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## Research Brief

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## Complete Streets and their effect on increasing safety for all road-users

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This research brief highlights the Complete Streets concept and its effect on increasing safety for pedestrians and bicyclists in communities.

Complete Streets is a transportation policy and design concept that promotes safe and convenient access to roadways for users of all transportation modes including walking, biking, driving motor vehicle, and riding public transportation [1]. The Complete Streets concept is a shift from planning and designing streets with motor vehicles as the dominant mode. Complete Streets explicitly acknowledges the mobility and safety needs of all road users by all modes.

Complete Streets aim to reduce the risk of crashes for motor vehicles, pedestrians, and bicyclist, by allocating space for different modes more efficiently and limiting the number and type of interactions between users of different modes [2]. Several Complete Streets elements lead to a reduction of vehicle speeds on the roadways. Research shows that the safety of all road users, and particularly vulnerable road users, increases with slower vehicle speeds [3].

The following are examples of how some communities have incorporated Complete Street elements into their street planning and design:

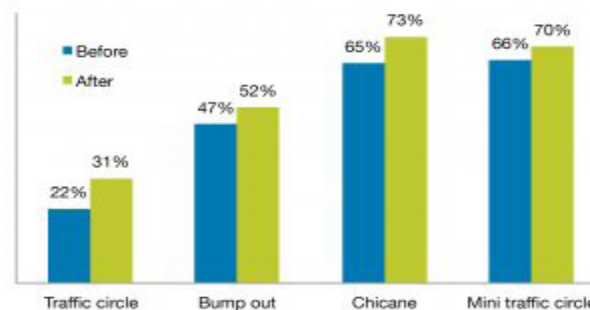
- A study conducted by the University of British Columbia analyzed the impact of Complete Street elements on bicyclist injuries along selected routes in the cities of Toronto, Ontario and Vancouver. The results showed that protected bike lanes were safer compared to similar roads with no infrastructure for bicycles on the road [4].
- According to the Nevada Complete Streets Coalition, a number of studies concluded that the inclusion of some safety features for bicyclists such as separate bicycle lanes (not necessarily protected) led to a reduction in the risk of bicyclists crashing into moving or parked cars [5].

- The National Complete Streets Coalition conducted safety demonstration projects in South Bend, IN, Lexington, KY, and Orlando, FL, to encourage these cities to design for all modes of transportation while engaging the community.

### South Bend, IN

To address speeding problems on City's neighborhood streets, the City of South Bend launched a demonstration project to examine the effects of traffic-calming tools including traffic circles, chicanes, and bulb-outs. The traffic calming features resulted in traffic to slow down considerably as shown in the following graph [6].

Percentage of people driving 25 miles per hour or less before and after South Bend's demonstration project



### Lexington, KY

City staff worked closely with the community to redesign two intersections that had a history of pedestrian collisions. The new designs redirected motor vehicles, and added crosswalks and pedestrian refuges, leading to a reduction in motor vehicle speed and safer crossing for pedestrians at these intersections [7].

### Orlando, FL

The City of Orlando implemented a road diet and a mid-block crosswalk with painted pedestrian refuge on one of its commercial arterials with a history of pedestrian and bicyclist crashes. The transformation of this street to a “Complete Street” slowed down motor vehicles and created a safer, more comfortable place for people walking and biking. While the local business owners and residents supported the demonstration project, there was concern by some individuals due to the slower speeds and occasional vehicle delay along the arterial. While the City removed the project at the end of the one-month demonstration, the demonstration project started a discussion between City staff and the community about the trade-offs between speed of motor vehicles and safety of pedestrian and bicyclist. It also improved the working relationship between city and county staff on coordinated projects [8].

In California, the Caltrans Smart Mobility and Active Transportation Branch created The Complete Streets Elements (CSE) Toolbox [9] to:

- provide guidance to help project planners, engineers, and designers select Complete Streets elements to meet safety, accessibility, efficiency, and equity objectives in their projects
- translate Caltrans’ policies into complete streets concepts for more effective implementation of CSE

Each CSE features information including a definition and examples or diagrams, and is organized by modes of transportation: Bicycle, Pedestrian, Roadway, and Transit. The toolbox is a helpful resource for transportation planners and engineers in designing and building safe and convenient roads for all road users in California.

### **References:**

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