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COMPLETE STREETS TOOLKIT

For the Southern New Hampshire
Planning Commission Region

January 2017

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2016

SNHPC Complete Streets Toolkit

Section I: Overview

The intent of this section is to provide an overview of Complete Streets including online resources available to assist the reader in addressing the following questions:

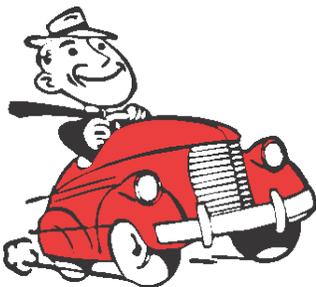
- What are Complete Streets?
- What is the history behind Complete Streets?
- For whom are Complete Streets designed?
- What are the benefits of Complete Streets?
- Where can Complete Streets be seen?

Special Thanks: This project was a success thanks to the many people who participated in the Stakeholder Committee and Pilot Programs including Deerfield, Francestown, and Windham, New Hampshire. These people volunteered their time to consider the concepts of Complete Streets, opened their communities to demonstration projects, shared their expertise, provided tours, hosted meetings, and sent inspiring Complete Streets news and links. Also, *thank you* to our funders for supporting this work. We know from many of our participating communities that this was a very worthwhile and meaningful project, and we look forward to continuing the work for years to come.



In this section:

- *Project Introduction*
- *What are Complete Streets?*
 - *Definition, historical perspective & present day in New England*
- *Complete Streets Overview*
 - *For whom are they designed?*
 - *A commitment in approach*
 - *Why in New Hampshire?*
 - *Benefits to Complete Streets*
- *Who is Incorporating Complete Streets?*
 - *Programs and projects within New Hampshire*
 - *Demonstration projects*
 - *Projects within New England and beyond*
- *Education, Outreach, and Training*
 - *Within New Hampshire*
 - *Within New England*



SECTION I: COMPLETE STREETS TOOLKIT AND PROJECT INTRODUCTION

In its capacity as MPO (Metropolitan Planning Organization) for the region, the Southern New Hampshire Planning Commission (SNHPC) is pleased to provide this Complete Streets Toolkit. The primary goal for this work is to develop and publish a resource guide for how to implement Complete Streets principles, policies, and projects for communities within the SNHPC Region and beyond.

Communities within the SNHPC region are as diverse as the street networks that weave through their landscapes, ranging in population (1,500 to over 110,000), resources, and character. One of the unique attributes of this toolkit is the recognition that rural, suburban, and urban communities may require very different solutions in making their streets systems friendly to all users. These three community distinctions are seen throughout the toolkit. Additionally, an abundance of examples are provided in each section, including hyperlinks to websites and other resources.

The SNHPC staff has put together a comprehensive guide of resources on a variety of Complete Streets topics including:

- *Section 1: Complete Streets Overview*
- *Section 2: Steering Committee Involvement and Guidance*
- *Section 3: Policy Guidance*
- *Section 4: Design & Engineering Standards*
- *Section 5: SNHPC Community Pilot Programs*

This section provides an overview of Complete Streets, an introduction of the topic and its elements, including: what they are and their history, why communities should consider incorporating them into their transportation planning, and a variety of examples of the type of projects happening in New Hampshire and elsewhere. Some of these topics are described in more detail in other sections of the toolkit and are referenced as such.

We hope you find this toolkit useful and welcome your feedback. Please note that the contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation or the New Hampshire Department of Transportation. Also, please thank our funding providers as they could provide additional resources towards Complete Streets Projects in the future: Federal Highway Administration Funds administered and allowed through New Hampshire Department of Transportation (NHDOT) as well as the New Hampshire Endowment for Health.

A. WHAT ARE COMPLETE STREETS?

1. THE BASIC DEFINITION:

According to *Smart Growth America*: *Complete Streets are streets for everyone.* A Community or Agency that adopts a *Complete Streets* approach to transportation planning is about their commitment to planning, engineering, and maintenance resources in creating and maintaining a street system for all users. It ensures safe access, convenience, and comfortable travel for pedestrians, bicyclists, motorists and transit riders of *all ages and abilities*. Complete Streets make it easy to cross the street, walk to shops, and bicycle to work.¹

B. COMPLETE STREETS HISTORY: WALKABILITY COMES FULL CIRCLE

1. HISTORICAL PERSPECTIVE - BACK IN THE DAY:

If you Google “life before the automobile”, you will be fascinated by photos from the late 1800s and early 1900s. This *stepping back in time*, pardon the pun, will remind us all that prior to the automobile, the street system, though not perfect, was originally built and used by all users. There was a time when walkers were the most prevalent users of the street network.



Los Angeles, 1900. Source: [http://waterandpower.org/museum/Early_City_Views%20\(1900%20-%201925\)_Page_1.html](http://waterandpower.org/museum/Early_City_Views%20(1900%20-%201925)_Page_1.html)

Since the 1930s, transportation planning has been one-dimensional, focused primarily on motorized vehicles. During this time, the proliferation of automobiles meant that the needs of pedestrians and

cyclists were often relegated to a back burner. A majority of the nation's policy, planning, and engineering of the transportation infrastructure developed into roads for able-bodied adults in automobiles. While these policies helped shape the character of our urban, suburban, and rural communities, they've often failed to recognize the needs of all travelers, including people of all ages and abilities as well as those who travel by transit, bicycle, and on foot.

According to the [NJ Bicycle & Pedestrian Resource Center](#), since the 1970s, advocacy groups have responded by championing the idea of "routine accommodation" in which the needs of cyclists and pedestrians would be considered during all roadway projects. In the 1970s and 80s the states of Oregon and Florida were the first to embrace this idea and, on a federal level, routine accommodation was incorporated into initiatives including the Americans with Disabilities Act (1990), the Transportation Equity Act of the 21st Century (1998), and policy guidance issued by the Federal Highway Administration and the U.S. Department of Transportation.²

The NJ Bicycle and Pedestrian Resource Center also reported that in 2003, bicycle advocates suggested replacing the technical phrase "routine accommodation" with a more powerful and inclusive term: Complete Streets. Representatives from the [League of American Bicyclists](#) subsequently formed the Complete Streets Task Force, which garnered active participation from groups such as AARP, the American Planning Association (APA), and the American Heart Association (AHA). The Task Force initially focused on lobbying for a Complete Streets policy in the subsequent federal transportation bill, SAFETEA-LU (2005), but soon widened its goal to state and local policy change. In 2005, the Task Force Steering Committee formed the [National Complete Streets Coalition](#), which continues to advocate for the adoption of Complete Streets policies at all levels of government. According to the Coalition, "a total of 448 regional and local jurisdictions, 27 states, the Commonwealth of Puerto Rico, and the District of Columbia have adopted [Complete Streets] policies or have made written commitment to do so".³

Finally, the NJ Bicycle and Pedestrian Resource Center stated that in 2010, the U.S. Department of Transportation issued a policy statement that declares "...DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects" and state and local governments, public agencies, and other organizations should adopted similar policies. Additionally, in 2011, bills were introduced in both chambers of Congress that would have required state DOTs and MPOs to consider "safety and convenience" of all roadway users during transportation projects but did not pass committee review. Complete Streets proponents continue to advocate for the adoption of Complete Streets policies at all levels of government.⁴

2. COMPLETE STREETS PRESENT-DAY WITHIN NEW ENGLAND

Complete Streets in New England have beginnings both as grass-roots efforts as well as support from state and non-profit agencies; interestingly enough stakeholders other than transportation departments! For example, in 2011, Vermont began their Complete Streets effort through the support of Vermont AARP and their State Department of Health. Look [here](#) for a summary of the history

regarding Vermont’s process. Their Act 34 is a wonderful example of ensuring transportation planning is for all users; an excerpt follows:

The purpose of this bill is to ensure that the needs of all users of Vermont’s transportation system— including motorists, bicyclists, public transportation users, and pedestrians of all ages and abilities—are considered in all state and municipally managed transportation projects and project phases, including planning, development, construction, and maintenance, except in the case of projects or project components involving unpaved highways. These “complete streets” principles shall be integral to the transportation policy of Vermont.

Much additional information on Vermont’s Complete Streets can be found in [their guide](#).

Massachusetts State Departments of Transportation is a major proponent of Complete Streets with State wide policies, opportunities for training, and materials and funding to assist communities. According to [WalkBoston](#), a non-profit pedestrian advocacy organization dedicated to improving walking conditions in cities and towns across Massachusetts, the Bay State has over 30 communities that have adopted Complete Streets Policies. (See Section III for Massachusetts Complete Streets Policy)

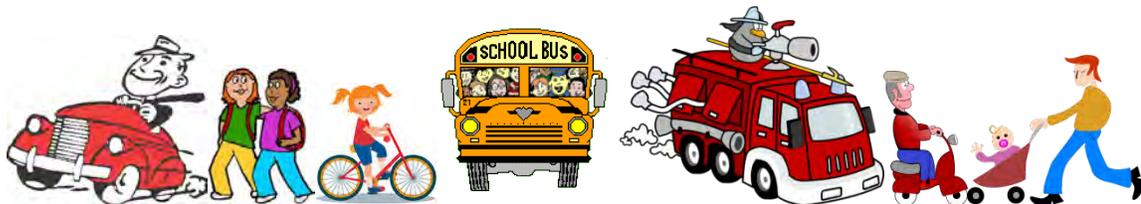
Similar to Vermont’s effort, in 2016, New Hampshire stakeholders joined forces to highlight the need for a statewide Complete Streets policy. A Coalition of communities, Regional Planning Agencies, and others worked to have the State Legislature recognize the need for Complete Streets. Some of that work and the agencies supporting the effort can be found [here](#).

Note: Section III Planning and Policy covers an additional and more in-depth look at these topics.

C. COMPLETE STREETS OVERVIEW

1. FOR WHOM ARE COMPLETE STREETS DESIGNED?

The Driver, The Walker, The Bicyclist, The Transit Rider, The Trucker, The Emergency Vehicle Driver, The Wheelchair User, or The Motorized Scooter User, The Dad with Stroller.



We all know when streets are not designed for users other than vehicles. Put yourself in the place of someone trying to get from Point A to Point B, perhaps your home to a local shop, the library or a park.



Deerfield, NH. Summer 2016

A typical rural or suburban setting may mean you are traveling on a road with *no designated lanes*, just a linear sea of pavement with no painted center line and no fog lines, (the white line along the road shoulder on each side of the road). Depending on the characteristics of the road, such as width and shoulder allowance, curvature, how flat or hilly it might be, available lighting, typical driver speed, and other nuances, it is likely your choices for the mode of how you travel are very limited. For many, it may be that vehicle travel is the only safe alternative, and for some, especially the elderly, this

too maybe limited to daytime travel due to the reluctance to drive at night. Again, depending on the lighting and other road characteristics, many, especially seniors, have trouble seeing the edge of the road. Considering the aging of our population, the issue of night-time driving will become more prevalent.

Conversely, if you are lucky enough to have your two points connected by a *Complete Streets system*, a system with designated lanes and other design elements for various users, you could have multiple options because the road was designed and maintained for vehicles, bicyclists, and walkers; you would feel safe utilizing any of those modes.

(See Section 4: Design and Engineering Standards for more details)



**Deerfield Complete Streets Pilot Program,
Church St. October, 2016**

2. COMPLETE STREETS: A COMMITMENT IN APPROACH

Avoiding conflicts in road systems is difficult, but reducing risks can be done through a Complete Streets approach. Staff at SNHPC has come to realize that Complete Streets require commitments on multiple levels including policy, design, and maintenance. Whether on the local level or state level, the first commitment must be a mindset that recognizes multiple modes of transportation deserve to safely, efficiently and comfortably utilize the road systems. This recognition not only differentiates modes of travel, but different abilities as well. For example, not every bicyclist wears spandex and can pump out a century ride (100 miles) and not every walker can also jog down to the corner store in under five minutes. Suffice it to say, the many ways in which we travel and our varied abilities must first be recognized.

From that recognition comes the commitment to create a Complete Streets Policy. According to [Smart Growth America](#), "These laws, resolutions, agency policies, and planning and design documents establish a process for selecting, funding, planning, designing, and building transportation projects that allow safe access for everyone, regardless of age, ability, income or ethnicity, and no matter how they travel."⁵ (*Complete Streets Policy, Resolution and Ordinance are all covered in Section III.*)

From policy, comes the commitment to incorporate Complete Streets design elements and engineering standards, taking into consideration the existing features of the road system (if it's to be redesigned), the Complete Street elements to be incorporated, the goals of the community or agency, and the resources available. (*Complete Streets elements in design and engineering of roads systems is covered under Section IV.*)



Photo: SNHPC

Lastly, the commitment to maintain the road system so that all users can enjoy the Complete Street system as planned, designed, and implemented is essential. This may include snow removal, annual painting, ensuring signage and lighting are functioning properly, and a host of other maintenance items. This report does not expand on this topic, but recognizes it as a needed commitment to the success of Complete Streets.

3. WHY IN NEW HAMPSHIRE

Complete Streets is a topic that could come up at the meeting tables of almost any state department including Departments of Health and Aging, Transportation, Economic Development, Tourism, Planning, and even our Military Agencies. Why?... because it's about people, of all ages, of all abilities, making connections, keeping healthy, promoting robust communities, and improving the quality of life for this and future generations. Traveling is not just getting from one place to another; it's about actively experiencing the way we get there and the places along the way. To have choices in modes of transportation and feeling safe in walking, biking, and driving will ensure vibrant communities, vibrant regions, and a vibrant state.

When we focus on NH's transportation system, suffice it to say that the state has a relatively robust local, regional, and state network. Typically, the discussion of Complete Streets is centered around local and sometimes regional road networks and, more often than not, roads in which they were designed for speeds of 40 mph or less.

According to Federal Highway Administration, close to 90% of the road network consists of collector and local roads.⁶ This provides the Complete Street Planner and Designer with ample opportunity for creating a Complete Streets network.

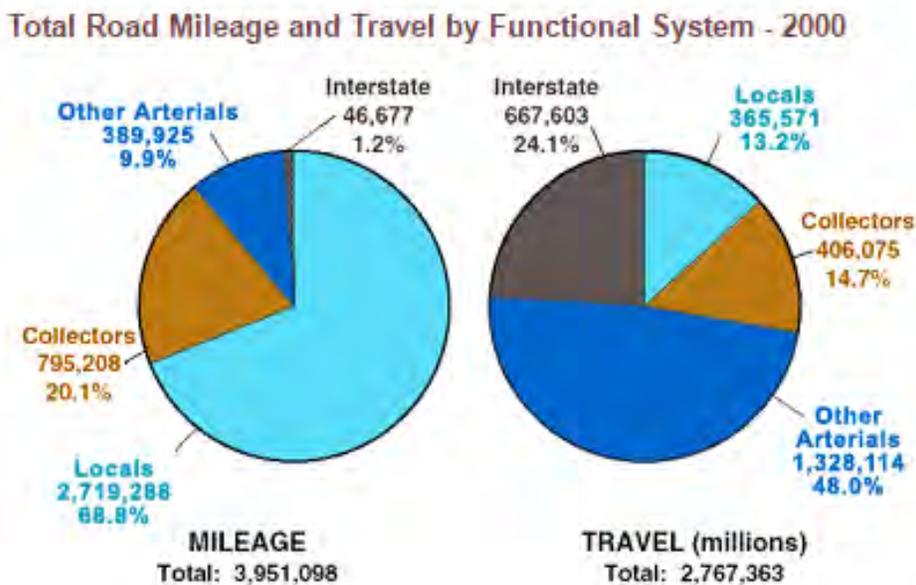
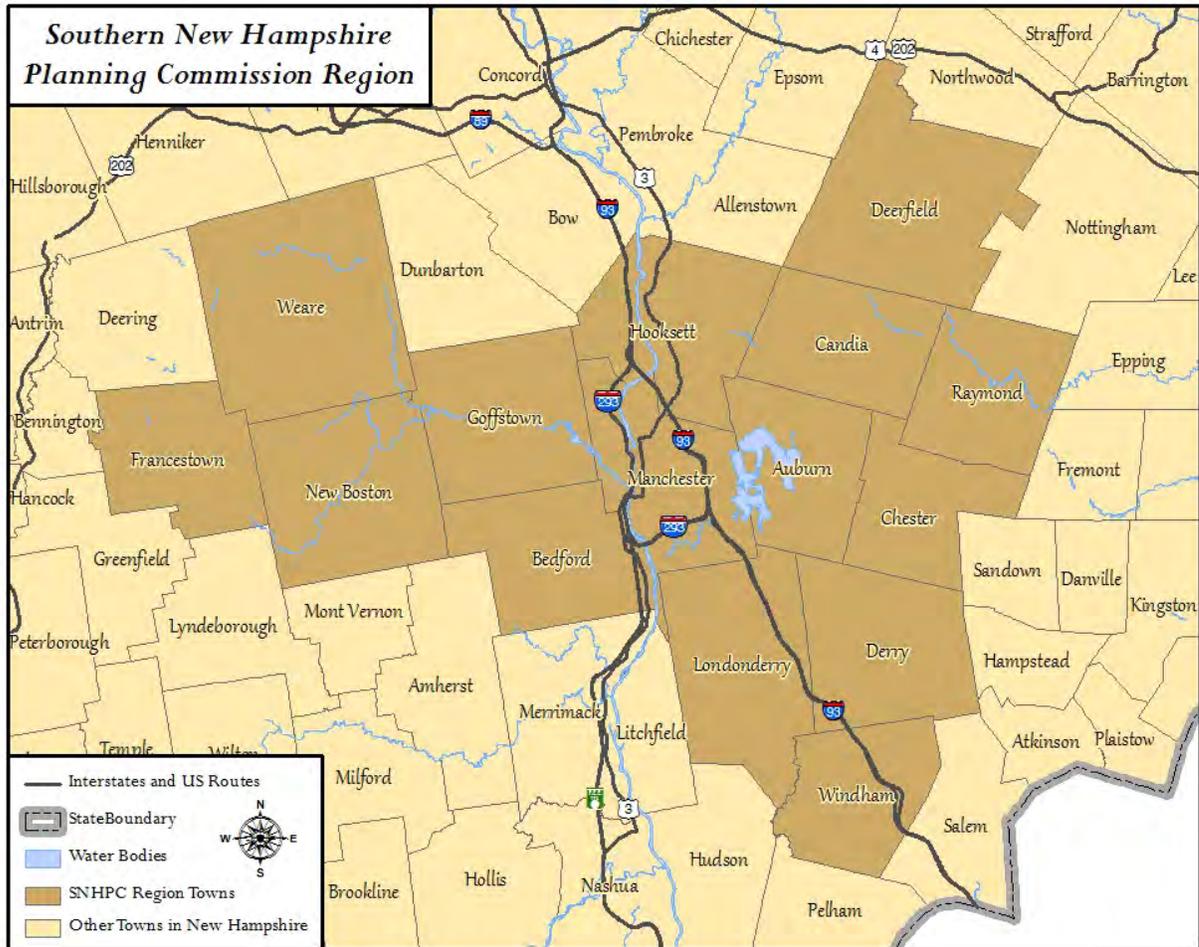


Figure 1: Federal Highway Administration, Office of Highway Policy Information

4. WHY IN SNHPC COMMUNITIES

The SNHPC team met with Planning Boards from each of the region's fourteen communities: Auburn, Bedford, Candia, Chester, Derry, Deerfield, Frankestown, Goffstown, Hooksett, Londonderry, Manchester,

New Boston, Weare, and Windham. To be sure, the range in settings varied widely, providing the team with challenges in rural, suburban, and urban street patterns. Surprisingly enough, there were many commonalities in the communities' street systems especially in their lack of Complete Streets features. These features being design elements that would provide safe usage of the road by walkers, bicyclists, and other non-motorized users.



One overarching theme witnessed in the region's road network was the need for decision makers to recognize that there are multiple users for most road systems. Additionally, many road systems lacked way-finding signage to let the traveler know if the town center was near, or pointing the way to a neighboring community; user signage, such as an indication that pedestrians may cross at a certain juncture or that a bicyclist may be sharing the lanes was also missing. Many roadways, whether in village centers or neighborhood cul-de-sacs experienced traffic at speeds that exceeded comfort levels of community residents. Finally, and almost universally, road systems lacked markings of any kind: center lines, fog lines, bicycle lanes, and crosswalks.

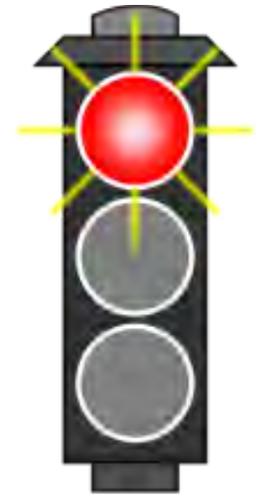
For more specifics of SNHPC's Community findings, see Section V: Pilot Projects.

Limitations to Existing Street Design in SNHPC Communities:

Lesson 1: Overall need for traffic calming and improved safety

Lesson 2: Lack of designated lane space: no fog lines, center lines, or bicycle lanes

Lesson 3: Lack of markings on roadways for bicyclists or pedestrians: no crosswalks or sharrows



5. BENEFITS TO COMPLETE STREETS

Do a Google search on "[benefits to Complete Streets](#)" and you will find ample evidence of benefits, even calculated in savings from using transit, walking, or biking verses driving. Although reviewed in detail in Section III, the Complete Streets benefits most often reported includes:

- Improves Safety for All Users
- Encourages Economic Development
- Improves Quality of Life
- Provides Choices
- Increases the Attractiveness of the Community
- Improves Health by Encouraging Walking and Biking

As mentioned in Section II, our Stakeholder Team was a critical component of the development of the toolkit. These representatives from our communities, agencies and special interest groups came to understand these benefits on a personal level. Kristi St. Laurent, a volunteer Planner on the Windham Planning Board, contributed this statement:

The beauty of the Tool Kit, and the Complete Streets concept, is that it is not a one-size-fits-all idea. It can be expansive and comprehensive, or it can be as simple as some paint and community outreach. The goals are the same, to increase utilization of our streets by more than just cars while increasing safety, community and physical activity.

At first I didn't see how Complete Streets could be of use in our rural town with little appetite for infrastructure spending, or for spending of any kind. Then, once I saw how designating bike-ped lanes on some of our wider residential streets could be done at minimal cost with existing infrastructure, I was hooked. Moving forward, the concept can be considered as new streets are planned in town. Complete Streets is kind of a mindset, of looking at streets holistically as a way to move people not just from point a to b, but move them to get outside, stretch their legs and experience their community as a whole, not just their destination. Planning for this engagement means it is safer for people in cars or not. It really is a win-win to get the most bang for the infrastructure buck.

There are multiple resources available online; three are included here, chosen in part because of the range in scope and scale of information. The first is a one-page, fact sheet created by New Hampshire's own South West Regional Planning Commission:

<http://www.swrpc.org/files/Benefits%20of%20CS%20v2.pdf>

The second, also New Hampshire based, is a short but good cost/benefit analysis done for Concord's Downtown Main Street project. [Concord NH benefit/cost analysis](#)

The third, Safer Streets, Stronger Economies, a very extensive study done by Smart Growth America in March 2015, reviewed costs and return on investments for 37 Complete Streets projects. <http://www.smartgrowthamerica.org/documents/safer-streets-stronger-economies.pdf> In this study, Smart Growth America found that Complete Streets projects tended to improve safety for everyone, increased biking and walking, and showed a mix of increases and decreases in automobile traffic, depending in part on the project goal. Compared to conventional transportation projects, these projects were remarkably affordable, and were an inexpensive way to achieve transportation goals. In terms of economic returns, the limited data available suggested Complete Streets projects were related to broader economic gains like increased employment and higher property values.⁷

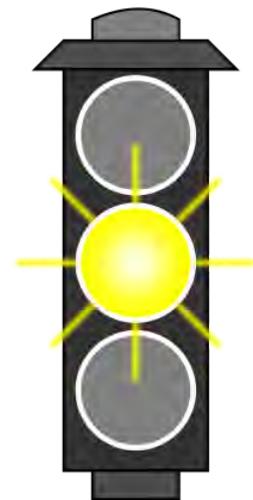
Section III of this Toolkit provides a much more in-depth view of Complete Streets benefits.

Lessons Learned:

Lesson 1: Complete Streets are not one-size fits all; they are flexible solutions

Lesson 2: Complete Streets can be begin with paint and community outreach

Lesson 3: Complete Streets is a mindset, allowing a community to get the biggest bang out of the infrastructure buck



D. WHO IS INCORPORATING COMPLETE STREETS?

1. PROGRAMS AND PROJECTS WITHIN NEW HAMPSHIRE

Communities across New Hampshire have incorporated Complete Streets principles into innovative programs and revitalizing roadway projects. Opportunities arise as communities are restriping, resurfacing, and reconstructing their street systems, or when developing new streets as in subdivisions. Urban, suburban, and rural communities alike are realizing the benefits of making streets safe for all users. The following highlights several of examples both on the regional and community level.

Manchester

The following is a statement provided by City's Public Works Design Engineer, Bruce Thomas:

The City of Manchester is a firm believer in “Complete Streets” We believe that bicycling and walking are affordable modes of transportation that provide physical activity, social interaction, and produce no pollution. In addition, both are gentle on the City’s infrastructure, will reduce traffic congestion, promote energy conservation, and improve the region’s air quality. The Southern New Hampshire Planning Commission’s Complete Streets Toolkit provides an abundance of resources to help Manchester with the development of our (and other communities) Complete Streets program. Using tools provided in the toolkit will help to ensure that our streets are safe for people of all ages and abilities.

A major part of the City’s Complete Streets Program is the development of a Bicycle Master Plan that will encourage bicycle use and make it safer for residents to ride their bicycles. While many residents and visitors currently bicycle, many more will join in as bike lanes, routes, trails and improved roadway crossings are provided. We encourage you to ride!



Two Manchester Projects: Chestnut Street and Wellington Road

Derry

Derry has begun their efforts through a crosswalk signage program to make pedestrians more visible to vehicles, especially in their busy downtown area. This program was in response to multiple accidents.



Photo courtesy of Elizabeth Robidoux, Town of Derry

Concord

The Concord Downtown Complete Streets Improvement Project was planned to generate significant benefits to the downtown, the central NH region, as well as the nation by providing a safe, reliable, and accessible multimodal transportation system. It was anticipated that by providing a more efficient and attractive transportation corridor, the project would increase commerce to the downtown core, revitalizing an underutilized downtown business and residential district and increasing adjacent property values.

Concord Main Street Project FAQ



Upon its completion, the Complete Streets project converted the existing 4-lane Concord Main Street to a 2-lane roadway promoting multi-modal use and offering more transportation choices, all while improving livability, safety, and providing a reliable transportation network. Innovative improvements to traffic signals, sidewalks, and accessibility has reduced traffic congestion and improved pedestrian safety.

Plan4Health Nashua project

The goal of the Plan4Health Nashua project was to advance street planning and design to support safer and easier ways to get around for pedestrians and bicyclists. One of the unique features about the Plan4Health project was its approach in analyzing existing conditions: through the use of [Level of Traffic Stress \(LTS\)](#) and [Level of Walkability \(LoW\)](#) analyses were used as a way to evaluate bicycle and pedestrian infrastructure. A method first used as part of a pilot project in 2014 by the New Hampshire Department of Transportation, the LTS process involves assigning a numerical value to every street and intersection to help determine how easy or difficult it is for bicyclists with varying degrees of experience to navigate. LTS differs from the more traditional evaluation approach, Level of Service, by looking at how stressed people might feel on the road versus how best to efficiently move vehicles. LTS takes into consideration various factors, including the presence of bike lanes, shoulder width, traffic speed, traffic signals, the presence of a median or pedestrian island and parking. The LoW was developed as a separate formula from the LTS to analyze various attributes of the built environment to gain a sense of the community's walkability. Attributes analyzed during the LoW process include the presence of sidewalks, buffers between sidewalks and streets, shoulder width, and traffic speed.

Results of these analyses coupled with public and partner feedback resulted in a more clear and realistic understanding of the navigability of Nashua’s streets and informed where improvements were most needed.

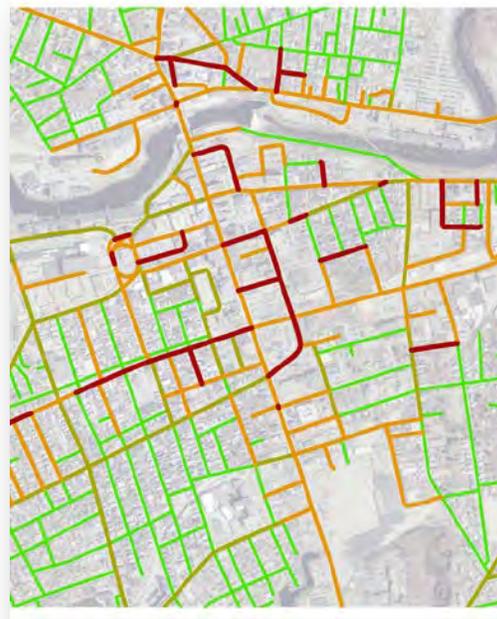


Photo courtesy of NRPC

2. DEMONSTRATION PROJECTS WITHIN NEW HAMPSHIRE

The demonstration projects (also known as pilot projects, or pop-up planning projects) that were conducted as part of this toolkit in three of SNHPC’s region (Deerfield, Frankestown, and Windham) are described in detail in Section V, *SNHPC Community Pilot Programs*. This section provides additional examples both within New Hampshire and beyond.

Pleasant Street, Concord: (Narrative Courtesy of Concord Public Works Staff)

In the early days of Concord’s Complete Streets efforts, trial by design became an effective tool for development of its policy. In this example, in 2008/2009, Concord reviewed Pleasant Street’s lane use and width as part of the resurfacing program. The goal was to maximize shoulder width for bicyclists while minimizing impacts to right-of-way and costs. Engineering and General Services staff, in collaboration with the Transportation Policy Advisory Committee (TPAC), tested narrowing the lane widths. The 2-year process allowed users to experience various lane and shoulder widths along the corridor for eventual final marking. These pragmatic efforts garnered early support for Complete Streets solutions and led to the development of Concord’s Complete Streets policy. The following photo documents two years of “trying on for size” the narrowing of through-road lanes from 14-15 feet down to 11 feet.



Circa 2010, Pleasant Street, Concord, NH
Photo: City of Concord, NH

Southwest Region Planning Commission Work: (Narrative Courtesy of SWRPC)

Throughout 2015 and 2016, Southwest Region Planning Commission (SWRPC) and the [Monadnock Alliance for Sustainable Transportation](#) (MAST) worked with several communities, including Swanzey, Keene, Hinsdale, and Troy to develop local Complete Street policies. In order to support the development of these policies and creatively engage members of the public in the planning process, SWRPC, MAST, the local municipalities, and over thirty community groups and partners worked together to coordinate four “Complete Street Demonstration” events. Funded by a population health initiative called “Partnerships to Improve Community Health” (PICH), these events provided opportunities to actively demonstrate how space within the public right-of-way can be reallocated to promote safety for all users while enhancing sense of place.

Swanzey Complete Streets demonstration project (8/29/15)

The Swanzey Complete Streets demonstration event took place on Saturday, August 29, 2015 in front of Whitcomb Hall on Main Street in West Swanzey. The event, which coincided with the Whitcomb Hall Committee's Annual Chicken BBQ, showcased street design elements such as narrowed travel lanes, curb extensions at pedestrian crosswalks, artistic crosswalks, street trees, pedestrian-scale lighting,

shared lane markings (i.e. "sharrows"), improved landscaping and green buffers, and other traffic calming measures. The Town collected feedback throughout the event. This feedback was taken into consideration during the re-design of Main Street, which was completed in the fall of 2016.

[Keene Complete Streets demonstration project \(9/19/15\)](#)

The Keene Complete Streets demonstration event took place on Saturday, September 19, 2015 on Marlboro Street. The event featured narrowed travel lanes, protected bike lanes and a pedestrian island, improved landscaping and green buffers, new pedestrian crossings, and other traffic calming measures. In addition, creative elements such as public art, benches made of recycled bicycle parts, mini golf courses, and more were incorporated to help stimulate discussion about how to reactivate this section of town. Activities included bicycle tours of downtown Keene, a bike art and kinetic sculpture exhibition, free yoga, free bicycle tune-ups, a special City Express bus route, live music, and food trucks. Volunteers and staff solicited input throughout the event from the public, which will be used to inform future capital improvement projects along the Marlboro Street corridor.

[Hinsdale Complete Streets demonstration project \(7/10/16\)](#)

On Sunday, July 10, 2016 a section of Main Street in Hinsdale was transformed to showcase ideas for making the Town Center a more walkable, bikeable, and vibrant place. The demonstration was an opportunity for the town to test out various streetscape elements, including a traffic pinch point, curb extensions, parklets, enhanced landscaping, shared lane markings (i.e. "sharrows"), a protected bicycle lane, and marked pedestrian crossings. This event helped spark conversations in town about how to slow traffic and reactivate the Town Center, ultimately resulting in the formation of a town beautification committee.



[Troy Complete Streets Demonstration \(9/10/16\)](#)

On Saturday, September 10, 2016 the Town of Troy and Southwest Region Planning Commission made temporary changes to the streetscape near the Troy Town Common to showcase examples of pedestrian- and bicycle-friendly street design. These changes included two temporary crosswalks and a bicycle lane. Comment boxes were used to collect feedback from the public throughout the demonstration. Although this demonstration was not organized as an event, the Town was able to collect useful feedback that was shared with Town officials.



Source: Southwest Region Planning Commission

[Keene](#) has been making streets safer for all users for years. One unique program there Public Works department conducted was a comparison of materials utilized for crosswalks under various conditions. They found that depending on the type of traffic and number of vehicles, various applications may or may not work, depending on the situation.



September, 2015, Keene, New Hampshire, Materials Comparison
Photo: S. von Aulock, SNHPC

3. WITHIN NEW ENGLAND

Across New England and the United States are innovative and successful examples of Complete Streets programs and projects. The following are a few examples of Complete Streets work going on in neighboring states as well as beyond our New England boundaries. Sections III Policy Guidance and IV Design and Engineering provide additional examples that will interest the reader.

[Burlington, VT:](#)

The City of Burlington has a longstanding commitment to provide a range of interconnected, safe, affordable, efficient and convenient transportation choices for residents, visitors and employees alike. Recently, this commitment has been formalized through state and local policies, but the real challenge is still ahead of us as we implement these policies -- making every Burlington street "complete."

[Maine:](#)

The Maine Department of Transportation (MaineDOT) has a long history of providing for the needs of all modes of travel in the planning, programming, design, rehabilitation, maintenance, and construction of the state's transportation system. In partnership with municipalities, Metropolitan Planning Organizations, Regional Planning Organizations, Federal Highway Administration and other federal agencies, MaineDOT develops and implements a safe, comprehensive transportation system that balances the needs of all users.

4. BEYOND

Innovative approaches to retrofitting existing roadway design and improving present design standards are seen in this country and far beyond our shores. Heating sidewalks and crosswalks to eliminate the need for snow plowing, using various means to light up travel ways, and designing new methods to help travelers recognize they share space with a variety of users are being incorporated into downtowns and local streets. These techniques range in costs and complexity but with the desire to make streets safe for all users. Innovators and willing communities are showing us new ways to create Complete Streets. One of the latest and very exciting improvements is the use of glow-in-the-dark style illumination for sidewalks and trails. Cities in Europe such as [Cambridge, England](#) are experimenting with various methods, and companies in the US and Canada are also manufacturing glow-in-the-dark gravel, blocks, and sand. Regardless of the technique, the result is not only safer sidewalks and trails, but also beautifully "lit" walkways and trails.



E. EDUCATION, OUTREACH AND TRAINING

1. WITHIN NEW HAMPSHIRE

Over the past several years there has been a concerted effort by Regional Planning Commissions, multiple agencies, communities, and various stakeholders to join forces and provide training and workshops throughout the state. In the spring and summer of 2016, Transport NH, Bike-Walk Alliance of New Hampshire, and all the Regional Planning Commissions combined forces to create a statewide outreach effort geared toward educating NH Legislators about Complete Streets. Many of the Regional Planning Commissions (RPC) have also worked with their communities in organizing workshops about the benefits of Complete Streets. Representatives from hospitals, engineering consultant firms, NHDOT, communities, and the RPC have discussed the health benefits, economic development, engineering standards, and other attributes associated with Complete Streets.

HealNH is another organization that has been very supportive in creating safer streets through a [Complete Streets approach](#).

One of the more recent outreach events occurred as part of the New Hampshire Municipal Association's [Annual Conference](#) in which Complete Streets policies, projects, and programs happening in NH were showcased.



September 2015 Complete Streets Workshop, Keene, NH
Photo: M. Brunner, Southwest Region Planning Commission

New Hampshire DOT

In 2016, NH Department of Transportation came out with two significant resources on their web site: one on [Complete Streets](#), and the other a guide for [accommodating bicycling and walking](#). NHDOT is largely a proponent of [Context Sensitive Solutions](#) in which a commitment to a process that encourages transportation officials to collaborate with stakeholders from the community and environmental resource groups so the design of the project reflects the goals of the people who live, work and travel in the area. Such collaboration results in creative and safe transportation solutions.⁸

2. OUTREACH AND TRAINING WITHIN NEW ENGLAND AND ONLINE

Many local, regional, state and national agencies in the fields of Planning, Health, and Transportation have created factsheets and training sessions on the topic of Complete Streets. Conduct a Google search on these topics and you will be wowed by the volume of relevant information there is on these topics. The sheer number of good works occurring across the globe is an excellent barometer of the concerns and dedication these stakeholders have regarding making street systems safe and useable for everyone. The following are a handful of examples for both outreach and training available on-line.

Metro Boston:

<http://www.mapc.org/sites/default/files/MAPC%20Complete%20Streets%20summary.pdf>

Many Massachusetts cities and towns are considering their streets as something more than simply thoroughfares for vehicles. These municipalities have joined a growing national movement for

“complete” streets: roadways that are safe, comfortable, and accessible for everyone, regardless of age, ability, income, or how they choose to travel.

Smart Growth America has a program in which communities that want a better understanding of Complete Streets can join forces and apply for technical assistance. An [application](#) for this program can be found online.

For 2017, the applications are due by Feb. 2. The following link is a pdf of the [application](#).

Some of the State Departments of Transportation have hosted training sessions on Complete Streets for their communities. These included:

- [Massachusetts Department of Transportation \(MassDOT\)](#)
- [New Jersey DOT](#)
- [North Carolina DOT](#)

¹ National Complete Streets Coalition. (n.d.). Retrieved from <https://smartgrowthamerica.org/program/national-complete-streets-coalition/>

² History of Complete Streets in the United States. (n.d.). Retrieved from <http://njbikeped.org/services/history-of-complete-streets-in-the-united-states/>

³ History of Complete Streets in the United States. (n.d.). Retrieved from <http://njbikeped.org/services/history-of-complete-streets-in-the-united-states/>

⁴ History of Complete Streets in the United States. (n.d.). Retrieved from <http://njbikeped.org/services/history-of-complete-streets-in-the-united-states/>

⁵ Research. (n.d.). Retrieved from <http://old.smartgrowthamerica.org/national-complete-streets-coalition-home/research/>

⁶ The Highway System - Our Nation's Highways - 2000. (n.d.). Retrieved from <https://www.fhwa.dot.gov/ohim/onh00/onh2p5.htm>

⁷ Anderson, G., & Searfoss, L. (March 2015). *Safer Streets, Stronger Economies Complete Streets: Project Outcomes From Across the Country* (p. iv, Rep.). Smart Growth America; National Complete Streets Coalition.

⁸ Context Sensitive Solutions | Highway Design | NH Department of Transportation. (n.d.). Retrieved from <https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/contextsensitivesolutions/index.htm>

2016

SNHPC Complete Streets Toolkit

Section II: Steering Committee

The project's Stakeholder Team included staff from multiple communities, state agencies, local transportation alternative groups, neighboring Regional Planning Commission staff, and staff from Southern New Hampshire Planning Commission. Guest speakers were invited to present elements of Complete Streets projects, including policies, design standards, and projects. All speakers shared lessons that were learned as Complete Streets policies and elements were adopted and implemented. It should be noted that enthusiasm for the Complete Streets Toolkit program and participation on the committee was palpable among stakeholders.



SECTION 2: STEERING COMMITTEE DEVELOPMENT AND ORGANIZATION

A. OUTREACH PROCESS

The staff at Southern New Hampshire Planning Commission (SNHPC) enthusiastically began this project in efforts to involve community and agency representatives as well as experts in the field of Complete Streets planning, design, and implementation. Staff reached out consistently via phone, email, and in person to ensure the Steering Committee was well represented. During the course of the project, staff presented existing committee of the project's progress. The following is the list of stakeholders that were involved with the Steering Committee.

B. STAKEHOLDERS AND ADVISORS INVOLVED

Community Representatives

Becky Hebert, Town of Bedford
Jeff Warner, City of Concord
Elizabeth Robidoux, Town of Derry
Jonathan O'Rourke, Town of Goffstown
Kristen Clarke, City of Manchester
Bill Klubben, City of Manchester
Bruce Thomas, City of Manchester
Laura Scott, Town of Windham
Kristi St. Laurent, Town of Windham

Agency Representation

Tim Blagden, Bike-Walk Alliance of NH
Mike Whitten, Manchester Transit Authority (MTA)
Tim White, NH DES
Larry Keniston, NH DOT
Carmen Lorentz, NH DRED
Rebecca Harris, Transport NH
Todd Fahey, AARP

Regional Planning Commissions

Matt Waitkins, Nashua RPC
Adam Hlasny, Southern NH PC
Cameron Prolman, Southern NH PC
Sylvia von Aulock, Southern NH PC
Craig Tufts, Central NH RPC

Guest Speakers

Juliet Walker, City of Portsmouth
Ed Roberge, City of Concord
Jeff Warner, City of Concord
Mari Brunner, Southwest RPC
Craig Tufts, Central RPC
Jeff Hyland, Ironwood Design Group
Phil Goff, Alta Planning and Design

Consultant

Randy Knowles, Landscape Architect, Knowles Design

C. MEETING AGENDAS/MINUTES

Meetings were held at regular intervals-on the following dates:

- December 17, 2015
- February 2, 2016
- March 15, 2016
- April 19, 2016
- June 15, 2016 (field visit)
- August 9, 2016

- September 15, 2016

- December 14, 2016

(See Appendix for meeting agendas and minutes)

D. PUBLIC ENGAGEMENT STRATEGIES AND OUTREACH

SNHPC meetings

Outreach and Community engagement has been a large component of the project. Aside from stakeholder meetings, staff took advantage of the Commission's existing outreach efforts with both their Metropolitan Planning Organization (MPO) and Technical Advisory Committee (TAC).

The Commission, as MPO for the region, conducts transportation planning in a cooperative, comprehensive, and continuous manner under the regulatory guidance of NHDOT and the Federal Highway Administration. The TAC is comprised of technical-level personnel from the SNHPC member communities and principal stakeholders. The primary responsibilities of the TAC are to provide input for the development of transportation-related documents, technical review, and to make recommendations to the MPO Policy Board regarding regional transportation issues.

On multiple occasions, staff provided updates and presentations regarding the Complete Streets toolkit project to both the MPO and the TAC committees. This provided an opportunity for community representatives to ask questions and become involved in both the stakeholder committee and in the pilot program.

Additionally, a large component of the project is dovetailing with existing statewide, regional, and local efforts. For example, on a statewide level, Commission staff participated on the Statewide Complete Streets Coalition, working with multiple agencies to bring about awareness and policy change through meetings with State Legislators. On a regional level, Nashua, Southwest, and Central NH Regional Planning Commissions shared Complete Streets projects, lessons learned, and even on-site tours of their many Complete Streets projects. Staff and the Stakeholders Committee benefited greatly from hearing the success stories of [Nashua](#), [Concord](#), and [Keene](#).

Early on in its review of policies and design standards, the Commission invited engineers and landscape architects to highlight their success stories during stakeholder meetings. Not only were participants amazed by the stories of these professionals, they were also inspired by the photos of actual projects in New Hampshire and beyond.

Bill Klubben, City Planner for the City of Manchester, shared the following concerning the project's stakeholder process: "I have appreciated the opportunity to learn so much about what Complete Streets is about, the how, the why, the options, the techniques, and the process for successfully implementing a complete streets program. I am still a long way from being an expert on Complete Streets, but I can now participate in the conversation and perhaps make a positive contribution."

New Hampshire Commercial Investment Board of Realtors (NHCIBOR)

Early on in the project, we visited NHCIBOR at one of their regularly scheduled meetings to introduce the project as well as to get their input on the importance of various elements commonly associated with Complete Streets. Staff asked the Realtors to identify how important certain criteria were to a business when deciding to locate or relocate to a new area. Out of the ten individual responders, 60% found that well-maintained sidewalks were important; 80% considered parking to be important; 70% thought having a business that is accessible by transit or other alternative transportation options was important; 70% perceived building space to be of importance; and 70% of responders thought having a walk/bike-friendly environment was important.

Spatial Criteria	Level of Importance:		
	Not Important	Somewhat Important	Important
Well Maintained Sidewalks	10%	30%	60%
Parking	0%	20%	80%
Accessible by Transit or Other Alternative Transportation Options	0%	30%	70%
Building Space	0%	10%	70%
Walk/Bike Friendly Environment	10%	20%	70%

E. RECOMMENDATIONS AND ACCOMPLISHMENTS

The Steering Committee was instrumental in guiding the project. Community representatives provided the front-line view of how communities and decision makers view Complete Streets; State Agency representatives offered insight into possible process improvements between state and local staff, especially regarding communication gaps; and non-profit organizations provided possible solutions and opportunities to participate in other Complete Streets efforts occurring in the New Hampshire. Together the group fueled the project, ensuring its success.

Steering Committee Accomplishments:

- Continued the discussion of Complete Streets with their community/agency.
- Participation helped to create a more comprehensive understanding of Complete Streets issues, opportunities, policies, strategies, and successes to the broader group.

- Participants collaborated with Town staff from three communities to work through the process of the pilot program
- Participants provided photos, stories, and editing input to the Toolkit to ensure accuracy and local projects

How to Create a Successful and Robust Steering Committee

Lesson 1: Draft a list of possible representatives and cast a broad net, keep the invite to join in open

Lesson 2: Emailing is effective but to ensure a robust committee, pick up the phone and talk to key representatives of various interest groups throughout the project

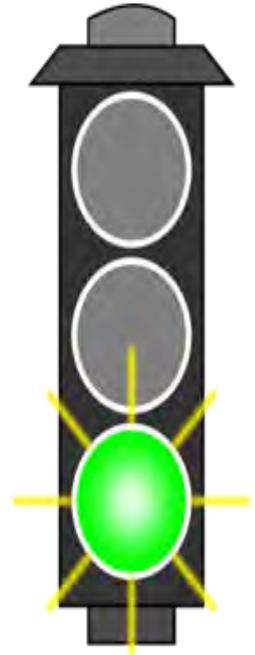
Lesson 3: Make meetings matter and make them interesting by inviting guest speakers with local success stories

Lesson 4: Make sure all members are heard from at least once; ask for feedback at each meeting

Lesson 5: Instill confidence by being organized, logical in process steps, and engaging

Lesson 6: Keep meetings lively and serve good snacks and hot coffee

Lesson 7: Make sure committee members know what you need from them



2016

SNHPC Complete Streets Toolkit

Section III: Planning & Policy

One hundred years ago, streets were shared by all; prior to the age of the automobile, streets were alive, literally and figuratively, with individuals walking to work, going to market, and exchanging pleasantries.

Thanks to the innovation and mass production ideas of Henry Ford, the age of motorized transportation dawned brightly, empowering millions and making countless travel dreams come true. Despite automobiles' many benefits, though, they became the focal point of transportation policy for over a half-century, often to the detriment of folks attempting to get around without one.

Over the last decade, however, transportation policy has begun to come full circle with the development of the Complete Streets philosophy, at its foundation a desire to ensure all members of society get from origin to destination safely and efficiently. There is a wide range of policies, and many states, cities and towns have laid a bold framework for their customization and development.

This section will also address Complete Streets' many benefits.



In this section:

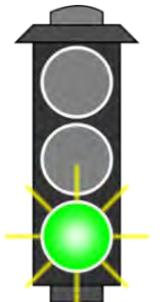
- *What's a Complete Streets Policy?*
- *What are the Benefits?*
- *Reaching Out*
- *Policies in New England*
 - *Lessons learned*
- *Interested in Adopting?*
 - *Rural*
 - *Suburban*
 - *Urban*
- *Resource Guide*



A. WHAT'S A COMPLETE STREETS POLICY?

Complete Streets policies can take many forms, and are dependent on what works best for a given community. Comprehensive Complete Streets policies are best developed after taking into consideration existing transportation policies and practices, such as site and subdivision regulations. Complete Streets can be accomplished through ordinances and resolutions as well as municipal policies including design guidelines.¹

What Complete Streets look like: Concord, NH



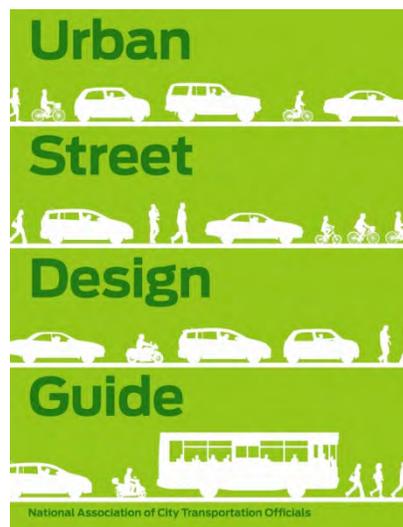
To legally require that the needs of all users of the road be addressed in transportation projects, municipalities may adopt a Complete Streets **ordinance**. A Complete Streets ordinance may change a municipality's code and may change zoning and subdivision regulations. Communities may also choose to pursue a Complete Streets approach by adopting a **resolution**. A resolution is a non-binding official statement of support for including a Complete Streets approach for a community's transportation projects. Ultimately, because resolutions are non-binding they do not require action and thus can be ignored or abandoned.

A town council or board of selectmen may also take action by adopting a Complete Streets policy as official town **policy**. The policy may be developed by representatives from planning, engineering, public works, economic development, health, elected officials, and community members. The policy would then be taken to the Selectmen for a discussion and a vote. A full Complete Streets policy should be more detailed than an ordinance or resolution; while not legally binding, policy is a good tool to build support for enabling safer and more accessible roads for all users.

A Complete Streets policy may include guidelines for incorporating complete street elements into design and engineering best practices. A Complete Streets policy would not necessitate creating new design guidelines. Rather, communities may look to nationally-supported design standards, such as the American Association of State Highway Officials ([AASHTO](#)), the National Association of City Transportation Officials ([NACTO](#)) state Departments of Transportation, the Institute of Transportation Engineers ([ITE](#)), the Americans with Disabilities Act ([ADA](#)), the Public Right-of-Way Accessibility Guidelines ([PROWAG](#)), or the Model Design Manual for Living Streets ([MDMLS](#)), and incorporate design standards which best fit the character of the community's roads. A Complete Streets policy should suggest that engineering, planning, and public works departments reference one of the aforementioned design resources.

Ensuring viability for future Complete Streets projects requires a degree of flexibility in Complete Streets policy. When developing a context-sensitive approach to Complete Streets policy, communities should include language that recognizes the need for some roads to offer varying degrees of accommodation for each type of user, while still ensuring basic accommodation is provided for all permitted users. More information about ordinances, resolutions and policies can be found below.

Regardless of the type, all Complete Streets policies should contain comparable elements that address the characteristics that define a Complete Street. According to the National Complete Streets Coalition, a robust policy should include the following elements:



Source: NACTO

1. **Vision:** The policy establishes a motivating vision for why the community wants Complete Streets: to improve safety, promote better health, make overall travel more efficient, improve the convenience of choices, or for other reasons.
2. **All users and modes:** The policy specifies that “all modes” includes walking, bicycling, riding public transportation, driving trucks, buses and automobiles and “all users” includes people of all ages and abilities.
3. **All projects and phases:** All types of transportation projects are subject to the policy, including design, planning, construction, maintenance, and operations of new and existing streets and facilities.
4. **Clear, accountable exceptions:** Any exceptions to the policy are specified and approved by a high-level official.
5. **Network:** The policy recognizes the need to create a comprehensive, integrated and connected network for all modes and encourages street connectivity.
6. **Jurisdiction:** All other agencies that govern transportation activities can clearly understand the policy’s application and may be involved in the process as appropriate.
7. **Design:** The policy recommends use of the latest and best design criteria and guidelines, while recognizing the need for design flexibility to balance user needs in context.
8. **Context sensitivity:** The current and planned context—buildings, land use, transportation, and community needs—is considered in when planning and designing transportation solutions.
9. **Performance measures:** The policy includes performance standards with measurable outcomes.
10. **Implementation steps:** Specific next steps for implementing the policy are described.²

B. WHAT ARE THE BENEFITS?

There are a number of measurable benefits from implementing Complete Streets:

- provides community members with more transportation choices
- improves quality of life and safety for all users
- encourages economic development
- increases the attractiveness of the community; and
- improves the overall health of the community by enabling healthier transportation options like walking and cycling

- Safety

In the majority of cases collision rates declined after Complete Streets projects were built, and there were fewer injuries as well. These safety improvements have real financial value: Our analysis found that the safer conditions created by Complete Streets projects avoided a total of \$18.1 million in collision and injury costs in one



year alone. These savings start as soon as a project is complete, and continue long after. And this was just the amount saved by the projects included in our sample. The financial impact of automobile collisions and injuries nationwide is in the billions of dollars annually. Targeting the country's more dangerous roads and taken to any meaningful scale, a Complete Streets approach over time has the potential to avert hundreds of millions or billions of dollars in personal costs.³

- Environment



The transportation sector accounts for more than 30 percent of all greenhouse-gas emissions in the United States, with over 88 percent of all trips being made by car (EPA, 2011). When road design is auto-centric, more unnecessary automobile trips are made. While most short-distance trips could easily be made on foot or by bike, about 65 percent of trips of less than one mile are made by the automobile in the United States (Collia, Sharp &

Giesbrecht, 2003). Switching to carbon-neutral transportation modes such as biking or walking can provide significant environmental benefits. If each person switched from automobile travel to walking or bicycling, an individual's carbon dioxide emissions could be reduced by 4,800 pounds per year (National Complete Streets Coalition, 2010). Converting short car trips to travel by walking, biking, or public transit can decrease the carbon footprint of daily vehicle travel, minimize the generation of greenhouse gases, and improve air quality.⁴

- Health

Livable streets encourage walking, running and biking. We already know that modest increases in physical activity can extend our lives and make us healthier. The Centers for Disease Control and Prevention recommend livable streets design as a means of reducing obesity rates by increasing active living alternatives.⁵ Walkability has a direct and specific relation to the health of residents. A comprehensive study of walkability has found that people in walkable neighborhoods did about 35–45 more minutes of moderate-intensity physical activity per week, and were substantially less likely to be overweight or obese than similar people living in low-walkable neighborhoods.⁶



An additional resource can be found on FHWA's [website](#).

- **Economy**

As more Americans — especially Millennials and Generation X-ers — gravitate towards urban centers, many city neighborhoods are seeing massive population influxes. With space at a premium, people need **robust transportation systems** to move from home to work to shops. Low-stress bike networks can help relieve pressure on the street system. By making biking safe and pleasant for a broader range of people, bike lanes are bringing more residents, employees and customers to neighborhoods without swamping streets with traffic. They help free the street system for buses, freight and essential car trips. And as city dwellers prioritize dog-walking and bike-riding over sitting in traffic, investment is flowing toward streets that are **built for connectivity and comfort**.⁷

Four Ways Protected Bike Lanes Boost Economic Growth



Fueling redevelopment to boost real estate value. As city populations grow, motor vehicle congestion increases. New roads are rarely an option in mature cities. Protected bike lanes bring order and predictability to streets and provide transportation choices while helping build neighborhoods where everyone enjoys spending time. By extending the geographic range of travel, bike lanes help neighborhoods redevelop without waiting years for new transit service to debut.



Making workers healthier and more productive. From D.C. to Chicago to Portland, the story is the same: people go out of their way to use protected bike lanes. By creating clear delineation between auto and bike traffic, protected bike lanes get more people in the saddle—burning calories, clearing minds, and strengthening hearts and lungs. As companies scramble to lower health care costs, employees who benefit from the gentle exercise of pedaling to work help boost overall hourly productivity and cut bills.



Helping companies score talented workers. Savvy workers, especially millennials and members of generation X, increasingly prefer downtown jobs and nearby homes. Because protected bike lanes make biking more comfortable and popular, they help companies locate downtown without breaking the bank on auto parking space, and allow workers to reach their desk the way they increasingly prefer: under their own power.



Increasing retail visibility and sales volume. In growing urban communities, protected bike lane networks encourage more people to ride bikes for everyday trips. And when people use bikes for errands, they are the ideal kind of retail customers: regulars. They stop by often and spend as much or more per month as people who arrive in cars. Plus, ten customers who arrive by bike fit in the parking space of one customer who arrives by car.

Source: Text verbatim from "Protected Bike Lanes Mean Business," by PeopleforBikes and the Alliance for Biking & Walking.

While transportation planning literature agrees on the benefits provided by Complete Streets, communities can observe the many advantages of adopting Complete Streets policies by establishing a set of performance measures to track the overall outcomes of the policy.

Performance measures let public agencies align their decisions at each phase of project development and delivery with established community goals. The adage “what gets measured gets done” is helpful in understanding how performance measures affect results. Conventional transportation measures, focused on automobile movement, have resulted in projects that expand roadway capacity and speed. Success in a Complete Streets paradigm means adopting different measures of success—what we want to get done must get measured. This shift requires agencies to embrace measures that:

- reflect the quality of place and environment
- better relate to how people interact with and understand their community
- direct investments toward creating transportation systems that are comfortable and convenient for accessing jobs, health care, education, and civic life by foot, bicycle, and transit in addition to the automobile.⁸

C. REACHING OUT

To safeguard a successful Complete Streets policy, stakeholders must experience education and training in order to learn how to incorporate alternative transportation facilities into existing road projects. Planners, engineers, consultants, and other agencies need a thorough understanding of new procedures. Elected officials need ongoing engagement to understand how general policy goals will be deciphered into projects on the ground. Communication with the public about what they want out of their streets, and what is happening to their roads, is crucial for implementation to be successful.



Many communities employ a workshop approach to help transportation staff understand and embrace the intention behind Complete Streets. They should hear how this approach works in other communities, and how it fits into their professional goals and standards.

The best messengers for these sessions are those within the same profession; engineers should hear directly from other engineers, planners from other planners. Many agencies have also used a more informal, on-the-job training approach that encourages dialogue between departments. Additional technical training should be part of regular professional development.



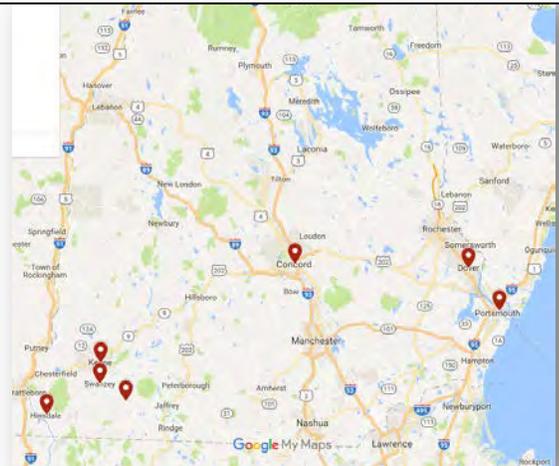
National Policy Inventory

Work with elected officials, involved stakeholders, and the general public must be constant. Transportation staff and Complete Streets supporters should be able to communicate how the proposed projects benefit the community and nearby residents and businesses, and how incomplete streets deleteriously affect mobility and access to schools, offices, and shops. Regular updates on goals and successes are essential. “Experiential” learning, through activities such as walking audits and bicycle tours, has been very helpful in building support and solidarity among staff, elected officials, and community members. Some have also produced or shared short videos that focus on the health, economic, and safety benefits of changing street design.⁹

D. POLICIES IN OUR REGION

1. NEW HAMPSHIRE, NEW ENGLAND AND BEYOND
In New Hampshire, the City of Dover was the first to adopt Complete Streets improvements, before the term ‘Complete Streets’ had even come into being. They were followed by Concord in 2009 and Keene in 2011. In 2015 and 2016, the towns of Troy and Hinsdale, in consultation with Southwest Regional Planning Commission, also adopted their own planning and

NH Municipalities with a Complete Streets Policy



design guidelines. [NH DOT](#) does not have an official CS policy as of December 2016, but the department has expressed a willingness to support communities in their complete streets projects. Legislation regarding a statewide complete streets policy is pending in the 2017 legislative session, thanks to the efforts of the NH Complete Streets Coalition. More information on the coalition can be found [here](#).

- **List of NH Policies**

- [Concord](#)
- [Dover](#)
- [Hinsdale](#)
- [Keene](#)
- [Portsmouth](#)
- [Swanzey](#)
- [Troy](#)

In its “Best Complete Streets Policies of 2015”, Smart Growth America establishes a scoring matrix for the completeness and effectiveness of Complete Streets Policies nationwide. To help communities understand what makes strong, effective Complete Streets policies, the Coalition established an objective set of ten ideal policy elements. These elements were developed in consultation with members of the National Complete Streets Coalition’s Steering Committee and its corps of workshop instructors, and through its ongoing research efforts. Based on decades of collective experience in transportation planning and design, the ten elements are a national model of best practice that can be employed in nearly all types of Complete Streets policies at all levels of governance.¹⁰ Further details on scoring can be found on pp. 21-22 of the [Best Complete Streets Policies](#) of 2015 guide.

As Troy and Hinsdale had not yet adopted their policies, their scores are not included here.

NH Municipality	Policy Adopted	Score
Portsmouth	2013	82.0
Dover	2014	77.2
Keene	2015	70.8
Swanzey	2015	68.0
Concord	2010	27.2

MAINE



The Maine Department of Transportation (MaineDOT) has a long history of providing for the needs of all modes of travel in the planning, programming, design, rehabilitation, maintenance, and construction of the state’s transportation system. MaineDOT strongly supports a multimodal transportation system, and recognizes that pedestrian and bicycle infrastructure such as sidewalks, bicycle lanes, separated facilities, transit stops, ADA-accessible routes, etc., are crucial elements of the transportation system. In addition, a safe, multimodal,

and vibrant transportation system is vital to Maine's economy, and to the community environments which are such an important component to our transportation system.

The MaineDOT [Complete Streets Policy](#), developed in 2013 and 2014, and formally approved in June, 2014, outlines how MaineDOT and its project partners will consider the needs of all users when planning and developing projects.¹¹ In addition to MaineDOT, the following communities have also adopted Complete Streets policies as of September 2016:

- [Auburn/Lewiston](#)
- [Portland](#)
- [Windham](#)



VERMONT

In [Vermont](#), Complete Streets builds upon the flexibility in design and context sensitive solution practices that have been implemented since 1997 when the Vermont State Standards were established. It was once common practice to reactively attempt to accommodate bicycle and pedestrian-friendly practices into projects. While this methodology would often result in a final product that contained benefits to bicyclists and pedestrians it did not allow the designer to consider all alternatives and consult with applicable stakeholders to determine what, or if, improvements would be of true value. Complete Streets principles require designers to consider how a project will incorporate the needs of all facility users, throughout a project's planning, design, construction, and maintenance phases. This methodology may result in additional benefits including: improving safety for all users, improving connectivity, improving human health, enhancing quality of life and livability, providing an aesthetically pleasing surrounding, supporting current and future economic vitality, and the reduction of pollutants into the environment.¹²

The Vermont Department of Health also produced its [Complete Streets: a guide for Vermont communities](#) in 2012.



MASSACHUSETTS

In 2006, MassDOT Highway Division became one of the first state transportation agencies to adopt a Complete Streets approach with the release of the [Project Development and Design Guide](#). This resource remains the guiding design manual for roadway projects under MassDOT jurisdiction or oversight. More recently, during the 2015 Moving Together Conference, MassDOT released its [Separated Bike Lane Planning and Design Guide](#). First of its kind by a state transportation agency, the design guide is a resource for considering, evaluating and designing separated bike lanes as part of a Complete Streets approach for providing safe and comfortable accommodations for all roadway users.¹³

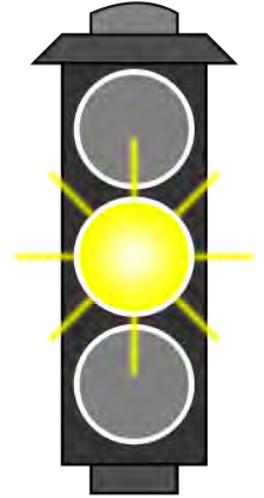
In addition to a state policy, nearly 40 MA municipalities have also enacted policies of their own.

The new [Boston Complete Streets](#) approach puts pedestrians, bicyclists and transit users on equal footing with motor-vehicle drivers. The initiative aims to improve the quality of life in Boston by creating streets that are both great public spaces and sustainable transportation networks. It embraces innovation to address climate change and promote healthy living.¹⁴

2. LESSONS LEARNED IN ADOPTING POLICIES

Lessons learned:

- Listen to communities and focus on addressing local issues when creating complete street policies.
- Create connections between Complete Streets and other programs or projects such as the Master Plan, tourism, economic development...
- CS can have a rural application utilizing a context-sensitive approach
- Implement projects incrementally
- Find low- or no-cost solutions such as repainting narrower roadway lanes
- When a community has an adopted CS policy, infrastructure projects may become more attractive to funding sources.
- Communities need to share their vision for their road systems with NHDOT and work with the state to implement their vision



E. INTERESTED IN ADOPTING?

There are many ways in which a community could adopt a Complete Streets policy. While the majority of communities implement Complete Streets through resolutions and ordinances, other means of adopting policy could be completed by council-approved measures, directives, or a citizen vote.



When creating a Complete Streets policy, stakeholders should consider existing policy, practice, and the political environment. The policy should be designed so that it fits the character of the community. The following are examples of ways Complete Streets can be adopted:

Ordinance

Ordinances legally require the needs of all users be addressed in transportation projects and change city code accordingly. Ordinances may also apply to private

developers by changing zoning and subdivision requirements. Ordinances require strong support from the community and elected officials, and are enforceable by law, making them difficult to overlook. City departments and commissions often approve ordinance language before it moves to the legislative branch, though broad partnerships between all the actors may not be truly developed during this process. With strong support from elected officials in place, ordinances are a worthy pursuit.

Resolution

Issued by a community's governing body, resolutions are non-binding, official statements of support for approaching community transportation projects as a way to improve access, public health, and quality of life. Resolutions are often a very helpful first step, providing the political support for a Complete Streets approach. However, as they do not require action, they may be forgotten or neglected if an implementation plan is not created. If you do not yet have strong support from your elected leaders, a resolution is likely your best choice.¹⁵

Community-wide Policy

A community's governing body may also take action by adopting a Complete Streets policy as official municipal policy. Generally, this means that a Complete Streets policy is developed by an internal group of stakeholders, which may include representatives from planning, engineering, public works, economic development, health, and/or elected officials, or a broader group that includes residents and community stakeholders. This document is then taken to the full governing body for discussion and a vote. These policies tend to be lengthier and more detailed than resolutions or ordinances, and can build partnerships between agencies, community members, and decision makers in a more robust way than resolutions or ordinances. Like resolutions, such policies are not legally binding; however, the community, political, and agency support for change tends to be very high, resulting in a shared, lasting push for implementation of the policy.

For more information on this, please visit p. 8 of Smart Growth America's 2013 [Local Policy Workbook](#), as well as their Complete Streets Policy Analysis, *The Best Complete Streets Policies of 2015*, which highlight examples of successful Complete Streets policies, also provides insight into how to determine the best policy to fit the character of the community.

In 2012, the Southern New Hampshire Planning Commission developed a policy recommendations guidance matrix as a part of the Livable Walkable Toolkit. The matrix identified the best policies in relation to the community's geographical context (urban, suburban, and rural).

The matrix identifies the following community principles and policies that would best fit rural, suburban, and urban communities:

1. RURAL COMMUNITIES¹⁶

- Transportation Planning should include car sharing, bike plans, centrally located civic center and connections to schools
- Adopt the Safe Routes to School model to encourage students to walk and/or bike safely to their school
- Increase bicycling and walking facilities to include connections that can be used during the winter for cross-country skiing, and snowshoeing
- Create long-range transportation strategies with strong partnerships between city and county officials
- Facilitate greater collaboration between environmental and public health agencies, planning organizations, regional councils of government and state and local transportation agencies



2. SUBURBAN COMMUNITIES¹⁷

- Locate parks and recreational amenities within walking distance of residences and schools. Incorporate trails, sidewalks and pedestrian wayfinding signage.
- Cooperate with and support regional and state efforts to raise awareness of relationships between land use and transportation issues, and incorporate in planning and development
- Examine street design guidelines to ensure policies are designed to “move people” and have an emphasis on multimodal transportation. “Road diets” are also recommended to include bicycling and transit opportunities
- Provide street design with pedestrians and bicyclists in mind: better transit stop design, street furniture, bike racks, building frontage, sidewalk width and landscaping
- Adopt the Safe Routes to School model to encourage students to walk and/or bike safely to their school



3. URBAN COMMUNITIES¹⁸

- Provide a safe means of getting about for pedestrians and bicycles, including sidewalks and bike paths that are safely removed from automobile traffic. Generate right-of-way laws that support this concept and provide clear way-finding

- Provide a public transportation system and provide access to public transit to reduce dependence on automobiles. Also, provide transportation stops that are visible, clean, and shelter from the elements, when possible
- Consider Complete Streets design guidelines when building or rebuilding roads
- Consider all ways that people could and/or need to get about. Keep in mind that not everyone can or does drive their own car
- Provide street design with pedestrians and bicyclists in mind: better transit stop design, street furniture, bike racks, building frontage, sidewalk width and landscaping
- Adopt the Safe Routes to School model to encourage students to walk and/or bike safely to their school
- Locate parks and recreational amenities within walking distance of residences and schools. Incorporate trails, sidewalks and pedestrian wayfinding signage
- Cooperate with and support regional and state efforts to raise awareness of relationships between land use and transportation issues, and incorporate in planning and development
- Examine street design guidelines to ensure that policies are designed to “move people” and have an emphasis on multimodal transportation. “Road diets” are also recommended to include bicycling and transit opportunities.



F. RESOURCE GUIDE

Many of the best resources available for Complete Streets can be found on Smart Growth America’s website. Specifically, their [‘Best Complete Streets Policies of 2015’](#) (released April 2016) outlines which US communities passed policies in 2015, and which did so with the most exceptional language. It also gives an annual update as to where Complete Streets are most prominent, and offers best practices.

¹ Smart Growth America: National Complete Streets Coalition (2013). Complete Streets Local Policy Workbook [PDF file]. <http://www.smartgrowthamerica.org/documents/cs-local-policy-workbook.pdf>.

² Smart Growth America: National Complete Streets Coalition. The Ten Elements of a Complete Streets Policy (2016). <https://smartgrowthamerica.org/program/national-complete-streets-coalition/>.

³ Smart Growth America: National Complete Streets Coalition. Safer Streets, Stronger Economies (2015). <https://smartgrowthamerica.org/resources/evaluating-complete-streets-projects-a-guide-for-practitioners/>.

⁴ Complete Streets in Delaware: a Guide for Local Governments. What are the Benefits of Complete Streets (2011). <http://www.ipa.udel.edu/healthyDEtoolkit/completestreets/sectionPDFs/chapter3.pdf>.

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- ⁵ Mid-America Regional Council (2010). Livable Streets Health Benefits [PDF file]. <http://www.marc.org/Transportation/Special-Projects/assets/Livable-Streets-health-benefits-flier.aspx>.
- ⁶ Neighborhood built environment and income: Examining multiple health outcomes (2009). Sallis, James F, et al. www.completestreets.org.
- ⁷ People for Bikes and Alliance for Biking and Walking (2014). Protected Bike Lanes Mean Business. [PDF file]. http://b.3cdn.net/bikes/123e6305136c85cf56_0tm6vjueo.pdf.
- ⁸ AARP, Smart Growth America, Complete Streets Coalition: Evaluating Complete Streets Projects: a guide for practitioners (2015). <http://www.aarp.org/content/dam/aarp/livable-communities/documents-2015/evaluating-complete-streets-projects.pdf>
- ⁹ Smart Growth America: National Complete Streets Coalition (2013). Complete Streets Local Policy Workbook [PDF file]. <http://www.smartgrowthamerica.org/documents/cs-local-policy-workbook.pdf>.
- ¹⁰ Smart Growth America: The Best Complete Streets Policies of 2015 (2016). [PDF file]. <https://www.smartgrowthamerica.org/app/legacy/documents/best-cs-policies-of-2015.pdf>
- ¹¹ Maine Department of Transportation (2014). Maine Complete Streets Policy. <http://www.maine.gov/mdot/completestreets/>.
- ¹² Vermont Agency of Transportation (2012). Complete Streets Guidance. <http://vtrans.vermont.gov/sites/aot/files/highway/documents/publications/Complete%20Streets%20Guidance%20Document.pdf>.
- ¹³ Massachusetts Department of Transportation (2006). Project Development and Design Guidance. <http://www.massdot.state.ma.us/highway/DoingBusinessWithUs/ManualsPublicationsForms/ProjectDevelopmentDesignGuide.aspx>.
- ¹⁴ Boston Complete Streets (2016). Introduction. <http://bostoncompletestreets.org/about/>.
- ¹⁵ Smart Growth America: National Complete Streets Coalition (2013). Complete Streets Local Policy Workbook [PDF file]. <http://www.smartgrowthamerica.org/documents/cs-local-policy-workbook.pdf>.
- ¹⁶ [Richmond bike lanes]. (2007). Retrieved December 7, 2016, from <https://richmondva.files.wordpress.com/2007/12/bike-lanes.jpg>
- ¹⁷ [Soccer mom with kids]. (n.d.). Retrieved December 7, 2016, from http://thechronicleherald.ca/sites/default/files/imagecache/slideshow_image/op_image/B97329778Z.120140617090412000GGP5Q044.11.jpg.
- ¹⁸ [Toronto diagram]. (2016). Retrieved December 7, 2016, from <http://urbantoronto.ca/sites/default/files/imagecache/display-slideshow/images/articles/2016/03/20180/20180-68776.jpg>.

2016

SNHPC Complete Streets Toolkit

Section IV: Design & Engineering

The intent of this section is to review current design elements and engineering standards including current flexibilities in context sensitive design standards. Consideration for three distinguishing land use challenges for rural, suburban, and urban circumstances will also be explored.



In this section:

- *Design Needs*
- *Flexibility in Design/Context-Sensitive Solutions*
- *Design Process in Constrained Rights-of-Way*
- *Conventional vs. Complete Street Design*
- *Transportation/Land Use Connections*
- *Recommended Steps for Design Guidelines*
- *Current Design Elements/Engineering Standards*



A. DESIGN NEEDS

Designing roads for all users requires an understanding of street elements that accommodate the various methods of travel. This section briefly highlights a number of roadway features of a complete street. Many organizations including National Association of City Transportation Officials (NACTO), the American Association of State Highway and Transportation Officials (AASHTO), and The Federal Highway Administration (FHWA) have done the heavy lifting in terms of defining these elements and articulating their best uses. Thus, this section will serve to highlight basic elements of complete streets, focusing on the needs of bicycles, pedestrians, vehicles, and transit. Links and other resources can be found throughout and at the end of this section.

1. BICYCLE FACILITIES

Bike Lane

A Bike Lane is defined by the National Association of City Transportation Officials (NACTO) as a portion of the roadway that has been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. Bike lanes enable bicyclists to ride at their preferred speed without interference from prevailing traffic conditions and facilitate predictable behavior and movements between bicyclists and motorists. The configuration of a bike lane requires a thorough consideration of existing traffic levels and behaviors, adequate safety buffers to protect bicyclists from parked and moving vehicles, and enforcement to prohibit motorized vehicle encroachment and double-parking. Bike Lanes may be distinguished using color, lane markings, signage, and intersection treatments.¹



Bike lane on South Mammoth Road, Manchester, NH. Photo from BikeManchester

Bike Lane Width

According to the American Association of State Highway and Transportation Officials (AASHTO), the minimum width of a bike lane should be 1.5 meters (5 feet) against a curb or adjacent to a parking lane. In instances where the bike lane is adjacent to the curb and the curb includes a one to two foot gutter pan, bike lanes should be a minimum of 4 feet wide, not including the gutter pan.²

Bike lanes against a fence or guard rail should be at least 5 feet wide. Outside of the listed conditions, 4 feet is adequate length for a bike lane. Additionally, a bike lane should be 7 feet if located next to a parking lane where there is frequent vehicle turnover.

Bike Lane Buffers

A buffer is a zone that provides protection and separation between bicycle and motor vehicle traffic. Buffered bike lanes are allowed per



Striped bike lane in Traverse City, MI. Photo from traversetrails.org

Manual on Uniform Traffic Control Devices (MUTCD) guidelines. These guidelines include specifications for roadway markings such as arrows and symbols. MUTCD requires two solid white lines buffering the bicycle lane from the traffic lane.

Maintenance

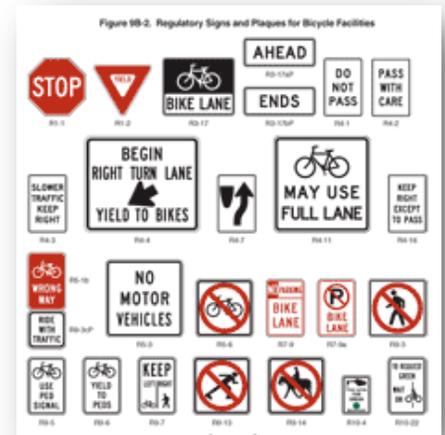
Just as a municipality would maintain a roadway, bike lanes should be kept clear of debris and vegetation in order to ensure a safe environment for non-motorized vehicles. Local departments and transportation agencies should include the frequent cleaning of bike lanes and other bicycle facilities in their maintenance policies.



Photo from bikesiliconvalley.org

Signage and Roadway Markings

Bike lanes should include signs and/or bicycle symbols on the pavement indicating that they are for bicycle use, and not a convenient space to park your car. Signage should alert motorists of the presence of bicyclists, and should direct bicyclists to follow traffic laws. Proper signage should be consistent with Chapter 9B of the MUTCD standards, which can be found [online](#).



MUTCD 2009 Edition Chapter 9B. Signs

Bike Lanes at Intersections

As like conventional intersections, special considerations should be paid to the configuration of bike lanes at intersections. Roadway markings should reduce any potential conflict between bicyclists and vehicle, and should intend to heighten visibility, denoting the right-of-way, and create an awareness of the various modes of transportation. Some examples of these configurations may include bike boxes, intersection crossing markings, median refuge islands, through bike lanes, and combined bike and turn lanes. More information can be found in NACTO's [Urban Bikeway Design Guide](#).



Photo from NACTO's [Urban Bikeway Design Guide](#)

Non-conventional Types of Bike Lanes

Contra-Flow Bike Lanes

Contra-flow bicycle lanes are bicycle lanes designed to allow bicyclists to ride in the opposite direction of motor vehicle traffic. They convert a one-way traffic street into a two-way street: one direction for motor vehicles and bikes, and the other for bikes only. Contra-flow lanes are separated with yellow center lane striping.



Photo from NACTO's Urban Bikeway Design Guide

Buffered Bike Lanes

- Provides greater shy distance between motor vehicles and bicyclists.
- Provides space for bicyclists to pass another bicyclist without encroaching into the adjacent motor vehicle travel lane.
- Encourages bicyclists to ride outside of the door zone when buffer is between parked cars and bike lane.
- Provides a greater space for bicycling without making the bike lane appear so wide that it might be mistaken for a travel lane or a parking lane.
- Appeals to a wider cross-section of bicycle users.
- Encourages bicycling by contributing to the perception of safety among users of the bicycle network



Photo from NACTO's Urban Bikeway Design Guide

Barrier-Protected Bike Lanes

Barrier-separated bike lanes are separated from the lanes of motorized traffic by a physical barrier, such as a line of poles, a low wall, or a fence. These bike lanes can encourage bicycling by providing additional protection.



Photo from NACTO's Urban Bikeway Design Guide

2. VARIOUS BICYCLE INFRASTRUCTURE

Bike Boulevards

Bicycle boulevards are streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority. Bicycle Boulevards use signs, pavement markings, and speed and



Photo from NACTO's Urban Bikeway Design Guide

volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets.³

Designing bike boulevards requires the planning and managing of routes, identifying the best signage, managing speed and vehicle volume, enabling safe and convenient crossings and navigations.

Shared Lane Markings

Shared lane markings, also known as “sharrows” (“share” + “arrow”), indicate the presence of bicyclists to motorists, guide bicyclists to utilize the middle of the lane, and discourage wrong-way bicycling using arrow markings. They are appropriate on roadways with speed limits up to 35 mph. Sharrows were added to the MUTCD in 2009.



Sharrow Marking on Chestnut Street, Manchester, NH. Photo from bikemanchester.org

Paved Shoulders

Paved shoulders provide a recovery area for errant motor vehicles, and lengthen the lifespan of the roadway by providing pavement structure support, reducing edge deterioration, and improving drainage. Paved shoulders significantly reduce maintenance costs and are proven to reduce crashes. Paved shoulders provide space for pedestrian and bicycle travel, which facilitates safer passing behaviors and improves comfort for all users.

Paved shoulders serve many purposes. All users should be considered to develop the most appropriate design given the intended use of the shoulder. Designers have flexibility in determining when to pave shoulders, as well as on factors such as shoulder width and rumble strip design and placement.⁴



Paved Shoulder Widening on Pleasant Street, Concord, NH.

Shared-Use Paths

A shared-use path serves as part of a transportation circulation system and supports multiple recreation opportunities, such as walking, bicycling, and inline skating. A shared-use path typically has a surface that is asphalt, concrete, or firmly-packed crushed aggregate. The 1999 AASHTO Guide for the Development of Bicycle Facilities defines a shared-use path as being physically separated from motor vehicular traffic with an open space or barrier (AASHTO,



Piscataquog River Rail Trail Bridge, Manchester, NH. Photo from myggm.org

1999). Shared-use paths should always be designed to include pedestrians even if the primary anticipated users are bicyclists.

There are various surface materials that can be used in outdoor environments. Shared-use paths are generally paved with asphalt or concrete, but may also use prepared surfaces such as crushed stone or soil stabilizing agents mixed with native soils or aggregates. High use trails passing through developed areas or fragile environments are commonly surfaced with asphalt or concrete to maximize the longevity of the shared-use path surface and promote bicycle and inline skating use.⁵

3. PEDESTRIAN FACILITIES

Sidewalks

Sidewalks are one of the most important elements of a complete street. Without sidewalks, public rights-of-way are inaccessible to all pedestrians, including people with disabilities. When sidewalks are not available, the roadway design forces pedestrians to share a street with motorists as well as limits pedestrians' access to public transportation.⁶

When designing sidewalks, it is important to consider a variety of elements, including proper width, clearance zone, curbs, buffer space, and other streetscaping. Each of these elements is described in the following sections.



Photo from NACTO's Urban Street Design Guide

Sidewalk Width

The AASHTO minimum clear width of four feet is too narrow for two wheelchair users to pass each other. Where sidewalks have less than five feet of clear width, passing spaces should be provided for wheelchair users.

Winter Sidewalk Maintenance

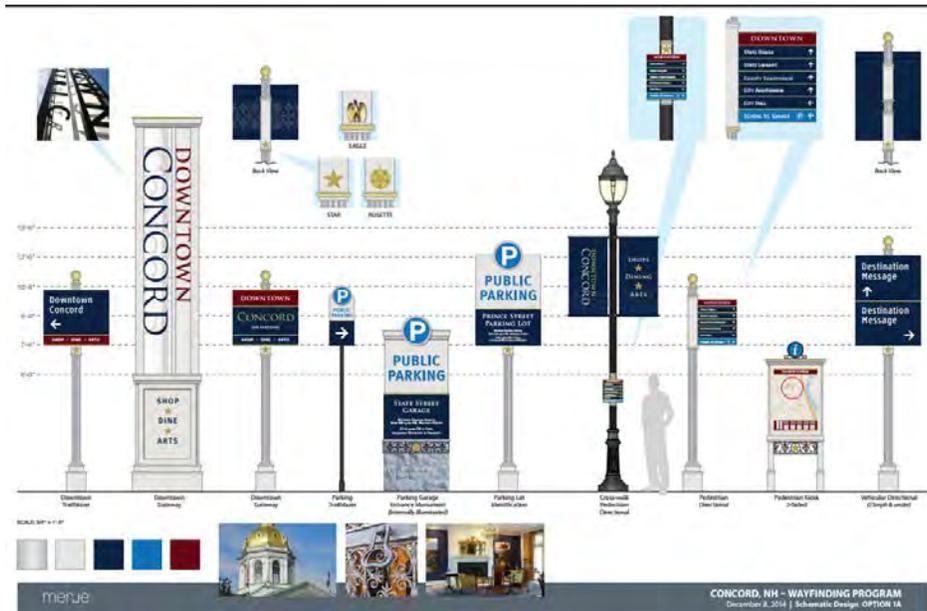
New Hampshire is subject to significant amounts of snow and ice during approximately five months out of each year. During this time period, special attention should be paid to the maintenance of pedestrian facilities. Icy conditions may cause injury from slipping, and walking in the roadway increases their risk of being hit by a car or truck. Some communities have ordinances requiring property owners to keep their sidewalks clear. However, in New Hampshire, sidewalks on public roads must be maintained and repaired by the municipality at no additional cost to the abutters.



Sidewalk Snowplow in Manchester, NH. Photo from unionleader.com

Wayfinding Signage

Signage shouldn't solely focus on driver and cyclist behavior. In many instances, cities have incorporated wayfinding signage as a means of communicating the local geography to pedestrians. These signs may tell you how far you are from a grocery store, or how many minutes it will take to walk to the nearest park. Wayfinding signage is important not only because it gives pedestrians a sense of direction, but proper signage can help build a sense of place.



Renderings of Wayfinding Signage in Concord, NH. Photo from www.concordmainstreetproject.com/public-downloads

4. STREET CROSSINGS

Signalized Crosswalks at Intersections

All intersections “should be designed with the premise that there will be pedestrians present, that they should be able to cross the street, and that they need to do so safely” (AASHTO, 2004a).

Turning motorists, especially those turning right on red when allowed, can present a danger to pedestrians using the intersection crossing. If the street is wide and creates a longer crossing time, median islands should be provided to decrease the individual crossing distance, even if the intersection is signalized. Crosswalks should be provided on all sides of the intersection. ADA-compliant pedestrian countdown timers should be provided at all signalized intersections.



Signalized Crosswalk at the Intersection of Elm St. and Bridge St. in Manchester, NH. Photo from Google Street View

Mid-Block Unsignalized Crosswalks

Mid-block unsignalized crosswalks are crosswalks away from intersections that do not have a signal, but have striping and signs. Mid-block unsignalized crosswalks can provide convenient crossings for

pedestrians when the nearest intersection is a significant distance away, or when major destination points are in the middle of the block.

According to a report by FHWA, pedestrians who cross at midblock account for as much as 26 percent of all motor vehicle-pedestrian crashes, according to a 1996 review of 5,000 pedestrian crash reports from six different states. Thus, communities should install advanced warning signage prior to the unsignalized crossing. Public Works or Highway staff should look to MUTCD for guidelines on appropriate warning signage.



Mid-Block Unsignalized Crossing in Keene, NH.
Photo from Southwest Regional Planning Commission

Mid-Block Signalized Crosswalks

For added safety, signals can be installed at mid-block crosswalks. One increasingly popular option for this is the Pedestrian Hybrid Beacon, or HAWK signal (High- intensity Activated cross-Walk). HAWK signals are pedestrian-activated signals suspended above the roadway. When activated, the HAWK signal cycles through six phases, proceeding from flashing yellow to steady red, instructing motorists to stop.



Mid-Block Signalized Crossing on Route 125 in Epping, NH. Photo from Google Street View

HAWK signals have been shown to improve safety, especially when installed at previously unsignalized crosswalks on high-traffic streets where motorists' failure to yield has been a concern. One study found that HAWK signals achieved up to a 69 percent reduction in pedestrian crashes.⁷

Rectangular Rapid Flash Beacons

The Federal Highway Administration states that Rectangular Rapid Flash Beacons (RRFB) can enhance public safety by reducing crashes between vehicles and pedestrians at unsignalized intersections and at mid-block pedestrian crossings by increasing driver awareness of potential pedestrian conflicts (see photo below of an existing RRFB mid-block crossing located within the Town of Marlborough, NH along NH Route 101). According to the FHWA:



An existing RRFB located in the Town of Marlborough, NH crossing NH Route 101. Photo from Google Street View

- RRFBs are user-actuated amber LEDs that supplement warning signs at unsignalized intersections or mid-block crosswalks. They can be

activated by pedestrians manually by a push button or passively by a pedestrian detection system.

- RRFBs use an irregular flash pattern that is similar to emergency flashers on police vehicles.
- RRFBs can be installed on either two-lane or multi-lane roadways.
- RRFBs are a lower cost alternative to traffic signals and hybrid signals that are shown to increase driver yielding behavior at crosswalks significantly when supplementing standard warning signs and markers.
- An official FHWA-sponsored experimental implementation and evaluation conducted in St. Petersburg, Florida found that RRFBs at pedestrian crosswalks are dramatically more effective at increasing driver yielding rates to pedestrians than traditional overhead beacons.
- The novelty and unique nature of the stutter flash provides a greater response from drivers than traditional methods.

Determining the Right Type of Pedestrian Traffic Signal

The MUTCD contains warranting procedures for conventional pedestrian traffic signals based on automobile and vehicle traffic volumes to help determine if a pedestrian signal is appropriate. These signals are typically considered when there are over 130 pedestrians an hour crossing a roadway.

Hybrid Beacons (HAWK beacons) may also be considered and the MUTCD contains warranting guidelines that utilize automobile traffic, pedestrian traffic, automobile speeds, and pedestrian crossing distance. The MUTCD recommends the following placement requirements for pedestrian hybrid beacons:

- The pedestrian hybrid beacon should be installed at least 100 feet from side streets or driveways that are controlled by STOP or YIELD signs,
- Parking and other sight obstructions should be prohibited for at least 100 feet in advance of and at least 20 feet beyond the marked crosswalk, or site accommodations should be made through curb extensions or other techniques to provide adequate sight distance,
- The installation should include suitable standard signs and pavement markings.⁸

Pedestrian Refuge Areas

Pedestrian refuge areas or pedestrian safety islands are designed to reduce the exposure time experienced by a pedestrian in the intersection. According to NACTO, pedestrian refuge areas may be used on both wide and narrow streets and could be applied where speeds and volumes make crossings prohibitive, or where three or more lanes of traffic make pedestrians feel exposed or unsafe in the intersection⁹



Photo from NACTO's Urban Street Design Guide

Curb Extensions

According to the FHWA, curb extensions extend the sidewalk or curb line out into the parking lane, reducing the street width and pedestrian crossing distances. Curb extensions can also improve the

ability of pedestrians and motorists to see each other. The FHWA lists the following considerations for curb extensions:

- Curb extensions should typically be used where there is a parking lane, and where transit and cyclists would be traveling outside the curb edge for the length of the street.
- Curb extensions should typically be used where there is a parking lane, and where transit and cyclists would be traveling outside the curb edge for the length of the street.
- Curb extensions should typically be used where there is a parking lane, and where transit and cyclists would be traveling outside the curb edge for the length of the street.
- Where intersections are used by significant numbers of trucks or buses, the curb extensions need to be designed to accommodate them. However, it is important to take into consideration that those vehicles should not be going at high speeds, and most can make a tight turn at slow speeds. It is also not always necessary for a roadway to be designed so that a vehicle be expected to turn from right lane to right lane -i.e., the vehicles can often encroach into adjacent lanes safely where volumes and/or speeds are slow. Keep in mind that speeds should be slower in a pedestrian environment.¹⁰



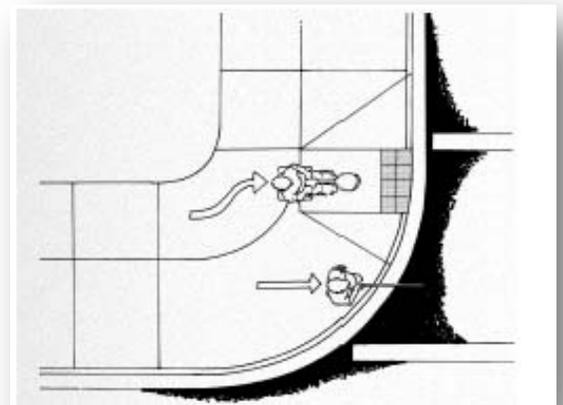
Photo from NACTO's Urban Street Design Guide

5. ACCESSIBLE ACCOMMODATIONS

The Americans with Disabilities Act (ADA) of 1990 requires sidewalks and other pedestrian facilities to be accessible to persons with disabilities.

ADA Ramps

Curb ramps are critical to providing access between the sidewalk and the street for people who use wheelchairs. Curb ramps are most commonly found at intersections, but they may also be used at other locations such as on-street parking, loading zones, bus stops, and midblock crossings. The implementing regulations under Title II of the ADA specifically identify curb ramps as requirements for existing facilities, as well as all new construction. Curb ramps for existing facilities must be included in Transition Plans. According to the Title II implementing regulations, priorities for the installation of curb ramps in existing facilities should include access to government facilities, transportation, public accommodations, and for employees to their place of employment.



Example of a well-designed ADA Curb Ramp. Photo from FHWA

ADA ramps enable people with disabilities to use the same infrastructural facilities

ADA ramps are curb ramps compliant with the ADA Accessibility Guidelines for Buildings and Facilities (ADAAG), Curb ramps provide “an accessible route that people with disabilities can use to safely transition from a roadway to a curbed sidewalk and vice versa”.¹¹

6. VEHICLE CONSIDERATIONS

Lane Width

According to NACTO, the width allocated to lanes for motorists, buses, trucks, bikes, and parked cars is a sensitive and crucial aspect of street design. Lane widths should be considered within the assemblage of a given street delineating space to serve all needs, including travel lanes, safety islands, bike lanes, and sidewalks.

Each lane width discussion should be informed by an understanding of the goals for traffic calming as well as making adequate space for larger vehicles, such as trucks and buses.¹²

AASHTO also provides guidance for widening lanes through horizontal curves to provide for the off-tracking requirements of large trucks. Lane width does not include shoulders, curbs, and on-street parking areas. The table below summarizes the range of lane widths for travel lanes and ramps.^{13,14}

Table 1. Ranges for Lane Width

Type of Roadway	Rural		Urban	
	US (feet)	Metric (meters)	US (feet)	Metric (meters)
Freeway	9-12	3.6	12	3.6
Ramps (1-lane)	12-30	3.6-9.2	12-30	3.6-9.2
Arterial	11-12	3.3-3.6	10-12	3.0-3.6
Collector	10-12	3.0-3.6	10-12	3.0-3.6
Local	9-12	2.7-3.6	9-12	2.7-3.6

(Source: A Policy on Geometric Design of Highways and Streets, AASHTO)

Shoulder Width

According to the New Hampshire Department of Transportation, a wide enough shoulder may be used as a breakdown area for stranded motorists, offering a safe area in which to assess damage and request assistance. In the absence of designated parking, the shoulder may be used as an alternative parking area in certain (especially rural) areas, as well as access points for Emergency Services vehicles.

The following table from AASHTO's *A Policy on Geometric Design of Highways and Streets* summarizes the ranges for minimum shoulder width.

Table 2. Ranges for Minimum Shoulder Width

Type of Roadway	Rural		Urban	
	US (feet)	Metric (meters)	US (feet)	Metric (meters)
Freeway	4–12	1.2–3.6	4–12	1.2–3.6
Ramps (1-lane)	1–10	0.3–3.0	1–10	0.3–3.0
Arterial	2–8	0.6–2.4	2–8	0.6–2.4
Collector	2–8	0.6–2.4	2–8	0.6–2.4
Local	2–8	0.6–2.4	–	–

(Source: *A Policy on Geometric Design of Highways and Streets*, AASHTO)

On-Street Parking

According to the FHAW, on-street parking can be both a benefit and a detriment to pedestrians. On-street parking does increase the "friction" along a street and can narrow the effective crossing width, both of which encourage slower speeds; parking can also provide a buffer between moving motor vehicle traffic and pedestrians along a sidewalk.

On-street parking can also create a visual barrier between motorists and crossing pedestrians. The FHWA recommends that where there is on-street parking, curb extensions should be built where pedestrians cross, and at least 20 feet of parking should be cleared on the approaches to crosswalks.



On-Street Parking on Main Street, Concord, NH. Photo from www.concordmainstreetproject.com/public-downloads

7. DESIGN VEHICLES

Design vehicles are selected motor vehicles with the weight, dimensions, and operating characteristics used to establish highway design controls for accommodating vehicles of designated classes. For purposes of geometric design, each design vehicle has larger physical dimensions and a larger minimum turning radius than most vehicles in its class. The design of an intersection is significantly affected by the type of design vehicle, including horizontal and vertical alignments, lane widths, turning radii, and intersection sight distance.¹⁵

Corner Radii

According to NACTO, corner radii directly impact vehicle turning speeds and pedestrian crossing distances. Minimizing the size of a corner radius is critical to creating compact intersections with safe turning speeds. While standard curb radii are 10–15 feet, many cities use corner radii as small as 2 feet.

In urban settings, smaller corner radii are preferred and actual corner radii exceeding 15 feet should be the exception.

NACTO recommends turning speeds should be limited to 15 mph or less. Minimizing turning speed can help increase pedestrians safety as corners are areas where vehicles and pedestrians are most likely to meet. The following is an image from NACTO’s Urban Street Design Guide which shows a formula for calculating turning speed.¹⁶

TURNING SPEED

The formula for calculating turning speed is:

$$R = \frac{V^2}{15 (.01E + F)}$$

R = Centerline turning radius (effective)

V = Speed in miles per hour (mph)

E = Super-elevation. This is assumed to be zero in urban conditions.

F = Side friction factor

V (MPH)	E	F	R (FT)
10	0	0.38	18
15	0	0.32	47
20	0	0.27	99
25	0	0.22	174

(Source: NACTO’s Urban Street Design Guide, Corner Radii)

8. TRANSIT

Transit refers to mass public transportation such as passenger rail and bus services. Transit is an important element of Complete Streets as it allows pedestrians to access greater distances without stepping foot in a single-passenger vehicles, thus reducing the overall number of vehicles on the road, and increasing pedestrian safety.

According to FHWA, fixed route transit are services provided on a repetitive, fixed schedule basis along a specific route with vehicles stopping to pick-up and deliver passengers to specific locations; each fixed route trip serves the same origins and destinations, such as rail and bus (MB); unlike demand responsive (DR) and vanpool (VP) services.

Bus

The most common type of transit in New Hampshire is by bus. A bus may be up to 41 feet in length, and the fuel can vary from diesel gasoline to biodiesel, to hybrid electric. Buses may have front and center doors, which are typically used in frequent-stop services.

The two primary types of bus service are local and express. Local bus service makes frequent stops, picking up and delivering passengers to a rapid transit station or express bus stop or terminal. Express bus service operates a portion of the route without stops or with a limited number of stops.¹⁷

TYPES OF BUS STOPS

When planning for a transit stop, three types of locations can be considered: near-side, far-side, and mid-block. A number of factors affect the decision of bus stop location, including transfer situations, space availability, and traffic volumes. As a result, there are trade-offs associated with each type of location, and the exact location should be based on adjacent land uses and likely paths of travel to and from the stop.

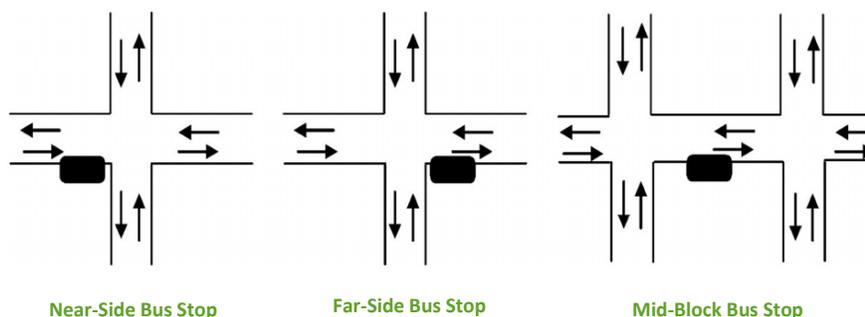


Figure 1 Manchester Transit Authority Bus. Photo from gallery.bustalk.info

Near-side bus stops are located immediately before an intersection. Placing the stop prior to an intersection minimizes walking distances to connecting transit service and can create a safer path for traveling pedestrians. Near-side stop locations do have the tendency to slow vehicles behind stopped buses at intersections. Limited visibility of crossing pedestrians is another potential disadvantage associated with near-side stops. Pedestrians who cross in front of a bus are not able to see around the bus, and also are not seen by motorists in the adjacent lane.

Far-side bus stops are located immediately after an intersection. According to NACTO's Transit Street Design Guide, far-side in-lane stops are generally the preferred stop configuration where transit lanes or transit ways are present. At intersections where transit vehicles turn, use far-side stops to simplify transit turns and allow pedestrians to better anticipate turning movements. However, far-side stop locations can create a backup of vehicles behind a stopped bus into an intersection.¹⁸

Mid-block stops are located between intersections. NACTO recommends that signaled or traffic-calmed pedestrian crossings should be provided at mid-block stops.



Examples of Bus Stops

Rail

Rail types may include heavy rail, light rail, commuter rail, high-speed rail, monorail and more. Currently, there are three passenger rail stations in Eastern New Hampshire (Exeter, Durham, and Dover) serviced by Amtrak, connecting Brunswick, Maine to Boston, Massachusetts. Additionally, there is an existing Amtrak station in Claremont – the only New Hampshire stop on the Vermonter – which runs daily from Washington, D.C. to St. Albans, VT. Below are pictures of the Claremont, Exeter, Durham, and Dover Stations.



Exeter Train Station



Durham Station



Claremont Station



Dover Train Station

B. UTILIZING GREEN INFRASTRUCTURE IN COMPLETE STREETS

Complete “green” streets manage the needs of diverse users while also attenuating storm water. A balanced design approach considers cost, maintenance & sustainability, carbon footprint, horticultural needs of plants, aesthetics, and economic prosperity.

Tree Box Filters

Tree box filters are based on an effective and widely used “bioretention or rain garden” technology with improvements to enhance pollutant removal, increase performance reliability, increase ease of construction, reduce maintenance costs and improve aesthetics.

The system consists of a container filled with a soil mixture, a mulch layer, under-drain system and a shrub or tree. Stormwater runoff drains from impervious surfaces through a filter media and treated water flows out of the system through an under drain connected to a storm drainpipe / inlet or into the surrounding soil.¹⁹



Tree Box Filter in Portsmouth, NH. Photo from Ironwood Design Group, LLC

Tree Lining

Street trees can be used to serve a variety of urban design functions. Based on their location, arrangement and spacing, trees can help to define and highlight spaces, emphasize linearity, provide shade and filter light, as well as calm traffic.

Heated Sidewalks

Many communities have begun to utilize unique ways to maintain their sidewalks. In Concord, NH, the City installed steam-heated sidewalks which will ultimately help reduce maintenance costs in the long run, and can decrease the amount of applied salt on the sidewalk.



Tree Lining in Nashua, NH. Photo from Google Street View



Heated Sidewalk Installation on Main Street, Concord, NH.

C. FLEXIBILITY IN DESIGN AND CONTEXT SENSITIVE SOLUTIONS

Many states and communities have adopted a process known as Context Sensitive Solutions (CSS), which is a means to address the many different needs of a community and their roadways. It should be noted that CSS is an approach to making decisions on roads, and does not always result in a Complete Street. While having a collaborative process like CSS can be beneficial, recognizing that streets should be designed for all users will likely result in safer, more complete streets. The following language is from the New Hampshire Department of Transportation.

Context Sensitive Solutions (CSS) to help ensure that streets are "complete" in the sense of being appropriate for the area in which a project is implemented. As defined by FHWA and the American Association of State Highway and Transportation Officials, CSS is a collaborative, interdisciplinary approach that involves all stakeholders in providing a transportation facility that fits its setting. CSS leads to preserving and enhancing scenic, aesthetic, historic, community, and environmental resources, while improving or maintaining safety, mobility, and infrastructure conditions.

Transportation officials can apply CSS early in the planning process and throughout project development and delivery. Some of the major elements of CSS include the following:

- Early and frequent consultation and collaboration with stakeholders and the community during planning and design, and using communications tools, such as design visualization, that help citizens better understand project proposals.
- Use of an interdisciplinary team to oversee and manage project development.
- Emphasis on enhancing and retaining the sense of place or uniqueness of an area and its valued resources and features.
- Consideration of multiple alternatives with the goal of building consensus on a final project, which might include elements of the various alternatives.
- Minimization of disruptive impacts on the community.

The New Hampshire DOT has internalized the CSS approach. Numerous NHDOT engineers, planners, project managers and community relations representatives, as well as consultants and community leaders have been trained in CSS techniques: flexible design, respectful communication, consensus-building and community participation, negotiation and conflict resolution.

The NHDOT takes certain steps to ensure a comprehensive approach in designing context sensitive solutions. The NHDOT CSS steps include a placemaking workshop, developing a problem and vision statement, screening criteria, developing alternatives, screening alternatives, identifying preferred alternatives, and holding a public hearing.

D. DESIGN PROCESS IN CONSTRAINED RIGHTS-OF-WAYS

1. TRAFFIC CALMING

The Institute of Transportation Engineers organizes traffic calming into four categories: vertical deflections, horizontal shifts, roadway narrowing, and closures (ITE, 2011).

Vertical Deflection

Speed Humps are parabolic vertical traffic calming devices intended to slow traffic speeds on low volume, low speed roads. Speed humps are 3–4 inches high and 12–14 feet wide, with a ramp length of 3–6 feet, depending on target speed. Speed humps reduce speeds to 15–20 mph and are often referred to as “bumps” on signage and by the general public.



Speed Hump on Kenberma St, Manchester, NH. Photo from Google Street View

According to ITE, the following are the potential impacts of speed humps:

- no effect on non-emergency access
- speeds determined by height and spacing; speeds between humps have been observed to be reduced between 20 and 25 percent on average
- based on a limited sample of sites, typical crossing speeds (85th percentile) of 19 mph have been measured for 3½ inch high, 12 foot humps and of 21 mph for 3 inch high, 14 foot humps; speeds have been observed to rise to 27 mph within 200 feet downstream
- speeds typically increase approximately 0.5 mph midway between humps for each 100 feet of separation
- studies indicate that traffic volumes have been reduced on average by 18 percent depending on alternative routes available
- studies indicate that collisions have been reduced on average by 13 percent on treated streets (not adjusted for traffic diversion)
- most communities limit height to 3-3½ inches, partly because of harsh ride over 4-inch high humps
- possible increase in traffic noise from braking and acceleration of vehicles, particularly buses and trucks

Although speed humps can be utilized to calm traffic, they are not without their problems. ITE lists the following problems with speed humps relating to emergency response:

- Concern over jarring of emergency rescue vehicles
- Approximate delay of between 3 and 5 seconds per hump for fire trucks and up to 10 seconds for ambulance with patient.²⁰

Speed Tables (Raised Crosswalks). A speed table is a raised surface above the roadway, usually 3-3.5 inches high and can be 22 feet long. Speed tables reduce traffic speed and can increase the visibility of pedestrians.



Example of a Speed Table. Photo from NACTO's Urban Street Design Guide

Intersection Tables (Raised Intersection). A raised intersection is similar to a speed table but for an entire intersection. According to the FHWA, construction involves providing ramps on each intersection approach and elevating the entire intersection to the level of the sidewalk. Speed tables can be built with a variety of materials, including asphalt, concrete, or pavers. Crosswalks on each approach should also be elevated to ensure pedestrians cross the road at the same level as the sidewalk. Raised intersections may prove to be burdensome for winter maintenance.²¹



Example of a Raised Intersection. Photo from NACTO's Urban Street Design Guide

Horizontal Shift

Roundabouts. A roundabout is a type of circular intersection, but is quite unlike a neighborhood traffic circle or large rotary. Roundabouts have been proven safer and more efficient than other types of circular intersections.

Roundabouts can provide lasting benefits and value in many ways. They are often safer, more efficient, less costly and more aesthetically appealing than conventional intersection designs. Furthermore, roundabouts are an excellent choice to complement other transportation objectives – including Complete Streets, multimodal networks, and corridor access management – without compromising the ability to keep people and freight moving through our towns, cities and regions, and across the Nation. The FHWA Office of Safety identified roundabouts as a Proven Safety Countermeasure because of their ability to substantially reduce the types of crashes that result in injury or loss of life. Roundabouts are designed to improve safety for all users, including pedestrians and bicycles.²²



Roundabout in Keene, NH. Photo from NHDOT

Roadway Narrowing

Roadway narrowing is another form of traffic calming designed to slow speeds by reducing roadway width.

Curb Extension. As noted previously in this section, curb extensions extend the sidewalk or curb line out into the parking lane, reducing the street width and pedestrian crossing distances and improve pedestrian visibility.

Road Diet. According to an informational guide developed by FHWA, four-lane undivided highways have a history of relatively high crash rates as traffic volumes increase and as the inside lane is shared by higher speed through traffic and left-turning vehicles. One option for addressing this safety concern is a “Road Diet.” A Road Diet involves converting an existing four-lane undivided roadway segment to a three-lane segment consisting of two through lanes and a center two-way left-turn lane (TWLTL). The reduction of lanes allows the roadway cross section to be reallocated for other uses such as bike lanes, pedestrian refuge islands, transit stops, or parking.²³

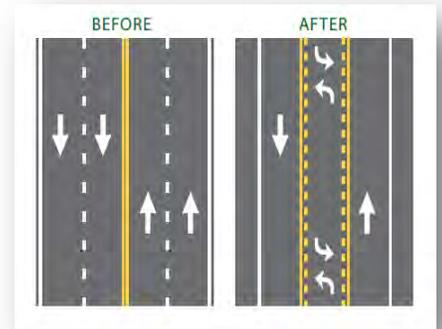


Figure 2 Image of a road diet. Image from FHWA

Diagonal Parking. Diagonal parking can be used to slow motor vehicles, as drivers will slow down as they anticipate parked vehicles backing out. While diagonal parking can slow traffic, its design can be burdensome on bicycles where bicycle lanes are provided. For instance, drivers backing out have poor visibility of oncoming bicycles.



Diagonal Parking in Virginia. Photo from SNHPC

E. CONVENTIONAL STREET DESIGN VERSUS COMPLETE STREET DESIGN

The difference between complete street design and conventional street design is that Complete Streets account for more users of the road. In doing so, street design has to find innovative ways to design safe areas of the road for these newly-incorporated users.

This section illustrates the differences between conventional and Complete Streets design using photos of urban, suburban, and rural areas of New Hampshire, and uses complete street renderings of the same locations to visualize what those locations may look like if they accounted for more users of the road.

1. MANCHESTER (URBAN)

Manchester, the state's largest city, population was 110,065 in 2014. The City has 3,330.3 persons per square mile of land area, the state's highest population density. Manchester contains 33.1 square miles of land area. Manchester is an urban area with over 400 miles of public streets, 250 miles of sidewalks, 9,000 street lights, and 150 traffic signals.

Pictured below is Bremer Street, a local road with an Average Annual Daily Traffic (AADT) of 5500. The street is currently 28ft wide with some on-street parking. Additionally, Bremer Street has sidewalks on both sides of the road, with no marked crossings. SNHPC asked Knowles Design to develop an illustration of Bremer Street with Complete Street elements. The potential fixtures include marked lanes, a designated bicycle lane on the north side of the street, marked non-signalized intersection crossings, and ADA curb ramps.



2. GOFFSTOWN (SUBURBAN)

Pictured below is Goffstown's Main Street, NH 13, which crosses the Piscataquog River. Currently, there are multiple local shops, a church, restaurants, a pharmacy, and many more businesses and public buildings on Main Street, making it the hub of downtown Goffstown. Main Street had an Average Annual Daily Traffic (AADT) of 15000 in 2015. The street is as wide as 30ft in some areas to allow for on-street parking, with travel lanes varying in width. The street does have sidewalks, and a midblock unsignalized crossing pictured below.

SNHPC asked Knowles Design to develop an illustration of Main Street with Complete Street elements. The potential fixtures include duplicate brick-edge sidewalk treatments, trees, pavers (or Resin Stamped Crossings) in areas where there are expanses of pavement along parking, and sharrow markings.



3. FRANCESTOWN (RURAL)

Pictured below is Francestown's town center, a 5-legged intersection including the following roads:

- Heading north from the intersection towards Bennington, is route 47.
- Heading south from the intersection is the town road, the 2nd New Hampshire Turnpike South.
- Crossing through town, east to west, is route 136 coming in on the west from Greenfield and the east from New Boston.
- The fifth road is a town road, Poor Farm Road, that heads Northeast between 136E and 47N.

Pictured is the middle of the unsignalized intersection on NH 136. In 2015, NH 136 had an Average Annual Daily Traffic (AADT) of 1400. Currently, the street does not have any marked crossings for pedestrians who occasionally cross from the near side of the street pictured below, to the Old Meeting House across the street. The illustration of NH 136 with Complete Streets design elements is pictured below with descriptions of the improvements. While not pictured in the illustration, a complete street in this location would also include advance warning signage, described in the Street Crossing subsection.





- Create Safer Pedestrian/Cyclist Travel
- Create crosswalk
- Fix stop bar – perpendicular to the road, stencil “STOP”, cover extended yellow line
- Add fog lines, keeping lane width at 10 ½ feet as exists in Village Center
- Reduce radius around right hand turn on route 136 and SW corner 2nd NH Turnpike
- Better define travel lanes vs. non-travel area

F. TRANSPORTATION AND LAND USE CONNECTIONS

1. STREET PATTERNS

Street form refers to the organization or layout of streets. A Complete Streets pattern will enable the most amount of connectivity for all users. For instance, a grid pattern is designed to allow high connectivity with short blocks and intersections. More well-connected streets can also reduce traffic congestion by dispersing traffic and offering more travel options.²⁴

In communities where the street patterns are hierarchical in nature may have a hard time increasing the connectivity of their streets. When building new roads, communities should consider how that road will not only connect to another road, but how it could potentially connect to places of work, recreation, hospitals, schools, etc.

2. ZONING

There are several types of zoning codes, including Euclidean, form-based, flexible or discretionary, and inclusionary zoning. Each approach has strengths and weaknesses and is best applied under a particular set of circumstances or with a particular goal in mind. The following will highlight form-based code and how it could be used to help implement Complete Streets.

Form-Based Code

Form-based codes use the physical form to establish predictable built results and a high-quality public, rather than separation of uses, as the organizing method for the code. Form-based codes address the relationship between building facades and the public realm, the form and mass of buildings in relation to one another, and the scale and types of streets and blocks. They are regulations, not mere guidelines that would need to be adopted into municipal law. Form-based codes could be used as a tool to help implement Complete Streets. For example, code could require sidewalk installation as a component of development. Similarly, the code could include incentives for reducing parking and incentivize bicycle and pedestrian accommodations.

3. LEED-ND

LEED-ND stands for Leadership in Energy and Environmental Design – Neighborhood Development. LEED-ND is a program administered by the U.S. Green Building Council, a private, non-profit organization, which evaluates and certifies green buildings across the U.S. Ultimately, LEED-ND applies the LEED certification to entire neighborhoods instead of just buildings. LEED-ND contains a set of measurable standards that can identify if a proposed development can be named environmentally friendly as well as identify if the roadway patterns and building techniques are sustainable and efficient. More information can be found at www.usgbc.org.

4. TRANSIT-ORIENTED DEVELOPMENT (TOD)

Transit Oriented Development (TOD) refers to a method of regulating land use that concentrates commercial and residential growth around transit centers in order to maximize access to transit and encourage the use of non-motorized transportation. TOD is a strategy that has broad potential in both large urban and small communities using bus or rail transit systems. It focuses compact growth around transit stops, thereby capitalizing on transit investments by bringing potential riders closer to transit facilities and increasing ridership.



Illustrative Example of TOD and Complete Streets. Image from Smart Growth America

TOD can be described as development, generally within half a mile of a transit station that provides sufficient densities, mixes of activities and convenient pedestrian linkages to support significant transit ridership. Focusing development in proximity to transit stations can create interesting and functional urban centers, diminish environmentally damaging urban sprawl, and play a major role in realizing regional development strategies.

G. RECOMMENDED STEPS ON DEVELOPING AND IMPLEMENTING COMPLETE STREETS DESIGN GUIDELINES

In many areas of New Hampshire, municipalities look to highway design manuals for designing their streets. In many cases, these municipalities are using older guidelines, which when originally published, didn't consider all users of the road, and instead focused mainly on vehicles. These manuals can be viewed as a systematic barrier to implementing Complete Streets, and communities should look to the most updated design guidelines such as AASHTO's "Green Book", NACTO's Urban Street Design Guide, and many more.

While some communities may choose to rewrite their design manuals, others may turn to existing design templates such as the [Model Design Manual for Living Streets and Complete Streets](#). Florida's Broward County is one example of a community adopting such design templates.

According to the National Complete Streets Coalition, the design guidance used on city-initiated projects should be incorporated into the review and approval process for streets modified or built by private developers. Doing so ensures all new roadways and planned developments are aligned with the community's Complete Streets goals.

Taken alone, updating design guidance may not be enough to change the everyday workings of an agency. Trainings, changes to procedure, and creating an inclusive process are vital complements to design manuals.²⁵

In the resource guide below, you can find links to resources which cover, in depth, various design and engineering manuals, federal resources, case studies, and more.

1. HOW NH REGIONAL PLANNING COMMISSIONS CAN HELP COMMUNITIES IMPLEMENT COMPLETE STREETS

The nine New Hampshire Regional Planning Commissions (RPCs) are a valuable resource to municipalities in the area of transportation planning. RPCs could be called on to help implement Complete Streets by assisting with administering complete streets programs, including assistance with assessing roadway standards, education and training, and implementing complete streets demonstrations. Similarly, RPCs could assist communities in writing policies and resolutions, as well as developing comprehensive performance measures which would help municipalities quantify the impacts of complete streets.

H. CURRENT DESIGN ELEMENTS AND ENGINEERING STANDARDS

1. EXISTING STANDARDS AND GUIDELINES

The design of Complete Streets encourages creativity and innovative uses of roadway space. Using efficient roadway design can enable a cost-efficient road project that increases safety for all users. This section highlights engineering standards and guidelines from national organizations and showcases engineering guidelines from cities and municipalities from all over the U.S.

Existing Standards and Guidelines

DOCUMENT	DESCRIPTION	LAST UPDATED	LINK
AASHTO Policy on Geometric Design of Highways and Streets	Roadways, including non-highway roads, with application to road diets.	2011	Link
AASHTO Guide for the Development of Bicycle Facilities, 4th edition.	Bicycle facilities.	2012	Link
AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, 1st edition.	Pedestrian facilities.	2011	Link
Manual on Uniform Traffic Control Devices (MUTCD).	Signals, signage, markings, etc. on roads and paths.	2009	Link
Americans with Disabilities Act Accessibility Guidelines (ADAAG).	Provisions of ADA related to buildings and building entrances.	2004	Link
Public Rights-of-Way Accessibility Guidelines (PROWAG).	Provisions of ADA specific to public rights-of-way.	2011	Link

Designing Sidewalks and Trails for Access.	Provisions of ADA related to sidewalks and trails.	2001	Link
Designing Walkable Urban Thoroughfares: A Context Sensitive Approach, An ITE Recommended Practice	Roadways in urban and suburban contexts.	2010	Link
National Association of City Transportation Officials: Urban Street Design Guide	Roadway design focusing on all users.	2013	Link
National Association of City Transportation Officials: Urban Bikeway Design Guide, Second Edition	Roadway design focusing on bicycle facilities.	2012	Link

2. STATE AND LOCAL DESIGN GUIDANCE

The following are examples of complete street design resources from municipalities all over the United States. From Connecticut to San Francisco, many of these communities have developed comprehensive design guidelines which articulate best practices for designing safer streets.

DOVER, NH:

The City of Dover has not only adopted a Complete Streets policy, they have developed Complete Streets and traffic calming guidelines, which can be found [online](#).

KEENE, NH:

The City of Keene Planning and Public Works Departments worked with the Southwest Region Planning Commission to develop complete street design guidance in 2015, which can be found [online](#).

MASSACHUSETTS:

The Commonwealth of Massachusetts developed a guide for project planners and designers as a resource for considering, evaluating and designing separated bike lanes as part of a complete streets approach for providing safe and comfortable accommodations for all roadway users, which can be found [online](#).

VERMONT:

The State of Vermont developed a comprehensive complete streets guide for communities, which can be found [online](#).

NEW HAVEN:

By articulating the many roles of city streets and linking their impact to larger policy goals, we are providing a focus for the considerable public investment in these streets. Rather than a static delivery of a narrow service that is divorced from the aspirations of our city, we acknowledge that street building will play a central role in the long-term health and vitality of our community. This manual strives to provide the framework for this transformation by enlisting our public infrastructure investments in the effort to address a host of critical issues that face our city.

From: [City of New Haven](#)

3. DESIGNING WALKABLE URBAN THOROUGHFARES: A CONTEXT SENSITIVE APPROACH (ITE)

The ITE Recommended Practice advances the successful use of context sensitive solutions (CSS) in the planning and design of major urban thoroughfares for walkable communities. It provides guidance and demonstrates for practitioners how CSS concepts and principles may be applied in roadway improvement projects that are consistent with their physical settings. The report's chapters are focused on applying the principles of CSS in transportation planning and in the design of roadway improvement projects in places where community objectives support walkable communities-compact development, mixed land uses and support for pedestrians and bicyclists, whether it already exists or is a goal for the future.

From: <http://www.ite.org/css/>

4. DESIGN TOOLS

Obtaining design software can be expensive. While a community should intend to have a professional engineer design a roadway, planners, local decision makers, and members of the public should have opportunities to envision what their roadways could look like if they were 'complete'. [Streetmix](#) is a tool that allows you to design, remix, and share your neighborhood street – all in your browser! Add trees or bike paths widen sidewalks or traffic lanes, and learn how your decisions can impact your community.



BIBLIOGRAPHY

- ¹ [National Association of City Transportation Officials. Bike Lanes - National Association of City Transportation Officials. Retrieved from http://nacto.org/publication/urban-bikeway-design-guide/bike-lanes/](http://nacto.org/publication/urban-bikeway-design-guide/bike-lanes/)
- ² [Safety | Federal Highway Administration. FHWA COURSE ON BICYCLE AND PEDESTRIAN TRANSPORTATION: Bicycle Lanes. Retrieved from http://safety.fhwa.dot.gov/ped_bike/univcourse/pdf/swless19.pdf](http://safety.fhwa.dot.gov/ped_bike/univcourse/pdf/swless19.pdf)
- ³ [Home - National Association of City Transportation Officials. Bicycle Boulevards - National Association of City Transportation Officials. Retrieved from http://nacto.org/publication/urban-bikeway-design-guide/bicycle-boulevards/](http://nacto.org/publication/urban-bikeway-design-guide/bicycle-boulevards/)
- ⁴ [Home | Federal Highway Administration. Paved Shoulders. Retrieved from http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/multimodal_networks/8_paved_shoulders.pdf](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/multimodal_networks/8_paved_shoulders.pdf)
- ⁵ [Federal Highway Administration. Part II of II: Best Practices Design Guide - Sidewalk2 - Publications - Bicycle and Pedestrian Program - Environment - FHWA. Retrieved from http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/sidewalks214.cfm](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/sidewalks214.cfm)
- ⁶ [FHWA: Designing Sidewalks and Trails for Access. Chapter 4 - Sidewalk Design Guidelines and Existing Practices](#)
- ⁷ [Federal Highway Administration. Part II of II: Best Practices Design Guide - Sidewalk2 - Publications - Bicycle and Pedestrian Program - Environment - FHWA. Retrieved from http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/sidewalks214.cfm](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/sidewalks214.cfm)
- ⁸ [Manual on Uniform Traffic Control Devices \(MUTCD\) - FHWA. Chapter 4F - MUTCD 2009 Edition - FHWA. Retrieved from http://mutcd.fhwa.dot.gov/htm/2009/part4/part4f.htm](http://mutcd.fhwa.dot.gov/htm/2009/part4/part4f.htm)
- ⁹ [National Association of City Transportation Officials. Pedestrian Safety Islands - National Association of City Transportation Officials. Retrieved from http://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/pedestrian-safety-islands/](http://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/pedestrian-safety-islands/)
- ¹⁰ [Safety | Federal Highway Administration. Curb Extensions. Retrieved from http://safety.fhwa.dot.gov/saferjourney1/Library/countermeasures/23.htm](http://safety.fhwa.dot.gov/saferjourney1/Library/countermeasures/23.htm)
- ¹¹ [Federal Highway Administration. Part II of II: Best Practices Design Guide - Sidewalk2 - Publications - Bicycle and Pedestrian Program - Environment - FHWA. Retrieved from http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/sidewalks207.cfm](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/sidewalks207.cfm)
- ¹² [Lane Width - National Association of City Transportation Officials. Retrieved from http://nacto.org/publication/urban-street-design-guide/street-design-elements/lane-width/](http://nacto.org/publication/urban-street-design-guide/street-design-elements/lane-width/)
- ¹³ [2011. American Association of State Highway and Transportation Officials: A Policy on Geometric Design of Highways and Streets, 6th Edition. Retrieved from https://bookstore.transportation.org/collection_detail.aspx?ID=110](https://bookstore.transportation.org/collection_detail.aspx?ID=110)
- ¹⁴ [Mitigation Strategies For Design Exceptions - Safety | Federal Highway Administration. Retrieved from http://safety.fhwa.dot.gov/geometric/pubs/mitigationstrategies/chapter3/3_lanewidth.cfm](http://safety.fhwa.dot.gov/geometric/pubs/mitigationstrategies/chapter3/3_lanewidth.cfm)
- ¹⁵ [National Association of City Transportation Officials. Design Vehicles and Turning Radii. Retrieved from http://nacto.org/docs/usdg/design_vehicles_turning_radii_washburn.pdf](http://nacto.org/docs/usdg/design_vehicles_turning_radii_washburn.pdf)
- ¹⁶ [National Association of City Transportation Officials: Urban Street Design Guide. Corner Radii. Retrieved from http://nacto.org/publication/urban-street-design-guide/intersection-design-elements/corner-radii/](http://nacto.org/publication/urban-street-design-guide/intersection-design-elements/corner-radii/)

¹⁷ APTA (American Public Transit Association). (1994). Glossary of Transit Terminology. Washington, D.C. www.apta.com/resources/reportsandpublications/Documents/Transit_Glossary_1994.pdf

¹⁸ [National Association of City Transportation Officials: Urban Street Design Guide. Stop Placement & Intersection Configuration.](http://nacto.org/publication/transit-street-design-guide/stations-stops/stop-design-factors/stop-placement-intersection-configuration/) Retrieved from <http://nacto.org/publication/transit-street-design-guide/stations-stops/stop-design-factors/stop-placement-intersection-configuration/>

¹⁹ [Low Impact Development \(LID\) Urban Design Tools. Tree Box Filters.](http://www.lid-stormwater.net/treeboxfilter_home.htm) Retrieved from http://www.lid-stormwater.net/treeboxfilter_home.htm

²⁰ [Institute of Transportation Engineers -- ITE. Traffic Calming Measures - Speed Hump.](http://www.ite.org/traffic/hump.asp) Retrieved from <http://www.ite.org/traffic/hump.asp>

²¹ [Safety | Federal Highway Administration. Raised Intersection & Pedestrian Crossing.](http://safety.fhwa.dot.gov/saferjourney1/Library/countermeasures/29-30.htm) Retrieved from <http://safety.fhwa.dot.gov/saferjourney1/Library/countermeasures/29-30.htm>

²² [Safety | Federal Highway Administration. Intersection Safety: Roundabouts and Mini Roundabouts.](http://safety.fhwa.dot.gov/intersection/innovative/roundabouts/) Retrieved from <http://safety.fhwa.dot.gov/intersection/innovative/roundabouts/>

²³ [Safety | Federal Highway Administration. Road Diet Informational Guide.](http://safety.fhwa.dot.gov/road_diets/info_guide/rdig.pdf) Retrieved from http://safety.fhwa.dot.gov/road_diets/info_guide/rdig.pdf

²⁴ [Smart Growth America. Implementing Complete Streets: Networks of Complete Streets.](http://www.smartgrowthamerica.org/app/legacy/documents/cs/factsheets/cs-networks.pdf) Retrieved from <http://www.smartgrowthamerica.org/app/legacy/documents/cs/factsheets/cs-networks.pdf>

²⁵ [AARP: Complete Streets in the Southeast.](http://www.aarp.org/content/dam/aarp/livable-communities/documents-2014/Complete-Streets-Southeast-Tool-Kit-aarp.pdf) Retrieved from <http://www.aarp.org/content/dam/aarp/livable-communities/documents-2014/Complete-Streets-Southeast-Tool-Kit-aarp.pdf>

2016

SNHPC Complete Streets Toolkit

Section V: Pilot Projects

In mid-2016, SNHPC staff reached out to every Planning Board within the region, providing them with a brief presentation on Complete Streets and the benefits of a pilot program aimed at implementing elements of Complete Streets into their communities. The pilot program was intended to provide three communities in the SNHPC region with an opportunity to develop a Complete Streets policy, design standards with elements of Complete Streets, education and outreach, or pursue a pop-up planning demonstration in their community.

Although each community and its projects had distinguishing features, there were many commonalities among the projects requested. There was a basic need for recognition that there are multiple users on most road systems. These project areas exhibited a lack of fog lines, center lines, and cross walks. Each situation called for a need for traffic calming and improved safety.

While there were vastly different reactions to the pilots among the three towns, the program was enlightening for all involved. It is our intention to implement more pilot projects for other SNHPC towns in the near future.



In this section:

- *Before we begin*
- *Who will it be?*
- *Francestown*
 - *Location*
 - *Outreach*
 - *Demonstration*
 - *Results*
- *Windham*
 - *Location*
 - *Outreach*
 - *Demonstration*
 - *Results*
- *Deerfield*
 - *Location*
 - *Outreach*
 - *Demonstration*
 - *Results*
- *Limitations*
- *Reflections*



SECTION 5: PILOT PROJECTS

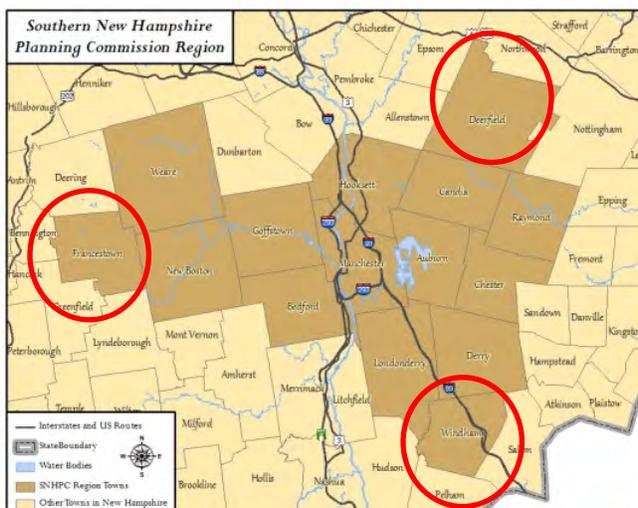
Originally, the project was designed to assist three communities, one urban, one suburban, and one rural community with developing and implementing a Complete Streets policy. However, the stakeholders group wanted a more robust pilot program. At their first meeting the Stakeholders requested more flexibility in the selection of project types. As a result, the Commission developed a Community Application Form that included a description of possible projects types: a Complete Streets policy, assistance with revising roadway standards or site and subdivision regulations to reflect Complete Streets principles, or a pop-up planning or demonstration project such as designing and implementing temporarily bike lanes.

A. BEFORE WE BEGIN

Over the course of two months, staff reached out to all participating communities in the SNHPC region, scheduling a short presentation on Complete Streets, project details, and the pilot program. Presentations were made to each community's Planning Board and attending staff (note, each community was different ranging from no staff to several staff from Planning and Public Works Departments). During the presentation, examples were shown of projects within New Hampshire and outside the state in a variety of settings. Discussion often ensued about potential projects with many questions including:

- what was feasible for a pilot program,
- would there be any cost to the community,
- what could be done for their community,
- how would NHDOT be involved if the roads were state maintained
- what was the cost of painting fog lines along roadways
- could there be rural and suburban applications for Complete Streets including Complete Streets policies

B. WHO WILL IT BE?



Three communities submitted applications: the rural communities of Franconia and Deerfield, and the suburban community of Windham.

Although the communities and their projects all had distinguishing features, there were many commonalities among the projects requested. First and foremost it was noted that there was a basic need for the communities to recognize that there are multiple users for most road systems.

For all projects there was a lack of fog lines, center lines, and crosswalks. Each situation called for a need for traffic calming and improved safety. Another common feature was the need for wayfinding signage.

C. FRANCESTOWN

1. BACKGROUND

In mid-2016, SNHPC staff reached out to every Planning Board within the 15-community region, providing them with a brief presentation on Complete Streets and the benefits of a pilot program aimed at implementing elements of Complete Streets into their communities. The pilot program was intended to provide three communities in the SNHPC region with an opportunity to develop a Complete Streets policy, develop design standards with elements of Complete Streets, education and outreach, or pursue a pop-up planning demonstration in their community.

Francestown submitted an application requesting a pop-up planning demonstration in their town center in an effort to give residents an opportunity to see and evaluate public realm improvements during the planning process and showcases temporary installations of possible improvements for Francestown's central roadway intersection. The following highlights the results of the planning demonstration.

2. PLANNING DEMONSTRATION LOCATION

Francestown applied to have a planning demonstration in a 5-legged intersection, including the following roads:

- Heading north from the intersection towards Bennington, is route 47.
- Heading south from the intersection is the town road, the 2nd New Hampshire Turnpike South.
- Crossing through town, east to west, is route 136 coming in on the west from Greenfield and the east from New Boston.
- The fifth road is a town road, Poor Farm Road, that heads Northeast between 136E and 47N.



3. COMMUNITY OUTREACH

On August 17th, the Southern NH Planning Commission (SNHPC) organized a "brain storming"

session in Francestown to look at options to make our five-way intersection safer for pedestrians, bikers and traffic. There was a wide range of people in attendance: Police Chief Douglas, Road Agent Gary Paige, Selectman Henry Kunhardt, DOT representatives, Fire Chief Kullgren, as well as members of the Heritage Commission, Planning Board, Old Meeting House, FHIS, landscape artists and interested town residents.



Community Meeting August 17, 2016

A second meeting with town officials and NH DOT was organized on August 31st to follow up on the discussion from the first meeting and to create a list of temporary improvements to be installed for the planning demonstration.



Northbound on NH 136

As a result of the meeting, the group decided that the following temporary improvements would be implemented in Francestown center’s intersection:



Demonstration Project Temporary Improvements:

- A. Fix stop bar – perpendicular to the road, stencil "STOP", cover extended yellow line
- B. Create crosswalk
- C. Add fog lines, keeping lane width at 10 ½ feet as exists in Village Center
- D. Reduce radius around right hand turn on route 136 and SW corner 2nd NH Turnpike (consider utilizing cones)
- E. Better define travel lanes vs. non-travel area (consider utilizing traffic cones)

4. MEASURING RESULTS PRIOR TO DEMONSTRATION

As a part of the demonstration, SNHPC, NH DOT, and community members decided to measure driver behavior before and during the demonstration. Community volunteers recorded vehicles at the stop sign at the intersection of NH 43 and NH 136, as local residents were concerned that

drivers were reluctant to stop at the stop bar. The following table reflects the vehicle behavior at the mentioned stop sign.

Vehicle Movements at Stop Sign at Intersection NH43/NH136: September 21, 2016

Time	7-8 AM	8-9 AM	3-4 PM	4-5 PM	5-6 PM	
Vehicle Movement						Total
Full Stop	46	35	35	32	32	180
Rolling Stop	31	24	20	15	7	97
Slight Pause	10	0	6	3	0	19
Double Stop	1	0	1	1	2	5

While the majority of vehicles came to a full stop, a total of 97 vehicles rolled through the stop sign.

Additionally, community volunteers measured vehicle reaction to pedestrians attempting to cross NH 136. The following table reflects the vehicle behavior during attempted pedestrian crossings.

Vehicle Behavior at Crosswalk on NH 136: September 21, 2016

Time	7-8 AM	8-9 AM	3-4 PM	4-5 PM	5-6 PM	Total
Vehicle yielded to pedestrians	13	14	27	29	35	118
Vehicle did not yield to pedestrians	31	14	42	43	90	220

The data collected by community volunteers shows that more vehicles did not yield to pedestrians. This was an expected result as no crosswalk exists in the intersection.



View of NH 136 Looking East

5. PLANNING DEMONSTRATION

On September 28th, SNHPC staff assisted town officials and community volunteers in the implementation of the temporary roadway markings using temporary chalk-paint and a hand-held marking wand. The following day, community volunteers used traffic cones, reflective white duct tape and a pedestrian crossing sign to mark a crosswalk on NH 136. Similarly, black roadway paint was applied on top of the yellow centerlines on the NH 47 SB approach so that the center line would stop at the stop bar. Prior to the temporary markings, the centerlines extended past the stop bar.



Jamie Pike, Francestown Town Administrator Applying Shoulder Markings



Temporary Pedestrian Crossing on NH 136

6. PLANNING DEMONSTRATION RESULTS

Community volunteers measured the same vehicle behavior during the planning demonstration to see if the temporary road markings influenced driving behavior.

Vehicle Movements at Stop Sign at Intersection NH43/NH136: September 29, 2016

Time	7-8 AM	8-9 AM	3-4 PM	4-5 PM	5-6 PM	Total
Vehicle Movement						
Full Stop	45	24	45	30	32	176
Rolling Stop	39	28	11	15	18	111
Slight Pause	4	1	2	3	12	22
Double Stop	0	0	0	2	2	4

As illustrated in the table above, vehicle behavior did not change as a result of covering the extended centerlines of the Southbound NH 47 approach’s stop bar. Community members felt that future improvements could include a stenciled “STOP” marking on the road as well as a larger stop sign.

Vehicle Behavior at Crosswalk on NH 136: September 29, 2016

Time	7-8 AM	8-9 AM	3-4 PM	4-5 PM	5-6 PM	Total
Vehicle yielded to pedestrians	31	15	60	58	53	217
Vehicle did not yield to pedestrians	4	1	23	29	15	72

As illustrated in the table above, the temporary pedestrian crossing markings and signage was effective in increasing the number of vehicles that yielded to pedestrians as well as decrease the number of vehicles that did not yield to pedestrians. While these results do show that roadway markings can have an impact on pedestrian safety, there are limitations to the demonstration and the intersection as a whole. For instance, there is a sight distance problem on NH 136 heading west towards the intersection. Without more signage warning vehicles of an approaching pedestrian marking, vehicles would need to come to a more abrupt stop when a pedestrian is using the cross-walk.

The results show that roadway markings can have an impact on vehicle behavior. SNHPC recommends that further discussion should be held between town officials, SNHPC and NH DOT to develop strategic roadway solutions for Francestown’s town center.

D. WINDHAM

1. BACKGROUND

Windham submitted an application requesting a pop-up planning demonstration on Squire Armour Road in an effort to give residents an opportunity to see and evaluate public realm improvements during the planning process. Specifically, it was hypothesized that a four-foot bike/ped shoulder carved out of the 28' existing road width would calm traffic and allow local residents a safer space to exercise and gain better access to nearby Griffin Park (pictured, top right).



2. PLANNING DEMONSTRATION LOCATION

Windham applied to have a planning demonstration on the westernmost 1,000' of Squire Armour Road, a subdivision road off of NH 111A/Range Road.

3. COMMUNITY OUTREACH

On August 31, the SNHPC organized a "brainstorming" session/site visit to summarize the Complete Streets movement and its potential application on Squire Armour Road. There was a wide range of stakeholders in attendance: Town Administrator, Police and Fire Department reps, Community Development Director, NH DOT, as well as members of the Planning Board, Board of Selectmen, and interested town residents.

3. TIMELINE

- 8/31: Initial meeting and site visit with town officials/interested parties
- 9/26: Presentation to Board of Selectmen re: Complete Streets background and pilot project
- 10/11: Pilot project begins with staff applying temporary chalk lines
- 11/4: Survey ends, results tabulated

4. PLANNING DEMONSTRATION

On October 7 and 11, SNHPC staff, assisted by Windham Highway Department, painted dual 4' bike-ped lanes on the first 1000' of Squire Armour Road with temporary chalk-paint and a hand-held marking wand.



Initial Site Visit – August 31, 2016

As a result of the meeting, the group decided that the following temporary improvements would be implemented:

Proposed Temporary Demonstration Project (Squire Armour Road) – October 2016



Approx. length of demonstration = 1000 ft.

Demonstration Project Temporary Improvements:

- A. Add fog lines 4 ft. from edge of pavement (in keeping with AASHTO recommendations, leaving a total vehicle lane width of 20 feet)
- B. Consider bicycle/pedestrian stencil on shoulder to show designation of bike/ped lane





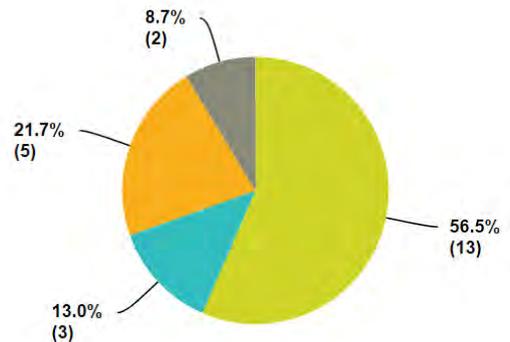
Measuring for Shoulder Markings – October 7, 2016



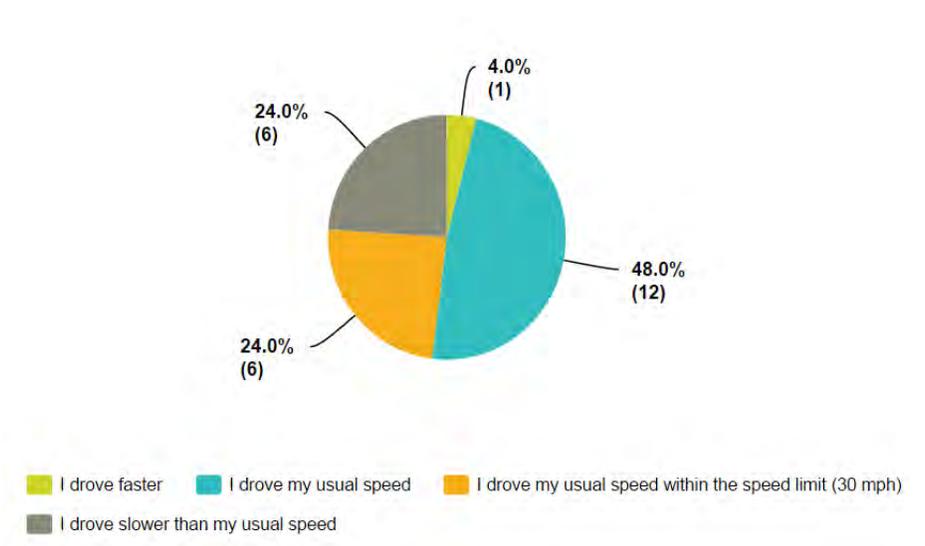
A Pedestrian in the Lane – October 11, 2016

5. SURVEY RESULTS

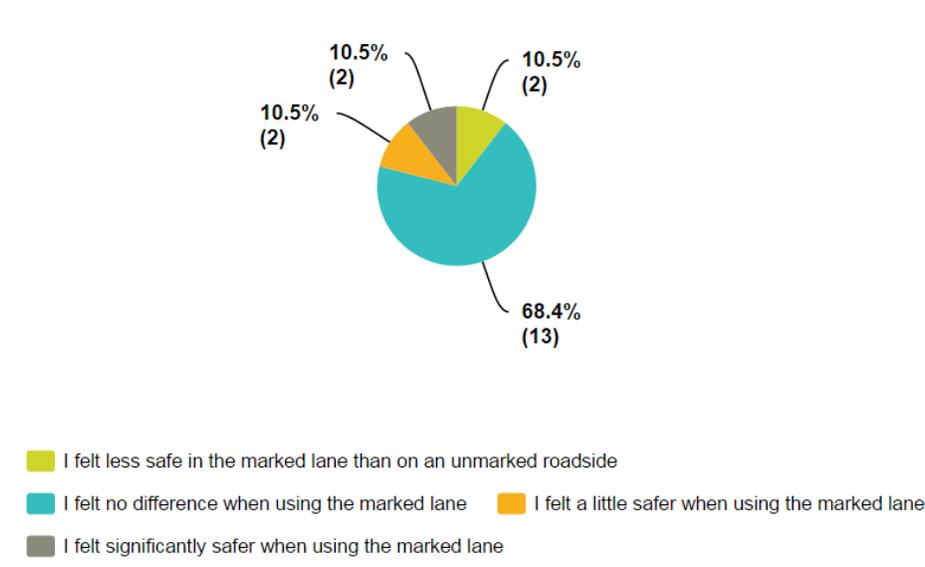
Community residents took part in an online survey via Survey Monkey; after nearly a month's window to participate, there were 25 responses. A few samples of the survey results are below:



- **57% (13 of 23) motorists found the lanes too narrow; 22% (5) found them adequate**
- **72% (18 of 25) motorists drove their usual speed through the project area; 6 drove slower than usual; 1 drove faster than usual**



- **68% (13 of 19) felt no difference in safety while using the marked lane; 4 felt safer or significantly safer; 2 felt less safe**



There were generally very negative attitudes toward the painted lines, with those surveyed claiming they were unnecessary and a poor use of resources. Anecdotally, they did not change driver behavior either.

E. DEERFIELD

1. BACKGROUND

Deerfield submitted an application requesting a pop-up planning demonstration on Church Street in an effort to give residents an opportunity to see and evaluate public realm improvements during the planning process. Specifically, the town applied to lay temporary striping on Church Street in order to narrow the traffic way and provide space for bicycling and walking on the road in Deerfield Center.



2. PLANNING DEMONSTRATION LOCATION

Deerfield applied to have a planning demonstration on the first 1,000' of Church Street, a 26' to 30' wide, town-owned road, intersecting with NH 107/NH 43 and Candia Road. The 2015 annual average daily traffic (AADT) volume on Church Street is 590 vehicles, a relatively low traffic volume compared to the AADT of 5700 vehicles on NH 107/NH 43.

3. COMMUNITY OUTREACH

On August 25, the SNHPC organized a "brainstorming" session/site visit to summarize the Complete Streets movement and its potential application on Church Street. There was a wide range of stakeholders in attendance: Town Administrator, Police and Fire Department reps, Town Planner, NH DOT, as well as members of the Planning Board, Board of Selectmen, Welfare reps, and interested town residents. Additionally, SNHPC distributed a press release to The Forum, a local newspaper which covers the towns of Deerfield, Candia, Northwood, and Nottingham in order to gather feedback through an online survey.

4. 2016 TIMELINE

- 8/25: Initial meeting and site visit with town officials/interested parties
- 9/26: Presentation to Board of Selectmen re: Complete Streets background and pilot project
- 10/26: Pilot project begins with staff applying temporary chalk lines on Church Street

- SNHPC staff developed a survey for town residents, and requested for residents to take the survey through The Forum, a local newspaper. The Survey was administered through an online survey platform.
- 11/10: Survey ends, results tabulated



Initial Site Visit – August 28, 2016

As a result of the meeting, the group decided that the following temporary improvements would be implemented:

Deerfield Demonstration Project
 BOS Meeting: Sept. 26, 2016
 Layout: _____
 Temporary Installment: Oct __, 2016

Demonstration Project Temporary Improvements and Policy Considerations:

- A. Create extra wide crosswalk(10") between Town Hall and Pre-school
- B. Add fog lines beginning with 3 ft from edge of pavement on the North side, keeping 20 ft total travel lane width and adding a fog line on south side
- C. Remove "no parking" signs
- D. Paint "Fire Dept Use Only" in designated areas
- E. Paint circulation arrows for shared FD and Library parking
- F. Discuss alternative or additional "hook drop off" with library
- G. Consider enforcing Fire Dept no-parking zone

5. PLANNING DEMONSTRATION

On October 26, SNHPC staff, assisted by Deerfield Highway Department, painted dual 4' bike-ped lanes on the first 1000' of Church Street with temporary chalk-paint and a hand-held

marking wand. Additionally, with insight and help from the Philbrick-James Library, staff painted four parking spaces for library visitors. SNHPC staff and the Highway Department also painted a cross-walk at the end of the demonstration area, where students from the local preschool cross the street to the playground behind the Deerfield Town Hall.

Marking Shoulders – October 26, 2016

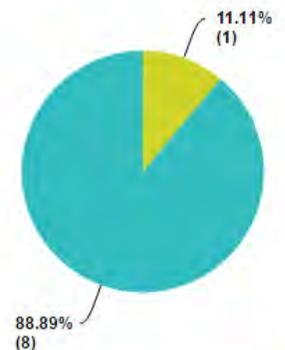


Pedestrian Crossing – October 26, 2016



6. SURVEY RESULTS

Community residents took part in an online survey via Survey Monkey; after nearly a month's window to participate, there were 13



responses. The majority of survey respondents felt that the newly narrowed lanes were adequate and that the narrowing slowed down traffic. Sixty-six percent of respondents stated that they would support the installment of wider shoulders and/or bike-ped lanes on Deerfield's streets to be added during future roadway improvements.

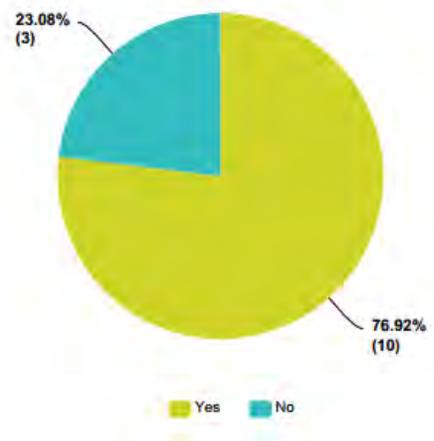
Survey Highlights

88.89% (8 of 9) motorists found the lanes to be adequate; 11.11% (1) found them noticeably narrower but easily passable.

50% (6 of 12) motorists drove slower than their usual speed within the demonstration area; 33.33% (4) drove their usual speed within the speed limit (30mph); and 16.67% drove their usual speed.

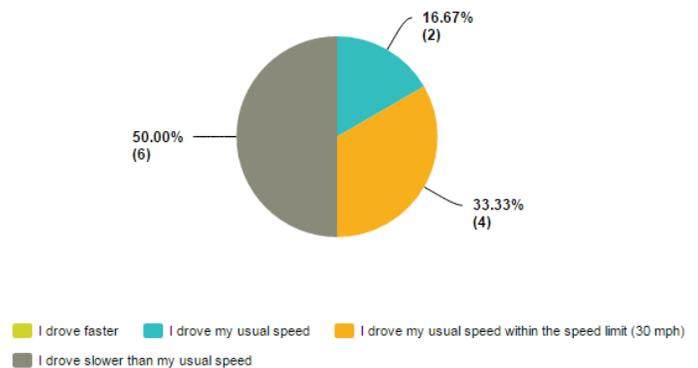
83.33% (5 of 6) of pedestrians felt a little safer using the marked shoulder when a vehicle passed; and 16.67% (1) felt no difference.

76.92% (10 of 13) felt that the temporary crosswalk was in a good location; and 23.08% (3) felt that it was not in a good location.



Note: One respondent who chose "No" stated that while they liked the location of the temporary crosswalk, they would like to have another crosswalk on Church Street.

Another respondent who chose "No" wished the crosswalk existed when their children used to cross the road at that location in the past.



D. DEMONSTRATION PROJECT LIMITATIONS/REFLECTIONS

While the primary focus of this temporary planning demonstration was to educate the town, town residents on the benefits of Complete Streets, there were limitations to this demonstration. Due to the limited time-window of the temporary demonstration, the volume of feedback was ultimately lower than if the demonstration had been implemented for a longer period of time. Similarly, poor weather conditions shortened the demonstration due to rain washing away the temporary chalk-paint. Additionally, the demonstration materials were not MUTCD compliant which may have impacted the feedback from Deerfield residents. For example, shoulder widths should be 4" wide, when the lines applied for the demonstration were only 2" wide. The chalk-paint was also non-reflective, making the paint almost invisible for vehicles traveling into the sun's location. Lastly, because the demonstration took place in late fall instead of summer, it is likely that more bicycle and pedestrian users of Church Street did not use the extended shoulders at all and thus missed an opportunity to provide feedback on the demonstration.

At a minimum, the demonstration projects were educational. They inspired the communities to talk about the concept of Complete Streets, to share concerns about their community's traffic concerns and road safety, and brought the community together to test out ideas.

Materials:

Demo projects were carried off with a minimal use of materials: specifically, industrial choice temporary chalk paint and a rolling applicator wand that allowed participants to apply paint in a fairly straight, uniform manner. The cost of 12 cans of paint was approximately \$42. Manchester DPW loaned SNHPC an applicator wand, which ordinarily would have cost approximately \$23.



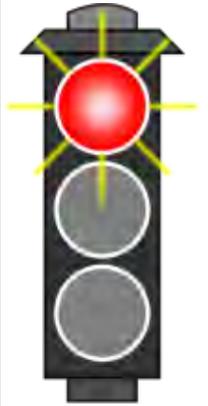
Overall limitations of demo projects:

Materials – 2 inch width line vs. 4 inch standard, spray chalk to ensure non-permanence but susceptible to weather conditions, spray chalk is non-reflective whereas standard road paint is reflective

No signage – We were unable to obtain "STOP" or bicycle stencils that would have enhanced the demonstrations

Weather – Unfortunately, rain came directly after application of both Deerfield's and Windham's demonstrations

Seasonal Uses – As all the pilot programs were installed in the fall, fewer bicyclists and walkers were able to "test" the demonstration sites than might have if applied in the summer.



Appendix 1.

Steering Committee Invite, Meeting Agendas, and Meeting Minutes

Initial Invite for Stakeholders Group

SNHPC has been given a fantastic opportunity through two grants provided by NHDOT and the Endowment for Health to develop a Complete Streets Toolkit for municipal officials and planning boards. The project's primary goal is to develop and publish a resource guide for how to implement complete streets principles and policies for communities within the SNHPC Region. This toolkit will include planning/policy guidance and design/engineering/land use needs and guidance.

Note: Three scopes of work are attached; first is the contract SNHPC has with NHDOT, the second and third are through the Endowment for Health for graphic/landscape architecture assistance and to create a website for the toolkit.

This project will be relatively short-term. At present, SNHPC is soliciting members for a steering committee that will help direct the work and provide input and guidance over the course of the next 8 months. Regarding time commitment: It is anticipated that between five and seven meetings will be held between Nov. 2015 and July 2016.

We are contacting you for a few reasons. First, many of you are movers and shakers in the field of Complete Streets and would be an amazing resource for this effort. Some of you are just starting projects and/or programs, while others may want to better understand complete streets principals and how they may apply to their community or region; there is plenty of room at the table for all.

Please review the attachment and let me know if you are interested in serving on the stakeholder committee and provide best days of the week and times that you are available. I will work to create a very feasible time table, make meetings effective and productive, and of course provide awesome snacks (the best caramel sea-salt brownies ever). It is my hope to have a kick-off meeting before Thanksgiving.

This is sure to be a lively and productive group as we entertain multiple topics pertaining to Complete Streets. I very much look forward to your participation.

Please forward this invite onto others in your municipality who may be interested.

Stakeholders List

Windham: Laura Scott
Derry: Elizabeth Robidoux
Manchester: Bruce Thomas
MTA: Mike Whitten
NHDES: Becky Ohler
Bike/Walk Alliance: Tim Blagden

Advisory:
NHDOT: Larry Keniston (271-1668)
Manchester Moves, Transport NH etc. Rebecca Harris

Engineers/Landscape Architects:
VHB: Gordon Leedy
CEI: Rebecca Blake, Matthew Lundsted
Altus Eng.g: Eric Weinrib and Jeff Clifford
Underwood Eng: Keith Pratt
Robbi Woodburn
Jeff Hyland
Tighe and Bond
JoAnn
Jones and Beach: Jon Ring

Community Invites: Kristen Clarke, Todd Connors, Bill Klubben
Commission Members: Fred McGarry, Bob MacKenzie
Communities: (planners from all 15 communities)
Other Planning Commissions: Mari Brunner (SWRPC), Matt Waitkins (NRPC), Craig Tufts (CRPC)
NHDRED: Carmen
AARP: Todd Fahey (left message)
City of Nashua: Sarah Marchant
City of Portsmouth: Juliet Walker
City of Concord: Ed Roberge
City of Keene: Rhett Lamb and Will Schoefmann

SNHPC Complete Streets Toolkit Stakeholders Committee Meeting

Dec. 17th, 2015 Meeting#1 Agenda

1. Introductions of Participants and Interest in Complete Streets (All Participants)
2. Overview of Complete Streets Toolkit Project (Sylvia)
 - Funders: NHDOT, Endowment for Health
 - Work Tasks:
 - Task 1. Steering Committee Development and Organization
 - Task 2. Project Planning and Complete Streets Research
 - Task 3. Toolkit Development – Planning/Policy Guidance Section
 - Task 4. Toolkit Development – Design/Engineering Guidance Section
 - Task 5. Complete Street Pilots
 - Task 6. Final Publication and Outreach
3. Suggested Areas of Focus (Group Discussion)
4. Identification of Tasks - Volunteers
5. Complete Streets Examples (Group Discussion)
6. What's Happening in New Hampshire on Complete Streets (Group Discussion) (green complete streets and Woonerf or Living Streets)
7. What's Happening Beyond NH on Complete Streets (Group Discussion)
8. Next Meeting

Syl's Questions and Homework

1. Location of example complete street designs you've encountered, incl. photos (you can email me these if it's easier).
2. Names of professional firms you know have been involved in complete streets work.
3. Specific areas within the realm of Complete Streets that you would like the team to tackle.

Complete Streets Stakeholder Meeting #1

Southern NH Planning Commission

17 December 2015, 10:00 am

In attendance:

Becky Hebert, Bedford
Elizabeth Robidoux, Derry
Kristen Clarke, Manchester
Bill Klubben, Manchester
Bruce Thomas, Manchester
Laura Scott, Windham
Tim Blagden, Bike-Walk Alliance
Mike Whitten, MTA

Matt Waitkins, Nashua RPC
Larry Keniston, NH DOT
Carmen Lorentz, NH DRED
Rebecca Harris, Transport NH
Adam Hlasny, SNHPC
Cameron Prolman, SNHPC
Sylvia von Aulock, SNHPC
Randy Knowles, Knowles Design

The meeting was called to order at 10:05 am.

After a round of introductions, Sylvia led an open discussion about the Complete Streets (CS) project, and what elements of CS should be focused on to ensure a robust toolkit/product. She noted that there is a tight timeframe of six months for the entire project; there is, however, the possibility of an extension.

The discussion came to focus on the importance of communicating directly with municipal Boards of Selectmen, Planning Boards, and DPWs, especially as concerns the cost-benefit or “return on investment” of CS. Laura said that many towns will be concerned about long-term maintenance, despite an initial interest in pursuing CS policies. Rebecca noted that some towns can ease into CS by an act as simple as restriping lines, and need not dive in completely at first.

Laura suggested writing letters to municipal boards throughout the region to solicit three communities for the pilot project. Tim added that a one-day “popup” event demonstrating how a complete street works could also be a possibility. Carmen proposed including a list of basic steps toward conducting a fiscal impact analysis in the toolkit; this would allow communities to decide for themselves whether or not adopting CS makes sense.

Finally, Sylvia asked those present to share any CS-related links or information to the whole group via email. Tim offered to help with any specific struggles the group might have in the information-gathering stage.

The next meeting will be held on Tue, February 2, 2016 (Groundhog Day) 10am at SNHPC.

The meeting adjourned at 11:27 am.

Takeaways and Important Areas Recommended by Stakeholder Team:

1. Investment – How will communities benefit from investing in CS?
 - a. Why should communities get involved in CS or support CS projects
 - b. What happens to tax base? To revenue? Property values?

- c. Can the Return on Investment be measured
 - d. Group needs input from NH Commercial Investment Board of Realtors to better understand what businesses are looking for when relocating
2. Barriers to implementing CS?
- a. Maintenance, especially winter and snow removal
 - i. Understand how businesses are responsible for their sidewalks as a part of development – connect islands of sidewalk improvements
 - ii. How is extra maintenance paid for?
 - b. How can Fire Dept.'s support Complete Street, involve fire & police into discussion
 - c. Limited ROW area, ie Manchester and 2nd Street restriping
3. Outreach and Engagement:
- a. Limited number of meetings between now and June, begin outreach efforts early
 - b. Mayor's Challenge for Safer People, Safer Streets
 - c. WalkScore
 - d. AARP Livability Index
 - e. Marketing the importance of CS
 - f. Take advantage of National Counting Day (Adam involved)
4. Pilot Program Possibilities
- a. Invite communities to submit their own ideas for CS – harnesses the public's want for sidewalks and safe pedestrian transportation
 - b. Pop-Up Planning demonstrations
5. Gaps
- a. Levels of Traffic Stress (LoTS)
 - b. Bridging gaps between existing trail infrastructure
6. Toolkit Directions
- a. Develop "Steps you can take" for possible Bike/Ped Committees as a resource for implementing Complete Streets
 - b. Must be realistic/feasible, good to show various levels of improvements, starting out small and working into more significant improvements
 - c. Low Cost Alternatives

SNHPC Complete Streets Toolkit Stakeholders Committee Meeting

Feb. 2nd, 2016 Meeting #2 Agenda

1. Greetings, Acknowledgement of Guests, and Agenda Review (All Participants)
2. Complete Streets Policy Focus and Guest Speakers
 - Policy Examples and Lessons Learned, (Mari Brunner – SWRPC, Jeff Warner – Concord, Juliet Walker – Portsmouth)
 - Outside of NH (Adam)
 - Policy Workbook (Cam)
 - Discussion and Recommended Steps
3. Community Outreach (Sylvia)
 - Review of NHCIBOR meeting and questionnaire results
 - Sample letters to communities
 - CS draft application for Pilot Program
 - Team recommendations
4. Identification of Next Tasks - Volunteers
5. Next Meeting – Possible topic: Design Standards

Committee Homework

- Getting the letters to the right people - suggestions

Complete Streets Stakeholder Meeting #2

Southern NH Planning Commission

2 February 2016, 10:00 am

In attendance:

Mari Brunner, SWRPC

Juliet Walker, Portsmouth

Tim Blagden, Bike-Walk Alliance

Kristen Clarke, Manchester

Rebecca Harris, Transport NH

Becky Hebert, Bedford

Mike McLaughlin, Bedford DPW

Larry Keniston, NH DOT

Bill Klubben, Manchester

Laura Scott, Windham

Elizabeth Robidoux, Derry

Bruce Thomas, Manchester DPW

Matt Waitkins, Nashua RPC

Sylvia von Aulock, SNHPC

Cameron Prolman, SNHPC

Adam Hlasny, SNHPC

The meeting was called to order at 10:10 am.

After a round of introductions, Sylvia introduced the main topic of the meeting, Complete Streets Policies, introducing guest speakers from Southwest Regional Planning Commission, Portsmouth and Concord to share their expertise.

Mari Brunner from the SWRPC started the discussion recalling her experiences working with communities in developing Complete Streets (CS) policies. While discussing her 'lessons-learned' from working with the *Town of Swanzey and the City of Keene*, Mari highlighted the following:

- Importance of listening to communities and focusing on addressing local issues when creating complete street policies.
- Create connections between complete streets and other programs or projects such as the Master Plan, CIP, tourism, economic development...
- Complete streets can have a rural application utilizing a context sensitive approach
- Implement projects incrementally
- Find low cost or no-cost solutions such as repainting narrower roadway lanes
- Mari also noted that when a community has an adopted CS policy, infrastructure projects may become more attractive to funding sources.
- Communities need to share their vision for their road systems with NHDOT and work with the state to implement their vision

Sylvia then invited *Portsmouth's Transportation Planner, Juliet Walker*, to share her experiences and lessons learned. Juliet built on the discussion of context sensitivity by discussing the importance of having a flexible CS policy. Portsmouth Planning Director Rick Taintor crafted the policy from other policies nationwide. The process was made easier by the fact that there was

already support in the community, especially since a Master Plan rewrite was in the works. Juliet added the following words of wisdom:

- CS Policies should be flexible (i.e. include an opt-out option)
- Need to educate staff to get them on board and air-out concerns. Also need to educate engineers submitting land-use proposals.
- CS doesn't automatically mean sidewalks.
- Create measurable goals such as encouraging the community to work towards a bike friendly status¹, ensure the goals are reflected in the CIP and Master Plan updates.
- Supplementing NHDOT classification, create a local road classification system based on the experience of the user (ie, high speed to slow neighborhood) and link this with appropriate and reasonable design standards.
- Report progress back to community officials (Board of Selectmen, City Council, and Alderman) to keep the program alive.

Jeff Warner, City Engineer of Concord, added that policy is a great communication tool, and that it can be used to leverage support from DPW and NH DOT. He gave some history behind CS in Concord, starting back in 2000 when discussions began. Part of that history includes a Transportation Policy group that has overseen policy, process, and project development. Since then Concord has created twenty miles of bike lanes, and its 2015 update of the original 2010 plan to legitimize CS policies citywide. Concord's standard includes a 10 ft road lane width and a nine ft. middle-road left turn lane. He attributed calmer streets due to complete streets projects. Jeff suggested that not only does staff need to be educated on complete streets but design engineers submitting land development proposals. Concord's latest project will be a "pop-up planning project" in May, during bike-to-work week. He did suggest that East Coast Greenway Alliance may be able to support our pilot studies and to look into this.

Adam Hlasny reported on communities that have complete street policies outside of New Hampshire, discussing the multiple New England communities that have adopted comprehensive policies as well as a weighted system designed to score CS policy. When asked about policies they had familiarity with, attendees noted Washington DC, Charlotte, NC, and Roanoke, VA. Juliet Walker asked about the correlation between municipal and statewide policies, using Brunswick, ME as an example. Cameron Prolman then brought up the Local Policy Handbook, a policy-writing guidebook which may be a useful resource in helping the pilot communities develop CS policy.

Sylvia began a discussion on community outreach efforts, which included results from a questionnaire to NHCIBOR as well as the sample letter and draft application for the Pilot Program. Stakeholders gave feedback on the community letter, noting that the letter should clarify or illustrate an example of a good application. This sparked an open discussion of various

¹ The Bicycle Friendly Community (BFCSM) program (from the League of American Bicyclists) provides a roadmap to improve conditions for bicycling and the guidance to make your distinct vision for a better, bikeable community a reality.

outreach efforts, including pop-up planning – a showcase for temporary installations of possible improvements to infrastructure.

Finally, Sylvia suggested that the next meeting will focus on design guidelines. Stakeholders mentioned that design guidelines are sometimes too constricting, and that the guidelines need to be flexible. Sylvia acknowledged concerns and added that she will be inviting a few individuals from various engineering firms to share success stories within NH and beyond, which will be a part of the Toolkit. Committee members also suggested focusing on benefits of CS and how to best sell the concept of CS to municipalities.

The next meeting will be held on Tue, March 15, 10am at SNHPC.

The meeting adjourned at 11:41 am.

Takeaways:

- Important areas:
 - Context Sensitivity when developing policy
 - Listen to community needs
 - Align CS policies with adopted transportation / master plans
 - CS are not just for urban areas
 - CS policy should have built-in flexibility
 - Incremental phasing is sometimes the most cost-effective
 - Develop a local road classification study to help determine ranges in design standards with various road types. Then tie design standards back to *Site and Subdivision Regulations*.
 - Weave CS projects into existing road reconstruction projects
 - Look for low or no-cost projects by dove-tailing with existing projects
 - Work collaboratively with DOT and municipal departments to implement CS projects
 - Policy can be a communication tool
 - CS policy acts as a guiding document for projects
 - Communities should develop and then share their vision for their streets with NHDOT and work with them to implement projects to realize that vision
 - Outreach and education efforts for staff and engineers submitting land-use proposals for development.
 - Keep the policy alive by updating municipal officials and connecting the policy with ongoing projects.
 - Develop more intuitive community application

SNHPC Complete Streets Toolkit Stakeholders Committee Meeting

March 15th, 2016 Meeting #3 Agenda

1. Greetings, Acknowledgement of Guests, and Agenda Review (All Participants)

2. Complete Streets Design Standards and Guest Speakers
 - Guest Consultants

 - Boston Standards and other good finds (Adam)

 - Discussion and recommended steps

3. Measurable Benefits (Cam)
 - Discussion and recommended steps

4. Pilot Program Update – Planning Bd Visits (Sylvia)

5. Identification of Next Tasks - Volunteers

6. Next Meeting – Possible topic: Pilot Program Examples

Committee Homework

Complete Streets Stakeholder Meeting #3

Southern NH Planning Commission

15 March 2016, 10:00am

In attendance:

Tim Blagden, Bike-Walk Alliance

Becky Hebert, Bedford

Bruce Thomas, Manchester DPW

Jeff Warner, Concord

Matt Waitkins, Nashua RPC

Terry Johnson, Concord/HEAL NH

Phil Goff, Alta Planning and Design

Jonathan O'Rourke, Goffstown

Sylvia von Aulock, SNHPC

Cameron Prolman, SNHPC

Adam Hlasny, SNHPC

The meeting was called to order at 10:10 am.

After a round of introductions, Sylvia introduced the main topic of the meeting, Complete Streets Design Standards, introducing Phil Goff, a guest speaker from Alta Planning and Design, to share his expertise.

Phil Goff began the discussion by introducing Alta, a planning, design, and engineering firm that specializes in Complete Streets. Phil gave a presentation on different examples of Complete Streets projects, such as a road diet in Arlington, MA where they reduced lane width, created a median, improved the crosswalk, and created a buffered bike lane. Phil then discussed different design and engineering techniques such as different tiers of separation for pedestrians and bicyclists as well as different treatments of pavements. Matt Waitkins stated that although bright and colorful crosswalks are nice, some communities may not allow what may be considered excessive crosswalks. In response, Phil said that the designs follow the National Association of City Transportation Officials (NACTO) guidelines which are widely considered to be a legitimate source of nationally-agreed design and engineering standards which could help make a case for a project following those guidelines.

Sylvia then asked Phil if he could illustrate some examples of rural Complete Streets. Phil stated that while he has worked with a handful of communities in New Hampshire, such as Portsmouth and Keene, he hasn't worked with any rural community. He stressed the importance of taking a context-sensitive approach when tackling a Complete Street project by looking for creative and inexpensive solutions to completing a street, and cited Kittery, Maine as a good example.

Sylvia thanked Phil for his presentation and introduced Adam Hlasny to discuss different design standard resources. Adam presented a list of cities across the country that developed their own design elements and engineering standards, which included Boston's design standards. Additionally, Adam showed the group an online street design tool called StreetMix, where one

can design a street by adding or changing various elements, such as adding bike lanes, widening sidewalks or traffic lanes, creating buffers, and more. The tool can help people understand how different design strategies can impact a street.

Sylvia then introduced Cameron Prolman to discuss how we can measure the benefits of Complete Streets. Cameron began the discussion by describing various ways to measure the impacts complete streets may have on a community. He stated that before a community decides on a given project, they should agree to a set of goals they wish to achieve. The goals will guide different strategies to achieve those goals, as well as define the performance measures needed to evaluate those strategies. Ultimately, communities can utilize performance measures to demonstrate direct and indirect benefits of transportation benefits, such as improving safety, the local economy, community health, community access, and more. This sparked a discussion about the importance of measuring the impacts of investment. Matt stated that NRPC has a regional matrix that considers origins and destinations, as well as stressing the importance of starting bike/ped counting projects early, in order to serve as a baseline data for future performance evaluation.

Terry Johnson brought up how applying to be a Bike/Walk-Friendly Community can serve as a proxy to build encouragement for Complete Streets projects as well as bring in new stakeholders and advocates. Tim Blagden agreed, acknowledging that Concord, Keene, and Portsmouth's bronze status as Bike/Walk-Friendly Communities helped initiate new interest and growth in the respective communities.

Finally, Sylvia suggested that the next meeting will mainly focus on the Complete Streets pilot projects.

The next meeting will be held on Tue, April 19, 10am at SNHPC.

The meeting adjourned at 11:40am.

Takeaways:

Important areas:

- Design and Engineering
 - National Association of City Transportation Officials Design Guidelines
 - Professional resource guide; updated frequently
 - Lane width
 - Reducing lane width is becoming a common practice
 - Utilize paint for inexpensive barriers for pedestrians and bicyclists
- Performance Measures
 - Qualitative and quantitative measures of progress toward achieving objectives and implementation of strategies

- Can be used to measure not only bike/ped counts, but can be used to measure impact on health, safety, economy, place
 - Create comprehensive examples of performance measures for Toolkit
- Encourage applying for Bike/Walk-Friendly Community
 - Builds encouragement and brings in new advocates and stakeholders

SNHPC Complete Streets Toolkit Stakeholders Committee Meeting

April 19th, 2016 Meeting #4 Agenda, Starting at 10:00

1. Greetings, Acknowledgement of Guests, and Agenda Review (All Participants)
2. Complete Streets Designs and Elements
 - Guest Speaker – Jeff Hyland Iron Wood Consultants on Complete Green Streets Designs
 - Matt from Nashua Regional Planning Commission (Complete Streets in Nashua Project)
 - Other good finds (staff)
3. Complete Streets and Costs (Adam)
4. Pilot Program Update – Planning Bd Visits (Sylvia)
5. Other Complete Streets Updates from Committee
 - (note new NHDOT web site!!!)
<https://www.nh.gov/dot/org/projectdevelopment/planning/complete-streets/index.htm>
 - Other items
6. Next Meeting – Possible topic: Concord Pop-Up Planning and Main Street Project

Complete Streets Stakeholder Meeting #4

Southern NH Planning Commission

19 April 2016, 10:00am

In attendance:

Sylvia von Aulock, SNHPC

Cameron Prolman, SNHPC

Adam Hlasny, SNHPC

Jeff Hyland, Iron Wood Consultants

Matt Waitkins, NRPC

Bruce Thomas, City of Manchester

The meeting was called to order at 10:10 am.

After a round of introductions, Sylvia introduced the main topic of the meeting, Complete Green Streets, introducing Jeff Hyland, a guest speaker from Iron Wood Consultants, to share his expertise.

Jeff Hyland began the discussion by introducing Iron Wood Consultants, a civil engineering firm that specializes in low impact development projects. Iron Wood has worked on projects such as the University of New Hampshire's Storm-water Center. Jeff discussed how a truly complete street should consider storm water management in its design. He stated that a complete "green street" manages the needs of diverse users while also attenuating storm water and added that a balanced design approach considers cost, maintenance & sustainability, carbon footprint, horticultural needs of plants, aesthetics, and economic prosperity. Jeff then presented case studies of complete green streets in New Hampshire.

His first example of a complete green street was of Historic State Street reconstruction in Portsmouth, NH. Jeff highlighted some of the features installed, including tree box filters and silva cells which allow the plants to grow in organic soil. Ultimately, the reconstruction allowed for 90% of the street's storm water to be treated.

Jeff's second example of a complete green street was the Silver Street Gateway Complete Streets Improvements in Dover, NH. Jeff noted that these improvements addressed complete street elements such as sidewalks, benches, and lighting as well as storm water management elements. In addition to the linear rain gardens that align Silver Street, Ironwood also constructed a rain garden in front of Dover's Woodman Park School.

SNHPC Complete Streets Toolkit Stakeholders Committee Meeting

June 15th, 2016 Meeting #5 Agenda, Starting at 11:00

1. Greetings, Acknowledgement of Host (Todd Fahey of AARP) and Agenda Review (All Participants)
2. Concord Tour (Tour Guides, Jeff Warner – City of Concord, Craig Tufts – Central Regional Planning Commission (11:00 to 12:00)
 - Review of tour elements
3. Complete Streets Success Stories (Larry Keniston NHDOT) (12:15 to 12:30)
4. Pilot Program Update – Planning Bd Visits and Application Review(Sylvia) (12:30 to 12:45)
5. Next Meeting – Possible topic: Pilot Program

SNHPC Complete Streets Toolkit Stakeholders Committee Meeting

August 9th, 2016 Meeting #6 Agenda, Starting at 9:30

438 Dubuque St., Manchester, NH

1. Greetings and Agenda Review and Complete Streets Stories (All Participants)
2. Complete Streets Projects for Rural, Suburban, and Urban Settings: Visual Storybook
(Famed Landscape Architect Randy Knowles)
3. Report Update, Design Standards Highlight (Cam and Adam)
4. Pilot Program Update: Three Communities, Four Applications! (Sylvia)
5. Next Meeting – Possible topic: Pilot Program Demonstration Highlights

Complete Streets Stakeholder Meeting #6

Southern NH Planning Commission

9 August 2016

In attendance:

Sylvia von Aulock, SNHPC

Adam Hlasny, SNHPC

Randy Knowles, Knowles Design

Matt Waitkins, Nashua RPC

Bruce Thomas, Manchester DPW

Tim Blagden, Bike-Walk Alliance

Rebecca Harris, Transport NH

Jonathan O'Rourke, Goffstown

Cameron Prolman, SNHPC

Elizabeth Robidoux, Derry

Bill Klubben, Manchester Planning Dept.

Kristi St. Laurent, Windham

Larry Keniston, NHDOT

The meeting was called to order at 9:35am.

Sylvia began the meeting by asking stakeholders to provide any updates on the status of Complete Streets developments around New Hampshire. Tim Blagden of Bike-Walk Alliance stated that the City of Lebanon is moving forward with a complete streets policy. He noted that the policy is to now go before the City Council, but has met no real opposition as of yet. Rebecca Harris told stakeholders that Troy, NH has developed a complete streets policy which would apply to their village district. Rebecca also noted that Transport NH is hosting an education forum on complete streets (9/7/16) at which a variety of statewide decision-makers and representatives from a handful of state agencies will be working to examine their missions and visions to see where complete streets – as a tool and a general philosophy – can be applied to help meet their goals.

Sylvia then introduced Randy Knowles, landscape architect and owner of Knowles Design. Mr. Knowles told stakeholders that he has been hired by SNHPC to provide graphics, illustrating the urban, suburban, and rural applications of complete streets to be used in the Complete Streets Toolkit. Mr. Knowles shared some example illustrations of Goffstown and Manchester. He noted that he will use Frankestown as an example of a rural community following the first pilot project meeting in the town. Mr. Knowles also discussed the importance of signage and how he will incorporate proper signage in his illustrations.

Adam Hlasny and Cam Prolman then discussed the progress being made on the toolkit, sharing the current draft of the Design Guidelines section. They noted that the design guidelines section will highlight some of the best practices from around New Hampshire and beyond, and will provide examples and graphics for various complete street design elements. Good NH examples from which photos could be obtained include:

- Dover (Silver Street)
- Hanover (mobility hub)

- Derry ("Stop, look & wave" signs downtown)
- Peterborough (Union Street)

Lastly, Sylvia updated the stakeholders on the complete streets pilot program. She discussed the communities' application process, SNHPC outreach efforts, and how the complete streets pilot program sub-committee reviewed and picked the projects. Ultimately, the towns of Deerfield, Frankestown, and Windham will be participating in the pilot program. Sylvia noted that there were commonalities among each participating town; each community felt that there is a need for recognition that there are multiple users for most road systems, lack of fog lines, center lines, cross walks, a need for traffic calming and improved safety, and a need for wayfinding signage. Tim mentioned "suggestion lanes" as a potential solution to wide, uncontrolled streets in Deerfield and/or Windham. He noted that there is a good NH example in Hanover.

Stakeholders then decided on the next meeting, taking place on September 22 at 9:30am.

The meeting adjourned at 10:56am.

SNHPC Complete Streets Toolkit Stakeholders Committee Meeting

Sept 22nd, 2016 Meeting# 7 Agenda, Starting at 9:00

438 Dubuque St., Manchester, NH

1. Greetings and Agenda Review and Complete Streets Stories (All Participants)

2. Pilot Program Update: Three Communities (Sylvia)
 - Francestown

 - Deerfield

 - Windham

 - Materials and Stencils

3. Brainstorm on Road Standards (Inspired by Deerfield Demonstration Project - Team discussion)

Complete Streets Stakeholder Meeting #7

Southern NH Planning Commission

22 September 2016

In attendance:

Sylvia von Aulock, SNHPC
Cameron Prolman, SNHPC
Adam Hlasny, SNHPC
Matt Waitkins, Nashua RPC

Bruce Thomas, Manchester DPW
Rebecca Harris, Transport NH
Bill Klubben, Manchester Planning Dept.
Kristi St. Laurent, Windham

The meeting was called to order at 9:45am.

Rebecca gave an update on the statewide Complete Streets Policy Group, the legislative study committee that has now met twice. This group is tasked with investigating the feasibility of a statewide complete streets policy – they will be meeting bi-weekly until the end of October, and presenting a report on findings in early November.

Sylvia noted that NH DOT will soon be reconvening the Transportation Planners Collaborative; Nate Miller will be SNHPC's rep to this group, and will emphasize the importance of addressing official statewide road design standards that are outdated, yet still strongly influence municipal design standards across NH.

Bruce noted that Manchester has put in a TAP application to connect the Rockingham Rail Trail to the existing city trail network. Obtaining funding for this project would enable Manchester's trail system to connect all the way to the NH coastline.

Sylvia then gave a presentation updating the status of the three pilot projects:

- Franconia: demo project to be held on 9/21 and 9/28, and including a temporary crosswalk, revised fog lines, repainted stop bar, etc.
- Deerfield: details remain unknown on Church Street project; will come into clearer focus after 9/26 BOS meeting
- Windham: more details to emerge after 9/26 BOS meeting, including whether or not the town will move forward at all

Cam gave a presentation on Subdivision Regulations, especially as they affect road design standards in NH communities. Cam showed the group alternative designs for Hartford Brook Road, a 22-foot wide subdivision road located in Deerfield. He explained that AASHTO and NH DOT standards have in the past been one-size-fits-all, and inadequate for many smaller town roadways. Despite efforts to combat this with NH DOT's context-sensitive solutions program, many (if not most) communities in NH rely on road design guidance from the 1980s or 1990s, leaving them unable or unprepared to address the needs of all users as laid out by the

Complete Streets movement. While NH DOT has said that they would like to update the standards, they have been unable due to lack of funding and/or staffing capacity.

Some further discussion included commentary on why standards are adopted, and towns' unwillingness to branch out from the formal and antiquated recommendations from the federal and state levels.

Sylvia decided to send out a Doodle poll to determine the next meeting date.

The meeting adjourned at 10:51am.

SNHPC Complete Streets Toolkit Stakeholders Committee Meeting
Dec. 14th, 2016 Meeting # 8 Agenda, Starting at 10:00
438 Dubuque St., Manchester, NH

1. Greetings and Agenda Review and Complete Streets Stories (All Participants)
2. Request for Stakeholder Input – Kristi St. Laurent Example

Some Complete Streets thoughts -

The beauty of the Tool Kit, and the Complete Streets concept, is that it is not a one-size-fits-all idea. It can be expansive and comprehensive, or it can be as simple as some paint and community outreach. The goals are the same, to increase utilization of our streets by more than just cars while increasing safety, community and physical activity.

At first I didn't see how Complete Streets could be of use in our rural town with little appetite for infrastructure spending, or for spending of any kind. Then, once I saw how designating bike-ped lanes on some of our wider residential streets could be done at minimal cost with existing infrastructure, I was hooked. Moving forward, the concept can be considered as new streets are planned in town. Complete Streets is kind of a mindset, of looking at streets holistically as a way to move people not just from point a to b, but move them to get outside, stretch their legs and experience their community as a whole, not just their destination. Planning for this engagement means it is safer for people in cars or not. It really is a win-win to get the most bang for the infrastructure buck. (Kristi St. Laurent Windham, NH. Dec. 2016)

3. A Year in Review – The Making of the Toolkit (Team Presentation)

Overview of the Toolkits 5 sections:

- Complete Streets Overview
- Stakeholder Committee
- Policy
- Design and Engineering Standards
- Pilot Program

4. Next Steps

- Toolkit Input
- Continuation of Pilot Programs as Resources Allow

Complete Streets Stakeholder Meeting #8

Southern NH Planning Commission

14 December 2016

In attendance:

Sylvia von Aulock, SNHPC

Cameron Prolman, SNHPC

Adam Hlasny, SNHPC

Matt Waitkins, Nashua RPC

Bruce Thomas, Manchester DPW

Rebecca Harris, Transport NH

Bill Klubben, Manchester Planning Dept.

Elizabeth Robidoux, Derry

Becky Hebert, Bedford

The meeting was called to order at 10:06am.

Sylvia, Cam and Adam presented the five sections of the toolkit, soliciting feedback from those present. Sylvia noted that the draft toolkit will be sent to stakeholders for written feedback on December 16. The final toolkit is due to NH DOT by December 31.

Sylvia added that NH DOT has approved use of any leftover funds for an extension of the pilot program, as long as work is completed by June 30, 2017.

Elizabeth said that this project has been eye-opening for her. Becky added that the toolkit will be valuable for planning board members in SNHPC's communities and those who are unfamiliar with Complete Streets concepts. Bruce said that keeping Complete Streets issues on the front burner has been an issue in Manchester.

The meeting adjourned at 10:58am.

Appendix 2.

Community Outreach Materials for Pilot Program

And Post-Pilot Project Community Surveys for Deerfield and Windham



Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102-3546, Telephone (603) 669-4664 Fax (603) 669-4350
www.snhpc.org

March 1, 2016

Dear SNHPC Communities,

The Southern New Hampshire Planning Commission has worked with its communities to preserve the special character and valuable resources of the region for half a century. SNHPC is pleased to announce an exciting new project for 2016 aimed at making more efficient use of existing local roadways for all users. Complete Streets are designed and operated to enable safe access for pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Complete Streets make it easier to cross the street, walk to shops, bicycle to work and enhance the community.

Project Background

SNHPC is preparing a Complete Streets toolkit over the next several months which will include planning/policy guidance and design/engineering standards, and regulatory land use guidance. A *Complete Streets Steering Committee* will be involved throughout the project and is made up of state and local agencies, professionals, municipal staff, transportation coalitions, and other stakeholders.

Pilot Program

An upcoming pilot program will provide three communities in the SNHPC region with a variety of project/program opportunities including:

- Pop-up planning initiative
- Policy/resolution development
- Design standards
- Education/outreach

Benefits can be recognized in all municipalities to which complete streets principles are applied, regardless of size. One of the goals of this program is to accomplish a pilot project in at least one urban, one suburban, and one rural community.

What are we looking for from your community?

Please let us know how complete streets could help your community by describing the following in the attached application:

- What are the existing impediments (physical or otherwise) to full access for all users?
- How could improving access to streets in your community improve safety, expand opportunities for use of the public way, encourage economic development, and/or increase tourism opportunities?

Please complete the accompanying application if your community is interested in being one of three communities for the pilot program. SNHPC looks forward to working with you to enhance streets region-wide. Please don't hesitate to contact us with any questions regarding the pilot project application or any aspect of the complete streets effort.

Sincerely,

Sylvia von Aulock, Deputy Executive Director
Southern NH Planning Commission



Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102-3546, Telephone (603) 669-4664 Fax (603) 669-4350
www.snhpc.org

May 20, 2016

Dear SNHPC Communities,

Over the past two months, I have had the pleasure to come out and meet with your community Planning Boards and present the Commission's Complete Streets Toolkit project. There have been many lively discussions as each Board, with their Planning Staff consider possible pilot projects for their community. Attached are some of the questions brought up in the course of these meetings with a short response to clarify concerns if they still exist.

To review, one of the goals of this program is to work with a minimum of three communities: one urban, one suburban, and one rural in the SNHPC region on one of the aspects of Complete Streets including:

- Policy/resolution development
- Design standards
- Education/outreach
- Pop-up planning initiative (demonstration project)
- Other (combination or some other project exemplifying Complete Streets standards)

If your community is interested in being one of three communities for the pilot program, please complete the accompanying application (by June 24th, 2016). Please don't hesitate to contact me with questions (603) 669-4664 or email me at svonaulock@snhpc.org regarding the pilot project application or any aspect of the complete streets effort.

This program is for all our communities and it is very important to us that we make it work for you all.

Sincerely,

Sylvia von Aulock

Deputy Executive Director
Southern NH Planning Commission



Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102-3546, Telephone (603) 669-4664 Fax (603) 669-4350
www.snhpc.org

SNHPC Complete Streets Toolkit Frequently Asked Questions:

- Could there be rural and suburban applications for complete streets including complete streets policies?

Yes, there are many rural and suburban applications for complete streets in policies, design standards, and actual projects. There are examples here in NH and in every state where rural and suburban communities are making it a priority to make their street networks safer for all users.

- Would a Complete Streets Policy obligate the town to make improvements?

Complete streets policies, ordinances, and resolutions would integrate allowances, best management practices, or mandates as dictated by the community. Communities typically make improvements during regularly scheduled roadwork, incorporating Complete Streets design elements into existing projects.

- We are interested in rewriting our Site/Subdivision Regulations regarding street layout requirements, would this be a consideration?

Yes, this is a great area to start having discussions with Planning Board members and Planning and Public Works staff in crafting requirements that make sense for your community.

- Should we wait for the toolkit to be developed first to help guide the pilot program, would that make more sense?

The program was developed in such a way that the toolkit would be guided by the lessons learned through each step of the project: stakeholder input, topic research, and pilot program interest and success stories. It is our goal to have the pilot programs completed by the fall with the toolkit completed by the end of the year.

- What is feasible for a demonstration project and is there any cost to the community?

There has been a lot of interest in demonstration projects. Our hope is that we can work with the community and have community and staff participation, get materials donated, and have an actual one day event. This of course is completely dependent on the level of success regarding participation. There would be in-kind service costs associated with this and perhaps some minimal material costs, but again, it is our goal to have materials donated.

- How will NHDOT be involved if the roads were state maintained?

NHDOT has been an active participant on our stakeholder committee and will assist the Commission in reviewing and implementing all pilot programs. NHDOT representatives continue to encourage context sensitive design, and are very interested in working with communities.



Southern New Hampshire Planning Commission

438 Dubuque Street, Manchester, NH 03102-3546, Telephone (603) 669-4664 Fax (603) 669-4350
www.snhpc.org

SNHPC Complete Streets Community Application Form

SNHPC has been provided funding from NHDOT to work with up to three communities on a pilot project that embraces the Complete Streets vision. Put simply, complete streets are streets designed for all users of all ages and all abilities. Please fill out the following form no later than May 6th and return to Sylvia von Aulock at SNHPC.

Name of Municipality: _____

Contact Person and Title: _____

Contact Phone and Email: _____

Authorizing Agent/ Title: _____

Project Title: _____

Project Type: Please check at least one in first column and one in the second column.

*For clarification on project types, see attachment entitled -
Complete Streets Pilot Program: Project Menu Items for Communities.*

- | | |
|--|-----------------------------------|
| <input type="checkbox"/> Policy Development | <input type="checkbox"/> Urban |
| <input type="checkbox"/> Pop-up Planning Initiative | <input type="checkbox"/> Suburban |
| <input type="checkbox"/> Design Standard Development | <input type="checkbox"/> Rural |
| <input type="checkbox"/> Education Outreach | |

Project Description: Narrative, Map, Photo

Provide attachment including narrative, map of location, and photo. Please check all those that are included. Note, only narrative is required, not all are applicable.

Project Partners including land use boards, town officials, town staff or departments, citizens, agencies, businesses, consultants: _____

Proposed Project Time Frame: _____

Materials and Other Resources Needed (Note: SNHPC can assist your community in researching Pop-up planning Initiative material resources but this program does not fund the purchase of materials):-

Public Meetings Anticipated Including Approximate Dates (Note: this could include Planning Board, Selectmen, or other public meetings) _____

Please let us know how complete streets could help your community by describing the following:

1. What are the existing impediments (physical or otherwise) to full access for all users? _____

2. How could improving access to streets in your community improve safety, expand opportunities for use of the public way, encourage economic development, and/or increase tourism opportunities? _____

Complete Streets Pilot Program: Project Menu Items for Communities

- Pop-up planning initiative
 - This will involve the planning of a temporary demonstration street segment, using materials such as tape and bollards to delineate bike lanes, wider sidewalks, or other Complete Street-recommended elements. Maximum length of street should not exceed 1,000 feet or two blocks, whichever is more applicable.
- Policy/resolution development
 - This will assist your municipality toward developing a CS policy, using nationwide best practices and New Hampshire examples as guidelines.
- Design standards
 - This will assist your municipality in developing design standards. A review and commentary on the appropriateness of existing planning documents could also be included if desired.
- Education/outreach
 - This will involve educational assistance within a town. Planning commission staff will recruit individuals in whose communities Complete Streets have been explored in an effort to share experiences, successes, and challenges.

Windham Complete Streets Demonstration Project Survey

Thank you for taking part in the project survey. These results are important to Windham and SNHPC. Please return to **SNHPC, 438 Dubuque St, Manchester, NH 03102** by **October 28, 2016**.

- 1) Do you live: (circle all that apply)
 - A) in Windham?
 - B) within the demonstration area (lined pavement)?
 - C) on Squire Armour Road?
 - D) on one of the connected roads (Appleton, Butternut, Poplar or Sagamore)?

- 2) What is your age range? (If under 18, please get parental permission before filling out)

<10	19-24	45-54	75+
11-15	25-34	55-64	
16-18	35-44	65-74	

DRIVING EXPERIENCE

- 3) Do you have a driver's license? (Yes / No)

- 4) How many times did you drive through the demonstration project area? (back & forth = 1x)
 - 1-3 times
 - 4-14 times
 - 15-30 times
 - 30+ times

- 5) Did you encounter oncoming traffic within the lined section of roadway? (Yes / No)

If Yes, did you find the lanes:

 - Too narrow
 - Noticeably narrower but easily passible
 - Adequate
 - Could be narrower to leave more room for pedestrians

- 6) Did you encounter any bike-ped users? (Yes / No)

If Yes, did you find your vehicle lane:

 - Too narrow, I had to cross the white line to pass by the other vehicle
 - Noticeably narrower, I had to slow down to pass by the other vehicle
 - Noticeably narrower but easily passible
 - Adequate width
 - Could be narrower to leave more room for pedestrians

- 7) Did you notice any effect on your driving habits in the demonstration project test area?
 - I drove faster
 - I drove my usual speed
 - I drove my usual speed within the speed limit (35 mph)
 - I drove slower than my usual speed

BIKE/PEDESTRIAN EXPERIENCE

- 8) Did you walk/run/bike/scooter/skateboard in the demonstration project area?
 - 1-3 times

- 4-14 times
- 15-30 times
- 30+ times

9) Did any vehicles pass by as you used the bike-ped lane? (Yes /No)

If Yes, what was your experience?

- I felt less safe in the marked lane than on an unmarked roadside
- I felt no difference when using the marked lane
- I felt a little safer when using the marked lane
- I felt significantly safer when using the marked lane

If No vehicles passed by you, what was your experience?

- I felt less safe in the marked lane than on an unmarked roadside
- I felt no difference when using the marked lane
- I felt a little safer when using the marked lane
- I felt significantly safer when using the marked lane

10) Please answer the following 'Yes' or 'No' questions:

- Did you use the bike-ped lane accompanied by a child or children? (Yes / No)
- Did you use the bike-ped lane with one or more other people? (Yes / No)
- Did you use the bike-ped lane accompanied by a pet? (Yes / No)
- Did you use the bike-ped lane on foot? (Yes / No)
- Did you use the bike-ped lane with a bike/scooter/skateboard etc.? (Yes / No)

11) Moving forward, would you support the implementation of bike/ped lanes on Windham's streets, where appropriate and adequate space exists:

- To be added during regular maintenance? (Yes / No)
- To be added at the request of a neighborhood? (Yes / No)
- To be planned for during the development of new town roads? (Yes / No)

12) Post-demonstration, have you seen any behavior changes by drivers or other road users? (Yes / No)

13) Please share any further comments about your experience or the use of bike/ped lanes in Windham?

Are you willing to be contacted about your survey results? (Yes / No)

Are you willing to have your comments or responses published with your name? (Yes / No)

Shall we contact you when the results of the demo project are presented to the Selectmen? (Yes / No)

If you answered yes, please leave your name and phone and/or email.

Thank you for participating in the Complete Streets demonstration project!

Kristi St. Laurent
 Windham Planning Board
KSt.Laurent@windhamnh.gov

Sylvia von Aulock, Deputy Executive Director
 Southern New Hampshire Planning Commission
svonaulock@snhpc.org

Deerfield Complete Streets Demo (Oct. 2016)

Deerfield Complete Streets Demo Project Survey

Dear Deerfield Resident,

Thank you for taking the time to complete this survey. Your feedback is incredibly valuable and will help shape the results of this planning demonstration. As you've witnessed, a planning demonstration gives residents an opportunity to see and evaluate public realm improvements during the planning process and showcases temporary installations of possible improvements. This planning demonstration utilizes marked shoulders to not only slow vehicles and increase safety, but to allow walkers and bikers to safely use the road system.

Thanks again for your participation!

Deerfield Complete Streets Demo (Oct. 2016)

1. Do you live (select all that apply):

- in Deerfield
- within the demonstration area (first 800' of Church Street)
- elsewhere on Church Street
- on a nearby road

2. What is your age range?

- <10
- 11-15
- 16-18
- 19-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65-74
- 75+

3. Do you have a driver's license?

- Yes
- No

4. How many times did you drive through the demonstration project area (back & forth = 1x)

- 1-3 times
- 4-14 times
- 15-30 times
- 30+ times

5. Did you encounter oncoming traffic within the lined section of roadway?

Yes

No

6. If Yes, did you find the lanes:

Too narrow

Noticeably narrower but easily passable

Adequate

Could be narrower to leave more room for pedestrians

Other (please specify)

7. Did you encounter any bike-ped users?

Yes

No

8. If Yes, did you find your vehicle lane:

Too narrow, I had to cross the white line to pass by the other vehicle

Noticeably narrower, I had to slow down to pass by the other vehicle

Noticeably narrower but easily passable

Adequate width

Could be narrower to leave more room for pedestrians

9. Did you notice any effect on your driving habits in the demonstration project test area?

I drove faster

I drove my usual speed

I drove my usual speed within the speed limit (30 mph)

I drove slower than my usual speed

10. How many times did you walk/run/bike/scooter/skateboard/ride a horse in the demonstration project area?

0 times

1-3 times

4-14 times

15-30 times

30+ times

11. Did any vehicles pass by as you used the shoulder?

Yes

No

Unsure

12. If Yes, what was your experience?

I felt less safe in the marked lane than on an unmarked roadside

I felt no difference when using the marked lane

I felt a little safer when using the marked lane

I felt significantly safer when using the marked lane

13. If no vehicles passed by you, what was your experience?

I felt less safe in the marked lane than on an unmarked roadside

I felt no difference when using the marked lane

I felt a little safer when using the marked lane

I felt significantly safer when using the marked lane

14. Did you use the shoulder accompanied by a child or children?

Yes

No

15. Did you use the shoulder with one or more other people?

Yes

No

16. Did you use the shoulder accompanied by a pet?

Yes

No

17. Did you use the shoulder on foot?

Yes

No

18. Did you use the shoulder with a bike/scooter/skateboard, etc.?

Yes

No

Other (please specify)

19. Did you use the crosswalk?

Yes

No

20. If yes, did vehicles yield to you as you crossed?

Yes

No

21. Considering multiple uses in the area (Church, preschool, local residents, others), do you think this is a good location for a crosswalk? If not, please state why you chose your answer.

Yes

No

22. Moving forward, would you support the implementation of wider shoulders and/or bike-ped lanes on Deerfield's streets, where appropriate and adequate space exists:

To be added during maintenance

To be added at the request of a neighborhood

To be planned for during the development of new town roads

Other (please specify)

23. Post-demonstration, have you seen any behavior changes by drivers or other road users?

Yes

No

Unsure

Other (please specify)

24. Please share any further comments about your experience or the use of shoulders in Deerfield:

25. Are you willing to be contacted about your survey results?

Yes

No

Contact Info

26. Are you willing to have your comments or responses published with your name (18+ only)?

Yes

No

Name

27. Shall we contact you when the results of the demo project are presented to the Board of Selectmen?

Yes

No

If so, please leave your name and phone/email

Appendix 3

Sample of Complete Streets Presentations to
Community Planning Boards, (Spring 2016),
SNHPC Metropolitan Planning Organization's
Transportation Advisory Committee (May, July, and October 2016)

SNHPC Complete Streets Toolkit Project



Concord, NH Main St.

Southern New Hampshire Planning Commission



Complete Streets Toolkit Project

Imagine our network of streets designed for all users, imagine yourself as the driver, the walker, the biker.



Before Improvements



After Improvements

Southern New Hampshire Planning Commission



Complete Streets Toolkit Project

Why Complete Streets?

Benefits:

- Improves Safety for All Users
- Encourages Economic Development
- Improves Quality of Life
- Provides Choices
- Increases the Attractiveness of the Community
- Improves Health by Encouraging Walking and Biking



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Complete Streets Toolkit Project

Project Elements

- Stakeholder Team
- Research (NH and Beyond)
- Policy Focus
- Engineering Design Standards
- Pilot Program
- Toolkit



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Complete Streets Toolkit Project

Stakeholder/Advisor Team

- Communities w/in SNHPC: Bedford, Windham, Derry, Manchester, Goffstown, Francestown
- Communities outside SNHPC: Nashua, Concord, Portsmouth, Keene
- Other Planning Commissions: SWRPC, NRPC, CRPC
- State Agencies: NHDRED, NHDOT,
- Other Agencies: Transport NH, MTA, Bike/Walk Alliance, AARP, HEAL NH



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Complete Streets Toolkit Project

Project Development Thru Stakeholder Involvement

- Providing input to the project
- Guiding toolkit development
- Sharing Complete Streets Progress in NH
 - What's happening in our state
 - Why complete streets works for NH
 - Trends



Southern New Hampshire Planning Commission

 Complete Streets Toolkit Project

Research Within and Outside NH

- Making Connections – Participating in Statewide Complete Street Policy Effort (*May 6th Legislative Ride*)
- Discovering Existing Complete Streets Projects
- Inviting Engineers & Landscape Architects to Highlight Their Success Stories
- Encouraging Neighboring Planning Commissions To Share Their Work
- Web Search of Existing Resources



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 Complete Streets Toolkit Project
Trends and Case Study Research



Examples from Ironwood Design Group, Jeff Hyland

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 Complete Streets Toolkit Project

Policy Guidelines

- Highlighting existing examples in Concord, Portsmouth, Dover, Keene, and Swanzey
- Researching experts in Complete Streets such as Smart Growth America's National Complete Streets Coalition
- Finding examples for urban, suburban, and rural settings

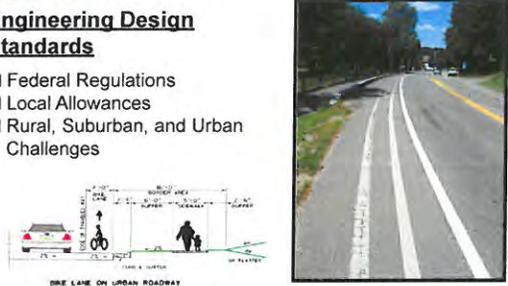


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 Complete Streets Toolkit Project

Engineering Design Standards

- Federal Regulations
- Local Allowances
- Rural, Suburban, and Urban Challenges



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 Complete Streets Toolkit Project

Pilot Program

- Three Communities (*urban, suburban, and rural focus*)
- Possible Projects may include:
 - Policy Development (Resolution, Policy, Ordinance)
 - Design Standard Development (Road/Sidewalk Stds)
 - Education Outreach (Public/staff workshop)
 - Pop-up Planning Initiative (Demonstration Project)



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 Complete Streets Toolkit Project

Keene, NH Demonstration Project (Sept. 2015), <https://www.youtube.com/watch?v=hqbaG-5-ZJY>



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Complete Streets Toolkit Project

Accessible Toolkit

- Fact sheets
- CDs
- Web-based



Southern New Hampshire Planning Commission



Complete Streets Toolkit Project

Questions / Comments



Southern New Hampshire Planning Commission

REPORT

TO: Technical Advisory Committee
FROM: Sylvia von Aulock, Deputy Executive Director
DATE: May 2nd, 2016
RE: Compete Streets Toolkit Update

RECOMMENDED ACTION

Information only

SUMMARY

Project Background

SNHPC has been preparing a Complete Streets toolkit over the last several months which will include planning/policy guidance and design/engineering standards, and regulatory land use guidance. A Complete Streets Steering Committee has been involved throughout the project and is made up of state and local agencies, professionals, municipal staff, transportation coalitions, and other stakeholders. To date the Committee has focused on success stories throughout the state on complete streets policies and projects.

Pilot Program

For the past month, staff has reached out to every Planning Board within the SNHPC's region, providing them with a brief presentation on complete streets and the benefits of the pilot program. The pilot program will provide three communities (at least one urban, one suburban, and one rural community) in the SNHPC region with a variety of project/program opportunities including:

- Policy/resolution development
- Design standards
- Education/outreach
- Pop-up planning initiative (demonstration project)

This outreach effort has been very well received by all the communities. We anticipate several applications. The applications will be reviewed by a subcommittee and get underway this summer.

SNHPC Complete Streets Toolkit Project Pilot Program Focus



Photo Courtesy of Bicycle Coalition of Maine

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Complete Streets Toolkit Project

Pilot Program Goals: to work with a minimum of three communities; urban, suburban, and rural in the SNHPC region

Possible Project Could Include:

- Policy/resolution development
- Design standards
- Education/outreach
- Pop-up planning initiative (demonstration project)
- Other (combination or some other project exemplifying Complete Streets standards)

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Complete Streets Toolkit Project

Application Process Review

1. Phoned every Planning Dept or equivalent with a follow up email describing the program.
2. Created draft application, incorporated comments from Stakeholder's Committee and later subcommittee
3. Arranged to present the concept to every participating community within the Commission's region this past spring.
4. Invited communities to participate in the pilot program, first at the public hearing, later via email.
5. Developed a frequently asked question handout and emailed that with reminder to community reps.
6. Extended application date and continued to encourage communities to apply.
7. Reviewed applications with subcommittee and accepted all applications.

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Complete Streets Toolkit Project

Influencing Engineering Design Standards



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Complete Streets Toolkit Project

Responding Communities

- Franconstown
- Deerfield (2 projects)
- Windham



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Complete Streets Toolkit Project

Rural Response: Franconstown

Goal: Connect amenities safely through traffic calming, provide recommendations to improve safety of problematic intersection.

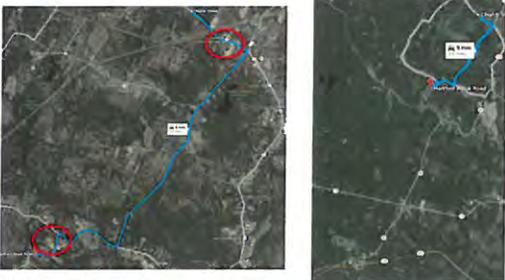


Challenges: multiple access lanes, lack of visibility, vehicle speed



Southern New Hampshire Planning Commission

SNHPC Complete Streets Toolkit Project
Rural Response: Deerfield, 2 Projects



Southern New Hampshire Planning Commission

SNHPC Complete Streets Toolkit Project
Rural Response: Deerfield, Town Center

Goals: Connect amenities safely through traffic calming, provide recommendations to improve safety for bicycles and pedestrians.




Challenges: no lines / no defined lanes, multiple access points to various town services, ROW size, vehicle speed

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SNHPC Complete Streets Toolkit Project
Rural Response: Deerfield, Subdivision

Goals: Demonstrate improved safety for peds/bicyclists for typical subdivision, recommend revisions to site/sub regs




Challenges: no defined lanes / no lines, popular cycling road, ROW size, vehicle speed

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SNHPC Complete Streets Toolkit Project
Suburban Response: Windham

Goals: Demonstrate improved safety for peds/bicyclists for typical subdivision, create project champions, educate decision makers.




Challenges: no defined lanes / no lines, wide ROW size, vehicle speed, decision makers attitudes

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SNHPC Complete Streets Toolkit Project
Suburban Response: Windham

Goals: Demonstrate improved safety for peds/bicyclists for typ. subdivision, create project champions, educate decision makers.




Challenges: no defined lanes / no lines, wide ROW size, vehicle speed, decision makers attitudes

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SNHPC Complete Streets Toolkit Project
Pilot Program Draft Process

- Establish stakeholder list, clarify project schedule and details incl. goals, challenges, outcomes, etc.
- Meeting and Site visit with key people (open to the public), review of options with town
- Acceptance/Sign off from Town Officials on project
- Implementation of project – find project champions
- Presentation to Board of Selectmen on results

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Complete Streets Toolkit Project

Commonalities

- Need for recognition that there are multiple users for most road systems
- Lack of fog lines, center lines, cross walks
- Need for traffic calming and improved safety
- Need for wayfinding signage



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Complete Streets Toolkit Project

Questions ?



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SNHPC Complete Streets Toolkit Project
Pilot Program Focus



Photo Courtesy of Bicycle Coalition of Maine



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SNHPC Complete Streets Toolkit Project

Triangle Effect of Responding Communities

- Francestown
- Deerfield (2 projects)
- Windham




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SNHPC Complete Streets Toolkit Project
Pilot Program Process

- Establish stakeholder list, identify project champion.
- Meeting and Site visit with stakeholders(open to the public),
- Review project details incl. goals, challenges, intended outcomes, site concerns, materials, responsibilities
- Identify town resources and brainstorm opportunities
- Presentation to BOS (Public Hearing), Acceptance/Sign off on project
- Clarify implementation schedule and outline tasks
- Identify project champions to track use/ behavior changes
- Presentation to Board of Selectmen on results of project



Southern New Hampshire Planning Commission

SNHPC Complete Streets Toolkit Project
Rural Application: Francestown Demonstration

Goal: Connect amenities safely through traffic calming, provide recommendations to improve safety of problematic intersection.




Challenges: multiple access lanes, lack of visibility, vehicle speed



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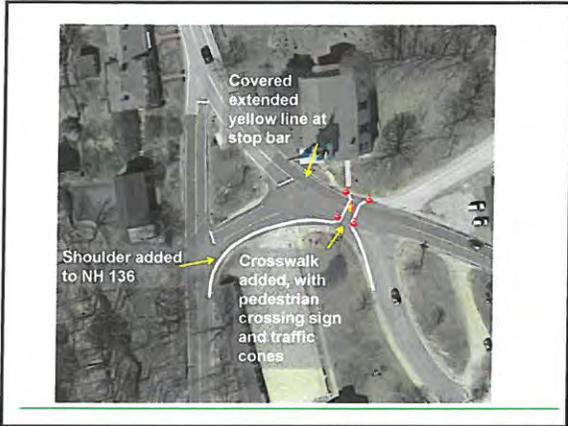
SNHPC Complete Streets Toolkit Project





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Complete Streets Toolkit Project
SNHPC

Vehicle Movements at Stop Sign at Intersection NH43/NH136 September 21, 2016

Time	7-8 AM	8-9 AM	3-4 PM	4-5 PM	5-6 PM	Total
Vehicle Movement						
Full Stop	46	35	35	32	32	180
Rolling Stop	31	24	20	15	7	97
Slight Pause	10	0	6	3	0	19
Double Stop	1	0	1	1	2	5

Vehicle Movements at Stop Sign at Intersection NH43/NH136 September 29, 2016

Time	7-8 AM	8-9 AM	3-4 PM	4-5 PM	5-6 PM	Total
Vehicle Movement						
Full Stop	45	24	45	30	32	176
Rolling Stop	39	28	11	15	18	111
Slight Pause	4	1	2	3	12	22
Double Stop	0	0	0	2	2	4

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Complete Streets Toolkit Project
SNHPC

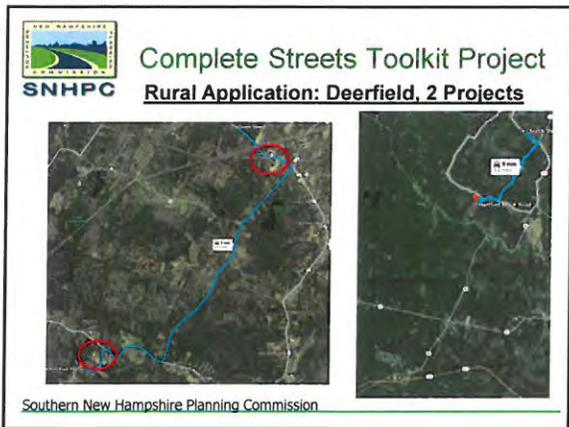
Vehicle Behavior at Crosswalk on NH 136 September 21, 2016

Time	7-8 AM	8-9 AM	3-4 PM	4-5 PM	5-6 PM	Total
Vehicle yielded to pedestrians	13	14	27	29	35	118
Vehicle did not yield to pedestrians	31	14	42	43	90	220

Vehicle Behavior at Crosswalk on NH 136 September 29, 2016

Time	7-8 AM	8-9 AM	3-4 PM	4-5 PM	5-6 PM	Total
Vehicle yielded to pedestrians	31	15	60	58	53	217
Vehicle did not yield to pedestrians	4	1	23	29	15	72

Southern New Hampshire Planning Commission





Complete Streets Toolkit Project Deerfield, Town Center



Goals: Connect amenities safely through traffic calming, provide recommendations to improve safety for bicycles and pedestrians.

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Deerfield, Connecticut Project
BOS Meeting: Sept. 26, 2016
Layout:
Temporary Installation: Oct. 2016

Deerfield

Discussion Points: Project Location, Recommendations, and Policy Considerations.

- Locate extra wide crosswalk (CUP) between Town Hall and Fire school
- Adding turn lane on wide 11 ft curb edge of pavement on the north side, keeping 20 ft total travel lane width, and adding a fog line on south side
- Remove "no parking" signs
- Paint "Fire Dept. Only" in designated area
- Paint circulation arrows for Wheel-ITD and Bicycle parking
- Place an arrowhead or additional "bank drop-off" with library
- Consider enforcing Fire Dept. no-parking zone



Complete Streets Toolkit Project Crosswalk and Safety



Deerfield Cooperative PreSchool

Southern New Hampshire Planning Commission

Deerfield: Project #2
Subdivision Regulation Consideration

ISSUES

- 22 ft. in width with no markings
- Steep and curving
- Acts as a link between South Road and Middle Road (dirt road)
- Vehicles tend to drive fast and use the road as a speedway
- No bike/ped designated access to existing recreation field



Complete Streets Toolkit Project Site/Subdivision Regulation Consideration



- Goals:
1. Make the road safer for all users
 2. Promote walking and biking
 3. Reduce speed of vehicles
 4. Keep impervious surface to a minimum
 5. Keep maintenance costs to a minimum

Southern New Hampshire Planning Commission



Complete Streets Toolkit Project Possible Solutions

- Utilize complete streets/traffic calming methods
- a. Provide visual separation for various users
 - Paint fog lines to create boundaries
 - Paint bike/ped lane
 - b. Provide awareness that other users may be present
 - Install signage
 - Paint sharrows



Southern New Hampshire Planning Commission

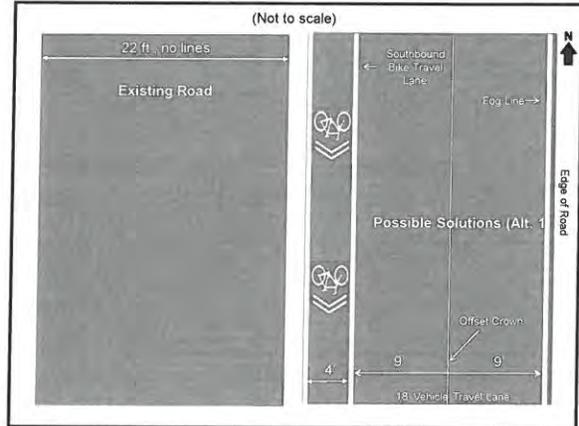


Complete Streets Toolkit Project Possible Solutions

Design Alt #1

- a. Provide visual separation for users
 - Paint yellow line separating vehicles and other users
 - Paint fog lines 1 foot off edge of pavement
- b. Create a 4 ft. bike lane on one side of the road
- c. Designate 18 ft remaining as vehicle travel lane, would require an off-set crown for the road
- d. Install signage designating bike/ped lane at each intersection

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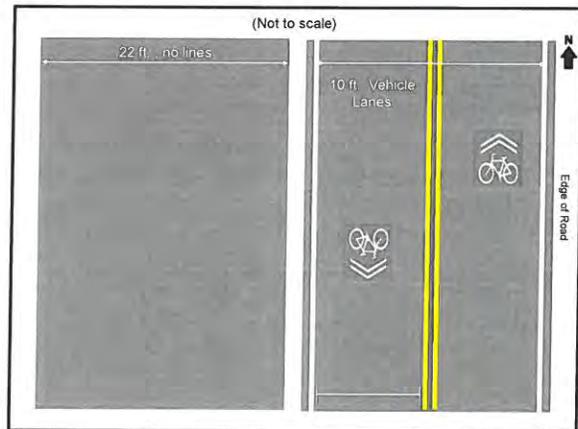


Complete Streets Toolkit Project Possible Solutions

Design Alt #2

- a. Designate lanes as multi-use lanes
 - Install sharrows per MUTCD requirements
 - Install signage designating bicyclists and other users share the road
- b. Create visual boundaries for vehicles
 - Paint fog lines 1 ft off edge of pavement
 - Paint centerline

Southern New Hampshire Planning Commission



Complete Streets Toolkit Project Suburban Application: Windham

Goals:

- Demonstrate improved safety for peds/cyclists for typical subdivision
- Create project champions
- Educate decision-makers.



Challenges:

- No defined lanes/no lines,
- High vehicle speeds
- Decision-makers' attitudes

Southern New Hampshire Planning Commission



Complete Streets Toolkit Project

Timeline

- Initial mtg./site visit: 8/31
- BOS Presentation: 9/26
- Setup: 10/7, 11
- Roadway = 28' wide, no markings of any kind
- Speed limit 30 mph; actual speeds 35-40+
- Marked two 4-foot bike/ped lanes, leaving two 10-foot vehicular travel lanes



Southern New Hampshire Planning Commission




Complete Streets Toolkit Project

Survey Results (so far)


- 10 responses as of 10/19
- 6 of 9 thought vehicle lanes too narrow
- 3 of 10 drove slower than usual speed
- 8 of 9 have not seen driver behavior change
- **Comments:**
 - "In addition to driving the road, I observed others and concluded that the painted lanes are not truly beneficial to the users. Everyone was cautious irrespective of the lane."
 - "I think the only way you are going to get people to slow down on Squire Armour is installing speed bumps. The lines have not made people slow down when they are driving."

Appendix 4.

Complete Streets Toolkit

Project Scope of Work

Southern New Hampshire Planning Commission

Complete Streets Toolkit Scope of Work

Project Background

SNHPC is preparing a Complete Streets toolkit in collaboration with the newly developed project Steering Committee. The toolkit will include planning/policy guidance and design/engineering/land use needs and guidance. While the primary audience will be Southern New Hampshire Planning Commission's cities and towns, the toolkit will also benefit other cities and towns across the state.

A *Complete Street Steering Committee* will be involved throughout the process and made up of state and local agencies, professionals, municipal staff, transportation coalitions, and other stakeholders involved in complete streets development and implementation.

The toolkit shall be divided into two parts: a planning/policy guidance section and a design/engineering guidance section. Aside from the toolkit, there will be an opportunity for three SNHPC communities to take part in a policy pilot program in which the stakeholder's committee will help each community develop a policy specific to the needs of that town.

Section I. Planning/Policy

1. Introduction, definition and background history on complete streets;
2. The basic elements, common features and characteristics of complete streets;
3. Costs and benefits of complete streets and why they are important regarding
 - a. safety,
 - b. environmental,
 - c. health,
 - d. transportation,
 - e. mobility and
 - f. economic standpoint;
4. Education, training and public outreach best practices;
5. A review of adopted resolutions/policies in other states, including locally adopted policies (case studies and lessons learned in overcoming obstacles in adoption and implementation) in New Hampshire
6. Recommended templates and model policies/resolutions for urban, suburban and rural sized communities in the state. *As part of the development of these models, SNHPC will work with three communities in the region – urban, suburban and rural in size to develop a recommended template and model policy.*

Section II. Design/Engineering

1. Review of current design elements and engineering standards, including ITE and AASHTO;
2. A review of the design needs of pedestrians/bicyclists and transit users;
3. A review of pedestrian and bicycle treatments, pavement types, and transit facilities;

4. The need for flexibility in design and context sensitive solutions in complete streets;
5. The design process in constrained right-of-ways, including traffic calming and road diets;
6. Conventional street design versus complete street design, including roadway widening, lane narrowing, lane reconfiguration, parking reduction, vehicle speeds, and winter considerations;
7. Transportation and land use connections, e.g. creating supportive environments for walking, bicycling and riding transit, including land use and urban form – street patterns, zoning, LEED-ND, and Transit Oriented Development (TOD).

Project Benefits

The completed **Complete Street Toolkit** will have the following benefits:

- ✓ This will be the first time a complete and comprehensive toolkit and resource guide on complete streets is prepared and published for cities and towns within the SNHPC Region. As such the toolkit will transferability across the state and will build upon previous generalized complete streets work recently included as part of the Livable Walkable Toolkit last updated in 2012 and 2014 by the SNHPC;
- ✓ As such, the toolkit will directly benefit municipal officials, planning boards, planning and public works staff, road agents and governing boards by providing a comprehensive and user-friendly resource guide, case studies and model policies/templates, including specific design standards for designing and implementing complete streets in urban, suburban and rural contexts. This information has never been compiled in one comprehensive guidebook before for municipal officials in NH; and
- ✓ Finally, as part of the development of this toolkit, there will be an opportunity for three (3) municipalities within the SNHPC Region to participate in a pilot program to develop and implement a complete street policy for their community. The results of this pilot program will be included in the final Complete Street Toolkit.

Detailed Work Tasks

Work Task 1. Steering Committee Development and Organization:

- A. SNHPC staff will be responsible for creating and facilitating a Steering Committee to guide the development and implementation of this project. A minimum of five (5) meetings of the Steering Committee will be held during the course of the project with meetings held at least every other month. All meetings will be organized by SNHPC. A Chair and Vice Chair will be appointed to ensure consistency through the project.
 1. The Steering Committee will be responsible for reviewing and guiding the work of the SNHPC staff and soliciting and engaging public and community outreach, interest and participation on the project, including:
 - i. Reaching out to active stakeholders and design professionals involved in complete street development and implementation. The first meeting will be

an organization meeting with a primary focus on assigning Committee members to work on specific sections and elements of the Toolkit.

Work Task 2. Project Planning and Complete Streets Research:

- B. SNHPC staff will be responsible for conducting research on complete streets both within and outside of NH reviewing the following:
- i. literature,
 - ii. resources,
 - iii. policies,
 - iv. history,
 - v. costs and benefits,
 - vi. education and training,
 - vii. design standards, and
 - viii. best practices currently in play including:
 1. identifying limitations, gaps, and data needs
 2. obtaining valuable information on existing information from towns and state agencies in NH, Vermont and Maine
 3. Understand and report the state of existing complete streets practices both locally and within New England.

This research will result in a working paper to be presented and shared with the Project Steering Committee and NH DOT at its second meeting following the Committee's first organizational meeting. The working paper will upon review and approval of the Steering Committee and NH DOT will be incorporated within the Toolkit.

Work Task 3. Toolkit Development – Planning/Policy Guidance Section:

- C. In carrying out this work task, SNHPC staff will work with designated Steering Committee members to prepare and draft various subsections to be contained with the Planning/Policy Guidance Section of the Toolkit. Specifically these subsections will include:
- i. an introduction, definition and background history on complete streets;
 - ii. the basic elements, common features and characteristics of complete streets and why they are important from a safety,
 - iii. environmental, health, transportation, mobility and economic standpoint;
 - iv. the importance of education, training and public outreach in developing completed streets and best practices;
 - v. a review of adopted resolutions/policies in other states, including locally adopted policies (case studies and lessons learned in overcoming obstacles in adoption and implementation) in New Hampshire;
 - vi. and recommended templates and model policies/resolutions for urban, suburban and rural sized communities.
 - vii. In addition to these drafts, a resource guide consisting of examples and a bibliography will be prepared as an Appendix to the Toolkit.

All completed drafts will be shared and reviewed with the entire Steering Committee at its third meeting.

Work Task 4. Toolkit Development – Design/Engineering Guidance Section:

- D. SNHPC staff will work with designated Steering Committee members to prepare and draft various subsections to be contained with the Design/Engineering Guidance Section of the Toolkit. Specifically these subsections will include:
- i. a review of current design elements and engineering standards applied in various complete street examples, including ITE and AASHTO;
 - ii. a review of the design needs of pedestrians/bicyclists and transit users;
 - iii. a review of pedestrian and bicycle treatments, pavement types, and transit facilities;
 - iv. the need for flexibility in design and context sensitive solutions in complete streets;
 - v. the design process in constrained rights-of-ways, including traffic calming and road diets;
 - vi. conventional street design versus complete street design, including roadway widening, lane narrowing, lane reconfiguration, parking reduction, vehicle speeds, and winter considerations; and finally
 - vii. the transportation and land use connections, e.g. creating supportive environments for walking, bicycling and riding transit, including land use form and urban form – street patterns, zoning, LEED-ND, and Transit Oriented Development (TOD).
 - viii. In addition to these drafts, a resource guide consisting of examples and a bibliography will be prepared to be added to the Appendix in the Toolkit. All completed drafts will be shared and reviewed with the entire Steering Committee at its fourth meeting.

Work Task 5. Complete Street Pilots:

- E. Under this work task SNHPC staff will contact towns within the SNHPC Region and formalize a pilot program for development and implementation of complete street policy for three (3) communities in the region: urban; suburban and rural. The draft sections of the Toolkit developed in Work Tasks 5 and 6 will be shared with the communities and tested for application and implementation as appropriate in each community. Based on feedback received draft policies, resolutions and standards will be prepared and presented to the planning boards and municipal staff for their consideration and adoption. A report will be prepared of the work conducted and the final outcomes in each community. The three reports will then be incorporated as case examples in the final draft of the Toolkit.

Work Task 6. Final Publication and Outreach:

- F. In carrying out this work task, SNHPC staff will prepare the final complete Toolkit document, including final edits and changes and share it with the Steering Committee at its final fifth meeting and NH DOT. Upon approval, the completed Toolkit will be published and made ready for distribution as a CD to local and statewide media sources, all fifteen SNHPC communities, NGOs, state and federal agencies, and the various stakeholders involved in the Toolkit development and complete street design and implementation. The Toolkit will also be posted on the SNHPC website. It is estimated that a total of 50 CDs will be prepared and mailed.