

Designing an Accessible Pedestrian Network for All



Northwest Universal Design Council Meeting
Mike Shaw, SDOT ADA Coordinator
January 14, 2016



SDOT Presenters

- Mike Shaw, SDOT ADA Coordinator
- John Ricardi, Associate Civil Engineer
- Eugene Pike, Construction Engineering Supervisor

Questions?

michael.shaw@seattle.gov

206-615-1974



2

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



3

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)

4

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



5

Accessible Sidewalks / Routes

Adequate
Clear Width



Slope of Sidewalk
(Running and Cross)



Capitol Hill

6

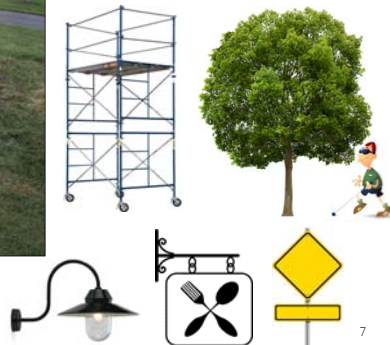
Accessible Sidewalks / Routes

Surface Requirements
(Smooth, Level)



"Protruding Objects"

Clear Headroom
And Detectability



7

Sidewalk Challenge: No Existing Sidewalk



Considerations:

- Neighborhoods 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

8

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

9

Sidewalk Challenge: Existing Sidewalk Clear Width



Considerations:

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



10

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

11

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

12

Sidewalk Solution: Built-up Curb to Level Sidewalk

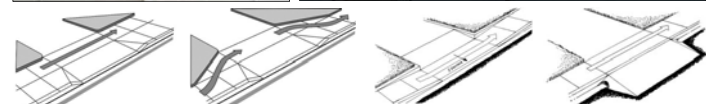


Considerations (at 2nd and Jackson):

- Streetcar rail installation and impact at intersections
- Elevation difference from north to south sides of Jackson

13

Sidewalk Solution: Driveway Alternatives



Considerations:

- Maintain vehicle access
- Drainage concerns

14

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



15

Sidewalk Challenge: Surface Conditions



16

Sidewalk Challenge: Surface Conditions



Considerations:

- Fabricated treatments: sidewalk "steps"
- Vibration or discomfort when rolling over



17

Sidewalk Challenge: Vegetation / Overgrowth



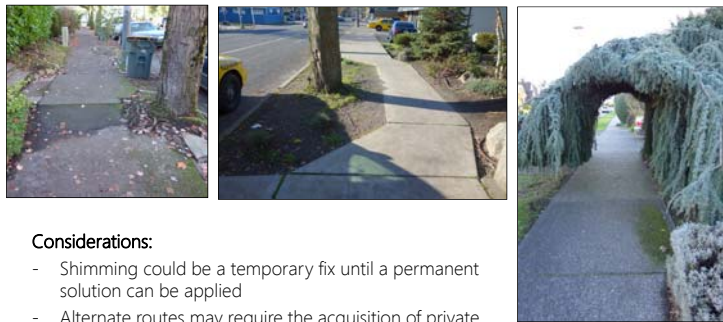
Considerations:

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



18

Sidewalk Solution:
Shimming / Alternate Routes / Pavement Alternatives



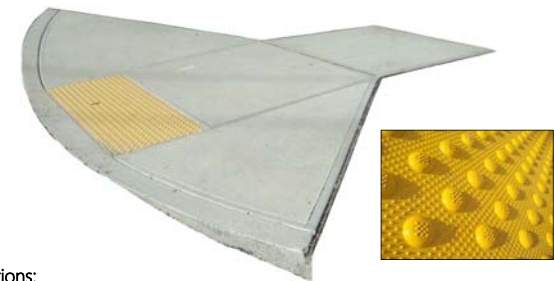
Considerations:

- 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

19

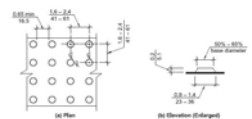
Accessible Curb Ramps

- Width
- Slope
- Landing
- Detectable
Warning



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!



20

Curb Ramp Challenge: No Existing Curb Ramp

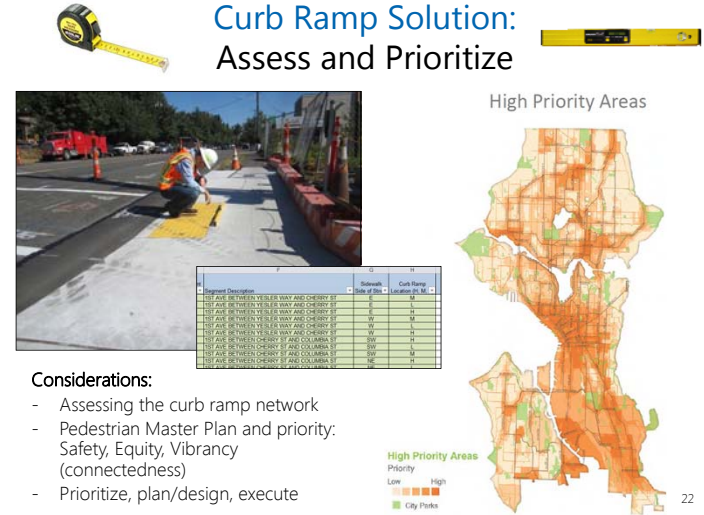


Considerations:

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

21

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

High Priority Areas
Priority
Low High
City Parks

22

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

23

Curb Ramp Challenge: Topography!

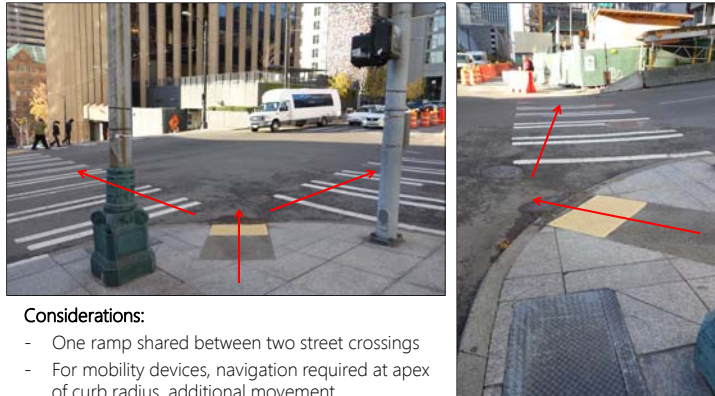


Considerations:

- 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?

24

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

25

Curb Ramp Solution: Diagonal (Shared) Ramp

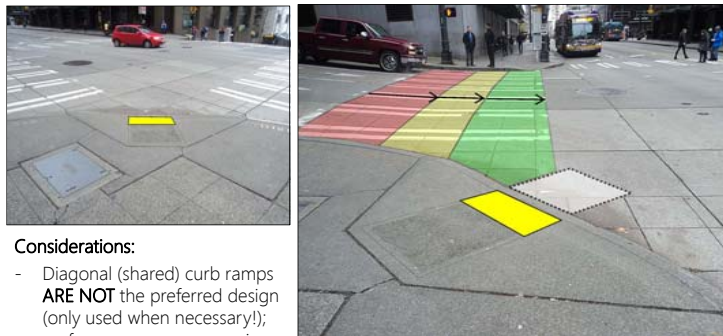


Considerations:

- 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

26

Curb Ramp Solution: Diagonal (Shared) Ramp

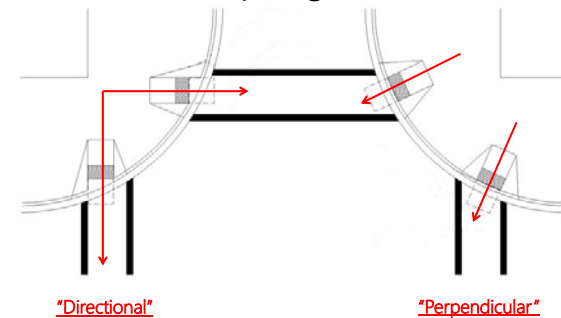


Considerations:

- 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

27

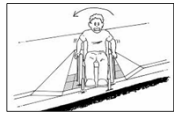
Curb Ramp Challenge: Ramp Alignment



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

28



Curb Ramp Challenge: Ramp Alignment



"Directional"



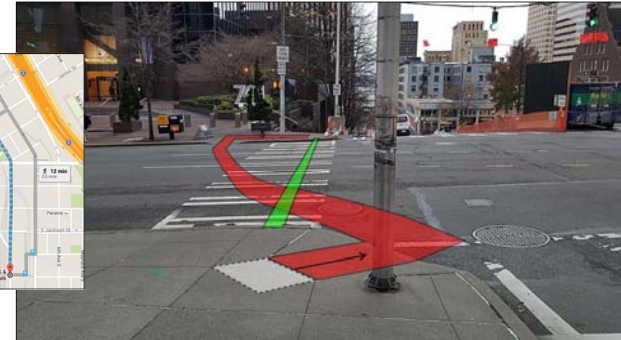
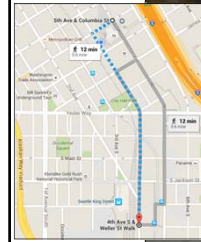
"Perpendicular"

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

29

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); $\Delta+60.38\%$

30

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

31

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



32

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

33

Curb Ramp Challenge: Detectable Warning



Considerations:



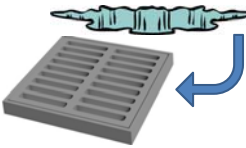
- Detectable warning units may not have the same life span as concrete
- Replaceable units is an option when products wear down or fail
- Alternate materials available





34

Curb Ramp Challenge: Drainage



If > 100' to upstream inlet, new inlet installed at new curb ramp

Considerations:

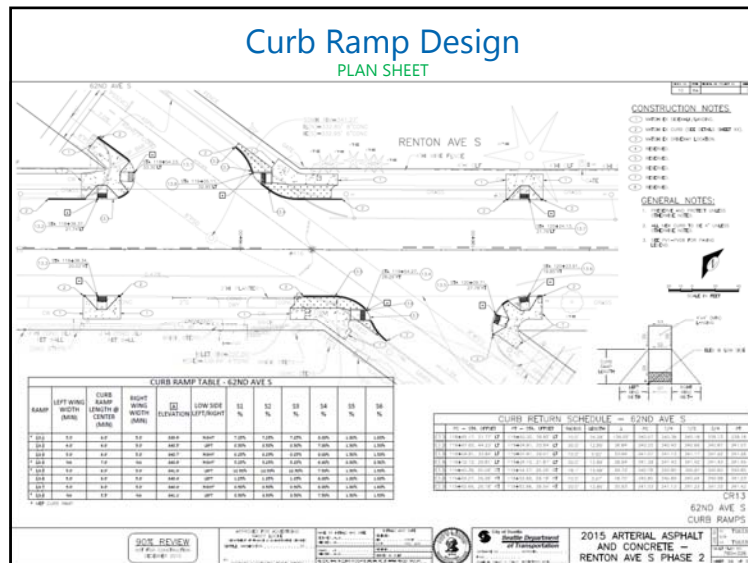
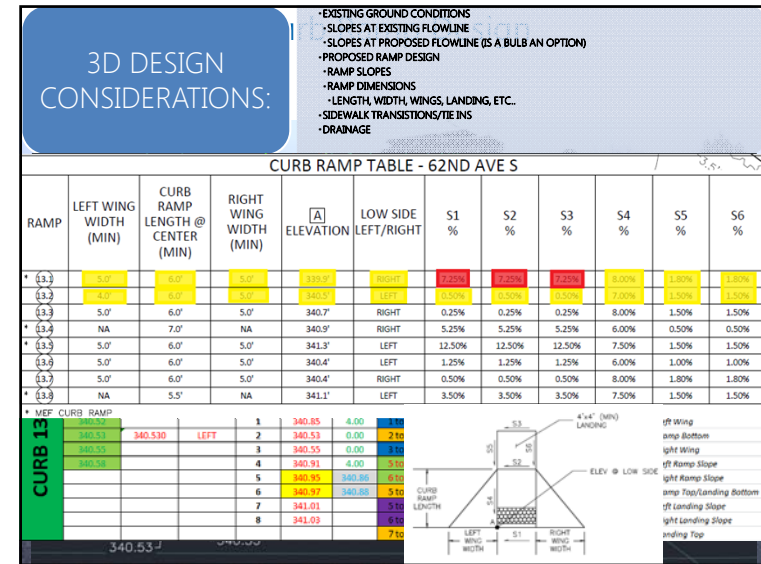
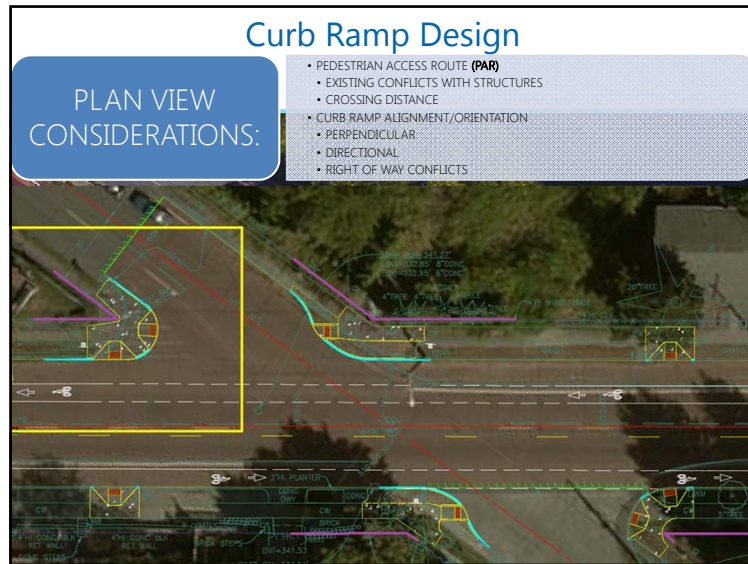
- Ponding at the base of curb ramps may obscure changes in level or other potential barriers
- Ponding may leave debris at the base of ramp when water is gone
- Freeze??!!

35

Curb Ramp Design & Construction

36



Curb Ramp Construction: Common Construction Challenges



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

41

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

42

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

43

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

44

Curb Ramp Construction: Common Construction Challenges



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

45

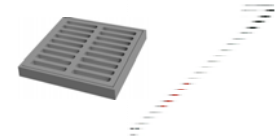


Accessible Street Crossings



Route Requirements:

- Slopes
- Clear Width
- Surfaces

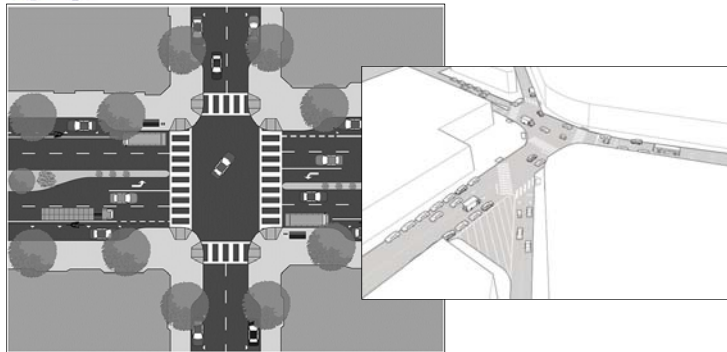


Note: Signals and Crosswalk Markings are Determined by a Traffic Engineer!

46



Accessible Street Crossings



Considerations:

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

47



Accessible Street Crossings



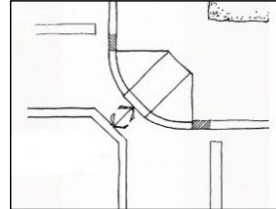
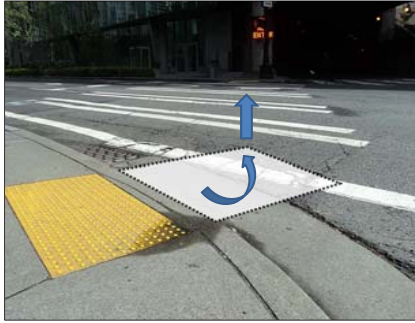
Considerations:

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

48



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

49

Accessible Street Crossings



3.5 ft/sec



Considerations:

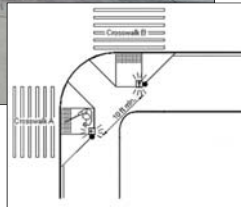
- Manual of Uniform Traffic Control Devices (MUTCD) recommends 3.5 ft/sec
- Timing on existing signals
- Adjusting signal timing or consider adding various traffic or pedestrian treatments

50

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

51

Street Crossing Challenge: Focusing on the Pedestrian



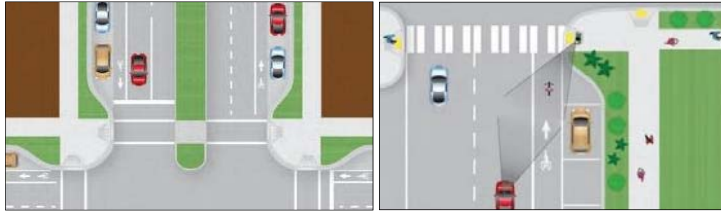
Considerations:

- 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

52



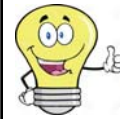
Street Crossing Solution: Curb "Bulb"



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

53



Street Crossing Solution: Curb "Bulb"



Example:
Mercer St &
Warren Ave
N

54

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

55

Street Crossing Solution: Rapid Flashing Beacon



Example:

25th Ave & E. Cherry St

Considerations:

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

56



Other Access Factors: Transit Facility Access



Example:

Bethesda, MD – Montgomery
County

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

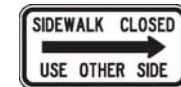
57

Other Access Factors: Temporary Routes (Construction Zones)



Considerations:

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



58

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"



59

Other Access Factors: Wayfinding Technology

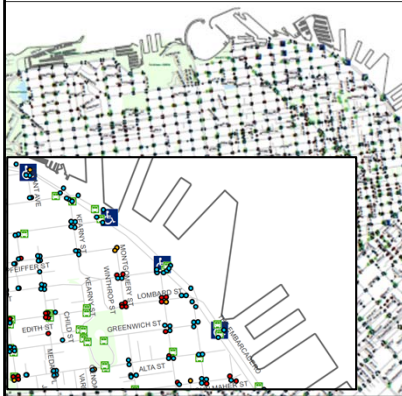


Considerations:

- Textures or surfaces may help identify a route
- May be new technologies or products available

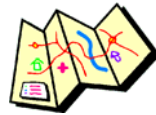
60

Other Access Factors: Map of Access Route (San Francisco)



Curb Ramp Identification

- Curb ramp was recently built and should be useable by most, if not all, people with disabilities.
- Curb ramp is older. Many, but not all, wheelchair users can use it.
- Curb ramp is old and does not meet our construction standards. If you use this ramp, please do so carefully.



Considerations:

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

61

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

62

Questions?

michael.shaw@seattle.gov | (206) 615-1974
http://www.seattle.gov/transportation.ada_request.htm

<http://www.seattle.gov/transportation>

