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ITS and Telecommunications

11 Intelligent Transportation Systems (ITS) and Telecommunications

This chapter provides information on projects that are being planned or implemented in Franklin County that utilize technology to improve transportation networks and service delivery. These types of programs are aimed at reducing congestion, enhancing efficiency and improving safety by employing the use of technologically advanced structures, and they are commonly referred to as Intelligent Transportation Systems (ITS). With the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, Congress established a new era for transportation, calling for more efficient and safe use of existing highway and transit infrastructure and emphasizing the seamless integration of multiple transportation modes. Title VI of ISTEA established the Intelligent Vehicle-Highway Systems Program, which was later renamed the Intelligent Transportation Systems (ITS) Program, and the program was further developed as a component of TEA-21 and SAFETEA-LU. The ITS program prescribed the "widespread implementation of intelligent (transportation) systems to enhance the capacity, efficiency, and safety of the federal-aid highway system and to serve as an alternative to additional physical capacity of the federal-aid highway system."

The ITS provisions in the transportation legislation recognize that surface transportation systems are the ties that link communities and facilitate commerce, connecting residents to work, homes, schools, services, and each other. Intelligent transportation systems offer solutions that respond to the challenges of growing congestion, traffic fatalities, and outdated management systems for freight transport and mass transit. ITS systems are diverse and versatile, combining

telecommunications, computer, and sensing technologies to provide real-time information to both traffic managers and travelers on traffic, weather, navigation, and vehicle diagnostics in order to achieve greater system efficiency, safety, and convenience. ITS systems have the potential to provide vehicles with crash-warning and collision-avoidance capabilities that will dramatically enhance our surface transportation system's safety.

This chapter provides information on ITS projects that are currently being implemented in Franklin County.

Western Massachusetts Regional ITS Architecture

The goal of the Federal ITS program is to implement innovative, technologically advanced and integrated improvements to the transportation infrastructure in order to improve safety, enhance mobility, and reduce congestion. The successful deployment of ITS is dependent on an approach to planning, implementation and operations that stresses collaboration between important stakeholders and transportation operators. An ITS architecture outlines a strategy for coordinated communications and systems, and ensures that new individual ITS projects are developed in this broader, holistic, interconnected context. According to MassDOT, an ITS architecture offers three important benefits to a region: improved interagency coordination, cost savings for transportation operations, and better services to the traveling public. Some examples of ITS projects include electronic tolling that doesn't require drivers to stop and collect toll tickets or pay tolls, variable message signs notifying motorists of construction schedules or traffic delays, weather sensors, traffic cameras, and on-line or mobile phone tracking of bus and train locations.

There are four Regional ITS Architecture areas in the Commonwealth: Western Massachusetts, Central Massachusetts, Metropolitan Boston, and Southeastern Massachusetts including Cape Cod and the Islands. The Western Massachusetts Regional ITS Architecture was originally developed in 2005 with stakeholder and transportation providers and users in the four western counties:

Berkshire, Franklin, Hampshire, and Hampden. This architecture was updated in 2010. It includes participation from over twenty partners that represent: Regional Planning Agencies; Transit Authorities; Municipal/Regional Agencies, Authorities, Commission and Organizations; State Agencies; and Federal Agencies.

The primary goals of the Western Region ITS Architecture implementation plan include: An Event Reporting System (an internet-based tool that serves as a centralized repository for information on events affecting the transportation network); Expansion of the Massachusetts Interagency Video Integration System (expansion of a video sharing and distribution system to allow sharing of real-time video feeds among a larger group of agencies); 511 Travel Information System (a universal phone number to obtain travel information on certain roadways and transit services in the region); and Planning Data Archive (a system for coordinating the planning data archives for the transportation agencies in the region).

The Western Massachusetts Regional ITS Architecture ensures that all transportation stakeholders and providers in the region are committed to making technology investments that are consistent with one another and with the framework. This, in turn, ensures that individual projects not only benefit the intended audience, but are able to communicate with and benefit the greater Western Massachusetts region as a whole. The Regional ITS Architecture is able to adapt to new technologies and will continue to evolve as technology evolves and as new projects are developed and implemented.

Regional Traveler Information Center (RTIC)

The Regional Traveler Information Center is a collaborative venture between the U.S. Department of Transportation, MassDOT, and the University of Massachusetts Amherst (UMass). It is physically housed in a new state-of-the-art facility at UMass. The overall goal of RTIC is to develop and put into operation a fully integrated, sustainable, traveler information system for Western Massachusetts, including Franklin, Hampshire, and Berkshire

Counties, the North Quabbin Portion of Worcester County, and the Springfield area of Hampden County. Its primary goals are to develop, deploy, and maintain an expanded RTIC website that includes real-time traveler information on local roadways, bus locations, congestion and construction, and to support regional economic development initiatives including tourism marketing. The RTIC Advisory Committee includes regional stakeholders, like the FRCOG, in addition to its state and federal partners.



RTIC Webcam Screenshot – Route 116 Deerfield, near Route 5 & 10, facing West

The RTIC website is accessible at <http://masstraveler.com>. MassTraveler provides real-time road and traffic conditions (via a growing number of observation cameras at select locations), public transit information, and a listing of regional arts and events to help plan a trip in or to Western Massachusetts. To assist with its goal of supporting economic development and tourism, RTIC made funds available to the three Western Massachusetts Regional Planning Agencies (BRPC, FRCOG and PVPC) in 2010-11 to write narrative content and gather photos and graphics related to the seven designated Scenic Byways of Western Massachusetts. This information will be used to develop the website component of a larger Western Massachusetts Scenic Byway Promotional Campaign. The Scenic Byway website will be hosted by RTIC and will be coordinated with other MassTraveler information, thus expanding the

information available to both RTIC and Scenic Byway users. It is expected that the development and launch of the Scenic Byway Promotional Campaign will take place during 2011-12.

Intelligent Transportation Systems Applied As Part of Highway Maintenance or Construction

It is becoming more routine to include ITS components into roadway construction projects. For example, Route 2 Safety Improvements constructed over the last few years have included variable message signs and the installation of weather sensors at certain locations. Both technologies are very useful in informing the traveling public about special situations in the areas including road conditions, weather conditions, accidents, construction, or congestion due to seasonal events such as Fall foliage. The continued installation of these types of devices in upcoming projects will further enhance travel safety and mobility in the region, but it should be done in a context sensitive nature on appropriate roadways.

Ridesharing

With the dramatic increase in the price of gasoline during the last few years, many Franklin County residents have had a new or renewed interest in carpooling. At the same time, technological improvements have made the management of database information easier. The Franklin Region has some limitations in successfully implementing a carpool/vanpool program in that our population is both small and dispersed. However, there are several programs and internet-based resources that promote carpooling or "ridesharing" in Franklin County and the wider region. MassRides, an organization funded by MassDOT, provides travel assistance to commuters, employers, students, and other travelers by providing information about transportation alternatives, including: transit, biking, and walking. It also helps employers to establish vanpool or carpool options for employee commutes. Another important rideshare program for Franklin County is run through UMass Amherst, which is a major employer for county residents. There are also several other locally-based internet rideshare resources that attempt to connect ride-seekers with drivers offering rides within the region.

They include: Zipride.com, RideBuzz.org, and Craigslist.org.

Telecommunications Infrastructure Improvements

In many parts of Franklin County, the services available through the current telecommunications infrastructure are inadequate for present day needs. Issues of reliability, affordability, and access are significant obstacles for small and large businesses, educational and health care institutions, and individuals. Broadband telecommunications through the telephone network (such as T1 and Digital Subscriber Lines (DSL) class services) is limited in many areas due to the lack of infrastructure, the quality or capacity of existing infrastructure, and/or the cost of access. For example, technology for DSL services is distance sensitive, which means that the service can travel on the copper wires no further than 15,000 feet (almost 3 miles) from where the equipment is located. Broadband services through the cable television system are widely used and available for both residential and business purposes. However, only half of the 26 Franklin County towns have cable systems, and service is not necessary available throughout the entire community. Some residents and businesses use a satellite broadband connection; however, this technology has limitations.

The issues of quality telephone service, access to broadband services, and advanced infrastructure deployment has been a top priority for the Franklin County and FRCOG for many years. In the late 1990s, efforts on this issue began in Franklin County through a working group of the Comprehensive Economic Development Strategy (CEDS) Committee. From there, the initiative grew to become Franklin Connect in 1999, and then expanded to become Pioneer Valley Connect in 2003. Throughout this process, the Connect partnered with Berkshire Connect, Inc. and the Massachusetts Technology Collaborative (MTC), a quasi-state agency dedicated to fostering the innovation economy. By 2009, the two Connects merged to form WesternMA Connect, Inc., an independent, non-profit organization whose mission is to encourage the creation of more

competitive and robust telecommunications landscape with access to advanced, affordable, and redundant broadband services in Western Massachusetts.

As the technological, regulatory, and economic conditions have evolved, Connect has explored different models to alleviate the broadband access inequity in the region. Through a 2006 joint award from the John Adams Innovation Institute of the MTC, Connect was able to build upon previous work conducted to complete the first broadband availability database, conduct a regional survey of broadband access, implement a test of wireless technologies, and develop a public-private sector model to deploy infrastructure and broadband services into unserved areas.

Broadband service is not a regulated industry by state or federal authorities, like how telephone and cable services are. As a result, broadband service providers cannot be compelled to provide service in areas that are unserved. The Connect determined that in a deregulated environment, the private sector did not have a sufficient return on their investment by traditional industry standards. Without access to significant resources, the public sector also could not fund a sustainable solution. One of the greatest barriers to making a solution work was the lack of a “middle mile”¹ infrastructure that connected unserved areas to the greater global telecommunications network. Based on these findings, Connect developed a hybrid network model employing a sub-regional deployment framework. An evaluation of costs to implement the model utilizing a public-private partnership to ensure affordability and scalability to adapt to evolving technologies was completed.

Based on this model and through Connect advocacy, the Massachusetts Broadband Institute (MBI) and a \$40 million Incentive Fund were established by Governor Deval Patrick and the state

¹ “Middle mile” refers to the backhaul or backbone portion of the telecommunications network, which connects the greater global network to a local access point from which “last mile” internet access is then distributed to the individual home or business.

legislature in 2008. The MBI is a division of MTC with the mission to extend affordable high-speed internet access to all homes, businesses, schools, libraries, medical facilities, government offices and other public places across the Commonwealth. The MBI is guided by a Board of Directors that includes the FRCOG Executive Director. More detailed information about the MBI is available on their website at www.massbroadband.org.

The MBI will construct a fiber-optic, middle mile network throughout western and north central Massachusetts. Using a federal American Recovery and Reinvestment Act (ARRA) award of \$45.4 million plus \$26.2 million of their Incentive Fund, the MBI will deploy over 1,100 miles of fiber optics through 123 municipalities within three years. The first segment of this middle mile network has already been constructed along the I-91 corridor. The I-91 segment was deployed in coordination with the Massachusetts Department of Transportation, and has been cited as a national model for government collaboration to deploy infrastructure.



Installation of ITS Infrastructure along I-91
(Photo credit: Massachusetts Broadband Institute)

The MBI’s middle mile network will have access points to allow “last mile”² service providers to connect to it. The middle mile is a necessary element to allow broadband services to be more

² “Last mile” refers to the segment of the telecommunications network that connects homes and businesses to the middle mile network.

economically and efficiently deployed to individual homes and businesses. Last mile broadband services can be transmitted by a variety of technologies, including fiber optic, copper telephone wire, coaxial cable, and wireless. This middle mile network, and any other long term assets constructed using state or federal funding, will be owned and managed by the MBI. Since the MBI was awarded federal ARRA funds, the network is required to be "open access," which means that more than one service provider will be allowed access to it. In addition, the MBI has designed their network to connect to many local community anchor institutions (such as hospitals, schools, and police stations).

The MBI is encouraging broadband service providers, network builders, and other interested parties to explore and develop innovative ways to deploy broadband services in the region. The MBI will conduct a formal public procurement process to select partners that will access the middle mile network and deploy last mile broadband services into unserved areas. Since the middle mile network is open access, the last mile service providers that connect to this network may include a variety of entities, such as local ISPs, national telecommunications companies, or community-based groups. For example, a new organization called WiredWest has formed to explore developing an open-access, fiber-to-the-home, last mile network in the region.

The MBI is implementing a strategy that will allow public investment in a middle mile network to change the business model for last mile broadband deployment. The FRCOG continues to work in collaboration with the MBI, WesternMA Connect, and other regional planning agencies to support the swift deployment of the MBI middle mile network.

Recommendations for ITS and Telecommunications

- Continue working to ensure that all new ITS applications and deployments are consistent with the Western Massachusetts **Regional ITS Architecture**.
- Continue working with the partners that developed the Western Massachusetts **Regional ITS Architecture** to ensure that it evolves as necessary.
- Continue working with RTIC to identify locations for additional traffic cameras, weather sensors, and other technology infrastructure to **expand travel information available to the public**.
- Continue collaboration with RTIC and the Western Massachusetts Regional Planning Agencies to develop the **Western Massachusetts Scenic Byway Promotional Campaign**.
- Continue supporting the deployment of variable message signs, as appropriate, and installation of weather sensors to enhance **real time information for the traveling public**.
- Continue supporting efforts to **enhance carpooling options** in the region.
- Continue working with WesternMA Connect, Inc. and the Massachusetts Broadband Institute to support the swift deployment of the **MassBroadband 123 fiber optic network** and related broadband technologies in the region.