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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM **139**
SYNTHESIS OF HIGHWAY PRACTICE

PEDESTRIANS AND TRAFFIC-CONTROL MEASURES

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FIGURE 9 Pedestrian refuge islands.

Conditions Where Refuge Islands Are Least Beneficial or Possibly Harmful

- On narrow streets and/or when narrow safety islands are used.
- Where a high turning volume of large trucks exists.
- Where roadway alignment obscures the island so it is not easily seen and vehicles are likely to drive into them.
- In areas where the presence of a safety island hampers snowplowing.

Advantages of Pedestrian Refuge Islands (10)

- Can reduce pedestrian exposure to traffic, and allow pedestrians to cross in stages.
- Permit pedestrians to look for traffic in only one direction at a time.
- Give pedestrians a resting place when crossing wide roads or intersections.

Disadvantages of Pedestrian Refuge Islands (10)

- May present an illusion of safety.
- May cause street sweeping or plowing problems.
- May cause damage to vehicles if drivers hit them.

ONE-WAY STREETS

Conversion from two-way to one-way street systems can reduce the level of complexity for pedestrians crossing the street, because they must look only in one direction. Also, drivers can give more attention to pedestrians, because they do not have to worry about opposing traffic (10). The initial period after converting to one-way street systems may require public education. Also, one-way street systems should be planned in terms of the total traffic network in an area.

Numerous studies have attempted to determine effects of one-way street systems on pedestrian safety. In a 1982 research study by Zegeer (25) of signalized intersections in 15 U.S. cities, a comparative analysis was used to identify factors associated with pedestrian accidents. Intersections of two-way streets had significantly higher pedestrian accidents, compared with intersections having one-way streets, when controlling for other important traffic and roadway variables. The presence of one-way streets was the geometric feature found to be most related to low pedestrian accidents (although less related than pedestrian volume or traffic volume) (25).

Various studies in the United States and Canada have evaluated the accident effects of converting two-way street systems to one way. A study in Sacramento found a 62 percent reduction in pedestrian accidents after 19 central area streets were converted to one way (11). In Hamilton, Ontario, pedestrian accidents were also found to decrease, after 27 miles of streets were converted to one-way operation (26). In fact, pedestrian accidents dropped by 9 (10 percent) during the first six months after the one-way street conversion, and by 58 (66 percent) during the second six-month after period. During those same periods, pedestrian accidents increased on two-way streets in the city, which helps to confirm that the reductions in pedestrian accidents were the result of the one-way street conversion and not caused by random accident fluctuations. Conversion of a span of streets from two-way to one-way streets in Manhattan reduced pedestrian accidents from 117 to 77, as reported by Bruce in 1967 (27).

In summary, conversion from two-way to one-way street systems has consistently been found to reduce pedestrian accidents, because it can greatly reduce the complexity of crossings for pedestrians and allows motorists to pay more attention to crossing pedestrians. Where one-way street systems are feasible in terms of traffic-circulation patterns, improved pedestrian safety is a likely result.

Conditions Where One-Way Streets Are Most Beneficial

- Downtown grid street networks, particularly on narrow streets with high traffic volumes.
- Streets with inadequate gaps for vehicle turns.
- Streets with heavy pedestrian activity and a high frequency of conflicts between turning vehicles and pedestrians.
- Where there is a substantial number of left-turn accidents, right-turn accidents, and/or midblock pedestrian accidents.

Conditions Where Least Beneficial or Possibly Harmful

- When vehicle speeds would be substantially increased as a result (e.g., some very wide streets).