CHAPTER 7: PEDESTRIAN AND BICYCLE ACCESS AT INTERCHANGES AND BRIDGES

7.1 Relevant Policies

All newly constructed and reconstructed bridges shall accommodate bicycle and pedestrian access where appropriate and feasible to do so. It is SHA's policy to provide sidewalks and shoulders on both sides of bridges where bicyclists and pedestrians are permitted to operate.

7.2 Bridges on Controlled Access Freeways

Bridge replacement projects on controlled access freeways where pedestrians and bicyclists are prohibited by law will generally *not* include facilities to accommodate bicyclists and pedestrians. In cases, however, where a bridge replacement project on a controlled access freeway impacts a non-controlled access roadway (i.e. a new overpass over an arterial roadway), the project should include the necessary access for pedestrians and bicycles on the non-limited access roadway, including such elements as: paved shoulders, sidewalks, and pedestrian/bicycle crossing improvements to associated ramps and intersections. Further guidance is provided below.

7.3 Bicycle and Pedestrian Access at Interchanges

Interchanges and other locations with on-ramps and off-ramps can be among the most difficult locations for pedestrians and bicycles to navigate. The combination of high speed merging traffic and crossings by pedestrians and bicyclists creates inherent conflicts and can be very uncomfortable for non-motorized users. Particularly in urban and suburban locations where pedestrian and bicycle traffic can be expected to use the roadway, interchange design should account for their needs.

When an intersection is converted to an interchange, pedestrian and bicycle access should be considered in the design of interchange ramps and all other crossings.

The most important principle in designing interchanges that accommodate pedestrians and bicyclists is to reduce motor vehicle speeds at locations where pedestrians and bicyclists either cross the road, or (as in the case with bicyclists operating on-road) merge with traffic. For this reason, urban interchange design with conventional 90 degree intersections (instead of merge lanes) is preferable for pedestrian and bicycle safety. Interchange designs that enable motor vehicles to maintain speeds above 30 mph without stopping are not conducive to pedestrian and bicycle access and should be avoided.

7.4 Urban/Suburban Bridges (Closed Section)

On urban and suburban bridge projects, shoulder width should be based on anticipated (20 year) traffic volumes, as identified in the table shown in Figure 7.1. Sidewalks on bridges should be wider, if possible, than sidewalks on the bridge approaches. Pedestrians should not be forced to walk uncomfortably close to a wall or barrier. In general, a 2 foot shy distance is needed adjacent to a wall or a vertical curb. A barrier between the sidewalk and the curb may be needed on roadways with volumes that exceed 20,000 vehicles per day and/or operating speeds that exceed 45 mph, or in locations with high volumes of heavy vehicles (see further information on barrier design in Section 7.6).

Projected Traffic Volumes (20 Year)	Preferred Shoulder Width	Preferred Sidewalk width (min)
<15,000 ADT 15,000> ADT	5 feet 6.5 feet	5.5 feet 8 feet*

* Consider combining sidewalk and shoulder space behind a barrier

Figure 7.1 – Sidewalk & Shoulder Widths on Urban and Suburban Bridges

7.5 Locations with Shared Use Pathways

For bridges that have an existing or proposed shared use path approaching one side, the bridge should be constructed with a 10 foot wide minimum (12 foot wide preferred) shared use path on that side, which will consist of a raised wide sidewalk with a Type A curb. Depending upon the speed and volume of motor vehicle traffic, it may be necessary to separate the path from the adjacent vehicular lanes with a barrier (see Section 7.6 for further guidance). Transitions at the bridge approaches should enable access to the pathway on the bridge by bicyclists who may be riding on the paved shoulder rather than on the pathway.

7.6 Barrier Design

Barriers that are used to separate the sidewalk and/or bikeway from adjacent motor vehicle lanes can be constructed of various materials and various heights, depending upon the amount of desired separation (considering the speed and volume of traffic, the amount and mix of pedestrian and bicycle users, etc.) This is an area of design that requires engineering judgment and attention to the overall appearance of the bridge.

In locations with high volumes and high speed motor vehicle traffic (or high volumes of heavy vehicles), a concrete barrier is preferred. Use of a uni-directional concrete barrier between the pathway and adjacent motor vehicle lanes should be designed so that it does not pose a hazard to errant vehicles. It is possible in some instances to design the end of the concrete barrier so that it is sufficiently tapered away from the roadway that a crash cushion is not needed. These barriers are typically 42" in height from the surface of the pathway.

It is not recommended that barriers be used when they are not needed, as they tend to trap trash and other debris and are difficult to maintain. Square tube barriers have been used in a number of locations to separate sidewalks from the adjacent motor vehicle lanes – they are easier to terminate at the ends, by sloping them downward to the surface of the pathway. The type of end treatment chosen should be appropriate for both the design speed and site context.

Figure 7.2 – Example of Barrier between Bikeway and Travel Lanes

In situations where a uni-directional crash worthy concrete barrier is used between the pathway and the adjacent motor vehicle lanes, the railing on the other side of the pathway is not required to be crashworthy. This railing should be constructed to a height of 54" from the surface of the pathway.

7.7 Long Bridges

Bridge replacement projects in urban or suburban areas that include one continuous bridge that is over 0.5 mile in length should include a multi-use pathway on at least one side of the bridge that is separated from traffic with a concrete barrier. The provision of a pathway on one side requires that safe crossings (grade separated, if necessary) be provided on each end of the bridge so as to allow access to the other side of the road.

7.8 Bridge Retrofit Projects

Bridges can be retrofitted to better accommodate bicyclists and pedestrians. There are a variety of ways to accomplish this:

- Reduce the width and/or number of travel lanes to create more space for bicycles and/or pedestrians (see Figure 7.3). In the example shown in Figure 7.3, the narrow sidewalk was widened to provide for a more comfortable pedestrian environment, while maintaining adequate shoulder width for on-road bicycling.

- Adding a new bicycle and pedestrian structure to the existing bridge structure. In some cases, bridge footers may have been constructed in anticipation of a future roadway widening, or it may otherwise be possible to add an additional structure for pedestrians and bicyclists.

Figure7.3 – Retrofitted bridge: Stewart Avenue Bridge over I-97. *Photo credit – Harvey Muller*