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NEVADA DEPARTMENT OF TRANSPORTATION
DESIGN DIVISION

ADA DESIGN GUIDELINES

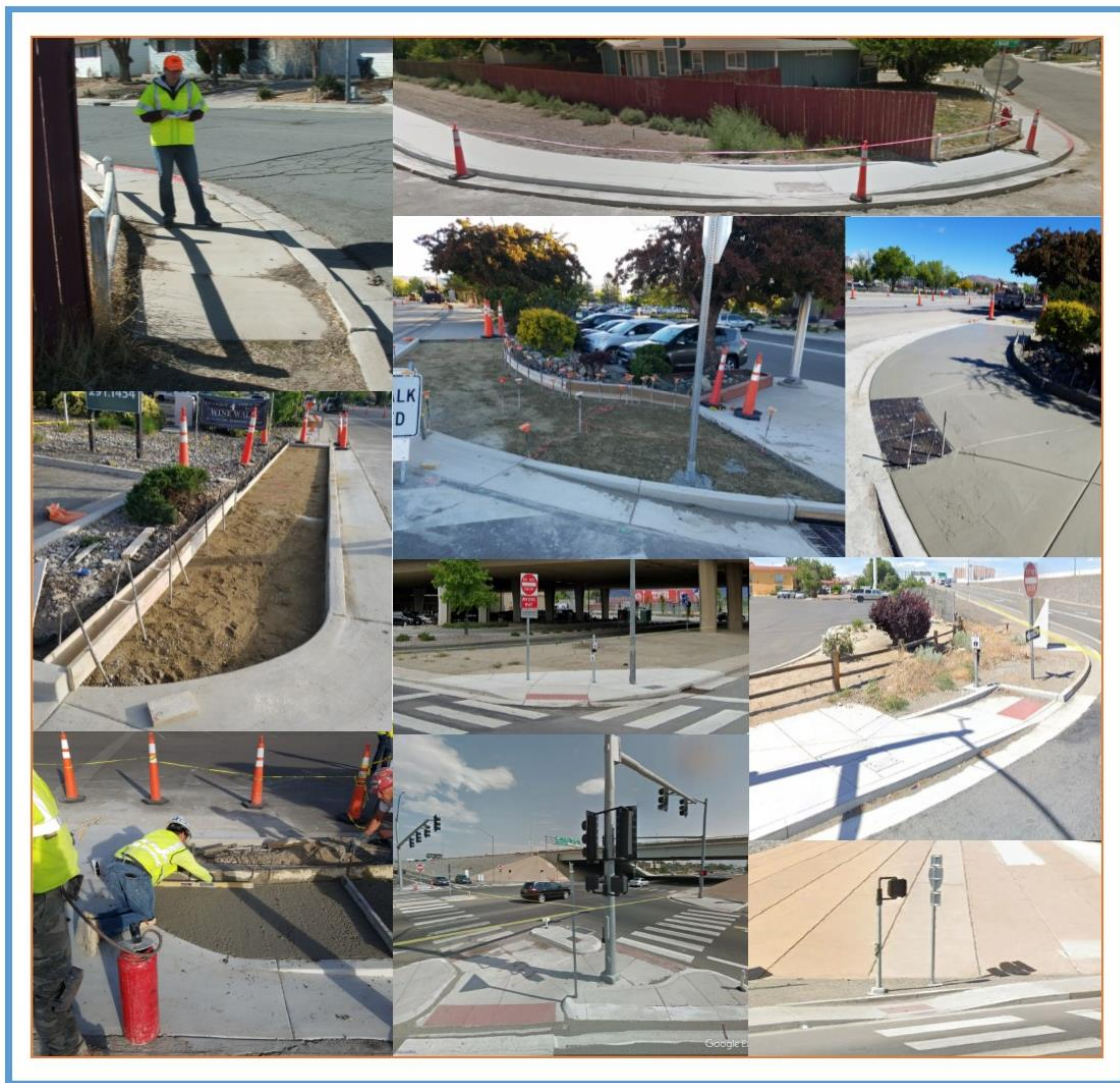


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GLOSSARY OF TERMS

Accessible: A site, building, facility, or portion thereof that complies with this part (of the 2010 ADA Standards) [2010 ADA Standards].

Accessible Pedestrian Signal (APS): Integrated device that communicates information about the WALK and DON'T WALK intervals at signalized intersections in non-visual formats (i.e., audible tones and vibrotactile surfaces) to pedestrians who are blind or have low vision.

Alteration: An asphalt or concrete pavement repair that requires curb ramp upgrades at the time of improvement. These include open-graded surfacing, cape seals, mill & overlay, hot in-place recycling, microsurfacing/thin-lift overly, addition of new layer of asphalt, asphalt/concrete rehabilitation, reconstruction, new construction [FHWA/DOJ Briefing Memo 2013]

Blended Transition: A raised pedestrian street crossing, depressed corner, or similar connection between the pedestrian access route at the level of the sidewalk and the level of the pedestrian street crossing that has a grade of 5 percent or less [PROWAG R105.5]. See page 3.

Curb Ramp: A ramp that cuts through or is built up to the curb. Curb ramps can be perpendicular or parallel, or a combination of parallel and perpendicular ramps [PROWAG R105.5].

Detectable Warning Surface: Raised truncated domes in a rectangular array that must contrast the surrounding surface color.

Facility: All or any portion of buildings, structures, improvements, elements, and pedestrian or vehicular routes located in a public right-of-way [PROWAG R105.5].

Historic Property/Historical Resources: Under Federal law [36 CFR 800.16(l)] the term used is “Historic Property” and includes any building, structure, site, object or district that is listed in or eligible for listing in the National Register of Historic Places.

Landing: A level area at the top and bottom of each ramp run [PROWAG R407.6].

Parallel Curb Ramp: A curb ramp design in which the sidewalk slopes down on either side of a landing at street level; parallel curb ramps require users to turn on the landing before entering the street [Designing Sidewalks and Trails for Access]. See page 3.

Passing Space: A 5' by 5' minimum space for passing at intervals of 200' maximum where the PAR is less than 5' wide [PROWAG R302.4]

Path or Pathway: A track or route along which people are intended to travel [Designing Sidewalks and Trails for Access].

Pedestrian: A person who travels on foot or who uses assistive devices, such as a wheelchair, for mobility [Designing Sidewalks and Trails for Access].

Pedestrian Access Route (PAR): A continuous and unobstructed path of travel provided for pedestrians with disabilities within or coinciding with a pedestrian circulation path [PROWAG R105.5].

Pedestrian Circulation Path: A prepared exterior or interior surface provided for pedestrian travel in the public right-of-way [PROWAG R105.5]. Pedestrian overpasses and underpasses (pedestrian overcrossings and undercrossings) are treated the same way as a pedestrian circulation path.

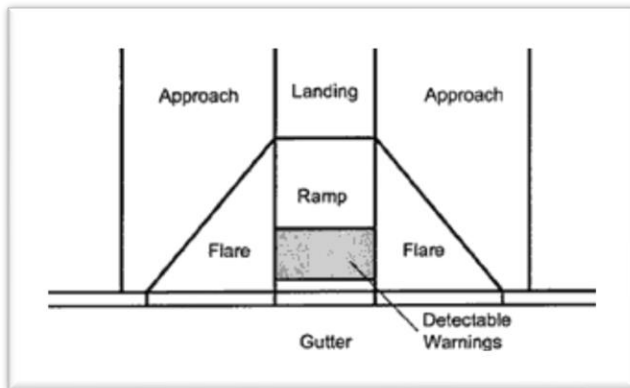
Perpendicular curb ramp: A curb ramp design in which the ramp path is perpendicular to the edge of the curb [Designing Sidewalks and Trails for Access]. See page 3.

Public Right-of-Way: Public land or property, usually in interconnected corridors, that is acquired for or devoted to transportation purposes [PROWAG R105.5].

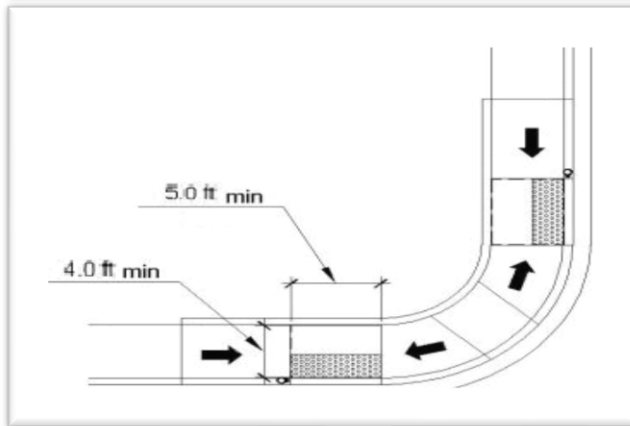
Sidewalk: A walkway that is paved and separated from the street, generally by a curb and gutter [FHWA-SA-17-067].

Structurally Impracticable: Rare circumstances when the unique characteristics of terrain prevent the incorporation of accessibility features. [28 CFR 35.151(a)(2)(i)].

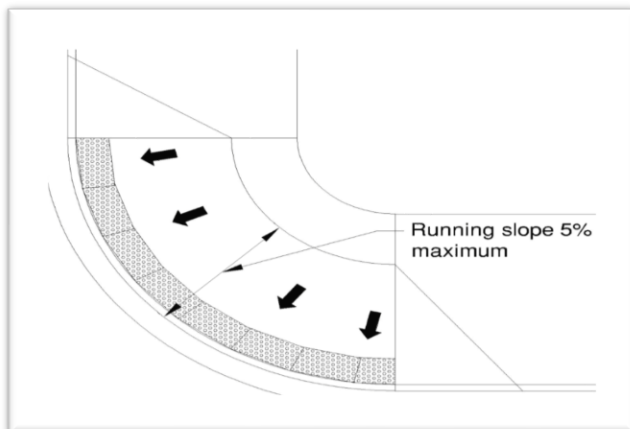
Walkway: Any type of defined space or pathway for use by a person traveling by foot or using a wheelchair. This may be pedestrian a walkway, shared use path, sidewalk, or roadway shoulder [FHWA-SA-17-067].



Perpendicular Ramp [FHWA-HRT-04-091]



Parallel Ramp [PROWAG R304.3]



Blended Transition [PROWAG R304.4]

ADA DESIGN REQUIREMENTS

ADAAG, PROWAG, AND THE MUTCD

NDOT's responsibility regarding the Americans with Disabilities Act (ADA) is to ensure that pedestrians with disabilities have an equal opportunity and access to use the public rights-of-way in the transportation system. NDOT also must provide access to all its programs including maintenance facilities, rest stops, etc. ADA facilities are required by law to be designed to the ADA Accessibility Guidelines (ADAAG), but these guidelines do not fully address public rights-of-way. In 2011, the Public Rights of Way Accessibility Guidelines (PROWAG) were developed specifically to address transportation and other public facilities. PROWAG has gone through multiple reviews and comments, and although it has not been adopted as a regulation by the Department of Justice (DOJ), NDOT has committed to following PROWAG.

PROWAG covers:

- pedestrian access routes and alternate pedestrian access routes
- pedestrian street crossings
- curb ramps and blended transitions
- detectable warning surfaces
- accessible signals and pushbuttons
- protruding objects in pedestrian paths
- signs
- street furniture
- transit stops and shelters
- on-street parking spaces and passenger loading zones
- stairways and escalators
- handrails
- doors, doorways, and gates

The MUTCD Section 4E includes guidance on proper placement of pedestrian push buttons. See pages 6 and 7 for the NDOT ADA Design Criteria.

DETERMINING WHAT TO UPGRADE

CURB RAMPS

NDOT Roadway projects undergoing "alterations" shall construct new ramps that meet ADA standard or bring existing ramps up to ADA standard when there is a pedestrian walkway with a prepared surface for pedestrian use and a curb, elevation, or other barrier between the street and the walkway. Most existing curb ramps do not meet ADA standard because they do not have a landing area that meets standards.

Alterations include:

- New Construction
- 3R Projects (open-graded surfacing, cape seals, mill & overlay, hot in-place recycling, microsurfacing/thin-lift overly, addition of new layer of asphalt, asphalt/concrete rehabilitation, reconstruction)

Projects that are considered "maintenance" and do not require curb ramp upgrades include:

- Crack filling/sealing
- Surfacing Sealing (chip seal/slurry seal/fog seal)
- Joint Repairs
- Dowel Bar Retrofit
- Spot High-Friction Treatments
- Diamond Grinding
- Pavement Patching

ADDITIONAL UPGRADES ON ADA PROJECTS

ADA projects are scoped by the ADA Coordinator and typically originate from citizen complaints or known problem areas on NDOT facilities. All items listed below shall be upgraded as a part of ADA projects. Work closely with the ADA Coordinator to determine the scope, schedule, and budget of an ADA project. An ADA project is intended to bring the entire pedestrian path in a corridor up to standard. Right-of-way needs including fee, easement, and utility relocations should be identified early to allow for the 18 – 24 months it takes to acquire right-of-way. If not all upgrades can be made, work with the ADA Coordinator to determine priority.

To Be Upgraded:

- Substandard pedestrian push button locations (consider height, horizontal distance from the ramp, and reach). This may be dictated by other signal improvements. See Design Criteria.
- Substandard pedestrian routes with no alternate accessible route such as stairs or longitudinal grades steeper than the roadway grade
- Driveways with cross slopes greater than 2% cross slope (“dustpan” driveways) with no alternative pedestrian path
- Transverse cross slopes greater than 2%
- Pedestrian access route (PAR) less than 48” wide
- PAR greater than 48” but less than 60” wide without a passing space within 200’
- Vertical discontinuities greater than or equal to ¼”
- Horizontal discontinuities greater than or equal to ½”
- Vertical Clearance of any facilities less than 80” in the PAR (i.e. signs, utility pole guide wires)

ADA UPGRADES ON 3R PROJECTS

All 3R projects must, at a minimum, upgrade curb ramps to be compliant. Additional ADA-related features as shown above should be upgraded on all 3R projects but may be limited by right-of-way or construction costs. Scope additions to 3R projects need approval by the Chief Road Design Engineer. Work with the Senior Designer and Principal Road Design Engineer to determine the priority of the upgrades. Note each of these items during the ADA Field Visit and prepare an ADA Project Compliance Memo (see below) denoting which items are not feasible to be included in the project. If a deficiency listed below cannot be brought up to current standards, document it so it can be included in a future ADA project.

DOCUMENTATION OF ADA COMPLIANCE

Any improvements that are minimally required, but will not be made at the time of the initial project because it is structurally impracticable (for new construction) or technically infeasible (for alteration

projects), will require a follow-up project to be delivered as soon as feasible. These needed improvements are to be documented in an [ADA Project Compliance Memo](#) that is reviewed and approved by the Chief Road Design Engineer. This memo is to be submitted to the ADA Coordinator to add this work to the NDOT ADA Transition Plan.

NDOT ADA DESIGN CRITERIA

NDOT ADA DESIGN CRITERIA			
DESIGN ELEMENT	DESIREABLE	LIMITING CRITERIA	COMMENT
Ramp			
Width	5'	4'	
Slope	7.50%	8.33% max	
Length		Not to exceed 15'	
Turning Space (Landing Area)			
Width	4' (min) wide x 5'	4'x4'	
Slope	1.50%	2.00%	Prefer to slope toward roadway
Flared Side (Wing)			
Slope	9.00%	10.00% max	All flared wings must be compliant, even if it leads to nowhere
Length		Not to exceed 15'	
Detectable Warning Pad			
Size		Match ramp width x 2'	Minimum ramp width of 4'
Placement		Bottom of ramp	Typically located at bottom of ramp with the following exception: When the distance between the back of curb and the end of the ramp exceeds 5' (as measured along the back of sidewalk) detectable warnings must be placed on the back of curb in a curvilinear fashion. See Standard Plans.
Islands (At-Grade Cut-Through)			Standard ramp designs can be utilized in lieu of a cut-through
Width		5' min	
Detectable Warning Pad		Match cut-through width x 2'	One on each side with a minimum 2' between them. If island is less than 6' wide, do not use detectable warning pads.

NDOT ADA DESIGN CRITERIA, continued			
DESIGN ELEMENT	DESIREABLE	LIMITING CRITERIA	COMMENT
Grade Breaks		11%	Gutter pan must be flattened to 2% in ramp/landing interface area (where curb height is 0")
Sidewalk			
Width	5'	4'	Must include a passing zone (5'x5' every 200' if using widths less than 5'). Does not include width of curb.
Cross Slope	1.50%	2.00%	Prefer to slope toward roadway
Running Slope	5% max	Match roadway slope	If sidewalk does not follow the road and is steeper than 5%, provide a landing area every 200'
Pedestrian Access Route		4'	Protrusions like poles, fire hydrants, signal cabinets, etc. must not reduce the PAR below 4'.
Vertical obstructions		80" min	Minimum height for signs in the PAR so pedestrians don't hit their heads
Discontinuities			cracks/gaps/bumps
Horizontal Transverse	0"	1/2" max	
Horizontal Parallel		0"	
Vertical	0"	1/4" max	
Residential and Commercial Driveways			Maintain a minimum 4' wide Pedestrian Access Route with ramp and sidewalk slopes meeting previously listed design criteria.
Pedestrian Push Buttons			APS on all new signals. Upgrade to APS when the signal controller and software are altered, or the signal head is replaced
Setback from back of curb	1.5' to 6.0'	10' max	See MUTCD pg. 501 Figure 4E-3
Lateral offset from edge of crosswalk		5' max	
Lateral Reach		10" max	Check with the local agency to see if they allow push button extensions.
Button Height	42"	32" min - 48" max	

SCOPING, FIELD VISITS, MEASURING, AND ESTIMATING

BEFORE THE FIELD

There are many resources that can help the Designer get a good feel for the ADA deficiencies within a project and prepare for an effective field visit. Contact the NDOT ADA Coordinator to understand any specific ADA needs within your project footprint. The NDOT Standards & Manuals team also has the expertise to assess ADA deficiencies and strategies for upgrades. Research as-built plans within your project footprint to see if upgrades have already been made. Reference local County, City, and RTC standards to know what features they require locally (stamped, colored concrete, etc.)

The NDOT ArcGIS ADA Right of Way Inventory (see the quick link on page 9) is an application used to collect and share data on existing ADA facilities within (and surrounding) NDOT Right of Way. It identifies whether features including ramps, residential driveways, pedestrian push buttons, and pedestrian access routes are compliant or not. This inventory may not be up to date with the latest project improvements, so use it as a scoping tool but verify data with field measurements.

It is also important to obtain the Right of Way Verification from the Right of Way Division to know the limits of the NDOT Right of Way before your field visit. If you do not yet have this information, you can often find rough property lines on local jurisdictions' assessors map websites.

Google Earth is also useful to visually identify substandard features and measure rough lengths and areas for estimating. Pay close attention to the date that the map and street views were captured as changes may have occurred since then.

Finally, put together a plan set that includes project limits, existing mapping, and verified right-of-way lines. This will help in taking field notes.

ADA FIELD VISIT

The goal of an ADA field visit is to identify which ADA-related items are non-compliant and document them to determine the need and feasibility to upgrade any deficiencies. Invite the ADA Coordinator and a Standards and Manuals representative to the field visit to help determine existing compliance. The ADA coordinator can also bring a tablet with the ArcGIS ADA Inventory on it to refer to previously assessed data while in the field. This application can also be made available to anyone who has a tablet and the ADA Coordinator can provide training. Take a measuring tape, measuring wheel, slope measuring tool, and [NDOT ADA Field Guide](#) as a reference. Use the [ADA Estimating Tool](#) help track your field findings.

ESTIMATING

Use the [ADA Estimating Tool](#) to aid in developing a scoping-level estimate for the project. This tool will help estimate costs for areas of curb ramp retrofits, sidewalk and curb & gutter replacement, driveway replacement, and pedestrian push button retrofits. Keep in mind that ramp, sidewalk, and driveway replacements need to extend to the nearest existing joint.

Scoping and estimating the ADA needs in a project early is vital to successful statewide project planning and funding. Work with your Principal Road Design Engineer to provide accurate estimates for the NDOT 5 Year Plan and STIP.

LEVEL OF DESIGN

NDOT STANDARD PLANS

Design details for curb ramps and sidewalks may only need reference to the NDOT Standard Plans. This is rare, and most projects will require more detailed design. Work with the Senior Designer and the Standards and Manuals group to determine the feasibility of using the Standard Plan details for new construction and retrofit projects.

DETAILED DESIGN

When a standard plan design cannot be easily applied, special details are needed. This typically occurs at signalized intersections, in areas of steeper roadway grades, utility obstructions, driveways requiring permissions to construct, and a pedestrian access route that is limited by right-of way. This level of design is needed approximately 75% of the time. If mapping is already available in MicroStation, then survey may not be needed unless the mapping is outdated. The designer should make field visits to determine the accuracy of the existing topographic mapping as well as to determine/check the proposed ramp designs. Keep in mind that ramp, sidewalk, and driveway replacements need to extend to the nearest existing joint. Designers should create special details or geometric sheets at a 20:1 scale or larger with station/offset notation at critical points. These plans should also include a note stating that slope requirements in the NDOT Standard Plans must be met. See the [example plans](#) located on the Roadway Design Sharepoint page for detailed design plans.

VERTICALLY CONSTRAINED DESIGN

This type of design should be used when NDOT does not have right-of-way access to change the elevations of the private sidewalks/driveways. Specifically, where there are vertical constraints that must be met such as doorways, steps, and private sidewalks/driveways. This method would also be used for new construction and ADA design adjacent to roads being reprofiled. In this case, the designer should create a custom curb ramp design that shows the grades and dimensions of the proposed ramps and landings and show how they will tie into the constrained area with station/offset/elevation notation. Survey of the existing condition will be needed to provide accurate detail in the design. Contact the NDOT Location Division to inquire about obtaining survey information. If the project has been assigned an NDOT Construction Crew, contact the Resident Engineer to retain the services of their surveyor, otherwise consultant services may be obtained as needed. If using a crew or consultant, coordinate this data with the Location Division to verify it is consistent with your mapping. See the [example plans](#) located on the Roadway Design Sharepoint page for vertically constrained design plans.

QUICK LINKS TO TOOLS

ARCGIS ADA RIGHT OF WAY INVENTORY:

<https://ndot.maps.arcgis.com/home/webmap/viewer.html?webmap=0202ae8a996a4715b9da2fe1b2e2548e>

Disclaimer: this data is to be field verified as it may not be updated with more recent project improvements.

REFERENCES

United States Access Board, *Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG)*, July 2011

<https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/proposed-rights-of-way-guidelines>

United States Access Board, *ADA Accessibility Guidelines (ADAAG)*, Amended September 2002

<https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/background/adaag>

United States Access Board, *Accessible Public Rights-of-Way: Planning and Designing for Alterations*, July 2007

<https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/guidance-and-research/accessible-public-rights-of-way-planning-and-design-for-alterations>

2009 Manual on Uniform Traffic Control Devices (MUTCD)

https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/pdf_index.htm

NDOT ADA Training Class PowerPoint

[ADA NDOT Training Class Link](#)

NDOT ADA Homepage:

<https://www.nevadadot.com/doing-business/external-civil-rights/ada-program>

NDOT ADA Transition Plan:

<https://www.nevadadot.com/home/showdocument?id=44>

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