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PRIORITIES AND GUIDELINES FOR PROVIDING PLACES FOR PEDESTRIANS TO WALK ALONG STREETS AND HIGHWAYS

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I. INTRODUCTION

The Uniform Vehicle Code defines a 'sidewalk' as *that portion of a street between the curb lines, or the lateral lines of a roadway, and the adjacent property lines, intended for use by pedestrians*. A sidewalk need not be a paved surface, but in accordance with the Federal ADA law, new sidewalks that are constructed must be fully accessible to people in wheelchairs.

Governments at the state, regional and local level are being called on to develop regulations and provide funding for installing and retrofitting sidewalks. The problem, of course, is that while there are tremendous needs, there are also limited resources. As a result, governments are faced with the task of making tough choices on priorities related to when and where to install sidewalks.

The purpose of this document is to provide government agencies at the state, regional and local level with the tools they need to develop their own guidelines for creating places for pedestrians to walk. This is done with the recognition that a 'one set of guidelines fits all approach' will not work due to regional and jurisdictional differences as well as differences between urban, suburban and rural areas.

II. BASIC PRINCIPLES FOR DEVELOPING GUIDELINES

A. Goals and Objectives: Installing and retrofitting sidewalks is not an end in itself. It must lead to certain desired outcomes. Typically, communities should focus on 1) increasing levels of walking and 2) reducing the number of crashes involving pedestrians. While percentages will differ from jurisdiction to jurisdiction, setting specific targets will help in the development of criteria for installing and retrofitting sidewalks.

B. Desired Outcome: In the most general sense, the desired outcome should be to have well designed, safe places for people to walk wherever people want to walk along public rights-of-way. Typically this is going to mean sidewalks although it is also recognized that wide shoulders and unpaved walkable space will be appropriate in some situations.

C. Phasing and Flexibility: Sidewalks should be built wherever walking is anticipated or desired. In developing and rural areas, it may be appropriate to start with unpaved walkable space and then phase in sidewalks as development accelerates. The key is to preserve the space for sidewalks and to have future funding sources identified. Guidelines for installing new sidewalks should also allow for some flexibility to reflect unique circumstances. However, exceptions should be kept to a minimum and applications should be carefully considered on a case by case basis.

III. PRIORITIES FOR NEW SIDEWALK CONSTRUCTION

As previously mentioned, the desired outcome should be to have well designed, safe places for people to walk along public rights-of-way. Sidewalks should be built wherever walking is anticipated or desired.

1) **Guidelines for New Sidewalk Installation:** All roadways should have some type of walking facility, usually a paved sidewalk, out of the traveled way. The following table uses roadway classification, land use and density as determining factors for installing sidewalks. Whether this table or another table is used, the objective should always be to provide sidewalks wherever walking is anticipated or desired. Table 1 can either be used for sidewalk installation on new roads or for retrofitting sidewalks on existing roadways. For retrofitting sidewalks on existing roads, the next section provides an alternative method for establishing priorities.

2) **Phased Development of Sidewalks:** In developing and rural areas, it may be appropriate to start with shoulders and unpaved walkable space and then phase in sidewalks as development accelerates. Criteria for installing sidewalks along with new development should be developed with the following in mind:

   a) Space for Future Sidewalks: Space for future sidewalks should always be secured and/or reserved when a new right-of-way is being created or an existing one is being developed.

   b) “Triggers” for Future Sidewalks: In rural settings, if sidewalks are not installed at the time of development due to lack of need or density, then there needs to be clear guidelines as to when sidewalks will be required. For example, sidewalks might be required on residential

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TABLE 1. GUIDELINES FOR NEW SIDEWALK INSTALLATION.

ROADWAY CLASSIFICATION & LAND USE	SIDEWALK REQUIREMENTS	FUTURE PHASING
Highway (rural)	None. Min. 5' shoulders required.	Secure/preserve ROW for future sidewalks
Highway (rural/suburban - less than 1 d.u. / acre)	One side preferred. Min. of 5' shoulders required.	Secure/preserve ROW for future sidewalks.
Suburban Highway (1 to 4 d.u. / acre)	Both sides preferred. One side required.	Second side required if density becomes greater than 4 d.u. / acre.
Major Arterial (residential)	Both sides required.	
Collector and Minor Arterial (residential)	Both sides required.	
LOCAL STREET (Residential - less than 1 d.u. / acre)	One side preferred. Min. of 5' shoulders required.	Secure/preserve ROW for future sidewalks
LOCAL STREET (Residential -1 to 4 d.u. / acre)	Both sides preferred. One side required.	Second side required if density becomes greater than 4 d.u. / acre.
LOCAL STREET - (Residential - more than 4 d.u. / acre)	Both sides required.	
All Streets (commercial areas)	Both sides required.	
All Streets (industrial AREAS)	Both sides preferred. One side required.	

streets once an area has a density of more than four dwelling units per acre; and on arterial streets once they are within a school walking zone or have transit service.

c) Funding for Future Sidewalks: In rural settings, if sidewalks are not installed at the time of development, there needs to be clear regulations as to whom (developer, property owners, or governmental agency) will pay for the sidewalks. It is virtually impossible to have developers pay for sidewalks, years after development occurs. Consequently, it is recommended that developer contributions to sidewalks be set aside in an account at the time of development.

3) Retaining Rural Character: There is a desire in some residential developments to retain a "rural" atmosphere which includes very low density (large lots), no street lights, and the lack of curbs and sidewalks. The elimination of sidewalks on short residential cul-de-sacs (200 feet or less), is acceptable if there is a system of trails behind the houses. However, the wholesale elimination of sidewalks in a neighborhood network or along longer cul-de-sacs or other local streets is not a good practice.

Developers in outlying areas may argue that the land use will never fully develop into a pedestrian area. However, pedestrians still may need access to transit service, and future developments will likely occur and bring more pedestrian traffic into the area.

4) Sidewalk Continuity: Providing continuity along sidewalks is important, and pedestrians should not be required to cross a busy arterial street midblock or at an unsignalized location to continue to walk along a street. Newly installed sidewalks should be fully accessible to side streets and adjacent sidewalks and buildings.

IV. RETROFITTING SIDEWALKS

Over eighty-five percent of the built environment that will be here in twenty years is already built. In some cases, sidewalks were never installed and need to be added. In other cases, existing sidewalks need replacement. Establishing priorities for installing sidewalks involves three steps: 1) develop a prioritized list of criteria; 2) develop a methodology for using the criteria to evaluate potential sites; and 3) create a prioritized list of sites for sidewalk improvements.

1) Criteria: The following are suggested criteria for establishing priorities. Select three or more of them when developing your own set of criteria. The key is to select criteria that produce the outcomes desired for your community.

a. Speed: Since there is often a direct relationship between speed and the frequency and severity of crashes, it often makes sense to use it for establishing criteria. For example, arterials might be divided by posted speed limits, such as 35 mph or less, 40 mph, and 45 mph or more.
b. Crash Data: Since pedestrian crashes seldom occur with high frequencies at one location, using crash data to target locations for improvements can be difficult. However, crash data should be checked since there are situations where some crashes occurring due to a lack of sidewalks. Also, there may be a pattern of pedestrian crashes at multiple locations along a corridor.
c. School Walking Zones: School walking zones typically extend ¼ to ½ mile from an elementary school. Streets (especially arterial streets) in these zones make good candidates for new sidewalks.
d. Major Transit Routes: Transit riders need sidewalks to access transit stops. Arterials with high levels of transit use make good candidates for sidewalks.
e. Special Needs: Locations that attract high numbers of people with special needs, can be good candidates for sidewalks. Examples include homes for people with disabilities and senior centers.
f. Urban Centers/Neighborhood Commercial Areas: Areas of high commercial activity are often high volume pedestrian areas. Good sidewalks improve safety and the economic viability of these areas.
g. Pedestrian Generators: In addition to commercial areas, hospitals, community centers, libraries, sports arenas and other public places can be pedestrian generators where sidewalks should be given priority.
h. Disadvantaged Neighborhoods: Studies have shown that pedestrian crash rates may be higher in low and moderate income neighborhoods with lots of children. Targeting these neighborhoods for sidewalk improvements can be a way to begin to address this issue.
i. Missing Links: Installing sidewalks in connecting pedestrian areas to other adjacent pedestrian areas with sidewalks can create continuous walking systems.
j. Neighborhood Priorities: Local residents often know locations where sidewalks are most needed. Consider asking neighborhood groups or homeowners associations to provide a prioritized list of locations where they would like to see more sidewalks.
k. Arterial vs. Local: Street classification can be used as selection criteria. Arterial streets, for example, may have higher pedestrian use, and a greater need to separate pedestrians from motor vehicles. Additionally, certain funding sources may only be available for arterial streets.

2) Methodology: There are two recommended methodologies for selecting locations for improvements: a) the overlapping priorities method, and b) the points method. As a general rule of thumb, no more than five percent of a program budget should be spent on establishing priorities. In other words, the level of effort put into establishing priorities should reflect the size of the capital budget.

There is no single 'right way' to select which criteria to use when developing priorities. In general, the outcome should reflect the needs and objectives of the community. Additionally, the criteria should include both safety measures, such as vehicle speeds and pedestrian crash data, and pedestrian usage measures such as proximity to schools or commercial areas.

A. Overlapping Priorities Method: The easiest and often most cost effective methodology for selecting locations for improvements is to use graphical representation to identify overlapping priorities. The intent is to identify those locations that meet multiple criteria. This methodology is especially useful in cases where there is not a lot of staff time and funding for detailed analysis. It can be accomplished using a GIS system or it can be done by hand.

The best way to describe this methodology is through an example. Assume that priorities are going to be developed based on transit routes, proximity to schools, people with special needs, and neighborhood commercial areas. Start with a map of your jurisdiction. Using a colored pen, identify those arterials that have high transit use. Then draw a half-mile circle around every elementary school. Do the same thing around locations that attract people with disabilities. Finally, color in the neighborhood commercial areas. By taking this visual approach, it will immediately become clear where there are overlapping priorities. Those areas lacking sidewalks within the overlapping areas are the highest priority for retrofitting sidewalks.

B. Points Method: A more precise methodology for selecting locations for improvements is to use a weighted points system. This methodology is especially useful in cases where there is staff time and funding available for more detailed analysis. Additionally, it may be desirable when there is a large amount of capital available for sidewalk construction. If there is a lot of competing projects, a more sophisticated point system can be used to explain to the public why certain projects were funded and others were not.

There are many ways a point system can be developed. The key is to use a system that is simple and that produces desired outcomes. Any of the criteria listed above can be assigned a range of numbers and then be used to analyze the desirability To improve any given location. For example, a corridor could be assigned points based on the number of 'walking along roadway' crashes over a five-year period; the number of buses that travel the corridor during peak times; and the proximity to elementary schools. However, this method can be very time consuming because it will be necessary to analyze multiple locations with sidewalk needs to effectively create a listing of priority projects.

3) Prioritized List: Both the overlapping priorities method and the points method will produce an initial list of prioritized projects. The next step is to refine the list so that it 'works'. In other words, apply some common sense. Are there a

lot of surprises? Are priority locations ones that might be expected? Are priority locations in line with community priorities and expectations? Are some priorities at locations that don't have any pedestrians? If the answer to all these questions is "yes", then the criteria used in the methodology should be refined to create outcomes that better reflect expected outcomes. It is important to use the methodologies to prioritize known needs, and not create a new set of priorities that don't make sense.

The final step is to create 'packages' of fundable projects. The idea is to use to prioritization process to create reasonable packages that decision-makers can embrace and support. For example, it may be possible to install sidewalks on one side of every arterial within a half mile of every elementary school, for five million dollars over a period of five years. Or, it may be possible to replace sidewalks in neighborhood commercial areas for two million dollars over a period of three years. The objective is to take what may appear to be an unsolvable problem (endless need for more funds), and to package it in such a way that it begins to address some of the most critical pedestrian needs in a community.

Sidebar

Seattle Example

Seattle recently completed an inventory of all sidewalks in the City using a three-step process: First, an intern was hired to review aerial photographs to determine if a sidewalk existed. This information was then recorded as a new layer on the existing G.I.S. street database. Second, the intern field checked all locations where there was some uncertainty regarding the existing of a sidewalks (about ten percent of the aerial photos were not clear). Finally, each of thirteen neighborhood groups that cover the city, were given a draft copy of the inventory and asked to check for errors. The total effort took the equivalent of one full time person working for six months in a city of 530,000 population, 84.3 square miles of land use and 1,652 roadway miles (i.e., 1,202 residential street miles and 450 arterial miles).

Once the inventory was completed, the information was combined, on a map, with three other types of information: 1) School Walking Zones. A colored circle identified a half-mile area around each school; 2) Pedestrian Generators. A second color was used to identify a half-mile area around key pedestrian generators such as hospitals, libraries and community centers; 3) Neighborhood Commercial Areas: A third color was used to identify the dozen neighborhood commercial areas in Seattle (about one for each of the major neighborhood areas). Once the map was printed, it was

very easy to see where the three colors overlapped, two colors overlapped etc.

The final step was to have the computer calculate the sidewalk deficiencies in the overlapping areas. They found, for example, that there were less than two miles of arterial streets that were within school walking zones, a pedestrian generator area and a neighborhood commercial area, that did not have sidewalks on either side of the street. There were close to three miles of arterial streets that were within school walking areas but outside of neighborhood commercial areas and pedestrian generators, that did not have sidewalks on either side of the street. This compared to a citywide deficiency of more than twenty miles of arterial streets that lacked sidewalks on both sides of the street.

By developing these and other numbers, the pedestrian program was able to put together packages of information that demonstrated what could be accomplished with additional funding. What everyone thought to be an unsolvable multi-million-dollar problem, was reduced to a series of smaller, fundable projects that decision-makers could endorse. The result was increased funding and a new optimism that meaningful progress could be made on solving Seattle's sidewalk deficiencies.

V. SIDEWALK DESIGN GUIDELINES

Sidewalk Placement: Large and Small Cities

Sidewalks should be placed along both sides of all fully improved arterial, collector and local streets in urban and suburban areas, and should be continuous on both sides of the street. In low density residential areas (1 to 4 dwelling units per acre), sidewalks may be limited to one side of the street, but are preferred on both sides along both sides of the street. Sidewalks should be fully accessible to side streets, connecting sidewalks, and adjacent buildings. Accessible crossings should be provided across center median islands, frontage road medians and other raised islands.

Sidewalks, Walkways and Shoulders: Rural Areas

It is generally not cost-effective nor practical to provide traditional sidewalks in rural areas. However, there must be a safe walking area for pedestrians, where pedestrian traffic exists, outside the traveled way for motor vehicle traffic. Where sidewalks exist in rural areas, they should be well separated from the highway. Isolated residential areas should have a pedestrian connection to the rest of the rural community for school access, shopping and recreational trips.

When it is impractical to provide a separate sidewalk or walkway along a rural road, a paved or unpaved shoulder should be provided where pedestrians are

expected to walk. Paved shoulders are preferred to provide an all-weather walking surface, an emergency vehicle distress area and space for bicyclists. A five-foot wide shoulder is acceptable for pedestrians along lower-type highways. Paved shoulder widths of 10 to 12 feet are desirable along high speed highways, particularly with a high number of large trucks. Paved shoulders should be marked with an edgeline stripe between the shoulder and the traveled way.

One walkway type that is used in some rural settings is what has been termed a "side path". This is a walkway, which may or may not be paved, and is separated from the roadway by a grass or landscaped strip. This leaves a more rural look but is safer and more comfortable than a shoulder.

Sidewalk Width:

The width of a sidewalk is dependant on the number of pedestrians who are expected to use the sidewalk at a given time. Obviously high use sidewalks should be wider than low use sidewalks. A sidewalk width of five feet will allow two adult pedestrians to comfortably walk side by side, and is the recommended desirable minimum. The desirable minimum sidewalk widths in large or small cities are:

Local or collector streets	- 5 feet
Arterial or Major streets	- 6 to 8 feet
CBD areas	- 8 to 12 feet*
Along parks, schools and other major pedestrian generators	- 8 to 10 feet

**8 foot minimum in commercial areas with a planter strip,*
12 foot minimum in commercial areas with no planter strip.

These widths are intended to represent a clear or unobstructed width. Point obstructions may be acceptable as long there is at least 36 inches for wheelchair maneuvering (48-inch desirable minimum), but every attempt should be made to locate street light and other utility poles, sign posts, fire hydrants, mail boxes, parking meters, bus benches and other street furniture out of the sidewalk. When that is not possible, a wider sidewalk should be provided to accommodate a line of obstructions.

Similarly, when the sidewalk abuts store fronts, the sidewalk should be built about two feet wider to accommodate shoppers stopping to look into windows, and to avoid conflicts with doors opening and pedestrians entering or leaving the adjacent buildings.

Many 4-foot sidewalks were built in the past. While this may or may not create a specific safety problem, this width does not provide adequate clearance room or mobility for some pedestrians passing in opposite directions. Therefore, a 5-foot width or wider should be used on all new sidewalks.

Sidewalk Buffer Width:

Buffers between pedestrians and motor vehicle traffic are important to provide a greater level of comfort, security and safety to pedestrians. Landscape buffers can also serve as a snow storage area and splash protection for pedestrians, and a space for street light poles and traffic signs. Sidewalk buffers can result from an on-street parking lane, on-street bike lane, or a landscape area between the sidewalk and motor vehicle traffic lanes. In areas where there are no on-street parking or bike lanes, the ideal width of a planting strip is 6 feet. Minimum allowable landscape buffer widths are:

Local or Collector Streets - 2 to 4 feet
Arterial or Major Streets - 5 to 6 feet

If these minimum planting strips are not provided between the sidewalk and roadway, then the sidewalk width should be a minimum of 6 feet. When there is a landscape buffer area between the sidewalk and street, care must be taken to ensure that the bus stops are fully accessible to wheelchair users and have connections to the sidewalk. Note that if 2 to 4 foot planting strips are used, irrigation will likely be needed.

Sidewalk Surface:

A concrete sidewalk surface is preferred. It will provide the longest service life and will require the least amount of maintenance. Asphalt is an acceptable sidewalk or walkway surface, especially in rural areas and in park settings. Crushed granite may also be an acceptable all-weather walkway surface in park settings or rural areas, but they generally require the highest level of maintenance and they are less desirable for wheelchair users.

Sidewalks, walkways, and crosswalks can be constructed with bricks and pavers if they are constructed to avoid settling or removal of bricks which can be a tripping condition. Consideration should be given to the use of “stamping” molds to create the visual appearance of bricks and pavers. The technique has the advantages of traditional concrete without some of the maintenance issues associated with bricks and pavers. There are commercially available products that produce a variety of aesthetically pleasing surfaces that are almost impossible to distinguish from real bricks and pavers.

Sidewalk Grade and Cross Slope:

Sidewalks should be built to accommodate pedestrians of all abilities and should be as flat as practicable. The maximum desirable sidewalk grade is 1:12 (8.3%). The maximum rise for any run on a slope greater than 1:20 (5%) shall be 30 inches. A flat landing of at least 60 inches should be built between ramped sections of 5% or more.

The maximum sidewalk cross slope should be no greater than 1:50 (2%) to provide drainage but maintain stability for wheelchair users. At least 30 inches of flat sidewalk area is required at the top of a sloped driveway to accommodate wheelchair use. In some cases, it may be necessary to bend the sidewalk around the back of the sloped driveway to accomplish 30 inches.

Curb Ramps:

Curb ramps must be provided at all midblock crosswalks or sidewalk crossings at intersections for wheelchair access. These ramps also accommodate strollers, carts, bicyclists and elderly pedestrians with mobility limitations. Curb ramps should be as flat as possible, but must have a slope that is no greater than 1:12 (8.3%). The ramps must be free from any abrupt changes in elevation. The minimum curb ramp must be at least 36-inches wide, but 48-inches is a desirable minimum width for a diagonal curb ramp. If a curb ramp is located where pedestrians must walk across the ramp, the ramp must have flared sides of no more than 1:10 (10%) slope. Curb ramps also require a 60-inch landing at the top.

Diagonal curb ramps at an intersection are not desirable because they provide no directional guidance to vision impaired pedestrians. It is recommended to build separate curb ramps at corners, one for each crosswalk. Raised islands in a crossing must have at least a 48-inch cut-through level with the street or curb ramps on both sides of the island.

Bus Stops and Shelters:

It is generally preferable to place bus shelters between the sidewalk and the street, or between the sidewalk and adjacent property, so that waiting transit patrons do not obstruct the flow of pedestrians along the sidewalk. Where bus shelters exist, the desirable minimum sidewalk width is eight feet. Bus benches and other street furniture for bus shelters should be placed outside the walking paths to maintain the accessibility of the walkway and to provide good pedestrian service

Obstacles Along the Sidewalk:

The distance to the bottom of a sign placed in or immediately adjacent to a sidewalk should be at least eight feet above the street surface, and sufficiently high enough to avoid injury to pedestrians. Bushes, trees and other landscaping should be maintained to prevent encroachment into the sidewalk. Jurisdictions should adopt ordinances requiring local property owners to trim the landscaping they place along their frontage to maintain clear and unobstructed sidewalks. The jurisdictions should provide an inspection procedure or a system of receiving and responding to sidewalk encroachment and maintenance complaints.

Guy wires and utility tie downs should not be located in or across sidewalks at heights below seven feet. When placed adjacent to sidewalks or pedestrian walkways, the guy wires should be covered with a bright yellow (or other high visibility) plastic 'guard' to make the wire more visible to pedestrians.

Lighting:

It is desirable to have street lighting to improve the visibility, comfort and security of pedestrians. It is impractical to provide lighting in most rural areas, particularly where there is not a nearby power source. In urban areas, it is most important to light intersections and other pedestrian crossing areas. Lighting is also recommended in areas where there is a high concentration of nighttime pedestrian activity, such as churches, schools, and community centers. Where continuous lighting is provided along wide arterial streets, it is desirable to place the lights along both sides of the street. Continuous street lights should be spaced to provide a relatively uniform level of light. In shopping districts or in downtown areas with high concentrations of pedestrians, it may be desirable to provide pedestrian level lighting, in addition to the street lighting to improve the comfort and security of pedestrians. The most preferred pedestrian-level lights are mercury vapor or incandescent. Low pressure sodium lights can be the most energy-efficient lighting, but is not desirable because it creates considerable color distortion. Pedestrian level lighting may also be installed in selected areas of pedestrian activity, which can create a sense of intimacy and place.

Other Design Considerations:

Sidewalks should be built within the public right-of-way or in a sidewalk easement along the right-of-way. This will provide access to the sidewalk for maintenance activities, and will prevent the adjacent property owners from obstructing or removing the sidewalk in the future.

Care must be taken to avoid planting trees or large bushes in the landscape buffer area that will obstruct the visibility between a pedestrian attempting to cross or enter a street and an approaching motorist. Trees with large canopies planted between the sidewalk and street should be generally trimmed up at least eight feet high and bushes should be kept to about 30 to 36 inches in height. Trees with large caliper trunks may not be appropriate near intersections and in other situations where they may block visual sight triangles.

Meandering sidewalks are sometimes used when wider rights of way are available and there is a desire to provide a high level of landscaping, such as in a park or along a waterway or other natural feature. Meandering sidewalks can create a more pleasant walking environment. However, they do create a longer walking distance and are more appropriate for parkways or recreational settings. Meandering sidewalks are less desirable for providing the most convenient walking route.

Sidewalks should be built along both sides of bridges if pedestrian traffic is expected. Where sidewalks or walkways are built on bridges for high speed streets, concrete barriers built between traveled way and sidewalk may be appropriate in some situations to shield pedestrians from errant vehicles. Pedestrian rails or fencing is generally required along the outside of the bridge. When these facilities exist, periodic inspection is needed to sweep and remove debris from the sidewalk.

Rollover Curbs: Rollover curbs should not be used. They often encourage motorists to park on planting strips and sidewalks. They also can be problematic for the visually impaired since they don't create as definitive an edge between the street and adjacent uses.

Sidewalk Depth: Concrete sidewalks should be built to a minimum depth of 3 inches (4 inches is preferred). Additionally, sidewalks should be reinforced and built to a minimum depth of 5 inches at driveways.

VI. SIDEWALK COST CONSIDERATIONS

The actual cost of providing sidewalks will be different for each region of the country, and will vary with the seasons. Actual bid prices will also be influenced by how busy contractors are at the time of bid-letting.

The pure cost of construction sidewalks is relatively low; typical bids run between $20 and $30 a square yard, which roughly translates to $12 to $20 a running foot for 6' wide sidewalks. On a per mile basis, this means that sidewalks can run between $150,000 to $250,000, both sides of the roadway. (Costs are from Oregon DOT, 1999).

This discussion will list some of the factors to consider when calculating the cost of sidewalks, as well as some tips to reduce the final price paid.

1. Stand-alone vs. integrated within another project: Invariably, stand-alone sidewalk projects cost more than the same work performed as part of a larger project (typically 50% higher). Examples of larger projects that can include sidewalks are surface preservation projects, water or sewer lines, or "undergrounding" utilities. The savings are greater than monetary – the political out-fall is reduced, as the public doesn't perceive an agency as being inefficient, as is the case when a road is worked on one year, then the agency comes back in the near future to do more work. The reduced impacts on traffic are a bonus to integration.

2. Combining Projects: Cost savings can be achieved by combining several small sidewalk projects into one big one. This can occur even if the sidewalks are under different jurisdictions, or even in different localities, if they are fairly proximate. The basic principle is that bid prices drop as quantities increase.

3. Presence of curb and gutter: The costs of providing curb and gutter, which presumes the need to also provide a street drainage system, typically run about 4-5 times higher than the cost of plain sidewalk. Yet on many urban streets, this work must be performed prior to installing sidewalks. If this is the case, only the cost of sidewalks should be attributed to expenditures for pedestrians – sewers are provided to drain the roadway surface used by motor vehicle traffic.

4. Number of driveways: To comply with ADA, many existing driveways must be replaced with ones that provide a level passage at least 3' wide. Replacing driveways can run about $1000 per driveway. It can also be advantageous to inventory all existing driveways to see if any can be closed; the can result in a cost-savings.

5. Number of intersections: While intersections represent a skip in the sidewalk quantities, each corner must be fitted with ADA ramps, which typically run between $600 and $1000 each. Each intersection also represents a need for additional traffic control.

6. Obstacles to be removed: Sidewalks much be free of impediments such as power poles, signposts and fire hydrants. The costs for moving or removal of these obstacles vary too much to be itemized here; these costs must be calculated individually for each project.

7. Structures: While minor sidewalk projects rarely involve new structures such as a bridge, many projects with significant cuts and fills may require retaining walls to avoid the need to acquire right-of-way. The costs of retaining walls must be calculated individually for each project In semi-rural environments, culverts may need to be extended to accommodate the extra width needed for a sidewalk.

8. Right-of-way: While most sidewalk projects can be built within existing rights-of-way, especially sidewalk infill projects, some may require some right-of-way takings or easements. An alternative to acquiring right-or-way is to narrow the roadway.

9. Miscellaneous factors: Planters, irrigation, benches, decorative lampposts and other esthetic improvements add cost to sidewalks, but they are usually well worth it if the impetus for the project is to create a more pleasant and inviting environment.

When project costs appear to be escalating due to one or more of the above listed items, especially retaining walls or acquiring right-of-way, consideration should be given to narrowing the sidewalk in constrained areas. The full sidewalk width should be resumed in non-constrained areas – this is preferable to providing a narrow sidewalk throughout, or dropping the project because of one difficult section.

VII. BIBLIOGRAPHY AND LIST OF REFERENCES

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Please provide written comments on these draft guidelines to

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