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**DANGEROUS BY DESIGN:  
PEDESTRIAN SAFETY IN CALIFORNIA**



Surface Transportation Policy Project  
September 2000

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#### EXECUTIVE SUMMARY

Pedestrian accidents are a significant public health problem in California and are one of the leading causes of fatal and hospitalized injuries for children statewide. Pedestrian fatalities alone accounted for nearly 20 percent of all traffic-related deaths in the state, even though only eight percent of all trips are made on foot. The number of pedestrians killed as a percentage of total traffic fatalities ranged as high as 26 percent in Sacramento County, 30 percent in Los Angeles County, and 54 percent in San Francisco County (Table 2).

According to an analysis of 1999 data, pedestrian accidents cost California nearly \$4 billion in lost economic productivity, medical expenses and pain and suffering (Table 6). Yet California spends less than one percent of its federal transportation funds on pedestrian safety, less than any other state in the nation. Ironically, the most visible effort statewide related to pedestrians has been the highly controversial removal of crosswalks under the guise of improved safety.

#### THE PROBLEM

An analysis of statewide data collected by the Department of California Highway Patrol shows that in 1999, at least 688 pedestrians died and another 14,346 were injured on California's streets. Los Angeles County experienced by far the greatest number of pedestrian fatalities and injuries - 203 pedestrian deaths and 5,377 injuries represent more than a third of all pedestrian fatalities and injuries in the state. But Los Angeles is also California's most populous county, and if the rankings are adjusted to reflect population, San Francisco ranks as having *per person* the highest incidence of pedestrian fatalities and deaths.

However, more people walk in San Francisco than in any other California city because there is a mix of residential, retail and other land uses within walking distance, population and development patterns are dense, and public transit is convenient. Therefore, any real measure of the relative danger facing pedestrians must factor in the amount of walking, or "exposure," that occurs in each location.

These factors are all incorporated in a "pedestrian danger index," arrived at by dividing the number of fatalities and injuries in each county by population, and then dividing that number by the county's "exposure index," or overall levels of

pedestrian activity. This number is then adjusted to a relative scale from 1 to 100, with 100 being the most dangerous.

Using the pedestrian danger index, Sacramento County ranks as the most dangerous county for pedestrians in California in 1999, followed by Contra Costa, Los Angeles, Santa Clara and San Mateo (Table 1). This is the first time Sacramento County has ranked most dangerous since our survey began in 1996. Ventura County ranks in the top 10 for the first time since 1996, and San Francisco, San Joaquin and Tulare counties all climbed in the rankings. While Los Angeles County dropped from first to third, the number of fatalities actually increased from 200 to 203, and the drop in the rankings had more to do with the fact that the number of fatalities increased more sharply in other counties. The ranking shows that counties in Southern California, the Silicon Valley and the Central Valley are among the most dangerous in the state.

As alarming as these figures are they may not fully measure the danger to pedestrians because it's been estimated that injuries are underreported by as much as 56 percent. Police often do not report collisions that result in emergency room treatment but not hospitalization, and don't report collisions that occur on private property, or in alleys or driveways. These are the locations where many accidents involving the youngest children occur. It is important to note that pedestrian injuries account for two-thirds of all severe traffic-related injuries among children, and that the probability of a child dying or becoming severely disabled exceeds that of all other causes of childhood illness. The elderly are also two to four times more likely to die when struck.

As with automobile fatalities, the total number of pedestrian deaths has dropped slightly in the last few years. However, while the amount of driving is increasing, statistics show that the amount of walking is declining. This may mean that while driving is getting safer, walking is getting more dangerous. The sharp decline in walking has coincided with significant increases in obesity and inactivity among the general population. These trends have so alarmed health officials that they have joined with pedestrian advocates in calling for policies and investments that make communities safer and more walkable.

#### THE VICTIMS

An analysis of the most recent statewide hospitalization data (a smaller but more detailed database that records race and ethnicity information) shows that Latinos and African Americans were more likely to be injured relative to their share of California's overall population. While 30 percent of the population of California is Latino, 37 percent of all hospitalized pedestrian fatalities and injuries in 1998 were Latino. African Americans represented 7 percent of the state's population but accounted for 10 percent of all hospitalized pedestrian fatalities and injuries (Table 3). Race and ethnicity data at the local level in California points to a similar trend, with Latinos and African Americans disproportionately represented as victims of pedestrian-vehicle crashes in nearly every one of the state's most populous counties (Table 4).

Prior research, supported here with a new analysis by the Latino Issues Forum, also shows that low-income populations are more likely to be victims in pedestrian accidents. While 35 percent of all pedestrian victims under the age of 65 were covered by Medi-Cal, just 11 percent of the general population under 65 were covered by Medi-Cal. While the higher risk for low-income populations has been documented in dozens of studies conducted by health professionals here and abroad, this information has largely been absent from the public debate over pedestrian safety in California. Further analysis reveals hospital charges alone topped \$200 million for pedestrian victims in 1998, \$23 million of which was paid out of pocket. But when factoring in lost economic productivity and pain and suffering, pedestrian fatalities and injuries are estimated to cost California nearly \$4 billion a year.

Other studies show that pedestrian injuries and deaths, particularly among children, are correlated to income and several other socioeconomic factors including access to a car. Factors include unemployment, single-parent and especially female-headed households, young mothers, low levels of education, the number of times a family has moved, and the number of children in a household. More than one study found that lack of access to a car was associated with a doubling of the risk of injury as a pedestrian.

Limiting exposure by simply staying inside, however, has grave implications for both health and well-being. The vast majority of children already fall short of the recommended daily dose of activity, which can have a negative effect on both a child's physical and mental development. Concerns have also been raised about the extent to which transportation policy and investments focused on

improving travel by automobile have circumscribed the independence and mobility of both children and the elderly.

#### THE RESPONSE

For decades state and local governments have focused transportation policy and investments on accommodating more traffic by widening streets, increasing speed limits, removing crosswalks and enacting laws that give vehicles the advantage - such as allowing right turns on a red light. Meantime rapid suburbanization has dramatically increased traffic and spread development patterns ever further apart so that stores, homes, schools and other destinations are no longer easily accessible on foot. The result has been deadly for pedestrians. Studies show that traffic speed and traffic volume are two of the environmental factors with the highest correlation to pedestrian injury and death. One of the more disturbing trends in California is the removal of crosswalks at uncontrolled intersections (intersections without a stop sign or traffic signal), a policy that has left pedestrians to largely fend for themselves.

Moreover, in order to provide a safe environment for pedestrians, the basic infrastructure of sidewalks, paths and crosswalks must be provided. Yet an analysis of federal transportation funding shows that while California has the second highest share of pedestrian deaths compared to all traffic-related fatalities, it ranks last among the 50 states in spending on pedestrians. While an average of \$40 per person in federal transportation funds was spent on highway projects statewide, an average of just 4 cents per person was spent on improving conditions for pedestrians. Even though statewide roughly 20 percent of all traffic fatalities are pedestrians, less than one percent of all federal traffic safety money was spent on making the streets safer for pedestrians.

Pedestrians, even if they are young children, are often found to be at fault in crashes, obscuring the fact that the real problem may be that laws favor motorists, that speed limits are set too high, or that there are a lack of crosswalks and safe places for children to play. The tendency to blame pedestrians creates the impression among policy makers and the public that nothing that can be done. As a result efforts to improve pedestrian safety are often limited to pedestrian education, even though numerous health studies conclude that education alone has limited effectiveness, especially with children,

and that modifications in street design and the lowering and enforcement of speed limits are also needed.

#### SOLUTIONS

The report also discusses how local and state policies across California that have focused on accommodating more traffic have been deadly for pedestrians, and why a tendency to blame pedestrians for collisions has served to further hamper programs and policies that could potentially prevent thousands of additional injuries. In conclusion, new policies and investments are suggested that can make California's cities, towns and suburbs safe and walkable. The report's recommendations include:

1. **Dedicate a fair share of traffic safety funding to pedestrians.** Pedestrian accidents cost California nearly \$4 billion in 1999 alone, while spending on pedestrian safety measures is a mere fraction of that figure. If 20 percent of all traffic fatalities are pedestrians, it stands to reason that a similar amount of safety funding should be directed toward solving the problem.
2. **Suspend California's crosswalk removal policy.** The trend toward removing crosswalks due to the belief that they give pedestrians a false sense of security is like removing traffic

signals so that motorists will proceed with greater caution. State agencies need to do more for pedestrians, not less. California should develop a new minimum design standard for crosswalks that includes "zebra" striping and overhead lighting or flashing signals.

3. Consider pedestrians during the design phase of every project. Communities must be designed so that people have a place to walk to, which means that shops, offices, schools, libraries and transit stops are located within reasonable walking distance. All facilities should be designed for the disabled and meet basic standards established in the Americans with Disabilities Act.
4. Collect more information on pedestrians. Existing databases provide little information about the amount of pedestrian activity in different locations, the risks associated with walking, the effectiveness of pedestrian safety measures, or even how much is spent on pedestrian safety. This lack of information makes pinpointing underlying problems and solutions difficult.
5. Develop a statewide blueprint for bicycling and walking. California needs a statewide vision and strategy for maximizing the benefits of bicycling and walking that includes goals and an action plan for all levels of government. This includes targeted strategies like Safe Routes to School programs, as well as an economic analysis of the potential benefits of bicycle tourism, regional trail systems and more pedestrian-oriented developments.



## CHAPTER TWO: THE VICTIMS

The risk of injury and death, however, varies depending not only on where you live but also to a large degree on your race, ethnicity and income. This phenomenon has been widely reported in studies and surveys conducted both in the U.S. and abroad, but has largely been absent from the public discussions and debate surrounding pedestrian safety in California.

An analysis of the most recent statewide hospitalization data (a smaller but more detailed database that records race and ethnicity information) shows that Latinos and African Americans were more likely to be injured relative to their share of California's overall population. While 30 percent of the population of California is Latino, 37 percent of all hospitalized pedestrian fatalities and injuries in 1998 were Latino. African Americans represented 7 percent of the state's population but accounted for 10 percent of all hospitalized pedestrian fatalities and injuries. Race and ethnicity data at the local level in California points to a similar trend, with Latinos and African Americans disproportionately represented as victims of pedestrian-vehicle crashes in nearly every one of the state's most populous counties (see Table 4).

Race/Ethnicity	Pedestrian Fatal Injuries 1998	Hospitalized Pedestrian Injuries 1998	Total Hospitalized Incidents 1998	Percent Share of Total Incidents	Percent Share of Total Population
HISPANIC	246	1859	2105	37.3	29.7
WHITE	300	1947	2247	39.8	51.6
BLACK	67	615	682	12.1	7.2
ASIAN/ PACIFIC ISLANDER	43	340	383	6.8	11.1
UNKNOWN/ OTHER	1	180	181	3.2	--
NATIVE AMERICAN	5	31	36	.6	.6
<b>TOTAL</b>	<b>662</b>	<b>4972</b>	<b>5634</b>	<b>100.0</b>	<b>100.0</b>

*NOTE: Share of total population is based on California Department of Finance 1998 estimates. Totals may not add due to rounding. Data is based on fatal hospitalized and nonfatal hospitalized pedestrian incidents only. SOURCE: Latino Issues Forum; California Department of Health Services, Death Records; California Office of Statewide Health Planning and Development, Hospital Discharge Dataset; California Department of Finance.*

Several recent surveys elsewhere in the United States have produced similar findings. The Centers for Disease Control in Atlanta reported recently that Latinos in Atlanta were six times more likely to be hit and killed than whites. A survey conducted by the Washington Post found that Latinos in suburban Washington D.C. were three times more likely to be hit and killed.<sup>11</sup> Another survey conducted by the Los Angeles Times in Orange County showed that while Latinos make up 28 percent of the county's population, they accounted for 40 percent of all pedestrian injuries and 43 percent of all deaths.<sup>12</sup>

PEDESTRIAN PROFILE #1:  
NANCY HERNANDEZ, 43  
COMMUNITY ORGANIZER  
EL SERENO, LOS ANGELES COUNTY,  
CALIFORNIA

The predominantly Spanish-speaking El Sereno neighborhood in Los Angeles County where Nancy Hernandez lives is marked by the sights and sounds of busy foot traffic. Child pedestrians and bicyclists from elementary, middle and high schools, elderly pedestrians from the Senior Center, park-goers, patrons from small restaurants and stores, and people getting on and off local buses create a busy, lively street life. All but the high school are located on a half mile strip down Eastern Street.

Hernandez regularly takes transit and walks. But she says there's a mean side to the streets in her neighborhood: residents are fearful of being hit and killed by speeding cars. "There's so much traffic in the morning, it's scary," explains Hernandez. "Cars are on the crosswalk. Instead of walking in front of the cars,

you have to squeeze in between to cross the street. You don't know if the cars are going to reverse and squash you."

Over six months ago, Hernandez witnessed a tragic accident in the neighborhood. A boy was hit while crossing the street towards his mother on the other side, he was thrown into the other direction of traffic and struck again and killed by a second car. Both were hit and runs.

"I have three girls," says Hernandez. "When we do have to walk, it's scary. I've taught them to look four ways, not just two, before they cross." Area residents are now circulating petitions to install a crossing signal or warning light to slow down traffic or retrofit Eastern Street with other traffic calming measures.

Studies by both UC-Irvine<sup>13</sup> and the Santa Ana Unified School District in Orange County<sup>14</sup> show that Latino children are twice as likely to be injured or killed. Several studies show the risk of injury to be significantly higher among African American children than other children,<sup>15</sup> and in census tracts with higher percentages of non-white residents.<sup>16</sup> In New Mexico, Native American children had a death rate 2.5 times that of other ethnic and racial groups.<sup>17</sup>

"Pedestrian injury death rates for non-white children are consistently found to be higher than the rates for white children," write UC-Irvine researchers in a review of nearly 100 studies on child pedestrian injuries, which was presented at a 1998 Centers for Disease Control-sponsored conference.<sup>18</sup> An analysis of child pedestrian injuries and fatalities conducted by STPP and the Latino Issues Forum in 1999 shows a similar trend statewide, with Latino children comprising 39 percent of California's child population but 48 percent of all pedestrian incidents, and African-American children accounting for 8 percent of the state's child population but 14 percent of all pedestrian incidents.

**TABLE 4: RACIAL BREAKDOWN OF HOSPITALIZED  
PEDESTRIAN INJURIES AND FATALITIES BY COUNTY —1998**

IV. Comments and Responses to the Draft EIR

COUNTY	PERCENT SHARE OF	WHITE	BLACK	HISPANIC	NATIVE AMERICAN	ASIAN/PACIFIC ISLANDER	OTHER/ UNKNOWN
ALAMEDA	Ped Incidents	37 %	27 %	14 %	n/a	10 %	13 %
	Population	46 %	18 %	17 %	n/a	19 %	n/a
CONTRA COSTA	Ped Incidents	51 %	23 %	n/a	n/a	n/a	n/a
	Population	65 %	9 %	13 %	1 %	11 %	n/a
FRESNO	Ped Incidents	33 %	n/a	48 %	n/a	n/a	n/a
	Population	45 %	5 %	38 %	1 %	11 %	n/a
KERN	Ped Incidents	56 %	n/a	26 %	n/a	n/a	n/a
	Population	58 %	6 %	32 %	1 %	3 %	n/a
LOS ANGELES	Ped Incidents	27 %	16 %	48 %	n/a	6 %	3 %
	Population	33 %	10 %	44 %	n/a	13 %	n/a
MONTEREY	Ped Incidents	41 %	n/a	52 %	n/a	n/a	n/a
	Population	47 %	6 %	39 %	1 %	8 %	n/a
ORANGE	Ped Incidents	39 %	n/a	45 %	n/a	11 %	n/a
	Population	57 %	2 %	28 %	n/a	12 %	n/a
RIVERSIDE	Ped Incidents	48 %	n/a	42 %	n/a	n/a	n/a
	Population	61 %	5 %	29 %	1 %	4 %	n/a
SACRAMENTO	Ped Incidents	56 %	17 %	15 %	n/a	n/a	n/a
	Population	65 %	10 %	13 %	1 %	11 %	n/a
SAN BERNARDINO	Ped Incidents	46 %	15 %	34 %	n/a	n/a	n/a
SAN DIEGO	Ped Incidents	55 %	9 %	31 %	1 %	5 %	n/a
	Population	48 %	11 %	33 %	n/a	4 %	n/a
SAN FRANCISCO	Ped Incidents	61 %	6 %	24 %	1 %	8 %	n/a
	Population	37 %	16 %	18 %	n/a	26 %	n/a
SAN JOAQUIN	Ped Incidents	40 %	10 %	16 %	n/a	34 %	n/a
	Population	44 %	n/a	36 %	n/a	n/a	n/a
		55 %	5 %	25 %	n/a	14 %	n/a

SAN MATEO	Ped Incidents	57 %	n/a	27 %	n/a	n/a	n/a
	Population	53 %	5 %	21 %	n/a	20 %	n/a
SANTA BARBARA	Ped Incidents	44 %	n/a	44 %	n/a	n/a	n/a
	Population	61 %	3 %	31 %	n/a	5 %	n/a
SANTA CLARA	Ped Incidents	37 %	n/a	42 %	n/a	14 %	n/a
	Population	50 %	4 %	24 %	n/a	22 %	n/a
VENTURA	Ped Incidents	49 %	n/a	42 %	n/a	n/a	n/a
	Population	62 %	2 %	30 %	n/a	6 %	n/a
CALIFORNIA	Ped Incidents	40 %	12 %	37 %	1 %	7 %	3 %
	Population	52 %	7 %	30 %	1 %	11 %	n/a

*NOTE: n/a unreported due to statistically insignificant data. See Appendix for race and population breakdowns by absolute numbers by county. SOURCE: Latino Issues Forum; California Department of Health Services, Death Records; California Office of Statewide Health Planning and Development, Hospital Discharge Dataset; California Department of Health Services, Epidemiology and Prevention for Injury Control Branch; California Department of Finance.*

**IN THEIR OWN WORDS**

**MIMI SOTO, 24**

**COMMUNITY ORGANIZER**

**EAST LOS ANGELES**

**PART OF AN EXCHANGE WITH TRANSPORTATION OFFICIALS AT A COMMUNITY MEETING**

"You didn't even tell us that you were going to remove the crosswalk. When we said we wanted it back you told us we didn't meet the criteria. So we said, that's okay, because what we really need is a stop light. No, you said, we don't meet the criteria. So we said please, at least put in a stop sign because the cars drive too fast. No, you said, we don't meet the criteria. Well I say the problem isn't that we don't meet your criteria. The problem is that your criteria does nothing to address the safety problems in our neighborhood."

California hospitalization statistics also concur with the results of dozens of health studies in the U.S., Canada, Great Britain and New Zealand that correlate the risk of pedestrian injury and death, particularly among children, to income and related socioeconomic factors. These factors include unemployment, single-parent and especially female-headed households, young mothers, low levels of education, the number of times a family has moved, and the number of children in a household. Children in families without a car are twice as likely to be injured as those in car-owning families.<sup>19</sup>

Studies in Quebec<sup>20</sup> and in Scotland<sup>21</sup> found that poor children were four times as likely to be injured as children of wealthy families. A study in Baltimore found that children whose parents own a car and home cross an average of 3.7 streets a day, whereas children whose parents do not own both a car and home cross an average of 5.4 streets a day, a difference that is, say the researchers, "highly significant."<sup>22</sup>

Ian Roberts, who has done extensive research on the socioeconomic and racial determinants of pedestrian injury and death, wrote in the *British Medical Journal*, "For injuries to child pedestrians the number of roads that children cross is a key determinant of the occurrence of injury. Children in families with the lowest quarter of income cross 50 percent more roads than those in families in the highest quarter." Roberts goes on to add, "The strong association between injury and poverty is the most consistent finding in published epidemiological studies of childhood injury . . . the association between injury and poverty is particularly strong for traffic accidents."<sup>23</sup>

While no exact statistics are collected on socioeconomic status for pedestrian victims in California, both independent research and existing data on health insurance strongly suggest that the state's pedestrian accident victims are likely to be low-income. Of all hospitalized pedestrian injuries under 65 years of age in 1998, nearly 35 percent were covered by Medi-Cal. Of that same age group in the population at large, only 11 percent were covered by Medi-Cal in the same year (see Table 5). Caps on earnings for Medi-Cal insurance requires that recipients be in the lowest income brackets.

TABLE 5: HOSPITALIZED PEDESTRIAN INJURIES BY INSURANCE COVERAGE AND HOSPITAL COSTS — 1998					
ITEM	MEDI-CAL	OTHER/ GOV'T	PRIVATE INSURANCE	SELF-PAY	TOTAL
0-4 yrs	279	22	168	44	513
5-12 yrs	395	69	303	37	804
13-20 yrs	223	33	216	62	534
21-64 yrs	631	576	775	527	2509
65+ yrs	73	575	129	31	808
TOTAL DISCHARGES	1,601	1,275	1,591	701	5,168
PERCENT SHARE OF ADMISSIONS	30.9 %	24.7 %	30.8 %	13.6 %	100.0 %
HOSPITAL CHARGES	\$ 71,129,64 8	\$ 52,658,96 2	\$ 56,338,182	\$23,611,6 92	\$203,738.48 4
PERCENT SHARE OF ADMISSIONS 0-64 yrs	35.0 %	16.1 %	33.5 %	15.4 %	100.0 %
PERCENT OF POPULATION 0-64 yrs COVERED	11.0 %	n/a	n/a	n/a	n/a
NOTE: Hospital charges don't include physician charges or any outpatient costs. SOURCE: Latino Issues Forum; California Office of Statewide Health Planning and Development, Hospital Discharge Dataset 1998; California Department of Health Services, Epidemiology and Prevention for Injury Control Branch.					

It is speculated that the link between pedestrian collisions and ethnicity is due to the fact that Latinos and African Americans in California are less likely to own a car and more likely to walk, bike and take public transit - resulting in greater

exposure to the dangers of the street. The link with socioeconomic status may also have to do with the fact that more affordable housing is located along high-speed, high-volume arterial streets - which are more dangerous for pedestrians.

**THE COST OF PEDESTRIAN COLLISIONS**

While spending on pedestrian safety measures usually fails to be a priority in local, regional and state transportation funding programs, health providers, private companies and Californians themselves are spending billions as a result of pedestrian injuries and fatalities. As demonstrated in Table 5, hospital charges alone are in excess of \$200 million - a cost partly covered by health insurance providers but that also included over \$23 million in out of pocket expenses in 1998. Yet these initial costs do not factor in physician charges, physical rehabilitation, work loss or property damages. An independent analysis of pedestrian injury and fatality data performed by the Children's Safety Network Economics and Insurance Resource Center concludes that pedestrian collisions cost California at least \$1.3 billion in lost economic productivity in 1999 alone. This cost estimate rises to nearly \$4 billion once "quality of life" costs including pain and suffering are accounted for (see Table 6).

<b>TABLE 6: TOTAL COST OF CALIFORNIA PEDESTRIAN FATALITIES AND INJURIES — 1999</b>			
<b>TYPE OF COST</b>	<b>FATALITY COST</b>	<b>INJURY COST</b>	<b>TOTAL</b>
MEDICAL	\$3,500,000	\$228,600,000	\$232,100,000
VICTIM WORK LOSS	\$683,500,000	\$261,200,000	\$944,700,000
PUBLIC SERVICES	\$900,000	\$4,100,000	\$5,000,000
PROPERTY DAMAGE	\$8,700,000	\$67,100,000	\$75,800,000
(SUBTOTAL ECONOMIC COSTS)	(\$696,600,000)	(\$561,000,000)	(\$1,257,600,000)
LOST QUALITY OF LIFE COSTS	\$1,324,500,000	\$1,355,600,000	\$2,680,100,000



TOTAL COSTS	\$2,021,100,000	\$1,916,600,000	\$3,937,700,000
<i>NOTE: Based on provisional data from Statewide Integrated Traffic Records System (SWITRS) August 1999; SOURCE: Children's Safety Network Economics and Insurance Resource Center; Pacific Institute for Research and Evaluation; Cost per Injury and Fatality based on research by Miller, Romano and Spicer.</i>			

**RESTRICTING ACTIVITY INCREASES OTHER HEALTH RISKS**

Unfortunately, the initial response to increasing traffic dangers is often to limit pedestrian activity, and children in particular are often the first to be discouraged from walking or bicycling. But the fact that so many children are kept inside or are chauffeured to destinations in order to guarantee their safety has increased their exposure to another kind of danger – the health risks associated with inactivity and obesity. Seventy-eight percent of U.S. children already do not get the recommended daily dose of 30 minutes of exercise, including 20 minutes of vigorous activity.<sup>24</sup> This can have a negative impact on a child's cardiovascular health<sup>25</sup> and also contributes to obesity. Physical activity not only stimulates muscles and joints but also improves concentration, memory and learning, and enhances creativity and problem-solving abilities.<sup>26</sup> Studies have shown that physical activity also improves the mood of children.<sup>27</sup>

Advocates working in low-income communities note that fear of both traffic and crime often cause parents to keep their children home from after-school programs. This loss of mobility and

PEDESTRIAN PROFILE #2:  
  
 PIO PICO ELEMENTARY SCHOOL  
 SANTA ANA, ORANGE COUNTY  
 CALIFORNIA

Two years ago, 12 students and teachers at Pio Pico Elementary School in Santa Ana formed a "Research Club" to identify hazards to pedestrians in their neighborhood. The student researchers took community walks, interviewed parents and neighborhood leaders, and canvassed neighborhoods to identify problems. They found that excessive speeding, drivers failing to yield to pedestrians, and the amount of traffic in the school zone posed major problems for walkers. They also found a vast difference between the amount of traffic in their lower income neighborhood compared to the amount of traffic going through the nicer part of town to the north.

Emily Wolk, a fourth grade teacher at Pio Pico and one of the researchers, highlights some of the traffic concerns in their neighborhood. "Many of the Researchers wouldn't cross the street without crossing guards. Moms run across the street with their babies. Four kids have been run over. We're not used to taking on these issues." Pio Pico students chime in: "In the north end of town, they had everything. There was police enforcement all the time in the nicer part of town...The houses are very nice. There's a lot more rich people, and a lot less traffic."

Student researchers presented their findings to the public and garnered community support for their pedestrian safety effort. They asked that Santa Ana city officials install a four way stop sign at the intersection of Highland and Flower. The city initially concluded that there wasn't enough money for a stop sign or signal, but the research team continued to stay committed to building their case by generating media coverage and teaming with other groups like the newly-created Santa Ana Pedestrian Safety (SAPS) Project and the Santa Ana Police Department. The researchers worked with police to use a radar gun to track speeding motorists, conduct a traffic count, implement 'crosswalk stings' and enforce speed limits in school zones. At a meeting with the SAPS Project Task Force, the Director of the California Office of Traffic Safety, and the city's traffic engineering staff, student researchers presented their case for a litany of new pedestrian safety measures.

The Santa Ana Department of Public Works finally responded by installing a four way stop sign. The police department also provided new training to crossing guards and gave guards brighter uniforms with bigger stop signs. Through the efforts of the Research Team working with other partner agencies, they've produced a pedestrian safety video, organized a pedestrian safety parade,

created incentives to have other teachers to talk about the issue, and generated public awareness. They will soon participate in the painting of a mural, begin mass distribution of the video, and hold community meetings to reinforce the program.

independence prevents them from becoming familiar with and exploring their neighborhoods, and prevents them from acquiring the traffic skills they need in order to stay safe. In addition, researchers also believe that the loss of independence and mobility has even more significant impacts on their cognitive skills. Children who are driven everywhere and who aren't allowed to venture outside are often unable to draw basic maps of their communities and develop an understanding of spatial relationships.<sup>28</sup>

"Independent play and mobility by school-aged children in their neighborhoods have been found to contribute to their social and spatial development," write UC-Irvine health researchers in a recent article published in the Journal of the Institute of Traffic Engineers. "if children play only under strict adult supervision, they miss the opportunity to develop skills such as negotiation and leadership. Residential neighborhoods without a safe and healthy environment do not accommodate the developmental needs of children."<sup>29</sup>

#### PEDESTRIANS AND ALCOHOL

Those who are critical of efforts to improve pedestrian safety are often heard to cite studies showing that many pedestrians who are hit by cars are drunk. According to a 1997 study for the National Highway Traffic Safety Administration, one third of all adult pedestrians who are injured or killed were intoxicated.<sup>30</sup> But two thirds of the adults were not drunk, and many pedestrian victims are children. Moreover other examinations of local data, including a recent story in the Los Angeles Times, suggest that these results may be exaggerated. The Times analysis of accident reports in Santa Ana found that alcohol or drug use was cited in just six percent of the crashes that were blamed on pedestrians.<sup>31</sup>

**IN THEIR OWN WORDS**

**ADRIAN MENDOZA RUIZ, 10**

**STUDENT**

**NORTHEAST LOS ANGELES, CALIFORNIA**

"I live on a high traffic street. It avoids the crowded 110 freeway and connects Pasadena to the downtown area. Commuters drive as if it were actually a freeway. In the past year there has been very good enforcement against speeders in certain patches of the street. But, where I live there is a huge hill, so people tend to accelerate while going downhill on Monterey Road to gain momentum to drive up the other street.

There is a crosswalk at this intersection which all the neighborhood kids and families use on their way to school. There has been several occasions where people have had to run to avoid getting hit, or jump back on the curb, including my mother and brother. At one point I approached a traffic cop waiting for a speeder on the next block of my street, and informed him of the situation. He told me he could not do anything about it unless there was a report. I proceeded to call the Police Department which kindly stated, 'We will look into it, thank you.' I have yet to see a police officer stationed at that intersection."

## CHAPTER THREE: THE RESPONSE

Despite the clear public health and safety problems that have been documented, as well as the social equity issues that are raised by the statistics showing non-white and low-income residents to be at greatest risk, pedestrian safety is still largely neglected by state, regional and local transportation officials. Roughly 20 percent of all traffic-related fatalities in California are pedestrians, even though only eight percent of all trips are made on foot. Yet California spends less than one percent of its federal traffic safety money on pedestrians. In 1997, \$739 million in federal funding was spent on traffic safety projects statewide, but only \$6 million was spent on pedestrians.

**TABLE 7: STATES WHERE PEDESTRIANS ACCOUNT FOR HIGHEST SHARE OF ALL TRAFFIC-RELATED DEATHS — 1997-98**

RANK	STATE	Average Spending on Pedestrian Projects per Capita (1997-1998)	Average Percent of Spending on Pedestrian Safety (1997-1998)	Percent of Traffic Deaths that Were Pedestrians
1	NEW YORK	\$1.22	1.2 %	24 %
2	CALIFORNIA	\$0.04	0.1 %	21 %
3	MASSACHUSETTS	\$2.05	2.1 %	20 %
4	NEW JERSEY	\$0.08	0.2 %	20 %
5	FLORIDA	\$0.71	1.0 %	19 %
6	HAWAII	\$0.14	0.3 %	18 %
7	MARYLAND	\$0.29	0.3 %	18 %
8	ARIZONA	\$0.34	0.5 %	16 %
9	CONNECTICUT	\$1.91	1.8 %	15 %
10	NEVADA	\$0.75	0.9 %	15 %

*NOTE: Spending is based on federal funds only. SOURCE: Federal Highway Administration; Surface Transportation Policy Project.*

Providing basic facilities is the first step toward improved pedestrian safety. Building sidewalks, crosswalks, trails and other accommodations is fundamental to providing a safe walking environment. Unfortunately, an examination of federal transportation funding shows that California ranks last among the 50 states in spending on pedestrians. While an average of \$40 per person in federal

transportation funding was spent on highway projects, an average of just 4 cents was spent improving conditions for pedestrians. Although data for state and local spending on pedestrian safety measures isn't collected, rough estimates place expenditures at all level of government in the one to three percent range.

#### A STEP BACKWARDS: REMOVING CROSSWALKS

Exacerbating the lack of funding is the fact that transportation officials throughout California have been removing marked crosswalks at uncontrolled intersections (i.e. intersections with no stop sign or traffic light) due to studies that suggest they provide pedestrians with a "false sense of security." This crosswalk removal policy - now widespread across California - has caused a

**PEDESTRIAN PROFILE #3:**  
**ADRIENNE LEIGH, 43**  
**PRODUCER/ACTRESS**  
**HILLSBOROUGH,**  
**SAN MATEO COUNTY, CALIFORNIA**

When Adrienne Leigh first moved into suburban Hillsborough in 1997, she was expecting all the benefits of a small town nestled in the hills halfway between San Francisco and San Jose: open space, friendly neighbors and quiet streets. After a few weeks, however, Adrienne, her husband and two small children soon realized that life in Hillsborough was going to be more difficult than they thought. Even though the public elementary school that Adrienne's children attended was a mere two and a half blocks away, she began driving them because walking to school without sidewalks was far more difficult than she expected.

"I live in a beautiful community but everyone drives everywhere. Kids are completely dependent on parents to get where they need to go," explains Leigh. "People speed through the streets, the same streets that kids have to walk in because we have no usable bike paths or sidewalks." After finding that she wasn't alone in her dilemma, Leigh decided to join her school's safety committee. But after local officials and city engineers repeatedly denied

requests from committee members to undertake a proactive pedestrian safety effort, she and another mom soon went on to form their own organization. "Safe Paths of Hillsborough" is stumping for safer places for kids to walk and bike, especially around schools and parks. "We went and bought books on traffic engineering, street design, and pedestrian safety because we needed to learn what could be done within traffic engineering standards," says Leigh. "We found that there was indeed lots you could do to improve pedestrian safety. But nothing seemed to be happening. There was a lot of sentiment to just preserve the status quo."

Leigh notes that after more than a year of meetings, rallies and city council hearings, the group is growing and winning support. "At first we thought the effort would just attract parents, but we've appealed to a lot of seniors and empty nesters too. They used to be able to walk around the community but now it's too dangerous so they want to get involved."

And in recent months, local officials have begun to respond. Hillsborough recently hired a new city engineer, launched a comprehensive pedestrian safety study around schools, approved its first bike lane, and increased enforcement efforts evidenced by a 400 percent increase in moving violations issued within the last twelve months. "I walk my kids to school now. There still aren't any dedicated sidewalks, but hopefully that'll change soon," says Leigh. "More kids walking means fewer parents driving and less traffic, hopefully that's reason enough for the city and school district to start paying attention."

great deal of controversy among a growing number of citizens, researchers and traffic engineers, who note that once crosswalks are removed other protective measures are rarely put in place, leaving pedestrians to fend for themselves. Many critics compare the policy to that of removing traffic lights at busy intersections so motorists will pay more attention.

The debate began when in 1970 when a study in San Diego found that placing crosswalks at mid-block and unsignalized locations could cause pedestrians to drop their guard and step into the path of an oncoming vehicle. This has prompted local officials to express concern about whether they are liable for creating legal crossings that don't guarantee protection.

According to the California vehicle code there is a legal crosswalk at every intersection whether it is marked or not. However, very few motorists or pedestrians know this. As a result, motorists often don't expect pedestrians to cross at an intersection that isn't marked with a crosswalk, and assume they're jaywalking if they do. And the absence of any visible markings is likely to lead to uncertainty on the part of the pedestrian, who may - not knowing there is a legal crosswalk - decide to jaywalk mid-block instead.

Pedestrian advocates also contend that the standard California crosswalk - which typically consists of two thin white or yellow lines - offers little protection compared to techniques employed elsewhere in the U.S. and other countries and that are designed to draw more attention to both the pedestrian and the crossing. These include zebra striping, textured surfaces or raised surfaces in the road at pedestrian crossings, flashing lights embedded in the pavement, yellow flashing lights or florescent signs overhead, and limit lines placed in advance of the crosswalk to alert motorists.

There have been so many questions raised about the crosswalk removal policy that the Federal Highway Administration has commissioned a comprehensive study to help settle the issue. Preliminary results seem to indicate that crosswalks at mid-block or unsignalized intersections are indeed an adequate safety measure on two lane streets or multi lane arterials with low traffic volumes. A crosswalk alone may not be enough to adequately protect pedestrians where streets are wide, speeds are high, and traffic is heavy. Yet researchers make a critical distinction that local transportation officials are failing to make. Researchers say that on wide, high-speed, high-volume arterials more - not less - protection needs to be provided for pedestrians than just a simple crosswalk. These safety enhancements could include additional markings, flashing lights or a traffic signal, raising the crosswalk and incorporating it into a speed hump to slow traffic, or the addition of raised medians where the pedestrian can seek refuge.

As will be discussed below, these principles are critical to the discussion of assigning fault in pedestrian fatalities and injuries. If pedestrians have fewer and fewer places to cross safely, they will begin jaywalking by necessity rather than by choice. Indeed, a cursory glance at state and national statistics reveals a substantial number of pedestrian fatalities occur outside a crosswalk. Yet a



closer look at national data shows that 59 percent of pedestrian deaths for which location information was recorded happened in places where pedestrians had no convenient access to a crosswalk. While jaywalking is often cited as a cause of pedestrian accidents, less than 20 percent of fatalities occurred where a pedestrian was crossing outside an easily available crosswalk.

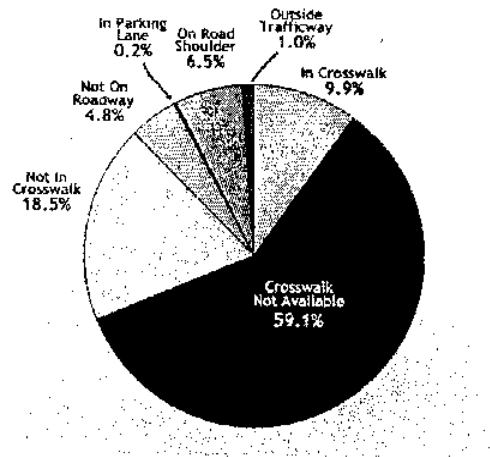


Figure 1: A majority of pedestrian fatalities occur in locations where no crosswalk is available

#### DANGEROUS BY DESIGN

A significant part of the problem is that the highest priority of traffic engineers is to improve "levels of service" on streets so that the greatest numbers of vehicles can be accommodated at the greatest speeds. That typically means designing roads with wide lanes, large turning radii at intersections, and ample passing and turning lanes. Unfortunately, this makes streets more dangerous for pedestrians. Until recently, the national design manual for streets and highways officially defined pedestrians as "traffic flow interruptions."

Traffic speed and traffic volume are two of the environmental factors with the highest correlation to pedestrian injury and death. According to a study by the