



How do we Accommodate People with Disabilities?

A thorough discussion of the impacts of recent federal rulings on ADA compliance and ODOT's plan to address deficient curb ramps

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ODOT Transportation Engineering Conference 2015

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Topics:

- Characteristics₍₁₆₎
- History/Background₍₃₎
- Standards₍₄₎
- ADA Transition Plan₍₁₁₎
- Fix-It ADA Funds₍₁₃₎
- Scoping₍₈₎
- Curb Ramps₍₁₃₎
- Wheelchair Testing₍₁₃₎

- **Your Questions:**
- Tolerances₍₇₎
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- Signal Pushbuttons₍₄₎
- Our Roles₍₇₎
- Design Exceptions₍₈₎
- Crossings₍₁₁₎
- Shared Use Paths₍₂₎
- Parking₍₃₎
- Temporary Trf Control₍₁₀₎



Who has a disability?

What percent of the U.S. population (age 15+) has a disability?

21.3% (2010 Census 51.5 Million)

70% will eventually have a temporary or permanent disability.



Physical Disabilities:

What percent ...
uses a
wheelchair?

1.5% (2010 Census 3.6 Million)

What percent ...
uses a cane,
crutches or a
walker?

4.8% (2010 Census 11.6 Million)

What percent ...
have difficulty
lifting and
grasping?

2.3% (2010 Census 7.6 Million)

What percent ...
have difficulty
climbing stairs?

12.6% (2010 Census 30.6 Million)



Communication Disabilities:

What percent ...
have vision
disabilities?

3.3% (2010 Census 8.1 Million)

0.8% Blind (2.0 Million)

4.4% (Vision Difficulty Oregon)

What percent ...
have hearing
disabilities?

2.3% (2010 Census 7.6 Million)

0.5% Deaf (1.1 Million)

4.1% (Hearing Difficulty Oregon)



Picture from NCHRP 117A

What percent ...
have difficulty having
their speech
understood?

1.2% (2010 Census 2.8 Million)



Cognitive Disabilities:

What percent ... have a cognitive (mental) disability?

6.3% (15.1 Million)

4.7% (Cognitive Difficulty Oregon)

What percent ... have Alzheimer's, senility or dementia?

1.0% (2.4 Million)



Picture from FHWA

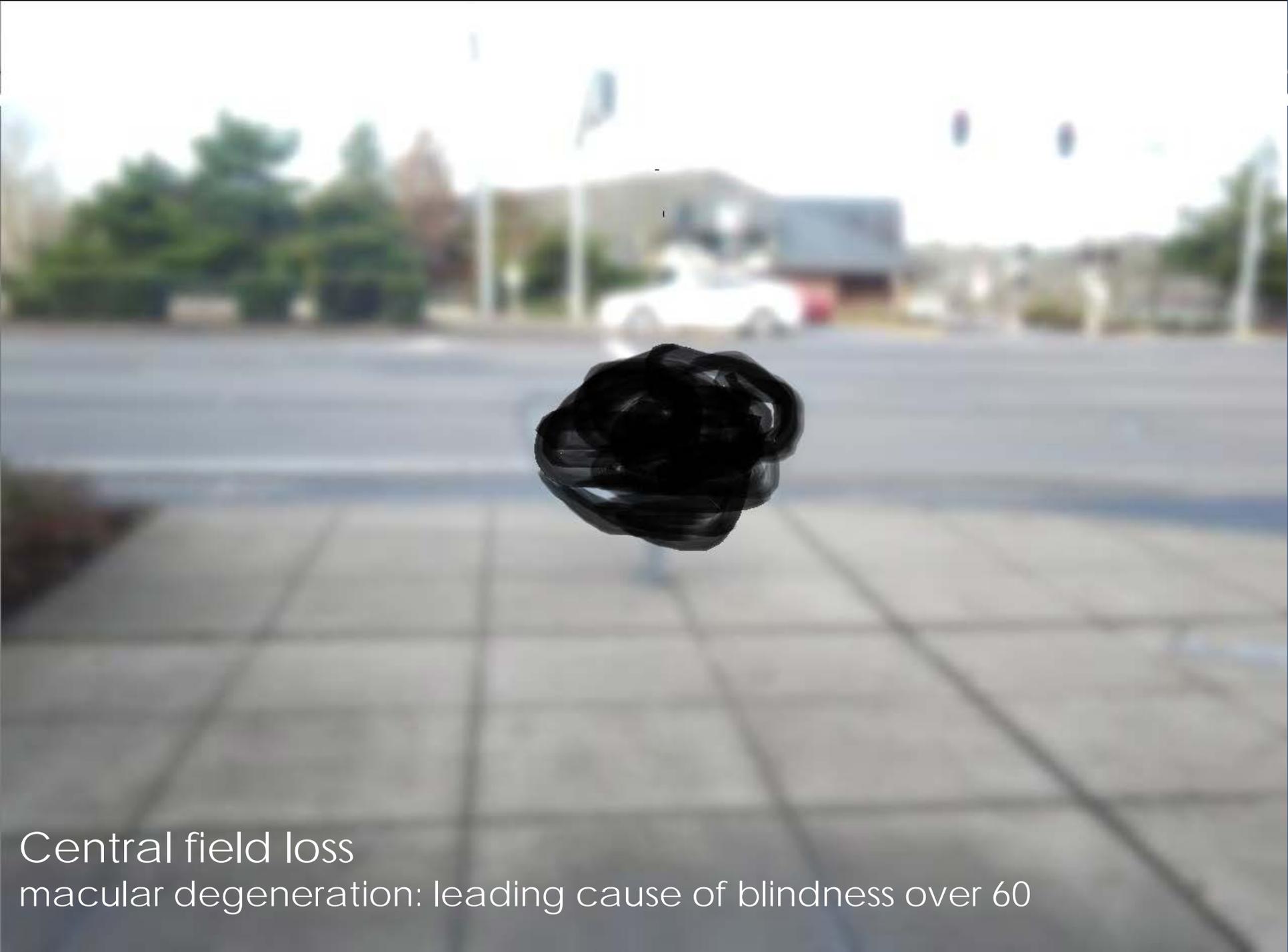
CROSSWALK
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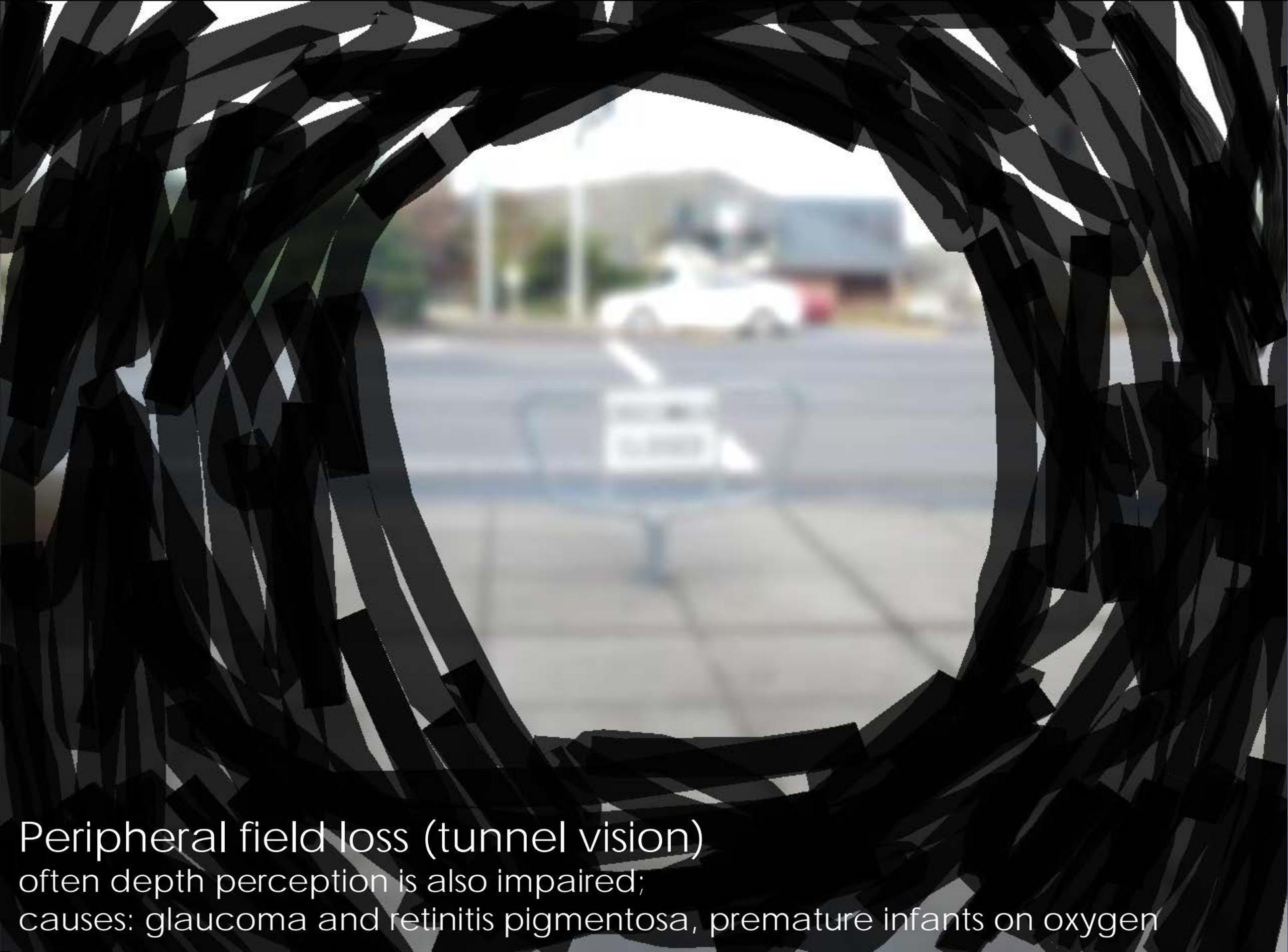


Reduced acuity

overall blur, sensitivity to glare, loss of contrast: common in elderly



Central field loss
macular degeneration: leading cause of blindness over 60



Peripheral field loss (tunnel vision)

often depth perception is also impaired;

causes: glaucoma and retinitis pigmentosa, premature infants on oxygen



Vision Disabilities

How do they travel?

- Sighted (human) guide
 - Orientation & Mobility Instruction
- White cane
- Dog guide
- Telescope or other low-vision aids
- No aid

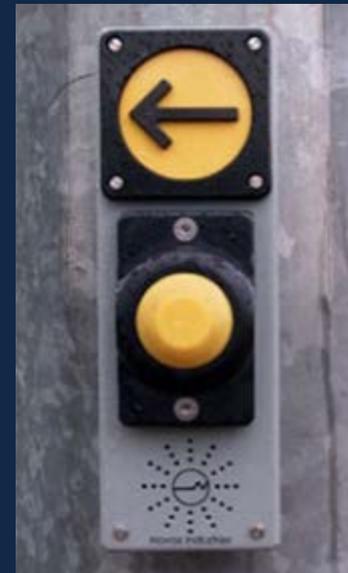


Vision Disabilities

Get information from sound, textures & contrast

They benefit from

- Audible/vibrotactile information
- Tactile indication of boundary
- Clearly defined pathways
- High color-contrasts





Vision Disabilities

Listening is not as specific as seeing

- Which lane is the car in?
- Loud car masks quiet one.
- Sound shadowed by objects & buildings

Tasks necessary to cross the street:

- Locate edge of street
- Determine traffic control & geometry
- Maintain alignment while crossing





Hearing Disabilities

Rely on vision

They benefit from

- Good sight lines for assessing street crossing conditions
- Information in visual or vibrotactile format



Cognitive Disabilities

Different processing & decision-making skills

They benefit from

- Straightforward, direct
- Uncomplicated street crossings
- Easy to understand symbols





Physical Disabilities

Limited agility, speed and endurance

They benefit from

- Firm, level surfaces
- Adequate clear width
- Limited cross slope

Curbs, stairs, etc. are barriers

- Stairs versus Longer Trip:
- Heart disease / Limited stamina

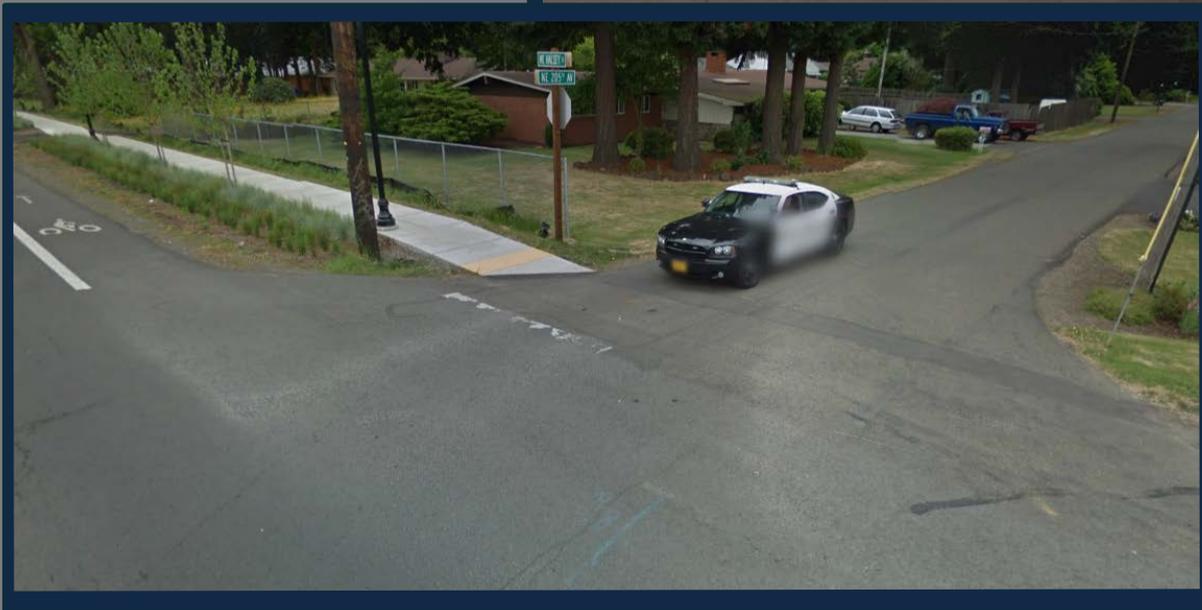
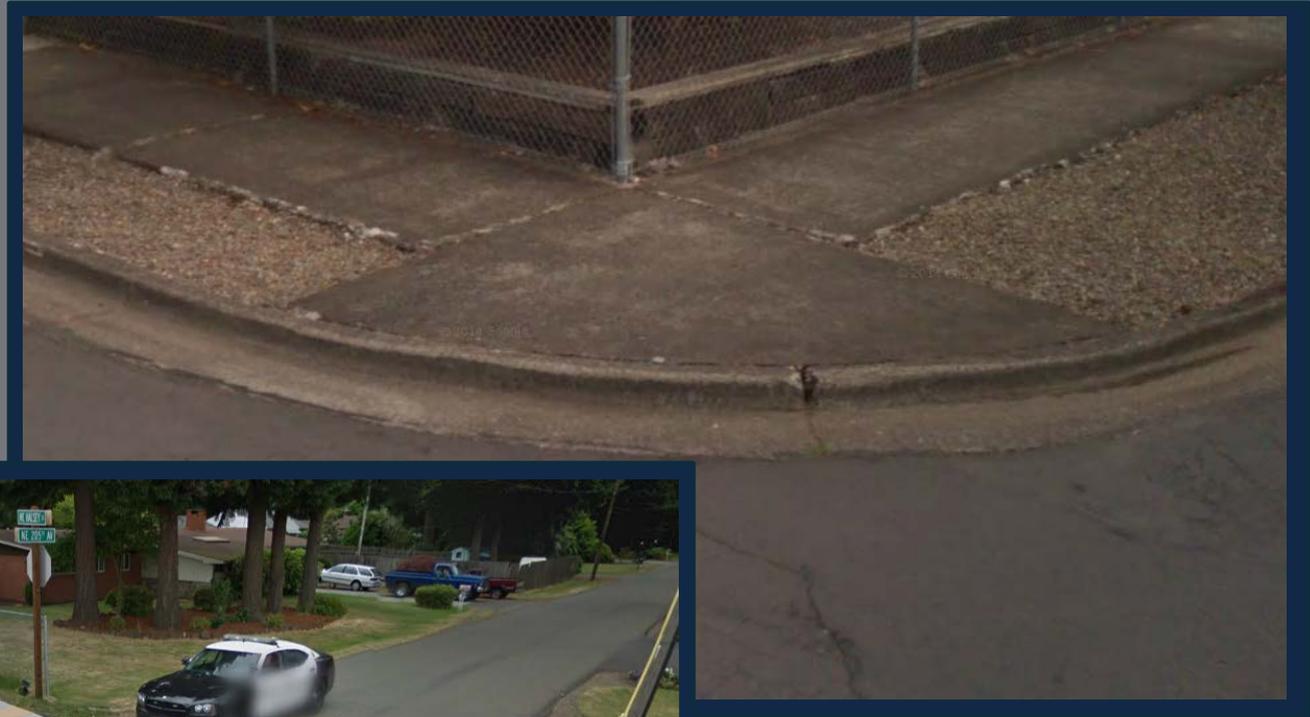


Engineering vs. Civil Rights

- Providing a service to some people, and excluding others is considered discrimination.
- A sidewalk is a service.
- A pushbutton triggering a walk signal is a service.



A sidewalk is a service



A pushbutton is a service





History/Background

- Architectural Barriers Act (1968)
 - If federal funds are used, it must be accessible.
- Rehabilitation Act (1973)
 - 1st requirement for curb ramps on Federal Aid projects
- Civil Rights Restoration Act (1987)
 - Recipients of federal funds, not just projects.
 - Rhodes City College vs. Bell: college students received federal aid
- Americans with Disabilities Act (1990)
 - Public & Private – regardless of funding



Five Titles of ADA

Title I Employment

Title II State & Local Governments

Title III Public Accommodations

(retail, commercial, sports complexes, movie theaters, et al)

Title IV Telecommunications

Title V Misc., including requirements for the U.S.
Access Board to develop **design guidelines**



Guidelines & Standards

<http://www.access-board.gov/guidelines-and-standards>

Communications & IT

Buildings & Sites

- 1991 ADAAG
- 2010 ADAAG
- ABA Standards

Recreation Facilities

- 2013 AGODA

Streets & Sidewalks

- PROWAG 2005
- PROWAG 2011
- PROWAG 2013

Transportation (Transit)

Healthcare



Guidelines & Standards

FHWA is responsible for implementation of **pedestrian access** requirements. DOJ is responsible for making them legally binding.

Standards adopted by USDOT & USDOJ & written into CFR

- 1991 ADA Accessibility Guidelines (ADAAG)
- 2010 ADA Standards for Accessible Design





Guidelines & Standards



FHWA Memorandum January 23, 2006:

...[PROWAG] are not standards until adopted by the [USDOJ & USDOT]. The present standards to be followed are the ADA Accessibility Guidelines (ADAAG) standards. However, the Draft Guidelines are the currently recommended best practices, and can be considered the state of the practice that could be followed for areas not fully addressed by the present ADAAG standards...

http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/accessibility_guidance/prwaa.cfm



Guidelines & Standards

ADAAG 2.2 – Equivalent Facilitation

Departures from particular technical and scoping requirements of this guideline by the use of other designs and technologies are permitted where the alternative designs and technologies used will provide **substantially equivalent or greater access to and usability of the facility.**

PROWAG is accepted by the courts.

Ultimately, we are to use best effort to make it accessible.



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Title II Requirements for State & Local Governments

- Designate an ADA Coordinator
- Development & postings of an ADA Policy Statement
- Development & postings of Grievance Procedures/Complaint Procedures
- Complete a self-evaluation
- Development of a Transition Plan



ADA Transition Plan

- Identify/list physical obstacles with location
- Describe in detail methods (funding, project list) to make the facilities accessible
- Provide a schedule to complete all access modifications



ADA Self-Evaluation

- Self-Evaluation (1993, 1995, 2003, 2011)
 - Owned/Leased Buildings
 - Accommodations for Employees with Disabilities
 - Curb Ramps
 - Parking Areas
 - Sidewalks
 - Shared Use Paths
 - Accessible Pedestrian Signals
 - Transit Stops



ADA Self-Evaluation

1995 Ramp Inventory

5,042 Priority 1 Ramps Needed Statewide

- Schools, public libraries, state & local government offices, hospitals, cemeteries, parks & recreational facilities, and social services (e.g., day care, senior services, etc.)

Estimated Cost: \$3.1 million

Budgeted \$600K/biennium to complete in 10 years.



ADA Self-Evaluation

2011 Ramp Inventory

6,764 Intersections, 27,566 corners

19,938 Ramps Warranted Statewide

- 1,668 Ramps Fully Compliant (9.8%)
- 2,200 Ramps Missing Truncated Domes (13.0%)
- 9,588 Ramps Not Compliant (56.6%)
- 3,482 Corners Missing Curb Ramps (20.6%)

Estimated Cost: \$24-35 million



ADA Ramp Fix-It Funds

- \$1 million Per Year beginning in FY 16
 - Strategy: Special Transportation Areas
 - Estimated 3 Years to Complete STAs

Layer Catalog Legend What's New

Layer Catalog

- Structures
- Drainage
- Equipment - Highway
- Roadway
- Roadside
- Freight
- Rail
- Public Transit
- Road Network
- Classifications
- Traffic Data
- Safety
- Projects & Needs for Scoping

ADA Ramp Needs

-  ADA Compliant - Except TD
-  Not Compliant with ADA
-  Missing Needed Ramps

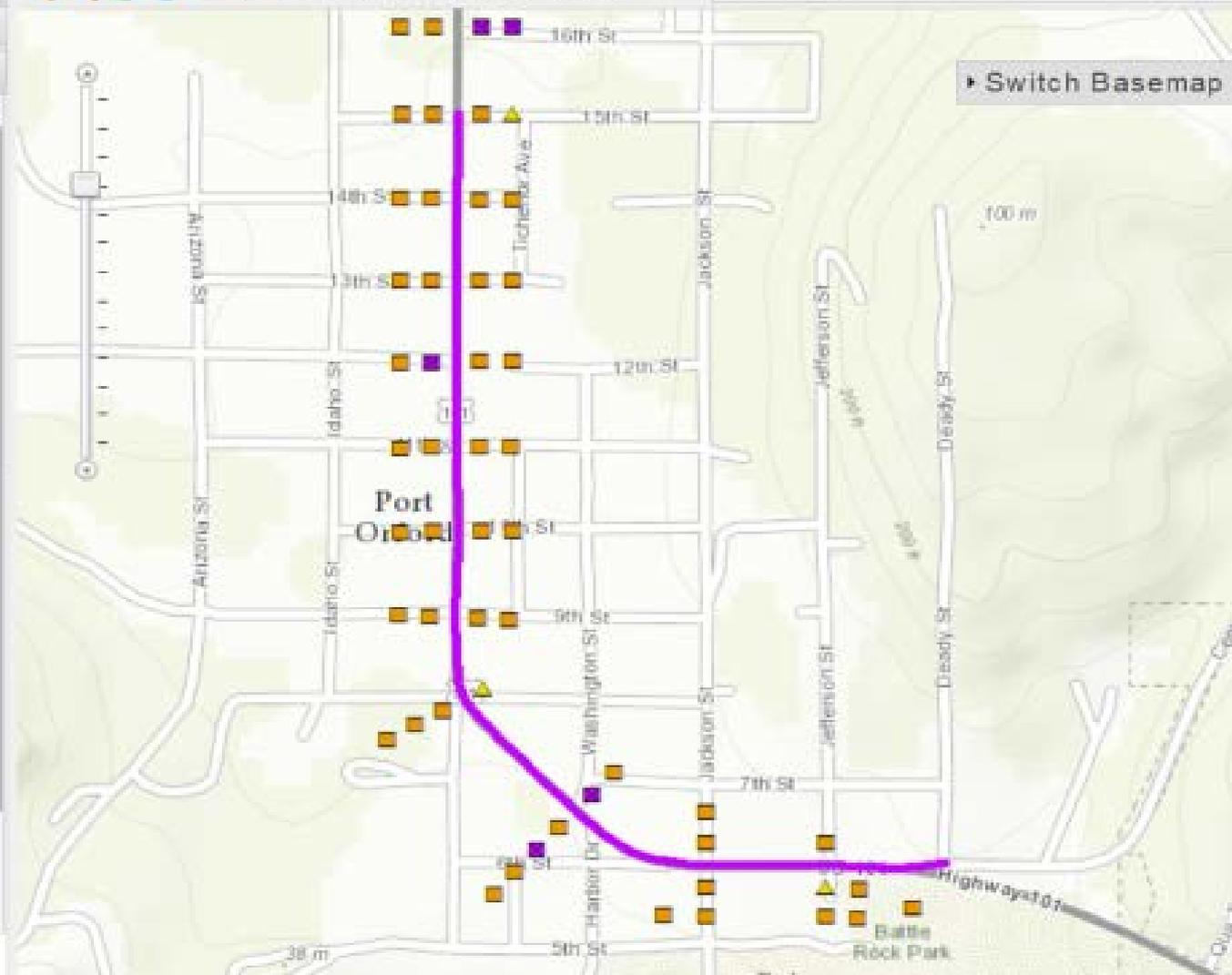
Safety Scoping Projects

- 

STIP 2012-2015 Segments Draft

Display | Go To | Analysis | Landmarks: <enter search text here>

Switch Basemap



0 549 feet



ADA Ramp Fix-It Funds

- FY 16-17-18 - Scoped
 - 938 curb ramp upgrades scoped
 - 194 ramps to retrofit with truncated domes
- FY 19-20-21 - to be scoped soon
 - 771 curb ramps remaining
 - 183 ramps to retrofit with truncated domes



Scoping

- Curb ramps
 - Any alteration project
- Everything else: PROWAG R201.1
 - All **newly constructed** facilities, **altered portions** of existing facilities, and **elements added** to existing facilities for pedestrian circulation and use located in the public right-of-way shall comply with the requirements in this document.



DOJ/FHWA Joint Technical Assistance

DOJ/DOT on Requirements to Provide Curb Ramps when Streets, Roads, or Highways ar... Page 1 of 2



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 Assistance¹ 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.² 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.³ Alterations of streets, roads, or highways include activities such as reconstruction, rehabilitation, *resurfacing*, widening, and projects of similar scale and effect.² 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. Yerusalem*, 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 1994.² 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?

Pavement Treatment Types

(Maintenance vs. Alteration)

MAINTENANCE

Potholes

**Prior to
DOJ/DOT
Agreement**

ALTERATION

Everything Else

(besides potholes)

Pavement Treatment Types

(Maintenance vs. Alteration)

MAINTENANCE

Chip Seals

Fog Seals

Scrub Sealing

Crack Filling and Sealing

Joint Crack Seals

Slurry Seals

Diamond Grinding

Joint repairs

Spot High-Friction Treatments

Dowel Bar Retrofit

Pavement Patching

Surface Sealing

ALTERATION

Addition of New Layer of Asphalt

Mill & Fill / Mill & Overlay

Cape Seals

New Construction

Hot In-Place Recycling

Open-graded Surface Course

Microsurfacing / Thin-Lift Overlay

Rehabilitation and Reconstruction

Pavement Treatment Types

(Maintenance vs. Alteration)

MAINTENANCE

Chip Seals

Crack Filling and Sealing

Diamond Grinding

Dowel Bar Retrofit

Fog Seals

Joint Crack Seals

Joint repairs

Pavement Patching

Scrub Sealing

Slurry Seals

Spot High-Friction Treatments

Surface Sealing

plus

ALTERATION

Addition of New Layer of Asphalt

Cape Seals

Hot In-Place Recycling

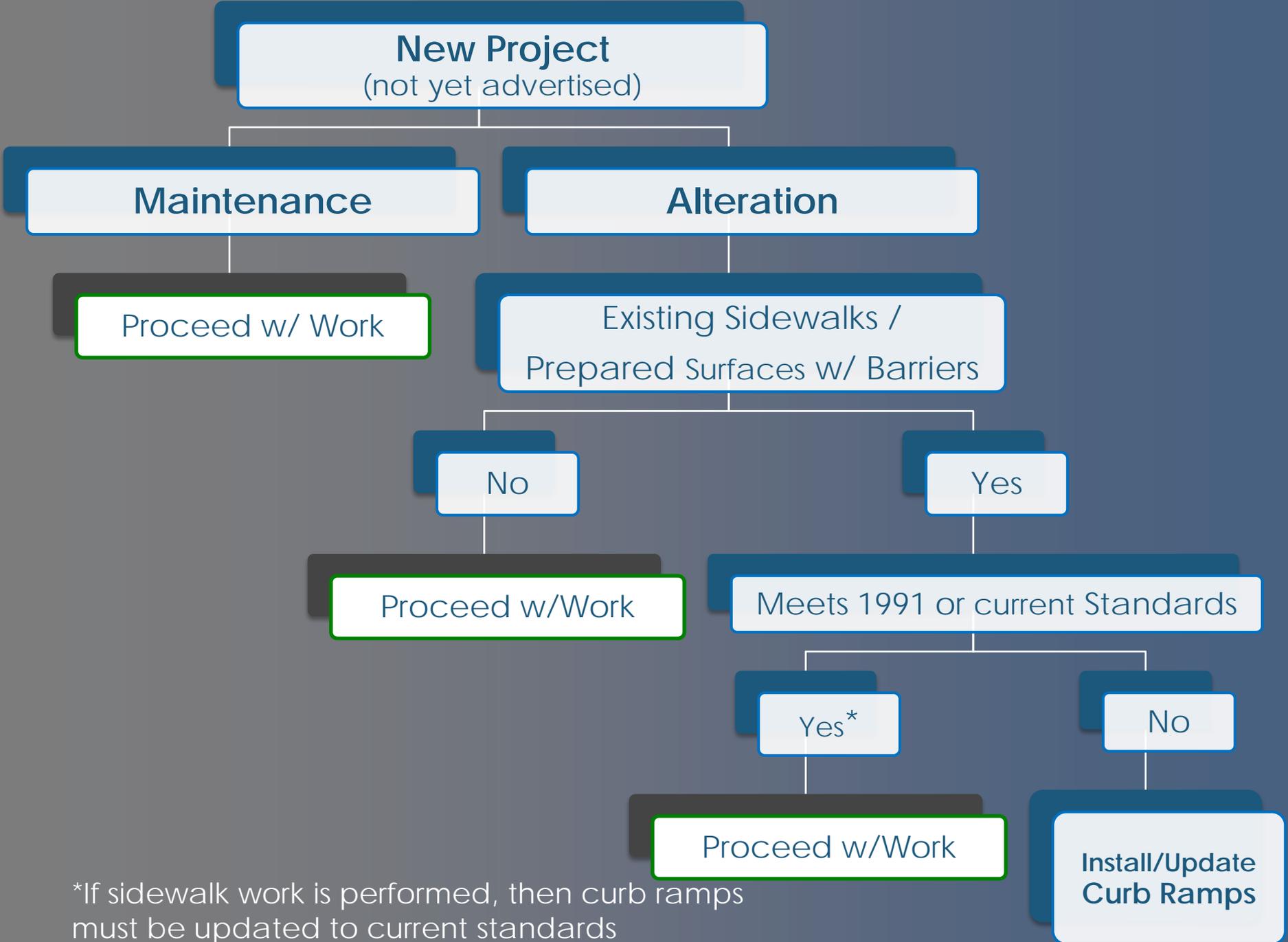
Microsurfacing / Thin-Lift Overlay

Mill & Fill / Mill & Overlay

New Construction

Open-graded Surface Course

Rehabilitation and Reconstruction



*If sidewalk work is performed, then curb ramps must be updated to current standards



1R Projects

- Install New Ramps and Replace Ramps that do not meet the 1991 ADA Standard
- Keep track of 1991-compliant ramps that were not upgraded
- “Child” Projects can be Programmed to Follow-up and Address those Deficient Ramps which require Right-of-Way
- 1R Roadside Inventories update 8 evaluation criteria data fields to Identify whether ramps not meet the 1991 ADA Standard.



ADA Ramp Evaluation Criteria

Attribute	Values	Meaning	Complies with:	Definition:
1. Running Slope	C NC	Compliant Not Compliant	1991 & 2011 Not Compliant	1:12 (8.3%) or less More than 1:12
2. Counter Slope	C NC	Compliant Not Compliant	1991 & 2011 Not Compliant	1:20 (5%) or less More than 1:20
3. Cross Slope	C NC	Compliant Not Compliant	1991 & 2011 Not Compliant	1:50 (2%) or less More than 1:50
4. Lip Height	C NC	Compliant Not Compliant	1991 & 2011 Not Compliant	¼ inch or less More than ¼ inch
5. Detectable Warning	C NC	Compliant Not Compliant	2011 1991	Truncated Domes No truncated domes
6. Clear Width	C CC NC	Compliant Conditionally Compliant Not Compliant	2011 1991 Not Compliant	4' clear of obstructions 3' clear of obstructions Less than 3' clear of obstructions
7. Level Landing	C NC	Compliant Not Compliant	2011 1991	4' x 4' landing or turning space No landing
8. Slope Differential	C NC	Compliant Not Compliant	2011 1991	Difference in slope 11% or less More than 11%

*The 2011 Public Rights-of-Way Accessibility Guidelines (with its 2013 supplement) represent ODOT's current standard.



1. Running slope

1991 Standard: 8.3% Max. (1:12)

2011 Standard: 8.3% Max. (1:12)





1. Running slope

1991 Standard: 8.3% Max. (1:12)

2011 Standard: 8.3% Max. (1:12)





2. Counter Slope

1991 Standard: 5% Max. (1:20)

2011 Standard: 5% Max. (1:20)





2. Counter Slope

1991 Standard: 5% Max. (1:20)

2011 Standard: 5% Max. (1:20)





3. Cross Slope

1991 Standard: 2% (1:50)

2011 Standard: 2% (1:50)

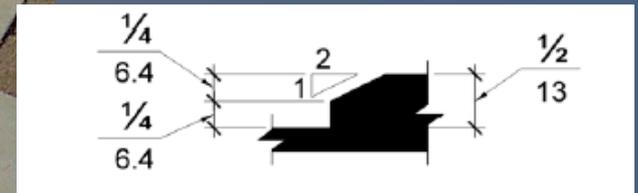
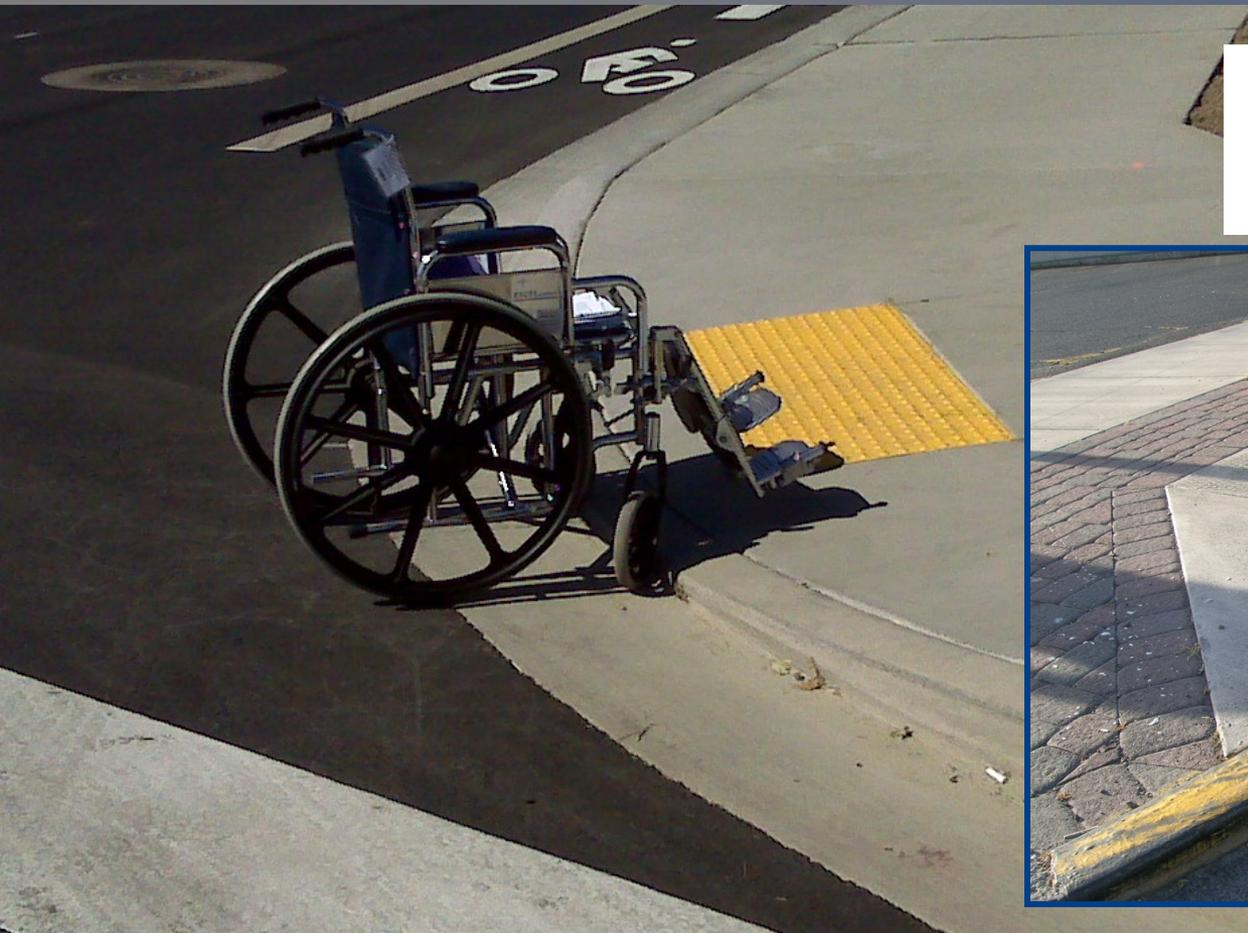




4. Lip height at the end of the ramp

1991 Standard: ¼" Max Vertical (1/2 inch if beveled at 1:2)

2011 Standard: ¼" Max Vertical (1/2 inch if beveled at 1:2)





5. Truncated Domes at base of ramp

1991 Standard: not required; suspended for research

2011 Standard: truncated domes along full width of lowered curb





5. Truncated Domes at base of ramp

1991 Standard: not required; suspended for research

2011 Standard: truncated domes along full width of lowered curb





6. Clear Width

1991 Standard: 3' clear of obstacles

2011 Standard: 4' clear of obstacles





7. Level Landing (turning space)

1991 Standard: N/A

2011 Standard: 4' x 4' turning space with $\leq 2\%$ slope in both directions; 4' x 5' if against curb or other constraint



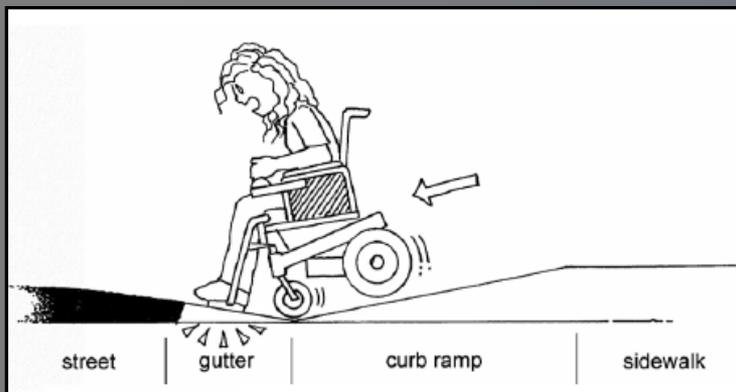


8. Slope Differential

1991 Standard: N/A

2011 Standard: N/A

AASHTO Pedestrian Guide: 11%



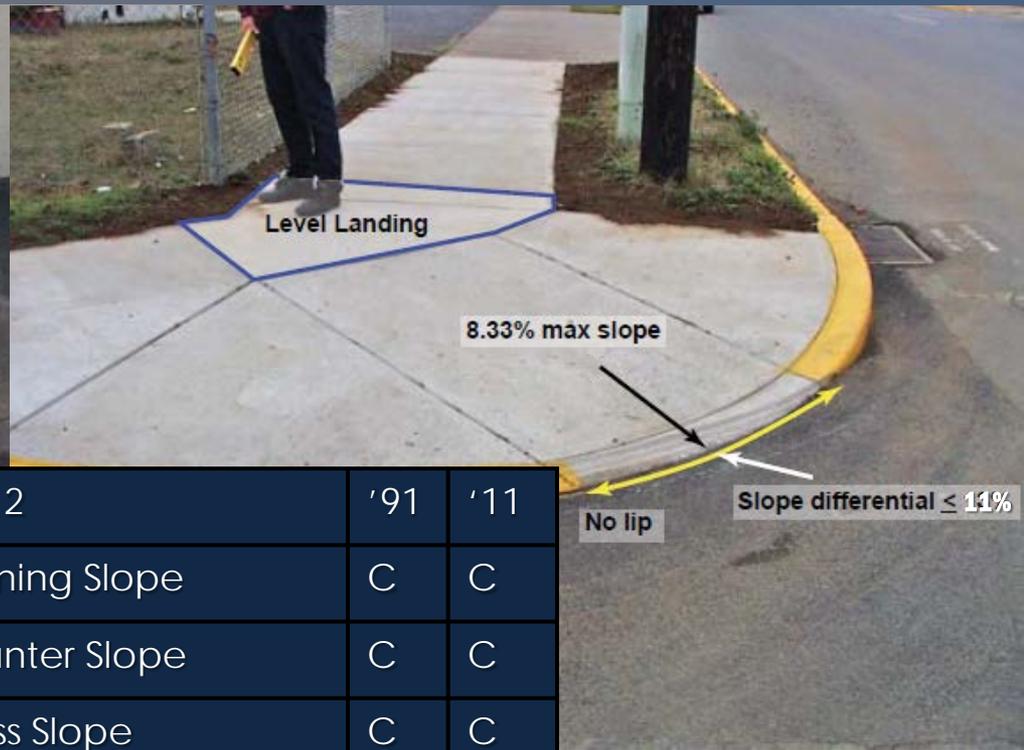
If change in grade between ramp and street or gutter $\geq 11\%$, add 2' level strip.

Designing Sidewalks and Trails for Access, 7.3.7 page 7-29

$8.3\% \text{ ramp} + 5\% \text{ street/gutter} = 13.3\%$; Standard = 11%



Oregon Department of Transportation: A Century of Service



Ramp 1	'91	'11	Ramp 2	'91	'11
1. Running Slope	C	C	1. Running Slope	C	C
2. Counter Slope	C	C	2. Counter Slope	C	C
3. Cross Slope	C	C	3. Cross Slope	C	C
4. Lip Height	C	C	4. Lip Height	C	C
5. Detectable Warning	---	C	5. Detectable Warning	---	NC
6. Clear Width	CC	NC	6. Clear Width	C	C
7. Level Landing	---	NC	7. Level Landing	---	C
8. Slope Differential	---	C	8. Slope Differential	---	C

Topics

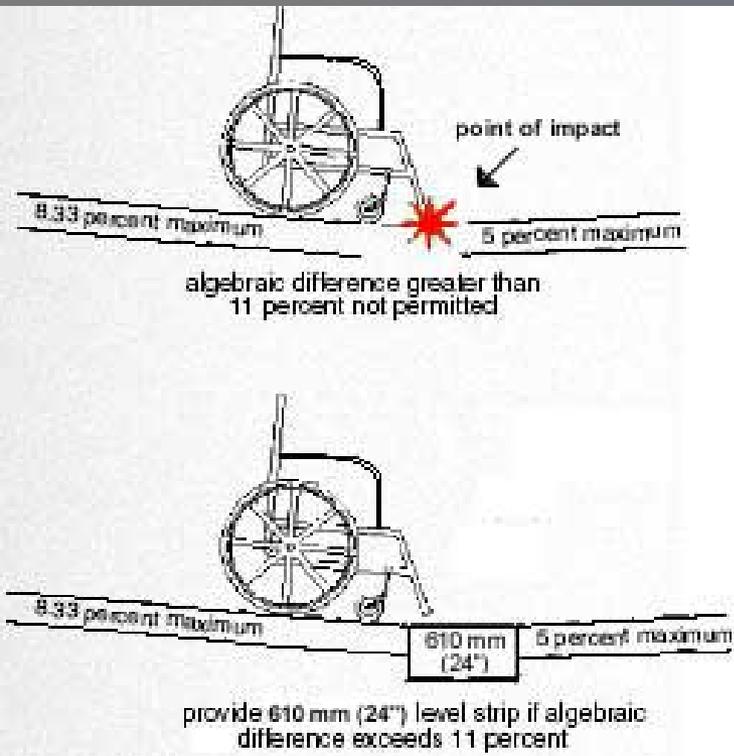


Gutter too Steep





Change in Grade

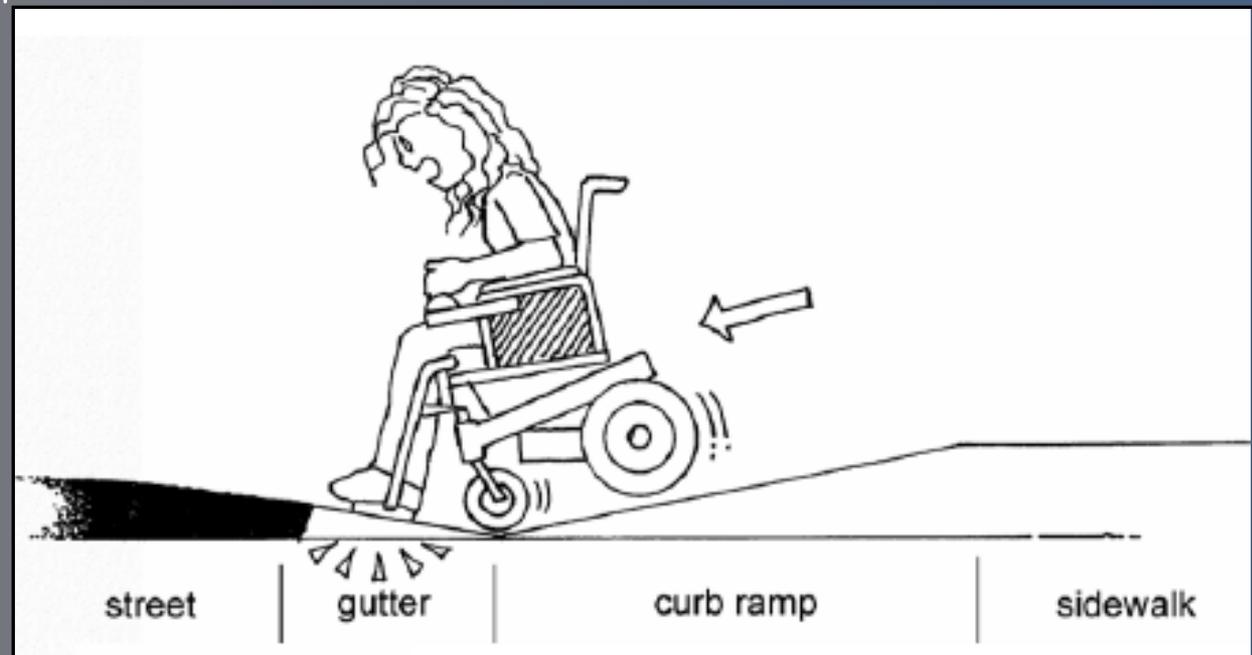


Considering the needs of
change of grade can be
over a 24" interval, which
is the approximate length of a
gait pace and the base of
assistive devices such as
canes or walkers.



Gradual Change

- Transitions should have minimum grade changes (less than 11%) for a gradual transition for wheelchair users.
- Grade changes that happen over a short interval, such as between the gutter and ramp, can cause wheelchair users to fall forward.





Impacts of Change

Footrests & anti-tip wheels:

- Footrests are low to the ground & extend beyond the front casters.
- Anti-tip wheels are in back, behind the rear axle, to improve stability.
- Both limit clearance height of the wheelchair.
- Both extend beyond the wheelbase
- Either may contact the surface across the transition point from where the wheels are located.



Impacts of Change

Increased risk of tipping if the wheelchair user is traveling with speed.

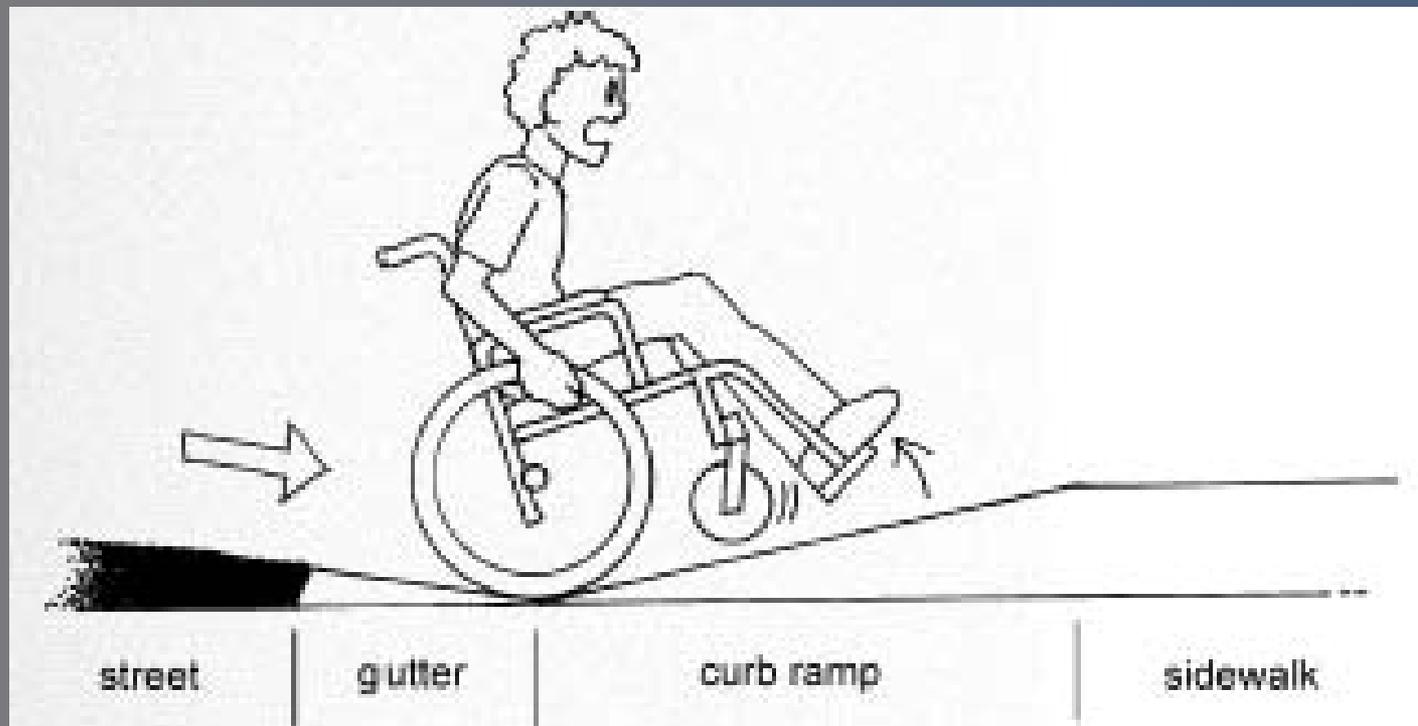
If the footrests catch on the ground, the wheelchair will come to an abrupt stop; the forward momentum of the individual and wheelchair is interrupted and can cause the wheelchair user's upper body to fall forward or can cause the user and the wheelchair to tip forward.

If the user moves quickly through the change in grade, without compromising the ground clearance of the wheelchair, the dynamic stability of the wheelchair may still be compromised. Dynamic stability can be compromised because the momentum of the wheelchair will rotate backwards as the wheelchair climbs up the gutter slope. If there is a severe change in grade, this may cause the wheelchair to tip over backwards. Any amount of height transition such as lips between the curb ramp and the gutter can further contribute to the stability problems experienced by wheelchair users.



Impacts of Change

Grade changes that happen over a short interval, such as between the gutter and ramp, can cause wheelchairs to flip over backwards.





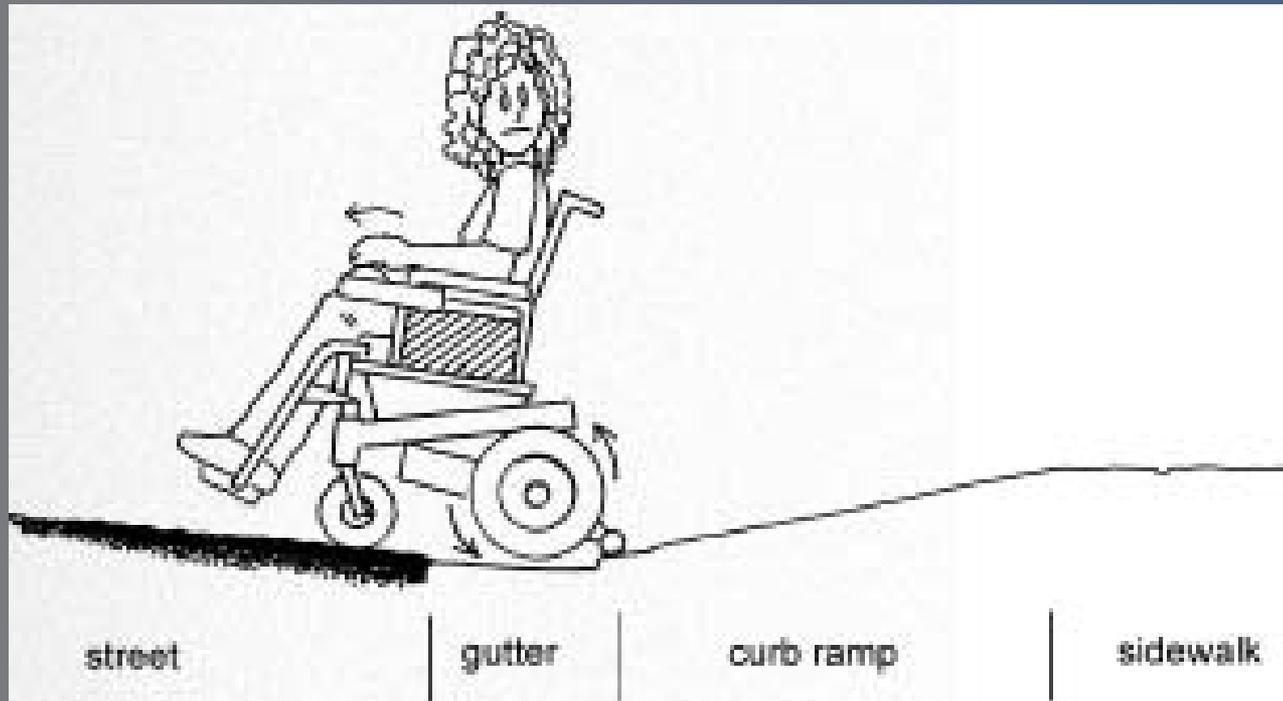
Impacts of Change





Impacts of Change

Anti-tip wheels and devices in the back bottom of the wheelchair can get caught when traveling over a significant change in grade.





Impacts of Change

Wheelchair driven
by wheel, which if
off the ground –
does not function.

Wheel spinning



Recommendations

In order to avoid difficult or potentially hazardous changes in grade, sidewalks and curb ramps should be designed with gradual grade changes whenever possible. Where abrupt changes are required, the difference in grade between adjacent surfaces should be minimized. **The exact change of grade that will be problematic varies among wheelchair users and is dependent on a variety of factors including the design of the wheelchair and the speed at which the user is traveling.** Additional research is needed to provide a more comprehensive evaluation of the impact of change of grade on wheelchair users.



Recommendations

- The maximum recommended change of grade is 11%. Whenever possible, sidewalks and curb ramps should be designed with a maximum grade change that is less than 11% to ensure that the maximum grade change between the installed surfaces will remain less than 11% after street resurfacing or other roadway maintenance activities. Change of grade can be minimized by an addition of 9" of 2% ramp and 9" of 2% gutter. 18" of gradual change of grade can prevent wheelchair users from flipping forward or backward.



Recommendations

- Overlaying existing asphalt without milling away the old asphalt can create steep slopes on either side of the centerline.





Street Resurfacing

- The manner in which streets are maintained significantly impacts the slope of the curb ramp approach from the street. Asphalt is an economical and durable material used to pave most roads. In the past, repairing damage to asphalt roads typically entailed overlaying the existing pavement with more asphalt. Then, as the asphalt layers built up, the roadway crown created steep slopes on either side of the centerline. This also created an abrupt transition between the gutter and the asphalt surface. These slopes significantly exaggerate the intended change of grade



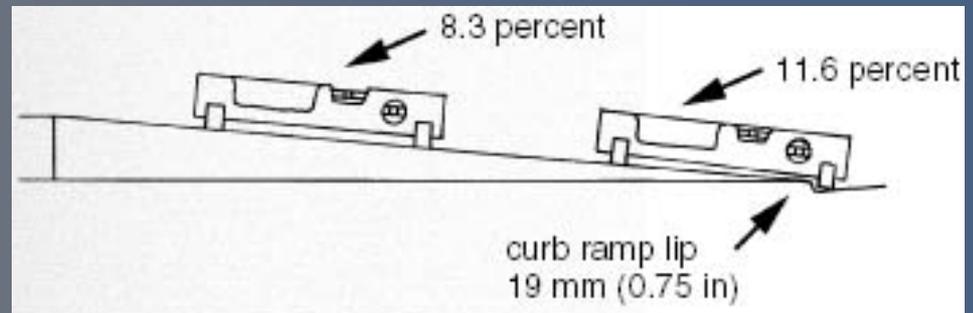
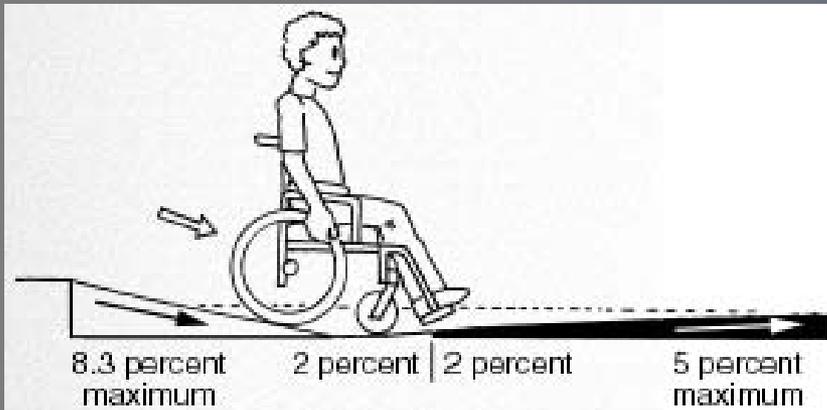
Street Resurfacing

When resurfacing is done to a road, access improvements must be made to the curb ramp and driveway crossings that are adjacent to the roadway surface. The Department of Justice mandates that "resurfacing beyond normal maintenance is an alteration" (U.S. Department of Justice, 1994a). In contrast to maintenance activities, alterations such as resurfacing trigger the requirements to provide accessibility improvements such as curb ramps.

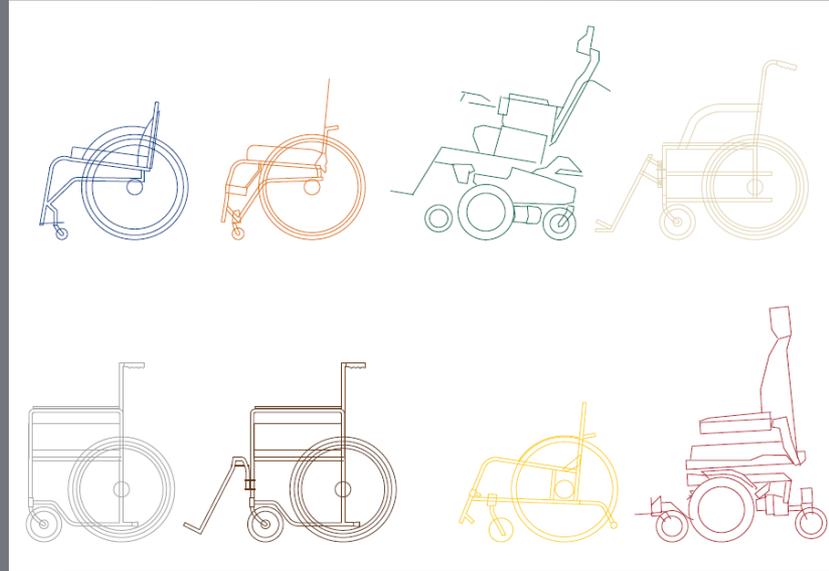


Street Resurfacing

- Figure 7-24. Milling away asphalt before resurfacing results in a smooth transition between curb ramps, gutters, and streets.

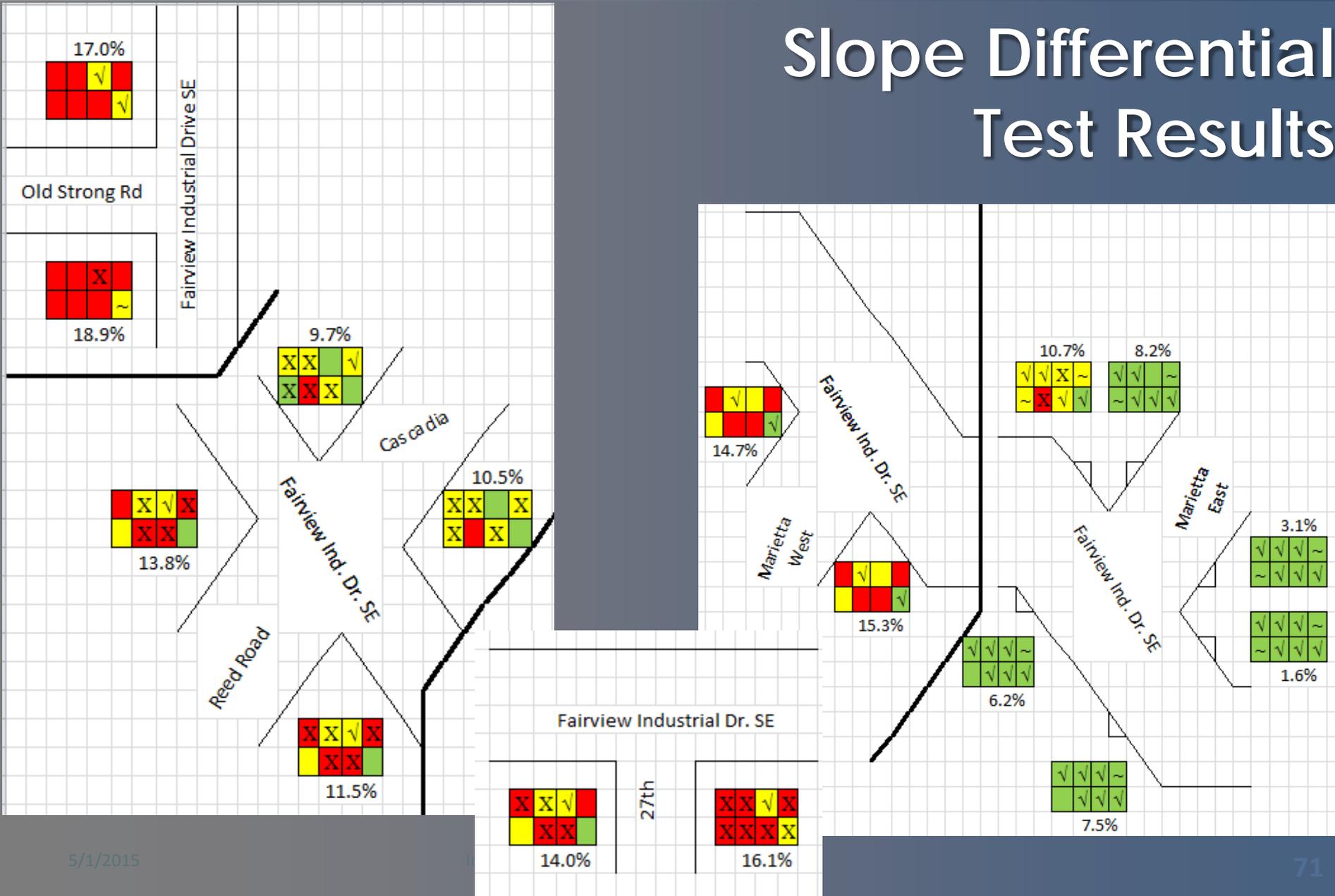


- The actual slope a wheelchair user will have to negotiate on an 8.3% slope with a $\frac{3}{4}$ " lip is 11.6%.





Slope Differential Test Results





Conclusion

- 11% works for more wheelchairs than 13.3%.
- In order to work for all wheelchair, slope differential should be 8%-9%

		chair								
		1	2	3	4	5	6	7	8	
slope differential	1.6%	✓	✓	✓	~	~	✓	✓	✓	
	3.1%	✓	✓	✓	~	~	✓	✓	✓	
	6.2%	✓	✓	✓	~		✓	✓	✓	
	7.5%	✓	✓	✓	~		✓	✓	✓	
	8.2%	✓	✓		~	~	✓	✓	✓	
	9.7%	X	X		✓	X	X	X		
	10.5%	X	X		X	X	X	X		
	10.7%	✓	✓	X	~	~	X	✓	✓	
	ODOT's standard = 11%									
	11.5%	X	X	✓	X		X	X		
	8.3% + 5.0% = 13.3% (PROWAG)									
	13.8%		X	✓	X		X	X		
	14.0%	X	X	✓			X	X		
	14.7%		✓						✓	
	15.3%		✓						✓	
16.1%	X	X	✓	X	X	X	X	X		
17.0%			✓					✓		
18.9%			X					~		