

Complete Streets Design Examples & Resources

September 15, 2022

Ben Lyman, Transportation Planner



Tell us a bit about yourself! Choose all that apply.

You may also share alternative answers in the chat.

- Interested community member
- Local/county elected official
- Local/county government staff
- Local/county commission/committee/board member
- Federal, state, or other public agency staff

- Consultant
- Nonprofit or advocacy staff/volunteer
- Business or business organization member
- Student or education professional
- Media





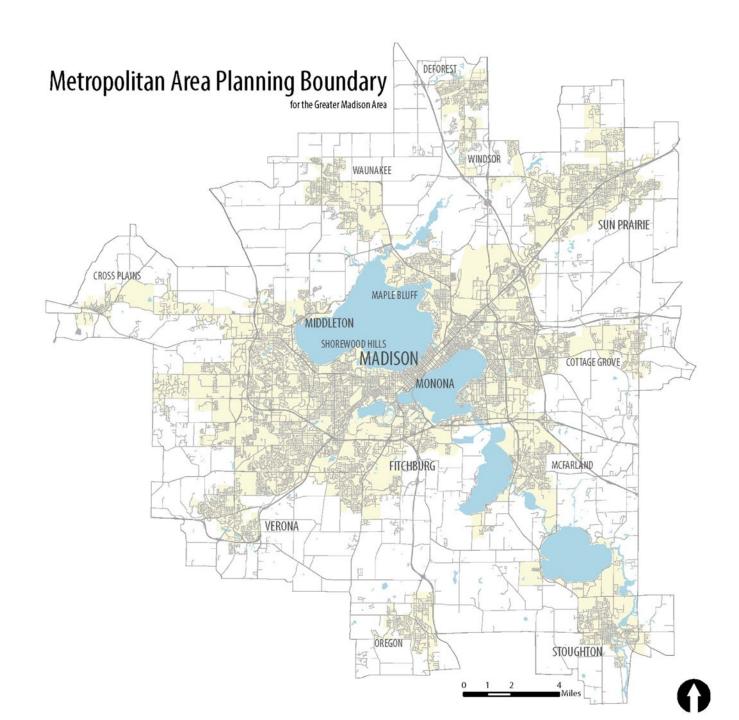
ABOUT THE MPO

MISSION

Lead the collaborative planning and funding of a sustainable, equitable transportation system for the greater Madison region.

VISION

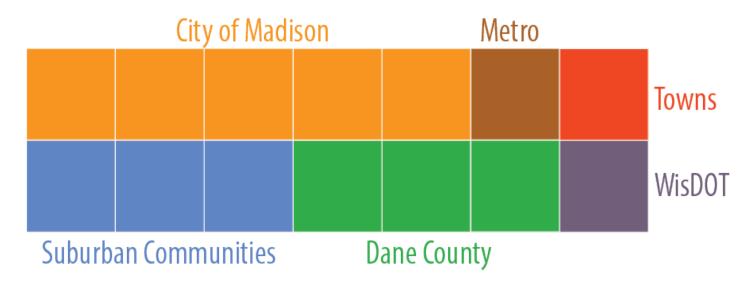
A sustainable, equitable regional transportation system that connects people, places, and opportunities to achieve an exceptional quality of life for all.





Governance Structure

of the Greater Madison MPO







Primary Responsibilities

What the MPO Does



Brings communities together to prioritize, coordinate, and fund transportation projects in our region.



Develops a long-range Regional Transportation Plan (RTP) that looks ahead 20-30 years.



Collects data and develops or supports special plans and studies.

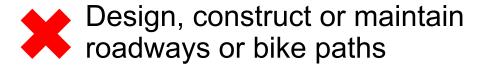


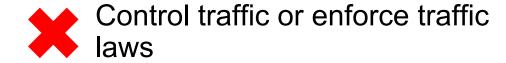
Approves federal funding for projects.



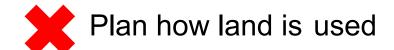
Manages RoundTripGreaterMadison.org and promotes sustainable transportation options such as bicycling, bus, carpool, vanpool and walking.

What the MPO Does NOT Do











Poll: How would you rate the quality of the Complete Street network in your community? (Single choice)

- 1. High Quality (mostly complete, connected network comfortably accommodating all users)
- 2. Above Average
- 3. Average
- 4. Below Average
- 5. Poor Quality





What are Complete Streets?

- "Complete Streets are streets designed and operated to enable safe use and support mobility for all users hose include people of all ages and a bilities, regardless of whether they are travelling as drivers, pedestrians, bicyclists, or public transportation riders." USDOT
- 'Complete Streets is an approach to planning, designing, building, operating, and maintaining streets that **enables safe access for all people** who need to use them, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities." Smart Growth America and National Complete Streets Coalition

Note that Green infrastructure (permeable pavement, rain gardens, bio -swales, etc.) is sometimes—and increasingly—considered an element of Complete Streets. This presentation will not address this critical component of infrastructure and design; please review the MPO/CARPC joint webinar on Green Infrastructure for more information on this topic.



Complete Streets are for Everyone



Does EVERY street need to be complete?

No

- Not all streets will have transit service
- Some streets will have no provision for modes other than automobiles (freeways and limited -access highways, although parallel separated paths are highly recommended (see path along USH 12 north of Middleton, and Military Ridge Trail along USH 18))

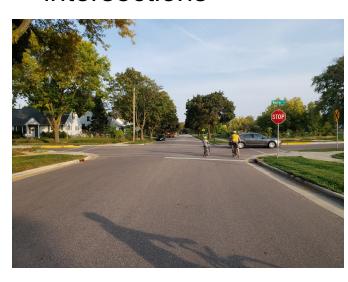
 – safe and convenient crossings of this type of barrier are critical
- Not all streets will have sidewalks (rural roads)



Context is Everything

Local/Residential

- Sidewalk on both sides (generally)
- No bike lanes
- Minimal transit improvements
- Stop-controlled intersections



Residential/ Commercial Transition

- Sidewalk on both sides
- Bike lanes on major routes
- Moderate transit improvements
- Stop- or signalcontrolled intersections



Major Roads

- Sidewalk on both sides
- Bike lanes, separated path, or cycletrack
- Moderate to extensive transit improvements
- Signalized intersections
- Grade-separated crossings
- Pedestrian refuge islands



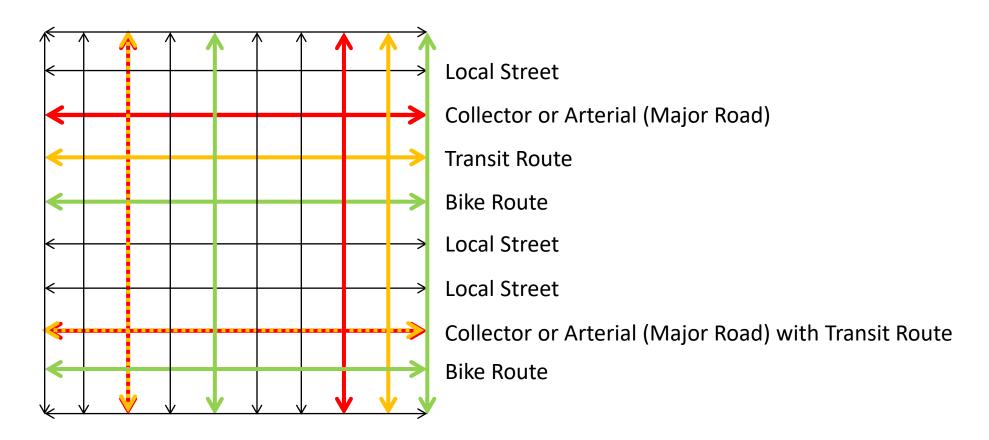
These are examples, not rules. Every community and every project are different.



Think of a Complete Street

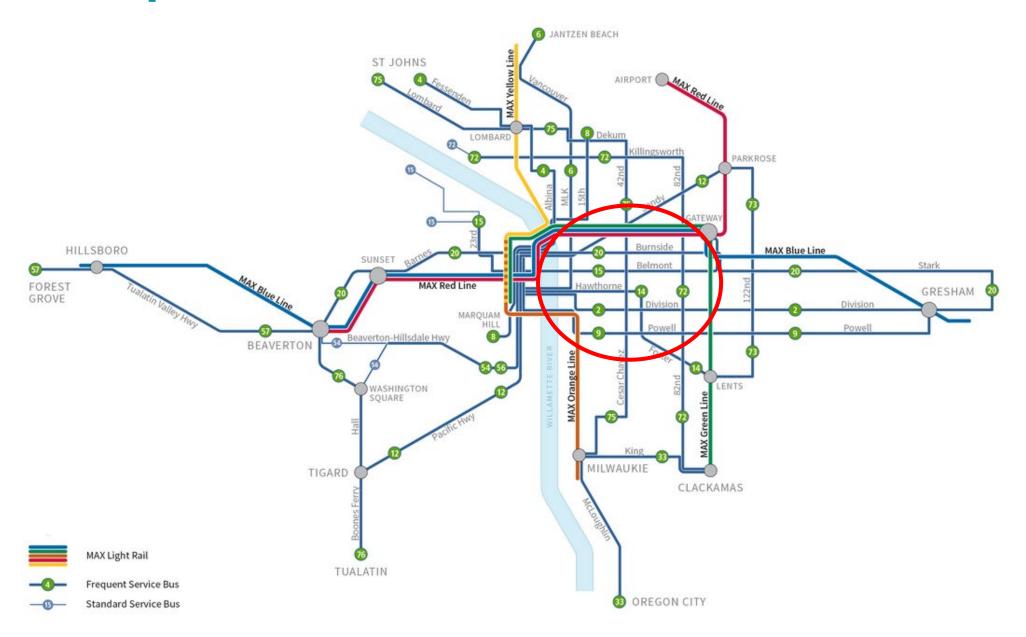
Network

Adjacent streets may be designed for different modes



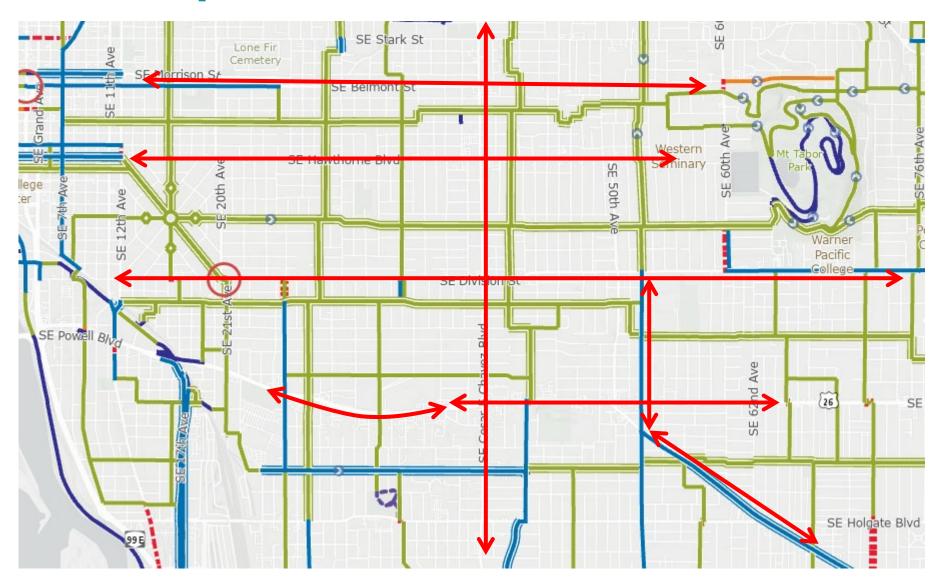


Example: Portland, OR





Example: Portland, OR



Neighborhood Greenways

lower traffic streets with pavement markings and directional signs to guide cyclists Calles con bajo nivel de tráfico y pavimento pintado con marcas y señales direccionales para quiar a los ciclistas

Shared Roadway

on lower traffic &/or lower speed street Calzada compartida en calle con poco tráfico y/o baja velocidad

Bike Lane: Protected, Buffered

or on lower traffic street Carril para bicicletas: protegido, con separaciones o en calle con poco tráfico

Bike Lane

or wide shoulder, on higher traffic streets Carril para bicicletas o arcén ancho, en calles de mayor tráfico

Multi-use Path

closed to motor vehicles Camino para peatones y ciclistas prohibidos los vehículos de motor

Multi-use Path (unpaved)

Camino para peatones y ciclistas (sin pavimentar)

Sidewalk Connection

go slowly, yield to pedestrians Conexión en la acera: avance despacio y ceda el paso a peatones

Shared Roadway with Wider Outside Lane

on moderate and higher traffic street Calzada compartida con carril exterior más ancho en calle con tráfico moderado o de mayor tráfico

Difficult Connection

in areas with higher speeds and/or volumes, combined with narrow lane widths or other problems for cyclists

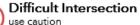
Conexión difícil en áreas de velocidades más altas y/o mayor tráfico, combinado con carriles estrechos u otros problemas para los ciclistas

Shared Roadway / Difficult

Connection

lower traffic street with sight distance limitations and higher speeds

Calzada compartida / Conexión difícil calle de menor tráfico con limitaciones de visibilidad de distancia y velocidades más altas

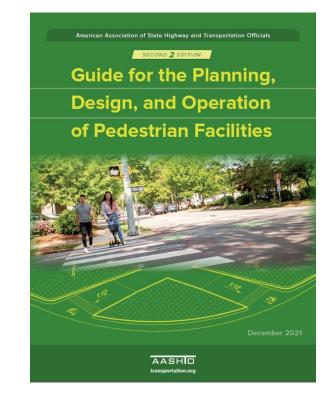


use caution Cruce difficil, tenga cuidado



Design Guidance

- National Association of City Transportation Officials (NACTO)
- American Association of State Highway and Transportation Officials (AASHTO)
- Institute of Transportation Engineers (ITE)







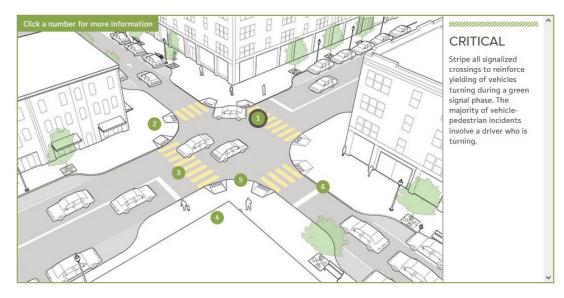














Active Transportation

Walking & Bicycling

Every trip begins and ends as a pedestrian

- Free or relatively inexpensive
- Best for shorter trips (13 miles)
- Available 24/7
- Accessible facilities required (ADA)
- Promotes mental and physical health
- Builds community
- "Vulnerable Road Users" in need of accommodation
- Dedicated federal and county funding sources for construction







Pedestrian Network





Pedestrian Network

Pedestrian Facilities

Pedestrian Bridge/Tunnel

- Existing
- Under Construction

Bike Elevator



Bike Off-Street Facilities - Paved

- Existing
- Under Construction

Bike Off-Street Facilities - Unpaved

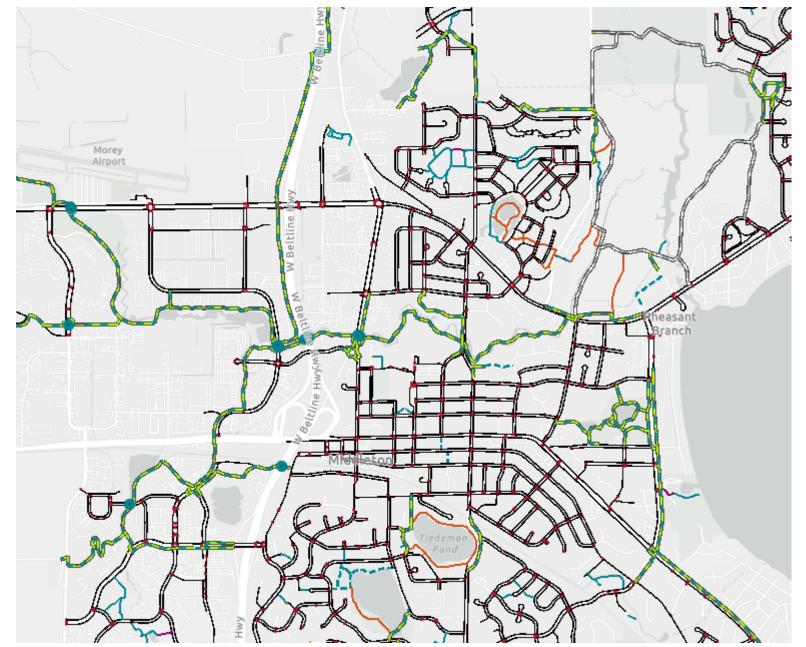
- = Existing
- Under Construction

Sidewalk

- Sidewalk
- -- Crosswalk
- Connecting Path
- Pedestrian Path
- Municipal Lot
- Hiking

Other Pedestrian Paths

- -- Public Path
- -- Private Path







Pedestrian Network

Pedestrian Facilities

Transition Point Accessibility

- Curb Cut, Accessible
- No Curb Cut, Accessible
- Driveway Apron, Accessible
- Inaccessible
- Steps,Inaccessible

Pedestrian Bridge/Tunnel

- Existing
- Under Construction

Bike Elevator



Bike Off-Street Facilities - Paved

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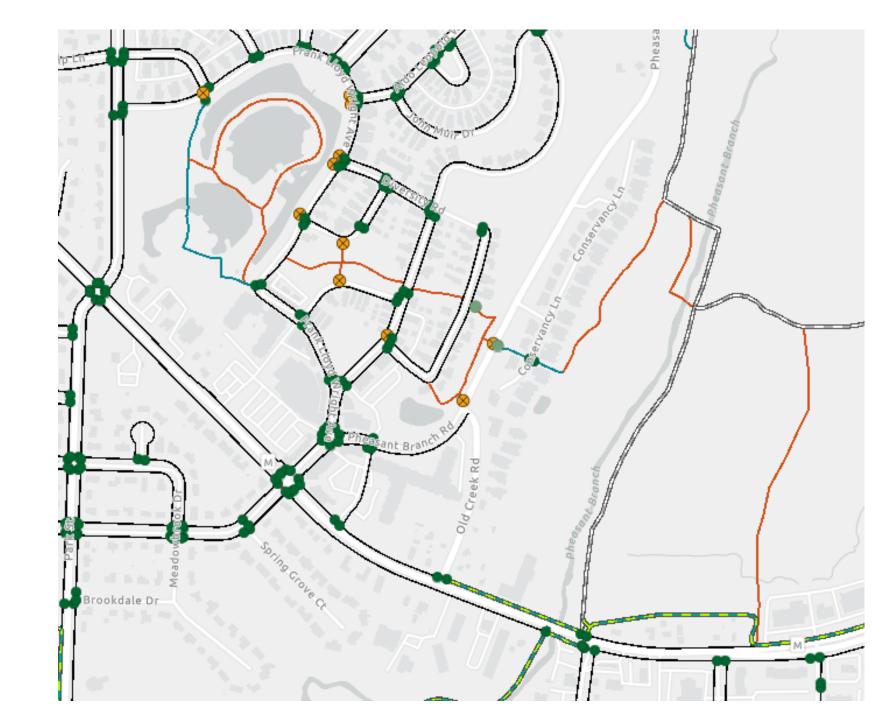
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Other Pedestrian Paths

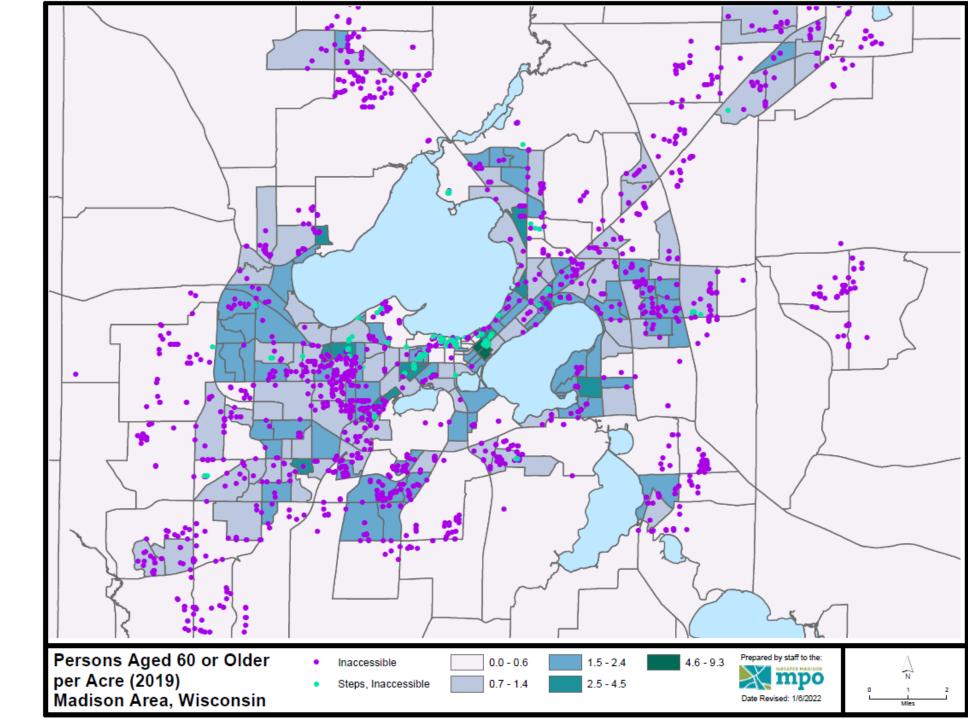
- -- Public Path
- -- Private Path



In

Inaccessible Sidewalks and Persons Aged 60 or Older

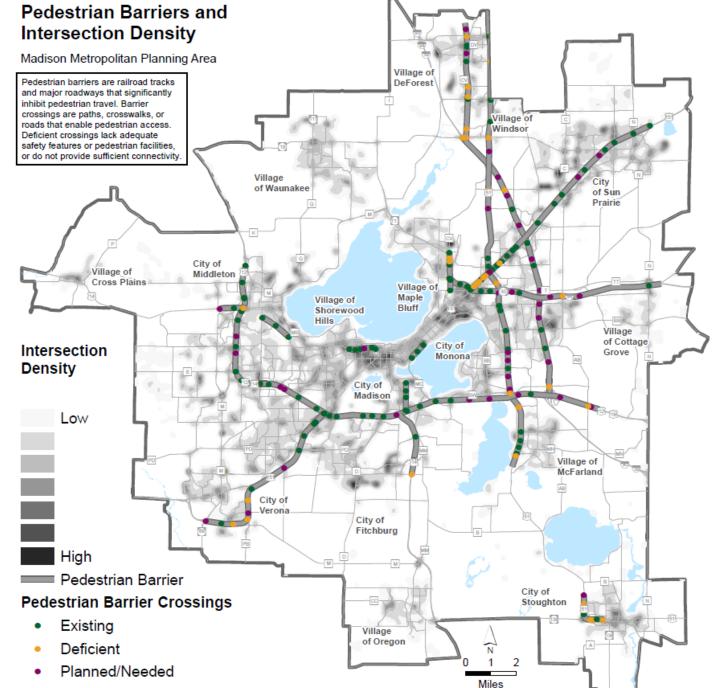






Barriers & Intersection Density







Pedestrian Facilities





Provide a safe place to wait in the middle of a crossing; allows pedestrians and cyclists to focus on one direction of traffic at a time



RRFBs

Rectangular Rapid Flashing
Beacons improve stop compliance
by motorists; most effective on
single-lane roads



Bicycle Network





Level of Traffic Stress

LTS - Level of Traffic Stress

Off Street LTS 1

Bike Path

On Street LTS

LTS 1: Lowest stress

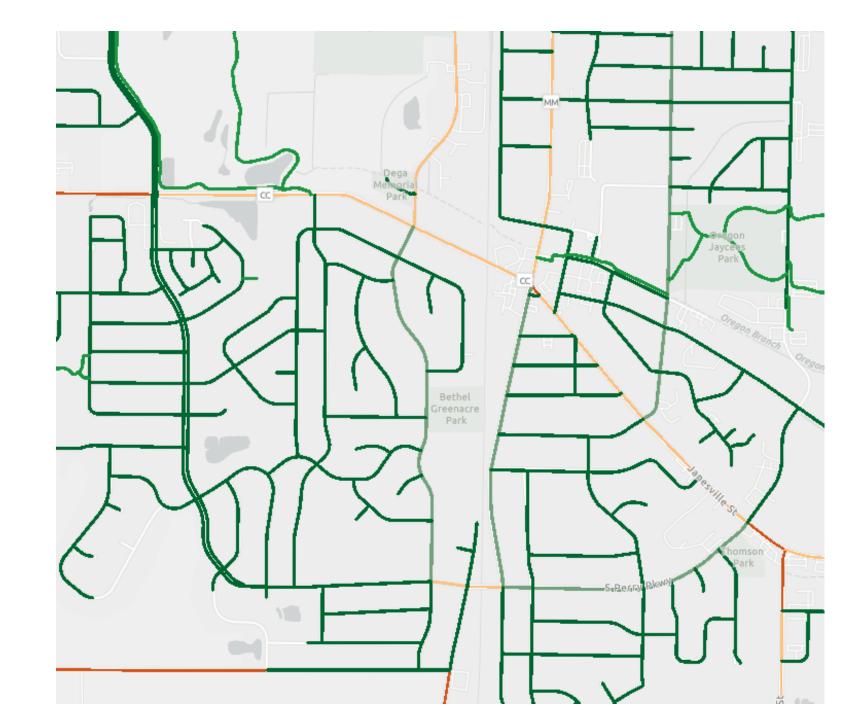
LTS 2: Low stress

— LTS 3: Moderate stress

LTS 4: Highest stress

Bicycles prohibited

MPO efforts are focused on building out the low -stress network.





Bicycle Network & Traffic Stress

Level of Traffic Stress (LTS)

LTS 1– Strong separation from all except low speed, low volume traffic. Simple -to-use crossings. Suitable for children.

LTS 2— Except in low speed / low volume traffic situations, cyclists have their own place to ride. Limits traffic stress to what the mainstream adult population can tolerate.

LTS 3— Involves interaction with moderate speed or multilane traffic, or close proximity to higher speed traffic. Acceptable to the "enthused and confident."

LTS 4— Involves being forced to mix with moderate speed traffic or close proximity to high-speed traffic. Acceptable only to the "strong and fearless."



Strong & Enthused & Confident (7%)

< 1%

Interested but Concerned (60%)

Source: Roger Geller, City of Portland

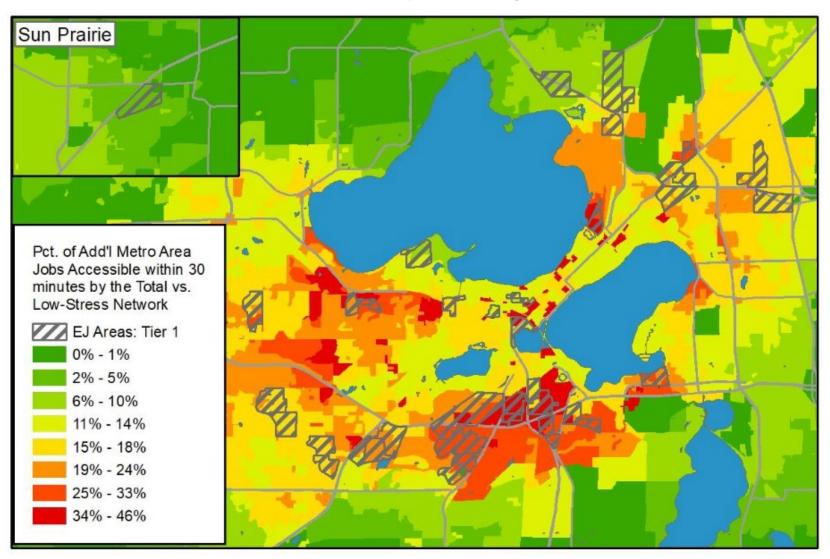




Low Stress Bicycle Network

Report

Areas of Opportunity



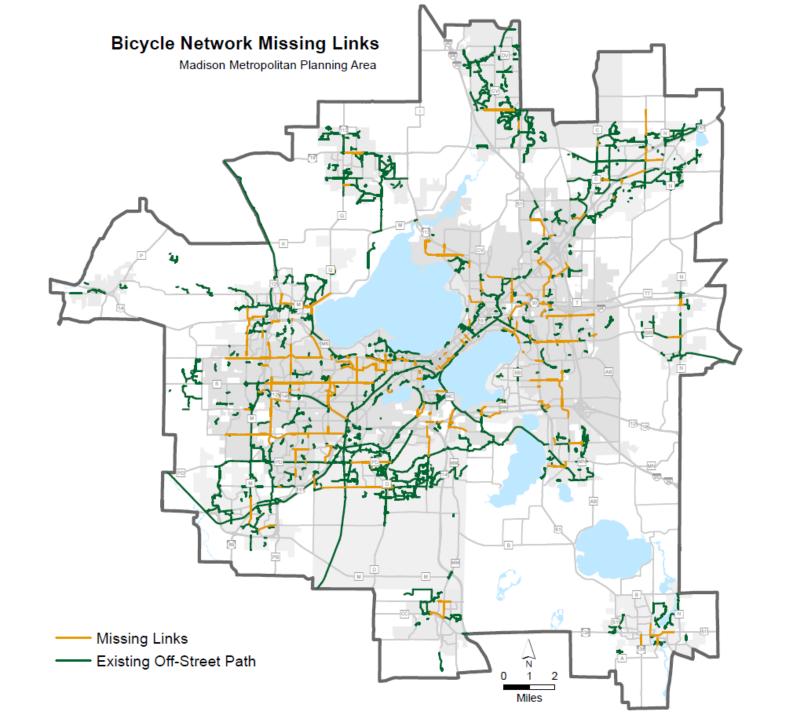




Priority Missing Links

Regional Transportation Plan Draft Recommendation:

Prioritize development of connected, low stress network, filling in missing links.



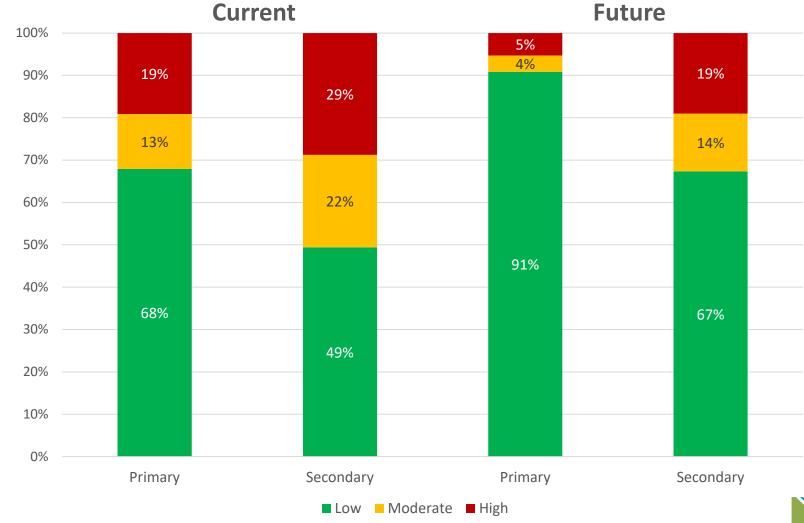




Bicycle Network

Current and Future LTS on Regional Routes

Planned improvements are expected to substantially reduce LTS on the regional network.









Bike lanes should continue through intersections, with conflict zones for turning vehicles clearly identified



Protected Bike Lanes

Provide physical separation between bicyclists and motorists









Provide additional space between bicycle and automobile travel lanes



Parking

Secure, convenient bicycle parking is needed at home, work, shopping, and other destinations (trees, railings, and sign posts don't count)







Provide clearly delineated waiting area for bicycles where they are visible and can clear the intersection before autos



Green Lanes

Provide visual reminder of conflict zones





Bike Detector

Sensor-controlled signal phase for bikes



Cycle Track

Two-way facility separated from traffic and delineated from sidewalk





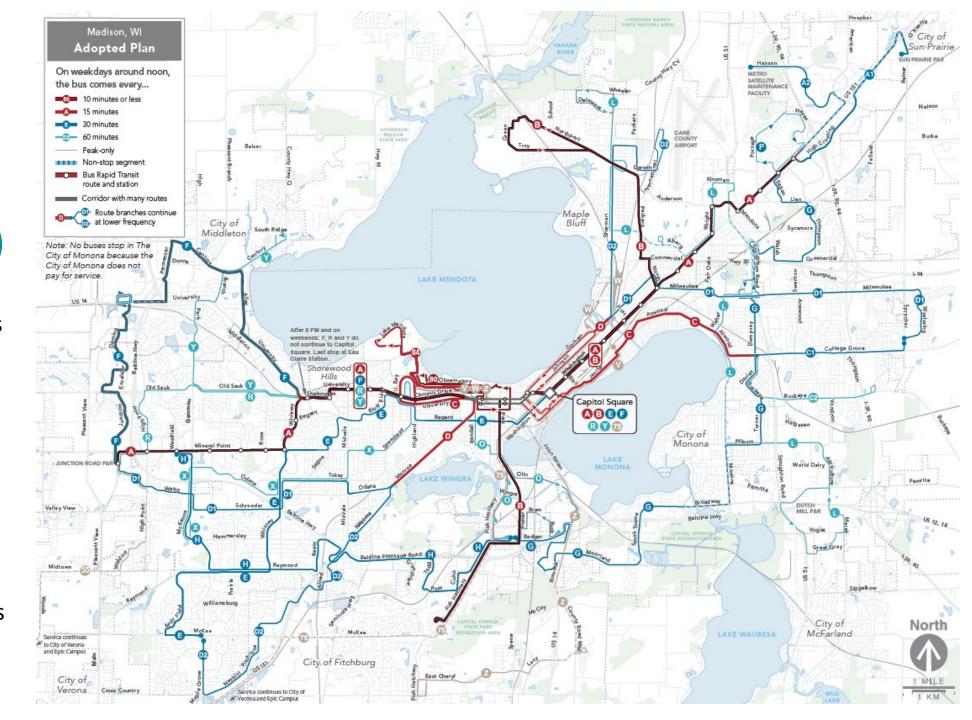
Transit Facilities





Metro Transit Network (June 2023)

- New stops on new routes
 - Accessible
 - Multi-modal connections
- Dedicated bus lanes
- Transit Signal Priority (TSP)
- New local Sun Prairie service (not shown)
- Potential new Monona and Cottage Grove routes (not shown)



Transit Facilities



Bus And Turn (BAT) Lanes

Lanes restricted to use by buses, bikes, and turning vehicles



Accessible Stops & Shelters

Level concrete boarding area reached via an accessible route; stops with many boardings (30 or more/day) may warrant shelters







Pedestrian/ Bicycle Facilities, Policies, and Street Standards

Review of Community
Requirements in the Greater
Madison
MPO Planning Area and
Recommended Best Practices

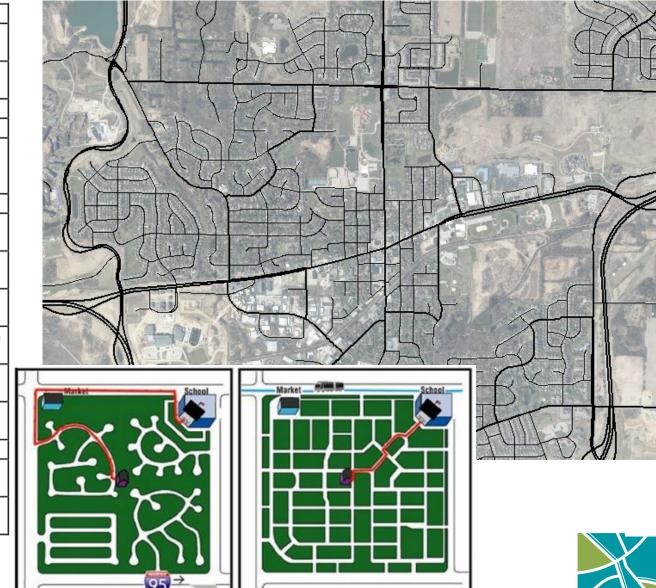




Block Length and Street Connectivity

Community	Block Length and Connectivity Standards
City of Fitchburg	Residential blocks should be 500-1,000 feet; use of cul-de-sacs
	limited, with a maximum length of 600 feet.
City of Madison	250-foot minimum between center lines of streets intersecting
	with local streets; cul-de-sacs generally prohibited.
City of Middleton	Blocks should be a minimum of 600 feet.
City of Monona	None specified.
City of Stoughton	Residential blocks, outside of traditional neighborhood
	development (TND) areas, should be 400-1,000 feet, cul-de-
	sacs limited to 600 feet.
City of Sun Prairie	Blocks should be 500-1,200 feet; cul-de-sacs limited to 750 feet
City of Verona	Blocks should be 500-1,200 feet; cul-de-sacs limited to 1,000
	feet.
Village of Cottage Grove	Blocks in residential areas should generally be 600-1,500 feet;
	cul-de-sacs limited to 500 feet.
Village of Cross Plains	Blocks should be 600-1,500 feet; cul-de-sacs limited to 1,600
	feet.
Village of DeForest	Blocks should be 600-1,600 feet; use of cul-de-sacs limited, with
	a maximum length of 500 feet.
Village of McFarland	Blocks should generally be 400-1,500 feet; cul-de-sacs limited
	to 800 feet.
Village of Oregon	Residential blocks should generally be 600-1,500 feet; cul-de-
	sacs limited to 500 feet.
Village of Waunakee	Residential blocks should generally be 500-1,500 feet.
Village of Windsor	Blocks should be 500-1,200 feet; use of cul-de-sacs to be
	minimized.
All communities may requi	re mid-block pedestrian paths for blocks longer than 900 feet (800
feet in Fitchburg).	

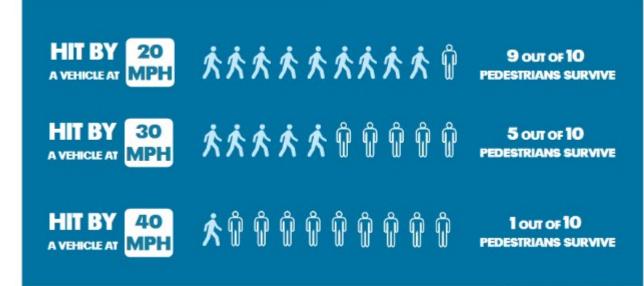
Mid-block crossings should be considered on any block longer than 400 feet; less in more intensive urban areas. - ITE





Relationship between Street Width and Vehicle Speeds

Figure 2 Vehicle Speeds and Pedestrian Fatalities



Source: Vision Zero

Table 5 Street Width Requirements in Greater Madison MPO Area Communities (Local/Minor Streets Only)

Community	ts in Greater Madison MPC Street Width (ft)
City of Fitchburg	32-36
City of Madison	28-36
City of Middleton	32
City of Monona	33
City of Stoughton	28-34
City of Sun Prairie	33
City of Verona	36
Village of Cottage Grove	28-36
Village of Cross Plains	28
Village of DeForest	32
Village of McFarland	32
Village of Oregon	38
Village of Waunakee	28-32
Village of Windsor	22-28

Table 4 Speeding Comparison, 35 mph Speed Limit – Divided Roads, No Parking

Road Segment	Number of Lanes	Bike Lane	Pct. of Vehicles at Least 5 mph Over Limit ⁷⁰
East Washington Ave -			
Figure 8	3	Yes	3.1%
(Wright St/Fair Oaks Ave to STH 30)			
South Whitney Way -			
Figure 9	3	No	2.2%
(Science Dr to Mineral Point Rd)			
University Ave - Figure 10 (Allen Blvd to Capital Ave)	2	Yes	1.9%





Curb Radii, Crossing Distance, and Vehicle Speeds

Figure 11 Curb Radius Effect on Crossing Distance

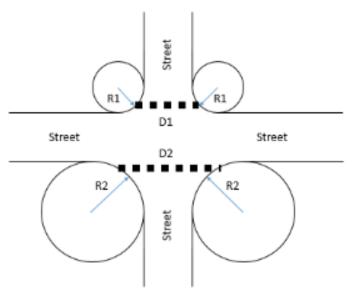


Table 7 Curb Radius Guidelines for Local Streets in Greater Madison MPO Area Communities, Summary

Community	Curb Radius (ft)
City of Fitchburg	20
City of Madison	20
City of Middleton	NA
City of Monona	NA
City of Stoughton	NA
City of Sun Prairie	Generally 20, may be reduced to 15
City of Verona	Per WisDOT standards; minimize
Village of Cottage Grove	25-30 generally
Village of Cross Plains	NA
Village of DeForest	20
Village of McFarland	20 generally
Village of Oregon	15 generally
Village of Waunakee	15-20 generally
Village of Windsor	25

Recommendations

Institute for Transportation Engineers (ITE)100

The smallest practical curb radii should be used when designing walkable urban streets.

National Association of City Transportation Officials (NACTO)¹⁰¹

Small curb radii are a requirement for compact intersections with safe turning speeds. In urban areas standard curb radii should not exceed 15 feet.

US Access Board¹⁰²

Smaller curb radii generally provide more pedestrian space, including curb ramps, and shorter pedestrian crossing distances; benefitting all pedestrians, and potentially reducing delay for vehicles.





Blooming Grove (right)

Sidewalks and HOLC -Legacies of Disinvestment

Figure 23 Historic HOLC Residential Security Map Zones and Existing Sidewalks - Northeast²⁸⁰





How do we get to Complete Streets?





Elements of a Complete Streets Policy



1. Establishes commitment and vision:

How and why does the community want to complete its streets? This specifies a clear statement of intent to create a complete, connected network and consider the needs of all users.

2. Prioritizes diverse users:

It prioritizes serving the most vulnerable users and the most underinvested and underserved communities, improving equity.

3. Applies to all projects and phases:

Instead of a limited set of projects, it applies to all new, retrofit/reconstruction, maintenance, and ongoing projects.



Elements of a Complete Streets Policy



4. Allows only clear exceptions:

Any exceptions must be specific, with a clear procedure that requires high-level approval and public notice prior to exceptions being granted.

5. Mandates coordination

Requires private developers to comply, and interagency coordination between government departments and partner agencies.

6. Adopts excellent design guidance

Directs agencies to use the latest and best design criteria and guidelines, and sets a time frame for implementing this guidance.



Elements of a Complete Streets Policy



7. Requires proactive land-use planning

Considers every project's greater context, as well as the surrounding community's current and expected landuse and transportation needs.

8. Measures progress

Establishes specific performance measures that match the goals of the broader vision, measurably improve disparities, and are regularly reported to the public.

9. Sets criteria for choosing projects

Creates or updates the criteria for choosing transportation projects so that Complete Streets projects are prioritized.

10. Creates a plan for implementation

A formal commitment to the Complete Streets approach is only the beginning. It must include specific steps for implementing the policy in ways that will make a measurable impact on what gets built and where.

Trivia Quiz: How many communities and agencies of government have adopted Complete Streets policies in Wisconsin?

(Single Choice)

- 6
- 10
- 15
- 22



Trivia Quiz: How many communities and agencies of government have adopted Complete Streets policies in Wisconsin?

(Single Choice)

- **-**6
- <u>-10</u>
- 15 (12 communities & 3 MPOs/RPCs)
- <u>22</u>







Example Complete **Streets Policies**

The best Complete Streets policies of 2018

Strong Complete Streets policies are an important step toward designing safer, healthier communities. We evaluated each of these policies based on the established elements of an ideal Complete Streets policy (see Appendix A). Based on these scores, we are proud to announce that the following communities passed the best Complete Streets policies of 2018:

Rank	Place	Points
1	Cleveland Heights, OH	91
2	Des Moines, IA	87
3	Milwaukee, WI	80
4	Baltimore, MD	79
5	Madison, CT	72
6	Neptune Beach, FL	67
7	Fairfield, CT	65
8	Huntsville, AL	58
8	Amherst, MA	58
8	Walpole, MA	58



Photo courtesy of the city of Cleveland Heights.



Top Three Complete Streets Policies of 2018

Cleveland Heights, OH Take your time, use your resources

Richard Wong, planning director, City of Cleveland Heights

Cleveland Heights earned the highest score of 2018 because of the policy's emphases on equity, attention to detail, and binding language to spur implementation. What steps did this small city in Ohio take to pass such a strong policy? Planning Director Richard Wong took time to build vital support from local leadership and capitalized on all of his resources to craft strong policy language, learn best practices, and demonstrate the need for, and affordability of, Complete Streets.

Des Moines, IA Smart timing, strong language

Stacy Frelund, government relations director, American Heart Association in Iowa

Des Moines' Complete Streets policy is noteworthy for its emphasis on health equity and for its strong language that sets a timeline for implementation. This solid policy was passed with the support of a broad range of advocates and benefited from its well-timed introduction, coinciding with the city's strategic planning.

Milwaukee, WI Implementing context-sensitive designs

James Hannig, Pedestrian and Bicycle Coordinator, Department of Public Works Caressa Givens, Milwaukee Projects Coordinator, Milwaukee Bike Federation

Milwaukee's policy earned 80 points—it's a solid policy with all of the basics. Although there is room for improvement, the policy is notable for emphasizing streets that reflect their surrounding context and creating a strong committee responsible for implementation that is made up of both city staff and people from outside organizations.

Poll: How would you rate the quality of the Complete Street network in your community? (Single choice)

- 1. High Quality (mostly complete, connected network comfortably accommodating all users)
- 2. Above Average
- 3. Average
- 4. Below Average
- 5. Poor Quality





ADA Transition Planning

Required to be developed by every public entity with 50 or more employees by 1992

2010 ADA Standards for Accessible Design include new facility types (swimming pools, fishing piers, golf courses, play areas, etc.)







ADA Transition Planning

A transition plan consists of:

- A list of the physical barriers that limit the accessibility of programs, activities, or services.
- The methods to remove the barriers and make the facilities accessible.
- The schedule to get the work completed.
- The name of the official(s) responsible for the plan's implementation.

Transition Plans must also include a schedule for providing curb ramps





Resources

Greater Madison MPO

Pedestrian / Bicycle Facilities, Policies, and

Street Standards and October 2021
Addendum

Pedestrian Facilities Toolbox (Connect Greater Madison 2050 Regional Transportation Plan Appendix G)

Low Stress Bike Route Finder

Pedestrian Facilities Web Map

Application

Bus Stop Amenities Study

F-6 | May 2022 PEDESTRIAN FACILITIES TOOLBOX

Treatment	Description	Benefits	Application / Consideration	Cost
Median Refuge Island	This treatment involves creating a raised island in the center of a roadway with cutouts for accessibility along the pedestrian path, creating a refuge for people crossing a roadway.	Allows pedestrians to focus attention on each direction of traffic separately and reduces the length of time a pedestrian is exposed to oncoming traffic. Particularly effective on multilane roadways at accommodating ADA pedestrian traffic.	Recommended for busy multilane roads or high traffic two-lane arterials. Need to be large enough to accom- modate expected bicycle and pedestrian traffic volumes.	\$\$\$
Staggered Median Refuge Island	A variety of a pedestrian island in which pedestrians cross one direction of traffic to reach the median island and have to walk towards oncoming traffic to reach the second half of the crosswalk.	Two-stage crossing allows pedestrians to concentrate on only one direction of traffic at a time and reduces crossing distances; the staggered design forces pedestrians to face oncoming traffic before completing their crossing.	Consider on multi-lane roads with obstructed pedestrian visibility or those with off-set intersections. Must be large enough to accommodate expected bicycle and pedestrian traffic volumes and designed for accessibility.	\$\$\$
Pedestrian Bump-out / Curb Extension	This roadway treatment increase the pedestrian space by providing a physical extension of the sidewalk into a roadway.	This treatment narrows the distance a pedestrian has to cross, reduces pedestrian exposure time, increases sidewalk space on corners, improves visibility of pedestrians, and lowers vehicle turning speeds.	Suitable for roadways that have parking lanes, so long as bump-out extends only as far as parking lane. May need to consider impact to transit, freight vehicles, and cyclists.	\$\$\$





Left: Stop 1358, Gorham at Hancock, serves 100+ riders daily on weekdays.

Right: Stop 2101, Sheboygan at State Office, is unique in that it has a bench-less shelter. With daily weekday ridership of more than 360, the stop lacks many amenities that it likely merits.



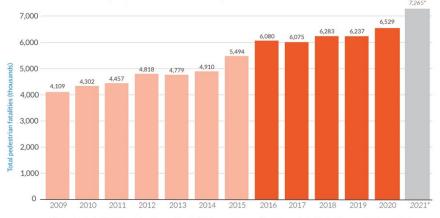


Resources

- Complete Streets
- Dangerous by Design 2022
- Benefits of Complete Streets Toolkit
- Safe System Strategies for Bicyclists and Pedestrians Toolkit
- US DOT Transportation Planning Capacity Building
- Designing for All Ages and Abilities: Contextual Guidance for High-Comfort Bicycle Facilities
- <u>Designing Walkable Urban Thoroughfares: A Context Sensitive Approach</u>
- Don't Give Up at the Intersection
- Urban Street Design Guide
- Planning and Design for Alterations
- (Proposed) Public Rights-of-Way Accessibility Guidelines
- ITE Complete Streets
- Improving Safety for Pedestrians and Bicyclists Accessing Transit

Driving went down in 2020, but deaths of people walking increased 4.7%

2021 deaths will likely represent a historic one-year increase



*This estimate for 2021 is produced by applying the 11.5 percent increase for 2021 projected by the Governors Highway Safety Administration (GHSA) to the federal FARS data for 2020 used in this report.



Bike Parking

A designated location for bikes to be safely stored, including bike corrals, bike racks, bike lockers, and other parking options. They encourage people to bike to their destinations because they have a safe place to store them.

When to Use: To encourage more people to bike by providing them plenty of safe ways to park bikes at destinations.

Encouragement and Education, Infrastructure



Rike Podeo

An on-bike education event for youth to teach them the skills needed to ride a bike safely. They can include bike safety inspections, helmet distribution to those in need, and teach bike maintenance skills and rules of the road. Rodeos can also include scooters, skateboards, and coller skates.

When to Use: To encourage school children to bike, scoot, skateboard or roller skate to school and educate them on how to do so safely.

Community Engagement/Partnerships, Encouragement and Education, Safe Routes to School (SRTS), Vulnerable Populations



Bike Safety Diversion Program

A <u>sponsored program</u> by a local law enforcement agency that offers bike traffic school to remove or reduce a traffic violation fine for people who bike. Attendees also learn bike laws and safe ridino skills

When to Use: To provide a way for people who bike to remove or reduce a traffic violation fine, similar to what is already provided for people who drive.

Community Engagement/Partnerships, Encouragement and Education, Vulnerable Populations





Thank You!

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