

were clustered in the eastern area of the city, an area with relatively low pedestrian volumes. Of the intersections surveyed, only one was in the downtown area.

"This finding suggests that although the highest volume intersections may be within the downtown area, these intersections are much safer than those in East Oakland because they accommodate a greater number of pedestrians with fewer pedestrian accidents, even though they may have a higher number of absolute pedestrian crashes."

Raford and Ragland use as an example two Oakland intersections, one in downtown and one in east Oakland. The downtown intersection was considered one of the most dangerous intersections in the downtown area, experiencing "an average of three pedestrian-vehicle crashes per year." Using Space Syntax, Raford and Ragland determined the intersection's annual pedestrian volume to be 998,000. The researchers found that these figures can be contrasted to those for an intersection in East Oakland where the average pedestrian volume was much lower, 343,000 a year. Pedestrians crossing at this intersection were approximately 5.6 times more likely to be involved in a collision than they were at the intersection in downtown. Data from every intersection studied for this report yielded similar results.

"From a public policy standpoint, from a safety standpoint, the message is, if you want safer streets have more people on them," Raford said.

In his 2003 study, "Safety in numbers: more walkers and bicyclists, safer walking and biking"⁽¹⁾ Jacobsen observed a similar phenomenon, but on a much broader level of analysis. Jacobsen examined the relationship between the rates of pedestrian and bicycle activity and the number of times pedestrians (or cyclists) were hit by cars in 68 California cities and multiple European countries and found that in most cases, the risk of collision went down as pedestrian and bicycle activity increased. For example, Jacobsen found that the per capita fatal injury rate for pedestrians and bicyclists in the Netherlands and the U.S is comparable: about 1.9 per 100, 000, even though the share of bicycle/pedestrian trips in the Netherlands is much higher, 46 percent versus 6 percent in the U.S.

Drivers Become More Careful

The results were consistent across several regions and countries and could not be explained solely by changes in pedestrian behavior, Jacobsen noted. According to Jacobsen, it is unlikely that pedestrians obey traffic signals or defer to vehicles simply because there are more pedestrians around. In fact, common sense would suggest that the opposite is true—the more pedestrians are around, the more confident, and less careful, individual walkers and cyclists become. Rather, Jacobsen sees the results as an expression of the relationship between motorist behavior and pedestrian activity. In other words, drivers drive more carefully when they observe large numbers of walkers and bicyclists.

"Adaptation in motorist behavior seems more plausible [than other alternatives] and other discussions support that view," Jacobsen writes. "In addition, motorists in communities or time periods with greater walking and bicycling are themselves more likely to occasionally walk or bicycle and hence may give greater consideration to people walking and bicycling."

Further analysis of this phenomenon may help planners find ways of improving the safety and walkability of built environments. For instance, if motorists change their behaviors according to the

