



## **CDTC NEW VISIONS**

### **COMPLETE STREETS ADVISORY COMMITTEE**

**White Paper**

**September 2015**

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## Introduction

The Complete Streets Advisory Committee (See: <http://www.cdtcmpto.org/compst/compst.htm>) was formed prior to the last Transportation Improvement Program (TIP) update in order to review “preservation” (i.e. maintenance repaving) projects for potential incorporation of complete streets improvements. The group developed a *Purpose and Planned Outcomes* statement as shown on Page 13 of this Complete Streets White Paper.

In addition to its ongoing mission, the Complete Streets Advisory Committee was asked to make recommendations for complete streets policies and actions for the New Visions 2040 Plan.

While the current New Visions Plan includes support for complete streets concepts and implementation actions, the Complete Streets Advisory Committee considered ways in which the Plan could be updated and strengthened. ***This White Paper will discuss how the New Visions Plan can continue to support complete streets, and explore ideas for improving complete streets planning and implementation across the region especially in consideration of recent developments, including passage of the New York State Complete Streets Act, among others.***

**New Visions 2040 topics identified by the Complete Streets Advisory Committee include:**

- Synthesis of **best practices** for complete streets **implementation** (state, regional, local levels)
- Analysis of **barriers to implementation**, including current language/requirements in the NYSDOT Highway Design Manual, and identification of potential solutions.
- Identification of best practices for **incorporation of green infrastructure** into roadway, sidewalk, bicycle facilities and other applicable projects.
- Description of data/analysis required to determine **Road Diet feasibility** in different contexts
- Associated **Training and Educational Materials and Implementation Tools**
- Examination of **economic, health and safety benefits** of complete streets improvements

The Complete Streets Advisory Committee is not a policy decision making committee, but rather has been asked to make recommendations to CDTC’s Planning Committee and Policy Board. Advisory Committee members include:

- Bradley Birge, City of Saratoga Springs
- Frank Bonafide, New York State Department of Transportation (NYSDOT) Region 1
- Steve Feeney, Schenectady County
- Rocco Ferraro, Capital District Regional Planning Commission (CDRPC)
- Amanda Mansfield, Capital District Transportation Authority (CDTA)
- Kate Lawrence, City of Albany
- Robert Leslie, Town of Bethlehem
- Kate Maynard, City of Saratoga Springs
- John Scavo, Town of Clifton Park
- Jennifer Viggiani, Town of Clifton Park
- Chris Bauer, Capital District Transportation Committee (CDTC) staff
- Anne Benware, CDTC staff
- Sree Nampoothiri, CDTC staff
- Chris O’Neill, CDTC staff

## Background

The concept of planning and designing transportation systems and facilities mindful of the needs of the various users of these systems and facilities is not a new one. Consideration of multiple modes of transportation (vehicles, pedestrians, bicyclists, transit vehicles and users, and local delivery needs) in the planning, design, operation and maintenance of all modes of transportation has been part of federal, state and local policy and practice for decades, although with mixed success. Momentum has been building for better approaches, including policy, planning, design processes and implementation to “Complete our Streets.” Evidence of this “new” or renewed interest in this approach to balancing the needs of all roadway users is the adoption of over six hundred and twenty (620) Complete Streets policies across the United States over the last decade. **New York State is among 27 states across the country that has passed [Complete Streets legislation](#).** (See: <http://open.nysenate.gov/legislation/bill/s5411a-2011>)

According to the National Complete Streets Coalition “*over 625 regional and local jurisdictions, 27 states, the Commonwealth of Puerto Rico, and the District of Columbia have adopted policies or have made written commitment to do so.*”  
<http://www.smartgrowthamerica.org/complete-streets/changing-policy/complete-streets-atlas>

## What is a Complete Street?

A common definition of a Complete Street is one that is *designed & operated to enable safe access for all users, including:*

*Pedestrians, bicyclists, motorists, & public transportation users of all ages & abilities including children, the elderly, and persons with disabilities*

According to the [National Complete Streets Coalition](#):

*Complete Streets make it easy to cross the street, walk to shops, and bicycle to work.*

*Complete Streets allow buses to run on time and make it safe for people to walk to and from train stations.* (See: <http://www.smartgrowthamerica.org/documents/cs/cs-brochure-policy.pdf>)

The National Association of City Transportation Officials ([NACTO](#)) and the [NYS DOT](#) websites list various Complete Street elements such as:

- Sidewalks, crosswalks, raised crosswalks, curb ramps, pedestrian control signals
- Road diets, lane striping, bicycle lanes, paved shoulders suitable for use by bicyclists, signage, curb cuts
- Traffic calming measures, curb extensions, bus bulbs, gateways, speed humps, speed tables
- Transit streets with dedicated bus lanes, bus pull-outs, and
- Stormwater management – bioswales, flow through planters and pervious surfaces.

Source: <http://nacto.org/usdg/>



## Why should Roadways be Complete Streets?

This excerpt from [Complete Streets: A Guide for Vermont Communities](#) says it best:

*Complete Streets projects can provide diverse and widespread benefits, including the following:*

- *Streets that accommodate all users are safer for everyone, including automobile drivers and passengers. For example, everyone on the road is put at risk when a driver must cross the center line to avoid a collision with a bicycle or pedestrian, especially on a narrow road with restricted sight distance.*
- *Complete Streets can provide greater mobility and accessibility to those without a car. This can be particularly important to the quality of life for seniors and young people, allowing for greater opportunities to participate in constructive social and educational activities.*
- *Complete streets can offer a choice for less costly modes of transportation, which has economic benefit to individuals or families.*
- *Active travel (walking and bicycling) can improve health and provide needed daily exercise.*
- *It is more efficient to accommodate all modes at the planning and design stage, rather than retrofit after the fact, and correct safety issues for non-automobile road users.*

[http://healthvermont.gov/family/fit/documents/Complete\\_streets\\_guide\\_for\\_VT\\_communities.pdf](http://healthvermont.gov/family/fit/documents/Complete_streets_guide_for_VT_communities.pdf)

November 2012

## More on the Benefits of Complete Streets

<http://www.smartgrowthamerica.org/complete-streets/complete-streets-fundamentals/benefits-of-complete-streets/>

### According to the National Complete Streets Coalition:

**Complete Streets make economic sense.** A balanced transportation system that includes complete streets can bolster economic growth and stability by providing accessible and efficient connections between residences, schools, parks, public transportation, offices, and retail destinations.

**Complete Streets improve safety by reducing crashes through safety improvements.** One study found that designing for pedestrian travel by installing raised medians and redesigning intersections and sidewalks reduced pedestrian risk by 28%.

**Complete Streets encourage more walking and bicycling.** Public health experts are encouraging walking and bicycling as a response to the obesity epidemic, and complete streets can help. One study found that 43 percent of people with safe places to walk within 10 minutes of home met recommended activity levels, while just 27% of those without safe places to walk were active enough.

**Complete Streets can help ease transportation woes.** Streets that provide travel choices can give people the option to avoid traffic jams, and increase the overall capacity of the transportation network. Several smaller cities have adopted complete streets policies as one strategy to increase the overall capacity of their transportation network and reduce congestion.

**Complete Streets help children.** Streets that provide room for bicycling and walking help children get physical activity and gain independence. More children walk to school where there are sidewalks, and children who have and use safe walking and bicycling routes have a more positive view of their neighborhood. Safe Routes to School programs, gaining in popularity across the country, will benefit from complete streets policies that help turn all routes into safe routes.

**Complete streets are good for air quality.** Poor air quality in our urban areas is linked to increases in asthma and other illnesses. Yet if each resident of an American community of 100,000 replaced one car trip with one bike trip just once a month, it would cut carbon dioxide (CO<sub>2</sub>) emissions by 3,764 tons of per year in the community. Complete streets allow this to happen more easily.

**Complete Streets make fiscal sense.** Integrating sidewalks, bike lanes, transit amenities, and safe crossings into the initial design of a project spares the expense of retrofits later. Jeff Morales, former Director of Caltrans, said, “by fully considering the needs of all non-motorized travelers (pedestrians, bicyclists, and persons with disabilities) early in the life of a project, the costs associated with including facilities for these travelers are minimized.

## Social Attitudes and Preferences Related to Complete Streets and Smart Growth

Notable societal changes, including both an aging population and lifestyle preferences of the millennial generation, are having an impact on how people are travelling and the types of communities and community attributes they value. For example, according to the report [Smart Growth and Economic Success: Benefits for Real Estate Developers, Investors, Businesses, and Local Governments](#), the aging of the Baby Boomers and the migration of younger workers to urban areas “are helping to drive an increasing preference for more compact, diverse, and walkable development.”

[http://www.epa.gov/smartgrowth/economic\\_success.htm#benefits](http://www.epa.gov/smartgrowth/economic_success.htm#benefits)

**Benefits: Economy**

Millennials want to work in areas with high quality transportation and high quality of life.

Businesses that encourage active transportation attract young professionals and better business.

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National Complete Streets Coalition

[The Many Benefits of Complete Streets, National Complete Streets Coalition, January 2013](#)

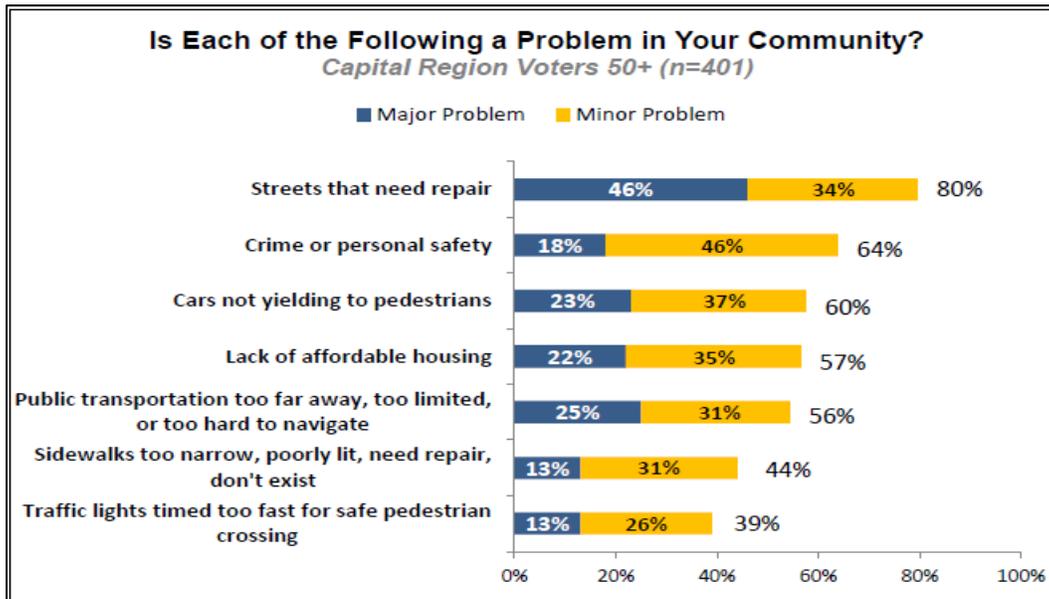
A recent Brookings Institute newsletter highlighted results of the most recent American Community Survey (ACS) on how different age groups commute to work which showed that “by and large, millennials and Generation X are leading the charge toward a range of alternate modes, including public transportation and walking...”

<http://www.brookings.edu/blogs/the-avenue/posts/2014/10/07-millennials-generation-x-commuting-trends-kane-tomer>

According to the [2013 National Community Preference Survey](#) conducted by the National Association of Realtors, eight in 10 Americans prefer being in a community that offers sidewalks and good places to walk.

While six in 10 prefer a neighborhood featuring a mix of houses, shops and services within an easy walk versus a neighborhood that requires a car for every errand.  
<http://www.realtor.org/articles/nar-2013-community-preference-survey>

AARP recently conducted a [survey](#) of people age 50 years and older across the country, New York State and within the Capital District. The chart below indicates the degree to which the 400 people responding to this survey question in our region view things like sidewalk repair and vehicles yielding to pedestrians as a problem to be addressed.



Pg. 18 [http://www.aarp.org/content/dam/aarp/research/surveys\\_statistics/general/2014/State-of-the-50-Plus-in-the-Capital-Region-of-New-York-AARP-res-gen.pdf](http://www.aarp.org/content/dam/aarp/research/surveys_statistics/general/2014/State-of-the-50-Plus-in-the-Capital-Region-of-New-York-AARP-res-gen.pdf)

In the Capital District the population of those age 65 or older is expected to continue to increase to 22% of the overall regional population by 2040.

## Benefits: Older Adults

By 2025, nearly 1 in 5 Americans will be 65 or older.

About 1/2 of all non-drivers over the age of 65 would like to get out more often.





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**National Complete Streets Coalition**

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[The Many Benefits of Complete Streets, National Complete Streets Coalition, January 2013](#)

## Complete Streets in New York State

According to the National Complete Streets Coalition website over 40 entities in New York State, ranging from villages, towns, cities, counties as well as the state itself, have adopted Complete Streets policies as of September 2014. <http://www.smartgrowthamerica.org/documents/cs/policy/cs-chart-allpolicies.pdf>

**New York State's Complete Streets Act** went into effect in 2012. The following excerpt from the New York State Department of Transportation (NYSDOT) [website](#) gives an overview of complete streets and the NYS Complete Streets Act:

*Governor Andrew M. Cuomo signed the Complete Streets Act (Chapter 398, Laws of New York) on August 15, 2011, requiring state, county and local agencies to consider the convenience and mobility of all users when developing transportation projects that receive state and federal funding. The New York State Department of Transportation (NYSDOT) is working to ensure that its policies and procedures meet the new standards. The initiative presents an opportunity to expand upon existing programs and collaborate with bicyclists, pedestrians, people with disabilities and others to identify best practices and designs for transportation facilities.*

### **Who's Responsible for Implementing Complete Streets?**

*The New York State Department of Transportation and local agencies - typically counties and municipalities - are responsible for implementing Complete Streets.*

*The law applies to projects that are undertaken by NYSDOT, or to local projects that receive both federal and state funding and are subject to NYSDOT oversight. Projects that are 100% locally funded are not subject to the law, but local agencies can choose to adopt Complete Streets practices. Many local agencies have already passed Complete Streets resolutions and/or adopted their own Complete Streets policies.*

### **What are the Benefits of Complete Streets?**

*As stated in the Act, Complete Streets will contribute to a "cleaner, greener transportation system" and "more citizens will achieve the health benefits associated with active forms of transportation while traffic congestion and auto related air pollution will be reduced."*

In February 2014 the New York State Department of Transportation released its [Complete Streets Report](#), which was a requirement of the [Complete Streets Act](#); the report is discussed below in the section on **Additional Policy Support for Complete Streets**.

## NYSAMPO Complete Streets Fact Sheet

The New York State Association of Metropolitan Planning Organizations (NYSAMPO) has developed several [fact sheets](#) to [offer examples of the types of treatments that are often included in a Complete Street](#):

- **Sidewalks** that are wide enough and without obstacles so they can be used comfortably by all pedestrians, including those with visual or mobility impairments. Providing sidewalks that are five feet wide is considered best practice. Four foot wide sidewalks meet current standards, but require additional width at regular intervals per ADA standards to allow wheelchairs to pass one another. Special design attention is necessary where spaces like sidewalk cafes will share the public right-of-way.
- **Narrower travel lanes**, which contribute to slower vehicle speed and free up space for other uses in the existing right-of-way. A design called a “road diet” may convert a four lane street to two through lanes, a center two-way left turn lane, and space for bicycle lanes. In an urban setting with lower speed limits and a low volume of trucks and buses, ten foot lanes are often sufficient for two lane roads.
- **Proper accommodation of pedestrians at intersections**, including crosswalks, curb ramps as required by the Americans with Disabilities Act, and accessible pedestrian signals. The latter are designed to accommodate visually impaired pedestrians with a locator tone and computer generated spoken messages. Crossing distance can be reduced through use of curb extensions and median refuge. (see NYSAMPO Fact Sheets on Designing Signalized Intersections to Accommodate All Users and Timing Traffic Signals to Accommodate Pedestrians at NYSAMPO website: [http://nysmpos.org/pdf/Ped%20Signal%20Timing%20Fact%20Sheet\\_Final.pdf](http://nysmpos.org/pdf/Ped%20Signal%20Timing%20Fact%20Sheet_Final.pdf)).
- **Bicycle lanes or wide paved shoulders**, depending on local policy. A new pavement marking called a “[sharrow](#)” may also be used when there is not enough pavement width for a bicycle lane. It consists of a bicycle and chevrons pointing in the direction of travel. It guides the cyclist to the proper location on the street, and alerts motorists that cyclists may be there.
- **Transit accommodations** including special bus lanes or bus pull-outs, and comfortable and accessible transit stops. Bus stops should have shelters, and must be designed so the bus driver can deploy the wheelchair lift or ramp.
- **Landscape elements** that help curb stormwater runoff such as bioswales, planters, rain gardens and street trees – are mutually beneficial for mobility and the environment. Such green elements contribute to a more comfortable and visually interesting environment for all users. Numerous trees reduce the heat island effect and offset CO2 while widened sidewalks and increased pedestrian features make the street friendlier to those walking by. Traffic-calming elements like chicanes, pedestrian islands, and curb extensions provide site opportunities for bioswales, street trees, and rain gardens.
- Complete streets are often used to **stimulate economic development**, ideally as compact mixed-use with both retail, commercial, and residential spaces. Designers must consider how stores and restaurants will receive deliveries, and where visitors and residents will park their cars without interfering with the needs of pedestrians, cyclists, or transit. Concepts include rear delivery access, and strategically placed loading zones with time restrictions.

## Additional Policy Support for Complete Streets

Since the enactment of the federal Intermodal Surface Transportation Act (ISTEA) of 1991 there has been an evolving shift in thinking about the role of transportation in communities and an attempt to better integrate non-motorized modes of transportation into existing and planned facilities. CDTC's 1997 New Visions long range plan was the first one after ISTEA to include support for complete streets. The New Visions 2030 and 2035 plans reinforced this emphasis on integrating land use and transportation and the need to plan, design and implement projects to meet the needs of all modes.

In addition to New York State's recent Complete Streets Law, other federal and state policies that reinforce this shift include:

- **USDOT Policy Statement - March 2010 on integrating non-motorized modes into projects:**
  - Consider walking and bicycling equal to other modes
  - Ensure convenient choices for people of all ages and abilities
  - Go beyond minimum design standards
  - Maintain sidewalks & paths on par with roadways
  - Improve non-motorized facilities during maintenance projects
- **[NYS Smart Growth Public Infrastructure Policy Act](#)**– requires that all public infrastructure projects undergo an evaluation to ensure they are compliant with ten Smart Growth criteria (to the extent possible). Among the criteria are:
  - To provide mobility through transportation choices including improved public transportation and reduced automobile dependency;
  - To coordinate between state and local government and intermunicipal and regional planning; to participate in community based planning and collaboration;
- **Americans with Disabilities Act (ADA) of 1990** - requires State and Local Governments to:
  - Ensure that individuals with disabilities are not excluded from programs, services and activities. Pedestrian facilities are a program and must therefore be made accessible to mobility or visually impaired individuals.
  - Develop transition plans to identify physical obstacles, describe ways to make them accessible and provide a schedule for bringing facilities into compliance.
- **[USDOT Safer People Safer Streets: Pedestrian and Bicyclist Safety Initiative](#)** – **September 2014** in recognition of the growing numbers of citizens walking and bicycling not just for recreation but for school and work commute trips, the USDOT released a plan to:
  - Address increasing numbers of pedestrian and bicyclist injuries and fatalities related to collisions with motor vehicles as overall motor vehicle crashes continue to decline. Since 2009, fatalities have been increasing for bicyclists and pedestrians. In 2012, bicyclist and pedestrian fatalities were over 16% of all traffic-related fatalities.
  - In addition to a new Road Diet Guide, USDOT “will research and promote evidence-based design concepts that help drivers, bicyclists, and pedestrians share the road together safely, including roadway reconfigurations that better serve all users.

[http://www.dot.gov/sites/dot.gov/files/docs/safer\\_people\\_safer\\_streets\\_summary\\_doc\\_acc\\_v1-11-9.pdf](http://www.dot.gov/sites/dot.gov/files/docs/safer_people_safer_streets_summary_doc_acc_v1-11-9.pdf)

## New York State [Complete Streets Report](#)

[As stated in NYSDOT's report](#) "The Complete Streets Act required the New York State Department of Transportation (NYSDOT) to develop a report that demonstrates the Department's implementation efforts and identifies best practices in Complete Streets implementation throughout New York State. Further, the Act states that NYSDOT must show how it has institutionalized Complete Streets by addressing and incorporating its design features in planning, project scoping, design and implementation of transportation projects."

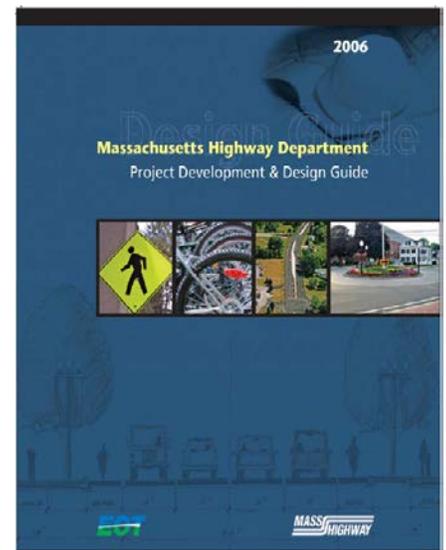
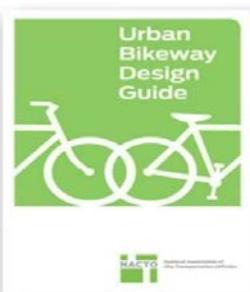
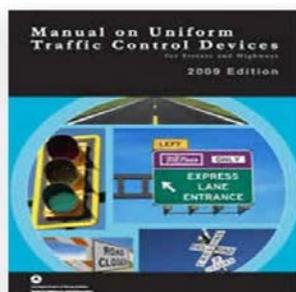
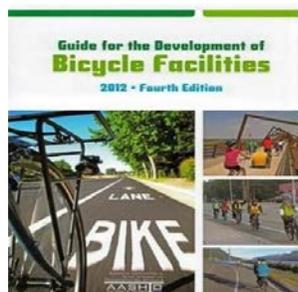
According to the report "NYSDOT has a number of policies and procedures in place that are either directly or indirectly related to the implementation of Complete Streets principles. NYSDOT's internal review ... illustrated how the Department has integrated the principles and the spirit of the Complete Streets Act into its policies and procedures. In instances where guidance was absent or not consistent, NYSDOT identified the steps required to address those gaps."

*Information in the [NYS Complete Streets Report](#) can be used as a starting point for several of the topics to be explored as part of the New Visions 2040 plan update.*

## Existing Design Guidance Related to Complete Streets

Over the past several years as the desire to create a more balanced transportation system that works safely and more efficiently for a variety of users has taken hold in many states and communities across the United States, a growing list of **design standards and guidance manuals** specifically aimed at **designing, operating and maintaining a system of Complete Streets** is now available and includes, among others:

- [National Association of City Transportation Officials \(NACTO\) Urban Street Design Guide](#)
- [Massachusetts Highway Project Development and Design Guide](#)
- FHWA Guide for Maintaining Pedestrian Facilities for Enhanced Safety
- New York City DOT Street Design Manual
- AASHTO Bicycle Facilities Design Guide, 2012
- [NACTO Urban Bikeway Design Guide](#)
- Broward County MPO Complete Streets Guidelines
- Boston Complete Streets Manual <http://bostoncompletestreets.org>
- <http://www.modelstreetdesignmanual.com/>
- Cornell Local Roads Program Complete Streets Manual





## Urban Street Design Guide Endorsement Campaign

The National Association of City Transportation Officials (NACTO) unveiled a new design manual for city streets in September, 2013. A blueprint for the 21st century streetscape, the [Urban Street Design Guide](#) demonstrates how streets of every size can be reimagined and reoriented as safe, sustainable public spaces for people walking, driving, biking, and taking transit. In cities, streets must serve multiple purposes, from storefront or doorstep to throughway. The Guide emphasizes the core principles for making urban streets great public places with an instrumental role in building communities.

### [Urban Street Design Guide Endorsements](#)

#### [USDOT](#)

[FHWA Memorandum](#)

#### [States](#)

[California](#)

[Colorado](#)

[Massachusetts](#)

[Minnesota](#)

[Tennessee](#)

[Utah](#)

[Washington](#)

## FHWA Questions & Answers about Design Flexibility for Pedestrian and Bicycle Facilities

### What is FHWA's perspective on NACTO's *Urban Street Design Guide*?

NACTO's *Urban Street Design Guide* provides sample scenarios that build on the flexibilities in the AASHTO *Policy on Geometric Design of Highways and Streets*, *Guide for the Planning, Design, and Operation of Pedestrian Facilities* and *Guide for the Development of Bicycle Facilities*.

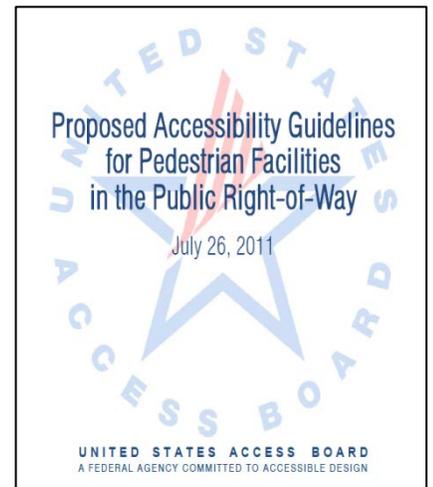
The *Urban Street Design Guide* can be used to inform the planning and design process in conjunction with these other resources. FHWA distributed copies of the *Urban Street Design Guide* to all of our Division and Federal Lands Highway Offices in fall 2013. It can serve as an additional resource as communities plan and design facilities for all modes of travel.

***FHWA supports the use of the Urban Street Design Guide in conjunction with the other resources cited above in the process of developing nonmotorized transportation networks.***

[http://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/guidance/design\\_guidance/design\\_flexibility\\_ga.cfm](http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_guidance/design_flexibility_ga.cfm)

Specific Complete Streets Design Guidelines are not currently available at the federal or New York State level. However, there are both federal and New York State roadway design standards and guidelines in place related to the appropriate application and design of various complete streets elements.

- NYS Highway Design Manual (various chapters, especially [Chapter 17 Bicycle Facility Design](#) and [Chapter 18 Pedestrian Facility Design](#)) NYSDOT's website provides a table listing specific design treatments and related NYS HDM references see:  
<https://www.dot.ny.gov/programs/completestreets/designing>
  - **Note:** NYSDOT has drafted both a [Complete Streets Planning Checklist](#) to replace the previously used Pedestrian Generator Checklist in Chapter 18 to be used in project scoping and development, and a
  - [Complete Streets Checklist for Highway Work Permits](#)
- ADA Requirements in the NYS Highway Design Manual Chapter 18 Pedestrian Facility Design: "The following references provide nationally accepted standards for pedestrian facilities. The Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities ([ADAAG](#)) ([www.access-board.gov](http://www.access-board.gov)) as supplemented by the 2011 Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way ([PROWAG](#)) are the primary regulatory standards that govern the design and construction of all pedestrian facilities in all Department projects."
- [National Manual of Uniform Traffic Control Devices](#) and the NYS Supplement
- NYSDOT's Shared Lane Marking ("sharrow") Policy (<https://www.dot.ny.gov/programs/completestreets/repository/TSM113-07final.pdf>)



According to NYSDOT's website, "These additional design resources may be used in conjunction with the appropriate traffic and engineering studies":

- Cornell Local Roads Program [Complete Streets Manual](#)
- New York City DOT [Street Design Manual](#)
- National Association of City Transportation Officials (NACTO) [Urban Street Design Guide](#)

## The Role of the CDTC Complete Streets Advisory Committee –

[CDTC's Complete Streets Advisory Committee](#) includes staff from entities represented on CDTC's Planning Committee including NYSDOT, CDTA, CDRPC, two cities, one county, and two towns as listed on page 2 of this White Paper. The Committee's work is facilitated by CDTC staff.

The Complete Streets Advisory Committee was formed prior to the last Transportation Improvement Program (TIP) update in order to review "preservation" (i.e. maintenance repaving) projects for potential incorporation of complete streets improvements. At that time, NYSDOT adopted a "[Preservation First](#)" policy and associated guidance to be used in development of NYSDOT's own capital program update and Metropolitan Planning Organization TIPs. According to this guidance, Preservation First means "Expected resources will not support a "build new" or "worst first" approach but must have a "preserve what we have" approach."

To help guide the work of the group, the Advisory Committee developed a [Purpose and Planned Outcomes statement in September 2013](#):

***Purpose:*** *The Complete Streets Advisory Committee's purpose is to assist in identifying opportunities and mechanisms to assist roadway improvement project implementers and municipalities, in partnership with roadway owners, in integrating complete streets elements into a variety of project types as listed below.*

*The group will research, learn and then share learned information with the Planning Committee and Policy Board, as appropriate, on complete streets tools and techniques that should be integrated into projects across a range of project types. Initial emphasis will be on low cost techniques and partnerships to assist CDTC, NYSDOT, the four counties and municipalities to meet stated goals for improved transportation safety, a multimodal transportation system serving all users, and sustainability goals. Fostering improved communication between project planners and designers to achieve integration is a major goal.*

***Applicability:*** *There are three broad categories of projects:*

- *Preservation First/Maintenance and Operations projects (Includes projects currently on the adopted/draft TIP and those to be selected through upcoming preservation set aside project solicitations)*
- *Existing TIP infrastructure projects (Includes projects currently on the adopted/draft TIP which are considered "beyond preservation" )*
- *Land development/redevelopment initiated improvements*

***Planned Outcomes:***

- *Revised TIP Project Justification Package/Solicitation Materials and Project Selection process that includes questions and evaluation criteria to incentivize incorporation of complete streets elements into "preservation first"/maintenance and operations type projects.*
- *Identification of complete streets elements that can be integrated into various categories of project types (i.e. repaving/restriping projects, signal timing improvements, etc.) with an emphasis on low cost or shared cost elements.*
- *A list identifying "beyond preservation" projects on the TIP currently in the pipeline where there's a window of opportunity to identify and implement complete streets elements.*
- *Institutionalization of a process between NYSDOT, CDTC and municipalities to foster enhanced communication and to provide an ongoing mechanism to provide meaningful input that will be utilized in the design process to integrate complete streets elements into projects. Determination of*

*the points in the project development/design process representing windows of opportunity for this input. Identification of the most effective means of communication and input such as a regularly set meeting schedule (bi-monthly?) or based on NYSDOT's project development/design schedule.*

- *Improve communication and coordination between NYSDOT and municipalities to ensure a unified approach and complete streets oriented outcomes as a result of development site plan review and approvals. In these fiscally challenging times, one key avenue for integration of complete streets elements into the capital region's roadways and realization of a multi modal transportation system that serves the capital region's communities is incremental improvements related to newly developed or redeveloped sites along major roadways. Incremental improvements are typically required as part of mitigation of development impacts to these roadways. To achieve this there needs to be more consistency among the region's municipalities in requiring private sector participation in appropriate development mitigation as well as consistent support from and ongoing coordination with NYSDOT, CDTA, other agency and municipal partners.*

As mentioned previously, in addition to its ongoing mission, the Complete Streets Advisory Committee was asked to make recommendations for complete streets policies and actions for the New Visions 2040 Plan. ***This White Paper will discuss how the New Visions Plan can continue to support complete streets, and explore ideas for improving complete streets planning and implementation across the region.***



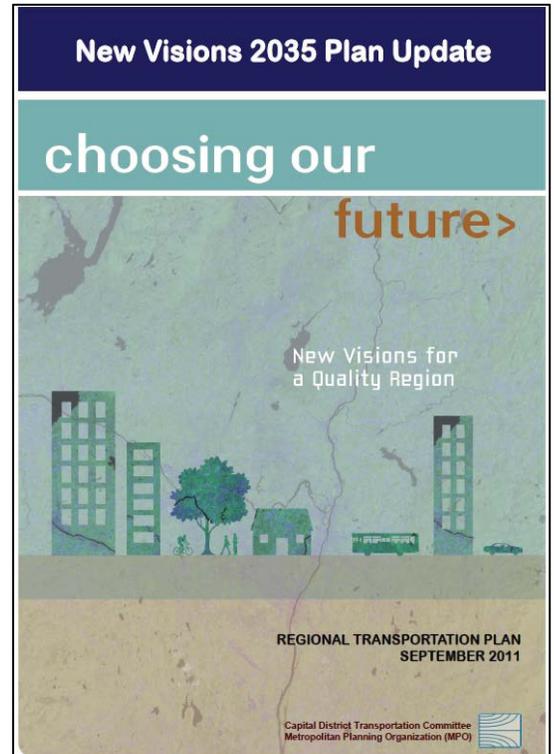
Source: NYSDOT website

## New Visions and Complete Streets

The current New Visions Plan addresses complete streets in a number of important ways

The [New Visions 2035 plan](#) incorporated the previous plan's adopted strategies and actions related to [Complete Streets](#) including:

- *Treat all modes fairly in the Capital Program*
- *Routinely make road projects bicycle, pedestrian and transit friendly.*
- *Pro-actively plan vibrant communities:*
  - *Projects should be designed such that they are sensitive to the communities through which they traverse. Improving site and access design practices to better accommodate pedestrians, bicycles, goods movement, transit, and auto access is a key aspect of this strategy.*
- *Use of Integrated Community and Transportation Design techniques in the design of local, county and state road systems:*
  - *Transportation projects that are designed to support and adhere to land use plans that promote compact development and emphasize connected streets, sidewalks, convenient transit access and human-scale design are critical elements of the process for fostering a sense of place and community.*



[CDTC's Linkage Planning Program](#), supported in **New Visions**, includes the following core strategies that support planning, design and implementation of Complete Streets to foster livable, economically vibrant, healthy communities:

- Support urban revitalization and redevelopment of existing commercial/residential areas;
- Improve street connectivity and reduce driveway conflicts through access management;
- Enhance and develop activity centers and town centers;
- Enhance and develop transit corridors and transit supportive built environments;
- Encourage a greater mix and intensity of land uses;
- Develop bicycle and pedestrian-friendly design standards;
- Create an integrated multi-modal transportation network.

### The Community and Transportation Linkage Planning Program



A land use/transportation planning assistance program offered by the Capital District Transportation Committee

## New Visions 2040 Complete Streets Planning and Investment Principle:

The following Planning and Investment Principle proposed for the [New Visions 2040](#) update explicitly supports complete streets:

**Complete Streets – Street design will serve all users including pedestrians, bicyclists, transit riders, freight, and drivers.**

*Transportation investments are made based on a complete streets framework which supports the convenient and safe travel of all people — of all ages and abilities as appropriate to a facility's community context.*

*Utilizing a complete streets framework ensures that transportation investments are consistently planned, programmed, designed, operated and maintained with all users in mind – including bicyclists, public transportation vehicles and riders, pedestrians of all ages and abilities, and local delivery needs.*

*Successful implementation of a complete streets framework will be achieved by working with federal, state, regional and local partners to improve communication and coordination, training and education, and design standards and other resources.*

## New Visions 2040 Topics

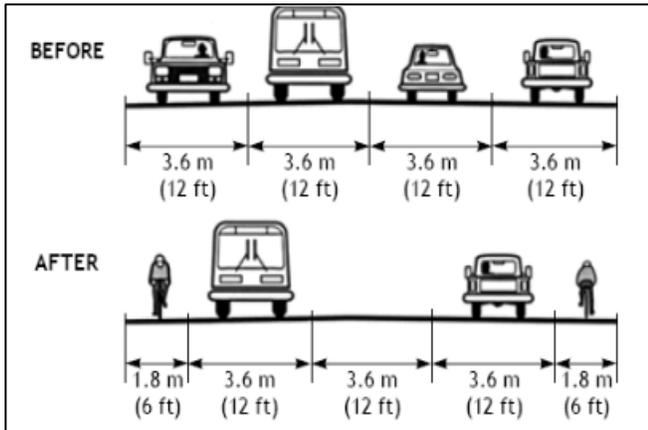
As mentioned above, the Complete Streets Advisory Committee identified a list of topics or issues to be further explored as part of the New Visions 2040 update. Some of these will take more time and effort than can be accomplished during the New Visions 2040 update timeframe; accordingly, these issues can be addressed through [recommendations](#) detailing actions that will be undertaken subsequent to adoption of the New Visions 2040 plan. Topics include:

1. Synthesis of **best practices** for complete streets **implementation** (state, regional, local levels)
2. Analysis of **barriers to implementation**, including current language/requirements in the NYSDOT Highway Design Manual, and identification of potential solutions.
3. Description of data/analysis required to determine **Road Diet feasibility** in different contexts
4. Identification of best practices for **incorporation of green infrastructure** into roadway, sidewalk, bicycle facilities and other applicable projects.
5. Associated **Training and Educational Materials and Implementation Tools**
6. Examination of **economic, health and safety benefits** of complete streets improvements

Topics 3. and 4. were researched by CDTC staff with results described below.

## Topic 3. Assessing Road Diet Feasibility in Different Contexts

Road Diets can be one of the lower cost elements of a community’s Complete Streets toolkit as they can be implemented through restriping travel lanes as part of a repaving project.



<https://michigancompletestreets.wordpress.com/tag/road-diet/>



**Consider what can be accomplished with pavement markings.**

- o **Road diet.** Is this a 4 lane street that can be reduced to 2 through lanes, a center two-way left turn lane, and bike lanes?

Source: NYSAMPO CS Fact Sheet 2.0

According to FHWA’s [“Proven Safety Countermeasures” website](#) “a [Road Diet](#) is a way to reconfigure a roadway that involves converting an undivided four lane roadway into three lanes made up of two through lanes and a center two-way left turn lane. The reduction of lanes allows the roadway to be reallocated for other uses such as bike lanes, pedestrian crossing islands, and/or parking. Road diets have multiple safety and operational benefits for vehicles as well as pedestrians”.

As with any potential street reconfiguration project public outreach that provides community residents, businesses and other stakeholders the opportunity to learn about the issues and potential solutions by being engaged throughout the planning process is critical. Public meetings, paper and online surveys, walking tours, websites and other mechanisms have been important components of public involvement plans for proposed road diet projects around the country. Case studies are often used as one way to illustrate how other communities have examined the potential for a road reconfiguration project via a road diet. Case study information can be useful to provide information on “before and after” results that focus on impacts to safety, accessibility and the local economy. (See: <http://infoforward.org/info-forward/middlefield-road-redesign>)

### Generic Benefits of Road Diets

- ✓ *Manages Traffic Speed:* Narrowing streets through road diets helps promote self-compliance with speed limits. This has been found to be the most successful approach to managing speeds on major streets. Slowing traffic creates a safer, more comfortable environment for cyclists and pedestrians, and minimizes the cost of crashes when they do occur.
- ✓ *Makes Driving Safer:* When a car stops in a moving traffic lane to turn left, it causes congestion, blind spots, unsafe lane changes, and changes in travel speed. In a three-lane system, there is always one lane for driving and one lane for left turns, making driving safer and more reliable, with fewer conflicts and frustrations. With a center lane, left turns onto a three-lane road are simpler with drivers crossing one lane at a time. With an undivided four lane road, a driver must find a gap in two or three lanes at once to make a left turn.
- ✓ *Walking is Made Safer:* Crossing is limited to three lanes, not four. Speeds in a three lane system are lower, making it more comfortable to walk. Shoulders provide space outside the travel lane to walk, until sidewalks can be constructed in the future.

- ✓ *Cycling is Made Safer:* Shoulder space significantly increases safety for cyclists, separating them from the traffic stream.
- ✓ *Enhances Quality of Life and Improves Accessibility:* By improving the walking and bicycling environment, vehicle travel can be reduced, decreasing energy use, and air pollutant emissions. Accessibility to businesses is also enhanced, making it easier for residents to patronize local businesses without relying on a car or when driving, reducing turning conflicts due to the center turn lane.

### Criteria Used to Identify Road Diet Candidates

Road dieting has been found to be successful in environments where traffic is low, driveways are managed, and intersections work at an acceptable level-of-service.

- ✓ *Traffic Volume:* According to the Federal Highway Administration, dieting has an excellent chance of working on four lane roads carrying less than 15,000 vehicles per day. Dieting on higher volume roads can work where driveways are few, turn movements are low, and intersections are uncongested. Some municipalities on the west coast, including Seattle and Fresno, for example, will consider dieting on roads carrying as many as 25,000 vehicles per day. In the City of Schenectady a four lane section of Route 5/State Street carrying 16,000 vehicles per day was recently road dieted, creating a more inviting pedestrian and bicycling environment and slowing travel speeds. Fuller Road in Albany County was road dieted in the section that carries over 17,000 vehicles per day to a two travel lanes northbound, one southbound and a center turn lane; on the section carrying 13,000 vehicles per day between Washington Avenue and Western Avenue, a typical road diet layout was retained in the recent project.
- ✓ *Driveway Number & Volume:* Roads with properly-spaced driveways, interconnected properties, and manageable left-turn volumes, are good candidates for dieting. Standards have been established for driveway design and location.
- ✓ *Intersection Performance:* Intersection congestion impacts and associated signal timing adjustments are a major consideration in successful dieting projects. Highway Capacity Manual analysis must show that intersections maintain current level-of-service or better.



Fuller Road between Washington Avenue and Western Avenue, near SUNY Albany

### Data Required for Assessment

1. Traffic counts
  - a. Traffic volume along road segments
    - i. Vehicular AADT and bike/ped (intensity). NYSDOT, County, Municipality, or CDTC might have previous counts available.
  - b. Intersection turn counts for peak periods
    - i. Auto
    - ii. Bike
    - iii. Pedestrian
    - iv. Truck
  - c. Intersection configuration and control
    - i. Number of lanes for each approach and traffic movement on each lane (left turn only, thru/right, right turn only, etc.)
    - ii. Stop signs (all-way stop or two-way stop)
    - iii. Signal phasing and timing
2. Pavement width and marking
  - a. Lanes, median, shoulder, bike lanes, sidewalk, crosswalk, etc.
3. Driveways
  - a. Separate counts of residential and commercial driveways in each road segment
  - b. Average distance between driveways
4. Traffic projection to the horizon year

In order to understand the potential future traffic, carry out a Traffic impact study. If study is not possible, find out the following per Traffic Analysis Zone (TAZ) to come up with an estimate (CDTC can provide the TAZ information):

- a. Square foot of proposed/envisioned commercial/office development
  - b. Number of proposed/envisioned residential units
  - c. Use Trip Generation Manual to come up with potential traffic generation
  - d. CDTC can use its STEP model to simulate the traffic and figure out potential routes the traffic might take.
5. Safety data
    - a. Any traffic incident information available, particularly bike/ped and auto conflicts
    - b. CDTC could look at NYSDOT's ALIS system to check this.

### Analyses Required and Thresholds

1. Traffic Volume

According to the Federal Highway Administration, dieting has an excellent chance of working on four lane roads carrying less than 15,000 vehicles per day. Dieting on higher volume roads can work (may be up to 25,000) where driveways are few, turn movements are low, and intersections are uncongested. In the City of Schenectady a four lane section of Route 5/State Street carrying 16,000 vehicles per day was road dieted, creating a more inviting pedestrian and bicycling environment and slowing travel speeds. Fuller Road in Albany County was road dieted in the section that carries over 17,000 vehicles per day to a two travel lanes northbound, one southbound, and a center turn lane.

### 2. Driveway Compatibility Analysis

Roads with properly-spaced driveways, interconnected properties, and manageable left-turn volumes, are good candidates for dieting. CDTC has developed a methodology to analyze the driveway compatibility based on the traffic volume (AADT), number of commercial and residential driveways, and average distance between driveways. This is a measure of conflict between mainline traffic and driveway traffic.

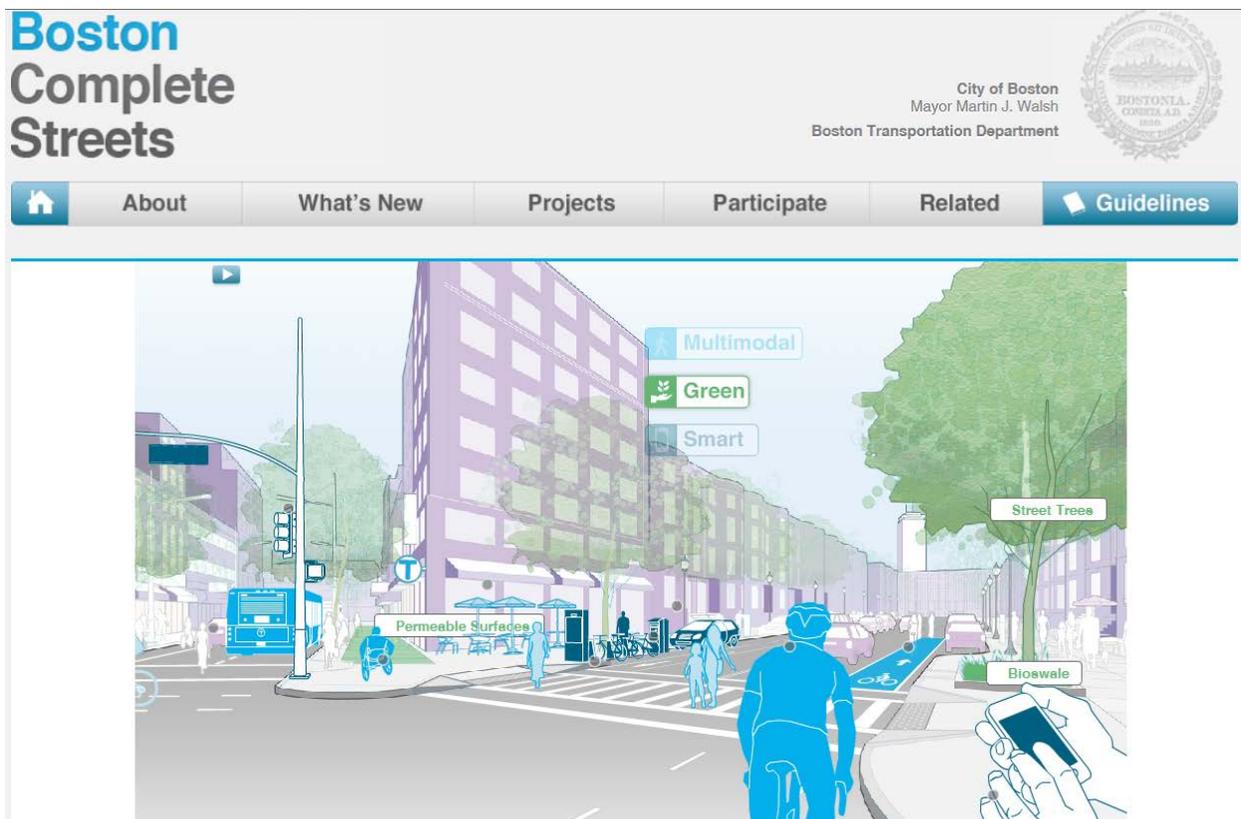
### 3. Intersection Performance

Intersection congestion impacts and associated signal timing adjustments are a major consideration in successful dieting projects. Highway Capacity Manual analysis must show that intersections maintain current level-of-service or better.

## Topic 4. Green Streets

*The integration of sustainable elements into complete streets projects is another feature gaining momentum as communities around the country gain experience as they implement projects.*

**Green streets** integrate **green infrastructure** elements into street design to manage stormwater runoff, and utilize attractive, functional elements to minimize or offset negative environmental effects typically associated with street infrastructure. Complete streets complement sustainability efforts, ensuring benefits for mobility, community and the environment. Implementation of a complete streets project provides an additional opportunity to improve the livability of our communities by incorporating green infrastructure. Making our transportation system more sustainable involves policies and practices that minimize environmental impact and create streets that are safe for everyone, regardless of age, ability, or mode of transportation. Many elements of street design, construction, and operation can work in favor of achieving both Complete Streets and ‘green’ streets that serve environmental sustainability.



**Information on best practices for incorporation of green infrastructure into roadway, sidewalk, bicycle facilities and other applicable projects is more fully explored in Appendix 2.**

## New Visions 2040 Recommendations:

In addition to retaining the strategies and actions from New Visions 2035 as listed above, these recommended actions are presented for consideration:

1. **Develop and adopt an explicit Complete Streets Policy and encourage the region’s municipalities to adopt their own policies** – while the New Visions Plan, the Linkage Planning Program, and the TIP Project Justification Package each support a complete streets framework, other MPOs around the country have adopted explicit Complete Streets Policies.

**It is recommended that:**

- A CDTC Complete Streets Policy be developed and modeled after the current effort being undertaken by the [Binghamton Metropolitan Transportation Study \(BMTS\)](#), the MPO for the Binghamton/Broome County area in NYS. This policy would be developed with the assistance of the CDTC Complete Streets Advisory Committee in partnership with NYSDOT and the Planning Committee. Examples of other MPOs around the United States that have adopted Complete Streets Policies and Complete Streets Design Guidelines include [IndyMPO](#), [Broward County MPO](#), and [MORPC](#) (Columbus, Ohio), among others. Adopting a Complete Streets Policy would help provide consistency with New York State policy and law and the growing number of local municipal policies, as well as provide a foundation for further complete streets implementation activities such as those recommended below.
- CDTC develop incentives for municipal and county adoption of complete streets policies. One incentive would be that a project sponsor’s proposed Linkage Program project would receive points and a higher project ranking if that entity had an adopted complete streets policy.

As part of CDTC’s complete streets policy development, the safety, public health, and economic benefits of complete streets will be explored and documented. **Information on benefits will be explored using resources such those listed below, among others:**

[NYC Measuring the Street Report](#)

[Bikes Mean Business](#) report

Active Living Research’s [Economic Impacts of Walkable Shopping Areas](#),  
[Economic Impact of Bicycling and Walking in Vermont 2012](#)

The [National Complete Streets Coalition](#) has identified **four key steps for successful implementation of a Complete Streets Policy**:

- 1) Restructure procedures to accommodate all users on every project;
- 2) Develop new design policies and guides;
- 3) Offer workshops and other training opportunities to planners and engineers; and
- 4) Institute better ways to measure performance and collect data on how well the streets are serving all users.

<http://www.smartgrowthamerica.org/documents/cs/policy/cs-policyelements.pdf>

- 2. Develop a Complete Streets Training and Education Program in partnership with NYSDOT tailored to those who use, plan, approve, fund, design, construct and maintain transportation facilities at all levels of government, the private sector and the broader community -** Regionally tailored training and education materials, targeted to each audience, should be developed through this effort that can then be used in the future and updated as needed. As recommended in its [Complete Streets Report](#) (February 2014), NYSDOT recognizes the importance of continued training to a variety of agencies and stakeholders. CDTC will partner with NYSDOT and other state agencies, such as the Department of State, to provide training and outreach.

**It is recommended that:**

- Utilizing available national training resources, develop a yearly training and education program to assist local, regional and state practitioners and policy makers implement complete streets across the region. It is widely acknowledged that successfully integrating complete streets features into different types of projects and at different project stages, including operations and maintenance, requires an understanding of recently crafted tools and techniques. A focus of this training will be to ensure local communities have an understanding of both the elements of the most up to date complete streets design guidance available, and the flexibility in their application. Use of regional and local examples and case studies will be critical in developing a successful training and education program.

To communicate the availability of training opportunities and educational resources a calendar of events, websites and social media should be developed and used.

- An audit of available training and education resources is conducted. Organizations such as AASHTO (American Association of State Highway and Transportation Officials), ITE (Institute of Transportation Engineers), NACTO (National Association of City Transportation Officials), APBP (Association of Pedestrian and Bicycle Professionals), Smart Growth America, PBIC (Pedestrian and Bicycle Information Center), Cornell Local Roads Program, APA (American Planning Association) and others offer training and education opportunities that will be explored and utilized as part of the training and education program.

Significant efforts to communicate the benefits of complete streets to key decision makers and the public should be incorporated into the early stages of the Education Program.

- In consultation with CDTC's Planning Committee, develop and institute a series of incentives for participation in complete streets training. Ensure that continuing education credits such as PDHs (professional development hours) and CM credits (AICP certification maintenance) for professional engineers and planners are available for training participants.

- 3. Develop Complete Streets Design and Implementation Guidelines** – The number of entities developing and adopting complete streets design standards and guidance continues to grow across the US. These standards and guidelines can be standalone documents or integrated into existing roadway design standards and project development and operations processes, with those undertaking these changes to implement complete streets ranging from states, to municipalities, to MPOs.

**It is recommended that:**

- Working with state, local and MPO partners, and utilizing the rich set of resources currently available, develop a complete streets toolkit to assist agencies in planning, designing and operating transportation facilities consistent with complete streets policies.
  - ✓ To accomplish this task, complete an analysis of barriers to implementation, including:
    - Current language/requirements in the NYSDOT Highway Design Manual, and identification of potential solutions. This is crucial since all locally sponsored federal aid projects funded through the TIP are required to comply with the Highway Design Manual.
    - Current municipal site plan and highway access permitting and approval processes.
    - Less straightforward barriers such as social, political, and even psychological barriers.
- Guidelines and associated materials should:
  - ✓ Provide sufficient detail to ensure understanding of specific design treatments and how they fit into and can feasibly be implemented in various contexts: urban, suburban or rural. Detailed case studies comprised of examples from around New York State, and locally where available, illustrating implementation of complete streets features into a variety of project types and roadway/land use contexts should be included.
  - ✓ Incorporate information on FHWA 's Proven Safety Countermeasures related to complete streets elements such as Road Diets, Roundabouts, HAWK signals and other treatments as appropriate. In addition, these materials should include information on implementation of signal technology improvements as these have the potential to improve traffic mobility and safety at low cost. Signal technology also can enhance pedestrian, bicycle and transit access and provide an important component of complete streets. The CDTC Regional Operations and Safety Advisory Committee is developing recommendations for implementing and operating signal technology.
  - ✓ Include specific tools to assist the region's local communities to implement complete streets projects.

- 4. Develop a method** to track progress and measure performance of complete streets policies focused on TIP project outcomes.

**It is recommended that:**

- The Complete Streets Advisory Committee convene working sessions with other representatives of CDTC's Planning Committee that have experience with TIP project implementation. The purpose of these working sessions will be:
  - ✓ To devise a process and associated tools to both keep the Planning Committee informed on progress and to help ensure that projects that were proposed to include various complete streets elements at the conceptual level as described in Project Justification Packages are on track to include those elements or the intent of those elements into built projects.

The idea is to have some type of "report back" to the Planning Committee on TIP projects as they move through the scoping, design, NEPA (National Environmental Protection Act) steps. The overriding purpose would be to enhance communication and coordination and to assist project implementers in integrating complete streets elements into projects by providing support from others who may have encountered similar situations/barriers/constraints and by providing research support from staff on potential solutions.

- 5. Incentivize implementation of complete streets by modifying the TIP Project Candidate Merit Evaluation Process.**

**It is recommended that:**

- The TIP Project Justification Package (PJP) and Merit Evaluation Process be modified to give additional credits to project proposals that:
  - ✓ Include complete streets features where potentially feasible and appropriate
  - ✓ Have been submitted by project sponsors that have attended a complete streets training conducted by a professional organization such as the training proposed in Recommendation 2 above.
- Any future PJP Training Workshops that may be conducted by CDTC staff for prospective TIP project sponsors include a module on complete streets using the training and education materials developed in Recommendation 2 above.
- Modifications are made to the TIP Project Justification Package to include a certification by the project sponsor that complete streets training was attended by project sponsor staff responsible for project implementation.

## Proposed Initial List of Performance Measures

- Number of communities in the region adopting complete streets policies via governing body action
- Number of complete streets training sessions held and number of attendees from the following targeted groups:
  - ✓ Policy and decision makers
  - ✓ Planners
  - ✓ Roadway designers, operators and maintainers (city engineers, town highway superintendents, DPW staff, NYSDOT traffic and safety, design and operations staff, consulting firm staff)
  - ✓ Residents/Citizens, other stakeholders
  - ✓ Real estate developers
- Number of projects including complete streets features
- Number of project development, operations and maintenance practices that utilize a complete streets approach

## Appendix 1 – Examples of Complete Streets Projects Around the US

Before



After



Location: Main St., Pottstown, PA; Photo Credit: Michael Ronkin; Source: FHWA



Location: East Blvd., Charlotte, NC; Photo Credit: Dan Gallagher; Source: FHWA



Location: Stone Way North, Seattle, WA; Photo Credit: SDOT; Source: FHWA

## Examples of Complete Streets Projects Around New York State

Before



After



Location: NY Route 347, Hauppauge to Port Jefferson, NY; Source: NYSDOT



Location: Great Neck Rd., Great Neck, NY; Source: NYSDOT



Location: US Route 11, Canton, NY; Source: NYSDOT

## Examples of Complete Streets Elements in the Capital District



Location: State St., Schenectady, NY; Source: CDTC



Location: State St., Schenectady, NY; Source: CDTC



Location: Dunning St., Malta, NY; Source: CDTC



Location: Delaware Ave., Albany, NY; Source: Times-Union



Location: Broadway, Saratoga Springs, NY; Source: CDTC



Location: Broadway, Saratoga Springs, NY; Source: CDTC



Location: Washington Ave., Albany, NY; Source: CDTC



Location: NY Route 2, Troy, NY; Source: CDTC

## Appendix 2 – Green Streets

### Stormwater Management

Drainage and stormwater runoff are common issues in traditional streets. Wide streets are problematic for both mobility and ecology. They can be unpleasant or, worse, unsafe, for pedestrians and bicyclists. Large swaths of impervious pavement necessitate expensive drainage and treatment systems that can have harmful effects on water quality and quantity. Drainage facilities can affect pedestrians, bicyclists, and public transportation users in various ways as well. Poorly maintained systems create puddles that splash pedestrians and those waiting in bus shelters, and are hazards for bicyclists, by hiding potential cracks.

Sustainable stormwater management looks beyond removing large quantities of water as quickly as possible. Negative environmental impacts associated with both storm-water quality and quantity includes polluted runoff, sedimentation, and bank erosion. Green street stormwater management focuses on efforts to retain, treat, and/or eliminate runoff at the source through cost-effective green infrastructure, improving water quality and complementing Complete Streets efforts.

A green street uses a combination of vegetated and engineered strategies to manage rain or melting snow, i.e. stormwater runoff, at the source. Green street designs incorporate various green stormwater infrastructure tools, including tree trenches, planters, bumpouts, and pervious pavement. Using these tools, a green street captures stormwater runoff from streets and sidewalks, infiltrates it into the soil to recharge groundwater and surface water, reduces the amount of polluted stormwater runoff going into our sewer system, and reduces sewer overflow events.

### Permeable Surfaces

Permeable surfaces include porous asphalt and concrete surfaces, concrete pavers (permeable interlocking concrete paving systems), or polymer-based grass pavers, grids and geocells. Porous pavements and concrete pavers enable stormwater to drain through a stone base layer for on-site infiltration and filtering. Polymer based grass grid or cellular paver systems provide load bearing reinforcement for unpaved surfaces of gravel or turf.

Grass pavers, plastic turf reinforcing grids, and geocells are honeycombed grid-cellular systems, made of thin-walled plastic or other polymer alloys. These provide grass reinforcement, ground stabilization and gravel retention. The 3D structure reinforces infill and transfers vertical loads from the surface, distributing them over a wider area. Selection of the type of cellular grid depends on the surface material, traffic and loads. The cellular grids are installed on a prepared base layer of open-graded stone or engineered stone. The surface layer may be compacted gravel or topsoil seeded with grass and fertilizer. In addition to load support, the cellular grid reduces compaction of the soil to maintain permeability, while the roots improve permeability due to their root channels.

Permeable paving is an important component in Low Impact Development, a process for land development that attempts to minimize impacts on water quality. In new suburban growth, porous pavements protect watersheds. In existing built-out areas and towns, redevelopment and reconstruction are opportunities to implement stormwater water management practices.

Permeable surface can be used on Complete Streets once it has been determined the surfaces will not compromise pedestrian and bicyclist access and safety.

**Permeable Surfaces**

<b>Advantages</b>	<b>Other Considerations</b>
<p><b>Managing Runoff</b> Permeable paving surfaces have been demonstrated as effective in managing runoff from paved surfaces.</p> <p><b>Controlling Pollutants</b> Permeable paving surfaces keep the pollutants in place in the soil or other material underlying the roadway, and allow water seepage to groundwater recharge while preventing the stream erosion problems.</p> <p><b>Trees</b> Permeable pavements may give urban trees the rooting space they need to grow to full size.</p> <p><b>Snow Melt</b> Some research suggests that rapid drainage below porous surfaces increases the rate of snow melt above.</p>	<p><b>Runoff Volumes</b> Permeable pavements are designed to replace impervious areas not to manage stormwater from other impervious surfaces on site.</p> <p><b>Pollutant Load</b> Since porous pavement is an infiltration practice, it should not be applied near land uses where pollutant concentrations exceed those typically found in stormwater (ex: fueling stations, hazardous materials sites, etc.) due to the potential for groundwater contamination.</p> <p><b>Weight and Traffic Volumes</b> Reference sources differ on whether low or medium traffic volumes and weights are appropriate for porous pavements, however, given the variability of products available, the growing number of existing installations in North America and targeted research by both manufacturers and user agencies, the range of accepted applications seems to be expanding.</p> <p><b>Siting</b> Permeable pavements may not be appropriate when land surrounding or draining into the pavement exceeds a 20% slope, where pavement is down slope from buildings or where foundations have piped drainage at their footers.</p> <p><b>Cold Climate Challenges</b> Road salt contains chlorides that could migrate through the porous pavement into groundwater. Snowplow activities can damage pervious pavement dependent upon the type of equipment used and the experience of the operator. Sand cannot be used for snow and ice control on pervious asphalt or concrete because it will plug the pores and reduce permeability. Infiltrating runoff may freeze below the pavement, causing frost heave, though design modifications can reduce this risk.</p> <p><b>Maintenance</b> Some permeable pavements require frequent maintenance because grit or gravel can block the open pores. This is commonly done by industrial vacuums that remove the sediment.</p> <p><b>Efflorescence</b> Over time efflorescence begins to negatively affect the overall appearance of masonry/concrete and may cause the surfaces to become slippery when exposed to moisture. This can be of serious concern especially as a public safety issue. Efflorescence remover chemicals can be used to remove calcium/lime build-up without damaging the integrity of the paving surface.</p>

### Landscaping

Landscaping elements that help curb stormwater runoff – bioswales, planters, rain gardens, and street trees – are mutually beneficial for mobility and ecology. Such green elements are increasingly found to be important deterrents of crashes and injuries, and contribute to a more comfortable and visually interesting environment for all users. Plants and trees to clean runoff and manage stormwater at the site can be incorporated when redesigning streets. Traffic-calming elements, such as chicanes, islands, and curb extensions provide site opportunities for bioswales, street trees, and rain gardens.

### Climate

Complete Streets make their most basic contribution to green streets by providing space for low-emission travel. In the United States, transportation is a significant source of greenhouse gas emissions. The largest source of transportation greenhouse gas emissions are personal cars and trucks. Complete Streets policies are an essential tool in providing transportation choices beyond the personal automobile. Walking and bicycling for short trips, rather than taking a car, could reduce greenhouse gas emissions. Providing safe and easy access to public transportation provides additional environment benefits.

Communities can look to maximize pavement albedo (reflectivity) to reduce the urban heat island effect by reducing temperatures, which has the added benefits of enhancing the aesthetics of the roadway, improving air quality, increasing pavement durability, and improving nighttime illumination.

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## Appendix 3 – Additional Selected Resources

From CDTC's UPWP

An important component of complete streets is managing access in major travel corridors. Implementation of access management strategies in major travel corridors has dramatically improved transportation system performance in the Region. Integration of access management principles and strategies into Linkage Program studies has been routine.

CDTC established the Complete Streets Advisory Committee to research, learn, and then share information with the Planning Committee, Policy Board, and other stakeholders on complete streets tools and techniques that could be integrated into roadway projects. Fostering improved communication between municipal and project planners and designers is a major goal.

City of Troy – Complete Streets Law

**City of Troy, Adopted by City Council on June 5, 2014:**

**Ordinance Amending the Code of the City of Troy, by Creating a New Chapter 271 Entitled Complete Streets [Complete Streets policy](#).**

*The city shall design, build, operate and maintain a safe, reliable, efficient, integrated and connected multimodal transportation network that will provide access, mobility, safety, and connectivity for all users. In addition, the city will appoint a citizen run Complete Streets Advisory Board to whom quarterly reports on upcoming projects, and previously awarded exceptions, will be furnished.*

*Complete Streets design will promote improved health, economic growth, public safety, recreational opportunity, and social equality throughout the City of Troy, and will ensure that the safety and convenience of all users of the transportation system are accommodated, including pedestrians, bicyclists, users of mass transit, people of all ages and abilities, motorists, emergency responders, freight providers and adjacent land users.*

**City of Albany, Section 2. Chapter 323 of the Code of the City of Albany, Article VI – took effect in January 2014**

**Complete Streets Law:**

The City of Albany Common Council finds that the mobility of freight and passengers and the safety, convenience, and comfort of motorists, cyclists, pedestrians – including people requiring mobility aids, transit riders, and neighborhood residents of all ages and abilities should all be considered when planning and designing Albany's streets. Integrating sidewalks, bike facilities, transit amenities, and safe crossings into the initial design of street projects avoids the expense of retrofits later. Streets are a critical component of public space and play a major role in establishing the image and identity of a City. By encouraging good planning, more citizens will achieve the health benefits associated with active forms of transportation while traffic congestion and auto related air pollution will be reduced. The goal of this law is to improve the access and mobility for all users of streets in the community by improving safety through reducing conflict and encouraging non-motorized transportation and transit.

Town of Bethlehem Town Board Resolution on Complete Streets

**Adopted August 12, 2009**

NOW, THEREFORE, BE IT RESOLVED, the intent of the Town of Bethlehem Complete Streets Policy is to recognize bicyclists and pedestrians as equally important as motorists in the planning and design of all new street construction and street reconstruction undertaken by the Town.

BE IT FURTHER RESOLVED, it is also the intent of the Town of Bethlehem Complete Streets Policy to recognize that local Town streets with low vehicle volumes and slow travel speeds safely and efficiently accommodate bicyclists and pedestrians. However, principal Town roads that are characterized as having high vehicle volumes and high travel speeds, and are important for bicycle and pedestrian travel to access and connect to destinations in and adjacent to the Town, shall be considered for Complete Streets treatment.

**Engineering:** The Highway Superintendent shall consider the safe and efficient accommodation of bicyclists and pedestrians in all new street construction and street reconstruction undertaken by the Town of Bethlehem.

**Encouragement:** The Town supports the promotion of bicycling and walking for health, fitness, transportation and recreation through events, programs and other educational activities, which benefit residents, students, businesses and visitors of all ages and abilities.

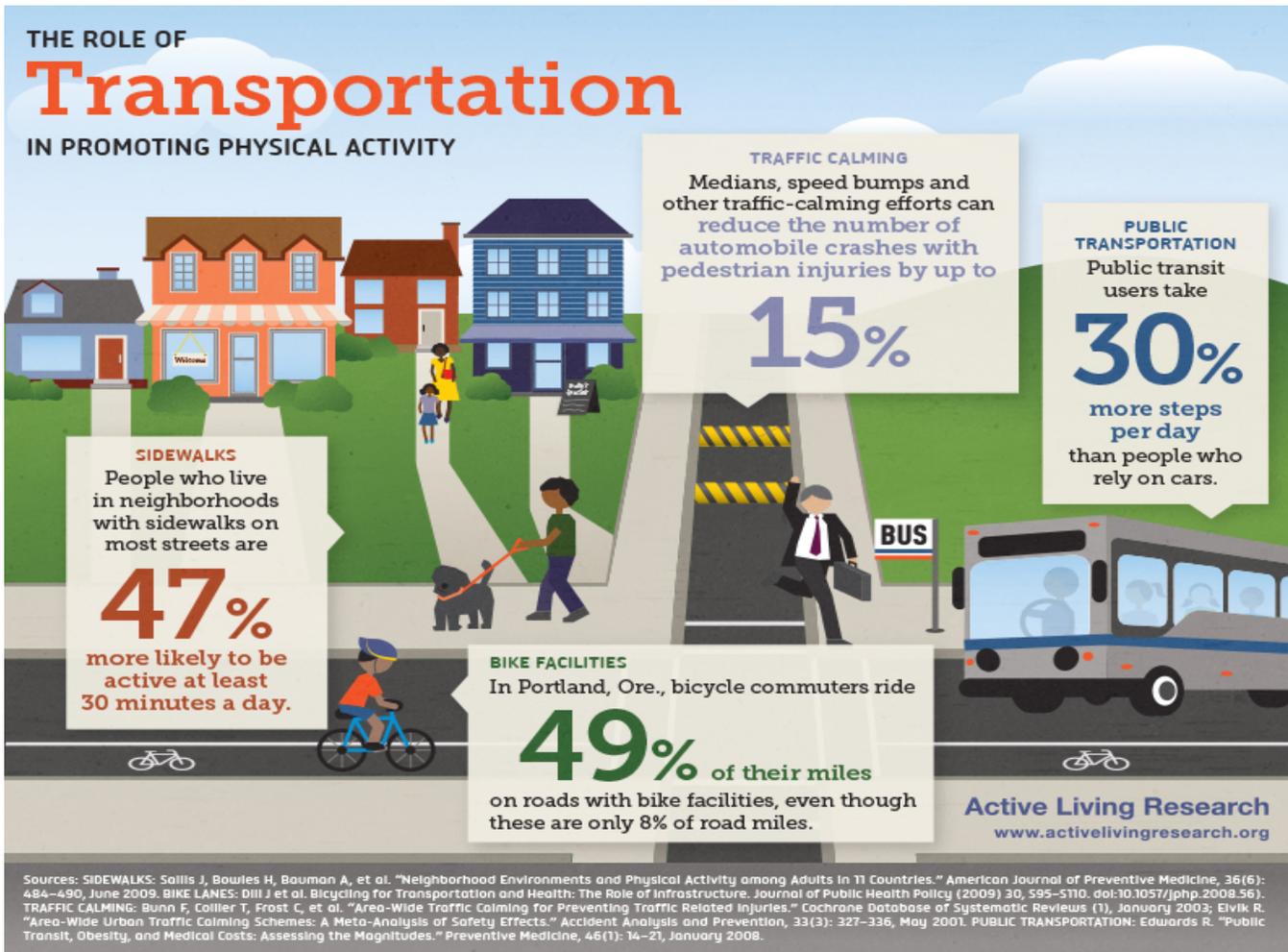
**Enforcement:** The Town will provide a balanced enforcement of the New York State Vehicle and Traffic Law for motorists, pedestrians and bicyclists. This will include enforcement of pedestrian's right-of-way in crosswalks, bicyclists riding with traffic and all modes sharing the road safely. Additionally, the Town may consider the use of traffic calming applications as an alternative to bicycle and pedestrian facilities. Traffic calming applications help to physically or psychologically calm motor vehicle traffic behaviors, thereby aiding in the enforcement of a safe environment for bicycle and pedestrian travel.

City of Saratoga Springs – Complete Streets Policy

**Adopted May 1, 2012**

**City of Saratoga Springs Complete Streets Vision**

With the signing of the Complete Streets Law by Governor Cuomo, statewide attention is being given to the complete streets programs, which improve the safety, health and vibrancy of New York State communities. The City of Saratoga Springs Complete Streets Policy will encourage the development of a complete streets network throughout the City to create a more balanced transportation system. The Complete Streets Policy shall be consistent with and assist in achieving the goals and recommendations set forth in the City's Comprehensive Plan and other policy documents. The Policy shall ensure that new and updated public and private projects are planned, designed, maintained and operated to enable safe, comfortable and convenient travel to the greatest extent possible for users of all abilities including pedestrians, bicyclists, motorists and transit riders.



# CDTC New Visions Complete Streets Advisory Committee White Paper

- Complete Streets in Broward Map
- Guidelines
- Safe Streets Summit
- RSVP
- Sponsorship
- 2014 Proceedings
- Safe Streets Awards 2015
- Technical Assistance
- Walking Audits

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## WHAT ARE COMPLETE STREETS?

A complete street is a street where the entire right of way is planned, designed, and operated for all modes of transportation and all users regardless of age or ability. Pedestrians, bicyclists, transit riders, and motorists of all ages and abilities must be able to safely move along and across a complete street. Complete streets make it easy to cross the street, walk to shops, catch the bus, and bike to work. [Click here](#) to download our fact sheet.

## WHY COMPLETE STREETS?

- **Safety.** Making these travel choices more convenient and attractive means making them safer. The Sun Sentinel reports that Florida has more senior citizen road fatalities than any state in the nation (Florida Leads Nation in Number of Senior Citizens Killed in Traffic Accidents, February 23, 2012).
- **Equity.** Complete streets are for everyone. People of all ages, abilities, and income will have more options when making essential trips such as to work, to school, to the grocery store, or for healthy recreation. Walking, bicycling, and taking public transportation are cheaper forms of personal transportation than relying on automobiles.
- **Public Health.** Complete streets promote active transportation, which is human powered transport (walking, bicycling, accessing public transit). The Centers for Disease Control (CDC) identified a strong correlation between planning and investments in infrastructure and some of the most serious health concerns facing the United States, including heart disease, obesity, and diabetes. Currently, one-third of our nation's children are overweight or obese according to the CDC.
- **Capacity.** Complete streets can improve the efficiency and capacity of existing roads by moving more people in the same amount of space. Complete streets can maintain volume, reduce speeds, and conveniently accommodate bicyclists and pedestrians. Getting more productivity out of the existing road and public transportation system is vital to reducing congestion. Sustainability. The Broward MPO 2035 Long Range Transportation Plan (LRTP) calls for a shift from investment in automobile centric projects to transit and other modes that support transit. Complete streets support this sustainable transportation vision established by the MPO and its constituencies.
- **The Time is Right.** Many interests are aligning for safer, healthier streets. The AARP is a strong supporter of complete streets. In addition, a broad collection of interests such as smart growth, schools, planners, realtors, insurance companies, health professionals, and engineers (such as the Institute of Transportation Engineers [ITE] and the American Society of Civil Engineers [ASCE]) support complete streets initiatives. More than 100 cities across the United States and at least three MPOs have adopted complete streets policies. Many local governments right here in Broward County are already beginning to redesign their streets to conveniently accommodate more modes of transportation.

**BROWARD COMPLETE STREETS INITIATIVE: [Click here](#)**

For more information about the Broward MPO's Complete Streets Initiative contact Ricardo Gutierrez, at [rgutierrez@browardmpo.org](mailto:rgutierrez@browardmpo.org) or 954-878-0044.

## 2014 Proceedings

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## SAFE STREETS SUMMIT 2014 PROCEEDINGS

### SAFE STREETS SUMMIT 2014 PROCEEDINGS

The Safe Streets Summit 2014 took place on on January 31, 2014 at the Marriott Hollywood Beach, 2501 North Ocean Drive, Hollywood, FL 33019.

This event helped attendees explore the safety, health, and economic benefits of streets designed for all users. Click below to access materials from the summit.

- Final Schedule of Events
- Speakers & Bios
- Sponsors
- Safe Streets Awards 2014
- Program
- Presentation Slides (Low Resolution)
- Presentation Slides (High Resolution)
- Hollywood Current Projects



### PHOTOS & COVERAGE OF THE SAFE STREETS SUMMIT 2014