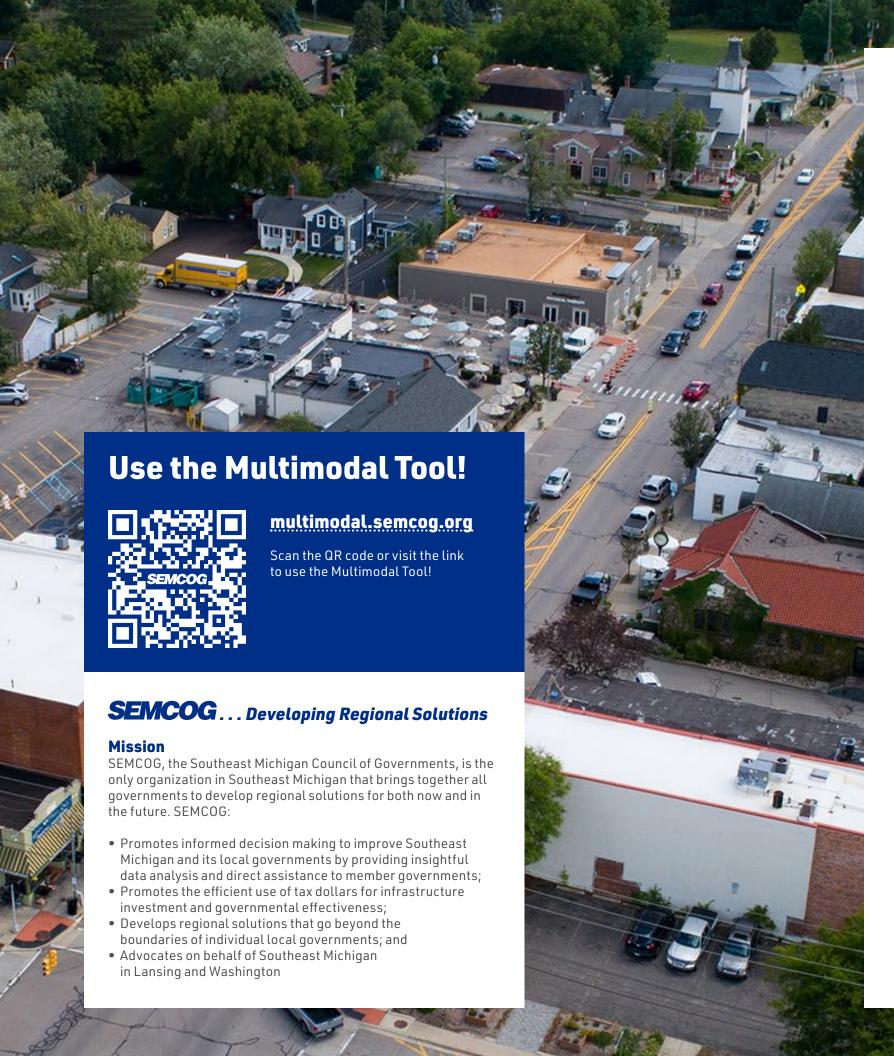


Multimodal Tool User Guide

December 2024





Multimodal Tool User Guide

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What is the Multimodal Tool?

SEMCOG and MDOT have developed a web application that lets you plan, design, and evaluate multimodal street cross-sections for each of five travel modes: pedestrian, bike, transit, auto, and freight. The Tool has two modules:



Modal Prioritization

This webmap lets you view modal networks and tiers, identify a project corridor, review modal priorities, and determine land use contexts.



Right-of-Way Allocation

This user interface lets you design street crosssections to best serve the prioritized modes in the given land use context and evaluate how well the designs serve users.

Who is the Multimodal Tool for?

This Tool is intended to help the following users:









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Stakeholders

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Appendix C. Scoring Criteria & Crash Reduction Factors

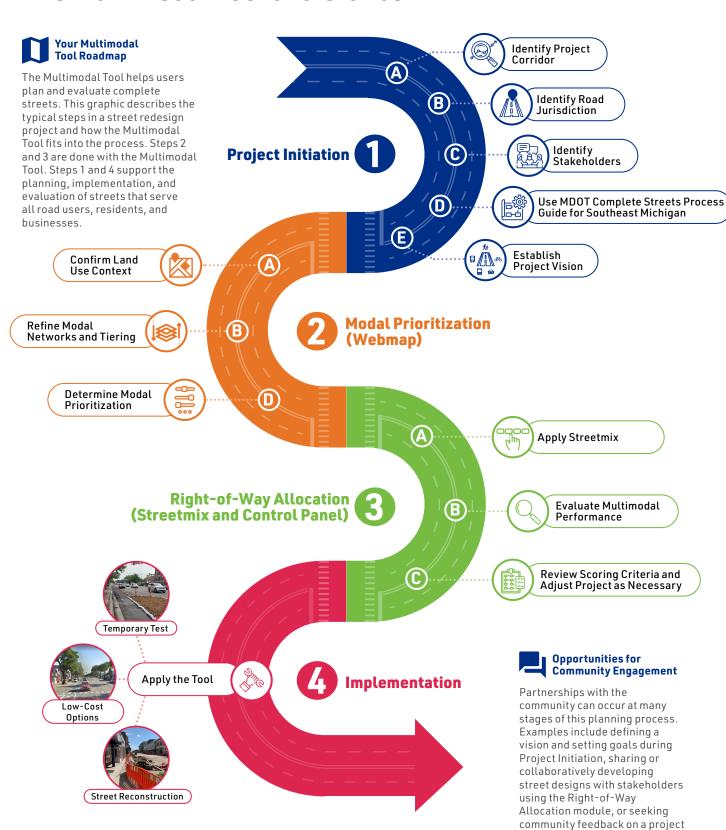
Methodology for how scores in the Multimodal Tool are derived and crash reduction factors associated with FHWA Proven Safety Countermeasures.







The Multimodal Tool at a Glance



1 Project Initiation



Identify Project Corridor

Project corridor may be identified as part of a network evaluation to find gaps, determine priorities, or address safety concerns and operational needs. May be based on community needs, existing plans, or other criteria.

May include one or multiple segments.



Identify Road Jurisdiction

Identify if the road falls under local, county, MDOT, or private jurisdiction, using the SEMCOG Road Jurisdiction Map.



Identify Stakeholders

Depending on the project location, stakeholders may include city and local agency staff; county, SEMCOG, and MDOT staff; and downtown development or corridor improvement authorities, community-based organizations, and other large trip generators.



Use MDOT Complete Streets Process Guide for Southeast Michigan

The guide (see page 6) describes the process for evaluation of requests to modify or repurpose travel lanes along roads within the seven-county SEMCOG region.



Establish Project Vision

The vision may relate to enhancing safety, livability, equity, environment and air quality, economic development, and multimodal connectivity.





Confirm Land Use Context

Confirm that you will use the land use context that has been assigned to the project corridor or override the default. Longer corridors may pass through multiple land use contexts.



Refine Modal Networks and Tiering

Identify which modes the road is intended to serve. Then, identify how important the road is for serving each travel mode: Tier 1 (most important), Tier 2 (moderate importance), Tier 3 (lower importance).



Determine Modal Prioritization

Determine which mode takes precedence when more than one mode is Tier 1.



Right-of-Way Allocation (Streetmix and Control Panel)



Apply Streetmix

Create conceptual cross-section designs for the project corridor using the <u>Streetmix</u> platform, which has been integrated into the Tool.



Evaluate Multimodal Performance

Use the Tool's Control Panel to input additional details of your project not captured in Streetmix and determine how well the proposed cross-sections serve different road users.



Review Scoring Criteria and Adjust Project as Necessary

Review each mode's score and see if objectives are met. Review weakest link elements and adjust inputs if needed.



Implementation



Apply the Tool

Temporary tests, permanent low-cost options that do not change the existing curbs, and permanent projects that reconstruct the entire street are three common strategies for implementing street reconfigurations developed using the Multimodal Tool.

during Implementation.





Introduction

This section explains the reasons for creating the Multimodal Tool and the Tool's goals. It explains how the Tool was prepared, including stakeholder coordination, regular meetings with MDOT, and other input.

Vision and Goals

Complete streets are a focal point for Southeast Michigan communities as they strive to develop transportation networks that are safe, convenient, and affordable for people of all ages and abilities and balance the needs of different travel modes within limited road space. Complete streets planning is often part of larger discussions around economic development, livability, sustainability, safety, and equity in our communities.

Many communities across Southeast Michigan have complete streets policies and have integrated complete streets projects into their capital improvement plans. The region also has the joint SEMCOG-MDOT Bicycle and Pedestrian Mobility Plan for Southeast Michigan, and communities throughout the region continue to plan for complete streets. However, jurisdictions have experienced approval and implementation challenges on varying road classifications and seek a streamlined process to deploy complete street projects.

MDOT has been refining its approach to delivering complete streets to Michigan communities with initiatives such as the MDOT Multi Modal Development & Delivery Guidebook (M2D2), the MDOT Main Street Trunklines Guide, and the MDOT Road Diet Checklist. The Multimodal Tool was developed at MDOT's request for use when working with local jurisdictions to plan for complete streets.

Transportation professionals also have a growing body of complete streets implementation guidance from sources like the Federal Highway Administration (FHWA), Transportation Research Board (TRB), American Association of State Highway and Transportation Officials (AASHTO), Institute of Transportation Engineers (ITE),

and National Association of City Transportation Officials (NACTO).

The Multimodal Tool was created to streamline complete streets implementation based on the specific needs of the region. It strives to:

- Address growing competition between travel modes for limited space within the right-of-way
- Help local communities understand what is permitted for each project and road jurisdiction
- Provide a framework for communities to work with SEMCOG and MDOT to determine the order in which modes may be prioritized on certain corridors or within a district, and to work within operational standards

The Multimodal Tool equips local jurisdictions, SEMCOG and MDOT staff, and stakeholders in the region with a user friendly tool that assists in modal priority decision-making, performance-based street design, and fast-tracking complete street project approval and implementation across varying road types and land uses. The following topics are covered within this user guide:

- Ensuring the Tool fits your needs
- Explaining transportation concepts like land use contexts, layered networks, and modal priorities
- Describing how to use the Tool

SEMCOG and MDOT jointly created the Multimodal Tool with stakeholder input from across the region.

We are what we measure, which has typically been vehicle level-of-service. The Tool is an attempt to better communicate multimodal metrics in a context sensitive process.

Is This Tool Right for You?

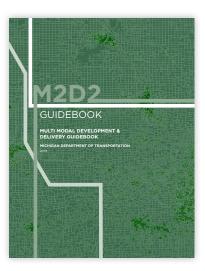
SEMCOG, MDOT, and the transportation industry provide several tools and guidelines for developing a complete streets project. The Multimodal Tool serves to complement existing processes while also filling a gap.

Existing workflows such as road safety audits, the MDOT Road Diet Checklist, or utilizing the MDOT M2D2 and the MDOT Main Street Trunklines Guide are good starting points for addressing specific safety concerns and right-sizing a road segment. The Multimodal Tool does not replace these workflows but is an efficient add-on. The Tool can determine if a road diet would fulfill project modal goals prior to going through the lengthy MDOT Road Diet Checklist. The Tool can also be used to evaluate how a safety redesigned cross-section would perform across multiple modes.

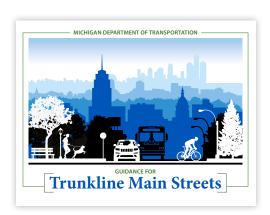
Jurisdictional self-review can assist in determining:

- How can the Multimodal Tool best fit into the project workflow?
- What processes and tools has the jurisdiction used in the past for a complete streets project?
- What gaps could the Multimodal Tool fill, or replace, in the previous workflow?

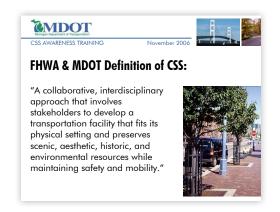
SEMCOG and MDOT encourage county and city/village road agencies to use the Multimodal Tool for roadways under their jurisdiction. Learning more about the Multimodal Tool, its functionality, and underlying concepts can help in determining where the Tool fits into a project.



MDOT Multi Modal Development & Delivery Guidebook (M2D2)



MDOT Guidance for Trunkline Main Streets



MDOT Context Sensitive Solution Initiative

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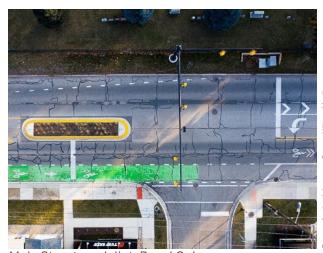


MDOT Road Diet Checklist

Many communities within the SEMCOG region and across the state have contemplated a "road diet" on state trunklines ("M-roads"). A road diet is the conversion of one or more driving lanes to other uses, including wider sidewalks, bike lanes, on-street parking, or a two-way center left-turn lane. Road diets are typically considered when there is data or a perception suggesting there may be excess capacity in the vehicle travel lanes.

In many cases there is a feeling that a reduction in travel lanes could reduce vehicle speeds and improve safety, especially for more vulnerable travelers like people walking and biking. There may also be economic development benefits in terms of increased sales at businesses or environmental benefits like reduced impervious surfaces and green infrastructure. As with many transportation design options, evaluation of a potential road diet requires thoughtful analysis and a balance between vehicle travel times, safety, and serving people traveling by all modes.

MDOT has developed a Road Diet Checklist to create a standardized, comprehensive evaluation of potential road diets on MDOT roads. This checklist can be used by the MDOT, and in discussions with a municipality, to help identify factors that need to be considered when a community or MDOT is evaluating the potential to reduce the number of travel lanes on a state trunkline. Many MDOT staff have found the Road Diet Checklist works reasonably well to very well statewide.



Main Street road diet, Royal Oak

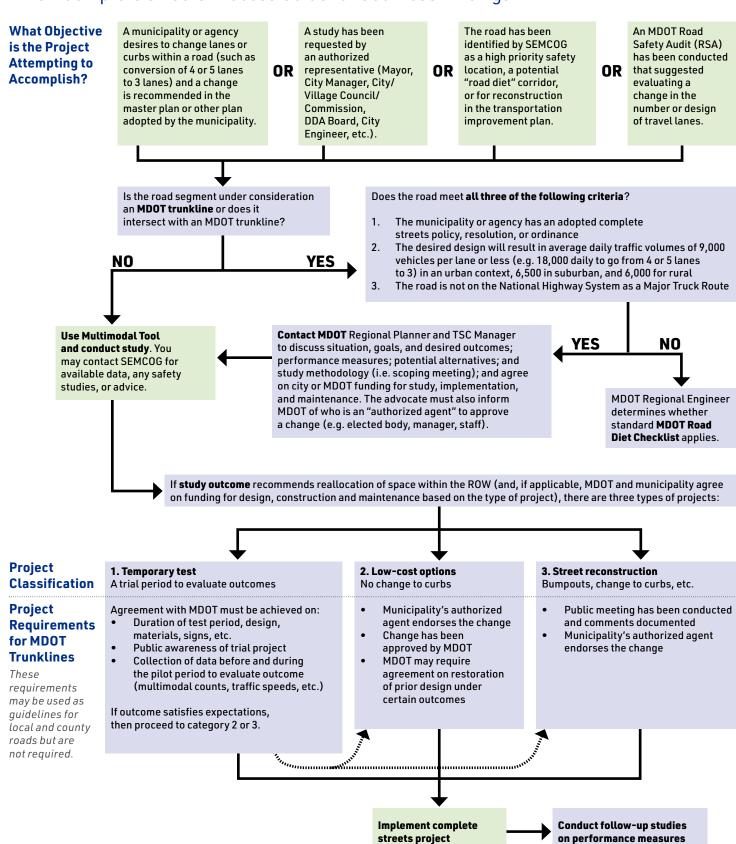
But in Southeast Michigan, MDOT and local staff have found the checklist at times cumbersome and not as applicable as it may be in other parts of the state. For example, tolerance for some additional congestion may be higher in Southeast Michigan where a level-of-service E or even F is common. In much of the rest of Michigan, there may be an expectation of a level-of-service C or better. MDOT staff in Southeast Michigan have also observed that use of the Checklist, in some cases, has made the road diet process lengthy and costly for municipalities. There is also a desire to weight safety as a higher factor than some of the other criteria on the Checklist. Finally, the land use context types in the SEMCOG region are more varied than the rest of the state, ranging from Downtown Detroit to hundreds of small to midsized downtowns, and a wide range of suburban and rural communities.

The Multimodal Tool offers an alternative to the MDOT Road Diet Checklist for situations that meet certain criteria. Instances where the Tool may be appropriate are detailed in the MDOT Complete Streets Process Guide for Southeast Michigan on page 6. This flow chart describes the process for evaluation of requests to modify or repurpose travel lanes along roads within the SEMCOG region. Note that the Complete Streets Process Guide is a draft procedure that is still subject to change and refinement. MDOT is working to take the Complete Streets Process Guide to a Region Engineer for approval across the SEMCOG region.



John R Road road diet, Hazel Park

MDOT Complete Streets Process Guide for Southeast Michigan



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Explaining Transportation Concepts

This section introduces the concepts, terms, and techniques used throughout the Multimodal Tool planning process.



Land Use Contexts

Land use and development patterns greatly impact available transportation options and traveler mode choice in Southeast Michigan. Development density, types and mixture of land uses, and site design (setbacks, parking layout, planting, amenities) all impact travel choices.

Expansive development patterns in parts of the SEMCOG region and the prioritization of vehicle travel have led to high proportions of single occupancy vehicle trips throughout the region. Lower development densities typically do not lend themselves to walkability and lead to more miles of road per capita. Communities are reluctant to invest in non-motorized facilities or enhanced transit infrastructure when funding is limited and the projected use of the infrastructure might not justify the investment in suburban or rural environments. However, many communities throughout the SEMCOG region successfully exhibit walkability and multimodal travel patterns in their downtowns, along commercial corridors, and in residential neighborhoods.

As communities, transportation professionals, and policymakers use these tools, it is important for the user and the public to understand the connection between land use patterns and transportation choices, and how their community's built environment objectively compares to others across the region.

Additionally, a road's surrounding land use context helps inform the types of infrastructure that may be considered "desirable" for different modes on a road given its modal tiering. Modal tiering is explained on page 21. Context is the whole environment surrounding a road, not just the land use configuration or the road configuration. Context can change due to changes in roadway configurations or land use patterns and type.

The project team has classified roads in the region into five overarching context categories based on a series of metrics and manual review. The assigned contexts are incorporated as a categorical input in the Modal Prioritization module. The categories, which are explained in greater detail on the following pages, are:

- Main Streets (Existing and Aspirational)
- Urban Corridors and Walkable Thoroughfares(Existing and Aspirational)
- Suburban Corridors
- Small Town Hamlet or Village Commercial Corridor
- Rural Corridors

The project team conducted a multi-step process to develop the above categories. To help identify existing main streets (traditional downtowns), walkable thoroughfares, and small town hamlets, the team considered land use and building

height, proximity to other buildings, and setback. Community master plans and zoning maps were also used to identify aspirational main streets and walkable thoroughfares (see Aspirational Corridors section below). The remaining urban, suburban, and rural land uses were determined using TAZ (transportation analysis zone) area type designation from SEMCOG's Travel Demand Model. Urban land use and walkable thoroughfares were combined because they have the same modal prioritization in the Multimodal Tool.

The Context Classification Matrix on pages 11-12 describes the typical characteristics and built form of each context category and illustrates typical development patterns that fit into each category.

The map on pages 9-10 shows the land use contexts across the SEMCOG region. It is a screenshot of the Multimodal Tool's Webmap, which lets you view the context and modal networks in greater detail. Note that these land use context classifications represent a default that may be changed by the Tool user based on local knowledge or updated plans.

To continue to encourage proactive multimodal and complete streets planning, SEMCOG will periodically update the context classification maps based on guidance from local communities.

Typical Corridor Illustration

The above illustrations show that it is common to find different land use and development patterns throughout a study corridor. There may be design elements that are necessary along one segment of a corridor but not others.

Land Use
Commercial
Cultural/institution
Industrial

Mixed use
Office

Residential

These context illustrations portray typical land use and development patterns that each fit into one of the context categories. On the following pages, each context category is described and the corresponding illustrations are highlighted and explained.

Aspirational Corridors

The Main Street and Urban Corridor and Walkable Thoroughfare context designations include both "existing" and "aspirational" corridors, as many communities in the SEMCOG region have established planning and policy frameworks that aspire to catalyze denser, walkable development along corridors currently more suburban or rural in nature, and which do not, in part or in whole, currently possess Walkable Thoroughfare or Main Street attributes.

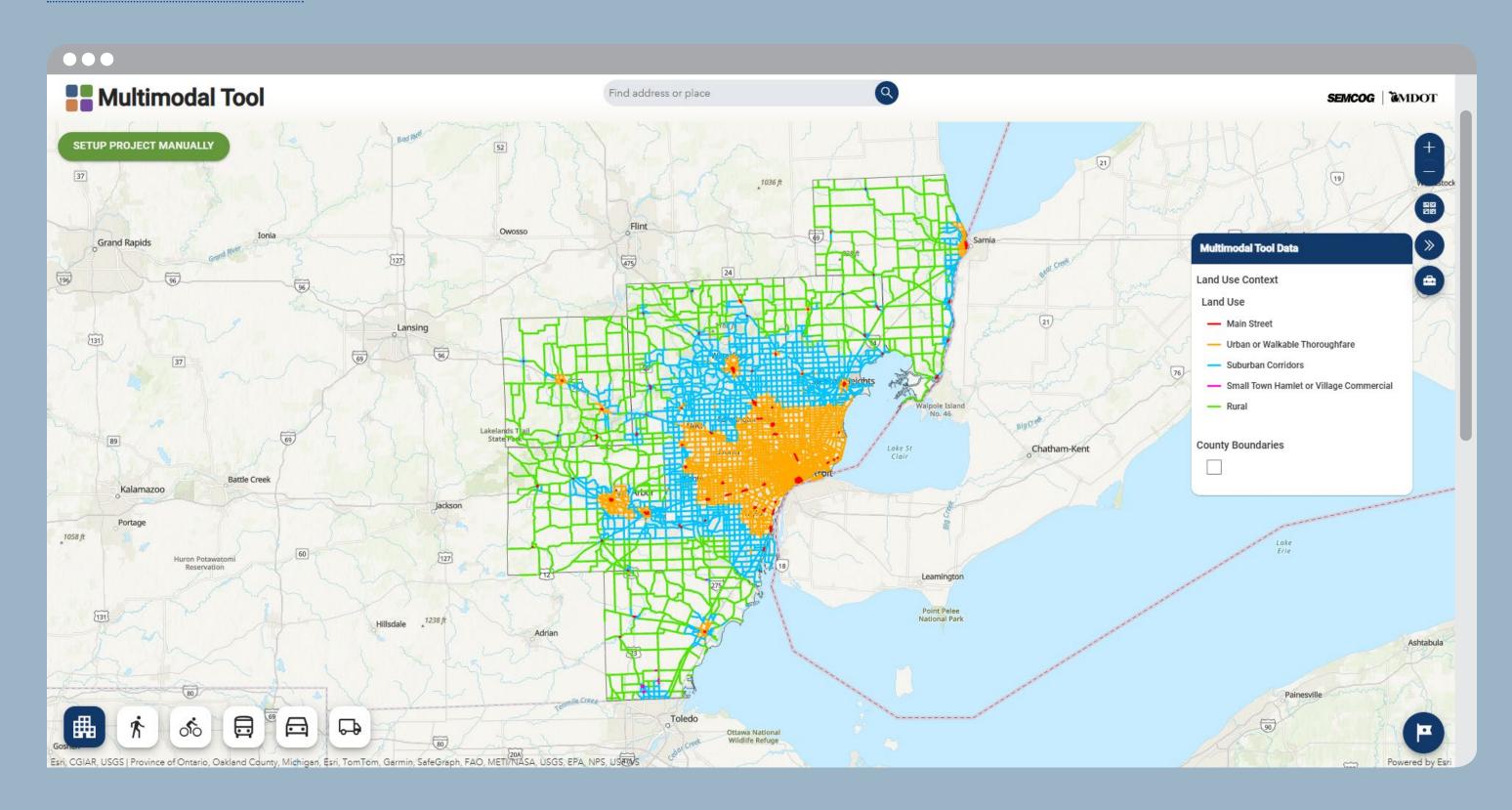
On page 17, Big Beaver Road in Troy is described as an example of how a roadway can graduate from a Suburban Corridor to a Walkable Thoroughfare.

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Land Use Contexts to the Multimodal Tool.







Context Classification Matrix

	Main Streets (Existing and Aspirational)	Urban Corridors and Walkable Thoroughfares (Existing and Aspirational)	Suburban Corridors	Small Town Hamlet or Village Commercial Corridor	Rural Corridors
Description	Michigan main streets serve as the commercial and cultural centers of their communities and are the primary street(s) that traverse a downtown or business district	Urban corridors and walkable thoroughfares contain varying types of development and land uses with an emphasis on pedestrian connectivity and walkability. They share the same modal priorities	Suburban corridors may serve a variety of land uses and have traditionally been designed to accommodate vehicle travel	Small town hamlets and village commercial corridors serve as local 1-2 block commercial hubs and are typically found in lower-density environments	Rural corridors are found in low density environments and typically feature residential and agricultural land uses, with some low-density commercial development
MDOT's M2D2 Context Area Types Associated with each Context Category	Urban Environments: Urban roads urban environments with a diverse populations generally exceed 100	e mix of land uses. Area	Suburban environments: Lowerdensity environments, usually surrounded by auto-oriented commercial and residential uses. Area populations generally are between 20,000-100,000 residents	Small town environments: Low density areas with distinct land uses. Small town populations generally are less than 20,000	Rural roads & corridors: State and US highways that connect cities, suburbs, and towns. These road networks are largely rural and tend to accommodate freight traffic
Data Sources	SEMCOG Model CBD, Urban Economic Activity Areas, Established WalkUps, Emerging WalkUps, Walkable Neighborhoods	SEMCOG Model Urban, Urban Economic Activity Area	SEMCOG Model Suburban, Urban, Urban Economic Activity Area	SEMCOG Model Suburban, Rural	SEMCOG Model Rural
Metrics					
Land Use	Typically retail, office, mixed use	Typically retail, office, occasional mixed use	Typically retail and office surrounded by residential	Typically retail and office surrounded by residential	Typically estate residential, open space, agriculture, logistics centers, and other industry
Building Height	Buildings typically >15' tall	Buildings typically >15' tall	Buildings typically >15' tall	Some buildings >15' tall	Some buildings >15' tall
Proximity of Buildings	Clusters of attached buildings	Clusters of buildings, mostly attached some detached	Mostly detached buildings	Mostly detached buildings	Detached buildings
Building Setbacks from Sidewalk	Buildings typically within 20' of sidewalk	Buildings typically within 20' of sidewalk	Buildings typically not within 20' of sidewalk	Some buildings within 20' of sidewalk	Buildings typically not within 20' of road shoulder or sidewalk
Block Length/Approximate Size	Linear or multiple blocks deep	Linear, length varies	Varies	1-2 blocks, linear	N/A
On-Street Parking	Typically yes	Varies	Typically no	Typically yes	Typically no

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Main Streets (Existing and Aspirational)

Land Use Commercial Cultural/institution Industrial Mixed use Office Residential

Typical Corridor Illustration Highlighting Main Street Examples



Main Street Characteristics

Michigan main streets serve as the commercial and cultural centers of their communities. These streets are the primary street(s) that traverse a downtown or business district, and may not actually be named "Main Street." Main streets may be under city, township, village, county, or state jurisdiction.

These main street rights-of-way often serve several functions including pedestrian travel, access for business customers, and deliveries as a commercial district. Some main streets have on-street parking, curbside pick-ups, transit stops, bicycle facilities, outdoor dining, and other features. Often there can be conflicts between the various users. Some, but not all, main streets are part of a grid system. This section describes common characteristics and design considerations to help provide safe travel for all but emphasize the performance of some modes over others.

Communities throughout the SEMCOG region have developed their main streets at varying scales, and development patterns have changed over time. As described in the Context Classification Matrix on the previous page, main streets typically feature a mix of uses, multi-story development, attached buildings, and shorter setbacks from the sidewalk than are found on other types of thoroughfares outside of a downtown or commercial district. They often have on-street parking in the right-of-way, and are the best (or only) served corridor by transit in their community. In the Modal Prioritization module, any district or cluster of development that

constitutes a main street will have the main street modal priorities hierarchy applied for the entirety of the street segments the district fronts.

Walkability is a hallmark of Michigan main streets. Pedestrians are typically assigned top priority on main streets in the Modal Prioritization module as default.

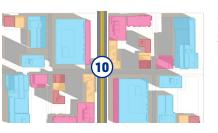
Aspirational Main Streets

The main street context also applies to "aspirational" main streets, where localities have a planning and regulatory framework in place to change future land use patterns and catalyze downtown-style development.



MDOT Guidance for Trunkline Main Streets

Main Street Contexts



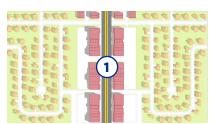
The **Downtown Core Main Street** context applies to the largest downtowns and concentrated employment centers in the region.



The Linear Downtown
Main Street context applies
to downtowns in densely
populated urban and suburban
areas that are largely developed
along the primary main street
and cross street.



The **Downtown Main Street** context applies to medium-sized downtown districts that expand beyond the primary main street and cross street.



The **Small Town Main Street** context applies to linear downtown districts approximately one to two blocks in length, surrounded by lower density development.



Main street: Riley Street, Dundee



Main street: Woodward Avenue, Detroit



Aspirational main street example: M-36, Hamburg Township, which proposes a pedestrian-friendly commercial main street district





Urban Corridors and Walkable Thoroughfares (Existing and Aspirational)

Typical Corridor Illustration Highlighting Urban Corridor & Walkable Thoroughfare Examples



Walkable thoroughfares and urban corridors contain different types of development and land uses. However, these contexts have the same modal priorities and as such have been grouped together in the Multimodal Tool.

In the Modal Prioritization module of the Multimodal Tool, any district or cluster of development that constitutes an urban corridor or walkable thoroughfare will have the corresponding modal priorities hierarchy applied for the entirety of the street segments in the context area.

Aspirational Urban Corridors and Walkable Thoroughfares

The urban corridor and walkable thoroughfare contexts also apply to "aspirational" corridors where localities have a planning and regulatory framework in place to change future land use patterns and improve walkability.



Aspirational walkable thoroughfare example: The 2015 Riverview Master Plan identifies the Fort Street corridor as an Investment Opportunity Area for higher density, pedestrian friendly mixed use development

Walkable Thoroughfare Characteristics

Walkable thoroughfares serve as local commercial and cultural hubs for their surrounding communities, and they may have varying levels of walkability and scales of development. Walkable thoroughfares are secondary to main streets and may be a continuation of, adjacent to, or in a different area from a community's main street. In some communities, a street named Main Street may be classified as a walkable thoroughfare. Walkable thoroughfares may be under city, township, village, county, or state jurisdiction.

Common road configurations range from twolane roads to wide arterials. Some walkable thoroughfares are part of an interconnected grid system, while others have sporadic access to fragmented and irregular street networks.

Walkable thoroughfares typically feature commercial uses (retail and office), with occasional mixed use. Buildings are often multiple stories and attached or clustered together, with shorter setbacks from the sidewalk than are found on typical suburban thoroughfares.

Urban Corridor Characteristics

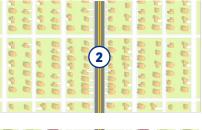
Urban corridors were identified using SEMCOG's Travel Demand Model and may contain a range of land uses. These corridors are often lined with compact commercial or residential development on small and medium sized parcels, in contrast to larger footprint development typical along walkable thoroughfares.

Walkable Thoroughfare Contexts





Urban Corridor Contexts





The Mixed Use Corridor context applies to traditionally suburban corridors where communities have encouraged development of varying land uses (commercial, institutional or residential) with walkable characteristics.

The Suburban Walkable **Thoroughfare** context applies where planning and regulations help catalyze redevelopment with walkable characteristics like a consistent street frontage, multistory development, mixed use, and reduced parking.



Land Use

Commercial Cultural/institution

Industrial Mixed use Office Residential

Walkable thoroughfare: Southfield Road, Lincoln Park

The Urban Residential Corridor

context applies to corridors that are primarily residential and developed with compact single or multiple family housing.

The **Hybrid Commercial District**

context applies to commercial corridors with a mix of compact walkable development (often historic) and auto-oriented uses or vacant parcels, typically surrounded by residential neighborhoods.



Urban corridor: Holbrook Avenue, Hamtramck

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Suburban Corridors

Land Use Commercial Cultural/institution Industrial Mixed use Office Residential

Typical Corridor Illustration Highlighting Suburban Corridor Examples



Suburban Corridor Characteristics

Suburban corridors may serve a variety of land uses including local and regional commercial destinations, residential development, and municipal and institutional campuses.

Suburban corridors have traditionally been designed to accommodate vehicle travel and prioritize operational efficiency over nonmotorized and transit facilities and amenities. Many of these corridors handle large daily truck volumes. These corridors typically have moderate nonmotorized demand, and varying levels of existing pedestrian and bicycle facilities. If the corridor is served by transit, the transit route is likely to have long headways. Development along suburban corridors is typically lower-density with large amounts of surface parking and large setbacks from the sidewalk or road.



Suburban street: Mound Road, Sterling Heights



Suburban street: Hamlin Road, Rochester Hills

What Does it Take to "Graduate" from a Suburban Corridor to a Walkable Thoroughfare?

Typically, a planning and regulatory framework exists to catalyze walkable development in suburban contexts with characteristics such as:

- Greater development density
- Smaller setbacks from the property line
- Off-street parking supply decreased or relocated (i.e. to rear of the property or structure)
- Emphasis on pedestrian, bicycle and transit access to surrounding land uses

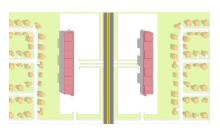


Big Beaver Road, Troy: Formerly a suburban corridor, now an urban corridor/walkable thoroughfare

Suburban Corridor Contexts



The **Suburban Commercial** context applies to traditional auto-oriented big box and commercial development with large lots and ample surface parking.



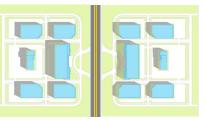
The Suburban Neighborhood Commercial

context applies to auto-oriented strip malls and shopping centers, often with large setbacks from the road and shared parking arrangements, and often surrounded by low-density suburban neighborhood development.



The Suburban Mixed Residential

context applies to corridors lined with suburban style single family or multiple family development. Development patterns often create fragmented and irregular street grids accessible from the corridor.



The Activity Center/Campus context applies to corridors adjacent to municipal, office, or institutional campuses.

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Rural Corridors/Small Town Hamlet or Village Commercial Corridor

Typical Corridor Illustration Highlighting Rural and Village Commercial Examples



Small Town/Village Characteristics

Small town/village commercial corridors are typically found in lower-density environments. These corridors serve as local commercial hubs and are typically linear, one to two blocks long, and surrounded by neighborhood residential development.

Development along small town/village commercial corridors is typically small scale, detached, lower-density with varying building setbacks and surface parking arrangements.

Commercial uses along these corridors are destinations for local trips, often by a variety of modes. These corridors typically have moderate non-motorized demand. If the corridor is served by transit, the service is likely to be paratransit.

In some instances, small town/village commercial corridors serve as a bridge between small town main streets, which fall in the main street typology, and traditional suburban commercial or residential development.



Small town/village: Main Street, New Haven

Small Town/Village Contexts



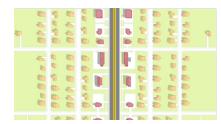
Business District context applies to commercial and institutional hubs in residential areas. These may exist in towns, suburbs, and urban neighborhoods.

The 1-2 Block



The **Suburban Neighborhood**context applies to corridors witl

to corridors with small commercial clusters or hamlets surrounded by suburban neighborhood development.



The Residential/Commercial

Corridor context applies to corridors characterized by small town commercial development.
Commercial uses may be intermixed with residential (typically single family).

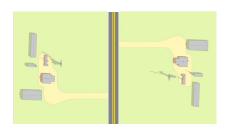
Rural Corridor Characteristics

Rural corridors are typically found in low density environments. Predominant land uses are residential and agricultural, with some lowdensity commercial development.

Rural corridors may serve as local roads or regional connectors. Personal vehicle and truck trips account for the majority of trips. Rural corridors typically have potential non-motorized demand and if present, existing non-motorized facilities typically include sidewalks or paved shoulders. The corridor is unlikely to be served by transit, and if it is, the service is likely to be paratransit.

Rural corridor development is typically small-footprint, low-density with large setbacks from the road.

Rural Corridor Contexts



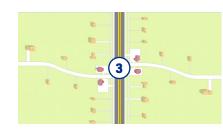
Agriculture context applies to corridors surrounded by agricultural land that often serve as connectors between communities.

The Rural Industry/

Land Use

Commercial
Cultural/institution

Industrial
Mixed use
Office
Residential



context applies
to corridors
surrounded
by low density
development that

The Rural Corridor

often serve as connectors between communities.



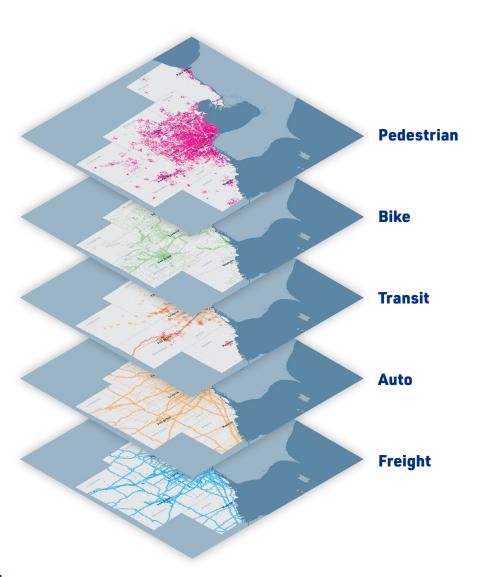
Rural corridor: King Road, Huron Charter Township

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Layered Networks

A modal network is a grouping of streets intended to facilitate movement by one of the five modes included in the Multimodal Tool. As shown above, these five individual networks layer together to form a cohesive network serving all travel modes. While some roads serve just one mode, many serve multiple modes. Indeed, accommodating travel by different modes where networks overlap is the basis for complete streets planning.

Modal Tiers

While a road may serve multiple modes, the road may not be equally important to each. Modal tiers indicate how important a road segment is in the modal network. For the SEMCOG region, there are three modal tiers: Tier 1, Tier 2, and Tier 3. Tier 1 indicates streets that are of the highest importance for carrying people using a certain mode. Tier 2

streets are of secondary importance, and Tier 3 streets are of tertiary importance.

The Multimodal Tool focuses on complete streets planning on surface thoroughfares. Accordingly, not all streets and highways in Southeast Michigan are included in the modal networks. The modal networks include National Functional Classification (NFC) categories 3-5:

- 3 Other Principal Arterial
- 4 Minor Arterial
- 5 Major Collector

The modal networks also include some short segments of NFC classes 6 and 7 (local streets) to capture all surface MDOT trunklines. In each modal network, these streets fall under Tier 3.

	Main Streets (Existing and Aspirational)	Urban Corridors and Walkable Thoroughfares (Existing and Aspirational)	Suburban Corridors	Small Town Hamlet or Village Commercial Corridor	Rural Corridors
1	PEDESTRIAN	TRANSIT	AUTO	PEDESTRIAN	AUTO
2	BIKE	*** PEDESTRIAN	*** PEDESTRIAN	BIKE	FREIGHT
3	TRANSIT	BIKE	BIKE	TRANSIT	BIKE
4	AUTO	AUTO	TRANSIT	AUTO	*** PEDESTRIAN
5				B	

FREIGHT

NFC classes 1 and 2 (freeways) are not included as these facilities fall outside of local jurisdiction and do not serve local land uses.

FREIGHT

Pages 23-32 describe what types of roadways fall into each tier for each mode included in the Multimodal Tool. Note that the project team created the modal tiers using regional and state datasets; localized adjustments may be necessary when using the Tool.

Modal Priorities

FREIGHT

When multiple modal networks overlap, planning for complete streets can require balancing limited available space among competing uses. Modal tiers help determine how to allocate space, but what happens when multiple Tier 1 modes use the same road? This is where modal prioritization provides a

consistent framework for making decisions about how to allocate space to different modes: the higher priority mode gets more of the available space.

TRANSIT

FREIGHT

As shown in the graphic above, modal prioritization varies by land use context. For example, walking is much more important in a land use context with a large amount of pedestrian activity than a rural environment where few walk. Accordingly, a street that served Tier 1 auto and Tier 1 pedestrian in the Main Street context would prioritize space for people walking. A similar street serving Tier 1 auto and Tier 1 pedestrian in the Suburban Corridor context would prioritize space for people driving.

Modal priorities are intended to provide guidance but may vary based on special circumstances, local priorities, and MDOT input on trunklines.

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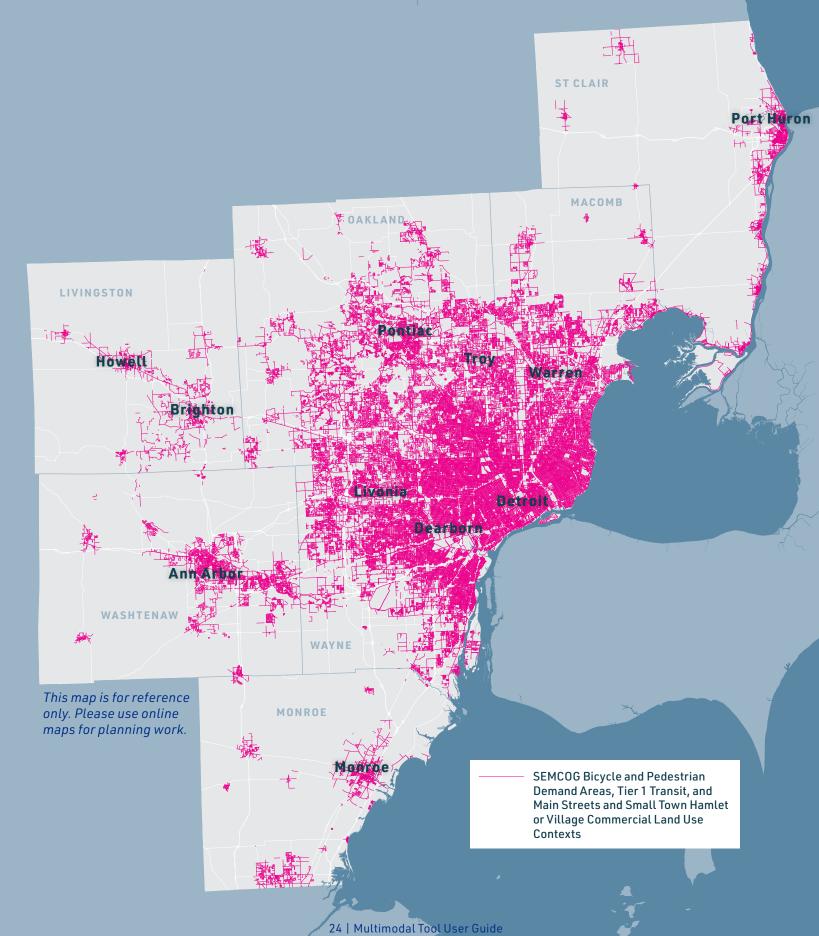
SEMCOG &MDOT

Pedestrian Network to the Multimodal Tool.

SEMCOG Bicycle & Pedestrian Demand Areas Facilities Included (Plus Others as Noted)

- High bicycle & pedestrian demand areas
 - Tier 1 transit streets (see Transit Network on pages 27-28)
 - Main Streets and Small Town Hamlet or Village Commercial land use contexts (see pages 13-14 and 19-20)
- Medium bicycle & pedestrian demand areas
- Potential bicycle & pedestrian demand areas

The pedestrian network is largely based on the Bicycle and Pedestrian Demand Analysis found in the Bicycle and Pedestrian Mobility Plan for Southeast Michigan (pages 42-45).







Bike Network

Tier SEMCOG Bicycle Network Facilities Included* (Plus Others as Noted)

• Shared-use paths

• Protected bike lanes (1-way, on both sides of street, or 2-way, on one side of street)

• Bike lanes

• Buffered bike lanes

• Two-way bike lanes

• Rural wide paved shoulders

3

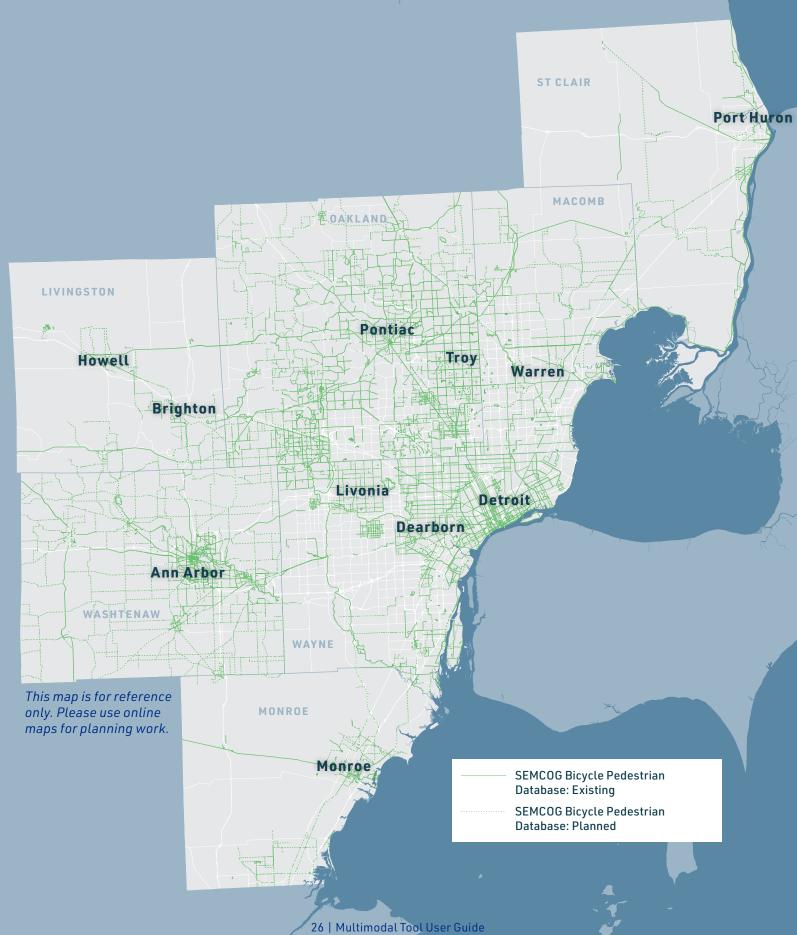
• Shared lane markings

• Bike routes

• Urban paved shoulders

• SEMCOG Bicycle & Pedestrian Demand Areas

The bicycle network is built from data found in the <u>Bicycle and Pedestrian Mobility Plan for Southeast Michigan</u>. It includes all identified existing and planned bicycle facility and bicycle and pedestrian demand analysis. The network does not show all the roads in the region, just those included in the Multimodal Tool.



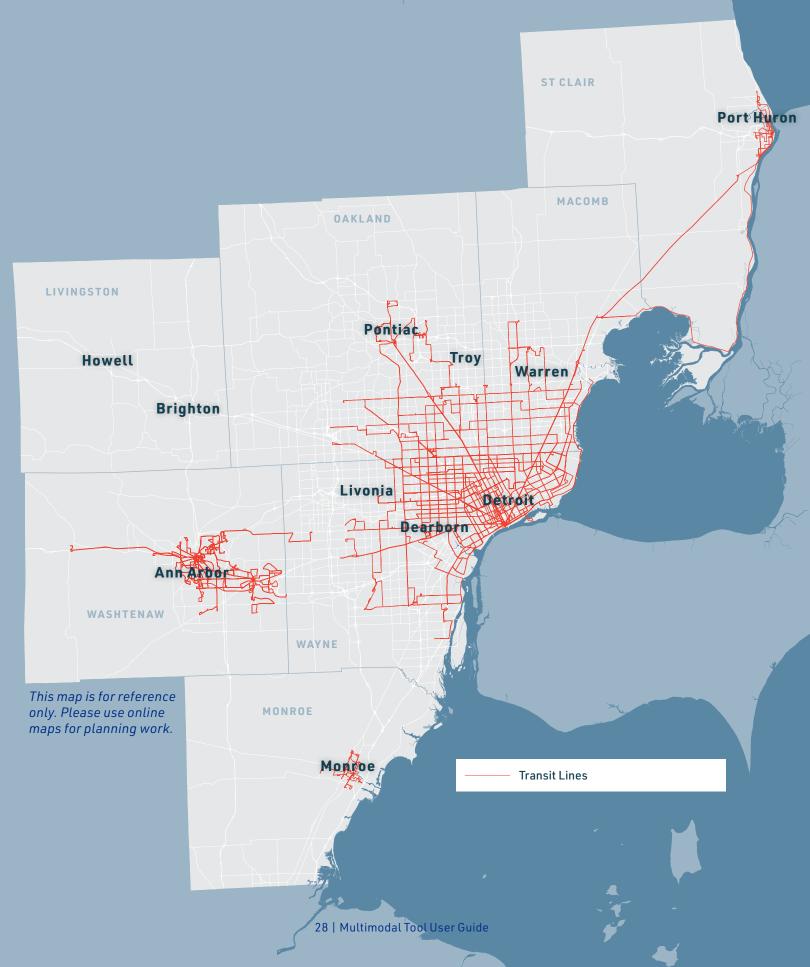
^{*} Includes all existing and proposed facilities





Transit Network

Tier	Frequency	Transit Services Included
1	Weekday service every 20 minutes or less	 DDOT Connect10 Routes FAST All routes QLine The Ride 4, 5, 6, 23, 28, 41, 62 University of Michigan All routes except Crisler Express RTA Planned "15 at 15" high-capacity transit corridors (Michigan Avenue, Grand River Avenue, Woodward Avenue, Gratiot Avenue, Washtenaw Avenue)
2	Weekday service every 20-40 minutes	 DDOT Key Routes The Ride 3, 21, 22, 24, 25, 26, 27, 29, 30, 31, 32A, 32B/C, 42, 43, 44, 45, 46, 47, 65, 66, 68 LET All routes RTA Remaining planned "15 at 15" high-capacity transit corridors not included in Tier 1
3	Weekday service every 40 minutes or more (or limited weekday service)	 DDOT Neighborhood Routes SMART All routes The Ride 33, 60, 63, 64, 81, 91/92, 98 University of Michigan Crisler Express BWAT All routes







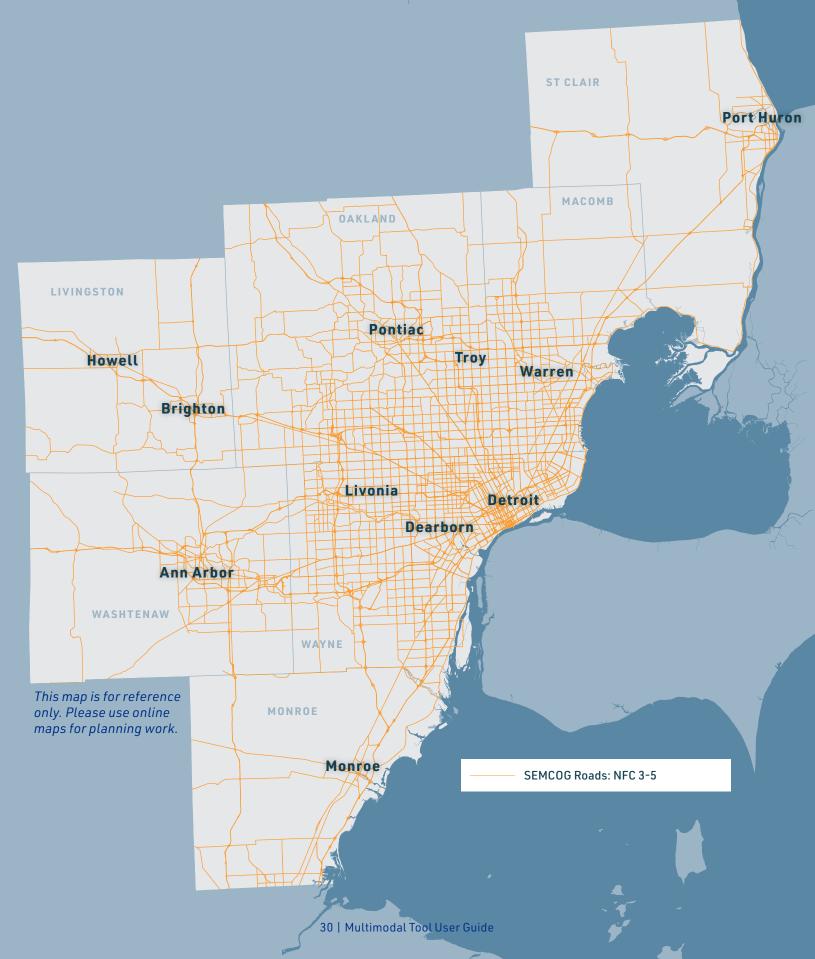
Auto Network

Tier SEMCOG Roads: National Functional Classification (NFC) Facilities Included

NFC 3 - Other Principal Arterial

• NFC 4 - Minor Arterial

• NFC 5 - Major Collector







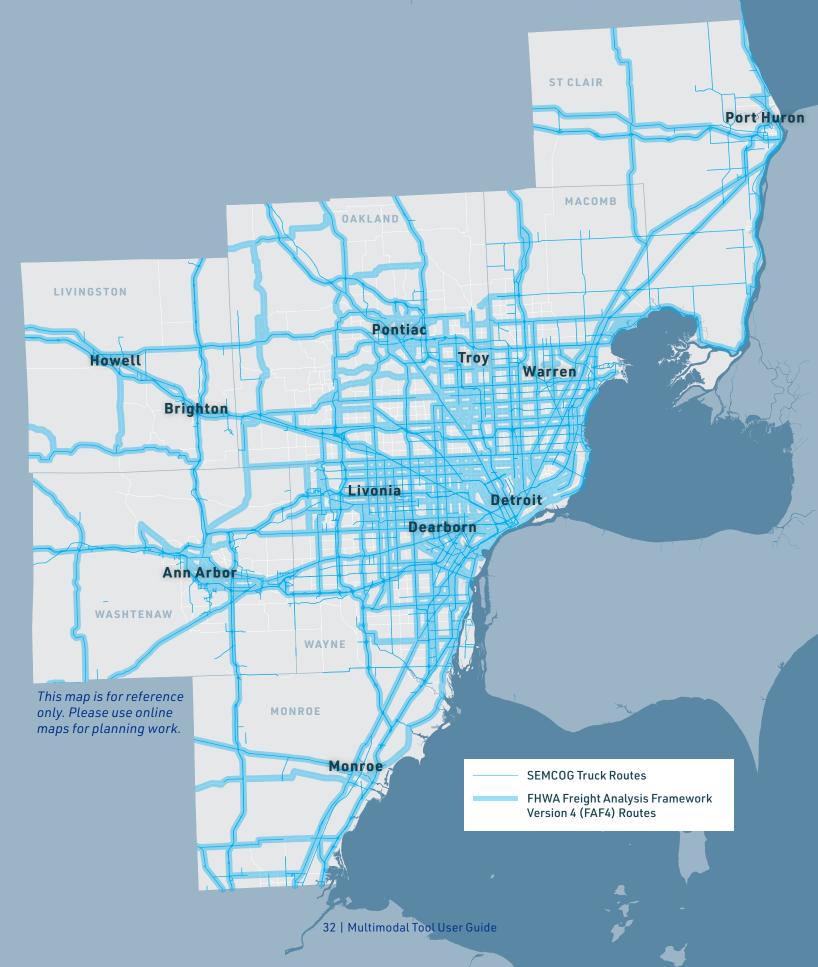
Freight Network

Tier SEMCOG Truck Routes and FHWA Freight Analysis Framework Version 4 (FAF4) Routes: National Functional Classification (NFC) Facilities Included

• NFC 3 - Other Principal Arterial

NFC 4 - Minor Arterial

• NFC 5 - Major Collector





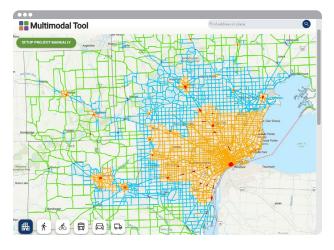


Using the Multimodal Tool

The Multimodal Tool has two modules: Modal Prioritization, which is used for network-level planning, and Right-of-Way Allocation, which is used for street crosssection-level planning. The Rightof-Way Allocation module has two components: Streetmix and a Control Panel of checkboxes for the user to select roadway characteristics. The Tool pieces are described at right, and each step in the Tool workflow is explained on the pages that follow.



Webmap



The Webmap lets you view modal networks, modal tiers, and land use contexts, and identify a project corridor.

Map Tools

Zoom In Zoom Out Basemap Gallery

Map Legend

Selection Tool

Take a Tour

Segment

Land Use Context

Pedestrian

Modal Network Layers

00 Bike

Transit

Freight

Auto

Right-of-Way Allocation

Streetmix



The Multimodal Tool integrates Streetmix, an open source platform that lets you build options for how to redesign a project corridor.

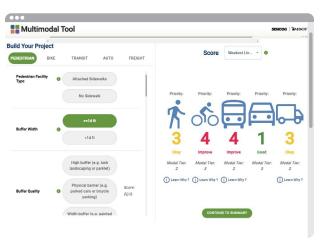
Multimodal Tool Tips

The Multimodal Tool is designed so that each of your scenarios (Existing, Proposed Option 1, Proposed Option 2, etc.) and corridor segments is set up and shared as a separate project with a unique link.

When you first open the Multimodal Tool, a dialog window offers a walkthrough, or tour, to guide you through the Webmap and Modal Prioritization screen. The Launch App button will take you directly to the Tool. The Setup Project Manually button allows you to bypass the Webmap and manually create your own segment, instead of selecting an existing corridor with pre-populated modal network and land use context data.

By default, the Land Use Context map layer will be visible. Clicking a road segment in this layer

Control Panel



The Control Panel allows you to input additional details that are not captured in Streetmix and shows how well your design serves different road users.

displays characteristics like street name, context and modal tiers, and allows you to add it to your project. The modal tier maps can be made visible for reference using the modal icon buttons on the bottom-left of the Webmap. Follow the instructions in the Set Up Your Project panel to finish entering corridor characteristics.

After tiers have been specified, the Tool will take you to the Right-of-Way Allocation module. Create the segment cross-section in the Streetmix component, and then move to the Control Panel to specify any remaining design details for all modes. The right side of the Control Panel will let you toggle between two different scoring methods (weakest link and average). The Summary button will take you to a printable report for your segment. The Save & Share button produces a unique link for

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1. Project Initiation

The steps below are conducted before using the Multimodal Tool.



Identify Project Corridor

The project corridor may be identified as part of a network evaluation to find gaps, determine priorities, or address safety concerns and operational needs. It may be based on community needs, existing plans, or other criteria

It is your choice to determine how many segments you want to study using the Multimodal Tool. For example, you may pick one or two segments that are representative of the entire project corridor. Alternately, you may want to create segments that are based on changes in land use context or modal tiers. Or, you may choose to design the corridor block-by-block if conditions or roadway geometry change substantially over the length of the corridor.



Identify Road Jurisdiction

Identify if the road falls under local, county, MDOT, or private jurisdiction, using the SEMCOG Road Jurisdiction Map. You may need to check the standards for the owner of the road to see if they have set requirements like minimum lane width.



Identify Stakeholders

Depending on the project location, stakeholders may include city and local agency staff; county, SEMCOG, and MDOT staff; and downtown development or corridor improvement authorities, community-based organizations, and other large trip generators. You may wish to involve the public using a survey, design workshops, charrettes, open houses or other techniques.

It may be useful to have the Tool and other information on existing conditions, data, available space, and other important factors to help identify what is most practical and what fits within the available space instead of starting with a "blank sheet of paper."



Use MDOT Complete Streets Process Guide for Southeast Michigan

The guide (see page 6) describes the process for evaluation of requests to modify or repurpose travel lanes along roads within the seven-county SEMCOG region.

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1. Project Initiation

(Continued)



Establish Project Vision

The vision may relate to enhancing safety, livability, equity, environment and air quality, economic development, and multimodal connectivity.

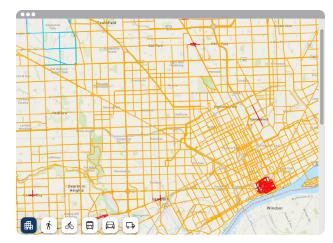
2. Modal Prioritization

The steps below are conducted using the Webmap.



Confirm Land Use Context

Use the Modal Prioritization Webmap to locate your project corridor. The first item to view on the map is the land use context for your corridor (see Explaining Transportation Concepts on page 7 for additional information about contexts). The Land Use Context layer will be visible by default when you launch the Tool. You can also toggle it on and off by clicking the layer's icon 開 on the bottom left. The corridor may have more than one context. After adding segments to your project, you can change the land use context in the Set Up Your Project panel to reflect recent or anticipated context changes. You may also choose to experiment with different land use context choices to compare outcomes for different land use scenarios in the Right-of-Way Allocation module of the Tool.

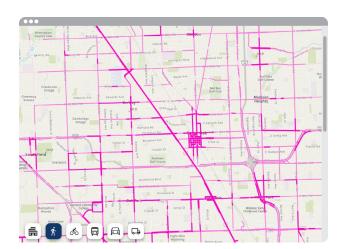


The land use context layer can be toggled on and off using the layer's icon on the bottom left.



Refine Modal Networks and Tiering

The next step is to view which modal networks your corridor is intended to serve and what tier of importance each mode takes (see page 21 for additional information about modal networks and tiers). The modal networks and tiers may vary over the length of your corridor. Note that networks and tiers are based on existing data and may change with your planned project. Toggle various modal network layers using 🏂 💰 🖨 📮 🕟 (modal icon buttons) in the bottom left corner of the map. Selecting a segment on the map also displays its modal tiers. These tiers can be changed in the Set Up Your Project panel. For example, a corridor may currently be an Auto Tier 1, but the project aims to increase active transportation options. In this instance, you would note to change the Auto tier in the project set up panel after project segments have been selected.

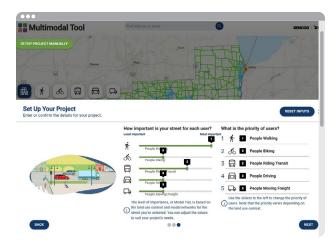


View modal tiers using the modal network buttons.



Determine Modal Prioritization

The final step is to confirm modal priorities, which can be viewed in the Set Up Your Project panel while changing modal tiers. The Tool is programmed to determine priorities based on a preset default order for prioritizing modes when the corridor serves multiple modes of the same tier (see page 22 for additional information about modal priorities). Modal priorities vary in different land use contexts and tiers, so these inputs will need to be changed until the desired prioritization is achieved for your corridor. You may decide to change modal priorities for your corridor if, for example, it is a high-priority transit corridor in a Main Street context, where pedestrians would typically take top priority under the default setting. This is also when roadway information like number of lanes, speed limit, and traffic volumes are entered through the Set Up Your Project panel.



Use the Set Up Your Project panel on the web map to change modal tiers and view priorities.

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3. Right-of-Way Allocation

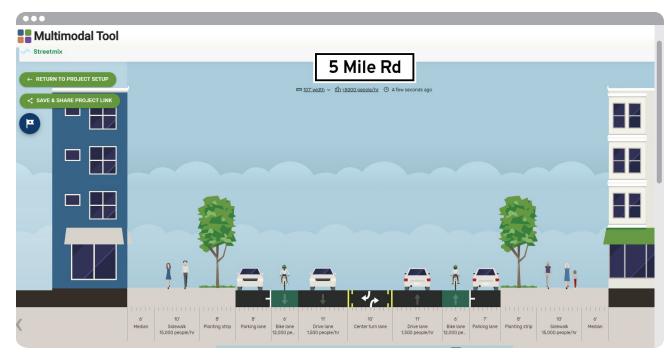
The steps below are conducted using the Streetmix and Control Panel components of the Tool.



Apply Streetmix

Streetmix is an open source platform developed by Streetmix LLC. The Multimodal Tool uses Streetmix to let you design options for your corridor. You may choose to design the existing cross-section plus any new configurations you want to evaluate through the Multimodal Tool. The design elements selected in Streetmix will automatically populate

any relevant options in the Control Panel below. The score displayed in the Control Panel will also update to reflect changes in cross-section design as you make them. Each cross-section design can be saved and shared through a unique link by clicking on the Save and Share Project Link button on the top left.



Streetmix lets you build options for how to redesign a project corridor. The options you select in Streetmix are further customizable using the Control Panel.



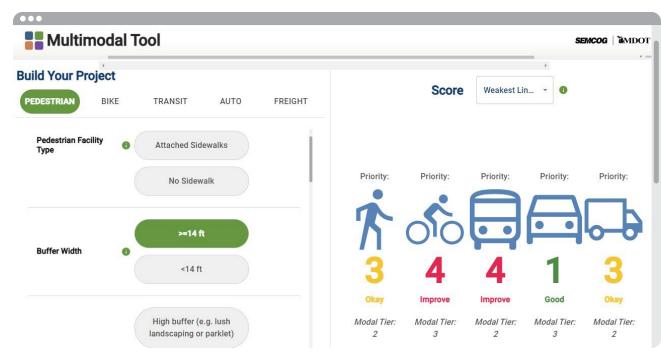
Evaluate Multimodal Performance

Once you have completed your cross-section design in Streetmix, use the Control Panel below to input additional details about the design elements that are not captured in the cross-section. Design element options in the Control Panel that are part of the Streetmix cross-section will be populated based on what you selected in the previous step. Click through each mode on top of the panel to ensure that all relevant modes have been addressed.

The scoring element on the right will update as you adjust different design options. The scores reflect

how well your design serves people traveling by each mode. A score of 1 is highest, and 4 is lowest. By default, the "weakest link" methodology is used. That is, the individual score of the worst-performing design element in each mode is assigned to that mode. The drop-down menu on the top right lets you switch between this option and the "average score" methodology, which averages the individual scores of all design elements.

Once you have input all the values for a particular mode, click the Continue to Summary button at the bottom of the tab.



The Control Panel allows you to input additional details that are not captured in Streetmix and calculates how well your street configuration serves people walking, biking, riding transit, driving, and moving freight.

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3. Right-of-Way Allocation

(Continued)



Review Scoring Criteria and Adjust Project as Necessary

The Scoring Summary shows how the existing or proposed cross-section, as entered in the Rightof-Way Allocation module, accommodates each mode based on the specified modal tiers, modal priorities, and land use context. This page displays your Streetmix cross-section and the final scores

for each mode. You can find modal scores, along with modal tier, priority, and whether the mode's performance objective has been achieved. To better understand the weakest link methodology, this page also shows the worst-performing elements for modes where the objective has not



Understanding Your Score

Land use contexts with lots of activity and lots of different types of road users, like Main Street, Urban or Walkable Thoroughfares, Small Town Hamlet or Village Commercial, and Suburban Corridors, need a score of 1 or 2 to create a safe and welcoming environment for all street users. Rural environments with less activity need a score of 1, 2, or 3 to satisfy this

Score	Main Street	Urban or Walkable Thoroughfares	Small Town Hamlet or Village Commercial	Suburban Corridors	Rural
Score 1 (Highest)	~	~	~	~	~
Score 2	~	~	~	~	~
Score 3	×	×	×	×	~
Score 4 (Lowest)	×	×	×	×	×

The Scoring Summary page shows how the cross-section entered into the Tool accommodates each user based on the specified modal tiers, modal priorities, and land use contexts. A score of 1 is highest, and 4 is lowest. The page includes both an overall score, based on weakest link and shown in the Score column, and an average score based on all the inputs for a given mode.

4. Implementation

The step below is conducted after using the Multimodal Tool.



Apply the Tool

Three types of implementation may be considered based upon the complete streets study outcome: temporary tests, permanent low-cost options that do not change the existing curbs, and permanent projects that reconstruct the entire street. These are described in further detail in the next section, Applying the Tool.



Temporary test example

Low-cost option within existing curbs example



Curb reconstruction example

been met. Some factors affecting weakest link, such as available right-of-way, may not be feasibly or desirably changed through the planning process. For this reason, the Average Score is also provided to show how the combination of changing multiple factors may holistically improve how the corridor accommodates its intended users. Inputs can be adjusted by clicking the Return to Project button on the top left.

Run the Tool for each scenario and then compare scoring summaries.

The Performance Objective Met column is based on land use context. As shown in the Scoring Criteria table on the previous page, land use contexts with more multimodal activity, greater diversity of modal users, and a higher presence of vulnerable users (like people walking and riding bikes) need higherscoring street configurations to adequately meet the objective of serving all users. Higher scores are achieved by using higher-quality treatments for the prioritized modes on the corridor. Rural contexts with less multimodal complexity, fewer users, and less diversity of modal users do not require as high of scores to still meet objectives as streets in these contexts are often less critical to moving multiple user types.

This page also reports any FHWA Proven Safety Countermeasures that have been incorporated into your design based on your inputs.

To print or save, click the Generate PDF Report button on the bottom of the page.





Applying the Multimodal Tool

Three types of implementation may be considered based upon the complete streets study outcome: temporary tests, permanent low-cost options that do not change the existing curbs, and permanent projects that reconstruct the entire street. The appropriate project type varies based on the proposed design changes, road ownership, stakeholder and political buy-in, and immediate vs. long-term funding opportunities.



Temporary Tests



Low-Cost Options within Existing Curbs



Curb Reconstruction



Parking-protected bike lane pilot in Lansing

Temporary Tests

Temporary Test projects are trials for a short period of time, often completed with materials not intended for permanent installation. They could be implemented for a month, or seasonally, or for a whole year. Before and after studies should be conducted of traffic speeds, volumes, delays, modal split, and ability of surrounding network to absorb excess traffic from a road diet or network change. Projects implemented as tests are often granted a more expeditious implementation process due to their temporary nature.

If being implemented on an MDOT trunkline, agreement with MDOT must be achieved on the duration of the test, design, materials, signage, public awareness of the project, and data collection/evaluation.

These projects are typically precursors to a more permanent low-cost option within the existing curbs or complete curb reconstruction.

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4-to-3 road diet in Berkley

Low-Cost Options within Existing Curbs

Options may include:

- Striping changes (often as part of a lane narrowing, lane reduction, bike lane project)
- Wider more visible crosswalks
- Bike lane enhancements such as colored paint or protection (i.e. flexible delineator posts)
- Painted curb extensions or sidewalk extensions
- Conversion of a travel lane to dedicated transit lane

The municipality's Authorized Agent must endorse the design changes. On an MDOT trunkline, MDOT must approve any design changes. MDOT may require agreement on restoration of the prior design under certain outcomes.

These design changes are often planned in tandem with a prescheduled repaving or restriping project. These projects may also be precursors to curb reconstruction.



Complete curb reconstruction project in Birmingham

Curb Reconstruction

Curb Reconstruction requires more extensive public and stakeholder engagement than other two types of projects due to higher cost and the more permanent nature of implementation. This typically includes conducting a public meeting and documenting public input. The municipality's Authorized Agent must endorse the design changes.

Examples of curb reconstruction include:

- Sidewalk widening
- Raised and separated bicycle facilities
- Curb extensions and median crossing islands
- Stormwater management
- Transit infrastructure and stop/station upgrades
- Adding a turn lane or travel lane

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The Multimodal Tool is a streamlined corridor planning tool for Southeast Michigan. The Tool brings together land use contexts and modal networks allowing you to see how overlapping networks fit together. You can design and evaluate complete street configurations to best determine how to serve multimodal needs today and in the future.

The Multimodal Tool is Currently Available to Users of All Types:





& community





The Multimodal Tool Will Continue to Evolve

SEMCOG and MDOT are continuously seeking input from Multimodal Tool users to iterate on and improve the Tool. For example, the Tool presently focuses on mid-block cross-sections, but complete street projects and safety are crucial at intersections, and future iterations of the Multimodal Tool will broaden to include intersection design and evaluation. Visit www. semcog.org/mmtool to submit your feedback and ideas for the Tool.

As we periodically update the land use contexts and modal networks in the Tool, we will also update it to stay current as new technologies come forward, such as shared mobility, mobility on demand services, and connected and autonomous vehicles. These modes will interact differently than traditional modes, but the Multimodal Tool will stay current to meet your current and future complete streets planning needs.







Appendix A. Glossary

Attached sidewalk		A sidewalk that is directly adjacent to the roadway and has no landscaping or other buffer.				
Complete street	design comfo	A transportation and design approach that requires streets to be planned, designed, operated, and maintained to enable safe, convenient, and comfortable travel and access for users of all ages and abilities regardless of their mode of transportation.				
Control Panel	users i	oonent of the of the Right-of-Way Allocation module of the Tool that lets nput roadway features for people walking, biking, riding transit, driving, oving freight and shows how well the street design serves each user.				
Cross-section		al representation of a roadway and its attributes, typically from right-of- ne to right-of-way line with the road's centerline shown in the middle.				
Detached sidewalk	A sidewalk that is separated from the roadway by a buffer, such as landscaping, parked cars, or a bike lane.					
Functional classification / National Functional		em for categorizing roads based on the purpose the road serves. Fications include:				
Classification (NFC)	NFC 1	Interstate freeway (not included in Multimodal Tool as it is not a local street)				
	NFC 2	Other freeway (not included in Multimodal Tool as it is not a local street)				
	NFC 3	Other principal arterial				
	NFC 4	Minorarterial				
	NFC 5	Major collector				
	NFC 6	Minor collector				
	NFC 7	Local road				
	NFC 0	Private				
Green infrastructure	A planning and design approach to managing stormwater, heat generated from impervious surfaces like asphalt, health, and air quality based on ecosystem network models.					
Implementation project types	Three ways of implementing a project designed and evaluated using the Multimodal Tool, each with a different level of investment. The appropriate project type depends on the proposed design changes, road ownership, stakeholder and political buy-in, and immediate vs. long-term funding opportunities. The three project types are, from smallest to largest investment:					

_						-	
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		u	u	ıa	ıv	LC	ЭL

Trial of a new concept for a short period of time, often

completed with non-permanent materials.

Low-cost options

Project completed with light-touch infrastructure withing existing curbs changes like striping, painted or temporary curbs, bollards, and planters.

Street reconstruction Complete rebuild of a street, with larger infrastructure investments like sidewalk widening or curb extensions, raised or separated bikeways, and dedicated transit infrastructure.

Land use context

The land use, building configuration, and environment adjacent to a road. These factors all influence how the road operates and the users it needs to serve. All should be taken into consideration when designing the road. There are five land use contexts in the Multimodal Tool, which may exist currently or may be an environment a community aspires to achieve through land use and transportation changes:

Main Streets

Michigan main streets serve as the commercial and cultural centers of their communities and are the primary street(s) that traverse a downtown or business district.

Urban Corridors and Walkable **Thoroughfares**

Urban corridors and walkable thoroughfares contain varying types of development and land uses with an emphasis on pedestrian connectivity and walkability. They share the same modal priorities.

Suburban Corridors

Suburban corridors may serve a variety of land uses and have traditionally been designed to accommodate

vehicle travel.

Small Town Hamlet Corridor

Small town hamlets and village commercial corridors or Village Commercial serve as local 1-2 block commercial hubs and are typically found in lower-density environments.

Rural Corridors

Rural corridors are found in low density environments and typically feature residential and agricultural land uses, with some low-density commercial development.

Level-of-service

A mechanism used to determine how well a transportation facility is operating from a traveler's perspective, typically through a letter rating between A and F.

Livability

A community or environment in which a person has multiple, convenient, safe, and healthy transportation options that provide access to economic opportunities and quality of life.

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M2D2	MDOT Multi Modal Development & Delivery Guidebook (M2D2), the new MDOT framework for implementing multimodal projects across Michigan.
MDOT	Michigan Department of Transportation, the government agency overseeing all forms of transportation in Michigan.
MDOT Complete Streets Process Guide for Southeast Michigan	Flowchart for determining when to apply the Multimodal Tool or when to use another approach to redesign a street in Southeast Michigan. It is located on page 6 of this User Guide.
MDOT Main Street Trunklines Guide	MDOT's guide for multimodal planning in main street contexts along state trunklines.
MDOT Road Diet Checklist	A step-by-step list used by Michigan Department of Transportation staff when considering a road diet's appropriateness and applicability in a given situation.
Modal network	A collection of roads that allow for continuous and connected travel for each of five travel modes: pedestrian, bicycle, transit, auto, and freight.
Modal prioritization	A system for allocating space to different modes when multiple Tier 1 modal networks overlap on a road, especially when available space is limited and tradeoffs need to be made between different users. Modal priorities are the "tie breaker." They set a level of importance for each mode in each land use context. The higher priority mode gets more of the available space.
Modal Prioritization module	The first of the two Multimodal Tool modules. It is a webmap that lets users view modal networks and tiers, identify a project corridor, review modal priorities, and determine land use contexts.
Modal tier (Tier 1, Tier 2, Tier 3)	Determines how important a road is for serving a travel mode. Tier 1 is the most important, Tier 2 is of moderate importance, and Tier 3 is of lower importance. Modal priorities are used as a "tie breaker" when multiple Tier 1 modes share the same road.
Mode; travel mode	A means of travel. The Multimodal Tool addresses five travel modes: pedestrian, bicycle, transit, auto, and freight.
Multimodal	Roadways that are intended to be used by multiple types of travel modes.
Multimodal performance	Determination of how well a street cross-section serves the modes that the corridor is intended to serve.
Multimodal Tool	A tool built by SEMCOG and MDOT that is the subject of this User Guide. It allows users to design and evaluate the multimodal performance of an existing or propose roadway cross-section.

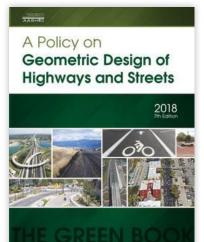
Project corridor	The street or collection of streets where the Multimodal Tool will be used to plan and evaluate a street redesign project. It may be identified as part of a network evaluation to find gaps, determine priorities, or address safety concerns and operational needs. It may be based on community needs, existing plans, or other criteria.
Right-of-way	The physical land that is either owned or controlled by a government entity, in which travel access is granted to the public. Roads fit within rights-of-way.
Right-of-Way Allocation module	The second of the two Multimodal Tool modules that uses Streetmix and the Control Panel to help users design cross-sections to best serve the prioritized modes in the given land use context and evaluate how well the designs serve users.
Road diet; lane repurposing	The conversion of one or more lanes, typically used for driving, to other uses, including wider sidewalks, bike lanes, on-street parking, or a two-way center left-turn lane.
Road jurisdiction	The entity that operates and maintains a given road. In Southeast Michigan, roads may fall under local, county, MDOT, or private jurisdiction. Road jurisdiction can be determined using the SEMCOG Road Jurisdiction Map.
Road Safety Audit	A formal safety performance examination of an existing or future road or intersection by an independent, multi-disciplinary Road Safety Audit team.
SEMCOG	Southeast Michigan Council of Governments, the regional body coordinating planning across the seven-county Southeastern Michigan region consisting of Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne counties.
Streetmix	An open source, web-based tool developed by Streetmix LLC that allows users to generate sidewalk-to-sidewalk street examples, also known as cross sections, quickly and easily. It is integrated into the Right-of-Way Allocation module of the Tool.
Trunkline	A road operated by MDOT.
Vulnerable road user	A person walking or biking, who is more likely to experience death or serious injury if they are involved in a crash.
Weakest link	The element of the cross-section that provides the lowest level of accommodation for the given user. Generally, the weakest link should be evaluated when using the Multimodal Tool.

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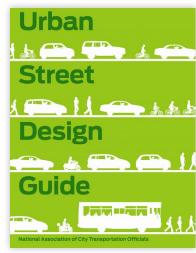




Appendix B. Additional Resources



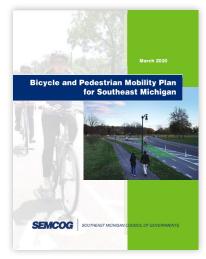
AASHTO Green Book



NACTO Urban Street Design Guide



ITE Implementing Context Sensitive Design



SEMCOG Bicycle and Pedestrian Mobility Plan for Southeast Michigan



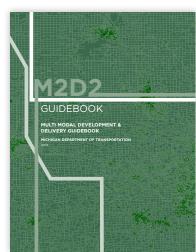
SEMCOG Southeast Michigan Transportation Safety Plan



SEMCOG 2050 Regional Transportation Plan for Southeast Michigan



MDOT 2045 State Long-Range Transportation Plan



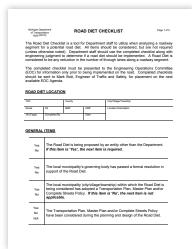
MDOT M2D2 Guidebook



MDOT Guidance for Trunkline Main Streets



MDOT Context Sensitive Solutions



MDOT Road Diet Checklist



RTA 2023 Regional Transit Master Plan

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Appendix C. Scoring Criteria & Crash Reduction Factors

Understanding Scores in the Multimodal Tool

Score	Main Street	Urban or Walkable Thoroughfares	Small Town Hamlet or Village Commercial	Suburban Corridors	Rural
Score 1 (Highest)	✓	✓	✓	✓	✓
Score 2	✓	✓	✓	✓	✓
Score 3	×	×	×	×	✓
Score 4 (Lowest)	×	×	×	×	×

Land use contexts with lots of activity and lots of different types of road users, like Main Street, Urban or Walkable Thoroughfares, Small Town Hamlet or Village Commercial, and Suburban Corridors, need a score of 1 or 2 to create a safe and welcoming environment for all street users. Rural environments with less activity need a score of 1, 2, or 3 to satisfy this objective.

Transit Scoring Criteria

TRANSIT		
Score		High Capacity Transit
1	Any 8, must include sign/identifier, shelter and sidewalk	Any 8, must include sign/identifier, shelter and sidewalk, any 1 of HCT
2	Any 5, must include sign/identifier and sidewalk	Any 5, must include sign/identifier and sidewalk
3	Any 3, must include sign/identifier and sidewalk	Any 3, must include sign/identifier and sidewalk
4	All other scenarios	All other scenarios

Auto Scoring Criteria

AUTO	V/C	Score
LOS		
A	0.00-0.50	1
В	0.51-0.70	1
С	0.71-0.80	1
D	0.81-0.90	2
E	0.91-0.99	3
F	>1	4

Freight Scoring Criteria

FREIGHT	
Score	
1	12' or more; <=1 special consideration
2	11 to 12'
3	11'; 2 special considerations
4	11' or less

Pedestrian Scoring Criteria

PEDESTRIAN INPUTS PED. SCORE 1		PED. SCORE 1		PED. SCORE 1	
Detached Sidewalk		Attached Sidewalk		No Sidewalk	
	Buffer >= 14 ft, <= 35 MPH / < 14 ft, <=				<10 MPH
Prevailing Speed	30 MPH	Prevailing Speed	<= 30 MPH	Prevailing Speed	
No. of Travel Lanes	Buffer >= 14 ft, 2-5 / < 14 ft, 2-3	No. of Travel Lanes	2-3	No. of Travel Lanes	No centerline / 1 lane
Buffer Quality Landscape Buffer and Street Trees	Lush landscaping, parklet Continuous	Speeds Turning Into Driveways Usable Sidewalk Width	<10 MPH >= 10 ft	Speeds Turning Into Driveways Comfort Zone	<10 MPH >= 6 ft
Landscape Buller and Street Trees Usable Sidewalk Width	>= 10 ft	Sidewalk Quality	Even, smooth surface	Lighting	Pedestrian-scale
Sidewalk Quality	Even, smooth surface	Sidewalk Accessibility	No driveways	Heavy Vehicles	<= 5%
Sidewalk Accessibility	No driveways	Lighting	Pedestrian-scale	Active Building Frontage	Majority of sw has active building
Lighting	Pedestrian-scale	Heavy Vehicles	<= 5%	Crossing Spacing	frontage <= 400 ft
	<= 5%	-	Majority of sw has active building	Special Considerations	None
Heavy Vehicles	. 070	Active Building Frontage	frontage		None
Active Building Frontage	Majority of sw has active building	Crossing Spacing	<= 400 ft	Crossing Improvements	-
Crossing Spacing Special Considerations	<= 400 ft None	Special Considerations Crossing Improvements	None Any 2		
Crossing Improvements	Any 2	Crossing improvements	Ally 2	⊒	
	•	-			
PED, SCORE 2 Detached Sidewalk		PED, SCORE 2		PED, SCORE 2	
	Buffer >= 14 ft, 36-40 MPH / < 14 ft, 31-	Attached Sidewalk		No Sidewalk	
Prevailing Speed	35 MPH	Prevailing Speed	-	Prevailing Speed	11-15 MPH
No. of Travel Lanes	Buffer >= 14 ft, 6+ / < 14 ft, No Change	No. of Travel Lanes	_	No. of Travel Lanes	-
Buffer Quality	Physical barrier	Speeds Turning Into Driveways	10-15 MPH	Speeds Turning Into Driveways	10-15 MPH
Landscape Buffer and Street Trees	Discontinuous	Usable Sidewalk Width	8 to 9 ft	Comfort Zone	10-15 MPH
Usable Sidewalk Width	8-9 ft	Sidewalk Quality	-	Lighting	Roadway lighting
Sidewalk Quality		Sidewalk Accessibility	Flat driveways cross the sidewalk	Heavy Vehicles	6-7%
Sidewalk Quality		Sidewalk Accessibility	comfort zone	rieavy venicies	0-7 /6
Sidewalk Accessibility	Flat driveways cross the sidewalk comfort zone	Lighting	Roadway lighting	Active Building Frontage	-
Lighting	Roadway lighting	Heavy Vehicles	6-7%	Crossing Spacing	-
Heavy Vehicles	6-7%	Active Building Frontage		Special Considerations	High volume of bikes/scooters
Active Building Frontage	-	Crossing Spacing		Crossing Improvements	-
Crossing Spacing		Special Considerations	High volume of bikes/scooters		
Special Considerations Crossing Improvements	High volume of bikes/scooters Any 1	Crossing Improvements	Any 1	_	
	7417	4			
PED, SCORE 3		PED, SCORE 3		PED, SCORE 3	
Detached Sidewalk		Attached Sidewalk		No Sidewalk	
Prevailing Speed No. of Travel Lanes	- < 14 ft. 4-5	Prevailing Speed No. of Travel Lanes	31-35 MPH 4-5	Prevailing Speed No. of Travel Lanes	16-20 MPH
No. of Travel Lanes Buffer Quality	< 14 π, 4-5 Width buffer	Speeds Turning Into Driveways	4-5 15-20 MPH	Speeds Turning Into Driveways	- 15-20 MPH
Landscape Buffer and Street Trees	No landscaping	Usable Sidewalk Width	6 to 8 ft	Comfort Zone	< 6 ft
Usable Sidewalk Width	6-7 ft	Sidewalk Quality	Some cracks	Lighting	-
Sidewalk Quality	Some cracks	Sidewalk Accessibility	Sloped driveways cross the sidewalk	Heavy Vehicles	
Sidewalk Quality		Sidewalk Accessibility	comfort zone	rieavy verilicies	-
Sidewalk Accessibility	Sloped driveways cross the sidewalk comfort zone	Lighting	-	Active Building Frontage	Majority does not have active frontage
Lighting	-	Heavy Vehicles	-	Crossing Spacing	> 400 ft
Heavy Vehicles	_	Active Building Frontage	Majority does not have active frontage	Special Considerations	
icavy venicies	_	Active Building Frontage	iviajonty does not have active nontage	Opecial Considerations	-
Active Building Frontage	Majority does not have active frontage	Crossing Spacing	> 400 ft	Crossing Improvements	-
Crossing Spacing	> 400 ft	Special Considerations	-		
Special Considerations	-	Crossing Improvements	None		
Crossing Improvements	None				
PED, SCORE 4		PED, SCORE 4		PED, SCORE 4	
Detached Sidewalk		Attached Sidewalk		No Sidewalk	
Prevailing Speed	Buffer >= 14 ft, >= 40 MPH / < 14 ft, >=	Prevailing Speed	>35 MPH	Prevailing Speed	>20 MPH
No. of Travel Lanes	36 MPH < 14 ft, 6+	No. of Travel Lanes	6+	No. of Travel Lanes	2+
No. of Travel Laries Buffer Quality	- 1+ II, UT	Speeds Turning Into Driveways	>= 20 MPH	Speeds Turning Into Driveways	>= 20 MPH
Landscape Buffer and Street Trees	-	Usable Sidewalk Width	< 6 ft	Comfort Zone	-
	<6 ft	Sidewalk Quality	Cracks, failing pavement	Lighting	No lighting
Usable Sidewalk Width		Sidewalk Accessibility	-	Heavy Vehicles	> 8%
Usable Sidewalk Width Sidewalk Quality	Cracks, failing pavement				
Usable Śidewalk Width Sidewalk Quality Sidewalk Accessibility	-	Lighting	No lighting	Active Building Frontage	-
Usable Sidewalk Width Sidewalk Quality Sidewalk Accessibility Lighting	No lighting	Lighting Heavy Vehicles	No lighting >= 8%	Crossing Spacing	-
Usable Śidewalk Width Sidewalk Quality Sidewalk Accessibility Lighting Heavy Vehicles	-	Lighting Heavy Vehicles Active Building Frontage		Crossing Spacing Special Considerations	- - -
Usable Sidewalk Width Sidewalk Quality Sidewalk Accessibility Lighting	No lighting	Lighting Heavy Vehicles		Crossing Spacing	

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Bike Scoring Criteria

BIKE, SCORE 1		BIKE, SCORE 1			BIKE, SCORE 1		BIKE, SCORE 1	
In-Road Protected Lane	One-way Two-way	Raised Protected Lane	One-way	Two-way	Bike Lanes/Shoulders Without Buffer		No Designated Bikeway	
Buffer Width	>= 6 ft OR continuous barrier	Buffer Width	>= 6 ft OR contin		Travel Lanes	1, 2	Prevailing Speed	<25 MPH
Barrier Type	25 MPH, painted buffer or more substantial for higher speeds	Usable Bike Lane Width	>= 6.5 ft	>= 10 ft	Usable Bike Lane Width	>=6 feet	Lane Markings	Yes; < 250 ft apart
Usable Bike Lane Width	>= 6.5 ft >= 10 ft	Barrier Type	25 MPH, painted buffer or more	substantial for higher speeds	Prevailing Speed	<= 25 MPH	Lateral Distance	>= 4 ft
Curbside Management	Vehicle loading planned through design	Sidewalk Buffer	Half-height bike lanes OR obj	ject and visual separation			Mid-Block Conflicts	<= 2 conflict points/block AND low volume OR raised crossings
Mid-Block Conflicts	<= 2 conflict points/block AND low volume OR raised crossings	Sidewalk Width	>= 6					
Special Considerations	None	Curbside Management	Vehicle loading plann					
		Mid-Block Conflicts	<= 2 conflict points/block AND low					
		Special Considerations	Non	e				
BIKE, SCORE 2		BIKE, SCORE 2			BIKE, SCORE 2		BIKE, SCORE 2	
In-Road Protected Lane	One-way Two-way	Raised Protected Lane	One-way	Two-way	Bike Lanes/Shoulders		No Designated Bikeway	
Buffer Width	3 to 6 ft	Buffer Width	3 to 6		Travel Lanes	2 to 4	Prevailing Speed	25 to 29 MPH
Barrier Type	• • • • • • • • • • • • • • • • • • •	Usable Bike Lane Width	5 to < 6.5 ft	8 to < 10 ft	Usable Bike Lane Width	4 to 5 feet	Lane Markings	Yes; >= 250 ft apart
Usable Bike Lane Width	5 to <6.5 ft 8 to < 10 ft	Barrier Type	25 MPH, No	Change	Prevailing Speed	30-35 MPH	Lateral Distance	-
Curbside Management	-	Sidewalk Buffer	Object separation only OR high-c	ontrast visual separation only			Mid-Block Conflicts	3-4 conflict points/block AND low volume OR raised crossings
Mid-Block Conflicts	3-4 conflict points/block AND low volume OR raised crossings	Sidewalk Width	-					. 3
Special Considerations	High volume of on-street dining	Curbside Management	-				•	
		Mid-Block Conflicts	3-4 conflict points/block AND low					
		Special Considerations	High volume of or	n-street dining				
BIKE, SCORE 3		BIKE, SCORE 3			BIKE, SCORE 3		BIKE, SCORE 3	
In-Road Protected Lane	One-way Two-way	Raised Protected Lane	One-way	Two-way	Bike Lanes/Shoulders		No Designated Bikeway	
Buffer Width	-	Buffer Width	-	2 ft	Travel Lanes	5+	Prevailing Speed	30 to 34 MPH
Barrier Type	25 MPH, No Change	Usable Bike Lane Width	-	-	Usable Bike Lane Width	<4 feet	Lane Markings	-
Usable Bike Lane Width		Barrier Type	=		Prevailing Speed	40-45 MPH	Lateral Distance	< 4 ft
Curbside Management	Vehicle loading not accommodated through design, blockages expecte	Sidewalk Buffer	- 5 ft				Mid-Block Conflicts	-
Mid-Block Conflicts Special Considerations	Vehicles parked in bikeway	Sidewalk Width Curbside Management	- · · · · · · · · · · · · · · · · · · ·					
Special Considerations	venicies parked in bikeway	Mid-Block Conflicts	Vehicle loading not accommodated the	rough design, blockages expected				
		Special Considerations	Vehicles parked	d in bikeway				
BIKE. SCORE 4		BIKE, SCORE 4			BIKE, SCORE 4		BIKE, SCORE 4	
In-Road Protected Lane	One-way Two-way	Raised Protected Lane	One-way	Two-way	Bike Lanes/Shoulders		No Designated Bikeway	
Buffer Width	< 3 ft	Buffer Width	One-way	1WO-Way	Travel Lanes	_	Prevailing Speed	>= 35 MPH
Barrier Type	-	Usable Bike Lane Width	< 5 ft	< 10 ft	Usable Bike Lane Width	_	Lane Markings	No
Usable Bike Lane Width	< 5 ft. or > 5 ft with obstruction < 8 ft	Barrier Type	- 011	- 10 11	Prevailing Speed	45-50 MPH	Lateral Distance	-
	on, or one man obstraction	**	Neither chiest per u	vigual congration	. Totalining opera	10 00 1111 11		>= 5 conflict points/block OR high
Curbside Management	-	Sidewalk Buffer	Neither object nor v	•			Mid-Block Conflicts	volume
Mid-Block Conflicts	>= 5 conflict points/block OR high volume	Sidewalk Width	< 51	π				
Special Considerations	*	Curbside Management Mid-Block Conflicts	- F Blok	als OD high values				
			>= 5 conflict points/blo	ck Ok nigh volume				
		Special Considerations	<u> </u>					

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Crash Reduction Factors

This information is excerpted from the Federal Highway Administration's Toolbox of Countermeasures and Their Potential Effectiveness for Pedestrian Crashes, which can be consulted for further documentation and a list of references.

A crash reduction factor (CRF) is an estimate of the percentage reduction that might be expected after implementing a given countermeasure. In some cases, the CRF is negative, i.e. the implementation of a countermeasure is expected to lead to a percentage increase in crashes. One CRF estimate is provided for each countermeasure. A number in bold indicates a rigorous study methodology and a small standard error in the value of the CRF.

Standard error, where available, is the standard deviation of the error in the estimate of the CRF. It is shown in parentheses. Where multiple CRF estimates were available from the literature, selection criteria were used to choose which CRFs to include in the issue brief:

- First, CRFs from studies that took into account regression to the mean and changes in traffic volume were preferred over studies that did not.
- Second, CRFs from studies that provided additional information about the conditions under which the countermeasure was applied (e.g. road type, area type) were preferred over studies that did not.

Signalization Countermeasures

Countermeasure(s)	Crash Severity	Left-Turn Crash CRF	Pedestrian Crash CRF
Add exclusive pedestrian phasing	All		34
Improve signal timing to intervals specified by the ITE Determining Vehicle Change Intervals: A Proposed Recommended Practice (1985)	Fatal/Injury		37
Replace existing WALK / DON'T WALK signals with pedestrian countdown signal heads	All		25
Modify signal phasing (implement a leading pedestrian interval)	All		5
Remove unwarranted signals (one-way street)	All		17
Convert permissive or permissive/protected to protected only left-turn phasing	All	99	
Convert permissive to permissive/ protected left-turn phasing	All	16	

Geometric Countermeasures

Countermeasure(s)	Crash Severity	All Crash CRF	Pedestrian Crash CRF
Convert unsignalized intersection to roundabout	Fatal/Injury		27 (12)
Install pedestrian overpass/underpass	Fatal/Injury		90
	All		86
Install pedestrian overpass/underpass (unsignalized intersection)	All		13
Install raised median	All		25
Install raised median (marked crosswalk) at unsignalized intersection	All		46
Install raised median (unmarked crosswalk) at unsignalized intersection	All		39
Install raised pedestrian crossing	All	30(67)	
	Fatal/Injury	36(54)	
Install refuge islands	All		56
Install sidewalk (to avoid walking along roadway)	All		88*
Provide paved shoulder (of at least 4 feet)	All		71*
Narrow roadway cross section from four lanes to three lanes (two through lanes with center turn lane)	All	29	

^{*} Applies to "walking along the roadway" type crashes only.

Signage, Marking, and Operational Countermeasures

Countermeasure(s)	Crash Severity	All Crash CRF	Pedestrian Crash CRF
Add intersection lighting	Injury	27*	
	All	21*	
Add segment lighting	Injury	23*	
	All	20*	
Improve pavement friction (skid treatment with overlay)	Fatal/Injury		3
Increase enforcement **	All		23
Prohibit right-turn-on-red	All	3	
Prohibit left-turns	All		10
Restrict parking near intersections (to off-street)	All		30

^{*} Applies to nighttime crashes only.

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^{**} Applies to crash reduction on corridors where sustained enforcement is used related to motorist yielding in marked crosswalks combined with a public education campaign.

