



COLORADO

Department of Transportation

Office of the Executive Director  
4201 East Arkansas Ave, Suite 262  
Denver, CO 80222

## RELEASE MEMORANDUM

To: All CDOT Employees

From: Shailen P. Bhatt, Executive Director

Re: Updated Procedural Directive 605.1 “ADA Accessibility Requirements in CDOT Transportation Projects”

Date: April 10, 2017

**Updated on August 3, 2018: Form #464 references have been deleted from the PD since the form is no longer used for curb ramps**

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1. Name of Updated Procedural Directive: PD 605.1 “ADA Accessibility Requirements in CDOT Transportation Projects”
  2. Date of Directive Superseded: July 30, 2012
  3. Executive Summary: PD 605.1 has been updated to reflect CDOT’s decision to adopt PROWAG (Proposed Right-of-Way Accessibility Guidelines) standards for curb ramps. Detailed requirements for ADA accessibility requirements have been removed and now reside in the updated CDOT ADA Transition Plan, which should be read in conjunction with updated PD 605.1. Updated PD 605.1 also provides the following:
    - An explanation on the difference between Maintenance Treatments and Alteration;
    - The responsibilities of various levels of employees involved in the ADA program, including newly defined responsibilities of the Project Manager, Project Engineer, Resident Engineer, and Program Engineer;
    - Updates to the section on local agency agreement projects; and
    - That with regard to Maintenance Treatment Projects, the Maintenance Superintendents or Traffic Engineers shall consult with the ADA Coordinator in the Civil Rights and Business Resource Center to determine whether a Project that could be categorized as an Alteration is included in the 5 year (FY 2017-2022) ADA Curb Ramp Program initiative.
  4. Effective Date: March 31, 2017
  5. Office to Contact with Questions: Civil Rights and Business Resource Center



<b>COLORADO DEPARTMENT OF TRANSPORTATION</b>		<input type="checkbox"/> <b>POLICY DIRECTIVE</b> <input checked="" type="checkbox"/> <b>PROCEDURAL DIRECTIVE</b>
<b>Subject</b> <b>ADA Accessibility Requirements in CDOT Transportation Projects</b>		<b>Number</b> <b>605.1</b>
<b>Effective</b> <b>03/31/2017</b>	<b>Supersedes</b> <b>07/30/2012</b>	<b>Originating Office</b> <b>Civil Rights and Business Resource Center/ Division of Project Support, Standards &amp; Specifications Unit</b>

## I. PURPOSE

To ensure that Transportation Facilities, Building Facilities, rest areas, and other services of the Colorado Department of Transportation (the “Department” or “CDOT”) are accessible to persons with disabilities in accordance with governing federal regulations set forth below.

## II. AUTHORITY

Policy Directive 605.0 Comprehensive Accessibility for Persons with Disabilities

Executive Director pursuant to § 43-1-105, C.R.S.

The Rehabilitation Act of 1973, 29 U.S.C. §701 (1973), as amended

The Americans with Disabilities Act of 1990, Title II, 42 U.S.C. § 12101, *et seq.* (1990) (hereinafter “ADA”), as amended; 28 CFR 35 Subpart B

Public Rights-of-Way Accessibility Guidelines (hereinafter “PROWAG”), proposed by the U.S. Access Board (available online at <https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way>)

49 C.F.R. 27 (Nondiscrimination on the Basis of Disability in Programs and Activities Receiving or Benefitting From Federal Financial Assistance)

FHWA’s Memorandum Clarification of FHWA’s Oversight Role in Accessibility dated September 12, 2006

§ 43-2-135, C.R.S.

§ 43-2-107, C.R.S.

## III. APPLICABILITY

This Procedural Directive applies to all divisions, branches, regions and offices of CDOT and any entity that receives funding from CDOT for all Transportation Facilities, Building Facilities, other services, and all local agency projects that intersect with Colorado State Highways and interstates regardless of the funding source.

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#### **IV. DEFINITIONS**

“Accessibility Feature” shall mean the ADA-compliant features available in the CDOT M & S Standard Plans. The Project Manager must select the most appropriate plan design for the specific location of the Transportation Project from these options.

“Alteration” for the purpose of this Procedural Directive is a change that affects or could affect the usability of all or part of a building or a facility. Alterations of streets, roads, or highways include activities such as reconstruction, rehabilitation, resurfacing, widening, and projects of similar scale and effort. *See Appendix A and B (FHWA Technical Assistance Memorandum).*

“Building Facility” shall mean any building which a member of the public may be expected to enter.

“FHWA” shall mean the Federal Highway Administration.

“Maintenance Treatment” for the purpose of this Procedural Directive means a treatment that serves solely to seal and protect the road surface, improve friction, and control, splash and spray because they do not significantly affect the public’s access to or usability of the road. Some examples of the types of treatments that would normally be considered maintenance are: painting or striping lanes, crack filling and sealing, surface sealing, chip seals, slurry seals, fog seals, scrub sealing, joint crack seals, joint repairs, dowel bar retro fit, spot high-friction treatments, diamond grinding, and pavement patching. In some cases, the combination of several maintenance treatments occurring at or near the same time may qualify as an alteration and would trigger the obligation to provide curb ramps. *See Appendix A and B (FHWA Technical Assistance Memorandum).*

“Off System” shall mean any intersection that is not on a state highway or does not intersect with a state highway.

“On System” shall mean any intersection that is on or intersects with a state highway or interstate.

“Technically Infeasible” shall mean when constructing a new Transportation Facility or altering an existing Transportation Facility, CDOT or a local agency shall consider what Accessibility Features must be included within the scope of the project. Whether an Accessibility Feature is Technically Infeasible depends on if there is little likelihood of it being accomplished because existing structural conditions would require removing or altering a load-bearing member that is an essential part of the structural frame, or because other existing physical or site constraints prohibit modification or addition of elements, spaces, or features that are in full and strict compliance with the minimum requirements. If a determination has been made that an Accessibility Feature is Technically Infeasible, then CDOT or the local agency is required to construct the Accessibility Feature to the maximum extent practicable. The Project Manager, Project Engineer, Resident Engineer, and Program Engineer shall follow the procedure set forth in Section V of this Procedural Directive regarding the Curb Ramp Variance Support Document.

“Transportation Facility” shall mean, but may not be limited to, a highway or other roadway, contiguous or detached walkway, shared use pedestrian/bicycle path, sidewalk, curb ramp, street, underpass, overpass, compacted pathway or other enhancement project.

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“Transportation Project” or “Project” shall mean, but is not limited to, any CDOT or local agency project involving a highway or other roadway, contiguous or detached walkway, shared use pedestrian/bicycle path, sidewalk, curb ramp, street, underpass, overpass, compacted pathway or other enhancement project.

## **V. PROCEDURES**

### **A. Adoption of Public Rights-of-Way Accessibility Guidelines (“PROWAG”)**

CDOT has determined to adopt PROWAG standards regarding curb ramps, proposed by the U.S. Access Board.

### **B. ADA Transition Plan**

This Procedural Directive shall be read in conjunction with the CDOT ADA Transition Plan, which contains further requirements for compliance with ADA standards.

### **C. Alteration versus Maintenance Treatment on a Transportation Facility**

ADA requires state and local governments to provide accessible routes in the public right-of-way. When streets, roadways, or highways are altered, state and local governments must provide curb ramps or street level pedestrian walkways cross curbs. Maintenance Treatments that are considered to be maintenance rather than an Alteration are exempt from the requirement to install curb ramps. See definitions above for Alteration and Maintenance Treatment, and also Appendix A for clarification on addressing curb ramps.

### **D. New Construction of or Alteration to a Building Facility or Portion Thereof**

Any entity that receives funding from CDOT for any new construction or alteration to a Building Facility (i.e., a local agency, a private non-profit corporation, or a private contractor) must include Accessibility Features required by the authorities set forth herein. When applying these requirements, the engineer or other responsible person shall follow the applicable CDOT guidance.

### **E. Disproportionality**

The disproportionality exception set forth in 28 C.F.R. 35.151(b)(4)(iii)(A) does not apply to Transportation Projects. This section states that “alterations made to provide an accessible path of travel to the altered area will be deemed disproportionate to the overall alteration when the cost exceeds twenty percent of the cost of the alteration to the primary function area.” However, the disproportionality exception applies to Building Facilities.

### **F. Right-of-Way Acquisition**

Right-of-Way acquisition in general does not qualify as Technically Infeasible, as defined in this Procedural Directive. Right-of-Way shall be purchased if needed to make a ramp compliant. Case-

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by-case situations may be escalated to the Region Transportation Director who may consult with the Civil Rights and Business Resource Center for clarification and/or assistance.

### **G. Right-of-Way, Utility and Access Permits**

All right-of-way, access and utility permits shall be issued on the condition that the Permittee complies with the requirements of this Procedural Directive 605.1 and the applicable authorities set forth therein.

### **H. Responsibilities**

**1. CDOT Civil Rights and Business Resources Center (“CRBRC”).** The CRBRC shall be responsible for the following:

- a) In conjunction with the Federal Highway Administration (FHWA), Federal Transit Authority, and Federal Aviation Administration, interpreting the relevant federal ADA regulations for inclusion of requirements within the design and construction of CDOT Transportation Projects and Building Facilities.
- b) Upon request of a CDOT Project Manager or Project Engineer, reviewing project sites and project plans to identify where specific ADA requirements must be implemented.
- c) In conjunction with the Division of Project Support, coordinating ADA-related training for CDOT engineers and other appropriate staff, including appropriate written materials.
- d) As needed, reviewing design exceptions with the Project Manager, Project Engineer, and Resident Engineer.
- e) Making random evaluations of project designs, projects under construction, and/or completed projects.
- f) Developing and overseeing the process for data collection and management related to the ADA requirements set forth in this Procedural Directive and the CDOT ADA Transition Plan.

**2. Division of Project Support.** The Division of Project Support shall be responsible for the following:

- a) Developing and disseminating the current version of the CDOT M & S Standard Plans and bulletins that serve as guidance for CDOT engineers and other appropriate staff.
- b) As needed, reviewing design exceptions with the Project Manager, Project Engineer, and Resident Engineer.
- c) Working with the CRBRC in developing and presenting ADA-related training for

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CDOT engineers and other appropriate staff.

**3. Project Manager (Design) / Project Engineer (Construction).** The Project Manager / Project Engineer shall be responsible for the following:

- a) Evaluating each project through the project development and project scoping processes to determine which Accessibility Features are required, and adhering to the budget set forth by the Resident Engineer and Program Engineer.
- b) Incorporating ADA requirements into the design and construction of Transportation Projects, referring to CDOT plan details contained in the current version of the CDOT M & S Standard Plans, or by contacting the CDOT ADA Coordinator for guidance in situations where there is uncertainty of requirements.
- c) Preparing the Curb Ramp Variance Support Document for situations where curb ramps or other Accessibility Features cannot be installed without a significant deviation from the current CDOT M & S Standard Plans.
- d) Reviewing the Curb Ramp Variance Support Document with the Resident Engineer to seek approval from the Program Engineer.
- e) Providing documentation to the project file and to CRBRC that demonstrates compliance with all authorities set forth herein.
- f) Monitoring that the local agency completes the specified project(s) in accordance with this Procedural Directive and the authority set forth herein.
- g) Confirming that the design complies with all requirements of this Procedural Directive and the authorities cited herein.
- h) Submitting the signed Curb Ramp Variance Support Document to the CRBRC.

**4. Resident Engineer.** The Resident Engineer shall be responsible for the following:

- a) Determining the appropriate budget for required Accessibility Features by evaluating each project through the project development and project scoping processes.
- b) Providing guidance and consultation to the Project Manager or Project Engineer related to the Curb Ramp Variance Support Document to request approval from the Program Engineer.
- c) Confirming that the design complies with all requirements of this Procedural Directive and the authorities cited herein.
- d) Ensuring the local agency completes the specified project(s) in accordance with this Procedural Directive and the authority set forth herein, and not accepting the project at

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final project inspection until all such requirements have been met.

**5. Program Engineer.** The Program Engineer shall be responsible for the following:

a) Approving or denying the Curb Ramp Variance Support Document, including the budget associated with the Accessibility Feature.

b) Confirming that the design complies with all requirements of this Procedural Directive and the authorities cited herein.

**6. Maintenance Treatment Projects.** With regard to Maintenance Treatment Projects, the Maintenance Superintendents or Traffic Engineers shall consult with the ADA Coordinator to determine whether a Project that could be categorized as an Alteration is included in the 5 year (FY 2017-2022) ADA Curb Ramp Program initiative.

**7. Local Agency Agreement Projects.** CDOT personnel who work on local agency agreement projects shall ensure the local agencies comply with these requirements below.

a) For new construction, reconstruction, major rehabilitation, widening, and projects of similar scale and effect, including Safe Routes to School Program projects, projects in public parks, or projects that are not adjacent to a state highway, or other Transportation Projects which impact pedestrian facilities, the local agency must address Accessibility Features required by the authorities set forth herein.

b) Under the provision of 28 CFR § 35.130(b)(1)(v), CDOT is prohibited from providing significant assistance to any local agency that does not fulfill the requirements of Title II of the ADA.

c) In practice, FHWA interprets 28 CFR § 35.130(b) as a requirement that CDOT obtain an assurance of compliance from the local agency stating that the local agency will meet all applicable ADA requirements. CDOT shall enforce the local agency's assurance of compliance.

d) The agreement between CDOT and any local agency regarding the Transportation Project shall contain language clearly stating that the local agency shall comply with all applicable ADA requirements referenced in this Procedural Directive 605.1 and the CDOT ADA Transition Plan.

e) Appropriate CDOT staff on each project will ensure that the local agency designs the project(s) specified in the agreement according to the requirements of Procedural Directive 605.1 and the authority set forth therein.

f) In the course of completing Accessibility Features, the local agency will evaluate the areas adjacent to the newly-installed or retrofitted curb ramp and take reasonable steps to relocate signs or other obstacles when it is within the local agency's authority to do so.

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g) Local Agencies must meet or exceed PROWAG design and construction standards for curb ramps. If the Transportation Facility is Off System, CDOT may permit the local agency to utilize its own alternative specifications regarding curb ramps, detectible warning, and other accessibility designs provided it complies with either the PROWAG guidelines or the most current Americans with Disabilities Act Accessibility Guidelines (ADAAG). If the Transportation Facility is On System, the local agency must utilize CDOT's specifications for the intersection or intersections On System; however, the Local Agency may be granted the opportunity to utilize alternate specifications if it can demonstrate that the Department of Justice concurs with the Local Agency's alternate specifications, and CDOT approves the suitability of the alternate specifications. In order to seek approval, the Local Agency must comply with the following:

(1) Submit the alternate specification proposal concurrently to the CDOT Project Manager, Project Engineer, the Civil Rights and Business Resources Center, and Standards and Specifications Unit.

(2) Include documentation establishing why the local agency cannot meet the specific ADA requirement.

(3) Seek approval from the CDOT Project Manager, Project Engineer, the Civil Rights and Business Resource Center, and the Standards and Specifications Unit who shall jointly accept or deny the alternate specifications or may provide alternative options to meet the requirements of the applicable federal regulations and this Procedural Directive 605.1 to the maximum extent technically feasible.

h) CDOT shall not disburse final payment to the Local Agency until the Local Agency has complied with the requirements of this Procedural Directive with regard to the completion of a Transportation Project.

## **VI. FISCAL IMPACT**

A. CDOT will fund and complete required Accessibility Features using funds allotted to the project.

B. In the circumstance where a specific Transportation Project requires the purchase of right-of-way, an additional fiscal impact may result. Regardless of the fiscal impact, under current federal regulations, the right-of-way required to meet the requirements of this Procedural Directive must be acquired.

## **VII. DOCUMENTS REFERENCED**

Curb Ramp Variance Support Document (available on the CRBRC website)

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Public Rights-of-Way Accessibility Guidelines (“PROWAG”), available online at <https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way>

Department of Justice/Department of Transportation 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 (2013) (“FHWA Technical Assistance Memorandum”), attached hereto as Appendix B.

Glossary of Terms for DOJ/FHWA Joint Technical Assistance on the ADA Title II Requirements to Provide Curb Ramps When Streets Roads or Highways are Altered Through Resurfacing (2013), attached hereto as Appendix C.

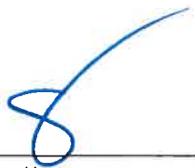
CDOT ADA Transition Plan, available online at:  
<https://www.codot.gov/business/civilrights/accessibility/ada>

**VIII. IMPLEMENTATION PLAN**

- A. This Procedural Directive shall become effective upon signature by the Executive Director.
- B. The Office of Policy and Government Relations shall post this Procedural Directive on CDOT’s internal website as well as on the CDOT Public Announcements.
- C. This Procedural Directive shall be implemented by the Civil Rights and Business Resources Center and the Division of Project Support, with the assistance of the Standards & Specifications Unit.
- D. The Civil Rights and Business Resources Center and the Division of Project Support, Standards & Specifications Unit, shall ensure within thirty (30) days that all CDOT divisions, branches, regions, and offices are aware of this Procedural Directive.

**IX. REVIEW DATE**

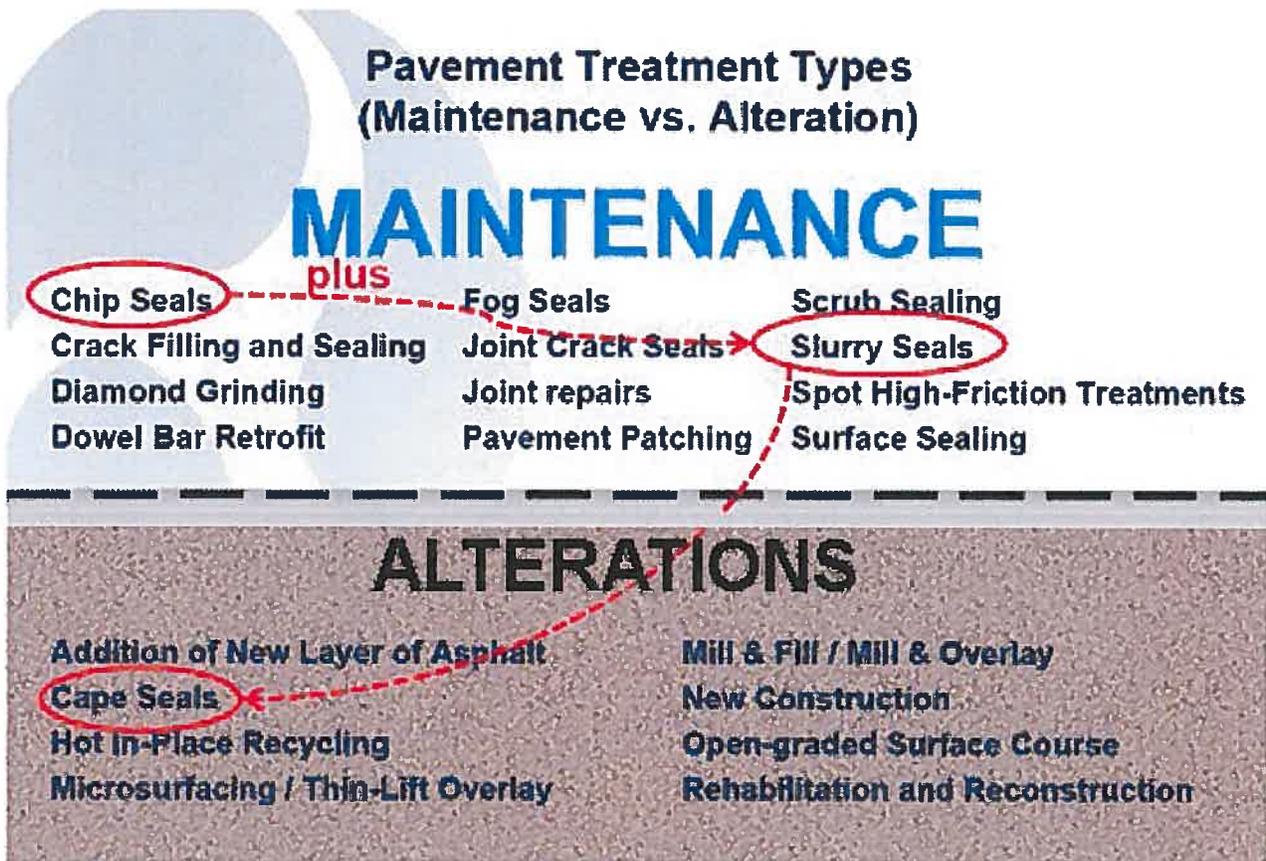
This Procedural Directive will be reviewed on or before February 2022.

  
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Shailen P. Bhatt  
Executive Director

3/31/17  
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Date of Approval

Appendix A

[Obtained from FHWA]



## Appendix B

U.S. Department of Transportation

# Federal Highway Administration

1200 New Jersey Avenue, SE

Washington, DC 20590

202-366-4000

## Civil Rights

## Civil Rights



U.S. Department of Justice  
Civil Rights Division  
*Disability Rights Section*



U.S. Department of Transportation  
Federal Highway Administration

### **Department of Justice/Department of Transportation Joint Technical Assistance<sup>1</sup> on the Title II of the Americans with Disabilities Act Requirements to Provide Curb Ramps when Streets, Roads, or Highways are Altered through Resurfacing**

Title II of the Americans with Disabilities Act (ADA) requires that state and local governments ensure that persons with disabilities have access to the pedestrian routes in the public right of way. An important part of this requirement is the obligation whenever streets, roadways, or highways are *altered* to provide curb ramps where street level pedestrian walkways cross curbs.<sup>2</sup> This requirement is intended to ensure the accessibility and usability of the pedestrian walkway for persons with disabilities.

An alteration is a change that affects or could affect the usability of all or part of a building or facility.<sup>3</sup> Alterations of streets, roads, or highways include activities such as reconstruction, rehabilitation, *resurfacing*, widening, and projects of similar scale and effect.<sup>4</sup> Maintenance activities on streets, roads, or highways, such as filling potholes, are not alterations.

Without curb ramps, sidewalk travel in urban areas can be dangerous, difficult, or even impossible for people who use wheelchairs, scooters, and other mobility devices. Curb ramps allow people with mobility disabilities to gain access to the sidewalks and to pass through center islands in streets. Otherwise, these individuals are forced to travel in streets and roadways and are put in danger or are prevented from reaching their destination; some people with disabilities may simply choose not to take this risk and will not venture out of their homes or communities.

Because resurfacing of streets constitutes an alteration under the ADA, it triggers the obligation to provide curb ramps where pedestrian walkways intersect the resurfaced streets. See *Kinney v. Yerusalim*, 9 F 3d 1067 (3rd Cir. 1993). This obligation has been discussed in a variety of technical assistance materials published by the Department of Justice beginning in 1994.<sup>5</sup> Over the past few years, state and local governments have sought further guidance on the scope of the alterations requirement with respect to the provision of curb ramps when streets, roads or highways are being resurfaced. These questions have arisen largely due to the development of a variety of road surface treatments other than traditional road resurfacing, which generally involved the addition of a new layer of asphalt. Public entities have asked the Department of Transportation and the Department of Justice to clarify whether particular road surface treatments fall within the ADA definition of alterations, or

whether they should be considered maintenance that would not trigger the obligation to provide curb ramps. This Joint Technical Assistance addresses some of those questions.

### **Where must curb ramps be provided?**

Generally, curb ramps are needed wherever a sidewalk or other pedestrian walkway crosses a curb. Curb ramps must be located to ensure a person with a mobility disability can travel from a sidewalk on one side of the street, over or through any curbs or traffic islands, to the sidewalk on the other side of the street. However, the 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.

### **When is resurfacing considered to be an alteration?**

Resurfacing is an alteration that triggers the requirement to add curb ramps if it involves work on a street or roadway spanning from one intersection to another, and includes overlays of additional material to the road surface, with or without milling. Examples include, but are not limited to the following treatments or their equivalents: addition of a new layer of asphalt, reconstruction, concrete pavement rehabilitation and reconstruction, open-graded surface course, micro-surfacing and thin lift overlays, cape seals, and in-place asphalt recycling.

### **What kinds of treatments constitute maintenance rather than an alteration?**

Treatments that serve solely to seal and protect the road surface, improve friction, and control splash and spray are considered to be maintenance because they do not significantly affect the public's access to or usability of the road. Some examples of the types of treatments that would normally be considered maintenance are: painting or striping lanes, crack filling and sealing, surface sealing, chip seals, slurry seals, fog seals, scrub sealing, joint crack seals, joint repairs, dowel bar retrofit, spot high-friction treatments, diamond grinding, and pavement patching. In some cases, the combination of several maintenance treatments occurring at or near the same time may qualify as an alteration and would trigger the obligation to provide curb ramps.

### **What if a locality is not resurfacing an entire block, but is resurfacing a crosswalk by itself?**

Crosswalks constitute distinct elements of the right-of-way intended to facilitate pedestrian traffic. Regardless of whether there is curb-to-curb resurfacing of the street or roadway in general, resurfacing of a crosswalk also requires the provision of curb ramps at that crosswalk.

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<sup>1</sup> The Department of Justice is the federal agency with responsibility for issuing regulations implementing the requirements of title II of the ADA and for coordinating federal agency compliance activities with respect to those requirements. Title II applies to the programs and activities of state and local governmental entities. The Department of Justice and the Department of Transportation share responsibility for enforcing the requirements of title II of the ADA with respect to the public right of way, including streets, roads, and highways.

<sup>2</sup> See 28 CFR 35.151(i)(1) (Newly constructed or altered streets, roads, and highways must contain curb ramps or other sloped areas at any intersection having curbs or other barriers to entry from a street level pedestrian walkway) and 35.151(i)(2) (Newly constructed or altered street level pedestrian walkways must contain curb ramps or other sloped areas at intersections to streets, roads, or highways).

<sup>3</sup> 28 CFR 35.151(b)(1).

<sup>4</sup> 2010 ADA Accessibility Standards, section 106.5.

<sup>5</sup> See 1994 Title II Technical Assistance Manual Supplement, Title II TA Guidance: The ADA and City Governments: Common Problems; and ADA Best Practices Tool Kit for State and Local Governments: Chapter 6, Curb Ramps and Pedestrian Crossings under Title II of the ADA, available at [ada.gov](http://ada.gov).

U.S. Department of Transportation

# Federal Highway Administration

1200 New Jersey Avenue, SE

Washington, DC 20590

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## Civil Rights

## Civil Rights

### **Glossary of Terms for DOJ/FHWA Joint Technical Assistance on the ADA Title II Requirements to Provide Curb Ramps When Streets Roads or Highways are Altered Through Resurfacing**

This glossary is intended to help readers understand certain road treatments referenced on page 2 of the DOJ/FHWA Joint Technical Assistance on the ADA Title II Requirements to Provide Curb Ramps When Streets Roads or Highways are Altered Through Resurfacing. The definitions explain the meaning of these terms from an engineering perspective and are provided in the order in which they appear in the Technical Assistance document.

#### **Treatments that are considered alterations of the road surface**

**Reconstruction** – Reconstruction refers to removing all or a significant portion of the pavement material and replacing it with new or recycled materials. This may include full-depth reclamation, where the pavement surface is demolished in place and new pavement surface is applied. In addition, reconstruction may also include grinding up a portion of the pavement surface, recycling it and placing it back, and then adding a wearing surface, such as in cold in-place asphalt recycling. Reconstruction often includes widening or geometrical changes to the roadway profile.

**Rehabilitation** – Rehabilitation refers to significant repairs made to a road or highway surface, including activities such as full slab replacement, filling voids under slabs (slabjacking), widening, and adding additional structural capacity.

**Open-graded surface course** – Open-graded surface course, also known as “open-graded friction course,” involves a pavement surface course that consists of a high-void, asphalt concrete mix that permits rapid drainage of rainwater through the course and off the shoulder of the road. The mixture consists of either Polymer-modified or rubber-modified asphalt binder, a large percentage of one-sized coarse aggregate, and a small amount of fibers. This treatment prevents tires from hydroplaning and provides a skid-resistant pavement surface with significant noise reduction.

**Microsurfacing** – Microsurfacing involves spreading a properly proportioned mixture of polymer modified asphalt emulsion, mineral aggregate, mineral filler, water, and other additives, on a paved surface. Microsurfacing differs from slurry seal in that it can be used on high volume roadways to correct wheel path rutting and provide a skid resistant pavement surface.

**Thin lift overlays** – Thin lift overlays are thin applications of mixtures of hot mix asphalt. Thin lift overlays may also require some milling along curbs, manholes, existing curb cuts, or other road structures to assure proper drainage and cross slopes.

**Cape seal** – A cape seal is a thin surface treatment constructed by applying a slurry seal or microsurfacing to a newly constructed chip seal. It is designed to be an integrated system where the primary purpose of the slurry is to fill voids in the chip seal.

**In-place asphalt recycling** – In-place asphalt recycling is a process of heating and removing around 1-2 inches of existing asphalt and remixing the asphalt with the addition of a binder additive and possible aggregate to restore the wearing surface for placement and compaction. All of this is performed in a train of equipment.

#### **Treatments that are considered maintenance of the road surface**

**Crack filling and sealing** – Crack filling and sealing involves placing elastomeric material directly into cracks in pavement.

**Surface sealing** – Surface sealing involves applying liquid sealant to pavement surface in order to stop water penetration and/or reduce oxidation of asphalt products. Sand is sometimes spread over liquid to absorb excess material.

**Chip seals** – Chip Seals involve placing graded stone (chips) on liquid emulsified asphalt sprayed on pavement surface. The surface is rolled to enable seating of chips.

**Slurry seal** – Slurry seals involve spraying a mixture of slow setting emulsified asphalt, well graded fine aggregate, mineral filler, and water on the pavement surface. It is used to fill cracks and seal areas of old pavements, to restore a uniform surface texture, to seal the surface to prevent moisture and air intrusion into the pavement, and to improve skid resistance.

**Fog seals** – Fog seals are a type of surface sealing.

**Scrub sealing** – Scrub sealing is type of surface sealing

**Joint crack seals** – Joint crack seals are usually associated with concrete pavement. This work consists of routing and cleaning existing cracks and joints and resealing to prevent water and non-compressibles from entering into the pavement joints and subgrade materials.

**Joint repairs** – Joint repairs are usually associated with concrete pavement. This work consists of selectively repairing portions of the pavement where the slabs are generally in good condition, but corners or joints are broken. The depth of the patch could be full depth or partial depth.

**Dowel retrofit** – Dowel retrofits are usually associated with concrete pavement. This work involves the installation of dowel bars connecting slabs in existing pavements. Pavement with dowel bar retrofits can have life extensions of as much as 20 years. Its application is almost exclusively on high-speed Interstate highways.

**Spot high-friction treatments** – Spot high-friction treatments involve using epoxy based resin liquids as a binder for an aggregate with high-friction properties. These are used in locations where drivers are frequently braking and the pavement surface has less resistance to slipping.

**Diamond grinding** – Diamond grinding involves using a gang saw to cut grooves in the pavement surface to restore smoothness and eliminate any joint faulting.

**Pavement patching** – Pavement patching involves selectively repairing portions of the pavement where the slabs are generally in good condition, but corners or joints are broken. The depth of the patch could be full depth or partial depth.