# Recommendations for Bicycle Planning and Design in Avon, Connecticut

Prepared by Christopher McCahill, Ph.D.
Prepared for Town of Avon, Department of Planning and Community Development
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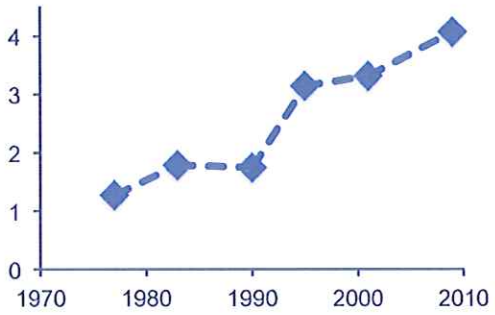
## WHY PLAN FOR BICYCLES IN AVON?

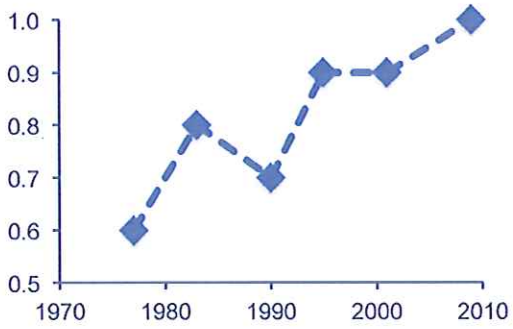
Bicycles offer low cost transportation that is non-polluting, energy-efficient, and has health benefits (*1*). Bicycle infrastructure has gained greater attention for its potential to improve quality of life, vitalize neighborhoods, and drive economic activity (*2*).

Bicycle use is rising steadily. Since 1977, the number of annual bicycle trips in the U.S. has increased from 1.3 billion to 4.1 billion. The share of all trips being made by bicycle increased from 0.6 percent to 1.0 percent (*3*).

**Annual U.S. bike trips (billions)**




**Share of all trips by bicycle (%)**




The Unplugged Learning Project conducted a survey of approximately 600 Avon households in May 2011. The survey was not a scientific representation of the town's population, but nonetheless it revealed a strong interest in bicycle infrastructure among many residents (*4*).

- More than 200 respondents identified inadequate infrastructure as a reason they travel exclusively by car and a reason their children travel by car or bus to school.
- More than 100 respondents indicated they already travel by bicycle in town and approximately 40 indicated their children travel by bicycle to school.

Bicycle planning is advancing in the neighboring towns of Simsbury and Canton.

- Simsbury was the first town in Connecticut to be designated a Bicycle Friendly Community by the League of American Bicyclists.
- The Town of Canton is planning to expand its multi-use trail system and mark certain streets with *sharrows*, which indicate that travel lanes should be shared with bicycles.

## TYPES OF BICYCLE USERS

It is important to consider different types of bicycle users in planning and design decisions. No one type of facility will suit all users in all circumstances. Bicycle corridors often combine multiple facility types.

AASHTO identifies factors influencing bicycling behavior (*5*), described below.

1. Trip purpose
   - *Utilitarian/Nondiscretionary*: Bicycles used as transportation for daily activities
   - *Recreation/Discretionary*: Trips for exercise and/or leisure
2. Level of user skill and comfort
   - *Children or seniors*: May not have good perception, judgment, or control of a bicycle

Appendix C

- *Experienced and confident*: More comfortable on streets; choose more direct routes; higher speeds
- *Casual and less confident*: Prefer separate facilities or low volume roads over direct routes

One survey of an American urban population revealed that 10 percent of those interested in cycling were comfortable on some roadways (though many preferred bike lanes and other accommodations), while the remaining 90 percent were interested in cycling but concerned about safety (*6*). Therefore, addressing safety issues can have multiple impacts:

- Improve safety for experienced cyclists that are already riding.
- Meet the needs of a greater number of residents that are interested in cycling but deterred by unsafe conditions. Town officials indicated the existing bike paths in Avon are a successful example of this.

## CURRENT CONDITIONS & FIRST STEPS

The Town of Avon hosts more than four miles of the Farmington Valley Greenway, which connect to segments in Farmington and Simsbury. There are no on-street bicycle facilities or bicycle markings and there is very little bicycle parking.

According to a report from the local police department, there were no reported bicycle collisions between 2006 and 2008, but 10 reported collisions since 2009 (*7*). Drivers of motor vehicles were found to be accountable for 7 of those collisions (70% of reported collisions). All of the collisions involved injuries, but none were serious.

According to AASHTO, roads should be "designed and constructed under the assumption that they will be used by bicyclists," wherever bicycles are permitted (*8*). Design standards are outlined below.

Advanced bicycle users travel on busy arterial roads such as Route 44 in Avon and neighboring Canton

This report includes a map of the existing bicycle network according to principles from the Bicycle Level of Service (BLOS) concept (*9*). The BLOS indicates that for roadways shared by bicycles and motor vehicle traffic, the following factors have a significant influence on cyclist comfort level:

- Width of the outside travel lane and shoulder
- Traffic volume
- Pavement surface conditions
- Heavy vehicle percentages

Each segment of the bicycle network in Avon has been classified according to road width and traffic volume, based on the availability of reliable data. This classification is intended to guide planning and design decisions, although the information can be used to develop a map of recommended bicycle routes. This classification system is outlined below.

- *Separate facilities:* Paved paths, bike tracks, and bike lanes
- *Low-volume roads*: Low-speed roads with 3,000 vpd or less
    - Shared lanes appropriate up to 35 mph posted speed; markings suitable for >1,000 vpd
- *Fair roads*: Medium-to-high-volume roads with wide shoulder (>3,000 vpd; minimum total width 30' or 5' shoulders)
    - Wide outside lane may be sufficient; bike lane may be considered for design speeds >25 mph
- *Poor roads*: Medium-to-high-volume or high-speed roads with narrow shoulder (>3,000 vpd; >35 mph posted speed; <30' total width)
    - Insufficient facilities

The information provided in this report paired with the knowledge and resources of the Director of Planning and the Town Engineer form a strong foundation for a comprehensive bicycle and pedestrian plan for the Town of Avon. A long-term plan should be developed and additional input from residents and interest groups may be desired. It is appropriate for town officials to pursue a demonstration project in accordance with this plan. Projects may be prioritized based on the following criteria or other agreed upon priorities:

- Projects that provide a safe connection between a large number of households and popular destinations
- Projects that address an existing safety issue (such as a high number of bicycle incidents or a great potential for incidents)
- Projects that provide a safe connection for vulnerable users (such as a connection to a school)
- Projects that fall within a planned bicycle corridor where high bicycle volumes are expected

Moving forward, it will be important to include bicycle projects in the town's Capital Improvements Program, in addition to seeking other funding sources (outlined below).

## GUIDELINES AND RECOMMENDATIONS

Two key documents provide guidance for making for bicycle planning and design:

1. *Bicycle Friendly America: The Blueprint*, produced by the League of American Cyclists
    - Recommendations for making communities safer and more bicycle-friendly, based on five areas: **E**ngineering, **E**ducation, **E**ncouragement, **E**nforcement, **E**valuation and planning
2. *Guide for the Development of Bicycle Facilities, 4th ed.*, produced by AASHTO
    - Recommended standards for the planning, design, and maintenance of bicycle facilities

## DESIGN STANDARDS

The design of streets should meet recommended design practices and should be appropriate for the context of each particular street. According to the AASHTO *Green Book* (*10*), the design of streets depends on whether the area is designated as urban or rural. According to the U.S. Census, a majority of the Town of Avon falls within the Hartford urbanized area, except for portions in the southeast and northeast corners.

AASHTO recommends lanes that are 9 to 12 feet wide (with 12-foot lanes predominant on high-speed, high-volume highways). Lanes 10 feet wide are considered acceptable on most low-speed facilities. Very low-volume local roads, on which most drivers are familiar with their features, can be designed to unique standards outlined in the *Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤ 400)* (*11*). In these cases, lanes and roads may be narrower. Based on conservative estimates of traffic volumes, at least 20% of roads in Avon may be designed to these standards.

The recently updated *Guide for the Development of Bicycle Facilities, 4th Ed.*, produced by AASHTO, provides recommendations for the following:

- Bicycle planning (Chapter 2)
- Bicycle safety (Chapter 3)
- Design of shared lanes (Chapter 4, Sect. 3-4)
    - Appropriate for positioning cyclists away from parked cars or curbs, in narrow lanes, and on multi-lane roads with no room for bike lanes
    - Compatible on roads with posted speeds of 35 mph or less
- Paved shoulders (Chapter 4, Sect. 5)
    - Minimum of 4 feet; wider in some cases
- Design of bicycle lanes (Chapter 4, Sect. 6-8)
    - Standard of 5 feet
- Retrofitting existing roadways for bicycles (Chapter 4, Sect. 9)
- Bicycle boulevards (Chapter 4, Sect. 10)
    - May be applied on low-volume local roads to form continuous bicycle routes
- Design of shared use paths (Chapter 5)
- Bicycle parking (Chapter 6)

## POTENTIAL FUNDING SOURCES

Funding for studies, planning, infrastructure, and programs should come from a variety of sources. Agencies that have made walking and biking priorities in their planning processes have a greater chance of securing funds. Helpful steps include developing a master plan and incorporating bicycle provisions into local ordinances and design standards.

### Federal

- *Transportation Alternatives* – Under MAP-21, previous programs such as Transportations Enhancements, Safe Routes to School, and Recreational Trails are combined into one program (info available at http://www.AdvocacyAdvance.org/MAP21)
    - Funds are distributed to MPOs or urban areas and by a competitive process administered by each state DOT
- *Surface Transportation Program (STP)* funds bicycle and pedestrian projects (info available at http://www.fhwa.dot.gov/environment/bicycle_pedestrian)
- *Highway Safety Improvement Program (HSIP)* funds safety infrastructure projects
- *Section 402 Safety Grants* administered to local advocacy groups to fund safety and education programs
- *Congestion Mitigation and Air Quality (CMAQ)* administered through CT DOT to fund infrastructure, planning, programs, and education in nonattainment areas (info available at http://www.bikeleague.org/resources/reports/pdfs/lab_cmaq.pdf)

**State** (info available at http://www.cga.ct.gov/2007/rpt/2007-R-0668.htm)

- *Connecticut Bikeway Grant Program*
- *Connecticut Greenways Small Grants Program*

### Municipal

- Dedicate funding for bicycles and pedestrians in Capital Improvements Programs to demonstrate commitment to maintenance and programs

### Fundraising and private partnerships

- *Bikes Belong* will fund facility projects, but encourages public agencies to partner with advocacy groups (info available at http://www.bikesbelong.org/grants)

## OTHER RESOURCES

League of American Bicyclists
1612 K Street NW, Suite 510
Washington, DC 20006
http://www.bikeleague.org

Bike Walk Connecticut
56 Arbor St., No. 310A
P.O. Box 270149
West Hartford, CT
http://www.wecyclect.org

Capitol Region Council of Governments
241 Main Street
Hartford, CT 06105-5310
http://www.crcog.org

Connecticut Bicycle and Pedestrian Advisory Board
2800 Berlin Turnpike
P.O. Box 317546
Newington, CT
http://www.ctbikepedboard.org

### Planning and design guides

*Bicycle Friendly America: The Blueprint.* February 2011.
http://www.bikeleague.org/programs/bicyclefriendlyamerica/pdfs/bfa_blueprint.pdf

*Safe Routes to School Guide.* February 2007.
http://guide.saferoutesinfo.org/pdfs.cfm

AASHTO *Guidelines for the Development of Bicycle Facilities, 4th ed.* 2012.

*MUTCD 2009 Edition, Part 9: Traffic Control for Bicycle Facilities.* December 2009.
http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part9.pdf

*City of Cambridge Bicycle Parking Guide.* Spring 2008.
http://www.cambridgema.gov/CityOfCambridge_Content/documents/tpat_BikeParkingBrochure.pdf

NACTO *Urban Bikeway Design Guide.* April 2011.
http://nacto.org/cities-for-cycling/design-guide/

*City of New Haven Complete Streets Design Manual.* September 2010.
http://www.cityofnewhaven.com/Engineering/pdfs/CS-Manual-FINAL.pdf

**Bicycle master plans**

*Glastonbury Bicycle Master Plan.* Revised December 2007.

*South Windsor Walk and Wheel Ways Master Plan.* January 2010.
http://www.swfoundation.org/Documents/SouthWindsorWalkandWheelWaysMasterPlan.pdf

*West Hartford Master Bike Plan*

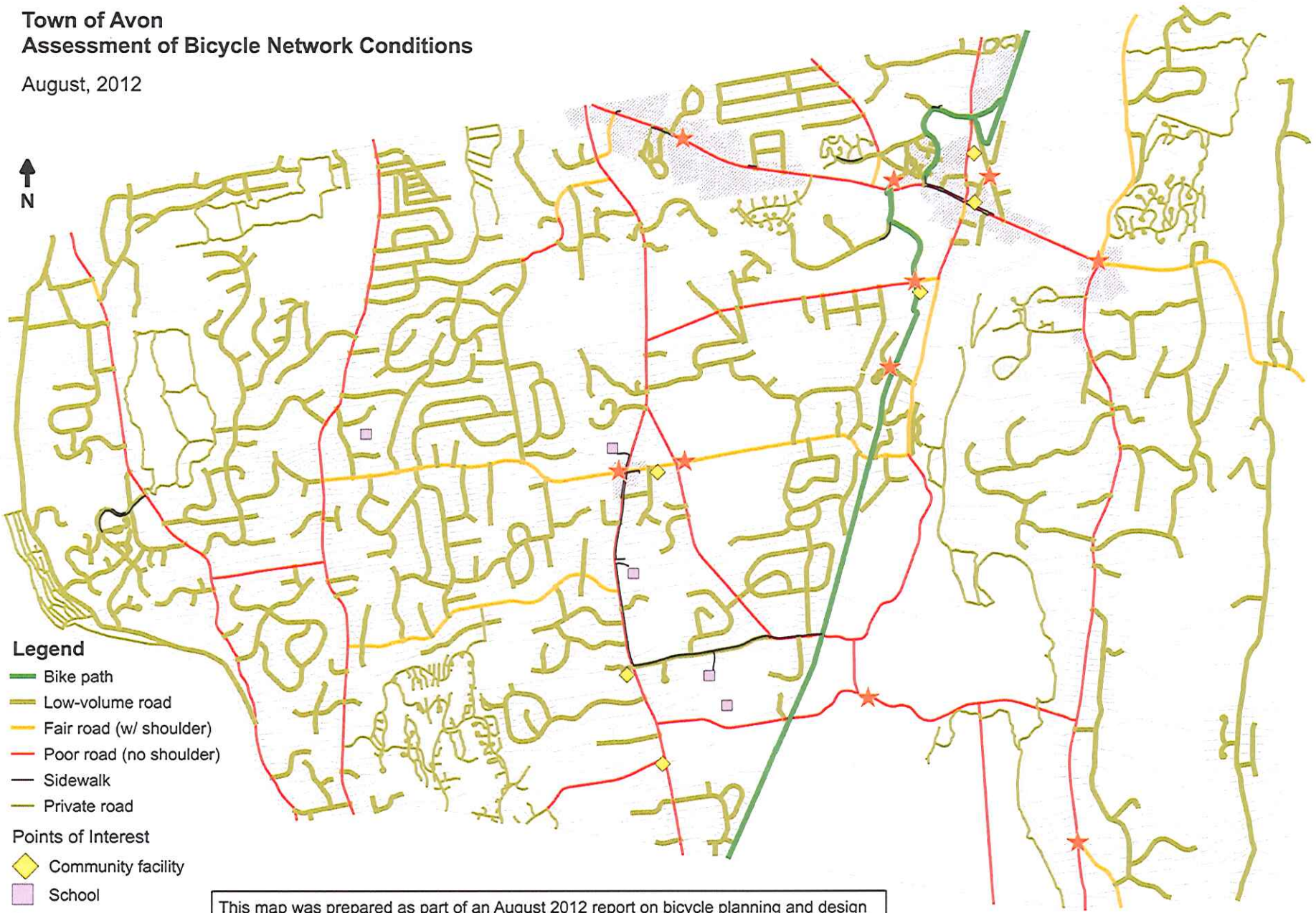
http://www.wecyclect.org/pdfs/WH_Bike_Task_Master_Plan.pdf

**REFERENCES**


1. Capitol Region Council of Governments. (2008). *Regional Pedestrian and Bicycle Plan.*
2. Rails-to-Trails Conservancy. (2007). *From Trail Towns to TrOD: Trails and Economic Development.*
3. J. Pucher, R. Buehler, & M. Seinen. (2011). Bicycling Renaissance in North America? An update and re-appraisal of cycling trends and policies. *Transportation Research Part A, 45*, 451-475.
4. Correspondence with Susan Rietano Davey, co-founder, The Unplugged Learning Project.
5. American Association of State Highway and Transportation Officials. (1999). *Guide for the Development of Bicycle Facilities, 3rd Ed.*
6. R. Geller, Bicycle Coordinator, Portland Office of Transportation. *Four Types of Cyclists.* http://www.portlandoregon.gov/transportation/article/264746
7. Correspondence with Mark Rinaldo, Chief of Police, Avon Police Department.
8. American Association of State Highway and Transportation Officials. (2012). *Guide for the Development of Bicycle Facilities, 4th Ed.*
9. Bicycle Level of Service: Applied Model. Sprinkle Consulting Inc., April 2007.
10. American Association of State Highway and Transportation Officials. (2011). *A Policy on Geometric Design of Highways and Streets, 6th Ed.*
11. American Association of State Highway and Transportation Officials. (2001). *Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤ 400).*

# Town of Avon
## Assessment of Bicycle Network Conditions

August, 2012




This map was prepared as part of an August 2012 report on bicycle planning and design in Avon. It provides an overview of existing conditions for planning and design purposes. It is not intended to serve as a guide for navigating the town by bicycle.

**DESCRIPTION OF GIS SHAPEFILE – 'avon_bike'**

OBJECTID

GIS_ID

- From Town of Avon GIS records

Line_type

- *Hiking trail*
- *Paved trail*
- *Road CL*
- *Walk*

Speed_knwn

- 0 – Posted speed on record with police
- 1 – Posted speed not on record with police

Speed_post

- Numeric: Posted speed limit (assumed 25 mph if not on record with police)

ADT_count

- Numeric: Average daily traffic as recorded by Connecticut DOT

ADT_sta

- Numeric: State traffic count station number

ADT_year

- Numeric: Most recent year of average daily traffic count

Traffic_V

- *High* – More than 10,000 vehicles per day
- *Medium* – 3,000 to 10,000 vehicles per day
- *Low* – 400 to 3,000 vehicles per day
- *Very low* – Fewer than 400 vehicles per day

Note: Some values assumed based on network configuration and number of parcels accessed.

Width

- Numeric: Roadway with on record with Town of Avon

Width_cat

- 0 – Width not known
- 1 – Width less than 20 feet
- 2 – Width 20 to 30 feet
- 3 – Width 30 feet or greater

Bike_cond

- 0 – Not classified
- 1 – Separate facilities: Paved paths, bike tracks, and bike lanes
- 2 – Low-volume roads: ≤3,000 vpd
- 3 – Fair roads: 3,000 to 10,000 vpd; at least 30; total width
- 4 – Poor roads: >3,000 vpd; >35 mph posted speed; <30' total width
- 5 – Sidewalk: Not appropriate for bicycle use

NAME_AVCL, OB_NAME, FROM_STREE, TO_STREET, TownOwner, TownAccept, Accepted_D, Accepted_Y

- From Town of Avon GIS records