



Better Transportation Infrastructure Can Mean Better Health

Massachusetts Department of Health
Stories from Public Health Innovators

Introduction

The Centers for Disease Control and Prevention's (CDC) [Health Impact in 5 Years \(HI-5\)](#)¹ initiative highlights community-wide approaches that can improve the places where we live, learn, work, and play. Efforts to expand public transportation infrastructure in Massachusetts were underway before CDC developed the HI-5 initiative, but showcase components that may be needed to carry out one of the HI-5 evidence-based approaches: [the introduction or expansion of public transportation systems](#).²

Massachusetts passed landmark transportation reform legislation in 2009³ that included the [Healthy Transportation Compact](#)⁴ (HTC), which was intended to encourage transportation decisions that would consider all transportation modes and users. Building on this new legislation, state agencies are working together to expand their public transit infrastructure, and in the process, turn challenges into opportunities. Besides making public transit more widely available, the state is working to reinvigorate and reunite communities by redesigning roadways that have the ability to improve health.

HI-5: Public Transportation System Introduction and Expansion²



The goal: Increase access to public transit—defined as buses, light rail, or subways—that are available to the public, run at scheduled times, and that may require a fare.



The strategy: Build or expand transportation systems to ensure people can reach everyday destinations—such as jobs, schools, healthy food outlets, and healthcare facilities—safely and reliably.



The health impact: Public transit is safer than private vehicles, improves air quality, provides opportunities for physical activity, and increases access to vital services.



The value: Providing high-quality transit services, including urban rail or “bus rapid transit” systems has the ability to produce per capita annual health benefits of \$355.⁵

Problem

Massachusetts faces many of the same transportation-related challenge as other states, including improving its population’s health, increasing people’s ability to get to jobs, schools, and healthcare facilities, and replacing crumbling infrastructure.⁶ The state is tackling all of those problems in a single project, by replacing a worn-out highway overpass in suburban Boston with a walkable, bike-friendly boulevard that connects people to an expanded light rail system.



The deteriorating 40-year-old overpass on McGrath Highway in Somerville had outlasted its usefulness. The overpass had never been highly regarded by community residents because it cut off parts of the city from one another, making it impossible to bike or walk between neighborhoods. The opportunity to redesign the



McGrath Highway Overpass in Somerville, MA

Support from Multi-Sector Partners

Massachusetts has a long history of working across sectors on efforts connecting transportation and health. The 2009 HTC recognized that transportation affects all aspects of life. As a result, state agencies have pledged to work together to make transportation decisions that balance the needs of all transportation users, expand mobility, improve public health, support a cleaner environment, and create stronger communities.⁴

The HTC is co-chaired by the secretary of the Massachusetts Department of Transportation and the secretary of the Massachusetts Department of Health and Human Services (MDHHS). The secretary of the Department of Energy and Environmental Affairs, the Massachusetts highway administrator, the state transit administrator, the commissioner of Public Health, and the secretary of Housing and Economic Development are all members of the HTC.



overpass presented a chance to reimagine both the roadway and the community. Residents favored “grounding” the overpass to create

a boulevard-style street with sidewalks and bike lanes, knitting the community back together.

The need to replace the crumbling overpass also coincided with expansion of Boston’s Green Line light rail into the suburb of Somerville. Not only would grounding McGrath Highway remove physical barriers dividing the community, the improved mobility by foot and by bike also promised to address “the last mile problem” making sure people could actually get to and from the new railway stations. Before greenlighting the plan, however, the HTC required the state to assess its potential health impacts and benefits in the surrounding community.

Health impact assessment⁷

is a process that helps evaluate the potential health effects of a plan, project, or policy before it is built or implemented. HIA brings potential positive and negative public health impacts and considerations to the decision-making process for plans, projects, and policies that fall outside traditional public health arenas, such as transportation and land use. An HIA provides practical recommendations to increase positive health effects and minimize negative health effects.

A cornerstone of collaboration between the health and transportation departments involves conducting the [health impact assessments \(HIAs\)](#)⁷ required for transportation-related projects in Massachusetts—including a study to redesign McGrath Highway and the nearby light rail expansion.

HIAs represent a new generation of public health evaluation approaches that more comprehensively look at the underlying factors that affect health, known as “[social determinants of health](#).”⁸

They rely heavily on community engagement and include vulnerable populations in decision-making, with a focus on recommending strategies to reduce health disparities.

Social determinants of health⁸

are conditions in the environments in which people live, learn, work, play, worship, and age that affect a range of health, functioning, and quality-of-life outcomes and risks.

“ The evidence base needs to be clearly laid out and presented from the beginning so it brings everyone onto the same page about why health needs to be considered and why we are considering different health impacts. ”

Benjamin Wood,
Massachusetts Department of Public Health

Making the Case

Expansion of the Green Line was an important consideration in determining how the redesign of the McGrath Highway could affect residents' health. The placement of new transit stops located parallel to the roadway would determine whether people would be driving, walking, or bicycling to the new stations.

It was also important to understand the potential effects of other planned development in the area. The Massachusetts Department of Public Health used data to model the differences



between the existing infrastructure and the proposed roadway designs in promoting walking and biking. The health department also used data from transportation department models to look at the potential dispersion of motor vehicle-related air

pollutants. The HIA also studied baseline health and socioeconomic indicators, air quality, noise levels, public safety, mobility and connectivity, as well as land use and economic development.

The HIA generated many findings and considerations related to health and socioeconomic disparities in the community surrounding the roadway, including the potential for gentrification after the roadway was redesigned and the new light rail expansion was operating. Based on these findings, the HIA recommended involving community residents in ongoing efforts to redesign McGrath Highway and the nearby light rail expansion, landscaping to reduce near-roadway pollution, and placing sidewalks and bike paths as far away from vehicle emissions as possible.

Massachusetts used the HIA data as a starting point for conversations with a diverse group of stakeholders. However, the individuals and groups involved had a wide array of interests. To promote interactive dialogue among participants, the health department held



separate meetings and interviews with stakeholders in the community, and customized presentations and discussions with each audience.

Artistic rendering of the proposed McGrath Urban Boulevard Development, Massachusetts

Creating a Win-Win

The health department noted three helpful strategies for involving stakeholders:

- Engage many different partners, including community groups, bike clubs, [Safe Routes to Schools](#)⁹ coalitions, the healthcare system, city planners, elected officials and residents.
- Frame the information for each audience: e.g., numbers for the traffic engineers, plain language for community residents, and economic information for businesses.
- Translate the health outcome information for decision-makers.

Considering all audiences from the beginning can provide a better understanding of the HIA findings when the study is completed.

Overcoming Barriers

One challenge related to promoting active transportation is the need to minimize exposures to motor vehicle emissions. The health department was able to respond to these concerns with evidence-



based recommendations from studies by the U.S. Environmental Protection Agency and other groups. Recommendations included locating sidewalks and bike paths farther away from the roadway, and installing barriers like shrubs and trees between the roadway and sidewalk and bike paths.¹⁰

“ The emergence of health impact assessments represents the next generation of public health assessment, by including a more comprehensive approach of the underlying factors that influence health, especially social determinants. ”

Benjamin Wood,
Massachusetts Department of Public Health



Artistic rendering of the proposed McGrath Urban Boulevard Development, Massachusetts

Impact and Sustainability

The recommendations from the HIA provide valuable insight about how considering health in planning stages can lead to healthier, more sustainable transportation policies and decisions. In Massachusetts, multiple factors are coming together to create a healthier environment. In addition to expanding the light-rail and grounding the McGrath Highway overpass to create more active transit options, the state has put together a successful low-emission vehicle program and has had increased support from both public and private sectors for more green spaces. Enthusiasm for walking and biking is growing in the community because of their

obvious health benefits as well as simple enjoyment. To sustain the benefits for the community, preserve affordable property rates in the neighborhood, and protect vulnerable populations who might be pushed out by development, the HIA recommended that planning regarding future housing options should continue to include community input. The HIA for the McGrath Highway overpass is just one of several HIAs that the health and transportation departments have completed. The two departments continue to work together and with other state agencies as part of the Healthy Transportation Compact.

About CDC's HI-5 (Health Impact in 5 Years) Initiative

HI-5 strategies can help you achieve healthy outcomes in your community in 5 years or less, providing good economic value for the investment. CDC reviewed the science to focus on 14 proven approaches that rose to the top as attainable wins for public health. The introduction or expansion of public transportation is just one of the 14 evidence-based interventions identified. CDC's HI-5 initiative can help you make decisions about what works and where to focus efforts to improve public health. To find out more about how your community can use the HI-5 initiative to improve the health of all people, visit the HI-5 website: www.cdc.gov/hi5.

This publication was supported by the Centers for Disease Control and Prevention (CDC) cooperative agreement #NU380t000161-04-01 awarded to the Association of State and Territorial Health Officials (ASTHO). The contents are solely the responsibility of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

CDC would like to thank ASTHO and the Massachusetts Department of Health for their significant contributions to the HI-5 series of stories with public health innovators across the United States. Please contact pophealth@astho.org with any questions.



HEALTH **IMPACT** IN 5 YEARS

References

1. Centers for Disease Control and Prevention. Health Impact in 5 Years: <https://www.cdc.gov/policy/hst/hi5/>. Accessed November 16, 2017.
2. Centers for Disease Control and Prevention. Health Impact in 5 Years: Public Transportation System: Introduction or Expansion: <https://www.cdc.gov/policy/hst/hi5/publictransportation/index.html>. Accessed November 16, 2017.
3. Commonwealth of Massachusetts. Transportation Reform Bill, Chapter 25 of the Acts of 2009. June 25, 2009. <https://malegislature.gov/Laws/SessionLaws/Acts/2009/Chapter25>. Accessed December 19, 2017.
4. U.S. Department of Transportation. Exemplary Human Environment Initiatives Award: Encouraging Non-motorized Transportation. <https://www.fhwa.dot.gov/Environment/ehei/awards/2010/massachusetts.cfm>. Accessed December 19, 2017.
5. Litman, T., Evaluating Public Transportation Health Benefits. 2010, Victoria Transport Policy Institute: Evaluating Public Transportation Health Benefits. http://www.apta.com/resources/reportsandpublications/documents/apta_health_benefits_litman.pdf. Accessed November 16, 2017.
6. Northeastern University, Dukakis Center for Urban & Regional Policy. The Toll of Transportation. November, 2013. <http://www.northeastern.edu/dukakiscenter/wp-content/uploads/2013/11/The-Toll-of-Transportation-Final-Report.pdf>. Accessed December 19, 2017.
7. Centers for Disease Control and Prevention, Healthy Places: Health Impact Assessment. Last Updated September 19, 2016. Available from: <https://www.cdc.gov/healthyplaces/hia.htm>. Accessed April 2, 2018.
8. U.S. Department of Health and Human Services, 2017. Healthy People 2020. Social Determinants of Health. Available from: <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>. Accessed December 19, 2017.
9. Safe Routes to School National Partnership: <https://www.saferoutespartnership.org/>
10. Massachusetts Department of Public Health, Bureau of Environmental Health. July 1, 2013. Health Impact Assessment of the Massachusetts Department of Transportation (MassDOT) Grounding McGrath Study: <http://www.mass.gov/eohhs/docs/dph/environmental/hia/hia-mcgrath-final-report.pdf>. Accessed December 19, 2017.

For more case examples of HI-5 approaches, please refer to www.cdc.gov/hi5

