

# **NOCOE**

# **Best Practices:**

# **Active**

# **Transportation**

**Report #9**

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# External Communication

## INTRODUCTION

Active transportation is a key component of the TSMO strategy of Transportation Demand Management (TDM). Mode shift from vehicles to other modes can be an effective way to reduce roadway vehicle congestion. In addition to light rail, subway, buses, or other forms of public transportation, active transportation plays an important role in successful TDM.

Chapter 26 of the AASHTO Transportation Operations Manual (TOM) focuses on Active Transportation Tactics. These tactics include:

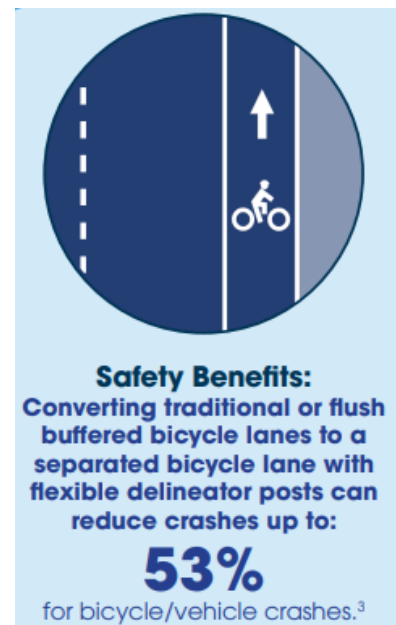
- Bicycle Lanes
- Cycle Tracks
- Bike Sharing
- Pedestrian Facilities
- Bicycle and Pedestrian Education

There are several active transportation related resources for planning, design, and operation of these facilities, including AASHTO's *Guide for the Development of Bicycle Facilities*, NACTO's *Urban Bikeway Design Guide*, FHWA's *Bikeway Selection Guide*, and ITE's *Designing Walkable Urban Thoroughfares*.

## BICYCLE LANES AND CYCLE TRACKS

Providing a high level of bicycle comfort via dedicated **bicycle lanes** can influence more travelers to bike and reduce the number of motor vehicles on the roadway. Signage and road markings provide clear delineation of space in the right-of-way for all road users and separate motorized and non-motorized travelers. There are several variations for bicycle lanes in the *Manual on Uniform Traffic Control Devices (MUTCD)* that range from conventional bike lanes that include a solid white line, bicycle symbol, directional arrow, and regulatory BIKE LANE sign to more robust approaches with striped buffers and enhanced pavement coloring. The TOM outlines how bicycle lanes may improve safety by:

- Increasing the number of bicyclists riding in the correct direction.



Source: FHWA, *Bicycle Lanes Proven Safety Countermeasure*, 2022.

**Sample Infographic for  
the Traveling Public**

- Making bicyclist position in the lane more predictable for motorists.
- Decreasing the number of motorists swerving into other lanes to get around the bicyclist (TOM, pg. 420).

Implementation issues can include identifying sufficient space for bike lanes, conflict areas at intersections, and maintenance needs. It is possible to retrofit bicycle facilities without widening the road by reducing or reallocating the width used by travel lanes; reducing the number of travel lanes; or reconfiguring or reducing on-street parking (TOM, pg. 423). Conflict areas at intersections can be addressed by the addition of a bike box, a painted green area to serve as a refuge for cyclists at the intersection and increase visibility to motorized vehicles. Maintenance needs are similar to needs for vehicle travel lanes and include keeping lane lines and markings legible and lanes free from obstruction.



Source: DDOT, *Bicycle Facility Design Guide*, 2022.

### Sample Infographic for the Traveling Public

**Cycle tracks (or protected bicycle lanes)** are very similar to on-road bicycle lanes with an added vertical separation from vehicle traffic, such as curbs, flexible delineator posts, bollards, or vegetation. Cycle tracks can be at grade or raised; like a bicycle lane, they can be one way or two way. As a Proven Safety Countermeasure, FHWA research indicates a 53% reduction in crashes by “converting traditional or flush buffered bicycle lanes to a separated bicycle lane with flexible delineator posts” ([FHWA](#)).

Bicycle lanes and cycle tracks can be an effective complement to transportation demand management strategies as a TSMO tool. A safer and more comfortable option for travelers to use bicycles can reduce demand for vehicles on the roadway. Operations considerations include the usage of intermittent turn

lanes and signal timing adjustments to avoid delays at intersections with the introduction of dedicated bicycle lanes. Data can be collected for bicycle intersection crossing times and directional distribution to determine optimal signal phases.

## BIKE SHARING AND MICROMOBILITY

Bike sharing and other micromobility options, such as scooters and e-bicycles, involves short-term rentals for last-mile or short trips, usually controlled through a mobile app. The presence of bike sharing programs involves jurisdictional policies, proper infrastructure, and operations considerations. Micromobility devices may be docked by being secured into a fixed docking station or dockless as a trip can end anywhere within certain guidelines or perimeters. The operational benefits of bike sharing include:

- Reduces street congestion: promotes modes other than driving alone for short trips; promotes transit use by reducing the time needed to access stations compared to walking or taking a bus.
- Reduces personal transportation costs: reduces the need to own and maintain a vehicle.
- Improves transportation system efficiency: increases the person throughput capacity of roadways (TOM, pg. 429).

Appropriate bicycle infrastructure is a necessary feature for successful bike-sharing and micromobility programs. “Regulations tend to require micromobility devices to operate on streets instead of sidewalks, as the differences in speed between pedestrians and micromobility users creates conflicts” (FHWA, 2024). Other considerations include promoting helmet use which can be incentivized by providing helmet discounts with bike sharing memberships. Understanding system usage data and ensuring bike-sharing programs have an approach for redistributing bikes across the area and docking stations can assist in ensuring availability for users. Bike-sharing programs may have options to incentivize users to pick stations with less supply by providing reduced rates or account credit. These considerations can reduce operational costs and enhance the user experience. System operations can be improved by collecting and analyzing data related to number of daily trips per pike, trip travel time, maximum daily concurrent usage, demographics of users either increasing or decreasing in use over time, and overall income and operating expenses (TOM, pg. 431).

## PEDESTRIAN FACILITIES

Pedestrian facilities promote a safe walking environment and can include infrastructure such as sidewalks, multi-use or shared-use pathways, and grade-separated facilities. At intersections or other potential conflict points with vehicles, pedestrian facilities separate pedestrians from the motorized roadway in time and space. These facilities may include pedestrian refuge islands, raised crosswalks, crosswalk visibility enhancements, rectangular rapid flashing beacons (RRFBs), and pedestrian hybrid beacons (PHBs), and leading pedestrian intervals (LPIs). FHWA considers several of these pedestrian facilities as [Proven Safety Countermeasures](#):



[Medians and Pedestrian Refuge Islands in Urban and Suburban Areas](#)



[Crosswalk Visibility Enhancements](#)



[Rectangular Rapid Flashing Beacons \(RRFB\)](#)



[Pedestrian Hybrid Beacons](#)



[Leading Pedestrian Interval](#)

Pedestrian facilities can result in many benefits, including reduced congestion, reduced pollution, improved safety, and community amenities, such as space for trees, lighting, and benches (TOM, pg. 433). Many local and state transportation agencies have implemented innovative pedestrian facilities and other accessibility features to improve the walking experience:

- Utah DOT (UDOT) is enhancing safety and accessibility for people with disabilities by deploying [Accessible Pedestrian Signals \(APS\) and a smartphone app](#) and television station KTSU has a [public service report](#) on the technology application.

The [I-270 North Design-Build Project](#) in Missouri enhances safety, mobility, and reliability for one of Missouri’s busiest interstates. It saves lives by eliminating dangerous ramps and improving pedestrian access, while advanced traffic management enables swift incident response.



Source: MoDOT, *BI-270 North Design-Build Project*, 2021.

- [Manatee County RRFBs and LPIs](#).

### RRFB Installation as Part of Freeway Access Road

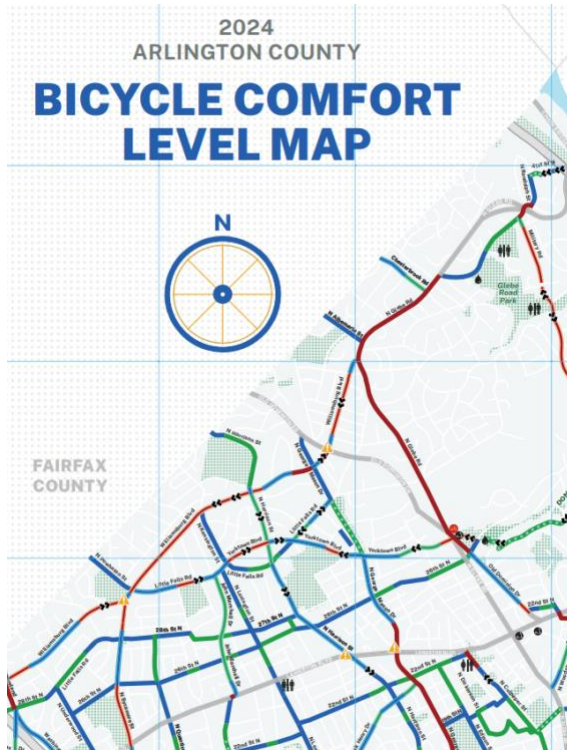
## BICYCLE AND PEDESTRIAN EDUCATION

Many TDM programs include a strong education component. “Education and encouragement programs can help improve bicycle and pedestrian safety and awareness, improve driver awareness (improving car/bicycle interactions), and increase traffic law compliance” (TOM, pg. 436). Local agencies may partner with a business improvement district, community-based organization, or other entity to promote TDM activities,



Source: Arlington County, *Bicycle Comfort Level Map*, 2024.

### Bicycle Route Colors and Markings



Source: Arlington County, *Bicycle Comfort Level Map*, 2024.

### Section of Bicycle Comfort Level Map

including public awareness campaigns and outreach events. In Arlington County, Virginia, [BikeArlington](#) developed a [Bicycle Comfort Level Map](#) that displays suggested routes around the county based on perceived level of comfort when biking.

Resources like this can encourage travelers to consider using existing bicycle and pedestrian facilities that they may have been unaware of previously. This outreach can result in reduced congestion, higher community activity levels, and improved safety.

# Resources

## RESOURCE LIST

### AASHTO Transportation Operations Manual (TOM)

- Chapter 26 Active Transportation Tactics

### Federal Highway Administration

[Guide for Maintaining Active Transportation Infrastructure for Enhanced Safety](#) (September 2024)

[Active Transportation and Demand Management Program](#) (FHWA webpage)

[Strengthening Linkages between Transportation Demand Management and Traffic Management](#) (June 2019)

[Bikeway Selection Guide](#) (February 2019)

[Incorporating On-Road Bicycle Networks into Resurfacing Projects](#) (March 2016)

### AASHTO

[Guide for the Development of Bicycle Facilities](#)

### NACTO

[Urban Bikeway Design Guide](#)

### ITE

[Designing Walkable Urban Thoroughfares](#)