

The Influence of Environmental Attributes on Children's Pedestrian-Crash Risk in School Zones

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Abstract : Children are the most vulnerable travelers and they are at risk for pedestrian injury. Creating a safe route to school is important because walking to school is one of the main opportunities for promotion of needed physical exercise among children. This study examined how the built environmental attributes near an elementary school influence traffic accidents among school-aged children. The study used two complementary data sources including the locations of police-reported pedestrian crashes and the built environmental characteristics of school areas. The environmental attributes of road segments were collected through GIS measurements of local data and actual site audits using the inventory developed for measuring pedestrian-crash risk scores. The inventory data collected at 840 road segments near 32 elementary schools in the city of Ulsan. We observed all segments in a 300-meter-radius area from the entrance of an elementary school. Segments are street block faces. The inventory included 50 items, organized into four domains: accessibility (17items), pleasurable (11items), perceived safety from traffic (9items), and traffic and land-use measures (13items). Elementary schools were categorized into two groups based on the distribution of the pedestrian-crash hazard index scores. A high pedestrian-crash zone was defined as an school area within the eighth, ninth, and tenth deciles, while no pedestrian-crash zone was defined as a school zone with no pedestrian-crash accident among school-aged children between 2013 and 2016. No- and high pedestrian-crash zones were compared to determine whether different settings of the built environment near the school lead to a different rate of pedestrian-crash incidents. The results showed that a crash risk can be influenced by several environmental factors such as a shape of school-route, number of intersections, visibility and land-use in a street, and a type of sidewalk. The findings inform policy for creating safe routes to school to reduce the pedestrian-crash risk among children by focusing on school zones.

Keywords : active school travel, school zone, pedestrian crash, safety route to school

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