

Enhancements to achieve Complete Streets

EXPAND AND IMPROVE BICYCLIST, PEDESTRIAN, SHARED, AND PUBLIC TRANSPORTATION OPTIONS AS AN ALTERNATIVE TO PERSONAL VEHICLE USE

Description and purpose of strategy: Complete Streets provide safe, accessible options for all modes of travel and encourage less personal vehicle travel (a significant source of greenhouse gas [GHG] emissions) by providing opportunity for walking, biking, and transit. A complete street may include sidewalks, bike lanes (or wide paved shoulders), special bus lanes, comfortable and accessible public transportation stops, frequent and safe crossing opportunities, median islands, accessible pedestrian signals, curb extensions, narrower travel lanes, roundabouts, and more.

Content of fact sheet: Overview of the costs and benefits of Complete Streets, example of the benefits of a sidewalk project in Sandwich, and information on the process and resources available for advancing Complete Streets initiatives.

Implementation support: This fact sheet expands upon strategies and actions from the Climate Actions Database, which can be found at: capecodcommission.org/climate.

BENEFITS

- Greenhouse gas (GHG) emissions reductions or sequestration
- Health improvement from reduced pollutants
- Increased recreation
- Lower maintenance/operational costs
- Environmental enhancement/protection
- Less damage to infrastructure
- Higher property values
- Increased resilience
- Job and economic growth

COSTS

- Higher capital costs
- Higher maintenance costs
- Higher operational costs
- Additional time for municipal staff to implement

KEY FINDINGS



Equity: Strategies to reduce potential economic burdens, including siting Complete Streets projects near vulnerable communities, could help maximize potential benefits to these populations and ensure equitable distribution of outcomes.



Financial benefits: A Complete Streets effort can be cost-effective as part of a larger planned project, depending on local context and project characteristics.



Non-market benefits: Improvements in health from reduced pollutants and increased recreational opportunities are major benefits of Complete Streets projects.



GHG reductions: Providing opportunities for alternative modes of transit can reduce vehicle miles traveled, with associated reductions in GHG emissions.



Ease of implementation: Complete Streets policies provide guidance for a wide range of transportation projects, ultimately becoming incorporated in normal practice. Community engagement should ensure that projects are designed to maximize equity benefits.

BENEFIT COST ANALYSIS

The diversity of project types and local contexts presents a challenge for estimating benefits and costs of Complete Streets projects. To help communities estimate the benefits, Smart Growth America has developed the [Benefits of Complete Streets \(BCS\) Tool](#), which is composed of several modules (with associated outputs):

- Equity (age, race, educational attainment, English proficiency, poverty)
- New cyclists (additional adult cycling trips over 20 years)
- Cycling environmental impacts (vehicle miles traveled, reduction in GHG and criteria pollutants)
- Pedestrian intersection safety (fatalities, injuries)
- Speed reduction (fatalities)
- Tree planting (monetized 20-year estimate of the benefits of environmental services, aesthetic beauty, and comfort)
- Cycling and pedestrian health (reduction in health-related deaths)
- Economic impacts (percent change in property tax base, dollar change in property tax revenue)

For example, in 2022, the Town of Sandwich began to undertake a project at the intersection of Forestdale and Meetinghouse Roads to include resurfacing, adding bicycle lanes, reconstructing sidewalks, and adding countdowns to crosswalk signals. Using local data on population characteristics, bicycle and pedestrian trips, traffic incidents, property values, and tax rates, the BCS tool calculates the following benefits over a 20-year horizon.

20-YEAR IMPACTS OF A COMPLETE STREETS PROJECT IN SANDWICH, MASSACHUSETTS

NEW CYCLISTS	
Additional adult cycling trips	246,549 trips
CYCLING ENVIRONMENTAL IMPACTS	
Vehicle miles traveled reduction	133,789 miles
CO ₂ reduction	62.6467 tons
NO _x reduction	0.0096 tons
PM ₁₀ reduction	0.0059 tons
SO _x reduction	0.0059 tons
VOC reduction	0.0059 tons
CYCLING AND PEDESTRIAN HEALTH	
Reduction in health-related deaths	1.2 deaths
ECONOMIC IMPACTS	
% change in property tax base	0.5%
\$ change in property tax revenue	\$165,704

The overall benefits and costs of the Sandwich project—calculated using the BCS tool for property tax revenues and reductions in pollutants, along with Environmental Protection Agency (EPA)-estimated values of the social costs of CO₂ and criteria pollutants ([IWG, 2021](#); [EPA, 2021](#))—are presented below.

BENEFITS AND COSTS OF A COMPLETE STREETS PROJECT IN SANDWICH, MASSACHUSETTS

BENEFIT/COST CATEGORY	AMOUNT
Increased property tax revenue	\$165,704
Reduced NO _x , SO _x , and VOCs	\$75–169
Reduced CO ₂	\$3,571
Total project cost	(\$2,400,000)
Massachusetts Complete Streets funding	\$400,000
Total	(\$1,830,603)

EQUITY

Complete Streets policies can lead to a variety of outcomes that strengthen equity and reduce burdens on vulnerable populations. The [Federal Highway Administration](#) regards Complete Streets as a strategy to improve equity due to potential benefits related to creating a “fair, safe, accessible, and healthy transportation network.” A few potential benefits include:

- **Enhanced economic opportunity.** Complete Streets policies may lead to increased employment and higher property values ([Cox et al., 2015](#)), which could be a large benefit to many communities.
- **Improved transportation options.** Many communities have limited access to personal vehicles and rely on public transportation systems. A Complete Streets program could help present additional (and safe) transportation options, such as new walking and bicycle paths. Notably, Complete Streets programs help create a more interconnected transportation network by creating first- and last-mile connections to transit stops ([Cox et al., 2015](#)), which can be a critical resource for communities that rely on public transportation.
- **Reduced vehicular emission exposure.** Complete Streets programs have been shown to increase walking and bicycling trips ([Cox et al., 2015](#)), which can lead to a reduction in GHG emissions and pollution. Many environmental justice and vulnerable communities are disproportionately exposed to vehicle emissions ([U.S. Federal Highway Administration, 2022](#)); therefore, reductions in emissions could be especially impactful.

Optimizing Equity During Implementation

Prioritizing low-income communities, environmental justice populations, and vulnerable communities when siting Complete Streets projects will help maximize potential benefits for these populations, ensuring equitable distribution of outcomes for all.

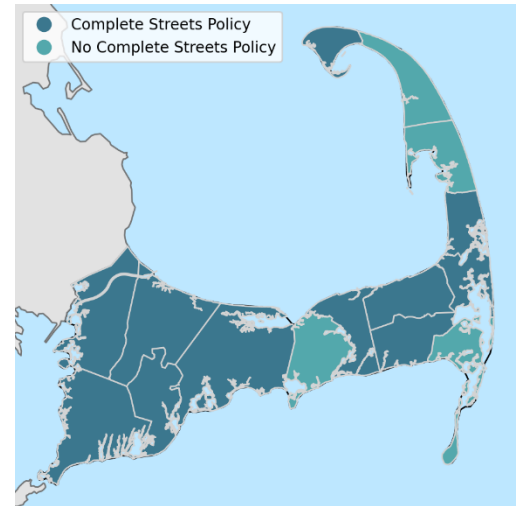
STATE OF PRACTICE

General State of Practice

The adoption of Complete Streets policies in the U.S. has increased from nine jurisdictions in 2000 to over 1,600 by 2022. These policies help decision-makers shape practices for street design, and are the first step in the process of creating a network that connects more people to destinations safely and efficiently ([Smart Growth America, 2023](#)).

Cape Cod Context

Several municipalities on the Cape participate in the Massachusetts Department of Transportation (MassDOT) Complete Streets Funding Program, which requires passage of a Complete Streets policy and development of a prioritization plan. As of March 2023, 11 towns have adopted policies and four projects have received awards through the program.



MASSDOT FUNDING PROGRAM AWARDS

DATE	TOWN	PROJECT	TOTAL PROJECT COST	AWARD AMOUNT
March 2018	Sandwich	Install Sandy Neck Road sidewalk	\$448,000	\$200,000
May 2022	Sandwich	Resurface the intersection at Forestdale Road and Meetinghouse Road to add bicycle lanes, reconstruct sidewalks, and add countdown crosswalk signals.	\$2,400,000*	\$400,000
October 2022	Eastham	Build a shared-use path along the northern side of Samoset Road to the Cape Cod Rail Trail. Realign the intersection at Samoset Road and Depot Road to create a conventional T-intersection and install a rectangular rapid flashing beacon at the Cape Cod Rail Trail crossing.		\$500,000
October 2022	Falmouth	Install new ADA-compliant sidewalks on the Dillingham Avenue extension from Hamlin Avenue to the Lawrence School.	\$225,000*	\$156,202

*current estimate

CASE STUDY: SANDWICH, MA

In 2016, the Town of Sandwich embarked on the development of a Complete Streets policy and a prioritization plan. Both were approved in 2017. The prioritization plan ranked 31 projects, which ranged in cost from \$3,000 to over \$7 million (2017 values). Several projects have been completed and others are well underway, including sidewalk construction, re-stripping shoulders of existing streets to accommodate bicyclists, creation of a bicycle route using signage and pavement markings, crossing improvements with rectangular rapid flashing beacon systems near a skate park and town offices, and a 4-mile-long shared-use path. Collaboration with and support from the town's Bikeways and Pedestrian Committee was instrumental in program development and continues to aid implementation. Securing grant funding from a range of programs, including for design and construction, has been critical to successful progress in implementation. Similar to other Cape towns, alterations to streets in the historic areas face unique challenges related to the preservation of the historic and scenic character of the streets and sidewalks.



IMPLEMENTATION

The following steps are required for MassDOT's Complete Streets Funding Program. Policies will address a broader set of transportation projects than MassDOT's funding will support, ultimately becoming incorporated into standard processes.

1. **Develop a policy.** Develop a municipal Complete Streets policy for adoption as a bylaw, ordinance, or administrative policy by the municipality's highest elected body. (A [model policy](#) is available from the Cape Cod Commission.)
2. **Formulate a plan.** Formulate a prioritization plan through a community-driven process representing a diversity of stakeholders to identify and rank all potential projects for approval by MassDOT. Support for the planning process is available from MassDOT with no cost to municipalities.
3. **Implement projects.** Prepare project design and budget documents to support funding applications and bidding. MassDOT funding is available for municipal roadways, new construction, reconstruction, some types of rehabilitation, standalone projects, or elements of larger projects, and must be approved by MassDOT.

REQUIRED EXPERTISE

Internal: Town engineer, town planner, Department of Public Works (DPW) staff

External: Traffic and civil engineering consulting firm

Resources that may help a municipality implement Complete Streets are provided below.

FINANCIAL AND TECHNICAL SUPPORT

MassDOT Complete Streets Funding Program	Addresses critical gaps in transportation networks by giving Massachusetts municipalities tools and funding to advance Complete Streets.
State Transportation Improvement Program (STIP)	A combined effort between MassDOT and many state agencies that work together to design and build highways and transit projects.
Shared Streets and Space Grant Program	Provides funding to municipalities and public transit authorities to quickly make improvements to plazas, sidewalks, curbs, streets, bus stops, parking areas, and other public spaces in support of public health, safe mobility, and strengthened commerce.
MassTrails Grants	Provides matching grants to communities, public entities, and nonprofit organizations to plan, design, create, and maintain a diverse network of trails, trail systems, and trail experiences.
Municipal Americans with Disabilities Act Grant	Supports capital improvements dedicated to improving access for persons with disabilities.
Massachusetts Safe Routes to School Program	Works to increase safe biking and walking among elementary, middle, and high school students by using a collaborative, community-focused approach that bridges the gap between health and transportation.

ADDITIONAL INFORMATION

Complete Streets/Living Streets: A Design Manual for Cape Cod	A guidebook focused on incorporating Complete Streets elements in Cape roadways in a context-sensitive way.
National Complete Streets Coalition	A program of Smart Growth America, the coalition is a nonprofit, nonpartisan alliance of public interest organizations and transportation professionals committed to developing and implementing Complete Streets policies and practices.
Benefits of Complete Streets Tool	Designed to measure the benefits of building activity-friendly routes to everyday destinations through Complete Streets.