Move Utah

ACTIVE, HEALTHY, CONNECTED COMMUNITIES

Trail Blazing: How New Active Transportation Design Manual Drawings are Making a Difference

GOLD LEVEL PARTNERS

X-FACTOR STRATEGIC COMMUNICATIONS

Horrocks.

Utah Department of Health & Human Services

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MAG

WASATCH FRONT REGIONAL COUNCIL

SALT LAKE COUNTY
PLANNING & TRANSPORTATION

UTAH LEAGUE OF CITIES AND TOWNS

GOVERNOR'S OFFICE OF PLANNING AND BUDGET

UTA

ULI Utah

WSP

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BRONZE LEVEL PARTNERS

AECOM

FELSBURG HOLT & ULLEVIG

BIO-WEST

DAVID EVANS AND ASSOCIATES INC.

Parametrix
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Sam Schwartz
A TYLin Company

PENNA POWERS

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STUDENT SCHOLARSHIPS

FEHR PEERS

SUMMIT FRIENDS

APA UT

GREENbike
UTAH'S NON-PROFIT BIKE SHARE
TEN YEARS

LOUIS ALLORO
CHAMPION OF CHANGE

BICYCLE COLLECTIVE

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SPEAKERS

Miranda Jones Cox
WFRC

Chris Wiltsie
Bike Utah

Blair Tomten
Avenue Consultant

Current Design Standards and Guidelines

National and State

AASHTO Bike Guide

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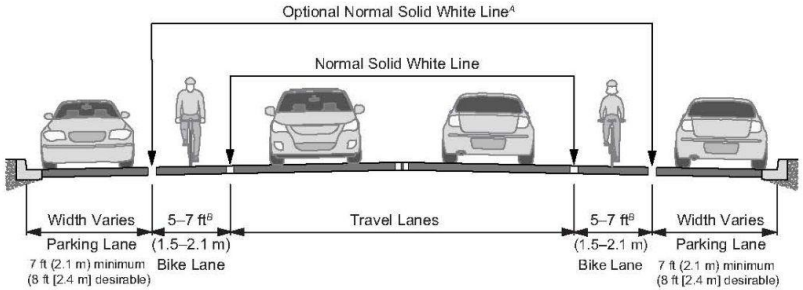
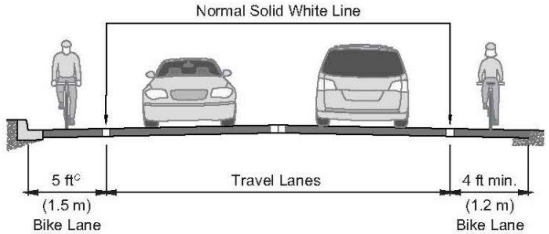


On Street Parking



Parking Prohibited

Notes:

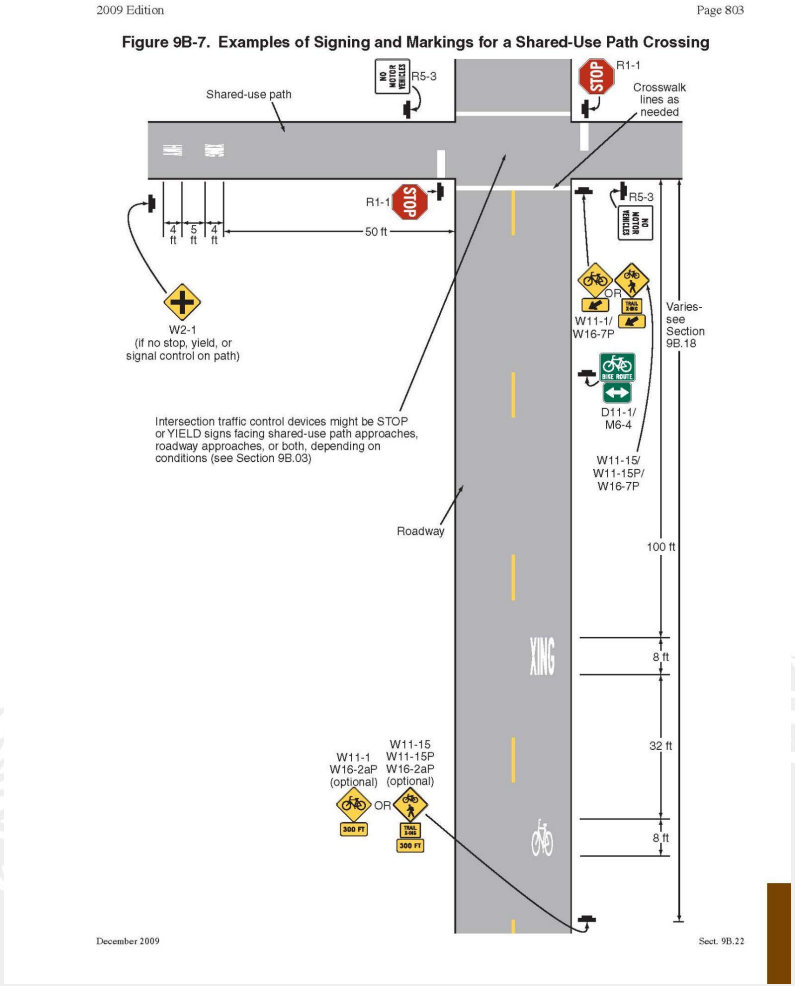
A An optional normal (4–6-in./100–150-mm) solid white line may be helpful even when no parking stalls are marked (because parking is light), to make the presence of a bicycle lane more evident. Parking stall markings may also be used.

B Bike lanes up to 7 ft (2.1 m) in width may be considered adjacent to narrow parking lanes with high turnover.

C On extremely constrained, low-speed roadways (45 mph [70 km/h] or less) with curbs but no gutter, where the preferred bike lane width cannot be achieved despite narrowing all other travel lanes to their minimum widths, a 4-ft (1.2-m) wide bike lane can be used.

Figure 4-13. Typical Bike Lane Cross Sections

2012 Bike Lane Widths



2009 MUTCD

- Striping Types and Sizes
- Signs
- Some information on where and how to place these

5-6 Lane Roadway (Buffered Bike Lane Option)

Bicyclists: Buffered bike banes can be created by narrowing the shoulders. The 6-foot bike lane with a 3-foot buffer does not improve comfort from the unmarked shoulder (BLOS = A) for confident cyclists, but does improve motorist awareness of bicyclists operating in the lanes. The interested but concerned cyclists is still relatively uncomfortable due to the operating speed and volume of the roadway (LTS = 3) despite the provision of buffered bike lanes. Many may still ride on the sidewalk or avoid the road.

Motorists: Motorists can easily overtake cyclists on the roadway and have decreased stress operating around bicyclists, as they have greater awareness for where bicyclists are expected to operate.

Pedestrians: Pedestrian comfort and safety remains unchanged from the existing conditions.

Transit Operators and Riders: Buses can stop within the shoulder ,which can create conflicts with bicyclists where transit routes operate with higher frequency. Riders may have challenges crossing the roadway to access stops.

5-6 Lane Roadway (Separated Bike Lane Option)

Source: Active Tyler: Active Transportation Plan for the Tyler, TX Area MPO

Bicyclists: The shoulders and travel lanes can be reduced in width to create a bi-directional separated bike lane (8 feet) with a buffer (6-foot minimum) on one side. It can create a very comfortable route (BLOS = A) for confident cyclists as well as interested but concerned cyclists (LTS = 1) due to the physical separation from the traffic.

Motorists: Motorists can easily overtake cyclists on the roadway and have decreased stress operating around bicyclists, as they have greater awareness for where bicyclists are expected to operate. Motorists will need to be aware of counterflow bicyclists, but the elimination of parking ensures adequate sight lines.

Pedestrians: Pedestrian comfort and safety remains unchanged from the existing conditions.

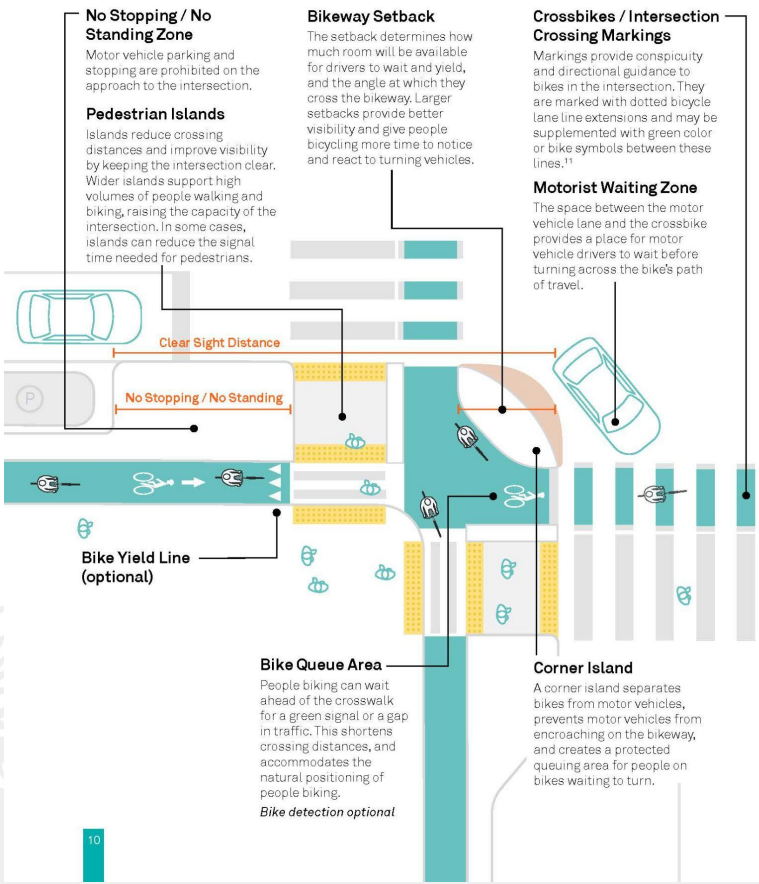
Transit Operators and Riders: Buses will be required to stop within the travel lane. Special care will be required at transit stops to ensure waiting pedestrians are not waiting on the shared use path. Rider access does not change from existing conditions with the exception of access across the separated bike lane.

2019 FHWA Bikeway Selection Guide

Guidance of how to utilize the space you have and how to pick which type of bikeway is best for the speeds and volumes of vehicular traffic

2019 NACTO Don't Give Up at the Intersection

Protected Intersections



Implementation Guidance

Bikeway Setback: The bikeway setback distance determines most other dimensions of the protected intersection. A 10' setback, created in the shadow of the parking/loading lane, is shown. Where practical, a setback of 14'-20' is preferred. If setbacks smaller than 12' are used, they should be accompanied by longer clear distances, and additional signal phasing or speed reduction strategies should be considered. Setbacks larger than 20' may increase turn speeds, and setbacks larger than 25' should be treated as a separate intersection.

Corner Island: Radii should be small enough that passenger cars are discouraged from turning faster than 10 mph.[12] This is accomplished with an effective turn radius of less than 18', usually resulting from a 10' to 15' curb radius. Corner islands may have a mountable override area to accommodate large vehicles. Corner islands may also be implemented as channelization markings that are reinforced by mountable vertical elements such as modular speed bumps.

Pedestrian Islands: Wider islands support high volumes of people walking and biking, raising the person-capacity of the intersection. To serve as an accessible waiting area, the minimum width of a pedestrian island is 6'.[13] The desired minimum width is 8'. If 6' or wider, detectable warning surfaces must be placed at both sides of the island to distinguish the bikeway from the sidewalk, and the island from the bikeway.

No Stopping/No Standing Zones: Zones should be long enough to allow approaching drivers and bike riders to see and recognize one another ahead of the intersection. Many cities already designate 20'-30' of curb before an intersection as a no-standing zone to increase visibility. Features that permit visibility, such as plants, seating, bike parking, and shared micromobility stations, can be placed here.[14]

Bike Queue Areas: Queue areas should be large enough for anticipated bicycle volumes, which often increase substantially after implementation of protected bike lanes. The bike queue area should be at least 6.5' deep, but dimensions of 10' or greater are desirable to accommodate trailers, cargo bicycles, and high bike volumes.[15]

Protected Intersections: Applications

Protected intersections can be applied on any street where enhanced bike comfort is desirable. They are most commonly found on streets with parking-protected bike lanes or buffered bike lanes. Variants can be applied where there is no bike facility on the intersecting street, as well as streets with two-way protected bike lanes. Protected intersections can also be implemented using interim materials.

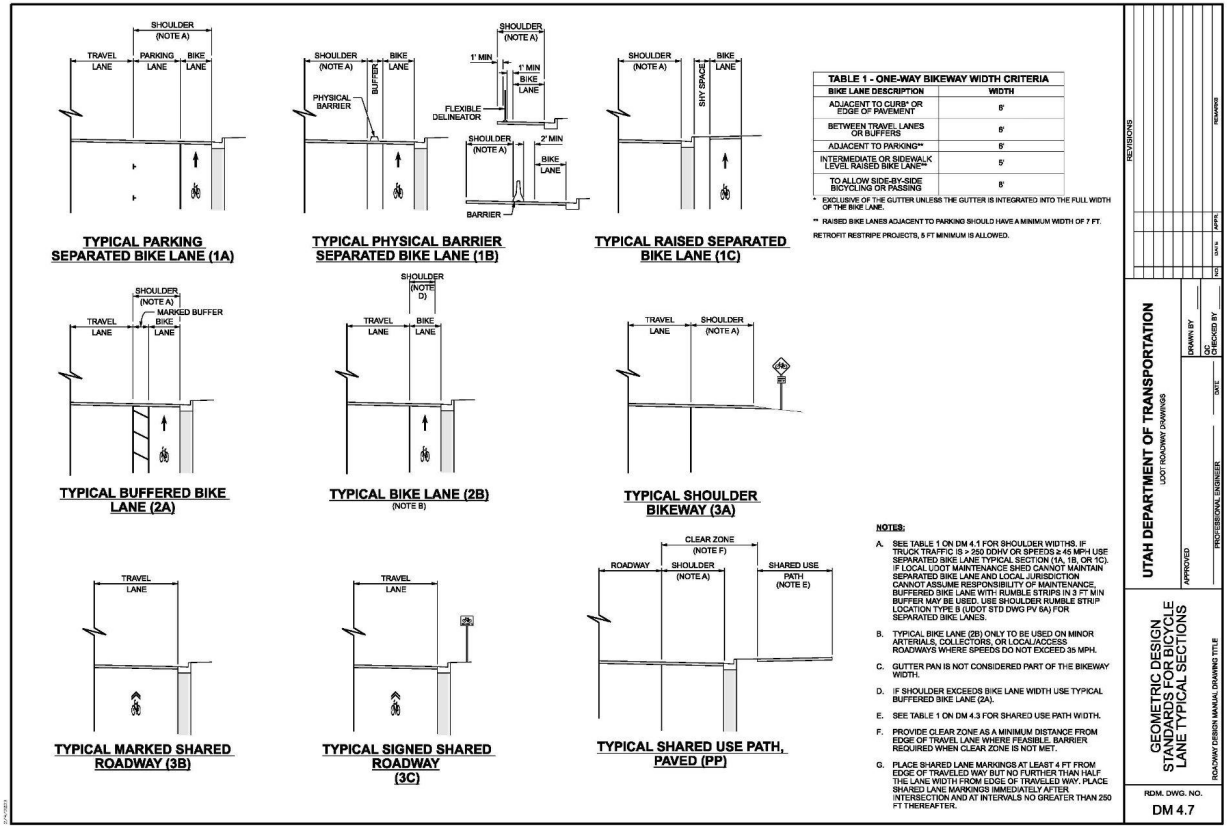
Where no parking lane exists, a setback can be created by shifting the bikeway or motor vehicle lanes away from one another as they approach the intersection.

Accessible Signals: See MUTCD Chapter 4E, PROWAG, other national guidance, and local standards for signal timing and location guidance.

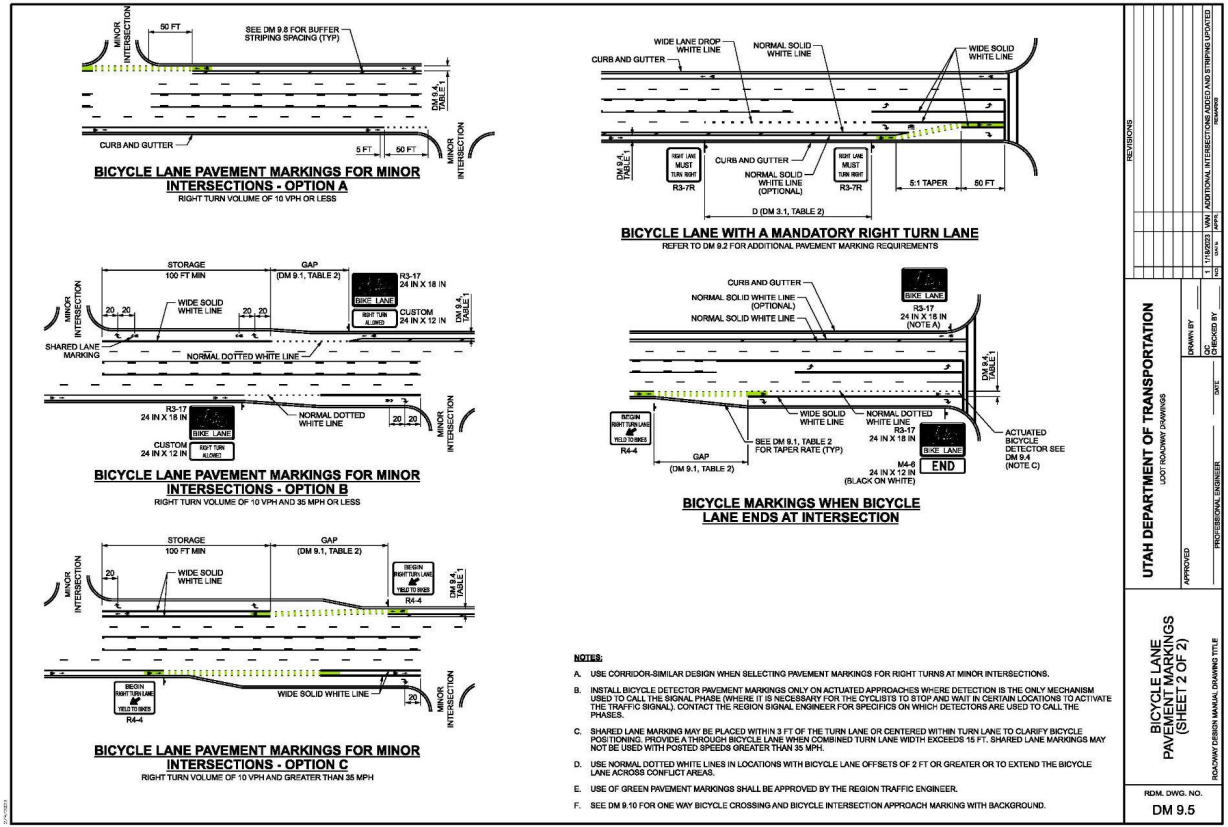
Bike Yield Line & Bike Lane Crosswalk: Bike traffic should be expected to move forward to the stop bar on any signal phase, and pedestrian traffic should also be expected to cross to the island on any phase. This operation may be formalized with optional yield teeth on the bikeway before the crosswalk.[16] The 2009 US MUTCD calls for a "Yield Here to Pedestrian" sign if yield teeth are used. In some jurisdictions, a yield line is not necessary before a crosswalk.

Signs: A modified "Turning Vehicles Yield to Bikes and Pedestrians" sign (R10-15)[17] is recommended where a signalized intersection allows right turns concurrent with bicycle and pedestrian movements. It is required in jurisdictions where state/provincial or local laws are such that pedestrians and bikes do not automatically have the right of way over turning vehicles. The sign should be mounted close to any signal head that regulates vehicles turning across the bikeway and any required location. (This modified sign remains experimental under the 2009 MUTCD.)

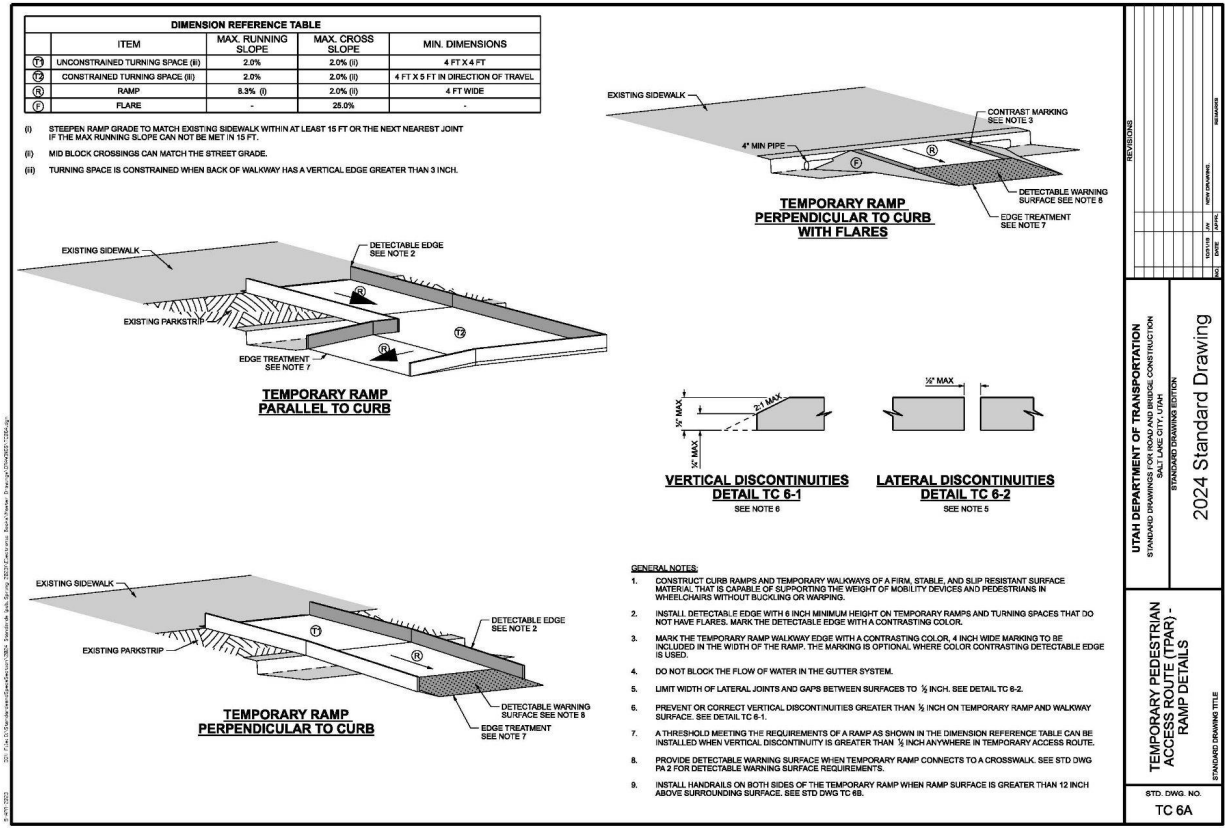
2023 UDOT Design Manual Drawings



2023 UDOT Design Manual Drawings



2024 UDOT Standard Drawings



DIMENSION REFERENCE TABLE

	ITEM	MAX. RUNNING SLOPE	MAX. CROSS SLOPE	MIN. DIMENSIONS
T1	UNCONSTRAINED TURNING SPACE (iii)	2.0%	2.0% (ii)	4 FT X 4 FT
T2	CONSTRAINED TURNING SPACE (iii)	2.0%	2.0% (ii)	4 FT X 5 FT IN DIRECTION OF TRAVEL
R	RAMP	8.3% (i)	2.0% (ii)	4 FT WIDE
F	FLARE	-	25.0%	-

(i) STEEPEN RAMP GRADE TO MATCH EXISTING SIDEWALK WITHIN AT LEAST 15 FT OR THE NEXT NEAREST JOINT IF THE MAX RUNNING SLOPE CAN NOT BE MET IN 15 FT.

(ii) MID BLOCK CROSSINGS CAN MATCH THE STREET GRADE.

(iii) TURNING SPACE IS CONSTRAINED WHEN BACK OF WALKWAY HAS A VERTICAL EDGE GREATER THAN 3 INCH.

TEMPORARY RAMP PERPENDICULAR TO CURB WITH FLARES

TEMPORARY RAMP PARALLEL TO CURB

VERTICAL DISCONTINUITIES DETAIL TC 6-1
SEE NOTE 6

LATERAL DISCONTINUITIES DETAIL TC 6-2
SEE NOTE 5

TEMPORARY RAMP PERPENDICULAR TO CURB

GENERAL NOTES:

1. CONSTRUCT CURB RAMPS AND TEMPORARY WALKWAYS OF A FIRM, STABLE, AND SLIP RESISTANT SURFACE MATERIAL THAT IS CAPABLE OF SUPPORTING THE WEIGHT OF MOBILITY DEVICES AND PEDESTRIANS IN WHEELCHAIRS WITHOUT BUCKLING OR WARPING.
2. INSTALL DETECTABLE EDGE WITH 6 INCH MINIMUM HEIGHT ON TEMPORARY RAMPS AND TURNING SPACES THAT DO NOT HAVE FLARES. MARK THE DETECTABLE EDGE WITH A CONTRASTING COLOR.
3. MARK THE TEMPORARY RAMP WALKWAY EDGE WITH A CONTRASTING COLOR, 4 INCH WIDE MARKING TO BE INCLUDED IN THE WIDTH OF THE RAMP. THE MARKING IS OPTIONAL WHERE COLOR CONTRASTING DETECTABLE EDGE IS USED.
4. DO NOT BLOCK THE FLOW OF WATER IN THE GUTTER SYSTEM.
5. LIMIT WIDTH OF LATERAL JOINTS AND GAPS BETWEEN SURFACES TO ½ INCH. SEE DETAIL TC 6-2.
6. PREVENT OR CORRECT VERTICAL DISCONTINUITIES GREATER THAN ½ INCH ON TEMPORARY RAMP AND WALKWAY SURFACE. SEE DETAIL TC 6-1.
7. A THRESHOLD MEETING THE REQUIREMENTS OF A RAMP AS SHOWN IN THE DIMENSION REFERENCE TABLE CAN BE INSTALLED WHEN VERTICAL DISCONTINUITY IS GREATER THAN ¼ INCH ANYWHERE IN TEMPORARY ACCESS ROUTE.
8. PROVIDE DETECTABLE WARNING SURFACE WHEN TEMPORARY RAMP CONNECTS TO A CROSSWALK. SEE STD DWG PA 2 FOR DETECTABLE WARNING SURFACE REQUIREMENTS.
9. INSTALL HANDRAILS ON BOTH SIDES OF THE TEMPORARY RAMP WHEN RAMP SURFACE IS GREATER THAN 12 INCH ABOVE SURROUNDING SURFACE. SEE STD DWG TC 6B.

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH
STANDARD DRAWING EDITION
2024 Standard Drawing

TEMPORARY PEDESTRIAN ACCESS ROUTE (TPAR) - RAMP DETAILS
STANDARD DRAWING TITLE

STD. DWG. NO.
TC 6A

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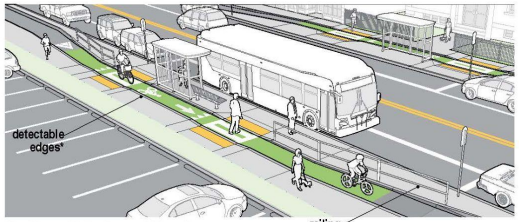
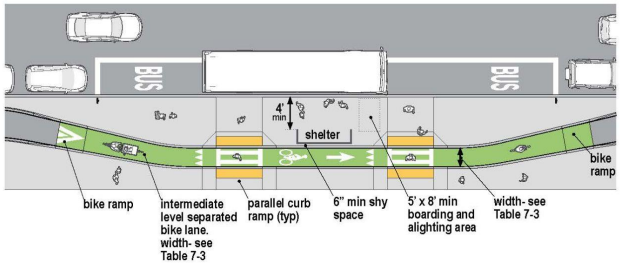
Figure 7-24: Example Configuration: Floating Transit Stop (Mid-Block)



*can be a vertical curb, mountable curb, sloping curb, directional indicator, planter box, railing, or other detectable edge

Note: Directional Indicators are an emerging treatment. See Section 7.5 for recommendations for implementation.

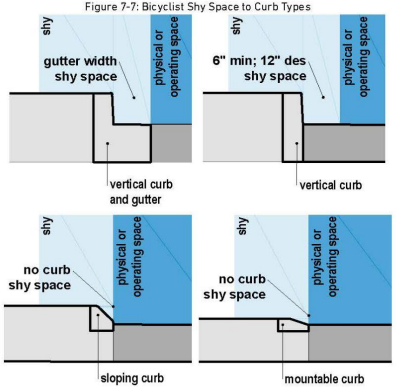


Note: Green-Colored pavement is permitted for use with Interim Approval from FHWA. (See Section 1.5)

2023(?) AASHTO Bike Guide

Draft Version

Figure 7-7: Bicyclist Shy Space to Curb Types



7.3.4. Bike Lane Width

The decision regarding the width of the bike lane zone is affected by the elevation of the bike lane, curb type selection, and the volume of users. Separated bike lanes generally attract a wider spectrum of bicyclists, some of whom operate at slower speeds, such as children or seniors. As with people who travel together in motor vehicles, bicyclists traveling together often wish to ride side-by-side. Because of the elements used to separate the bike lane from the adjacent motor vehicle lane, bicyclists typically do not have the option to pass each other by moving out of the separated bike lane. It is therefore preferable for the bike lane zone to accommodate side-by-side bicycling and allow for passing without creating unsafe or uncomfortable conditions. As noted in Section 7.3.3, to account for shy distances between bicyclists the bike lane width will need to be greater to accommodate side-by-side bicycling as compared to the width need to accommodate only occasional passing.

The preferable width of the bike lane will vary depending on the adjacent vertical features, the accommodation of side-by-side bicycling or passing, and the volume of users. There is more flexibility with respect to the width of the bike lane when it is not separated from adjacent zones with vertical curbs. When the bike lane is located at the same elevation as the adjacent street and sidewalk buffer zones or where sloping or mountable curbs are provided, the bicyclist can operate more closely to the edges of the bike lane during passing movements. For one-way separated bike lanes with low volumes of bicyclists (less than 150 per peak hour), the preferable width of the bike lane between two vertical curbs varies between 6.5 ft to accommodate passing and 8.5 ft to accommodate side-by-side riding (see Table 7-3).

Table 7-3: One-Way Separated Bike Lane Widths Based on Existing or Anticipated Volumes

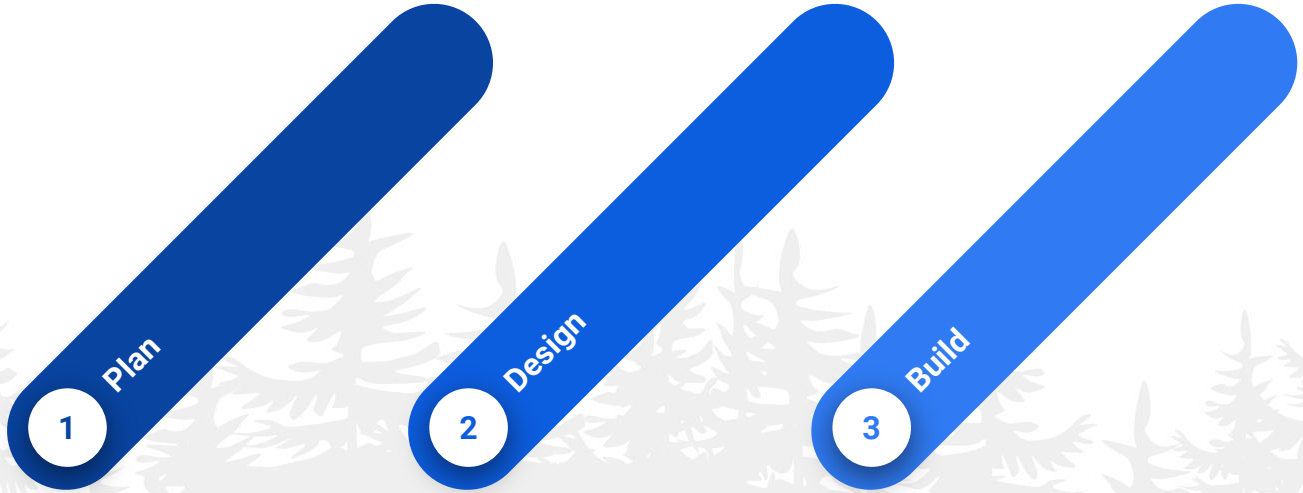
Peak Hour Directional Bicyclist Volume	One-Way Separated Bike Lane Width (ft)		
	Between Vertical Curbs	Adjacent to One Vertical Curb	Between Sloped Curb or at Sidewalk Level
<150	6.5 - 8.5	6 - 8	5.5 - 7.5
150-750	8.5 - 10	8 - 9.5	7.5 - 9
>750	≥10	≥9.5	≥9
Constrained Condition*	4.5	4	3.5

*Peak Hour Directional Bicyclist Volume not applicable

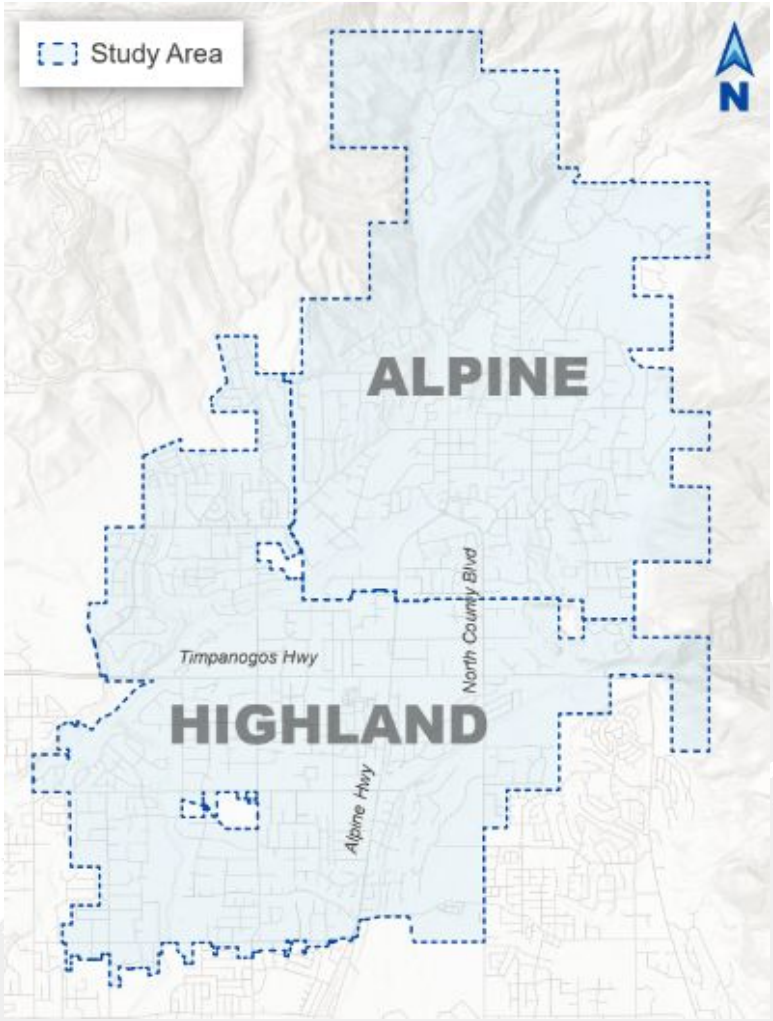
How Can We Use These New Designs

Our Research

The Process



Case Studies



Case Studies

- Bluff
- Parowan

Implementation Resources

Technical Assistance & Funding

What projects does my community need?

How will we pay for them?

Technical Assistance Planning

- Transportation Land Use Connection (WFRC)
- Technical Assistance for Governments (MAG)
- Technical Planning Assistance (UDOT)
- Outdoor Recreation Planning Assistance (DNR)
- Rivers, Trails, and Conservation Assistance (NPS)
- 1,000 Miles Project (Bike Utah)

MAG
Expert Resources. Enriching Lives.

UTAH DNR RECREATION

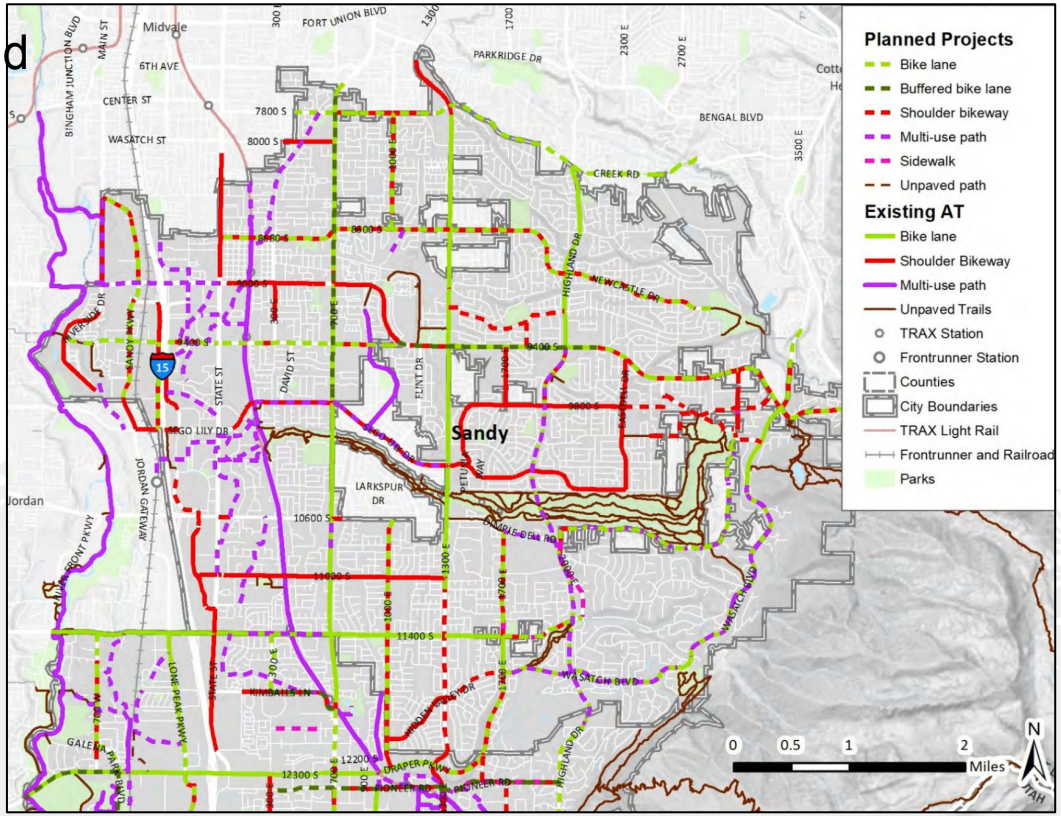
UDOT
Keeping Utah Moving

WASATCH FRONT REGIONAL COUNCIL

NATIONAL PARK SERVICE

Example: Sandy/Draper Active Transportation Plan

- Utilized Transportation Land Use Connection Program (WFRC)
- Process involves robust public engagement
- Identifies need gaps, implementation plan, and prioritized project list



TRANSPORTATION AND LAND USE CONNECTION

State Funding Opportunities

PROGRAM	ELIGIBILE PROJECTS	ADMIN. ENTITY	KNOWN LOCAL MATCH
Active Transportation Investment Fund (ATIF)	TBD.	UDOT	TBD.
Transportation Investment Fund (TIF) Active	Paved ped or nonmotorized projects that help mitigate congestion	UDOT	40%
Transit Transportation Investment Fund (TTIF) First/Last Mile	Paved ped or nonmotorized project connecting user to public transit	UDOT	30%
Safe Routes to School	Infrastructure improvements (sidewalks, etc.) encouraging walking/biking to school	UDOT	-
Safe Sidewalk Program	New sidewalks adjacent to state roads where no sidewalk currently exists	UDOT	25%
UDOT Maintenance Program	Routine street resurfacing to add bikeways or buffers	UDOT	-
Region Transportation Alternatives Program (TAP)	Pedestrian and Bicycle Facilities	UDOT	-
Outdoor Recreation Grant	Trails, pathways, and other amenities	GOEO	50%

Active Transportation Investment Fund

- $45M ongoing in stable, long-term funding
- Planning, design, construction, and maintenance of paved pedestrian or paved non-motorized trails
- Funding prioritized through the Transportation Commission

UTAH TRAIL NETWORK

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Federal Funding Opportunities

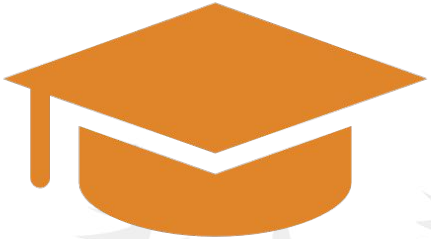
PROGRAM	ELIGIBILE PROJECTS	ADMIN. ENTITY	KNOWN LOCAL MATCH
Highway Safety Improvement Program	Pedestrian and bicycle safety improvements	UDOT	-
Community Development Block Grant	Streetscape revitalization, public facility improvements to streets and sidewalks, trails and greenway projects, ADA plan	MPOs (WFRC, MAG, etc.)	-
Recreational Trails	Maintenance, restoration, construction of recreational trail	UT Division of Outdoor Rec.	50%
Centers for Disease Control Grants	Prevention grants – can be used for pedestrian and bike infrastructure	CDC	-
Federal Lands Access Program	High-use recreation facilities for recreation and access to federal lands	USDOT	-
Land and Water Conservation Grants	Planning and acquiring new outdoor recreation areas, including trails	NPS/ UT State Parks	50%
Safe Streets and Roads for All	Projects that prevent transportation-related deaths	USDOT	20%

Local Funding Opportunities

PROGRAM	ELIGIBILE PROJECT	ADMIN. ENTITY	KNOWN LOCAL MATCH
Class B&C Road Funds	Enhancement of traffic and pedestrian safety including sidewalks, safety features, signals, and bicycle facilities	Cities & Counties	-
Local Option Sales Tax	Bik/ped facilities - great source for matching funds	County	-
Voter Approved Sales Tax	Increases sales tax to 1 cent / $4 - Can be used for transportation improvements including trails, bikeways, and sidewalks	Cities & Counties	-
Recreation, Arts, and Parks (RAP) Tax	Parks and rec (varies by ordinance)	Cities & Counties	-
Transportation Alternatives Program (TAP)	Construction, planning, design of on-road and off-road bike and pedestrian facilities	MPOs	6.77%
Congestion Mitigation & Air Quality (CMAQ)	Construction of bicycle or pedestrian facilities serving commuter transportation needs	MPOs	6.77%
Surface Transportation Program (STP)	Improving existing streets and active transportation projects that reduce traffic demand	MPOs	6.77%
Carbon Reduction Program (CRP)	Projects that reduce on-road CO2 emissions and facilitate single-occupant vehicle trip alternatives, including bike/ped facilities	MPOs	6.77%

Private Funding Opportunities

Hospitals



Universities

Businesses

Philanthropic

Funding Example:
Layton FrontRunner Pedestrian Bridge

STATE	Transportation Investment Fund (TIF) Active - UDOT	$3,600,000
FEDERAL	Congestion, Mitigation, Air Quality (CMAQ) - WFRC	$2,145,232
LOCAL	Layton City Proposition 1 (Voter approved sales tax)	$505,000
LOCAL	Davis County 3rd Quarter (Local option sales tax)	$2,000,000
	Total:	$8,250,232