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Local Highway Technical
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STRATEGY FOR IMPROVING THE GEOMETRY OF PEDESTRIAN AND BICYCLE FACILITIES AT SIGNALIZED INTERSECTIONS

Lest this be you" -- Safety education in Ames, Iowa, 1950.
Courtesy Ames Historical Society

Approaching major intersections with right-only turns often calls for additional striping close to the intersection. "

WHERE TO USE

Signalized intersections with high frequencies of pedestrian and/or bicycle crashes and on routes serving schools or other generators of pedestrian and bicycle traffic. Information on pedestrian travel at traffic signals can be found in Chapter 6--Intersection Design of the 2006 *Massachusetts Project Development and Design Guidebook*. (In Idaho, ITD Traffic Manual, Chapter 8).

DETAILS

The mix of travel modes at intersections, along with the possibility of vehicle-to-vehicle conflicts, can create safety and operational concerns for non-motorists. Geometric or physical improvements that can be made to an intersection to increase pedestrian safety include the provision of the following:

- Continuous sidewalks
- Signed and marked crosswalks
- Sidewalk set-backs
- Median refuge areas
- Pedestrian overpasses
- Intersection lighting
- Physical barriers to restrict pedestrian crossing maneuvers at higher-risk locations
- Relocation of transit stops from the near side of the intersection, and
- Other traffic calming applications to reduce vehicle speeds or traffic volumes on intersection approaches.

Some of the problems facing bicyclists at intersections include high-traffic volumes and speeds and the lack of space for bikes. Possible improvement projects include the following:

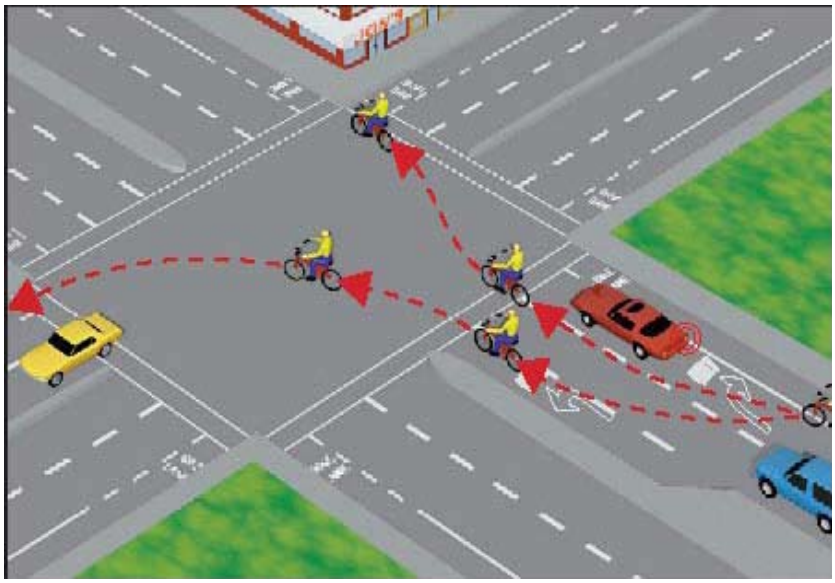
- Widening outside through lanes (or adding bike lanes)
- Providing median refuge areas
- Providing independent crossing structures
- Upgrading storm drain grates with bicycle-safe designs, and
- Implementing lighting.

KEY TO SUCCESS

A key to successful pedestrian and bicycle facilities is careful planning. The network of facilities should be well connected to meet the needs of the community. Landscaped medians should not obstruct visibility between pedestrians and bicyclists and approaching motorists or include objects representing a collision hazard to vehicles that may run onto the median.

ISSUES

Agencies must overcome decades of street and road construction projects that may have routinely ignored the needs of pedestrians and bicyclists. Pro-pedestrian and bicyclist policies and construction programs need to be implemented to correct this problem. Refuge islands may conflict with the need to provide open pavement for right-turning traffic with large turning paths. A right-turn slip lane can accommodate vehicles with large turning paths but should discourage high-speed vehicle turns and improve the right-turning motorist's view of other users.



Intersections with special lanes

TIME FRAME: SHORT

Many treatments addressing pedestrian and bicyclist improvements can be implemented in relatively short time frames.

COSTS: LOW

Costs will vary depending on the treatment implemented. Many are low cost in nature. Others, such as overpasses and lane widening, will cost significantly more.

EFFECTIVENESS: TRIED AND PROVEN

The presence of sidewalks on both sides of the street has proven to significantly reduce the "walking along roadway" pedestrian crash risk compared to locations where no sidewalks/walkways exist. Reductions of 50% to 90% of these types of pedestrian crashes have occurred. The Federal Highway Administration found that a raised median (or raised crossing island) was associated with a significantly lower pedestrian crash rate at multilane crossing locations, with both marked (46% reduction) and unmarked (39% reduction) crosswalks.

In contrast, painted (not raised) medians and center two-way left-turn lanes did not offer significant safety benefits to pedestrians on multi-lane roads, compared to no median at all. A Danish study concluded that providing bicycle lanes can reduce bicycle crashes by 36%.

First dedicated bicycle/pedestrian signal in San Francisco installed in 2008 on popular Panhandle multi-use recreational path

COMPATABILITY

These strategies are generally compatible with other signalized intersection safety strategies.

Reference: MASS INTERCHANGE, Volume 23, Number 3, Summer 2009