**Enhancing the State's Healthcare Landscape
through Trusted Information Exchange**

Category: Digital Government: Government to Business

Commonwealth of Massachusetts
Executive Office of Health and Human Services

THE **HI** WAY
MASSACHUSETTS HEALTH INFORMATION HIGHWAY

Project initiated: October 2012 (After launch of Phase 1)
Project completed: July 2014 (Phase 2 Complete)

Contact:
Sandra Edler
Massachusetts Office of Information Technology
One Ashburton Place, Room 804
Boston, MA 02108
617.626.4620
sandra.edler@mass.gov

In 2011, the federal government embarked on a program to encourage states to establish Health Information Exchange (HIE) systems. The objective was to enable healthcare providers to securely communicate clinical patient information electronically – with the greater goal of enhancing healthcare delivery and outcomes – regardless of providers' affiliation or differences in technology.

In October of 2012, Massachusetts launched its HIE, known as the Mass HIway (www.mass.gov/hhs/masshiway). The HIway offers doctors' offices, hospitals, laboratories, pharmacies, skilled nursing facilities, and other healthcare organizations a way to securely and seamlessly transmit vital health data electronically.

The HIway has created the technical infrastructure, procedures and processes, and governance structure that enables the flow of patient health information between providers across Massachusetts. It is open to all interested providers, hospitals, and other organizations within the healthcare community regardless of affiliation, location, or differences in technology.

Since the initial launch, we have completed a significant second phase of our HIway project that delivers substantial business benefits to healthcare providers of every size and type across the state.

One-stop public health interfaces simplify providers' compliance with state and federal reporting requirements to promote surveillance for infectious diseases and support their ability to achieve "meaningful use" of electronic health records, as mandated by the federal government.

In addition, the HIway's progressive model of serving as a hub of connectivity for private health organizations and private health information exchanges is an excellent example of successful collaboration between the public and private sectors.

The HIway is governed by a diverse health information technology council (http://www.masshiway.net/HPP/About/HITCouncilandAdvisoryBoards/index.htm) and informed by provider, consumer, legal, policy, and technology advisory groups to promote a transparent, multi-stakeholder engagement model.

The Mass HIway enables fast, secure, uniform, and reliable methods of data communication and provides actionable, real-time data for program reporting, quality improvement, and evaluation.

What began as a proof of concept is evolving into an established way of doing business for Massachusetts' healthcare community. With transaction volume now *exceeding thirteen million transactions*, the Mass HIway is a key component in the continuous enhancement of the state's healthcare landscape.

Business Problem

Healthcare providers and hospitals across the state of Massachusetts had limited ability to exchange health care information with providers and hospitals outside of their networks. Private efforts at health information exchanges via regional exchanges, electronic health record (EHR) vendors or Health Information Service Providers (HISPs), were successful in their intended purpose of exchanging health information among their existing provider/customer base but did not address the need for exchange of health information across all providers and hospitals, regardless of affiliation or technology.

This lack of ability to share information among non-affiliated healthcare entities resulted in issues including duplicative tests, lack of coordinated care, lack of security, increased costs, and an inability to exchange critical, sometimes life-saving information in a timely manner. Before they were able to communicate private, protected health information via a secure encrypted electronic method like the HIway, providers resorted to unreliable, inefficient, and non-secure methods, such as faxes and phone calls.

A second, more tactical problem that many providers faced was the ability to meet many of the 'meaningful use' program requirements set by the federal government. In order to receive (significant) funding dollars made available under the program, healthcare providers must submit electronic data to a number of different state Department of Public Health (DPH) registries, as well as send a certain percentage of care coordination transactions over a health information exchange.

These requirements posed a particular challenge to smaller provider organizations that lacked the IT infrastructure and resources to successfully meet them.

Project Approach and Solution

The Mass HIway is a central hub of connectivity for healthcare providers across the state and is becoming the tie that binds hospitals, private health exchanges, and regional health exchanges.

However, the Mass HIway model is not a top-down one that mandates all organizations connect directly through the HIway. Instead, the state uses a network approach and works closely with private health exchange entities to ensure that the exchange of health information occurs across all technological and organizational boundaries.

Due to its highly subsidized business model, the HIway has provided a cost-effective means for providers to meet the business challenges noted above.

User-friendly information about the HIway – and how to get connected – is readily available online at http://www.masshiway.net/HPP/index.htm.

Exchanging Health Information among Providers

The Mass HIway project team created the HIway infrastructure, trust architecture, governance structure, and processes and procedures to enable secure transport of health information, regardless of information or technology. The HIway's primary tasks are the validation of certificates and the authorization of users sending and receiving health information over the HIway.

By design, the HIway serves as a transport mechanism only. It does not open or store messages sent over its DIRECT gateway. All messages are encrypted and are only readable by sender and receiver.   This lack of a storage repository was a deliberate decision made by HIway stakeholders to alleviate data privacy and security concerns among patients, providers, and other healthcare entities hesitant about storage of personal health information in a central state repository.

Health information is exchanged over the HIway via either a push or a pull approach:

- Healthcare providers exchange clinical data about patients for care coordination, case management, and quality improvement via a "push" approach.

  The push method of exchange also facilitates submission of information to eight different public health registries and related applications via nodes or interfaces on the HIway. This automated reporting allows for more timely and efficient submission of immunization data, syndromic surveillance data, childhood lead poisoning data, and other elements critical to the state's public health.

- In query and retrieve – or "pull" – transactions, a clinician may query the Mass HIway to determine which health providers or organizations have electronic health records for a particular patient.

  Once a record is located, the clinician may request that the record be sent over the HIway from the provider or institution holding the record to the clinician requesting the record.

Interfacing with State Department of Public Health Registries

The Mass HIway project team worked closely with the state's DPH to transition all public health registries within the state to the Mass HIway.

The public health registry nodes on the HIway include a Clinical Application Layer that opens the incoming file, applies registry-specific validation rules for the file, and drops the file into the appropriate health registry. Today, healthcare providers can submit to the following DPH registries via a single interface on the Mass HIway:

- Intake Enrollment and Assessment Transfer Service/Opioid Treatment Program
- The Massachusetts Cancer Registry
- Childhood Lead Poisoning Prevention Program
- Adult Lead Poisoning Program

- Massachusetts Immunization Information System
- Electronic Lab Reporting
- Syndromic Surveillance

Connecting HISPs and other Private HIEs

Health Information Service Providers (HISPs) manage security and transport for health information exchange among health care entities or individuals using the DIRECT standard for transport. Private HISPs each have their own customer base, consisting of anywhere from hundreds to thousands of providers.

The Mass HIway project team created an interface to enable private HISPs– and their associated provider customer bases – to connect to the HIway. Today, eleven private HISP organizations are live with the Mass HIway. Before the end of 2015, we plan to connect an additional five HISPs.

Significance of the Project

Through the HIway, Massachusetts is shifting the role of state government in healthcare. Rather than a top-down, government-mandated approach, the HIway is an excellent example of innovative collaboration between the public and private sectors.

The state's Executive Office of Health and Human Services (EOHHS) has a robust partnership with the providers, electronic health record vendors, private health information exchanges, hospitals and other healthcare entities in Massachusetts.

Mass HIway's role as an independent, central health information exchange hub for the entire state, working closely with private health information exchange entities, represents a unique government approach. The HIway is well-positioned to fill this role for a number of reasons, including:

- This role requires acquisition of information that goes well beyond what any single organization or enterprise can gather willingly or efficiently. EOHHS and the Mass HIway team are in a good position to bring competing organizations together to work toward shared goals.

- Many of the services provided by the Mass HIway are well ahead of the private market and require an "incubation" period before being picked up by private companies. This was the case with the Mass HIway's initial launch of DIRECT messaging and continues to be the case with the pull method of query and retrieve that is just beginning to gain traction.

- State government is in a unique position to provide smaller providers and other less privileged healthcare market segments access to services to that might be otherwise cost prohibitive.

Through the digitization and exchange of healthcare data, the Mass HIway is providing a range of value-added services to these private entities and is moving the state closer to meeting its goal of a truly interoperable healthcare landscape.

Benefit of the Project

The number of healthcare organizations connected to the HIway indicates a highly connected state – and an enhanced healthcare landscape. At the highest level, 95% of Massachusetts hospitals are engaged with the Mass HIway: 65% are actively connected to the HIway and 30% are in the process of connecting.

Almost half of the state's hospitals – 46% – are sending information via the HIway to one or more public health agencies for mandatory public health reporting. Thirty hospitals – 38% of total – are now capable of sending and/or receiving transition of care information with at least one other healthcare provider. The total number of entries in the provider directory is (a whopping!) 6,551.

We also measure the HIway's by transaction volume and utilization statistics. In this respect, the HIway is a resounding success, with **13,770,336** transactions as of May 20, 2015. The table below illustrates year-to-date transaction growth.

It is worth noting that the highest utilization rate is in the Public Health Reporting space.

	Jan. '15	Feb. '15	Mar. '15	Apr. '15	May '15	YTD
# of transactions	761,022	1,247,932	1,427,187	1,656,319	1,830,403	**5,092,460**
By use case						
Public Health Reporting	550,336	1,043,516	1,154,867	1,266,912	1,496,573	**4,015,631**
% of transactions	72%	84%	81%	76%	82%	**79%**
Quality Data Reporting	142,397	147,378	195,238	221,790	150,268	**706,803**
% of transactions	19%	12%	14%	13%	8%	**14%**
Transition of Care	52,925	40,894	58,787	71,898	152,794	**224,504**
% of transactions	7%	3%	4%	4%	8%	**4%**
Payer Case Management	14,998	15,553	17,460	95,148	29,984	**143,159**
% of transactions	2%	1%	1%	6%	2%	**3%**

Public Health Reporting Benefits

The HIway provides significant value to both the state's DPH and the healthcare providers reporting to one or more public health registries. The public health interfaces simplify providers' compliance with DPH and other reporting requirements and support providers' ability to achieve meaningful use of electronic health records.

To submit data to the registries in keeping with state and federal public health requirements, in the past, healthcare providers maintained from four to eight different processes. The majority of submissions were made through a combination of electronic and manual processes that required financial resources to maintain.

On the receiving end, the state's DPH had to maintain a myriad of systems and processes to handle the influx of data from healthcare provider organizations. The expense from both a personnel and hardware/software perspective was significant. Enabling organizations to report electronically to these registries via a single end point on the HIway reduces the infrastructure and resource costs required to maintain multiple processes and systems.

In addition, use of the HIway promotes surveillance for infectious diseases while assuring fast, secure, uniform, and reliable methods of communication and providing actionable, real-time data for program reporting, quality improvement, and evaluation.

Transitions of Care Benefits

The benefits of ubiquitous statewide exchange of health information that accommodates all patients and providers in the state of Massachusetts include:

- Improved care coordination and efficiency
- Fewer medical errors and improved patient safety
- Reduction in duplicative tests
- Reduction in health care costs
- Improved public health reporting and analytics
- Provides the foundation for Accountable Care Organizations and other alternative payment based healthcare models
- Enables smaller organizations with limited resources to achieve 'meaningful use'

The Mass HIway has experienced tremendous growth since its launch; growth that is directly attributable to the value it provides to healthcare entities across the state.

We expect the HIways' growth to increase exponentially in the coming years due to healthcare payment reform and shifts in population health. The HIway is poised to accommodate these shifts so that better health outcomes, decreased costs, and improved healthcare quality can truly be achieved.