Small Town and Rural Multimodal Networks Overview

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History and Context
Rural Practice and Multimodal Design Guidelines
Design Guidance

- ITE Walkable Thoroughfares (2010)
FHWA Design Flexibility Memo (2013)

FHWA supports “taking a flexible approach to bicycle and pedestrian facility design. ... The NACTO Urban Bikeway Design Guide, and the Institute of Transportation Engineers (ITE) Designing Walkable Urban Thoroughfares guide builds upon the flexibilities provided in the AASHTO guides, which can help communities plan and design safe and convenient facilities for pedestrian and bicyclists. FHWA supports the use of these resources to further develop nonmotorized transportation networks, particularly in urban areas.”
Small Town and Rural Multimodal Networks (2016-17)
SOURCES: Where did the guide come from?

- AASHTO Flexibility Guide 2004
- AASHTO Bike Guide 2012
- AASHTO Pedestrian Guide 2004
- AASHTO Green Book 2011
- AASHTO Low Volume Roads 2001, 2017
- FHWA Achieving Multimodal Networks 2016
- FHWA Resurfacing Guide 2016
- FHWA MUTCD 2009
- FHWA Separated Bike Lane Guide 2015
- PROWAG 2011, 2013, 2014
- BIKESAFE 2014
Small Town/Rural Needs

ONE SIZE DOES NOT FIT ALL.

LONGER NON-LOCAL TRIP DISTANCES

HEALTH DISPARITIES

HIGHER CRASH RATES
(20% of population; 60% of traffic-related fatalities)

INCOME DISPARITIES
Guide Content

Treatments and Design Topics
Multimodal Facilities / Focus on Networks

- Application
- Benefits
- Case Studies
- Guidance
  - Geometric Design
  - Markings
  - Signs
  - Intersection treatment
  - Implementation
  - Accessibility
**Speed and Volume**

Most appropriate on streets with low to moderate volumes and moderate speed motor vehicles.

**Network**

Applies to constrained connections between built-up areas.

**Land Use**

For use outside, between and within built-up areas with bicycle and pedestrian demand and limited available paved roadway surface.
Applications

1. Mixed Traffic
2. Visually Separated
3. Physically Separated
1. Mixed Traffic

Yield Roadway
Bicycle Boulevard
Advisory Shoulder
Yield Roadway
Bicycle Boulevard – Geometric Design

• Combine pavement markings, traffic calming measures, and crossing improvements to enhance bicyclist comfort and keep traffic speeds below 25 mph
Advisory Shoulder/Yield Roadway

Motorists share the center lane with oncoming vehicles until it is time to pass. Dotted lane lines indicate the advisory nature of the center lane and permit cars to encroach when safe.

No centerline on roadway.

Motorists must yield to cyclists and pedestrians before merging into advisory lane to pass oncoming traffic.

In the diagram:
- 5'-0" Advisory Lane
- Shared 14' Travel Lane
- 5'-0" Advisory Lane

Graph: Preferred vs. Potential Motor Vehicle Volume (ADT) vs. Motor Vehicle Operating Speed (MPH)

- Preferred
- Potential

Legend:
- Green
- Red

X-axis: Motor Vehicle Operating Speed (MPH)
Y-axis: Motor Vehicle Volume (ADT)
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Advisory Shoulder- Benefits

**Benefits**

- May reduce motor vehicle travel speeds.
- Increases predictability and clarifies desired lateral positioning of users.
- Functions well within a rural and small town traffic and land use context.

- Provides a delineated space on a roadway otherwise too narrow for dedicated shoulders.
- Minimizes potential impacts to visual or natural resources.
- May function as an interim measure where plans include shoulder widening or traffic calming in the future.
Advisory Shoulder in Hanover, NH
2. Visually Separated

Paved Shoulder
Bike Lane
Pedestrian Lane
Bike Lane
Bike Lane - Geometric Design

Bike Lane

- The preferred minimum width of a bike lane is 6.5 ft (2.0 m).
- Absolute minimum bike lane width is 4 ft (1.2 m) when no curb and gutter is present or 5 ft (1.5 m) when adjacent to a curbface, guardrail, other vertical surface or on-street parking stalls (AASHTO Bike Guide 2012).
Pedestrian Lane
Pedestrian Lane

High Visibility Crosswalk

Bicyclists in Roadway

Double Solid Line

Pedestrian Lane Markings (5'-8', wide enough for two-way pedestrian traffic)
Pedestrian Lane

- Double Solid Line
- High Visibility Crosswalk
- Bicyclists in Roadway
- ON ROADWAY

Pedestrian Lane Markings (5'-8', wide enough for two-way pedestrian traffic)
As part of the planning process, agencies should explore issues and the potential challenges a pedestrian lane may face, including:

- Detectability by people with vision disabilities
- Undesired use by bicyclists
- Accessible cross-slope requirements
- Maintenance strategies, such as sweeping and snow removal
3. Physically Separated

- Shared Use Path
- Sidepath
- Sidewalks
- Separated Bike Lanes
Sidewalk – Geometric Design
Sidepath
Sidepath – Geometric Design Options

**Sidepath**

- Minimum recommended pathway width is 10 ft (3.0 m).
- In low-volume situations and constrained conditions, the absolute minimum sidepath width is 8 ft (2.4 m).
- Provide a minimum of 2 ft (0.6 m) clearance to signposts or vertical elements.
Sidepath - Transitions
Sidepath - Intersections
Sidepath/Shared Use Path – Intersections

Marked Crosswalk

Rapid Flashing Beacon

Median Safety Island

Pedestrian Hybrid Beacon
Separated Bike Lane
Separated Bike Lane – Geometric Design
Separated Bike Lane – Intersections

Bend In

- Position bicyclists closer to turning vehicles to increase visibility prior to the turn.
Separated Bike Lane – Intersections

Bend Out

• Provide space for right-turning vehicles to yield to bicyclists.
Separated Bike Lane – Intersections

Mixing Zone

• Shared turn lane with motor vehicles and bicyclists.

Shared turn lane with motor vehicles and bicyclists.
Separated Bike Lane – Intersections

Protected Signal Phase

- Separate conflicting movements in time.
Guide Availability
For Printing and Online Reference
FHWA Publication Distribution

PDF Download:


Publication No: FHWA-HEP-17-024
Welcome to the Small Town and Rural Design Guide — an online design resource and idea book, intended to help small towns and rural communities support safe, comfortable, and active travel for people of all ages and abilities.
A yield roadway is designed to serve pedestrians, bicyclists, and motorized vehicles. In the same sense, this type of roadway serves all vehicles, including motor vehicles. With the exception of the roadway, there are no line markings in the roadway.

**Geometry Design**

**Two Way Travel Lane**

The parabolic curve on the roadway should be narrow to encourage slow travel speeds and require courtesy yielding when vehicles traveling toward opposite directions meet.

- **Total travel lane width may vary between a 1.2 m (4 ft) min and 2.6 m (8.5 ft) max.**
- **Traffic design may vary by travel lane width and should follow the guidance of the AASHTO Green Book and AASHTO EM-13.**
- **When width is 1.8 m (6 ft) or narrower, specify pullout areas every 200-250 ft to allow for emergency vehicles and non-motorized travel areas.**
- **Access for emergency vehicles should be provided.**
- **There is no single line length standard for local roads, but a range of clear design for parking and designing the department approach is between 16-20 ft, 10-15 ft, and 5-10 ft.**
- **Designers should provide a spacing of 0.6-0.9 ft every 200-500 ft (1500-4500 m).**

**Roadside**

- **If desired, a carriageway may be located on the paved roadway surface or on a road or shoulder outside of the paved roadway.**
- **Parking lane may be located inside or outside of the paved roadway.**
- **When possible, the parking lane should be considered in conjunction with a crossing element to facilitate the lane from the sidewalk.**
- **Bus routes, crushed stone, gravel, and dirt shoulders may be used as an important element to the sidewalk.**

**Markings**

- **No markings are necessary to implement a yield roadway.**
- **Do not mark a center line within the roadway.**
- **The center line may be used to indicate traffic direction and a connection to a hypothetical layout environment.**
- **Consider parking regulations for a parking area in advance of intersections.**

**Signs**

- **The signs mark the major road of the street.**
- **The sign should include:**
  - **A Pedestrian (W1-13) marking sign with ON ROADWAY legend on the left.**
  - **Use a two way traffic warning sign (W1-3) to identify two way operation of the road.**
  - **Signs should include:**
    - **Pedestrian (W1-13) marking sign with ON ROADWAY legend on the left.**
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**Intersections**

- **An unscheduled crossing of local streets, no special construction is necessary.**
- **The additional space within the intersection space offers opportunities for vehicles traveling in opposite directions.**
- **Consider parking regulations for a parking area in advance of intersections.**
- **Provide adequate crossing sight distance around areas and at unscheduled intersections.**
- **Provide adequate crossing sight distance for a single lane road.**
- **Consider the stopping sight distance for a comparable two-lane road.**
Implementation

In rural communities with a disconnected street network, local streets are the only viable connection to a scene of an emergency. Implementing agencies should work closely with emergency response stakeholders.

Accessibility

Yield roadways allow motor vehicles, bicyclists, and pedestrians to share the same space. On very low-volume and low-speed streets, pedestrians and bicyclists may be comfortable using the roadway with the occasional vehicle. If the facility is intended for use by pedestrians, it must meet accessibility guidelines for walkways.

Selected Examples

![Map of Selected Examples](image)

YIELD ROADWAY CASE STUDY

Manzanita, Oregon

The residents of Manzanita cherish their small town and have cultivated ways to maintain this character. One of the goals identified in the town's Comprehensive Plan is "to maintain and create residential living areas which are safe and convenient, which make a positive contribution to the quality of life, and which are harmonious with the coastal environment." Toward this end they have a network of local streets that create peaceful conditions for people walking, bicycling, and driving.

In addition, there is recognition that even on collector streets bicycle and pedestrian travel should be safe. The plan states that "Sufficient pavements width should be included on all major streets or roads to accommodate bicycle traffic." Where a visual or physically separated facility is not provided, speeds will be slowed to create bicycle-friendly conditions. The plan states, "Efforts to reduce speeding on Linwood Avenue should be carried out by the city. This should take the form of maintaining a low speed (20 MPH), requiring that the City police and Tillamook County Sheriff's Department maintain a high level of enforcement, and installing signage." Efforts such as these enable Manzanita's local streets to be shared roadways where people driving, walking, and biking can all safely share the street.

Works Cited

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