 intersection, the Connecticut River Bikeway continues south along Route 47 into Hadley. There are several other opportunities to connect to the Franklin County Bikeway system. These Bikeway routes are detailed in the Recreational Resources Chapter.

Schell Bridge Replacement Project

There is a project in the preliminary planning and design stage to replace the historic Schell Bridge in Northfield with a new bicycle and pedestrian bridge across the Connecticut River. The Schell Memorial Bridge in Northfield is a 515 foot long steel cantilever truss bridge spanning the Connecticut River. It was built in 1903 and served to connect the east and west Northfield. The bridge was closed to traffic in 1985 due to deterioration and safety concerns. It was deemed too costly to rehabilitate the bridge, and the Town approved demolition of the bridge in 1987. The Friends of the Schell Bridge formed in 2004, with the mission of restoring the bridge as a recreational link for a network of hiking, walking and biking trails. However, due to severe deterioration it was determined that it was not possible to rehabilitate the existing structure and replacement is the only viable option. In 2013, a plan to remove the existing bridge and replace it with a pedestrian and bicycle bridge designed to pay homage to the original structure was supported by the Massachusetts Department of Transportation (MassDOT), the town and the Friends of the Schell Bridge.[3]

The project to reconstruct the Schell Bridge is currently in the preliminary design stage. According to MassDOT, construction of the new bridge is anticipated expected to take place in 2020. Once the bridge is in place, it will provide a scenic river crossing and connect the Connecticut River Bikeway and Franklin County Bikeway routes on each side of the Connecticut River in Northfield.

Hampshire County

The Route 47 Scenic Byway has many different characteristics to the roadway depending on what section you are on. In places the byway is a quiet roadway, with rolling terrain creating an exceptional opportunity for cyclists to enjoy nature, the byways is also a busy urban roadway with high vehicle volumes. Bicycling is one of the best ways to experience the quiet solitude of the winding roadway and the small town neighborhoods of the Byway.

The Pioneer Valley Planning Commission evaluated Route 47 in the towns of Hadley and South Hadley as well as Main Street in Hatfield for its suitability for bicycle travel through a process that involved measuring travel lane width, shoulder width, vehicle speed, traffic volume and available parking along each roadway segment. Using this information, each roadway segment was evaluated using the Level of Traffic Stress (LTS) criteria. Table 7-12 provides the descriptions for each LTS level and Table 7-13 provide the matrix for determining the LTS for each segment of roadway. Table 7-14 provides the LTC classification for each segment of Route 47 in Hadley and South Hadley and Main Street in Hatfield.

[3] "New Life for Schell Bridge?" David Rainville, *The Recorder*. May 23, 2013.

As can be seen in Table 7-14 all but segment 4 (Lawrence Plain and Hockanum Road) have a LTS factor of 3, segment 4 received a LTS 4. The primary reason for these scores is the lack of sufficient shoulder and the relative higher speeds on sections of segment 4.

Table 7-12 Level of Stress Descriptions

LTS 1	Presenting little traffic stress and demanding little attention from cyclists, and attractive for a relaxing bike ride. Suitable for almost all cyclists, including children trained to safely cross intersections. On road sections, cyclists are either physically separated from traffic or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are in mixed traffic with a low speed differential and demanding only occasional interaction with motor vehicles. Next to a parking lane, cyclists have ample operating space outside the zone into which car doors are opened. Intersections are easy to approach and cross.
LTS 2	Presenting little traffic stress but demanding more attention than might be expected from children. On road sections, cyclists are either physically separated from traffic or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from a parking lane, or are on a shared road where they interact with only occasional motor vehicles with a low speed differential. Where a bike lane lies between a through lane and a right-turn lane, it is configured to give cyclists unambiguous priority where cars cross the bike lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults.
LTS 3	Offering cyclists a mostly exclusive cycling zone (e.g., bike lane) requiring little negotiation with motor traffic, but in close proximity to moderately high speed traffic; or mixed traffic requiring regular negotiation with traffic with a low speed differential. Crossings may be stressful, but are still considered acceptably safe to most adult pedestrians.
LTS 4	Requiring riding in close proximity to high speed traffic, or regularly negotiating with moderately high speed traffic, or making dangerous crossings.

Table 7-13 Traffic Stress Criteria for Bicycles on Roadways

		LTS 1	LTS 2	LTS 3	LTS 4
Along a Parking Lange	Street Width (through lanes per direction)	1	-	2 or more	-
	Reach from curb (sum of bike and parking lane width, including marked buffer and paved gutter)	15 ft or more	14 or 15 ft	13.5 or less	-
	Speed limit or prevailing speed	25 mph or less	30 mph	35 mph	40 mph or more
	Bike lane blockage (typically occurs in commercial areas)	rare	-	frequent	-
Not along a parking lane	Street width (through lanes per direction)	1	2, if directions are separated by a median	more than 2, or 2 without a median	-
	Reach from curb, including marked buffer and paved gutter	6ft or more	5.5 or less	-	-

	Speed limit or prevailing speed	30 mph or less	-	35 mph	40 mph or more
	Bike lane blockage (typically applies in commercial areas)	rare	-	frequent	-

On non-commercial streets with speed limits equal or less than 25 mph, any reach is acceptable for

Table 7-14 Traffic Stress Criteria for Bicycles on Roadways - Results

Seg #	Route #	Town	Street Name	From	To	LTS
1	47	Hadley	River Drive	Sunderland Town Line	Middle Street	3
2	47	Hadley	Middle Street	River Drive	Bay Road	3
3	47	Hadley	Bay Road	Middle Street	Lawrence Plain Road	3
4	47	Hadley	Lawrence Plain Road / Hockanum Road	Bay Road	Hadley Street	4
5	47	South Hadley	Hadley Street	Hockanum road	College Street	3
6		Hatfield	Main Street	Whatley Town Line	Hatfield Center Historic District	3
7		Hatfield	Main Street	Hatfield Center Historic District	Elm Street	3

Emergency Planning

A substantial amount of emergency planning has occurred within the past few years to identify evacuation routes and vulnerabilities in the transportation network. As a result of these efforts, the following areas of the Byway have been identified as being important evacuation routes or are areas that are vulnerable to flooding. According to the 2013 Western Massachusetts Regional Evacuation Plan, the Byway is identified as a secondary evacuation route within the Franklin County Byway study area. A secondary evacuation route is defined as a main arterial road through towns that carries traffic where primary routes do not exist, or provides an alternate route to the primary route.

Flooding is one of the most common natural hazards in the region. A large portion of the Byway runs parallel to the Connecticut River, and the Byway crosses the Millers Rivers as well as numerous tributaries. The hilly terrain surrounding the Byway creates the conditions for flash floods during large rainstorms, causing erosion, road washouts, and potential personal property damage. Some of the farmland along the Byway is within the 100-year floodplain. Many of the villages and town centers in the region are also located adjacent to rivers, which once powered mills, and are susceptible to flooding. These areas may need to be evacuated during large flood events. Flooding also can make evacuation difficult due to washed out roadways. Even primary routes are susceptible to damage from flooding, as demonstrated by Tropical Storm Irene, when both Interstate 91 and Route 2 were impacted in the region.

Issues and Recommendations

Franklin County

Issues

- Traffic volumes along the Byway generally vary from 2,500 to 5,000 vehicles per day, with peaks of 4,600 vehicles per day in Sunderland center and the highest volume in Northfield center at around 7,700 and the lowest volume, 1,260 vehicles per day at the New Hampshire state line.
- There is ample capacity along the majority of the Byway to accommodate growth in traffic without changes to the existing infrastructure.
- There is evidence of congestion in Northfield center and at the intersection of Route 47 and Route 116 in Sunderland.
- There is limited access to public transportation services in Franklin County, except in Sunderland center where public transit service to Amherst runs frequently.
- There is suitable pedestrian infrastructure in most town centers, although accommodations in Erving and Sunderland do not meet current ADA (Americans with Disabilities) standards, posing safety hazards for pedestrians and other non-motorized users of the Byway.
- There is little to no shoulder along the edges of the roadway for the majority of the Byway.
- Reported motor vehicle crashes were distributed along the Byway, with the highest concentration on the Federal Street segment of Route 63 and on Route 47 in Montague.
- Lane departure crashes are a traffic safety concern along the length of the Byway.
- Some existing traffic signs are in poor condition and do not meet MUTCD requirements for retroreflectivity.
- Pavement markings are in poor condition and may not meet MUTCD requirements for retroreflectivity.

Hampshire County

- Signage along the corridor was noted to be reaching the end of its effective life and may not meet MUTCD requirements
- Guardrails long the corridor along the corridor appear to be aging and in some locations damaged
- Pavement markings where noted to be in fair to poor condition along the corridor.
- Pavement conditions in Hadley and Hatfield were found to be in fair to poor condition. Poor pavement decreases the enjoyment and safety for all modes of transportation

- Roadway shoulders do not provide minimum required reach to accommodate non vehicular traffic.
- Sidewalks were observed to be in fair to poor condition and do not meet ADA standards
- The intersection on Route 9 and Route 47 is anticipated to be reconstructed as part of the Federal Fiscal Year 2015 Transportation Improvement Program (TIP).
- The Crash rate at Route 9 at Route 47 exceeded the state wide crash rate and is identified as a MassDOT crash cluster. Crash rate is expected to be reduced significantly based on improvements made by TIP project.
- Farm equipment was observed on the roadway at several locations along the corridor in Hadley and South Hadley, potentially resulting in reduced travel times and safety issues.
- It was noted that there is a lack of amenities such as pull offs along the byway to allow for vehicles to safely stop and enjoy the byway.

Recommendations

Franklin County

- Continue to monitor traffic volumes and patterns along the Byway.
- Continue to monitor the performance of key intersections along the Byway.
- Perform a Road Safety Audit for lane departures from Federal Street in Montague to North Silver lane in Sunderland.
- Conduct an evaluation of the condition of traffic signage.
- Refresh pavement markings, including lane markings and crosswalks.
- Ensure that all improvements to the roadway infrastructure are in line with the scenic character of the Byway to the maximum extent possible, including guardrails.
- Widen or restripe the roadway to include appropriate shoulder widths for safety and bicycle accommodation.
- Pavement improvements should include rumble strips where appropriate, considering noise impact on abutting residences.
- Complete proposed streetscape project for pedestrian accommodations on Route 63 in Erving.
- Implement recommendations from Road Safety Audit at Route 47/Route 116 in Sunderland center.
- Implement Complete Streets recommendations in Erving and Sunderland center to better accommodate pedestrians and bicycles on the Byway.

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- Signage should be evaluated to ensure it meets MUTCD standards for both placement and retro reflectivity.
- Municipalities should implement a pavement marking management program to ensure pavement markings meet minimum requirements of the MUTCD
- Consider context sensitive design when upgrading roadway infrastructure to ensure improvements are in line with the character of the roadway
- Explore opportunities to improve the pavement conditions along the byway
- Roadway shoulders should be extended to provide for improved safety for motorized and non motorized vehicles.
- When considering roadway upgrades explore opportunities to provide minimum required standards from the MassDOT GreenDOT Healthy Transportation Policy Directive. MassDOT's Healthy Transportation Policy Directive requires all state transportation projects to increase bicycling, transit and walking options. On roadway projects this includes minimum travel lanes (11 feet on the byway) and minimum shoulder widths (5 feet on the byway).
- Continue to monitor vehicle volumes along the corridor.
- Continue to monitor performance of key intersection along the corridor.
- Explore opportunities to improve Sidewalks and upgrade them to meet ADA requirements.
- Additional evaluation should be made for the purpose of identifying logical locations along the byway where either paved or unpaved pull offs could be added for farm equipment to pull off the roadway to allow motorists to pass.
- Additional evaluation should be made to identify locations where it may be beneficially to install pull offs and other amenities to enhance to the byway experience. Ideally these pull offs would tie into the other features of the byway such as hiking trails and scenic viewpoints. Funding may be available to fund turnoffs through the Federal Land Access Program (FLAP).
- Additional evaluation should be made to identify locations on the byway where it may be more practical to provide an off road bicycle / Pedestrian facility to accommodate non vehicular traffic. A local example of an off road connector is the Umass Extension to the Norwottuck Rail Trail.