1200 Pedestrian Facilities

1200.1 General

Pedestrian travel is a vital transportation mode. It is used at some point by nearly everyone and is a critical link to everyday life for many. The New Mexico Department of Transportation (NMDOT) strives to ensure that pedestrians with disabilities have the opportunity to use the transportation system in an accessible and safe manner. In order to meet user needs and achieve compliance, designers must be aware of the diverse physical and emotional (i.e., perceived safety) needs and abilities of pedestrians.

Section 504 of the Rehabilitation Act of 1973 (Section 504) and Title II of the Americans with Disabilities Act of 1990 (ADA) require that pedestrian facilities be designed and constructed so they are readily accessible to and usable by persons with disabilities. This chapter provides accessibility guidance for the design of public right-of-way pedestrian facilities that meet applicable state and federal guidelines and standards. It is important to note that accessibility design criteria have evolved for decades and will continue to do so. In 2013, the United States Access Board issued a Supplemental Notice of Proposed Rulemaking (SNPRM) for the Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way. These draft guidelines are referenced as the PROWAG and are not enforceable standards until adopted by the United States Department of Justice (USDOJ) and the United States Department of Transportation (USDOT). However, the draft PROWAG is considered best practice and is consistent with the ADA's requirements for new and altered facilities. The NMDOT has adopted the PROWAG as an enforceable design guideline. It is important to have designers of NMDOT public right-of-way

pedestrian facilities be familiar with the PROWAG prior to scoping, designing, and constructing projects.

The pedestrian facilities included in a project are determined during the planning phase based on a variety of plans and factors. These plans include the Transportation Asset Management Plan, Statewide Transportation Improvement Program (STIP), and NMDOT's long-range transportation plan, current edition. Other factors that should be considered when determining pedestrian facilities include access control of the highway, local transportation plans, comprehensive plans, roadside environment, pedestrian volumes, user age group(s), and the continuity of local walkways along or across the roadway.

When developing pedestrian facilities in locations with challenging grades or areas with a limited amount of right-of-way, designers may be faced with multiple challenges. It is important that designers become familiar with the ADA/NMDOT/PROWAG/ Manual on Uniform Traffic Control Device (MUTCD) accessibility criteria in order to appropriately balance design with the often competing needs of pedestrians and other roadway users.

As with all roadway infrastructure, pedestrian facilities (and related elements) require ongoing maintenance to prolong the life of the facility, provide continued usability, and ensure compliance. Title II of the ADA requires all public agencies to keep the path of travel on pedestrian facilities open and usable for people with disabilities throughout the year. This may require snow and debris removal, maintenance of accessible pedestrian walkways in work zones, and correction of other disruptions.

1200.2 References

1200.2.1 Federal/State Laws and Codes

- Title II of the ADA Implementing Regulation – 28 Code of Federal Regulations (CFR) Part 35, as revised September 15, 2010.
- ADA, 42 United States Code (USC) 126.
- ADA Accessibility Guidelines (ADAAG).
- Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way, (PROWAG), SNPRM, 2013.

- 23 CFR Part 652, Pedestrians and Bicycle Accommodations and Projects.
- 49 CFR Part 27, Nondiscrimination on the Basis of Disability in Programs or Activities Receiving Federal Financial Assistance.
- 29 USC 794, Section 504 of the Rehabilitation Act.
- Uniform Federal Accessibility Standards (UFAS).

1200.2.2 NMDOT References

- NMDOT Standard Drawings Division 608.

1200.2.3 Design Guidance

- ADA Standards for Accessible Design, USDOJ, 2010.
- ADA Standards for Transportation Facilities, USDOT, 2006.
- Designing Walkable Urban Thoroughfares: A Context Sensitive Approach, Institute of Transportation Engineers (ITE), 2010.
- FHWA Raised Pedestrian Crossing Countermeasure https://safety.fhwa.dot.gov/saferjourney1/Library/countermeasures/29-30.htm
- Guide for the Planning, Design, and Operation of Pedestrian Facilities, American Association of State Highway and Transportation Officials (AASHTO), current version adopted by the Federal Highway Administration (FHWA). Provides guidance on the planning, design, and operation of pedestrian facilities along streets and highways.
- ITE Guidelines for the Design and Application of Speed Humps and Tables https://www.ite.org/technical-resources/topics/geometric-design/
- MUTCD, USDOT, FHWA, current edition.
- Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG), 2013 US Access Board. The current best practices for evaluation and design of pedestrian facilities in the public right-of-way.
- Urban Street Design Guide, National Association of City Transportation Officials (NACTO), 2013.

- USDOJ/USDOT Joint Technical Assistance on the Title II of the Americans with Disabilities Act Requirements to Provide Curb Ramps when Streets, Roads, or Highways are Altered through Resurfacing, July 2013. A glossary of terms is provided at http://www.ada.gov/doj-fhwa-ta-glossary.htm

1200.2.4 Supporting Information

- A Policy on Geometric Design of Highways and Streets (Green Book), American Association of State Highway Transportation Officials (AASHTO), current edition.
- Highway Capacity Manual, Transportation Research Board (TRB), current edition.
- Pedestrian Facilities Users Guide – Providing Safety and Mobility, FHWA, 2002.
- Special Report: Accessible Public Rights-of-Way Planning and Design for Alterations, Public Rights-of-Way Access Advisory Committee, August 2007.

1200.3 Definitions

The following definitions will be used in conjunction with the criteria described in this chapter:

- **Accessible pedestrian signal (APS)** - An 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.
- **Accessible** - Describes a facility in the public right-of-way that complies with PROWAG and related referenced standards in PROWAG.
- **Blended transition** - A raised pedestrian street crossing, depressed corner, or similar connection between the pedestrian access route at the level of the sidewalk and level of the pedestrian street crossing that has a grade of five percent or less. A blended transition is not considered a curb ramp.
- **Cross slope** - The grade that is perpendicular to the direction of pedestrian travel.

- **Curb line** - A line at the face of the curb that marks the transition between the curb and the gutter, street, or highway.
- **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.
- **Detectable warning surface (DWS)** - Detectable warning surfaces consist of small truncated domes built in or applied to a walking surface that are detectable underfoot. Detectable warning surfaces shall consist of truncated domes aligned in a square or radial grid pattern.
- **Element** - An architectural or mechanical component of a building, facility, space, site, or public right-of-way.
- **Extent practicable** - Where existing physical constraints make it impracticable for altered elements, spaces, or facilities to fully comply with ADA requirements for new construction, compliance is required to the extent practicable within the scope of the project. Existing physical constraints include, but are not limited to, underlying terrain, right-of-way availability, underground structures, adjacent developed facilities, drainage, or the presence of a notable natural or historic feature.
- **Facility** - All or any portion of buildings, structures, improvements, elements, and pedestrian or vehicular routes located in the public right-of-way.
- **Grade break** - The line where two surface planes with different grades meet.
- **Pedestrian access route (PAR)** - An accessible continuous and unobstructed path of travel provided for pedestrians with disabilities within or coinciding with a pedestrian circulation path (PCP). PARs may include parking access aisles, curb ramps, crosswalks at vehicular ways, walks, ramps, and lifts.
- **Pedestrian circulation path (PCP)** - A prepared exterior or interior surface provided for pedestrian travel in the public right-of-way.
- **Public right-of-way** - Public land acquired for or dedicated to transportation purposes, or other land where there is a legally

established right for use by the public for transportation purposes (per SNPRM PROWAG).

- **Qualified historic facility** - A facility that is listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate state or local law.
- **Running slope** - The grade that is parallel to the direction of pedestrian travel.
- **Vertical surface discontinuities** - Vertical differences in level between two adjacent surfaces.

1200.4 Policy

1200.4.1 General

The NMDOT's ADA policy is to provide appropriate and compliant pedestrian facilities along and across sections of state routes as an integral part of the transportation system. The FHWA and NMDOT policy is that bicycle and pedestrian facilities be given full consideration in the planning and design of all new construction and reconstruction highway projects, except where bicycle and pedestrian use is prohibited.

1200.4.2 Jurisdiction

Proposed projects in the public right-of-way are required to address ADA compliance as described in this chapter (see Section 1200.5 for ADA requirements by project type). Regardless of which public agency has jurisdiction within the right-of-way, the public agency that is sponsoring the project is responsible for ensuring ADA compliance is achieved on its project.

On all state routes outside of incorporated cities and on those with limited access (full, partial, and modified) within incorporated cities, jurisdiction remains with the state unless modified by a maintenance agreement.

1200.4.3 Transition Planning

Section 504 and the ADA require all public entities to conduct a self-evaluation of their programs. Public entities shall self-evaluate sidewalks, curb ramps, and other pedestrian facilities and elements within the public right-of-way to determine if barriers exist that

prevent people with disabilities from being able to access these programs, services, and activities.

If barriers are identified, agencies with 50 or more employees shall develop and implement a transition plan that describes the barriers, the modifications needed, and a schedule for when the needed work will be accomplished.

Noncompliant pedestrian elements identified during project scoping that will not be included within the scope of the project shall be compiled and included in the NMDOT transition plan.

1200.4.4 Maintenance

As noted in Section 1200.1, Title II of the ADA requires that a public entity maintain in operable working condition those features of facilities and equipment that are required to be readily accessible to and usable by persons with disabilities. This is an ongoing obligation.

1200.5 ADA Requirements by Project Type

Wherever pedestrian facilities are intended to be a part of the transportation system, federal regulations (28 CFR Part 35) require those pedestrian facilities to meet ADA requirements. All new construction or alteration of existing transportation facilities shall be designed and constructed to be accessible to and usable by people with disabilities. FHWA is one of the oversight agencies designated by the USDOJ to ensure ADA transportation project compliance.

1200.5.1 New Construction Projects

New construction projects, including the construction of a new roadway, interchange, or other transportation facility where none existed before, shall address and include pedestrians' needs within the scope of the project. All pedestrian facilities included in new construction projects shall meet the ADA, PROWAG, NMDOT, and MUTCD standards and guidelines. Project cost is not a reason to fail to construct or delay completing an ADA-required improvement for accessibility compliance.

The NMDOT design development process will assess and ensure that accessibility requirements are addressed during the earliest stages possible to reduce or prevent potential conflicts with various planning, right-of-way, environmental, utilities, or other highway design-related issues. Project scopes may also need to be expanded to meet pedestrian needs. PDEs should seek input from citizens with disabilities in the project area and consider their opinions and recommendations during scope development and the public participation process.

1200.5.2 Alteration Projects

A change to a facility in the public right-of-way that affects or could affect pedestrian access, circulation, or use is an alteration project. Alterations include, but are not limited to, resurfacing, rehabilitation, reconstruction, historic restoration, or changes or rearrangement of structural parts or elements of a facility. Where existing elements or spaces are altered, each altered element or space within the scope of the project shall comply with the applicable accessibility requirements to the extent practicable.

The following are some examples of NMDOT project types that are alteration projects and can potentially trigger a variety of ADA requirements including curb ramps:

- Hot-mix asphalt (HMA) overlay or inlay
- Installing a traffic signal, altering the signal controller and software, or replacing a signal head
- Drainage and structure repair
- Intersection realignment
- Roadway widening
- Roadway realignment (vertical or horizontal)
- Sidewalk and ADA-related improvements
- Bridge structure replacement
- Raised channelization
- Railroad crossing improvements

The following are not considered alterations:

- Patch pavement repair not affecting the PAR
- Crack filling and sealing
- Painting or striping
- Building truck escape ramps
- Guard rail removal or replacement not affecting the PAR
- Roadside slope flattening not affecting the PAR
- Shoulder rebuilding in areas not affecting the PAR
- Signal maintenance not affecting the PAR
- Sign maintenance or replacement not affecting the PAR
- Roadway lighting maintenance including luminaire and bracket arm replacements
- Safety and gate hardware upgrades
- Drainage – replacement of manholes, endwalls, pipes, culverts, and inlets not affecting the PAR
- Bridge painting

Normal maintenance activities are not considered alterations and do not require simultaneous improvements to pedestrian facilities such as curb ramps. Maintenance activities include actions that are intended to preserve the roadway system, slow future deterioration, and maintain the functional conditions of the roadway without affecting the structural capacity.

A designer should consult with the NMDOT ADA Coordinator if there is uncertainty as to whether a project meets the definition of an alteration project.

The following apply to alteration projects:

- All new pedestrian facilities included in an alteration project that are provided within an existing developed right-of-way shall meet ADA requirements to the extent practicable.
- All existing pedestrian facilities disturbed by construction of an alteration project shall be replaced and meet ADA requirements to the extent practicable.

- An alteration project shall not decrease or have the effect of decreasing the accessibility of a pedestrian facility or an accessible connection to an adjacent building or site below the ADA requirements in effect at the time of the alteration.
- Within the project area, any existing connection from a PAR to a crosswalk (marked or unmarked, including all intersections) that is missing a required curb ramp shall install an ADA compliant curb ramp to the extent practicable (see Section 1200.9.3 for curb ramp accessibility criteria).
- A crosswalk (marked or unmarked, including all intersections) served by a curb ramp shall also have a curb ramp on the receiving end unless there is no curb or sidewalk on the receiving end of the crosswalk. If there is curb on the receiving end of the crosswalk, but there is no existing ADA compliant curb ramp on the receiving end, an accessible curb ramp shall be provided. This NMDOT requirement shall be met regardless of whether the receiving end of the crosswalk is located within the project's scope of work.
- All existing curb ramps in the project area shall be evaluated to determine if the curb ramps meet ADA requirements. (See Section 1200.9.3 for curb ramp accessibility criteria.) Non-compliant curb ramps shall be modified to meet ADA requirements to the extent practicable. This may also trigger modification of other adjacent pedestrian facilities to incorporate transitional sidewalk segments to ensure elements of a curb ramp meet ADA requirements.
- All existing marked and unmarked crosswalks (including all intersections) within the project area shall be evaluated (see Section 1200.7.1 for accessibility criteria for PARs). Should design requirements for crosswalks not be in compliance, the extent practicable justification shall be documented using NMDOT's design exception and variance procedures discussed in Chapter 210 of the Design Manual.
- Title II also states "ADA does not require installation of ramps or curb ramps in the absence of a pedestrian walkway with a prepared surface for pedestrian use. Nor are curb ramps required in the absence of a curb, elevation, or other barrier between the street and the walkway."

1200.5.3 NMDOT ADA Design Exception and Design Variance Justification

It may not always be possible to fully meet the applicable design requirements during alterations of existing facilities. If such a situation is encountered, the designer shall consult with the NMDOT ADA Coordinator to develop a solution to meet accessibility requirements to the extent practicable. Cost is not to be used as a justification for not meeting the accessibility criteria. Physical terrain or site conditions that would cause structural impacts, environmental impacts, or unacceptable impacts to the community in order to achieve full compliance with the accessibility criteria are some of the factors that can be used to justify not achieving compliance with ADA requirements. If site conditions are determined to be virtually impossible to meet the accessibility criteria for an element, the designer shall document the decision using the NMDOT ADA design exception and design variance procedures discussed in Chapter 210, of the Design Manual. The existing site constraints shall be evaluated on a case-by-case basis using sound engineering judgment before submitting the NMDOT ADA design exception and design variance form presented in Chapter 210 of this Design Manual. The procedures form shall be prepared by the PDE or consultant and reviewed by the Regional Manager, Construction Liaison Engineer (CLE), and Chief Engineer. If acceptable, the ADA design exception and design variance procedures document will be approved and included in the design file (see Chapter 210 for a discussion of the design exception and variance procedures).

1200.6 Pedestrian Circulation Paths (PCPs)

PCPs are a prepared exterior or interior surface provided for pedestrian travel in the public right-of-way. They include independent walkways, sidewalks, shared-use paths, and other types of pedestrian facilities. PCPs can either be immediately adjacent to streets and highways or, preferably, separated by a buffer. Examples of PCPs are shown in Exhibit 1200-1.

Exhibit 1200-1
Pedestrian Circulation Paths

A smooth finish to vertical surfaces adjacent to a PCP shall be provided to mitigate potential snagging or abrasive injuries from accidental contact with the surface. Any projections into the PCP shall meet cane detectability design criteria.

When relocation of utility poles, signs, fire hydrants, or other potential obstacles is included in a project, the designer shall determine the impact of their new locations on all PCPs. As much as possible, obstructions should be relocated away from the PCP.

Highway shoulders are an extension of the roadway and are not typically considered pedestrian facilities. Pedestrians are allowed to use shoulders on some state highways. Although pedestrians are allowed to travel along the shoulder, its main function is to provide an area for emergency and maintenance activities, a clear recovery area for drivers and vehicles, and positive drainage away from the roadway.

Shoulders may serve as a pedestrian facility when sidewalks are not provided. If pedestrian generators, such as bus stops, are present and pedestrian use is evident or plausible, a minimum paved shoulder width of four feet should be provided.

Where pedestrian traffic is evident or plausible, the designer should consider a separate PCP during the planning and programming of the project, in consultation with the NMDOT Bicycle, Pedestrian, and Equestrian (BPE) Coordinator.

1200.6.1 Accessibility Criteria for Pedestrian Circulation Paths (PCPs)

The following design criteria apply across the entire width of a PCP, not just within the PAR. All PCPs in the public right-of-way are required to provide a continuous PAR and connect to all adjacent pedestrian facilities, elements, and spaces required to meet accessible requirements.

1200.6.1.1 Vertical Clearance

- The minimum vertical clearance for objects with leading edges, such as vegetation, signs, and canopies that protrude into or overhang into a PCP, is 80 inches above the finished surface unless otherwise specified in the MUTCD. Per the MUTCD, the minimum vertical clearance to the bottom of signs is seven feet (84 inches).
- Where the minimum 80-inch vertical clearance cannot be provided, railings or other barriers shall be provided. The leading edge of the railing or barrier shall be located a maximum of 27 inches above the finished surface for cane detectability. People who are blind or have low vision depend on cues to provide safety and support wayfinding.
- When signs are specifically intended to convey a message to pedestrians traveling on a PCP (such as at a pedestrian rail crossing or signage on a shared-use path or sidewalk), the designer shall ensure that all requirements for signage and protruding objects is met.

1200.6.1.2 Horizontal Encroachment – Protrusion Limits

The clear width of the PAR should typically be five feet wide. Objects on the PCP shall not reduce the clear width of the PAR to less than four feet, exclusive of the curb.

If an object protrudes more than four inches into a PCP with leading edges more than 27 inches and not more than 80 inches above the finished surface, then a railing or other detectable barrier shall be provided to meet cane detectability requirements.

1200.6.1.3 Post-Mounted Objects

Where objects are mounted on free-standing posts or pylons, and objects are a minimum of 27 inches and a maximum of 80 inches above the finished surface, the objects shall overhang the full width of the PCP by a maximum of four inches measured horizontally from the post or pylon base.

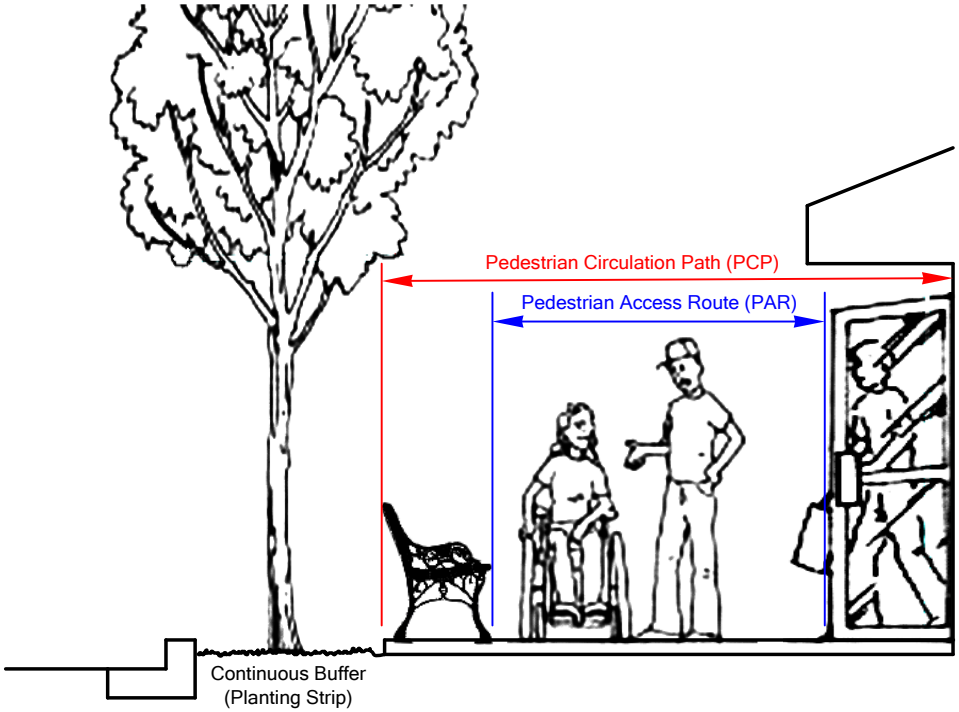
Where a sign or other objects are mounted between posts or pylons and the clear distance between the posts is greater than 12 inches, the lowest edge of the sign or object shall be a minimum of 27 inches or a maximum of 80 inches above the finished surface.

1200.7 Pedestrian Access Routes (PARs)

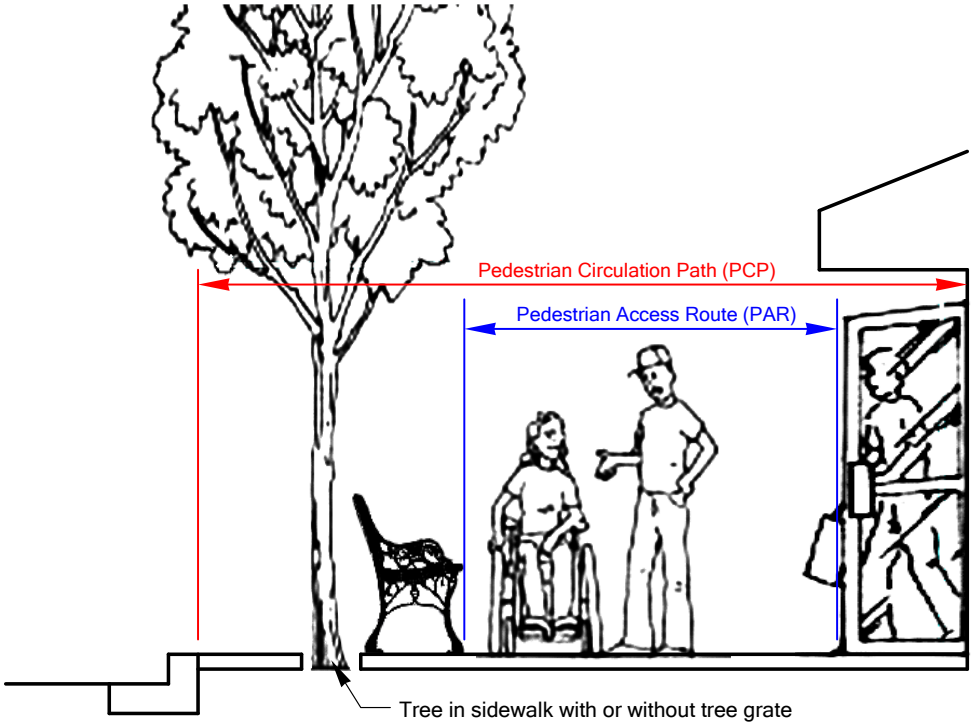
All PCPs are required to contain a continuous PAR (see Exhibit 1200-2) that connects to adjacent pedestrian facilities, elements, and spaces that are required to be accessible. PARs shall consist of one or more of the following components: sidewalks and other PCPs; pedestrian street crossings; at-grade rail crossings; curb ramps and blended transitions; pedestrian overpasses, underpasses, and similar structures; ramps, elevators, and limited use/limited application elevators; platform lifts; and doors, doorways, and gates.

Exhibit 1200-2

Relationship Between PCPs and PARs



With Continuous Buffer



Without Continuous Buffer

1200.7.1 Accessibility Criteria for Pedestrian Access Routes (PARs)

1200.7.1.1 Clear Width

- The minimum continuous and unobstructed clear width of a PAR shall be four feet, exclusive of curb width, and five feet typical. An obstructed PAR is shown in Exhibit 1200-3.
- Objects may not protrude into the clear width. Objects include items such as tree branches, vegetation, vehicle bumpers, mailboxes, utility poles, fire hydrants, and sign posts.
- PARs that have less than five feet of clear width, exclusive of curb width, shall provide passing spaces at intervals no farther apart than 200 feet. Passing spaces shall be a minimum of five feet by five feet and are permitted to overlap PARs.

Exhibit 1200-3
Obstructed PAR

Note: Wheel stops or a wider sidewalk would remedy the encroachment into the PAR.

1200.7.1.2 Cross Slope and Grade

- The cross slope of a PAR shall be a maximum of two percent measured perpendicular to the direction of pedestrian travel. The NMDOT design recommendation for cross slope is 1.5 percent.
- The grade of the PAR contained within a street or highway right-of-way is measured parallel to the direction of pedestrian travel and shall not exceed the general grade established for the adjacent street or highway.
- The grade of the PAR not within a right-of-way is measured parallel to the direction of pedestrian travel and shall have a maximum grade of five percent.

- Additional criteria on the design and exceptions for cross slopes and grades of PARs, including pedestrian street crossings with and without yield or stop control, are referenced in PROWAG.
- Section 1200.14 contains additional PAR criteria for pedestrian grade separations (structures). Ramps may be part of the PAR, in accordance with Section 1200.15.2.1.

1200.7.1.3 Surface

- The surface of the PAR shall be firm, stable, and slip resistant. To prevent potential falls, designers are encouraged to apply industry standards for slip resistance with surface materials specified. There is no minimum level of slip resistance established by the US Access Board.
- Hard surfaces like concrete or asphalt are commonly used surface materials. Pervious concrete or porous asphalt meeting ADA requirements are acceptable. Crushed gravel/base course or millings without a stabilizer and ongoing maintenance is not considered to comply with ADA requirements. Pavers, bricks and stamped concrete can be used in the PAR if all requirements are met and well maintained.
- Vertical alignment shall be planar within a curb ramp's running slope, turning space, and gutter counter slope area. Vertical alignment shall also be planar within the PAR, clear spaces, APSs, street furniture, and elements with operable parts.
- Vertical surface discontinuities (see Exhibit 1200-4 and Exhibit 1200-5) on existing surfaces in the PAR (such as at the joints of settled or upheaved sidewalk panels) shall not exceed a maximum of 1/2 inch. Vertical surface discontinuities between 1/4 inch and 1/2 inch shall be beveled with a slope not steeper than 50 percent. The bevel shall be applied across the entire vertical surface discontinuity.

  Exception: No vertical surface discontinuity is permitted at grade breaks on curb ramp running slopes. Grade breaks shall be flush.

Exhibit 1200-4
Vertical Surface Discontinuities

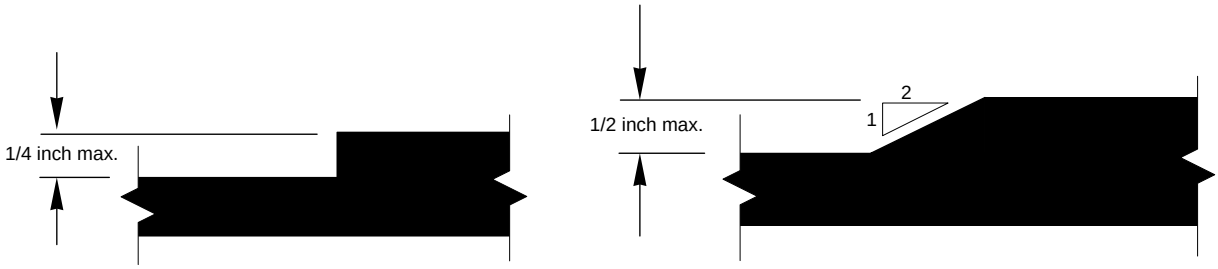


Exhibit 1200-5
Vertical Surface Discontinuities (Non-Compliant)

- Gratings, access covers, utility objects, and other appurtenances shall not be located on curb ramps, turning spaces, or gutter counter slope areas within the PAR. Where this is not practicable, covers, grates, and lids shall be slip resistant and installed flush with the surrounding surface (see NMDOT Standard Drawing Division, 608).

1200.7.1.4 Horizontal Openings

- Any sidewalk joints or gratings that are in the PAR shall not permit passage of a sphere more than 1/2 inch in diameter.
- Elongated openings, such as gratings, shall be placed so the long dimension is perpendicular to the dominant direction of pedestrian travel. Where there is no dominant direction of travel, the maximum opening is 1/2 inch.
- Flangeway gaps at pedestrian at-grade crossings shall be a maximum of 2-1/2 inches at non-freight rail track and a maximum of three inches at freight rail track. Section 1200.13, Pedestrian At-Grade Rail Crossings, includes additional requirements when a PAR crosses a railroad.

1200.8 Sidewalks

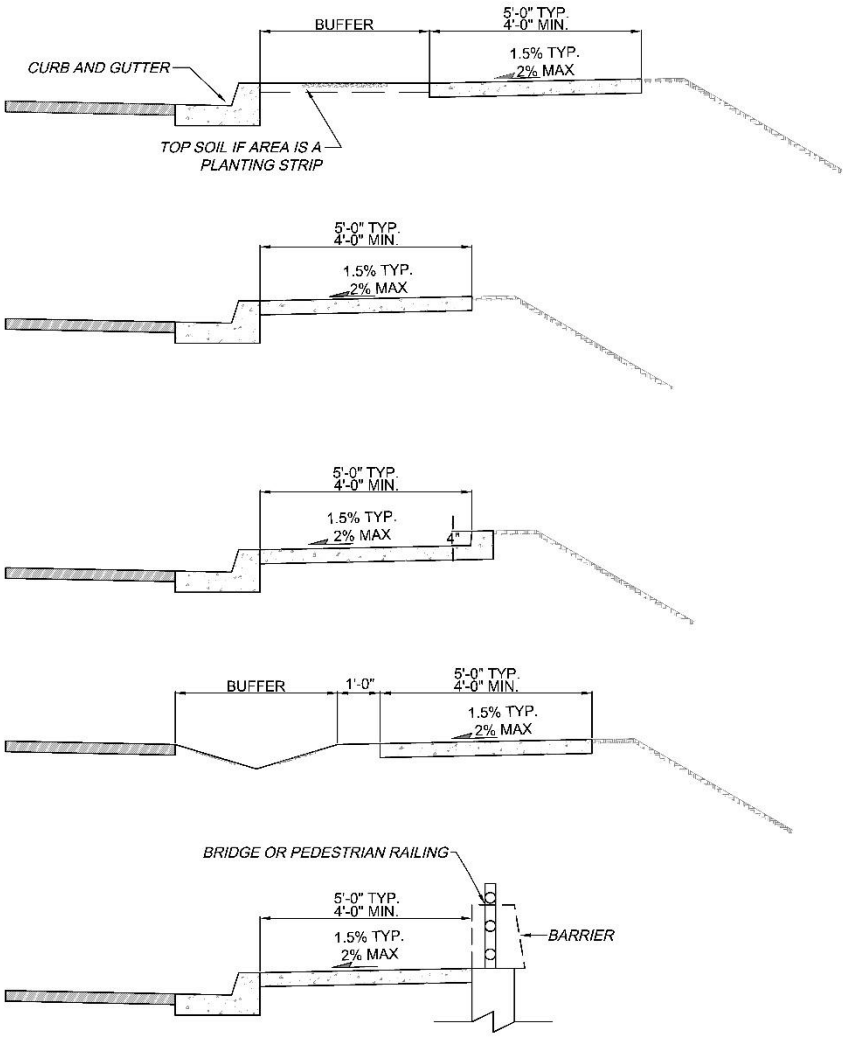
Sidewalks are one type of PCP (see Section 1200.6.1 for PCP accessibility criteria). Sidewalks shall be designed to include a PAR that provides access for all users (see Section 1200.7.1 for PAR accessibility criteria). Sidewalk design elements are shown in Exhibit 1200-6 and details for raised sidewalks are shown in the NMDOT Standard Drawing Division 608. Sidewalks shall be continuous and shall provide access to side streets. The preferred installation for pedestrians is a sidewalk separated from the vehicular way by a planted buffer. Sidewalk buffers are encouraged where applicable; the PDE should coordinate this with the local agency.

1200.8.1 Sidewalk and Buffer Widths

NMDOT minimum sidewalk width is four feet (excluding curb width), but requires minimum five foot by five foot turning space every 200 feet minimum. Therefore, NMDOT recommends a sidewalk width of five feet (excluding curb width); however, providing wider sidewalks is highly encouraged. Wider sidewalks are desirable on major arterials, in central business districts, and along parks, schools, and other major pedestrian generators as shown in Exhibit 1200-7. When sidewalks abut storefronts, additional width should be provided to accommodate window-shoppers and to avoid conflicts with opening doors and pedestrians entering or leaving the buildings. Wider sidewalks may also be required adjacent to parking to mitigate the encroachment of vehicle bumpers.

Exhibit 1200-6

Typical Sidewalk Designs



Notes:

If vertical drop is within the PAR and the posted speed is > 35 mph, then barrier may be needed.

If vertical drop is ≥ 2 feet 6 inches and barrier is not needed, then railing is recommended.

If vertical drop is < 2 feet 6 inches and barrier is not needed, then a 4-inch curb at back of sidewalk is acceptable.

General:

See the NMDOT Standard Drawing Division 608 for details on slopes at back of sidewalk.

Sidewalks may be sloped away from the roadway for stormwater treatment.

Exhibit 1200-7

Sidewalks with Buffers

Within the scope of the project or limits of construction, transitional connections to the existing sidewalk or other facilities shall be required. At these tie-in locations, deviations from the standards may be necessary to match the existing facility. For example, if as part of a curb ramp upgrade a portion of the sidewalk has been reconstructed to a five-foot width, but the existing sidewalk is three feet wide at the tie location, the sidewalk width will transition from the proposed width to the existing width as shown in the NMDOT Standard Drawing Division 608. The ADA design exception and design variance form is not required for transitions required to connect to existing facilities.

When a buffer (vegetated or alternative pavement material) is provided, the buffer area shall not permit any protruding objects in the PAR or PCP. If trees or shrubs are included in a buffer, the selected plants should have root systems that will not cause sidewalks to buckle, heave, or protrude. Buffer planting should be coordinated with NMDOT maintenance personnel and/or the local entity that will be maintaining the facility. It is important to note the requirement of passing spaces every 200 feet if the PAR is less than five feet wide, especially when a buffer is included in the design. Shoulders, bike lanes, and on-street parking are not considered buffers; however, they provide further separation between vehicles and pedestrians.

Snow removal for pedestrian facilities is a requirement. Snow must be stored in a location that keeps the pedestrian route clear and maintenance access unobstructed.

1200.8.2 Sidewalks at Driveways

A PAR shall be provided where driveways intersect a PCP (see Exhibit 1200-8) within the scope of the project. On PARs, DWSs indicate the boundary between pedestrian and vehicular routes where there is a flush rather than curbed connection. Where commercial driveways are provided with yield or stop control, DWSs are required to be provided at the junction between the PAR and vehicular route. DWSs should not be provided at residential driveways. The NMDOT Standard Drawings Division 608, show details of driveway designs that provide a PAR (see Sections 1200.6.1 and 1200.7.1 for PCP and PAR accessibility criteria).

Exhibit 1200-8
Typical Driveways with Pedestrian Access Route

1200.9 Curb Ramps

Curb ramps provide an accessible connection from a sidewalk to the roadway surface. A curb ramp shall connect the PAR at each pedestrian street crossing (where curbs and sidewalks are present), except where pedestrian crossing is prohibited (see Section 1200.10.2.3 for guidance on closed crossings). The curb ramp, excluding flared sides, shall be contained wholly within the width of the pedestrian street crossing served.

Curb ramps are also required at midblock pedestrian street crossings where curbs and sidewalks are present. Curb ramps shall typically be five feet wide with a minimum width of four feet.

1200.9.1 Types of Curb Ramps

Curb ramps may be perpendicular, parallel, or a combination of those two types. It is important to note in alterations where existing physical constraints prevent compliance for the design of the two types of curb ramps, a single diagonal curb ramp shall be permitted to serve both pedestrian street crossings. Designers should carefully analyze the site and verify with the PDE the installation of a single diagonal curb ramp, as this is only applicable where physical constraints prevent compliance.

1200.9.1.1 Perpendicular Curb Ramp

As shown in Exhibit 1200-9 and Exhibit 1200-10, perpendicular curb ramps do one of the following:

- Have a running slope that cuts through the curb.
- Are built up to the curb at right angles.
- Meet the gutter break at right angles where the curb is curved.

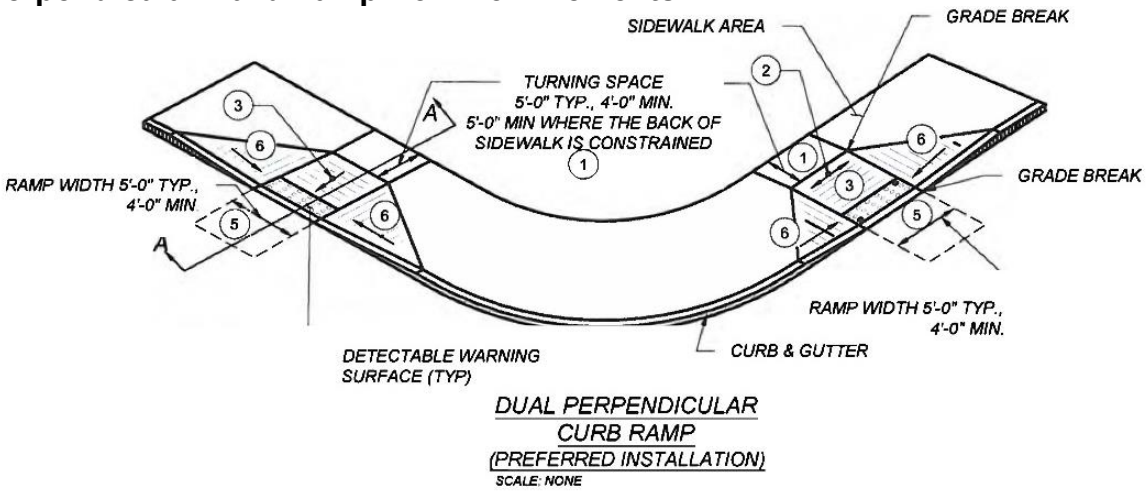
On corners with large radii, it will be necessary to indent the gutter break on one side of the curb ramp in order for the curb ramp to meet the gutter break at right angles. The following is a partial list of design considerations for incorporating perpendicular curb ramps:

- To facilitate use by individuals who use mobility devices such as wheelchairs and scooters, align the path of travel to cross the gutter grade break at a right angle.
- To facilitate drainage and discourage vehicular traffic from cutting across a corner, design the height of the ramp to run relative to the gutter elevation.
- On a corner with a small radius, the curb ramp alignment may be more closely aligned with the alignment of the crosswalk, whether marked or unmarked. This may assist people who are blind or have low vision with wayfinding.

Exhibit 1200-9
Perpendicular Curb Ramp

Exhibit 1200-10

Perpendicular Curb Ramp Common Elements



1200.9.1.2 Parallel Curb Ramp

Parallel curb ramps, as shown in Exhibit 1200-11 and Exhibit 1200-12, are parallel to the curb and have a running slope in line with the direction of sidewalk pedestrian travel. A parallel curb ramp lowers the sidewalk to a level turning space where a turn is made to enter the pedestrian street crossing. Parallel curb ramps:

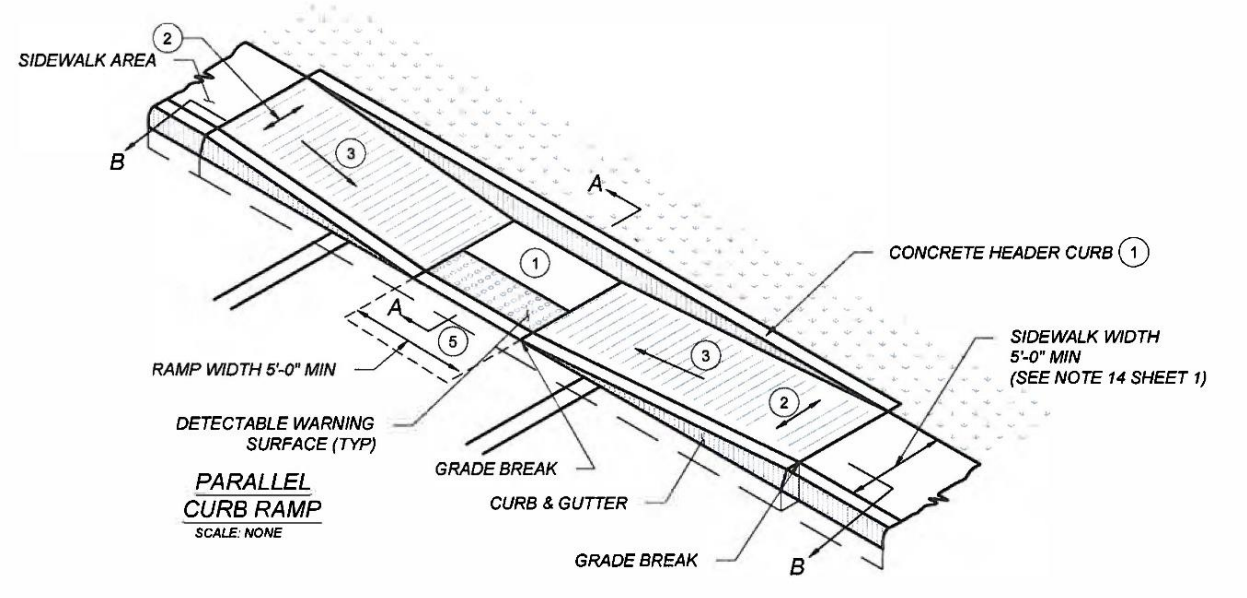
- Require minimal right-of-way.
- Allow the curb ramp running slope to be extended within the available right-of-way.
- May assist pedestrians who are blind or have low vision with wayfinding because they are parallel to the roadway.

Exhibit 1200-11

Parallel Curb Ramp

Exhibit 1200-12

Parallel Curb Ramp Common Elements



Note: The header curb shown on the back of the curb ramp is intended to retain material in a cut section and is not required if the re is no material to retain due to the nature of the roadside topography.

When designing a parallel curb ramp, it is important to consider the following:

- Depending on the style of parallel curb ramp, pedestrian through traffic on the sidewalk may need to negotiate two ramp grades instead of one, possibly making it more difficult to traverse for some users.

- The installation of additional drainage features in the upstream gutter line may be necessary to prevent the accumulation of water or debris in the turning space at the bottom of the ramp.

1200.9.1.3 Combination Curb Ramp

Combination curb ramps (see Exhibit 1200-13) combine the use of perpendicular and parallel types of curb ramps. A parallel curb ramp is used to lower the sidewalk to a mid-height turning space and a short perpendicular curb ramp connects the turning space to the street. Buffer areas and pedestrian curbing that define the pedestrian path of travel are inherent design elements for this type of curb ramp. Combination curb ramps:

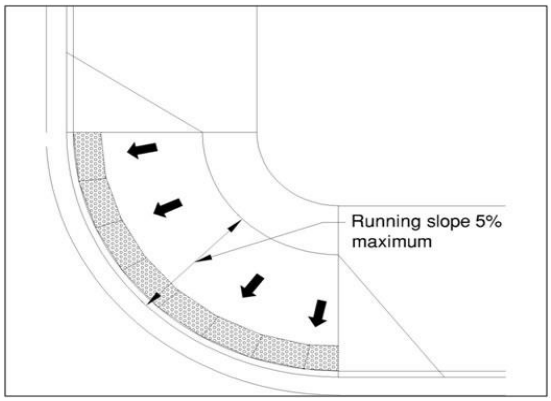
Exhibit 1200-13
Combination Curb Ramps

- Allow the elevation difference between the sidewalk and the gutter line to be transitioned with multiple curb ramps. This can assist in achieving compliant curb ramp running slopes.
- Provide additional locations in the gutter line along the radius where drainage structures can be placed outside the PAR due to the well-defined pedestrian paths of travel.
- Can be constructed within available right-of-way when the right-of-way boundary is located at the back of the existing sidewalk, provided sufficient buffer width is available on the roadway side of the sidewalk.
- Provide a way to avoid the relocation of existing features such as utility poles, fire hydrants, and signal poles by incorporating those features into the buffer areas.
- Use pedestrian curbing that defines buffer areas and forms curb returns for perpendicular ramp connections. This facilitates wayfinding for people who are blind or have low vision.
- Have a higher construction cost than other curb ramp types due to the extensive use of curbing and a larger footprint.

1200.9.2 Blended Transitions

Blended transitions (see Exhibit 1200-14) are raised pedestrian street crossings, depressed street corners, or similar connections between PARs at the level of the sidewalk and the level of the pedestrian street crossing. Blended transitions have a grade of five percent or less and are suitable for a range of sidewalk conditions. Blended transitions are not curb ramps; however, they share some common design requirements. When designing blended transitions, designers should review applicable requirements in the PROWAG.

Exhibit 1200-14
Blended Transition



1200.9.3 Design Considerations for Curb Ramps

There are multiple considerations when designing curb ramps in the public right-of-way. The following information is provided to support curb ramp running slope calculations.

To Calculate Ramp Length:

"G1" Proposed Curb Ramp Slope (percent)
"G2" Existing Grade or Proposed Curb Grade (percent)
"H" Height of Curb (Feet [ft])

$$\text{Ramp Length (ft)} = \frac{\text{H}}{\text{G1} - \text{G2}} \times 100$$

Example 1:
(Chasing Grade) Height of curb 6 inches, existing grade 2 percent, curb ramp slope 5 percent

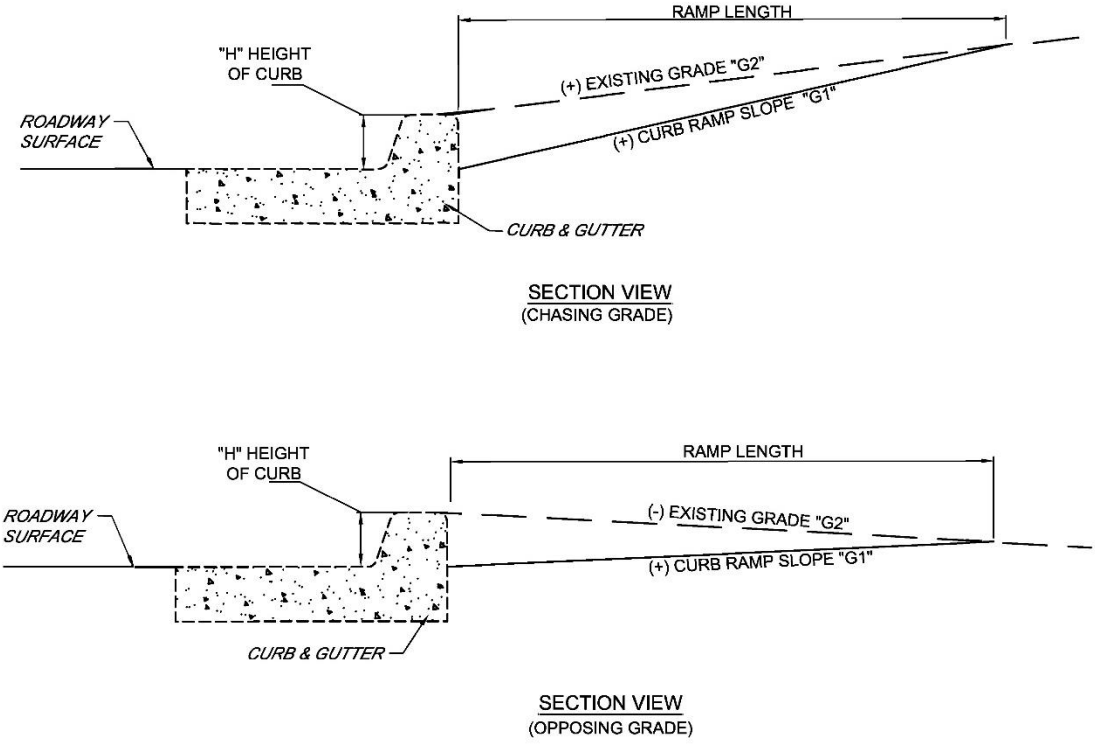
$$\text{Ramp Length (ft)} = \frac{0.5}{5-2} \times 100 = 16.7 \text{ ft, which is} > 15 \text{ ft so use steeper slope}$$

Example 2:
(Opposing Grade) Height of curb 8 inches, existing grade -3 percent, curb ramp slope 5 percent

$$\text{Ramp Length (ft)} = \frac{0.67}{5-(-3)} \times 100 = 8.4 \text{ ft}$$

Section views of both a chasing grade and opposing grade curb ramp are shown in Exhibit 1200-15.

Exhibit 1200-15
Ramp Length Elements



Approximate ramp lengths calculated from a variety of slopes (G1) and curb heights (H) are shown in Exhibit 1200-16 through Exhibit 1200-22.

Exhibit 1200-16

Approximate Ramp Lengths at 5% Slope

Approximate Ramp Length													
"G1" 5% Slope													
"G2" Existing Grade (%)	Chasing Grade	"H" Curb Height (inches)											
			1	2	3	4	5	6	7	8	9	10	11	12
		12	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		4	8.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		3	4.2	8.3	12.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2	2.8	5.6	8.3	11.1	13.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		1	2.1	4.2	6.3	8.3	10.4	12.5	14.6	n/a	n/a	n/a	n/a	n/a
		0	1.7	3.3	5.0	6.7	8.3	10.0	11.7	13.3	15.0	n/a	n/a	n/a
	Opposing Grade	-1	1.4	2.8	4.2	5.6	6.9	8.3	9.7	11.1	12.5	13.9	n/a	n/a
		-2	1.2	2.4	3.6	4.8	6.0	7.1	8.3	9.5	10.7	11.9	13.1	14.3
		-3	1.0	2.1	3.1	4.2	5.2	6.3	7.3	8.3	9.4	10.4	11.5	12.5
		-4	0.9	1.9	2.8	3.7	4.6	5.6	6.5	7.4	8.3	9.3	10.2	11.1
		-5	0.8	1.7	2.5	3.3	4.2	5.0	5.8	6.7	7.5	8.3	9.2	10.0
		-6	0.8	1.5	2.3	3.0	3.8	4.5	5.3	6.1	6.8	7.6	8.3	9.1
		-7	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	6.9	7.6	8.3
		-8	0.6	1.3	1.9	2.6	3.2	3.8	4.5	5.1	5.8	6.4	7.1	7.7
		-9	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.5	7.1
		-10	0.6	1.1	1.7	2.2	2.8	3.3	3.9	4.4	5.0	5.6	6.1	6.7
		-11	0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	5.2	5.7	6.3
		-12	0.5	1.0	1.5	2.0	2.5	2.9	3.4	3.9	4.4	4.9	5.4	5.9

Use the above chart to determine the approximate ramp length:

Step 1: Find the appropriate curb height along the top row.

Step 2: Follow the curb height down to the existing grade.

Step 3: The intersecting value is the approximate ramp length at the given slope.

Step 4: "n/a" indicates that a steeper slope must be used. The current slope produces a ramp length greater than 15 feet.

Exhibit 1200-17

Approximate Ramp Lengths at 6% Slope

Approximate Ramp Length													
"G1" 6% Slope													
"G2" Existing Grade (%)		"H" Curb Height (inches)											
			1	2	3	4	5	6	7	8	9	10	11	12
Chasing Grade		12	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		5	8.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		4	4.2	8.3	12.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		3	2.8	5.6	8.3	11.1	13.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		2	2.1	4.2	6.3	8.3	10.4	12.5	14.6	n/a	n/a	n/a	n/a	n/a
		1	1.7	3.3	5.0	6.7	8.3	10.0	11.7	13.3	15.0	n/a	n/a	n/a
		0	1.4	2.8	4.2	5.6	6.9	8.3	9.7	11.1	12.5	13.9	n/a	n/a
	Opposing Grade	-1	1.2	2.4	3.6	4.8	6.0	7.1	8.3	9.5	10.7	11.9	13.1	14.3
		-2	1.0	2.1	3.1	4.2	5.2	6.3	7.3	8.3	9.4	10.4	11.5	12.5
		-3	0.9	1.9	2.8	3.7	4.6	5.6	6.5	7.4	8.3	9.3	10.2	11.1
		-4	0.8	1.7	2.5	3.3	4.2	5.0	5.8	6.7	7.5	8.3	9.2	10.0
		-5	0.8	1.5	2.3	3.0	3.8	4.5	5.3	6.1	6.8	7.6	8.3	9.1
		-6	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	6.9	7.6	8.3
		-7	0.6	1.3	1.9	2.6	3.2	3.8	4.5	5.1	5.8	6.4	7.1	7.7
		-8	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.5	7.1
		-9	0.6	1.1	1.7	2.2	2.8	3.3	3.9	4.4	5.0	5.6	6.1	6.7
		-10	0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	5.2	5.7	6.3
		-11	0.5	1.0	1.5	2.0	2.5	2.9	3.4	3.9	4.4	4.9	5.4	5.9
		-12	0.5	0.9	1.4	1.9	2.3	2.8	3.2	3.7	4.2	4.6	5.1	5.6

Use the above chart to determine the approximate ramp length:

Step 1: Find the appropriate curb height along the top row.

Step 2: Follow the curb height down to the existing grade slope.

Step 3: The intersecting value is the approximate ramp length at the given slope.

Step 4: "n/a" indicates that a steeper slope must be used. The current slope produces a ramp length greater than 15 feet-0 inches.

Exhibit 1200-18

Approximate Ramp Lengths at 7% Slope

Approximate Ramp Length													
"G1" 7% Slope													
"G2" Existing Grade (%)		"H" Curb Height (inches)											
			1	2	3	4	5	6	7	8	9	10	11	12
	Chasing Grade	12	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		6	8.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		5	4.2	8.3	12.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		4	2.8	5.6	8.3	11.1	13.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		3	2.1	4.2	6.3	8.3	10.4	12.5	14.6	n/a	n/a	n/a	n/a	n/a
		2	1.7	3.3	5.0	6.7	8.3	10.0	11.7	13.3	15.0	n/a	n/a	n/a
		1	1.4	2.8	4.2	5.6	6.9	8.3	9.7	11.1	12.5	13.9	n/a	n/a
		0	1.2	2.4	3.6	4.8	6.0	7.1	8.3	9.5	10.7	11.9	13.1	14.3
	Opposing Grade	-1	1.0	2.1	3.1	4.2	5.2	6.3	7.3	8.3	9.4	10.4	11.5	12.5
		-2	0.9	1.9	2.8	3.7	4.6	5.6	6.5	7.4	8.3	9.3	10.2	11.1
		-3	0.8	1.7	2.5	3.3	4.2	5.0	5.8	6.7	7.5	8.3	9.2	10.0
		-4	0.8	1.5	2.3	3.0	3.8	4.5	5.3	6.1	6.8	7.6	8.3	9.1
		-5	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	6.9	7.6	8.3
		-6	0.6	1.3	1.9	2.6	3.2	3.8	4.5	5.1	5.8	6.4	7.1	7.7
		-7	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.5	7.1
		-8	0.6	1.1	1.7	2.2	2.8	3.3	3.9	4.4	5.0	5.6	6.1	6.7
		-9	0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	5.2	5.7	6.3
		-10	0.5	1.0	1.5	2.0	2.5	2.9	3.4	3.9	4.4	4.9	5.4	5.9
		-11	0.5	0.9	1.4	1.9	2.3	2.8	3.2	3.7	4.2	4.6	5.1	5.6
		-12	0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5	3.9	4.4	4.8	5.3

Use the above chart to determine the approximate ramp length:

Step 1: Find the appropriate curb height along the top row.

Step 2: Follow the curb height down to the existing grade slope.

Step 3: The intersecting value is the approximate ramp length at the given slope.

Step 4: "n/a" indicates that a steeper slope must be used. The current slope produces a ramp length greater than 15 feet-0 inches.

Exhibit 1200-19

Approximate Ramp Lengths at 8% Slope

Approximate Ramp Length													
"G1" 8% Slope													
"G2" Existing Grade (%)		"H" Curb Height (inches)											
			1	2	3	4	5	6	7	8	9	10	11	12
	Chasing Grade	12	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		7	8.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		6	4.2	8.3	12.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		5	2.8	5.6	8.3	11.1	13.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		4	2.1	4.2	6.3	8.3	10.4	12.5	14.6	n/a	n/a	n/a	n/a	n/a
		3	1.7	3.3	5.0	6.7	8.3	10.0	11.7	13.3	15.0	n/a	n/a	n/a
		2	1.4	2.8	4.2	5.6	6.9	8.3	9.7	11.1	12.5	13.9	n/a	n/a
		1	1.2	2.4	3.6	4.8	6.0	7.1	8.3	9.5	10.7	11.9	13.1	14.3
		0	1.0	2.1	3.1	4.2	5.2	6.3	7.3	8.3	9.4	10.4	11.5	12.5
	Opposing Grade	-1	0.9	1.9	2.8	3.7	4.6	5.6	6.5	7.4	8.3	9.3	10.2	11.1
		-2	0.8	1.7	2.5	3.3	4.2	5.0	5.8	6.7	7.5	8.3	9.2	10.0
		-3	0.8	1.5	2.3	3.0	3.8	4.5	5.3	6.1	6.8	7.6	8.3	9.1
		-4	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	6.9	7.6	8.3
		-5	0.6	1.3	1.9	2.6	3.2	3.8	4.5	5.1	5.8	6.4	7.1	7.7
		-6	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.5	7.1
		-7	0.6	1.1	1.7	2.2	2.8	3.3	3.9	4.4	5.0	5.6	6.1	6.7
		-8	0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	5.2	5.7	6.3
		-9	0.5	1.0	1.5	2.0	2.5	2.9	3.4	3.9	4.4	4.9	5.4	5.9
		-10	0.5	0.9	1.4	1.9	2.3	2.8	3.2	3.7	4.2	4.6	5.1	5.6
		-11	0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5	3.9	4.4	4.8	5.3
		-12	0.4	0.8	1.3	1.7	2.1	2.5	2.9	3.3	3.8	4.2	4.6	5.0

Use the above chart to determine the approximate ramp length:

Step 1: Find the appropriate curb height along the top row.

Step 2: Follow the curb height down to the existing grade slope.

Step 3: The intersecting value is the approximate ramp length at the given slope.

Step 4: "n/a" indicates that a steeper slope must be used. The current slope produces a ramp length greater than 15 feet-0 inches.

Exhibit 1200-20

Approximate Ramp Lengths at 8.3% Slope

Approximate Ramp Length													
"G1" 8.3% Slope													
"G2" Existing Grade (%)		"H" Curb Height (inches)											
			1	2	3	4	5	6	7	8	9	10	11	12
Chasing Grade		12	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		6	3.6	7.2	10.9	14.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		5	2.5	5.1	7.6	10.1	12.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		4	1.9	3.9	5.8	7.8	9.7	11.6	13.6	n/a	n/a	n/a	n/a	n/a
		3	1.6	3.1	4.7	6.3	7.9	9.4	11.0	12.6	14.2	n/a	n/a	n/a
		2	1.3	2.6	4.0	5.3	6.6	7.9	9.3	10.6	11.9	13.2	14.6	n/a
		1	1.1	2.3	3.4	4.6	5.7	6.8	8.0	9.1	10.3	11.4	12.6	13.7
		0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0
	Opposing Grade	-1	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	9.0	9.9	10.8
		-2	0.8	1.6	2.4	3.2	4.0	4.9	5.7	6.5	7.3	8.1	8.9	9.7
		-3	0.7	1.5	2.2	2.9	3.7	4.4	5.2	5.9	6.6	7.4	8.1	8.8
		-4	0.7	1.4	2.0	2.7	3.4	4.1	4.7	5.4	6.1	6.8	7.5	8.1
		-5	0.6	1.3	1.9	2.5	3.1	3.8	4.4	5.0	5.6	6.3	6.9	7.5
		-6	0.6	1.2	1.7	2.3	2.9	3.5	4.1	4.7	5.2	5.8	6.4	7.0
		-7	0.5	1.1	1.6	2.2	2.7	3.3	3.8	4.4	4.9	5.4	6.0	6.5
		-8	0.5	1.0	1.5	2.0	2.6	3.1	3.6	4.1	4.6	5.1	5.6	6.1
		-9	0.5	1.0	1.4	1.9	2.4	2.9	3.4	3.9	4.3	4.8	5.3	5.8
		-10	0.5	0.9	1.4	1.8	2.3	2.7	3.2	3.6	4.1	4.6	5.0	5.5
		-11	0.4	0.9	1.3	1.7	2.2	2.6	3.0	3.5	3.9	4.3	4.7	5.2
		-12	0.4	0.8	1.2	1.6	2.1	2.5	2.9	3.3	3.7	4.1	4.5	4.9

Use the above chart to determine the approximate ramp length:

Step 1: Find the appropriate curb height along the top row.

Step 2: Follow the curb height down to the existing grade slope.

Step 3: The intersecting value is the approximate ramp length at the given slope.

Step 4: "n/a" indicates that a steeper slope must be used. The current slope produces a ramp length greater than 15 feet-0 inches.

Exhibit 1200-21

Approximate Ramp Lengths at 9% Slope

Approximate Ramp Length													
"G1" 9% Slope													
"G2" Existing Grade (%)		"H" Curb Height (inches)											
			1	2	3	4	5	6	7	8	9	10	11	12
Chasing Grade		12	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		7	4.2	8.3	12.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		6	2.8	5.6	8.3	11.1	13.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		5	2.1	4.2	6.3	8.3	10.4	12.5	14.6	n/a	n/a	n/a	n/a	n/a
		4	1.7	3.3	5.0	6.7	8.3	10.0	11.7	13.3	15.0	n/a	n/a	n/a
		3	1.4	2.8	4.2	5.6	6.9	8.3	9.7	11.1	12.5	13.9	n/a	n/a
		2	1.2	2.4	3.6	4.8	6.0	7.1	8.3	9.5	10.7	11.9	13.1	14.3
		1	1.0	2.1	3.1	4.2	5.2	6.3	7.3	8.3	9.4	10.4	11.5	12.5
		0	0.9	1.9	2.8	3.7	4.6	5.6	6.5	7.4	8.3	9.3	10.2	11.1
	Opposing Grade	-1	0.8	1.7	2.5	3.3	4.2	5.0	5.8	6.7	7.5	8.3	9.2	10.0
		-2	0.8	1.5	2.3	3.0	3.8	4.5	5.3	6.1	6.8	7.6	8.3	9.1
		-3	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	6.9	7.6	8.3
		-4	0.6	1.3	1.9	2.6	3.2	3.8	4.5	5.1	5.8	6.4	7.1	7.7
		-5	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.5	7.1
		-6	0.6	1.1	1.7	2.2	2.8	3.3	3.9	4.4	5.0	5.6	6.1	6.7
		-7	0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	5.2	5.7	6.3
		-8	0.5	1.0	1.5	2.0	2.5	2.9	3.4	3.9	4.4	4.9	5.4	5.9
		-9	0.5	0.9	1.4	1.9	2.3	2.8	3.2	3.7	4.2	4.6	5.1	5.6
		-10	0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5	3.9	4.4	4.8	5.3
		-11	0.4	0.8	1.3	1.7	2.1	2.5	2.9	3.3	3.8	4.2	4.6	5.0
		-12	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8

Use the above chart to determine the approximate ramp length:

Step 1: Find the appropriate curb height along the top row.

Step 2: Follow the curb height down to the existing grade slope.

Step 3: The intersecting value is the approximate ramp length at the given slope.

Step 4: "n/a" indicates that a steeper slope must be used. The current slope produces a ramp length greater than 15 feet-0 inches.

Exhibit 1200-22

Approximate Ramp Lengths at 10% Slope

Approximate Ramp Length													
"G1" 10% Slope													
"G2" Existing Grade (%)		"H" Curb Height (inches)											
			1	2	3	4	5	6	7	8	9	10	11	12
Chasing Grade		12	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		9	8.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		8	4.2	8.3	12.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		7	2.8	5.6	8.3	11.1	13.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		6	2.1	4.2	6.3	8.3	10.4	12.5	14.6	n/a	n/a	n/a	n/a	n/a
		5	1.7	3.3	5.0	6.7	8.3	10.0	11.7	13.3	15.0	n/a	n/a	n/a
		4	1.4	2.8	4.2	5.6	6.9	8.3	9.7	11.1	12.5	13.9	n/a	n/a
		3	1.2	2.4	3.6	4.8	6.0	7.1	8.3	9.5	10.7	11.9	13.1	14.3
		2	1.0	2.1	3.1	4.2	5.2	6.3	7.3	8.3	9.4	10.4	11.5	12.5
		1	0.9	1.9	2.8	3.7	4.6	5.6	6.5	7.4	8.3	9.3	10.2	11.1
		0	0.8	1.7	2.5	3.3	4.2	5.0	5.8	6.7	7.5	8.3	9.2	10.0
	Opposing Grade	-1	0.8	1.5	2.3	3.0	3.8	4.5	5.3	6.1	6.8	7.6	8.3	9.1
		-2	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	6.9	7.6	8.3
		-3	0.6	1.3	1.9	2.6	3.2	3.8	4.5	5.1	5.8	6.4	7.1	7.7
		-4	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.5	7.1
		-5	0.6	1.1	1.7	2.2	2.8	3.3	3.9	4.4	5.0	5.6	6.1	6.7
		-6	0.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	5.2	5.7	6.3
		-7	0.5	1.0	1.5	2.0	2.5	2.9	3.4	3.9	4.4	4.9	5.4	5.9
		-8	0.5	0.9	1.4	1.9	2.3	2.8	3.2	3.7	4.2	4.6	5.1	5.6
		-9	0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5	3.9	4.4	4.8	5.3
		-10	0.4	0.8	1.3	1.7	2.1	2.5	2.9	3.3	3.8	4.2	4.6	5.0
		-11	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8
		-12	0.4	0.8	1.1	1.5	1.9	2.3	2.7	3.0	3.4	3.8	4.2	4.5

Use the above chart to determine the approximate ramp length:

Step 1: Find the appropriate curb height along the top row.

Step 2: Follow the curb height down to the existing grade slope.

Step 3: The intersecting value is the approximate ramp length at the given slope.

Step 4: "n/a" indicates that a steeper slope must be used. The current slope produces a ramp length greater than 15 feet-0 inches.

Note: This 10% ramp slope length chart can only be utilized when chasing grade. Chasing grade does not require a NMDOT ADA Design Exception and Design Variance Justification. If ramp slope is required to be greater than 8.3%, where existing physical constraints make it impracticable to meet compliance, the extent practicable triggers the justification requirements for a NMDOT ADA Design Exception and Design Variance procedure.

1200.9.4 Accessibility Criteria for Curb Ramps

The accessibility criteria for PCPs and PARs (see Sections 1200.6.1 and 1200.7.1) also apply to curb ramps unless superseded by the following accessibility criteria for curb ramps.

1200.9.4.1 Clear Width

The clear width of curb ramps and their turning space shall be five feet typical, excluding flared sides, and a minimum of four feet.

1200.9.4.2 Running Slope

The running slope of curb ramps shall be in line with the direction of sidewalk pedestrian travel. The slope shall be a minimum of five percent and maximum of 8.3 percent but shall not require the ramp length to exceed a minimum of 15 feet, to avoid chasing grade. While a slope of flatter than five percent is allowable, such a flat slope classifies the ramp as a "Blended Transition," which shall be designed in accordance with Section 1200.9.2. The turning space within a running slope shall be a maximum of two percent. NMDOT's design recommendation for running slope is seven percent and 1.5 percent for turning space. The running slope of a perpendicular curb ramp shall cut through or be built up to the curb at right angles or shall meet the gutter grade break at right angles where the curb is curved.

1200.9.4.3 Cross Slope

The cross slope of curb ramps, blended transitions, and turning spaces shall be a maximum of two percent, measured perpendicular to the direction of pedestrian travel. NMDOT's design recommendation for cross slope is 1.5 percent.

The exception for designing the cross slope of curb ramps is at a pedestrian street crossing without yield or stop control and at midblock crossings. In these cases, the cross slope of the curb ramp is permitted to equal the street or highway grade. Pedestrian street crossings without yield or stop control are crossings where there is no yield or stop sign, or where there is a traffic signal designed for the green phase. The maximum cross slope of a curb ramp with yield or stop control is two percent.

1200.9.4.4 Turning Space

A level turning space is required either at the top of a perpendicular curb ramp or the bottom of a parallel curb ramp, as noted in Sections 1200.9.1.1 and 1200.9.1.2 for the type of curb ramp used.

- The designer shall provide a typical turning space of five feet by five feet but a minimum of four feet by four feet. The turning space is permitted to overlap other turning spaces and clear spaces. Where the turning space is constrained on two or more sides, the turning space should be a minimum of four feet by five feet. The five-foot minimum dimension shall be provided in the direction of the pedestrian street crossing.
- The running and cross slopes of a curb ramp turning space shall be a maximum of two percent. The NMDOT design recommendation is a maximum of 1.5 percent.
- The designer should note the following exception: at pedestrian street crossings without yield or stop control and at midblock pedestrian street crossings the cross slope is permitted to equal the street or highway grade.

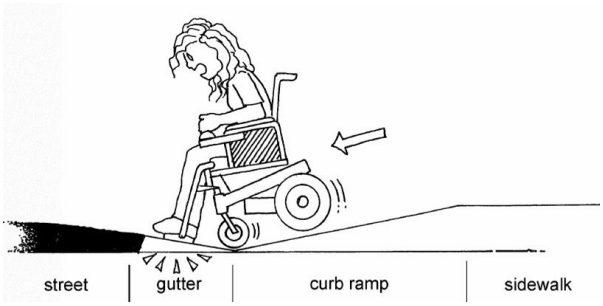
1200.9.4.5 Flared Sides and Returned Curbs

- Where a PCP crosses the curb ramp, flared sides shall be sloped to a maximum of 10 percent, measured at the back of the curb and parallel to the curb line.
- Returned curbs can be used instead of flared sides when there is landscaping or other appurtenances, such as railing, that prevent pedestrian cross-travel. Returned curbs shall be located outside of the required curb ramp width.

1200.9.4.6 Gutter Counter Slope

- The counter slope of the gutter or street at the foot of curb ramp runs, turning spaces, and blended transitions shall be a maximum of five percent. Gutter counter slope conditions with road surface slope may impact a safe transition for pedestrians with disabilities using wheelchairs or scooters, as shown in Exhibit 1200-23. The algebraic difference should not exceed 11 percent. If the difference exceeds 11 percent, an additional two-foot level area should be provided in front of the required clear space.

Exhibit 1200-23
Gutter Counter Slope Illustration



1200.9.4.7 Detectable Warning Surfaces (DWSs)

- A DWS indicates the boundary between pedestrian and vehicular routes where there is a flush rather than curbed connection. DWSs are required on PARs and at transit stops (see the PROWAG and the NMDOT Standard Drawing Division 608 for placement details and other applications).
- DWSs shall contrast visually (either light-on-dark or dark-on-light) with the adjacent PAR surface, gutter, street, or highway. Federal Yellow is the color used to achieve visual contrast on NMDOT projects. Within cities, other contrasting colors may be used if requested by the agency.
- DWSs shall extend a minimum of two feet in the direction of pedestrian travel and the full width of the curb ramp run (excluding flared sides), blended transitions, and turning spaces.

1200.9.4.8 Surfaces

- Surfaces of curb ramps shall be firm, stable, and slip resistant.
- Gratings, access covers, utility objects, and other appurtenances shall not be located on curb ramp runs, blended transitions, turning spaces, or gutters within the PAR. Where this is not practicable, covers, grates, and lids shall be slip resistant and installed flush with the surrounding surface

1200.9.4.9 Grade Breaks

- Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of travel on the ramp run.
- Grade breaks shall not be permitted on the surface of ramp runs and turning spaces.
- Surface slopes that meet at grade breaks shall be flush.

1200.9.4.10 Clear Space

- Beyond the bottom grade break of a curb ramp or turning space, a clear space that is typically five feet by five feet, but a minimum of four feet by four feet, shall be provided. Clear space shall be within the width of the pedestrian street crossing and located wholly outside the parallel vehicle travel lane.

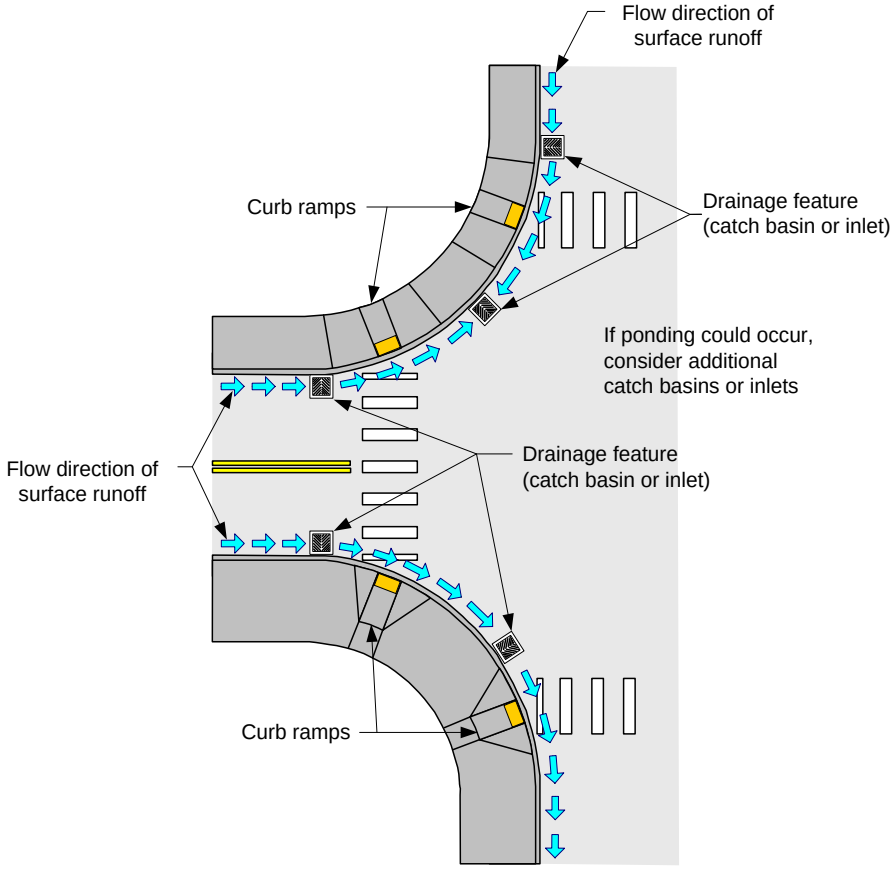
1200.9.5 Curb Ramp Drainage

1200.9.5.1 Curb Ramp Drainage

Surface water runoff from the roadway can flood the lower end of a curb ramp. The designer should provide catch basins or inlets to prevent ponding at the base of curb ramps and gutter counter slope and clear space. Examples of drainage structure locations are shown in Exhibit 1200-24. Drainage structures shall not be located in the PAR.

Exhibit 1200-24

Drainage Structure Locations at Curb Ramps



1200.10 Crosswalks

1200.10.1 Designing Pedestrian Crossing Facilities

Good design requires the consideration of many elements. The following should be considered when designing pedestrian crossing facilities:

- Minimize the turning radii to keep speeds low.
- Design crosswalks to connect to adjacent pedestrian facilities. Provide proper sight distance between drivers and pedestrians.
- Consider the feasibility of restricting or prohibiting turns.
- Consider shortening the crossing distance.
- Consider a raised median/cut-through island for a pedestrian refuge.
- Consider an upgrade to include APSs.

- Provide signing and delineation as required by the MUTCD.
- Consider the proximity and relation of the crosswalk to transit stops.
- Provide a PAR that meets the accessibility criteria at all pedestrian crossings.

1200.10.2 Crosswalks at Intersections

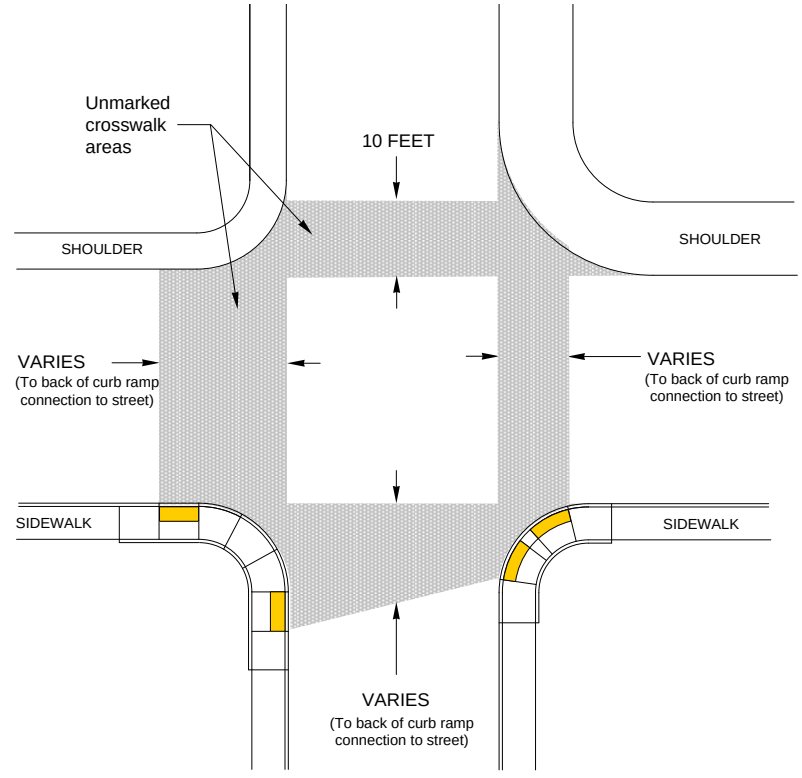
A PAR shall be provided within marked and unmarked pedestrian crossings (see Section 1200.7.1 for accessibility criteria for PAR).

Crosswalks shall be provided on all legs of an intersection, except in rare cases. There are normally three crosswalks at a T intersection and four crosswalks at a four-leg intersection. For pedestrian route continuity, the minimum number of crosswalks is two at T intersections and three at four-leg intersections. One example where crosswalks might not be provided on all intersection legs is a diamond interchange with heavy left-turn movements from the off-ramp approach (see Section 1200.10.2.3 for Closed Crossings).

1200.10.2.1 Unmarked Crossings

Legal crosswalks exist at all intersections, whether marked or not, regardless of the number of legs at the intersection. An unmarked crosswalk (see Exhibit 1200-25) is the portion of the roadway behind an extended curb or edge of the through traffic lane and the farthest extended sidewalk connection. If there are no sidewalks, an unmarked crosswalk is the portion of the roadway between the edge of the through traffic lane and a line 10 feet from there.

Exhibit 1200-25
Unmarked Pedestrian Crosswalks

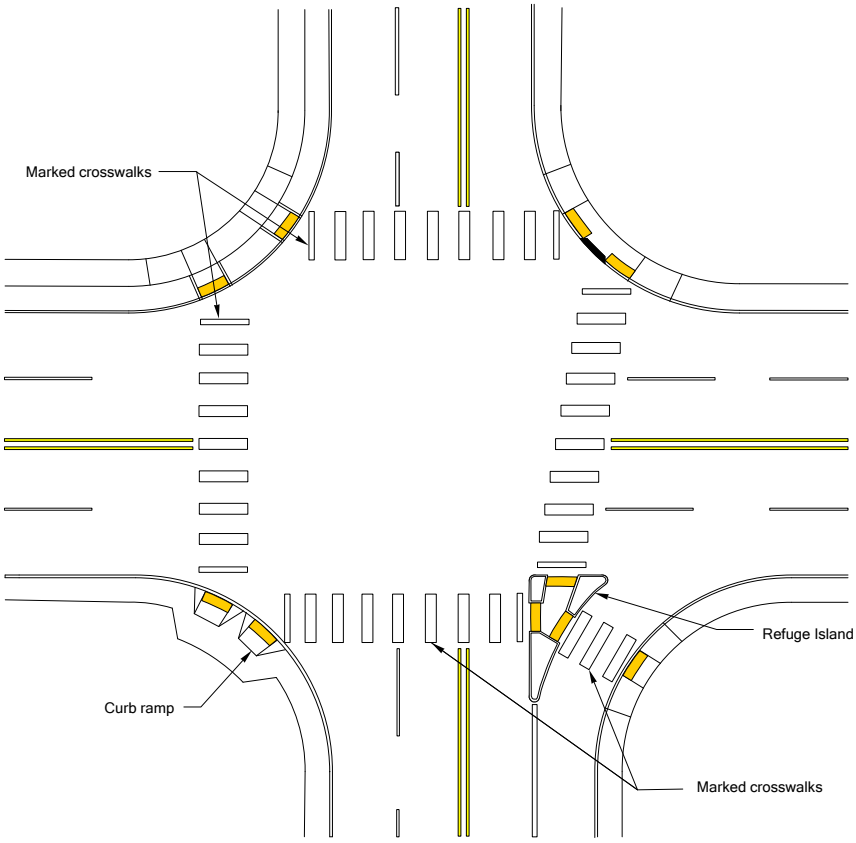


1200.10.2.2 Marked Crossings

Marked crosswalks are used at intersections or midblock crossings. They are not to be used indiscriminately. Maintenance agreements provide jurisdictional authority for decisions to mark crosswalks based on a population threshold of 25,000 and should be consulted prior to making a decision to mark a crosswalk. District Traffic Engineers should be consulted for best practices for marking crosswalks based on intersection type. The MUTCD is a good resource to use when evaluating locations for marking a crosswalk.

The desirable width for a marked crosswalk is 10 feet; the minimum width is six feet, with justification. The preferred type of marked crosswalk is a pattern known as the Continental Style, which is shown in the NMDOT Standard Drawing Division 608 and Exhibit 1200-26. These are high visibility markings that make the crosswalk more visible to motorists than the parallel-line style markings. Stop and yield line dimensions and placement must conform to the MUTCD and are shown in the NMDOT Standard Drawing Division 608.

Exhibit 1200-26
Marked Pedestrian Crosswalk



Some decorative crosswalk materials, such as colored pavement, may confuse pedestrians with low vision. Crosswalks are distinct elements of the PAR. Pavers, bricks, and stamped concrete, if used, shall meet all PAR requirements. Decorative crosswalks should be supplemented with standard style pavement markings to enhance visibility and delineate the crosswalk. An example of a decorative crosswalk is shown in Exhibit 1200-27.

Exhibit 1200-27
Decorative Crosswalk

1200.10.2.3 Closed Pedestrian Street Crossings

All pedestrian street crossings must be accessible to pedestrians with disabilities. If pedestrian crossing is prohibited at certain locations, "No Pedestrian Crossing" signs shall be provided along with detectable features such as grass strips, landscaping, planters, chains, fencing, railings, or other barriers. The District Traffic Engineer should be consulted for approval to close pedestrian street crossings.

1200.10.3 Midblock Pedestrian Crossings

A midblock crossing may be appropriate on roadways with pedestrian crossing traffic caused by nearby pedestrian generators, (see Section 1200.10.2 for crosswalk criteria for marked crosswalk recommendations at unsignalized intersections). The District Traffic Engineer should be consulted for approval of midblock crossings. An example of a midblock pedestrian crossing is shown in Exhibit 1200-28.

Exhibit 1200-28

Midblock Pedestrian Crossing

As with marked crosswalks at intersections, the creation and marking of midblock pedestrian crossings shall not be implemented indiscriminately. The designer shall evaluate various conditions that may increase the value of a midblock pedestrian crossing. These conditions include:

- A high pedestrian crossing volume with long block spacing.
- Evidence of pedestrian-vehicular midblock conflicts by site observations, law enforcement reporting, and city traffic engineers.
- A proposed crossing with a realistic opportunity to channel multiple pedestrian crossings to a single location.
- Sight lines that enable sufficient eye contact between motorists and pedestrians.
- Community commitment for a successful outcome.
- Ability to mitigate risks associated with the location using proven countermeasures such as, but not limited to, pedestrian refuge islands, rectangular rapid flashing beacons, and/or pedestrian hybrid beacons.
- Modal interchange points where high volumes of pedestrian crossings occur (e.g., transit stop to apartment complex).

Where a PAR is contained within the midblock street crossing, the cross slope of the PAR shall be permitted to equal the street or highway grade.

1200.10.3.1 Raised Midblock Pedestrian Crossings

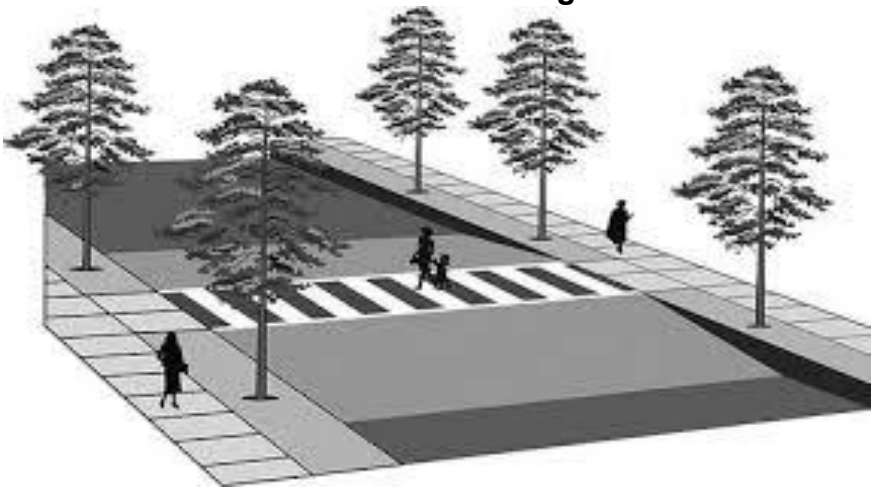
A raised crosswalk functions as an extension of the sidewalk and allows pedestrians to cross the street without stepping down to street level. A raised midblock pedestrian crossing, also referred to as a speed table, is the width of a crosswalk and is marked and signed as a pedestrian crossing. The width of the raised crosswalk may be increased at high volume pedestrian crossing locations. Raised crosswalks encourage motorists to yield to pedestrians because the raised crosswalk increases pedestrian visibility and forces motorists to slow down before going over the speed table. Raised pedestrian crossings reduce vehicle speeds, reduce the need for curb ramps (though detectable warning surfaces - truncated domes - should still be included), and enhance the pedestrian crossing environment. A raised crosswalk is between 3 and 6 inches above pavement level or level with adjacent curbs. A raised pedestrian crossing produces sufficient discomfort to a motorist driving above the raised crosswalk design speed to discourage speeding. The following conditions should be considered when planning a raised pedestrian crossing at a midblock location:

- Number of lanes on the roadway – typical candidate roadways are 2-lane and 3-lane roads
- Speed limit and traffic volume of roadway – typically appropriate for roadways with speed limits of 30 mph or less and annual average daily traffic (AADT) below 9,000
- Appropriate if there is an existing crosswalk in the approximate crossing location or if a crosswalk is warranted based on criteria
- Can be used on a single-lane one-way or two-lane two-way street
- Not appropriate along the primary access to a commercial or industrial site, truck routes, emergency routes, and arterial streets
- Emergency vehicles may experience issues with vertical deflection associated with raised crossings and emergency services agencies should be consulted prior to installation.
- Emergency vehicles should have less speed delay than for a speed hump

- Potential for increased noise due to vehicle braking and accelerating and to the vibration of loose items in truck beds or trailers
- Drainage needs to be evaluated and revised as necessary on retrofit projects

An example of a raised midblock pedestrian crossing is shown in Exhibit 1200-29.

Exhibit 1200-29
Raised Midblock Pedestrian Crossing



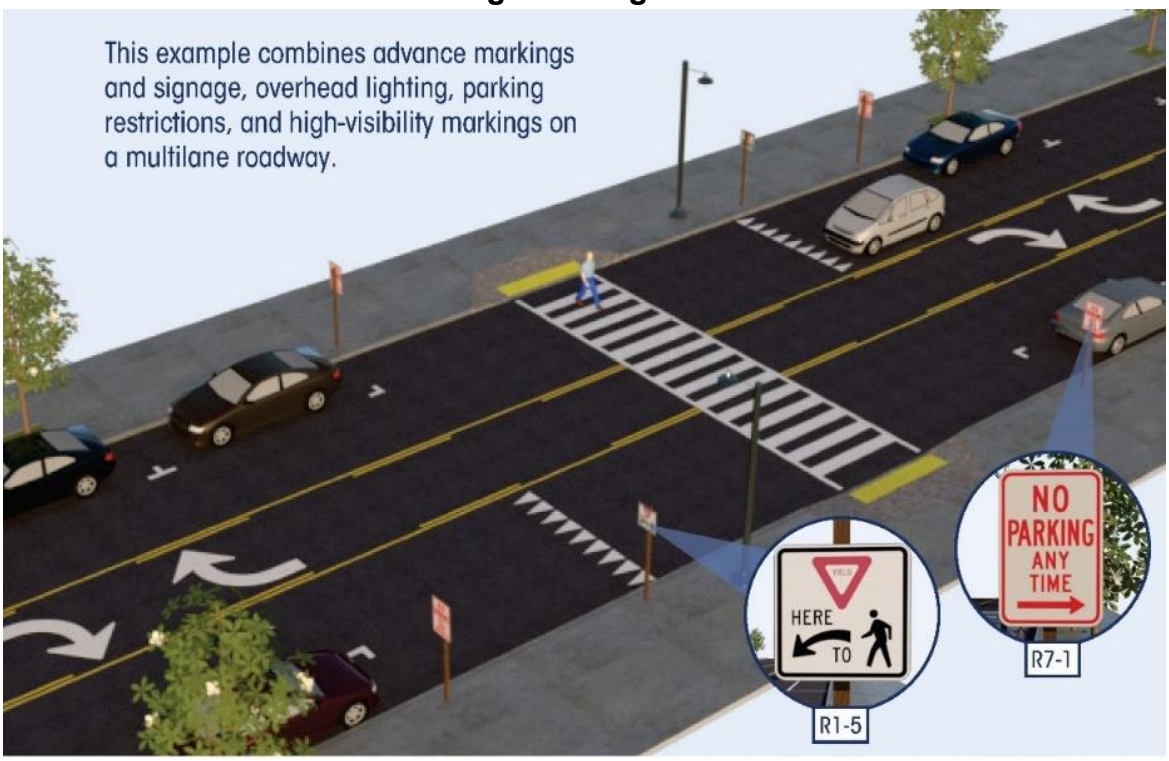
1200.10.3.2 High-Visibility Crosswalk Marking[AL1]

High-visibility crosswalk markings, either white diagonal lines at a 45-degree angle to the line of the crosswalk ("zebra" markings) or white longitudinal lines parallel to traffic flow ("continental" markings), are preferred over transverse parallel line crosswalks. High-visibility crosswalk markings should be provided at all established midblock pedestrian crossings, and uncontrolled intersections. Transverse crosswalk lines may be included with either crosswalk marking configuration. The NMDOT Signing and Striping Manual and the MUTCD should be referenced for further guidance on crosswalk markings.

1200.10.3.3 Advance YIELD or STOP Markings and Signs

The stop bar or "sharks teeth" yield markings are placed 20 to 50 feet in advance of a marked crosswalk to indicate where vehicles are required to stop or yield in compliance with the accompanying "STOP Here for Pedestrians" (R1-5c) or "YIELD Here to Pedestrians" (R1-5a) sign. Parking should be prohibited between the stop(yield) line and the crosswalk. An example of advance markings and signage is shown in Exhibit 1200-30.

Exhibit 1200-30
Advance YIELD or STOP Markings and Signs



Source: https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/step_tech_sheet.pdf

1200.10.3.4 In-Street STOP or YIELD to Pedestrian Sign

New Mexico traffic law [NM Stat 66-7-334 (2016)] requires vehicle drivers to yield the right-of-way to pedestrians crossing a roadway within a crosswalk. In-street "STOP for Pedestrians within Crosswalk" (R1-6a) or "YIELD to Pedestrians within Crosswalk" (R1-6) signs serve to remind road users of laws regarding right-of-way, and they may be appropriate on 2-lane or 3-lane roads where speed limits are 30 mph or less. When used, the signs shall be placed in the roadway at the crosswalk location on the center line,

on a lane line, or on a median island. An example of an in-street sign installation is shown in Exhibit 1200-31.

Exhibit 1200-31
High-Visibility Crosswalk Marking

Source: https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/step_tech_sheet.pdf

1200.10.3.5 Improved Nighttime Lighting[JP2]

Consideration should be given to placing lights in advance of midblock and intersection crosswalks on both approaches to illuminate the front of the pedestrian and avoid creating a silhouette. An example of overhead lighting at a crosswalk, in addition to high-visibility markings, is shown in Exhibit 1200-31.

1200.10.3.6 Rectangular Rapid-Flashing Beacon (RRFB)

A rectangular rapid-flashing beacon (RRFB) is a pedestrian-actuated conspicuity enhancement to supplement standard pedestrian crossing signs at uncontrolled marked crosswalks. These devices have proven to be effective in improving yielding compliance. The RRFB uses rectangular-shaped high-intensity LED indications, flashing rapidly in a combination wig-wag and simultaneous flash pattern and may be mounted immediately adjacent to the crossing sign. An example of an RRFB installation is shown in Exhibit 1200-32. They can be implemented at uncontrolled marked crosswalks.

Note that the FHWA has issued an Interim Approval (IA-21) for the optional use of RRFBs as a pedestrian-actuated conspicuity enhancement device at uncontrolled marked crosswalks. Installations must comply with the technical conditions of IA-21 and be approved by the FHWA in response to a written request from the NMDOT to the Office of Transportation Operations.

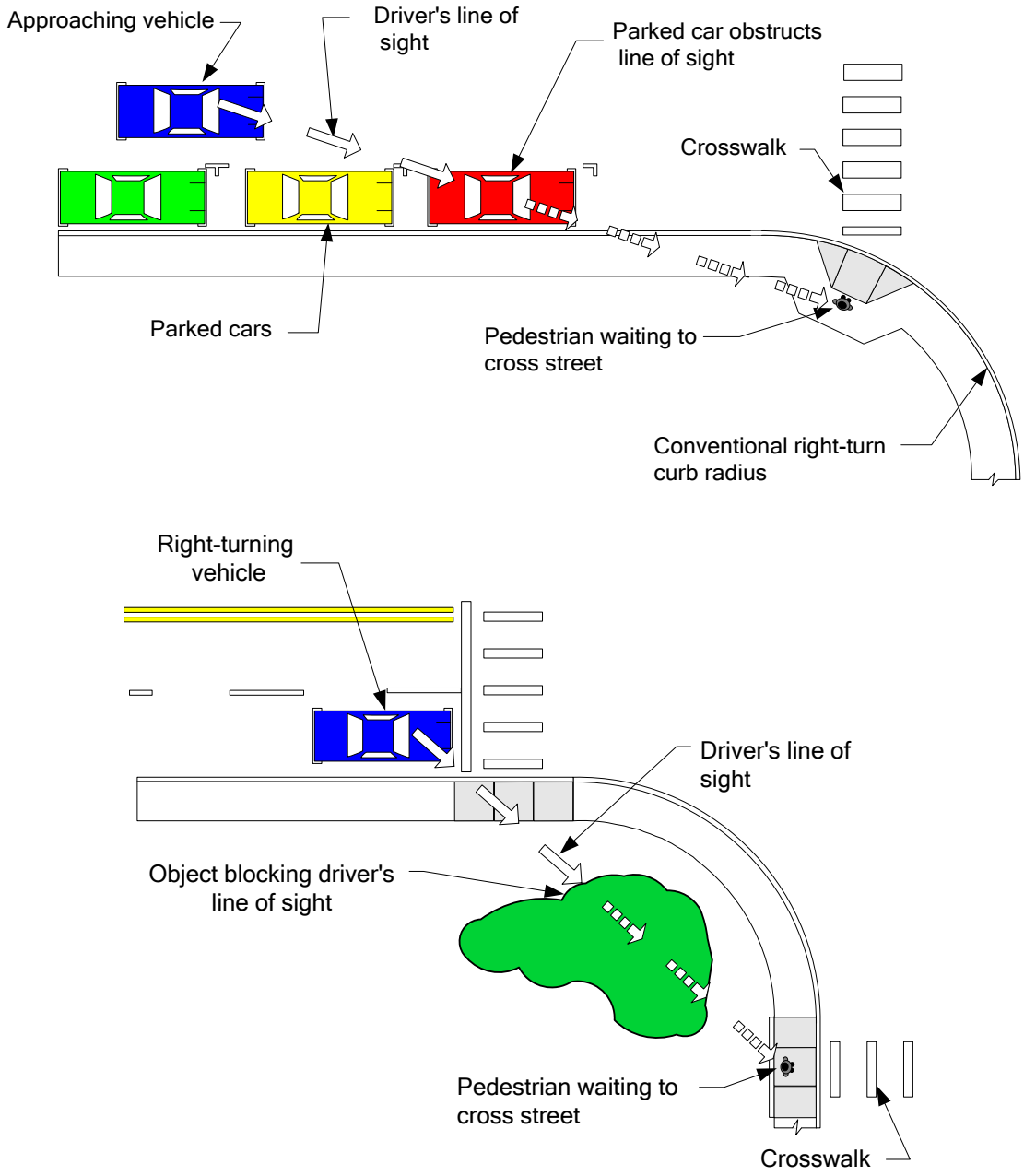
Exhibit 1200-32
Rectangular Rapid-Flashing Beacon (RRFB)

1200.10.4 Sight Distance at Crosswalks[JP3]

When locating crosswalks at intersections and mid-block locations, it is important to evaluate the sight lines between pedestrians and motorists. Motorists must be provided sufficient stopping sight distance to be able to see, react, and yield to pedestrians. Likewise, pedestrians require sufficient sight distance to identify and judge gaps in traffic. Shrubbery, signs, parked cars, and other roadside elements can block motorists' and pedestrians' views of one another. Examples of these sight distance concerns at intersections are shown in Exhibit 1200-33. Similar concerns exist for mid-block crossing locations as well. Where sight distance cannot be improved at mid-block locations, active warning devices should be installed.

Exhibit 1200-33

Obstructed Line of Sight at Intersection



1200.10.5 Curb Extensions

Curb extensions, also known as "curb bulbs" or "bulb-outs," extend the sidewalk or curb face into the parking lane or shoulder of a roadway. They improve sight distance between the motorist and pedestrian, thus enhancing pedestrian safety by increasing

pedestrian visibility, shortening crossing distances, slowing turning vehicles at intersections, and visually narrowing the roadway. Curb extensions may be used at unsignalized or signalized intersections, and at uncontrolled and controlled mid-block crossings. The design of curb extensions may necessitate the removal of parking and should not encroach into bicycle lanes.

When designing curb extensions, the curb should be extended no farther than the width of the parking lane or shoulder. The curb extension shall not interfere with conflicting vehicle travel paths, either for motor vehicles or bicycles. The approach nose shall be designed to ensure an adequate vehicle setback to provide visibility of pedestrians. At intersections with traffic signals, curb extensions can be used to reduce the duration of the pedestrian clearance phase. Examples of sidewalk curb extensions at intersections are shown in Exhibit 1200-34 and Exhibit 1200-35.

Exhibit 1200-34

Improved Line of Sight at Intersection with Curb Extension

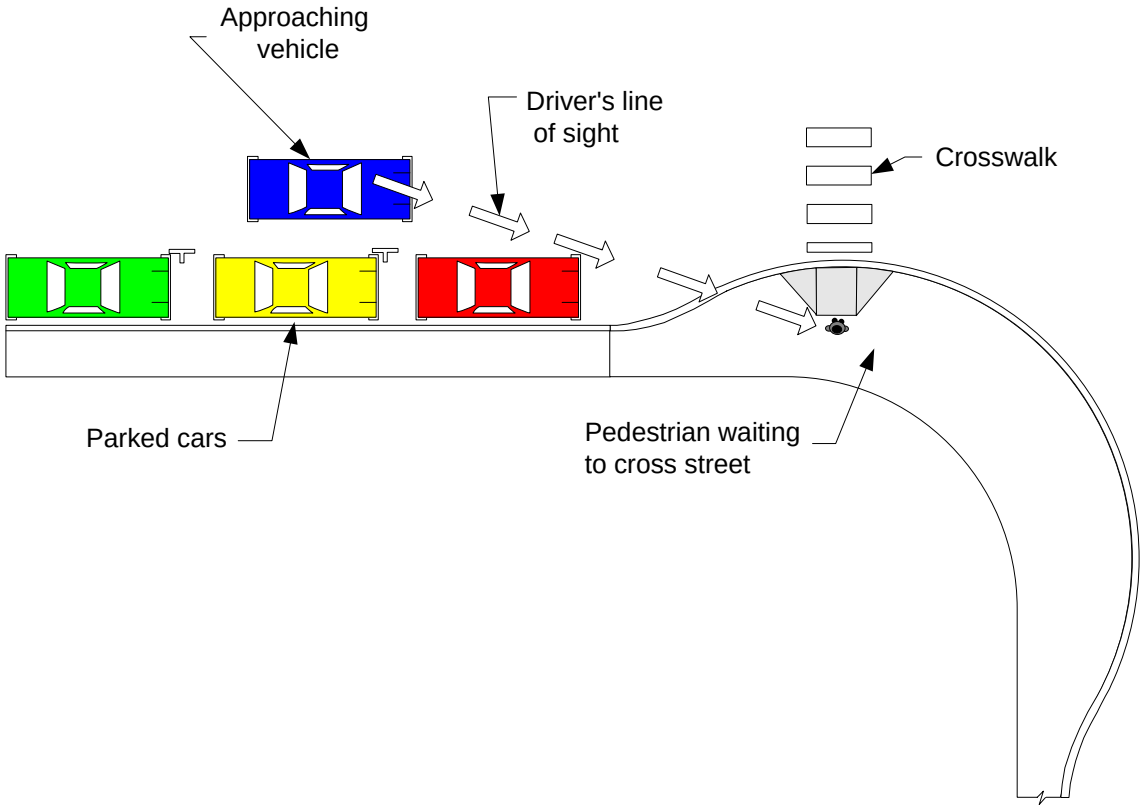


Exhibit 1200-35
Curb Extension Examples

Site features such as landscaping, cabinets, poles, benches, planters, bollards, newspaper stands, and sandwich boards should be selected and placed so they do not obstruct the vision of pedestrians or drivers within curb extension areas.

1200.10.5.1 Tighter Curb Return Radii at Intersections

The right-turn path of the design vehicle is a critical element in determining the size and shape of a curb extension. Sidewalk curb extensions restrict the width of the roadway and can make right turns difficult for large trucks. The geometry of the curb extension must be compatible with the turn path for the design vehicle selected. In addition to the geometric design guidance provided in the AASHTO Green Book, the context of the intersection should be evaluated to determine if tighter curb return radii may be appropriate.

1200.10.6 Pedestrian Hybrid Beacon (PHB)

Multi-lane, high-volume, high-speed roadways are barriers to pedestrian mobility. Some pedestrians may choose not to make a trip that involves crossing a busy roadway, and these roads pose additional safety and mobility issues for children and people with disabilities. On these types of facilities, pedestrian crossings are

primarily located at signalized intersections. Signals are often timed to minimize motorists delay and maximize capacity or vehicle throughput. The distance pedestrians must travel to reach signalized intersections, combined with long traffic signal cycles, results in frequent pedestrian crossings at mid-block or uncontrolled locations. In 2012, a total of 4,743 pedestrians were killed, with 76,000 injured in traffic crashes. Nearly three quarters (73 percent) of pedestrian fatalities occurred at midblock locations compared to intersections. [1] On multi-lane undivided roadways, pedestrians must judge gaps in multiple streams of traffic to successfully complete a crossing. On higher speed roadways motorists are less inclined (or less able) to stop for pedestrians in crosswalks — some communities have yielding rates of less than 2 percent at marked and signed mid-block crosswalks. [2]

1200.10.6.1 Location

If a location is deemed appropriate for a designated pedestrian crossing, then the traffic control should not be selected based solely on the volume of pedestrians; rather it should be selected based upon what is needed to provide a safe crossing. Because of the potential for roadside pedestrian crossing signs to be shielded from cars in the central lane(s), PHBs can be beneficial for all pedestrian crossings of 6-or-more lane undivided highways if traffic signals cannot be justified. Where used, PHBs should be located outside the functional area of a signalized intersection and outside of any turn lanes or acceleration lanes. An example of a PHB installation is shown in Exhibit 1200-36.

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[1] Fatality Analysis Reporting System (FARS) database query

[2] Florida Section ITE magazine: FLITE. Institute of Transportation Engineers - Florida Section, January 2008.

Exhibit 1200-36

Pedestrian Hybrid Beacon Installation

1200.10.6.2 Signing and Marking

In addition to the signal head displays, stop lines and marked crosswalks are required at PHB crossings. Advance stop lines should be used on multi-lane crossings to reduce the potential for second threat crashes (i.e., when one vehicle on a multi-lane roadway stops for a pedestrian but the vehicle traveling in the lane beside it does not).

1200.10.6.3 Length and Width

If an existing median is less than 6 feet wide or is not raised, the length of the crosswalk, as indicated in the MUTCD guidance, should allow for the crossing of both roadways of the divided highway.

1200.10.6.4 Adjacent Features

Features near the PHB should be considered when designing and installing the device. Parking should be restricted on the approach and departure side of the crossing to improve visibility. PHBs can be used adjacent to side streets and driveways if the crosswalk and approaching users are clearly visible from the side street.

1200.10.6.5 Signal Systems

As indicated in the MUTCD, existing signal systems should be considered when installing and operating PHBs. Excessive delays can result in pedestrians not waiting for the signal and as a consequence lead to motorists' non-compliance with the PHB. Immediate response is preferable to having pedestrians wait for the WALK signal. In coordinated signal systems, shorter delays could possibly be achieved by crossing one side of a divided highway at a time. However, this should only be done when the median is more than 6 feet wide.

1200.10.7 Leading Pedestrian Intervals

Leading Pedestrian Intervals (LPI), sometimes called Pedestrian Head Start or Life Preserving Interval, typically gives pedestrians a 3–7 second head start when entering a signalized intersection with a corresponding green signal in the same direction of travel. LPIs enhance the visibility of pedestrians in the intersection and reinforce their right-of-way over turning vehicles, especially in locations with a history of conflict. With this head start, pedestrians can better establish their presence in the crosswalk before vehicles have priority to turn left. LPI's provide the following benefits:

- Increased visibility of crossing pedestrians
- Reduced conflicts between pedestrians and vehicles
- Increased likelihood of motorists yielding to pedestrians
- Enhanced safety for pedestrians who may be slower to start into the intersection

FHWA's Handbook for Designing Roadways for the Aging Population https://safety.fhwa.dot.gov/older_users/handbook/ recommends the use of the LPI at intersections with high turning vehicle volumes. Refer to the Manual on Uniform Traffic Control Devices for guidance on LPI timing. Costs for implementing LPIs are very low, since only signal timing alteration is required. This makes it an easy and inexpensive countermeasure that can be incorporated into pedestrian safety action plans or policies and can become routine agency practice.

1200.11 Raised Medians/ Pedestrian Refuge Islands

Wide multilane streets are often difficult for pedestrians to cross, particularly when there are insufficient gaps in vehicular traffic due to heavy traffic volumes. The presence of a pedestrian refuge island at a midblock location or intersection allows pedestrians/bicyclists to focus on one direction of traffic at a time as they cross, and gives them a place to wait for an adequate gap in oncoming traffic before finishing the second phase of crossing. Raised medians and pedestrian refuge islands should be considered on roadways with the following conditions:

- Two-way arterials with intermediate to high speeds (35 mph or greater), moderate to high average daily traffic (9,000 AADT or higher), and high pedestrian volumes.
- Significant pedestrian collision history, according to crash data.
- Near a school or other community center.
- Complex or irregularly shaped intersections Exhibit 1200-37.

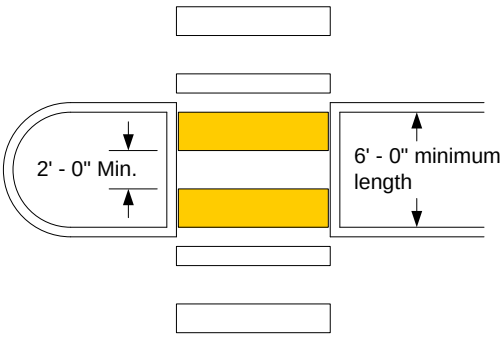
Exhibit 1200-37
Complex or Irregularly Shaped Intersection

- At signalized/ unsignalized intersections or uncontrolled locations.
- At midblock crossings. When installed, midblock crossings should be supplemented with marked, high visibility crosswalks and enhanced lighting (see Section 1200.10.3.2).
- Along streets with few acceptable gaps to cross both directions of traffic.

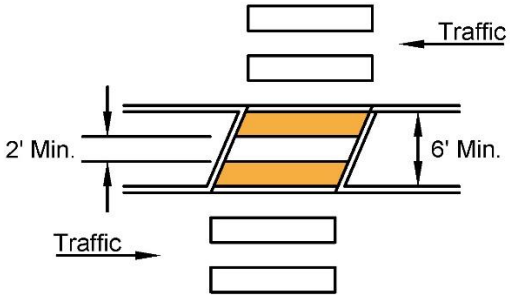
Consideration should be given to creating a two-stage crossing with the median or island providing refuge to encourage pedestrians to cross one direction of traffic at a time (see Exhibit 1200-38). This can be accomplished with either a straight or skewed path through the median or island. For skewed configurations, the skew should be toward oncoming traffic to improve visibility of traffic for the pedestrian.

Exhibit 1200-38

Raised Median with Pedestrian Cut-Through



Pedestrian Island Cut-Through

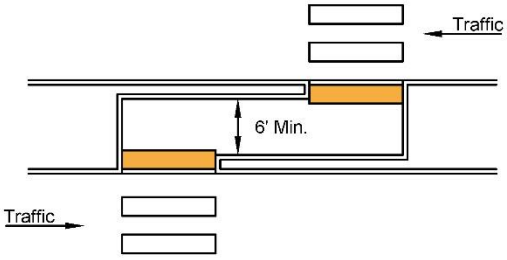


Skewed Pedestrian Median Cut-Through

In areas where a wider median is feasible an offset two-stage crossing can be considered which allows pedestrians to look towards oncoming traffic before completing the second part of the crossing (see Exhibit 1200-39). The pedestrian refuge island width should be at least 6 feet to provide a protected space so that more than one pedestrian can wait. Where practical, a width of 8 feet may be provided to accommodate bicycles, wheelchairs, scooters and groups of pedestrians. The minimum width of the pedestrian refuge island is 6 feet so that 2-foot detectable warning surfaces (DWS) can be provided at both sides of the island.

Exhibit 1200-39

Offset Two-Stage Crossing



Offset Pedestrian Median Cut-Through

The PAR through a raised median or pedestrian refuge island can be either raised with curb ramps or a cut-through type (see Exhibit 1200-40). Curb ramps in medians and islands can make it more difficult for some users to cross the roadway. The curbed edges of cut-throughs can provide useful cane-detectable cues that help users determine the direction of a crossing, especially on skewed or offset routes through a median or a pedestrian refuge island. Design considerations should include stormwater runoff and maintenance, such as the clearing of roadway debris.

Exhibit 1200-40

PAR Through a Raised Median – Cut-Through Type

A traffic island used for a channelized right-turn slip lane can provide a pedestrian refuge (See Exhibit 1200-41), but the slip lane may promote faster turning speeds. The turning radius of the slip lane should be minimized to keep speeds as low as practicable. To reduce conflicts, the slip lane should be kept as narrow as practicable, with a crosswalk alignment that is at a right angle to the face of curb.

Exhibit 1200-41

PAR Through a Raised Traffic Island Used for a Channelized Right-Turn Slip Lane

1200.11.1 Accessibility Criteria for Raised Medians and Pedestrian Refuge Islands

There are many design elements to consider when deciding whether to ramp up to the median or pedestrian refuge island grade or create a cut-through median or island matching the roadway grade. These considerations may include the profile grade and cross slope of the road, drainage patterns, and the length or width of the median or pedestrian refuge island.

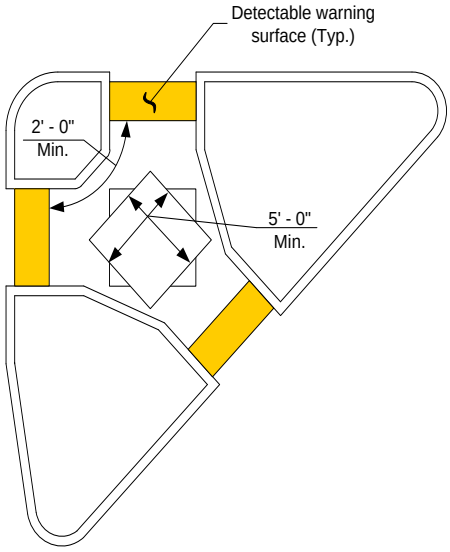
The following accessibility criteria apply:

- Each raised median or pedestrian refuge island shall contain a minimum PAR width of five feet to connect departure and arrival sidewalks and ensure compliant passing space (see Section 1200.7).
- A passing space shall be provided that is a minimum of five feet by five feet for each PAR in a raised median or on a pedestrian refuge island (see Exhibit 1200-42).

Exhibit 1200-42

PAR Through Cut-Through Refuge Island

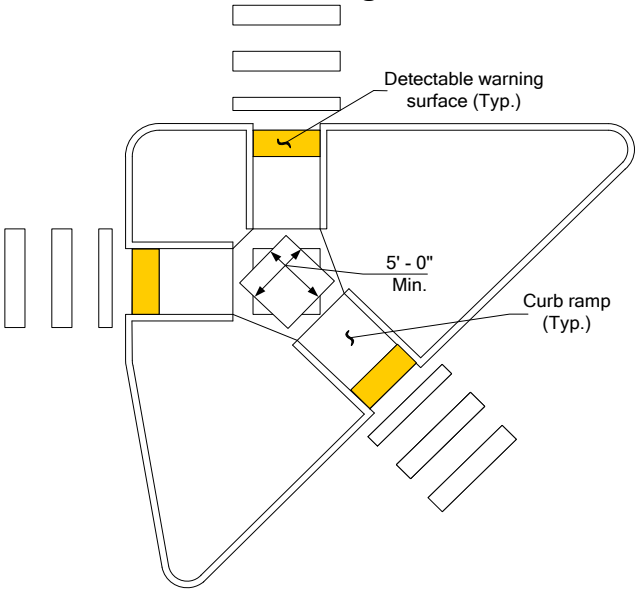
Island Cut-Through



Island Cut-Through

- At pedestrian refuge islands and medians with either cut-through access or curb ramps (see Exhibit 1200-38, Exhibit 1200-42, and Exhibit 1200-43), DWSs shall be provided for the full width of the cut-through or ramp and shall be separated by a surface without the DWS for a minimum length of two feet. If the overall cut-through or ramp length is less than six feet, DWSs shall not be provided.

Exhibit 1200-43
Raised Pedestrian Refuge Island with Curb Ramps



See the NMDOT Standard Drawing Division 608 for details.

1200.12 Pedestrian Pushbuttons at Signals and Accessible Pedestrian Signals (APSs)

Changes in intersection design and signalization, as well as the presence of quiet cars, have affected traditional street crossing techniques used by pedestrians who are blind or have low vision, making the pedestrian phase harder to recognize without seeing the visual pedestrian signal. APSs provide the same information that is provided by the visual pedestrian signal in an audible and vibrotactile format, which provides access to pedestrian signals for pedestrians who are blind. Providing APSs and pedestrian pushbuttons meets the effective communication requirements of ADA Title II.

The PROWAG references the latest version of the MUTCD Section 4E for signal pushbutton and APS design guidance. The MUTCD technical details are not included in this chapter. The NMDOT District Traffic Engineer and either region or maintenance personnel (as appropriate) should be consulted for current equipment specifications and additional maintenance requirements. In addition, refer to Attachment 1 of Chapter 1100 traffic Signals of this Design Manual for NMDOT's current guidance related to APSs. The following signal pushbutton design considerations follow PROWAG and are provided to support the designer with project development. A typical (non-accessible) pedestrian pushbutton is shown in Exhibit 1200-44.

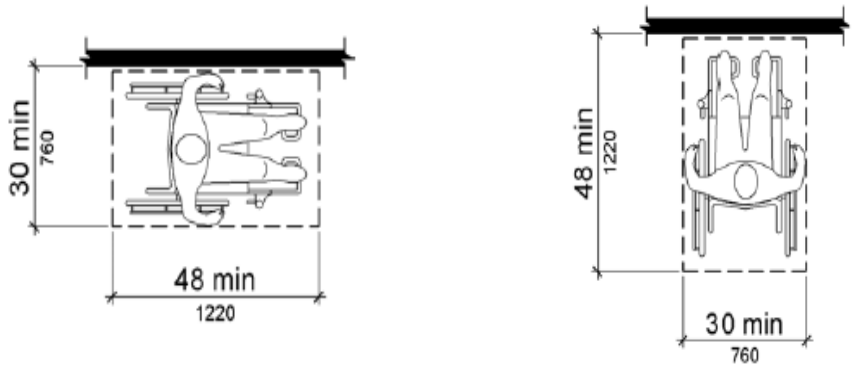
Exhibit 1200-44
Typical Pedestrian Pushbutton

1200.12.1 Accessibility Criteria for Pedestrian Signal Pushbuttons (including APSs)

1200.12.1.1 Clear Space Requirements

- Clear spaces are required at operable parts, including APSs and pedestrian pushbuttons.
- Clear space surfaces shall meet all firm, stable, and slip resistant requirements and have a running slope consistent with the grade of the adjacent PAR and a maximum cross slope of two percent.
- The size of the clear space shall be a minimum of 30 inches wide by 48 inches long (see Exhibit 1200-45). A 36-inch width is recommended where feasible.
- Clear space is permitted to overlap other PAR elements (i.e., sidewalk/curb ramp turning space).
- Additional maneuvering space is required if the clear space is constrained on two sides (see the PROWAG).

Exhibit 1200-45
Clear Space Parallel and Forward Approach Orientation



Parallel **Forward**

Note: A clear space accommodates users of wheeled mobility devices approaching the pedestrian signal pushbutton. Provide a minimum width of 30 inches and minimum length of 48 inches of clear space at a parallel approach with the pedestrian signal pushbutton centered within the length.

1200.12.1.2 Reach Range Requirements

- A clear space shall be provided at the operable parts of a pedestrian signal. Due to user challenges associated with reach ranges, it is desirable to design clear spaces for a parallel approach whenever practicable and to center the pushbutton within the minimum 48-inch length.
- Where a forward reach is unobstructed, the high forward reach shall be a maximum of 48 inches and the low forward reach shall be a minimum of 15 inches above the finished surface. A forward reach over an obstruction is not permitted.
- Where a clear space allows a parallel approach and the side reach is unobstructed, the same forward reach range requirements are applicable. An obstruction shall be permitted between the clear space and the pushbutton where the depth of the obstruction is a maximum of 10 inches. In these situations, a signal pushbutton extender may be required to meet ADA and PROWAG requirements as shown in Exhibit 1200-46.

Exhibit 1200-46
Signal Pushbutton Extender

1200.12.2 Accessible Pedestrian Signals (APSs)

At all locations where pedestrian signals are newly installed, replaced, or significantly modified, the installation of APSs and countdown pedestrian displays are required. An APS and pedestrian signal pushbutton are an 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. An APS pushbutton is shown in Exhibit 1200-47.

Exhibit 1200-47
Accessible Pedestrian Signal Pushbutton

New signals require APSs. Existing pedestrian signals shall meet APS requirements when the signal controller and software are altered, or the signal head is replaced.

Relocating existing pedestrian pushbuttons to satellite poles to improve accessibility does not trigger an APS upgrade; however, APS upgrades should be considered. Installation of these devices may require improvements to existing sidewalks and curb ramps to ensure ADA compliance. Specific NMDOT guidance for APSs is contained in Attachment 1 of Chapter 1100, Traffic Signals of this Design Manual.

1200.12.3 On-Street Parking and Passenger Loading Zones

1200.12.3.1 On-Street Parking

Accessible parking provided in parking facilities has been a requirement for decades. On-street parking and related parking meters and pay stations have not had related requirements until the development of the PROWAG. The technical criterion varies from traditional parking spaces and requires familiarity prior to planning for and designing accessible on-street parking.

On-street accessible parking spaces are provided based on the block perimeter where on-street parking is marked or metered. The

scoping requirements section of the PROWAG provides a reference table. Curb ramps, signage, and connection to a PAR are some of the related requirements referenced in the PROWAG.

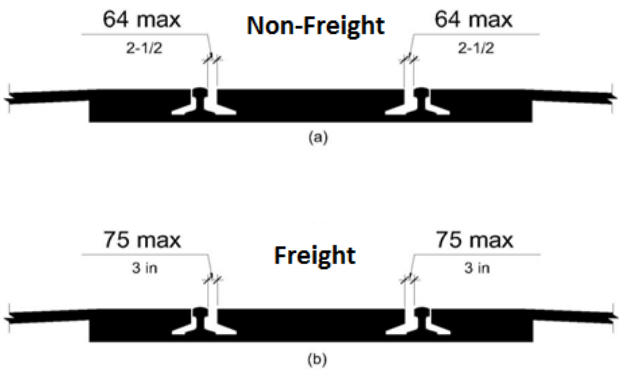
1200.12.3.2 Passenger Loading Zones

Passenger loading zones, which are different than signed loading zones, are required to be identified by signs displaying the International Symbol of Accessibility (ISA) and must meet additional PROWAG design criteria.

1200.13 Pedestrian At-Grade Rail Crossings

The design of pedestrian facilities that cross rail tracks (see Exhibit 1200-48) often presents challenges due to the conflicting needs of pedestrians and trains. The flangeway gap allows trains to traverse a crossing surface (e.g., sidewalk or roadway). These gaps may create a significant obstacle for a person who uses a wheelchair, crutches, or walking aids by entrapping casters of the wheeled devices and crutch tips. Whenever practicable, pedestrian crossings should be aligned perpendicular to the tracks to minimize safety issues related to flangeway gaps. Crossing surfaces may be constructed of asphalt, rubberized materials, or concrete. Concrete materials generally provide the smoothest and most durable crossing surfaces. At pedestrian at-grade rail crossings not located within a street or highway, DWSs shall extend the full width of the crossing. The PROWAG contains additional design criteria.

Exhibit 1200-48
Pedestrian At-Grade Rail Crossings



Flangeway gaps at pedestrian at-grade rail crossings shall be a maximum of 2-1/2 inches on non-freight rail track and three inches on freight rail track (see Exhibit 1200-48).

There are a number of rail crossing warning devices (see Exhibit 1200-49) intended specifically for pedestrian facilities; these are shown in the MUTCD. When selecting warning devices, factors such as train and pedestrian volumes, train speeds, available sight distance, number of tracks, and other site-specific characteristics should be taken into account. The NMDOT Rail Bureau should be consulted early in the design process so that all relevant factors are considered and an agreement reached regarding the design of warning devices and crossing surfaces.

Exhibit 1200-49
Pedestrian Rail Warning Device

1200.14 Pedestrian Grade Separations (Structures)

At overpasses and underpasses where pedestrians are permitted, a PAR shall be provided within a PCP. Where an overpass, underpass, bridge, or similar structure is designed for pedestrian use only and the approach slope to the structure exceeds five percent, a ramp, elevator, limited use/limited application elevator, or platform lift shall be provided. Elevators and platform lifts shall be unlocked during the operating hours of the facility served. Adequate illumination and drainage must be provided for pedestrian safety and comfort. Additional design criteria in the PROWAG provides guidance on structures that serve both pedestrian and vehicle use and related roadway public right-of-way.

In cases where there is a pedestrian collision history, and the roadway cannot be redesigned to accommodate pedestrians at-grade, planners should consider providing a grade-separated pedestrian structure. When considering a grade-separated pedestrian structure, the designer should determine whether the conditions that require the crossing are permanent. If there is likelihood that pedestrians will not use a grade separation, less-costly solutions should be considered.

The grade-separated crossing should be located where pedestrians are most likely to cross the roadway. A crossing might not be used if the pedestrian is required to deviate significantly from a more direct route.

It is sometimes necessary to install fencing or other physical barriers to channel pedestrians to the structure and reduce the possibility of undesired at-grade crossings.

A grade-separated crossing should be considered where:

- There is moderate to high pedestrian demand to cross a freeway or expressway.
- There are large numbers of young children, particularly on school routes, who regularly cross high-speed or high-volume roadways.
- The traffic conflicts that would be encountered by pedestrians are considered unacceptable (such as on wide streets with high pedestrian volumes combined with high-speed traffic).
- There are documented collisions or close calls involving pedestrians and vehicles.
- One or more of the conditions stated above exists in conjunction with a well-defined pedestrian origin and destination (such as a transit center across the street from a major commercial area).

1200.14.1 Pedestrian Bridges

Pedestrian grade-separation bridges (see Exhibit 1200-50) are more effective when the roadway is below the natural ground line, as in a cut section. Elevated grade separations in cut sections, where pedestrians climb stairs or use long approach ramps, tend to be underused. Pedestrian bridges need adequate right-of-way to accommodate compliant ramp approaches leading up to and off of the structure. The bridge structure shall comply with ADA requirements and meet the accessibility criteria for either a PCP or a ramp and shall include a PAR (see Sections 1200.6.1 and 1200.7.1 for PCP and PAR accessibility criteria; see Section 1200.15.2.1 for ramp accessibility criteria).

Exhibit 1200-50
Pedestrian Bridges

The height of the structure can affect the length of the pedestrian ramp approaches to the structure. When ramps are not practicable, both elevators and stairways should be provided.

1200.14.2 Pedestrian Tunnels

Tunnels are an effective method of providing pedestrian crossings for roadways located in embankment sections. Well-designed tunnels can be desirable crossings for pedestrians. When practicable, the tunnel should be designed with a nearly level profile to provide an unobstructed line of sight from portal to portal (see Exhibit 1200-51). People may be reluctant to enter a tunnel with a depressed profile because they are unable to see whether the

tunnel is occupied. Law enforcement also has difficulty patrolling depressed profile tunnels. Vandal-resistant daytime and nighttime illumination should be provided within the pedestrian tunnel.

Exhibit 1200-51
Pedestrian Tunnel

Pedestrian tunnels need adequate right-of-way to accommodate accessible approaches leading to the tunnel structure. The tunnel structure shall comply with ADA requirements and meet the accessibility criteria for either a PCP or a ramp and shall include a PAR (see Sections 1200.6.1 and 1200.7.1 for PCP and PAR accessibility criteria; see Section 1200.15.2.1 for ramp accessibility criteria).

1200.15 Other Pedestrian Facilities

1200.15.1 Transit Stops and School Bus Stops

The location of transit stops is an important element in providing appropriate pedestrian facilities. Pedestrian facilities at transit stops should be coordinated with the local transit agency provider. Newly constructed transit stops shall meet all related ADA

requirements and state and federal parking requirements. Newly constructed transit stops should connect to the sidewalk, PCP/PAR, street crossings, and paved shoulder. Transit routes normally function in both directions on the same roadway. A transit stop on one side of a street generally has a counterpart on the opposite side. Compliant pedestrian crossing facilities should be provided.

Accessible transit stops include but are not limited to the following design elements:

- Transit stops shall be connected to the sidewalk, curb ramps, street crossings, and PCPs by PARs.
- All walking surfaces shall be firm, stable, and slip resistant. Grass is not considered firm and stable.
- Signage content is generally provided by the transit agency and includes route information. All ADA requirements for distance, lettering, location, and Grade II Braille shall be met to ensure effective communication for all users.
- Boarding and alighting areas shall provide a clear length with a minimum of eight feet measured perpendicular to the curb or street edge, and a clear width with a minimum of five feet measured parallel to the curb or street edge.
- The parallel grade of the boarding and alighting area shall be the same as the street to the extent practicable. The perpendicular grade shall not exceed a maximum of two percent.
- Should a transit shelter be provided, all element compliances shall be met.
- Should a waste receptacle be provided, it shall not obstruct the PAR, the clear space within the shelter, or be placed adjacent to signage. Access to all elements is an ADA requirement, including the ability to read route information from a few inches away if needed by a user with low vision.

When locating a transit stop, the designer should review the transit agency requirements and clarify all requirements in the early planning phase. The transit stop should be compatible with the following roadway/traffic characteristics:

- Daily traffic volume
- Traffic speed
- Crossing distance
- Vehicle and pedestrian collision history
- Sight distance
- Connectivity to a PAR
- Traffic generator density
- ADA and state and local parking requirements

If any of the characteristics listed or other considerations suggests an undesirable location for a pedestrian crossing, the designer should consider a controlled crossing or another location for the transit stop.

When analyzing a transit stop location with a high pedestrian collision frequency, the presence of nearby transit stops and opportunities for pedestrians to cross the street in a safe manner should be taken into account. At-grade, midblock pedestrian crossings may be effective at transit stop locations on roadways with lower vehicular volumes. Pedestrian grade separations may be appropriate at midblock locations when vehicular traffic volumes prohibit pedestrian crossings at-grade.

School bus stops are typically adjacent to sidewalks in urban areas and along shoulders in rural areas. The designer should coordinate with the local school district and provide a safe waiting area. Because of their smaller size, children might be difficult for motorists to see at crossings or stops. Utility poles, vegetation, and other roadside features should not interfere with motorists' ability to see the children. When necessary, obstructions should be removed or relocated, or the bus stop should be moved. Parked vehicles can also block visibility, and parking prohibitions are advisable near the bus stop.

Schools are required to accommodate students with disabilities within their transportation system. Transit and school bus stop locations should be coordinated with the NMDOT District Traffic Engineer, transit agency, and school district, as appropriate.

1200.15.2 Ramps Serving Transit Stops, Park & Ride Lots, Buildings, and Other Facilities

A ramp (see Exhibit 1200-52) provides an accessible pedestrian route from a PCP or PAR to a facility such as a transit stop, park-and-ride lot, pedestrian overpass crossing/underpass crossing, or building (see Sections 1200.6.1 and 1200.7.1 for PCP and PAR accessibility criteria; see Section 1200.15.2.1 for ramp accessibility criteria.).

Exhibit 1200-52
Ramp with Accessible Handrails

1200.15.2.1 Accessibility Criteria for Ramps

Ramps are composed of one or more ramp runs interconnected by level landings and are considered a part of a PAR. Accessible ramps include but are not limited to the following design elements:

- Ramp runs are defined as having a minimum running slope of five percent and a maximum running slope of 8.3 percent.
- The cross slope of ramp runs shall be a maximum of two percent.

- The typical minimum clear width of a ramp run where handrails are provided is five feet but a minimum of three feet; however, it is desirable to match the width of the connecting pedestrian facility.
- The rise for any ramp run shall be a maximum of 30 inches.
- A ramp shall have landings at the top and bottom of each ramp run.
- A ramp landing's clear width shall be as wide as the widest ramp run leading to the landing.
- A ramp landing's length shall be a minimum of five feet.
- Ramps that change direction between ramp runs at landings shall have a minimum clear landing of five feet by five feet.
- Surfaces of ramp runs and landings shall comply with firm, stable, and slip resistance criteria.
- All ramp run segments with a rise greater than six inches shall have handrails that meet ADA requirements (see Section 1200.15.3 for handrail accessibility criteria).
- Edge protection on each side of ramps and landings is required. The extended surface prevents wheelchair casters and crutch tips from slipping off the ramp surface. The following are two options:
  - The surface of the ramp run or landing shall extend a minimum of 12 inches beyond the inside face of a handrail.
  - A curb or barrier shall be provided that prevents the passage of a four-inch-diameter sphere, where any portion of the sphere is within four inches of the ramp/landing surface.

1200.15.3 Railings and Handrails for Pedestrian Facilities

Accessible handrails are required on stairways and ramps that have a rise greater than six inches (see Section 1200.15.2.1 for ramp accessibility criteria). If the height of a drop-off (typically greater than 30 inches) adjacent to a pedestrian facility necessitates protecting pedestrians from falls, then a more robust railing system designed for fall protection should be used. If the drop-off is adjacent to either a stairway or a ramp with a rise greater than

six inches, then a combined railing system that meets the requirements for both accessibility and fall protection shall be used.

1200.15.3.1 Fall Protection Railing

Railing designed for fall protection alone is typically placed adjacent to pedestrian facilities other than stairs or ramps to prevent pedestrians or bicyclists from falls. The minimum railing height for pedestrian fall protection is 42 inches.

1200.15.3.2 Accessible Handrails

Accessible handrails meeting the accessibility criteria listed in Section 1200.15.3.3 are to be used for ramps.

1200.15.3.3 Accessibility Criteria for Handrails

The following accessibility criteria apply to handrails provided at ramps that have a rise greater than six inches.

- Handrails shall be continuous within the full length of each ramp run and provided on both sides of ramps.
- The top of handrail gripping surfaces shall be a minimum of 34 inches and a maximum of 38 inches vertically above walking and ramp surfaces. Handrails shall be mounted at a consistent height.
- Clearance between handrail gripping surfaces and adjacent surfaces shall be a minimum of 1-1/2 inches.
- Handrail gripping surfaces shall be continuous along their length and shall not be obstructed along their tops or sides.
- The bottoms of handrail gripping surfaces shall not be obstructed for more than 20 percent of their length.
- Where provided, horizontal projections shall be located a minimum of 1-1/2 inches below the bottom of the handrail gripping surface.
- Handrail gripping surfaces with a circular cross section shall have an outside diameter between 1-1/4 inches minimum and two inches maximum.

- Handrail gripping surfaces with a noncircular cross section shall have a perimeter dimension of four inches minimum and 6-1/4 inches maximum, and a cross section dimension of 2-1/4 inches maximum.
- Handrail gripping surfaces and the surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges.
- Handrails shall not rotate in their fittings.
- Ramp handrails shall extend horizontally above the landing for a minimum of 12 inches beyond the top and bottom of ramp runs.
- Handrail extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent ramp run. Handrail extensions shall not be required for continuous handrails at the inside turn of switchback or dogleg ramps.

1200.15.4 Shared Use Path (SUP)

Shared use paths (SUP) are multi-use paths designed primarily for use by bicyclists and pedestrians, including pedestrians with disabilities, for transportation and recreation purposes. Shared use paths are physically separated from motor vehicle traffic by an open space or barrier, and are either within the highway right-of-way or within an independent right-of-way. Specific provisions for shared use paths are included in the PROWAG.

1200.15.5 Other Pedestrian Facilities, Features, and Elements

This pedestrian facilities chapter covers the accessibility criteria for the most commonly encountered pedestrian design elements in the public right-of-way. However, there are ADA requirements that apply to any feature or element for pedestrian use such as doorways, elevators, stairs, call boxes, and drinking fountains. For accessibility criteria for less commonly encountered pedestrian design elements, consult the applicable federal guidance document(s) listed in Section 1200.2.3.

1200.16 Illumination and Signing

Chapter 920 of the Design Manual includes design guidance on illumination. Chapter 910 of the Design Manual and the MUTCD discuss pedestrian-related signing requirements.

1200.17 Work Zone Pedestrian Accommodation

Chapter 900 discusses work zone pedestrian accommodation requirements.

1200.18 Documentation

Chapter 200 of the Design Manual includes design documentation requirements.