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Relationship of Lane Width to Safety for Urban and Suburban Arterials

by

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ABSTRACT: This research investigates the relationship between lane width and safety for roadway segments and intersection approaches on urban and suburban arterials. The research found no general indication that the use of lanes narrower than 3.6 m (12 ft) on urban and suburban arterials increases crash frequencies. This finding suggests that geometric design policies should provide substantial flexibility for use of lane widths narrower than 3.6 m (12 ft). Inconsistent results were found which suggested increased crash frequencies with narrower lanes in three specific design situations. Narrower lanes should be used cautiously in these three specific situations unless local experience indicates otherwise.

CONCLUSIONS AND RECOMMENDATIONS

A safety evaluation of lane widths for arterial roadway segments found no indication, except in limited cases, that the use of narrower lanes increases crash frequencies. The lane width effects in the analyses conducted were generally either not statistically significant or indicated that narrower lanes were associated with lower rather than higher crash frequencies. There were limited exceptions to this general finding. It was found that crash frequency in one state was higher for 3.0 m (10 ft) lanes than for 3.3 and 3.6 m (11 and 12 ft) lanes on four-lane undivided arterials and was higher in the other state for 2.7 m (9 ft) lanes than for 3.0 m (10 ft) lanes on four-lane divided arterials. However, neither of these statistically significant effects observed in one state were statistically significant in the other state.

Similarly, a safety evaluation of lane widths for arterial intersection approaches found no indication, except in limited cases, that the use of narrower lanes increases crash frequencies. The lane width effects in the analyses conducted were generally either not statistically significant or inconsistent. With only one limited exception, there is no indication that the use of lanes narrower than 3.6 m (12 ft) on intersection approaches leads to increases in crash frequency. The data for one state showed higher crash frequencies for approaches to four-leg STOP-controlled intersections, for approaches with 3.0 m (10 ft) lanes than for approaches with 3.6 m (12 ft) lanes; however, just the opposite was found in data from the other state.

It is concluded from this research that there is no indication that crash frequencies increase as lane width decreases for arterial roadway segments or arterial intersection approaches.

These findings suggest that the AASHTO *Green Book* is correct in providing substantial flexibility for use of lane widths narrower than 3.6 m (12 ft) on urban and suburban arterials. Use of narrower lanes in appropriate locations can provide other benefits to users and the surrounding community including shorter pedestrian crossing distances and space for additional through lanes, auxiliary and turning lanes, bicycle lanes, buffer areas between travel lanes and sidewalks, and placement of roadside hardware. Interpretation of design policies as rigidly requiring the use of 3.6 m (12 ft) lanes on urban and suburban arterials may miss the opportunity for these other benefits without any documentable gain in safety.

The research found three situations in which the observed lane width effect was inconsistent—increasing crash frequency with decreasing lane width in one state and the opposite effect in another state. These three situations are:

- lane widths of 3.0 m (10 ft) or less on four-lane undivided arterials.
- lane widths of 2.7 m (9 ft) or less on four-lane divided arterials.
- lane width of 3.0 m (10 ft) or less on approaches to four-leg STOP-controlled arterial intersections.

Because of the inconsistent findings mentioned above, it should not be inferred that the use of narrower lane must be avoided in these situations. Rather, it is recommended that narrower lane widths be used cautiously in these situations unless local experience indicates otherwise.