Designing an Accessible Pedestrian Network for All

Northwest Universal Design Council Meeting
Mike Shaw, SDOT ADA Coordinator
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Our mission, vision, and core values

Mission: deliver a high-quality transportation system for Seattle

Vision: connected people, places, and products

Committed to 5 core values to create a city that is:
• Safe
• Interconnected
• Affordable
• Vibrant
• Innovative

SDOT Presenters

• Mike Shaw, SDOT ADA Coordinator
• John Ricardi, Associate Civil Engineer
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Questions?
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Presentation Overview

• What is an “Accessible Pedestrian Network?”

• Sidewalks, curb ramps, street crossings, pedestrian facilities
• SDOT’s role: public right-of-way, not generally transit (King County Metro or Sound Transit)
Presentation Overview

- Who benefits from an Accessible Pedestrian Network?
- Universal Design: safer, easier, and more convenient for everyone
- "ADA +" (not just about designing to the required standard)
- "Inclusive Design" with outreach and community input
- Challenges and Solutions: Providing Access for All

Accessible Sidewalks / Routes

- Adequate Clear Width
- Slope of Sidewalk (Running and Cross)

Accessible Sidewalks / Routes

Surface Requirements
(Smooth, Level)

Clear Headroom
And Detectability

*Protruding Objects*

Sidewalk Challenge:
No Existing Sidewalk

Considerations:
- Neighbourhoods may have been developed without sidewalks
- Pedestrians may be using the roadway for access
- There may be roadway shoulder or right-of-way available for sidewalk provision or improvements
Sidewalk Solution: Alternative Sidewalk Design

Considerations:
- SDOT is exploring “low cost” alternatives (in addition to standard sidewalk construction)
- Cost and impact may be reduced with alternatives to curb ramp and driveway construction/reconstruction
- Maintain separation from roadway with use of curb or other methods

Sidewalk Challenge: Existing Sidewalk Clear Width

Considerations:
- Fixed items: utility poles, hydrants, bus shelters, bike racks, etc.
- Loose items: signage, bicycles, etc.
- Sidewalk cafes

Sidewalk Challenge: Existing Sidewalk Running Slope

Considerations:
- Existing established topographical (vertical) challenges
- There may be possible alternatives (transit, use of elevators, etc.); citywide and interagency efforts and coordination may be necessary

Sidewalk Challenge: Existing Sidewalk Cross Slope

Considerations:
- Large elevation difference between existing facility entrances and roadway (reduction of access to facilities not permitted?)
- Roadway reconstruction may not be realistic or feasible
- Utility conflicts, parking lanes (high curbs), areaways
- Driveway, alley conflict points
Sidewalk Solution: Built-up Curb to Level Sidewalk

Considerations (at 2nd and Jackson):
- Streetcar rail installation and impact at intersections
- Elevation difference from north to south sides of Jackson

Sidewalk Solution: Driveway Alternatives

Considerations:
- Maintain vehicle access
- Drainage concerns

Sidewalk Challenge: Surface Conditions

Considerations:
- Settling concrete or paving can create level changes
- Fabricated treatments: pavers, utility covers, grates, tree pits
- Potential historic significance may limit sidewalk repairs in some areas
Sidewalk Challenge: Surface Conditions

Considerations:
- Fabricated treatments: sidewalk “steps”
- Vibration or discomfort when rolling over

Sidewalk Challenge: Vegetation / Overgrowth

Considerations:
- Protecting or preserving the tree
- Community awareness
- Dealing with vacated properties or lots
- Tree overhang: SDOT tree or private?

Sidewalk Solution: Shimming / Alternate Routes / Pavement Alternatives

Considerations:
- Shimming could be a temporary fix until a permanent solution can be applied
- Alternate routes may require the acquisition of private property
- “Rubber sidewalks” or other pervious treatments may react better to root upheaval

Accessible Curb Ramps

Other Considerations:
- Complexity!
- Many more elements to curb ramp construction: side flares/wings, surfaces, roadway connection and slope, relationship to crossing (including alignment), ponding, and much more!
Curb Ramp Challenge: No Existing Curb Ramp

Considerations:
- Reality: sidewalks constructed long ago
- Inventory and priorities for improvement (55,000+ potential locations!); cost

Curb Ramp Solution: Assess and Prioritize

Considerations:
- Assessing the curb ramp network
- Pedestrian Master Plan and priority: Safety, Equity, Vibrancy (connectedness)
- Prioritize, plan/design, execute

Curb Ramp Solution: Make a Request

Considerations:
- Backlog of curb ramp requests and estimated time to design and build
- Can also request Accessible Pedestrian Signals or technology evaluations
- Requests can also be made on City of Seattle Customer Service Request webpage or by calling SDOT

http://www.seattle.gov/transportation.ada_request.htm

Curb Ramp Challenge: Topography!

Considerations:
- Is building a ramp to the required standard possible? ("Maximum Extent Feasible")
- What elements of the ramp should take priority?
- Providing “accessibility” on very steep streets?
Curb Ramp Solution:
Diagonal (Shared) Ramp

Considerations:
- One ramp shared between two street crossings
- For mobility devices, navigation required at apex of curb radius, additional movement
- Existing utility/pole conflicts, space limitations

Curb Ramp Solution:
Diagonal (Shared) Ramp

Considerations:
- Diagonal (shared) curb ramps ARE NOT the preferred design (only used when necessary!); prefer one ramp per crossing, aligned with crossing
- "Tabled" intersections may be least sloped closer to the intersection

Curb Ramp Challenge:
Ramp Alignment

Considerations:
- Preferred to align with crossing when possible; consistency is important!
- Existing site constraints, drainage concerns and topography may require ramps perpendicular to curb radius
Curb Ramp Challenge: Ramp Alignment

Considerations:
- May not seem to be a substantial difference between the two designs
- Perpendicular ramps may be necessary for “grade break” concerns and stability of mobility device

Curb Ramp Challenge: Ramp Alignment / Route Comparisons

Example: 5th/Columbia to Weller St. Bridge
- Overall Route: 3,222’ (direct), 3,417’ (accessible); $\Delta +6.05\%$
- 5th/Columbia Intersection: 53’ (direct), 85’ (accessible); $\Delta +60.38\%$

Curb Ramp Challenge: Constraints and Limited Right-of-Way

Considerations:
- Buried utility structures and other structural elements (e.g. bridges) may limit available area where improvements can be made
- Limited right-of-way can reduce the options available for improvements, whether restricted by objects or if sidewalks are generally narrow
- Relocation of features may require coordination

Curb Ramp Challenge: Areaways

Considerations:
- Streets were raised in Pioneer Square after the Great Fire of 1889
- Most streets were raised by an average of 5’ per block
Curb Ramp Challenge: Areaways

Considerations:
- Curb ramp and sidewalk improvements may be extremely costly (if possible at all) due to existing structural composition
- Areaways are prevalent throughout Pioneer Square and the International District

Curb Ramp Challenge: Detectable Warning

Considerations:
- Detectable warning units may not have the same life span as concrete
- Replaceable units is an option when products wear down or fail
- Alternate materials available

Curb Ramp Challenge: Drainage

Considerations:
- Ponding at the base of curb ramps may obscure changes in level or other potential barriers
- Ponding may leave debris at the base of ramp when water is gone
- Freeze??!!

If > 100’ to upstream inlet, new inlet installed at new curb ramp
Curb Ramp Design

PLANT VIEW CONSIDERATIONS:
- PEDESTRIAN ACCESS ROUTE (PAR)
- EXISTING CONFLICTS WITH STRUCTURES
- CROSSING DISTANCE
- CURB RAMP ALIGNMENT/ORIENTATION
- PERPENDICULAR
- DIRECTORIAL
- RIGHT OF WAY CONFLICTS

EXISTING GROUND CONDITIONS
- SLOPES AT EXISTING & DRIVE
- SLOPES AT PROPOSED FLOWLINE IS A BULB AN OPTION
- PROPOSED RAMP DESIGN
- RAMP SLOPES
- RAMP DIMENSIONS
- LENGTH, WIDTH, WINGS, LANDINGS, ETC.
- TEMPERATE TRANSITIONS/REV
- DRAINAGE

3D DESIGN CONSIDERATIONS:

Curb Ramp Table - 62nd Ave S

Curb Ramp Construction:
Common Construction Challenges

- About 60-70% of curb ramps are built per design, other need field adjustments
- Contractor and field inspector’s experience
- Training to keep updated on current Standard
Curb Ramp Construction: Common Construction Challenges

- SDOT capital projects vs. private development
- The best fit curb ramp may not be in the Standard Plan

Curb Ramp Construction: Common Construction Challenges

- There are many conflicts on sidewalk: traffic signs, utility pole & casting, signal pole, pedestrian signal, pedestrian pushbutton, fire hydrant, retaining wall, RRFB, RTIS
- Fitting in curb ramps and sidewalk within the Right of Way

Curb Ramp Construction: Common Construction Challenges

- Fitting in curb ramps and sidewalk within the Right of Way
- Building accessible route without impacting existing access point

Curb Ramp Construction: Common Construction Challenges

- Fitting new curb ramps to existing building: doorway retaining wall and driveway
- Maintaining access to business during and after construction
Curb Ramp Construction: Common Construction Challenges

- Balance between project scope and providing an accessible route
- Thinking beyond curb ramps

Route Requirements:
- Slopes
- Clear Width
- Surfaces

Note: Signals and crosswalk markings are determined by a traffic engineer!

Accessible Street Crossings

Considerations:
- Consistency helps! (location of curb ramps, pedestrian pushbuttons, alignment)
- Topographical, geographical conditions may produce complex intersection geometry

Accessible Street Crossings

Considerations:
- Traffic engineer must assess the geometry to determine pedestrian crossing locations
- A crossing may be closed to all pedestrian use if necessary
Accessible Street Crossings

Considerations:
- Curb ramp is located within crosswalk striping (where provided) with adequate maneuvering space
- Shared ramps (not preferred) must have maneuvering space clear of both lanes of traffic

Accessible Street Crossings: APS

Audible Locator Tones
Audible WALK Sign
Vibrotactile Info

Considerations:
- Pushbuttons must be within an accessible reach range
- Consistency in locations and technology used
- Units may have an option to adjust to ambient sound to reduce “noise”
- Location of multiple units / locator tones
- Inventory

Accessible Street Crossings

Considerations:
- Manual of Uniform Traffic Control Devices (MUTCD) recommends 3.5 ft/sec
- Timing on existing signals
- Adjusting signal timing or consider adding various traffic or pedestrian treatments

Street Crossing Challenge: Focusing on the Pedestrian

Considerations:
- Streets in the past may have been designed to accommodate vehicles ahead of pedestrians
- Wide pedestrian street crossings may be challenging
- Vehicle speeds tend to be higher on wider, more open roadways
Street Crossing Solution:
Curb “Bulb”

Considerations:
- Where able to be constructed, curb bulb can shorten otherwise wide pedestrian street crossings
- Increased visibility of pedestrians approaching the intersection
- May have an effect of “traffic calming”
- Curb bulb can add room to provide curb ramps that better align with the street crossing

Example:
Mercer St & Warren Ave

Street Crossing Solution:
Refuge Islands

Considerations:
- Offers a place of refuge if crossing cannot be made in one WALK cycle
- Detectable warning provides information to pedestrians with visual impairments
- Can be “cut-through” or raised above street elevation

Example:
Lake City Way & 24th Ave

Street Crossing Solution:
Rapid Flashing Beacon

Considerations:
- Brings heightened awareness to drivers
- Can work in conjunction with curb bulbs, refuge islands
- Flashing lights may be activated by pushbutton

Example:
25th Ave & E. Cherry St
Other Access Factors: Transit Facility Access

Considerations:
- Providing high level of access allows use of transit facilities for all pedestrians
- Working with transit agencies to provide access to facilities helps to eliminate the high cost of paratransit

Example:
Bethesda, MD – Montgomery County

Other Access Factors: Temporary Routes (Construction Zones)

Considerations:
- Temporary facilities and routes must also be accessible!
- Closing a sidewalk is NOT preferred

Other Access Factors: Coordination with Bike Lanes

Considerations:
- Improving pedestrian facilities while improving bicycle facilities
- Maintain pedestrian visibility and safety
- Green bike lanes and “mixing zones”

Other Access Factors: Wayfinding Technology

Considerations:
- Textures or surfaces may help identify a route
- May be new technologies or products available
Other Access Factors: Map of Access Route (San Francisco)

Considerations:
- Routes can be better identified and planned
- Map could be used to help prioritize improvements

Other Access Factors: “Pedestrian Access Advisory Committee”

Considerations:
- Forum to discuss issues specific to pedestrian access
- Could help SDOT determine priorities for improvements related to accessibility

Questions?

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