The Health Impacts of Failing to Plan and Design for Children to Walk to School

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ABSTRACT

Walking and bicycling are forgotten modes of transportation in many parts of the United States, particularly for children traveling to and from school. Nationally, the number of children who regularly walk or bike to school fell from 67% to 12% over the last generation. Childhood obesity and associated health problems like Type II diabetes is at record levels. This paper examines these patterns and what policy and funding mechanisms exist to reverse this trend.

(Key words: childhood obesity, public health, community transportation planning, pedestrian infrastructure, pedestrian safety).

INTRODUCTION

Walking is an integral part of every mode of transportation. Commuters walk to their car, and from their car to the bus stop or train station, or from the parking lot to their work. Students walk to the bus stop and from the bus to the school. A few students walk all the way to school.

Forty years ago, half of all students in the United States walked to school. Today, that ratio has dropped from one of every two trips to school being conducted by walking or bicycling, to less than two of every 10 trips. (Salveson and Hervey 2003, Surface Transportation Policy Act 2002a).

The scope of this paper is to address both the health benefits and safety risks of children walking to school, as well as discuss programs designed to increase the numbers of children who walk and bicycle to school. Within that context, this report addresses funding sources and mechanisms to help implement programs to enhance children walking and bicycling to school. The paper then evaluates elements of pedestrian planning efforts in the Harford County, Maryland Public School System (as a case study), with a focused look at the pedestrian infrastructure at five selected elementary schools in Harford County.

WALKING TO SCHOOL

A national survey of 80 adults in October 2002 measured people's attitudes toward walking and the desire for more walkable communities (Surface Transportation Policy Project 2002). The survey found that 7 in 10 adults recalled walking or riding a bike when they were a child; but fewer than 2 of 10 parents surveyed had children walking to school today, and one source cites a number as low as 1 of 10 (National Center for Bicycling and Walking 2002).

Two-thirds of the respondents stated the school was too far away. The next most common reasons cited were too much traffic and no safe route (17%), followed closely by fear of abduction (16%) (Surface Transportation Policy Project 2003).

Reductions in the number of children who walk to school have been more recent than the gradual reduction seen over the last generation. In Georgia, the number of children who live within one mile of school and who also regularly walk to school has decreased by 20% in the last three years. Of all Georgia schoolchildren ages 5 to 15, only two percent walk to school (Frankston 2003).

The "too far away" reason for not walking to school lacks objective measurement. Assuming the students living 'too far away' live beyond the school district's walkable zone and would be bused to school, this leaves "too much traffic" and "no safe route" as the leading causes for children not walking or bicycling to school, with fear of abduction very close behind. Considering the safety record of pedestrians in the United States, those concerns are well founded.

PEDESTRIAN SAFETY

A study evaluating the risks of school travel determined the percent of injuries to pedestrians and bicyclists traveling to school to be relatively minor (Transportation Research Board 2002). An additional four modes of transportation were studied including school bus, other bus, passenger with an adult driver, and passenger with a teen driver. Injuries studied over a nine-year period showed 16,500 injuries (11% of the total) and 177 fatalities (22% of the total) occurred to pedestrians and bicyclists traveling to and from school.[1] By comparison, traveling to school by bus is far safer, accounting for 4% of injuries and 2% of fatalities. Travel by passenger vehicle accounted for 84% of injuries and 75% of fatalities to children traveling to and from school (Transportation Research Board 2002).

This data alone does not present the entire picture on the issue. By their nature, motorized transportation to school incurs many more miles than walking or bicycling. Factoring the number of student trips and miles traveled into the injury and fatality data presents an entirely new image for bicycling and walking to school. When the number of student trips and distance are factored into the injury and fatality data, bicycling to school becomes the single leading cause of injuries with 2,050 injuries and 12.2 fatalities per 100 million student miles. Walking fares little better with 590 injuries and 8.7 fatalities per 100 million student miles.

By comparison, riding with an adult driver (over age 19) has only 90 injuries and 0.3 fatalities per 100 million student miles. Safer still is riding the school bus, with 20 injuries and 0.1 fatalities per 100 million student miles (Transportation Research Board 2002).

Traffic crashes accounted for about 38,000 deaths in 2001, of which about 4,700 were pedestrians. While pedestrians account for only 5% of all trips, pedestrian fatalities account for 12% of all traffic fatalities — making walking one of the most dangerous modes of transportation in the United States (Ewing, Schieber, and Zegeer 2003).

Children are involved in more than 30% of the traffic accidents involving pedestrians. Entering the street mid-block accounted for 54% of fatal traffic accident fatalities for children ages 5 to 9 years and 26% for children ages 10 to 14 (Federal Highway Administration 1999). Children aged 5 to 9 have the highest population-based injury rate (Retting, Furguson, and McCartt 2003).

The challenge of creating a safe walking environment for school children is increased by the maturity level and cognitive abilities of children. Children have fewer capabilities than adults because of their developmental immaturity and lack of experience. Compared to adults, children tend to exhibit the following characteristics (Federal Highway Administration 1999, Retting et al. 2003, Institute of Transportation Engineers 1998):

- One-third less peripheral vision
- Less accuracy in judging speed and distance
- Difficulty in judging direction of sounds
- Overconfidence
- Inability to read or comprehend warning signs and traffic signals
- Unpredictable or impulsive actions
- Lack of familiarity with traffic patterns and expectations
- Trust that others will protect them
- Inability to understand complex situations

The cognitive limitations of children, coupled with the laws of physics make the injury and fatality rates of pedestrians all the more credible. Increased vehicle speed puts pedestrians at higher risk. A ten-mile-per-hour increase in speed, from 20 mph to 30 mph, increases the risk of death by a factor of nine. A pedestrian struck by a car traveling 20 mph has a 95% chance of survival, whereas being struck by the same vehicle traveling 30mph reduces survival to 45% (Bicycle Federation of America 1998).

Engineering changes to the built environment can reduce the risk of pedestrian-vehicle crashes. Such crashes can be classified into three broad categories: separating pedestrians and vehicles in time or space; increase the visibility and conspicuity of pedestrians; and reducing vehicle speeds (Retting, et al. 2003). Of these, Retting reports that speed management in residential settings with large numbers of children appears to have the greatest potential for injury prevention. Research shows that modern roundabouts were the most

[1] *Student bicyclist and pedestrian crashes represent only those accidents involving a motor vehicle. (Transportation Research* Board 2002).

effective measure; reducing vehicle-pedestrian crashes by about 75%. Other traffic calming efforts studied by Retting reduced the vehicle-pedestrian crashes by about 25% (Retting, et al. 2003).

PEDESTRIAN INFRASTRUCTURE AND HEALTH

Despite the proven health benefits of a physically active lifestyle, over 60% of American adults are insufficiently active to achieve those benefits. Additionally, 25% of Americans are not active at all in their leisure time (National Center for Bicycling and Walking 2002).

Obesity in the United States is at, or approaching, a national epidemic (Nestle and Jacobson 2000, Pucher and Dijkstra 2003). Obesity has increased in men and women across all socio-demographic groups and all regions. In 1985, none of the 20 participating states in a nationwide obesity analysis had obesity rates in excess of 15%; by 1995, 27 states did. In 1995 none of the states had obesity rates of 20% or more: by 1998 such rates were seen in 7 states, and by 2000, in 22 states.[2] For adults, the term overweight is defined as having a body mass index (BMI) between 25 and 30. Obesity is defined as having a body mass index equal to or greater than 30.[3]

The trend of increasing obesity rates in the United States is not limited to adults. In 1999-2000 about 15% of children aged 6 to 19 were overweight, an increase of 4% from 1988-1994 data (Perdue, Stone, and Gostin 2003), and double the proportion noted from 1976 through 1980 (Lavizzo-Mourey and McGinnis 2003). Additionally, diseases once only seen in adults, such as Type 2 diabetes, are now regularly diagnosed in children (Lavizzo-Mourey and McGinnis 2003).

Walking to school not only has the ability to provide children the exercise they need for physical development, it can have a positive influence on lifelong habits. The design of the built environment especially, distance and traffic hazards, influences whether a parent will allow a child to walk, bicycle, or be driven to school (Centers for Disease Control and Prevention 2002).

Data suggests that such community characteristics as proximity to recreation facilities, street design, and accommodation for safe pedestrian, bicycle and wheelchair use play a significant role in promoting or discouraging physical activity (Dannenberg, et al. 2003).

Research suggests that the design of cities and neighborhoods can affect levels of physical activity. This, in turn, is an important factor in preventing obesity and its associated adverse health effects (Dannenberg, et al. 2003, Nestle and Jacobson 2000). Research indicates that inadequate urban planning, including a lack of bike paths and sidewalks, has contributed to an increasingly sedentary lifestyle for children, possibly factoring into the growing rates of childhood obesity (Srinivasan et al. 2003, Saelens et al. 2003, Staunton et al. 2003).

The quality of a neighborhood's walkability has proven to have a benefit to the health of the residents in terms of physical activity and body weight. A study reported in the American Journal of Public health suggests that higher-walkable neighborhoods may contribute to a significantly greater total physical activity. The researchers determined that consistent with the physical activity differences between the walkable and low-walkable neighborhoods, there was a significant difference in the percent of those overweight (60%) of those in the low-walkability neighborhoods, compared with only 35% in the high walkability neighborhood (Saelens et al. 2003).

PEDESTRIAN PLANNING NEAR SCHOOLS

The Federal Highway Administration recognizes the challenges faced by school-aged pedestrians. An entire chapter of the Manual on Uniform Traffic Control Devices (MUTCD) is dedicated exclusively to the purpose of providing technical guidance for planning and designing pedestrian infrastructure in school districts (Federal Highway Administration 2003). This guidance repeatedly states the value of consistent and uniform approaches to school area traffic controls and movement. The MUTCD stresses that the best way to achieve safe and effective traffic control is the uniform application of realistic policies and practices, and standards

[2] *Centers for Disease Control and Prevention, www.edc.gov/nccdphp/dnpa/obesity/trend/index.htm*

[3] *Centers for Disease Control and Prevention, www.dcd.gov/nccdphp/dnpa/bmi/calc-bmi-htm*

developed through engineering judgment.[4]

A key step in the pedestrian planning process as outlined in the MUTCD is to identify the walking route for all students within the walking radius of the school. This allows the planner to identify potential conflict points between vehicles and pedestrians.

The Institute of Transportation Engineers recommends adopting a program consisting of two parts: the physical facilities and the operational plan. Sidewalks and walkways that separate children from the flow of traffic are key elements of the physical facilities component. The operational plan consists of the traffic control devices (traffic signals), and the supervisory control (crossing guards) elements for school trip safety (Institute of Transportation Engineers 1998).

The physical facilities element of the program involves a detailed analysis of walking routes and potential conflicts between vehicles and pedestrians. This is very similar in concept to the pedestrian routes analysis in school zones outlined in the Manual of Uniform Traffic Control Devices (Federal Highway Administration 2003). The analysis of potential pedestrian-vehicle conflicts is followed by an engineering analysis of how best to optimize pedestrian safety at those conflicts. Additionally, this document provides clear policy and guidance on the use and location of signage to help ensure the safety of school-aged pedestrians.

The Institute of Transportation Engineers issues the only guidance documents relating to safe routes to school, which addresses the issue of warrants (Institute of Transportation Engineers 1998, Centers for Disease Control and Prevention {undated}, Maryland Bicycle and Pedestrian Council 2003). In the lexicon of the transportation engineer, a warrant is a set of objective minimum requirements that should be met before a given traffic control device is installed (Ewing 1999, Federal Highway Administration 2003).

The Federal Highway Administration sets standards for warrants for school crossings, but only for signal devices.[5] This suggests transportation engineers at the local jurisdictions have the authority to establish the criteria for warrants in their own communities. The same document provides recommended standards for cross walks and signage, but does not prescribe the conditions under which they are implemented. This could be interpreted to mean that standards for crosswalks in one community could very well differ from the standards for crosswalks in another.

The Federal Highway Administration, in conjunction with the Institute of Transportation Engineers published a comprehensive guide on the use of application of traffic calming (Ewing 1999). This guide provides an analysis of a broad range of traffic calming tools applied in communities across the United States and Europe. The impact of traffic calming varied with the method used and the conditions under which the traffic calming methods were applied. Most traffic calming measures result in some reduction of traffic, and/or the speed of the traffic. Lowering the speeds and eliminating the conflicts between pedestrians and vehicles may result in fewer collisions. Because of the lower speeds, when collisions do occur, they may be less serious (Ewing 1999). This document provides a wide range of tools available to improve the safety of pedestrians under a broad spectrum of applications.

SAFE ROUTES TO SCHOOL PROGRAMS

A number of communities of various sizes have implemented programs to encourage students to walk and bicycle to school. The many programs across the nation fall into one of four models: engineering, enforcement, encouragement/ education, and dedicated resources (Surface Transportation Policy Project 2002).

The engineering model focuses on changing the pedestrian and bicycle environment to promote safety, such as through crosswalks, expanded sidewalks, and traffic calming. The enforcement model uses police enforcement of traffic laws around schools to change driver behavior. The Encouragement/Education model works with school children and parents to foster enthusiasm

[4] *Federal Highway Administration,* 2003, *Manual on Uniform Traffic Control Devices. Federal Highway Administration, Washington, DC. Section 7A.01.*

[5] *Federal Highway Administration, 2003, Manual on Uniform Traffic Control Devices. Federal Highway Administration. Washington, DC, p. 4C-6.*

about walking to school and includes structured education to teach fundamentals of pedestrian and bicycling safety. The dedicated resource model is based on legislative action that directs specific funding to safe routes to school programs at the local level. While each model has benefits relative to the others, the authors of the report conclude that a combination approach is more effective (Surface Transportation Policy Project 2002).

The Institute of Transportation Engineers recommends that a committee with representatives from local organizations be responsible for implementing this program. Members could include representatives from the school, law enforcement, parent-teacher association, engineering department, and the community safety department (Institute of Transportation Engineers 1998). The ITE recommends a six-step process in developing a school pedestrian program:[6]

1. Setting up the school trip safety process.
2. Identification of deficiencies in routes.
3. Designate route map for the safe route to school.
4. Selection of route improvements and control measures.
5. Implementation of route improvements.
6. Periodic evaluation of routes.

The ITE recognizes that elementary-aged children do not have the cognitive ability to correctly judge speed of approaching vehicles or the adequacy of gaps in traffic.[7] However, an element that appears to be absent from the Institute of Transportation Engineers approach is training the students on safe pedestrian practices.

The Centers for Disease Control's Guide to Promote Walking to School includes safety reminders for school children, but stops short of recommending that pedestrian and bicycle safety be part of the school's curriculum (Centers for Disease Control and Prevention {undated}).

The Centers for Disease Control and Prevention provides guidance on developing and implementing a Safe Routes to School Program that begins with strong parental involvement. The steps to develop and implement the program are similar to those recommended by the ITE, but provide much more detail in its 70-page guidance document. The CDC's guidance on its partnering organizations is also similar to the ITE's recommendations, but also includes local and state political leaders (Centers for Disease Control and Prevention {undated}).

Maryland initiated a "Safe Routes to School Program" at the direction of the State Legislature. The State of Maryland Program Guidebook recommends a three-step program: generate interest and identify core group of supporters, identify types of improvements and safety programs needed, and then implement the program. The Maryland program suggests 17 possible members of the committee to properly implement the program. In addition to those listed by ITE and the CDC, the Maryland program suggests including a number of other participants, such as representatives from the health department (or school nurse), a walking or biking club, children from the school, and a representative from the local planning agency (Maryland Bicycle and Pedestrian Advisory Committee 2003 {unpublished draft}).

FUNDING

The program guides produced by both the CDC and the State of Maryland recognize that the programs will cost money. Both documents identify the Transportation Equity Act for the 21st Century, also known as TEA-21, as a viable source of funding to implement capital improvement programs for pedestrian and bicycle infrastructure. Congress directed that states reserve at least 10% of its Surface Transportation Program funds for designated transportation enhancement activities. Congress provided $3.6 billion through 2003 for twelve categories of transportation enhancement activities. One category includes new or reconstructed sidewalks, walkways, curb ramps bike lane striping, bike parking, and bike and pedestrian bridges and underpasses.

Another category is for pedestrian and bicycle safety and education activities which includes programs designed to encourage walking and bicycling by providing education and safety

[6] *Institute of Transportation Engineers, "Design and Safety of Pedestrian Facilities." Institute of Transportation Engineers. Washington, DC. March* 2998, *p. 85*

[7] *Institute of Transportation Engineers! "Design and Safety of Pedestrian Facilities." Institute of Transportation Engineers. Washington, DC. March 1998, p. 83*

instruction through classes, pamphlets, and signage (National Transportation Enhancements Clearinghouse 1999). The TEA-21 legislation expired in 2004 and its replacement, the Safe Accountable, Flexible, and Efficient Transportation Equity Act, known as SAFETEA, is expected to have similar funding provisions to support pedestrian infrastructure and safety education.[8]

One of the better-known safe routes to school programs implemented in the last several years was in Marin County, California (Staunton et al. 2003). The Marin County program included elements of several of the models discussed above, though with increased emphasis on the engineering and encouragement/education models.

The two-pronged approach in Marin County identified and corrected pedestrian infrastructure to improve pedestrian safety, in conjunction with a program of pedestrian and bicycle safety instruction in the Schools (Staunton et al. 2003). In its first year of operation the program supported 9 schools with a total of about 3,500 students in the 2000-2001 school year. It grew to 15 schools the following year and to 21 schools in 2002-2003. This program initially received a grant from the Marin Community Foundation in 2000, and then another grant for $50,000 from the National Highway Traffic Safety Administration. By spring 2002, the program had received more than $1M in additional funding, to include donations from local foundations, local businesses, and local and state agencies.

The results are positive: participating schools reported school trips by walking increased by 64%; by biking 114%; and carpooling 91%, with a 39% decrease in trips by private vehicles carrying only one student. While the focus of these efforts were to create safe and accessible routes for children to walk and bicycle to school, the program provided safe walking and biking conditions for people of all ages (Staunton et al. 2003).

Based on the successes achieved in safe routes to school programs, increasing the number of children that walk to school cannot be effected by any one person, or even one organization. Such an effort requires the cooperative effort of a number of people in a variety of organizations. One author identifies five main legal routes for affecting the built environment: environmental regulation to reduce toxic emissions; zoning ordinances that designate specific land uses; building and housing codes that set standards for structures, (to include street and sidewalk design); taxing to encourage or discourage activities or behaviors; and spending to provide resources for projects that enhance the built environment (Perdue, et al. 2003).

In further discussions, the authors' specify elements of building codes to ensure buildings are safe and sanitary. The other element of building codes these authors overlooked are elements of the external design standards, such as sidewalk width, location in relation to streets (setback versus adjacent to the curb), curb radius, and specific design elements to meet requirements of the physically handicapped. First among those who have a role in the process are the parents in the school district. Another group are the children themselves. It is important for planners and engineers to learn their perspective and record their observations about the traffic, sidewalks, and crosswalks on their way to school (Centers for Disease Control and Prevention {undated}).

A number of public agencies can, and should, play a role in advocating policies and procedures to enhance the "walkability" of our communities. Among the first is the department of public health, who, according to some have been largely absent from discussions about land use decisions involving the built environment (Perdue et al. 2003).

The health-care related costs of obesity are well documented. A recent report puts the cost to taxpayers of treating obesity and related secondary health problems at $39 billion in 2003 (Hellmich 2004). A second report puts the total cost for obesity at $99 billion in 1995. This estimate also includes health care costs for obesity and secondary health-care related costs, excessive doctors visits, and lost productivity as well as 39.2 million lost workdays (Wolf and Colditz 1998). Several researchers are suggesting a direct correlation between health and the built environment (Perdue et al. 2003, Librett, Yore and Schmid 2003).

[8] *www.bikeleague.org and www.americabikes.org*

POLICIES ON WALKING TO SCHOOL

The State of Maryland does not have a fixed policy on the distance students should walk to school. Instead it has recommended maximum of one mile for elementary school students and 1.5 miles for middle and high school students.[9]

Harford County Public School policy on walking follows state recommendations.[10] The policy has flexibility by offering bus transportation to students within the walking radius who would be required to cross high-volume, high-speed roadways.[11] It is unclear who within the school system makes that determination. Oddly enough, some elementary schools in residential districts, specifically Bel Air Elementary School and Fountain Green Elementary School, identified that 100% of the children in those district are eligible for bus transportation.[12] Bel Air Elementary School is located in the heart of the town of Bel Air, MD and is surrounded by a grid network of streets with speed limits of 25 and 30 mph. Fountain Green Elementary faces a busy arterial route in Harford County, and logically the students living opposite the school from that arterial ride a bus to school. The students on the same side of the arterial as the school live in a residential neighborhood where every street has a speed limit of 25 mph, yet every student attending that school is eligible for bus transportation according to Harford County Public School Transportation Department. Questions to the Harford County Public School system on who makes that determination have gone unanswered.[13]

SCHOOL ZONE PEDESTRIAN PLANNING IN HARFORD COUNTY, MARYLAND

Of the 40,264 students in the Harford County Public Schools, 34,140, or 84.8% are eligible for bus transport to school.[14] These numbers by themselves suggests that Harford County with 15.2%, is above the national average of children who walk or bicycle to school. Accounts of traffic congestion at the schools at the beginning and end of the school day caused by parents driving their children to school, suggests, however, that Harford County is doing no better than the national average.

For the purpose of this study, the author evaluated five elementary schools located in predominantly urban areas of Harford County, MD. The schools studied included Bel Air Elementary School, Fountain Green Elementary School, George D. Lisby Elementary School, Halls Cross Road Elementary School, and Havre de Grace Elementary School. The descriptions and evaluation of the pedestrian network around these schools is based on the author's observations and photographs taken after walking, bicycling, and/or driving in the neighborhoods near these schools.

In the author's evaluation, pedestrian planning and infrastructure design leading to Bel Air Elementary School in Bel Air, Maryland is virtually a textbook application of the Manual on Uniform Traffic Control Devices. Focus points in the neighborhood for crossing busier streets have painted crosswalks using the same "zebra" style (Bicycle Federation of America 1998) and consistent application of crossing signs meeting standards specified by the Manual for Uniform Traffic Code Devices (Federal Highway Administration 2003). According to the Transportation Office of the Harford County Public Schools, every student attending this school is eligible for bus transportation.

In the entire neighborhood of George D. Lisby Elementary School there are two crosswalks, one of which is marked with signage consistent with the MUTCD (Federal Highway Administration 2003). Students walking from the south side of this community have the benefit of the only two crosswalks within this school district; one crossing Oxford Street at Edmunds Street; the other to cross Edmunds Street onto school grounds. Pedestrians crossing Oxford Street face multiple applications of the "zebra"

[9] *Discussion with Edward Beck. Pupil Transportation Unit, Maryland Department of Education, December 28, 2003*

[10] *Discussion Don Morrison, Director of Communication, Maryland Department of Education, February 9,2003*

[11] *Discussion with Dan Morrison, Director of Communication, Harford County Public Schools, February 9,* 2004

[12] *E-mail from Marcie Dawson, on behalf of Harford County Public School Director of Transportation, subject school pedestrians, dated February 17,* 2004.

[13] *The author posed the question of who determines the neighborhoods with walking or bused students in an e-mail to the Director of Communication, Harford County Public Schools on Feb* 2, 2004.

[14] *Conversation with Don Morrison, Communications Office, Harford County Public Schools, Feb 9,* 2004.

style of crosswalk marking, so that it approaches one solid mass of white paint across the road. Students walking to the school from the north encounter a sidewalk that ends abruptly before reaching the street, intersections with no markings, and no signage indicating the possible presence of school children.

Halls Cross Road Elementary School in Aberdeen, MD has one crosswalk across Bel Air Avenue leading to the school. There are no other crosswalks in the entire area of this school district. Students arriving from the north side of Bel Air Avenue face a sidewalk that ends in a parking lot for a strip mall that is 260 feet long, with no markings, no signs, or elevated curb to protect them from vehicles. Students arriving from the neighborhood on the south side of Bel Air Avenue have no sidewalks. In addition to the school neighborhood, children would also walk to the Boys and Girls Club located about 150 yards west of the school on Bel Air Avenue. Good pedestrian planning and infrastructure for the school would also benefit those who participate in activities at the Boys and Girls Club.

The intersection of Juniata and Revolution Streets is the only intersection within a three block radius of Havre de Grace Elementary School with marked crosswalks. Revolution Street is a high volume arterial leading to Havre de Grace's central business district. With that exception, there are no marked crosswalks in the community adjoining Havre de Grace Elementary School.

Several streets within a 3-block radius of the school do not have sidewalks. The sidewalk on the north side of Adams Street leading to the school is 24 inches wide.

There appears to have been some level of pedestrian planning for Fountain Green Elementary School. Several intersections within the walking network for the school have crosswalks and signs, but several others have none. However, the crosswalks in this neighborhood use "horizontal bars" (Bicycle Federation of America, 1998). That these are different than the style used at other school crossings is not in keeping with the concept of consistent application of traffic control devices advocated by in the Manual of Uniform Traffic Control Devices (Federal Highway Administration 2003). An indication of the level of effort given to school-aged pedestrians is crosswalk one block away from this school that leads not to a sidewalk, but to a strip of grass. Despite the fact that approximately half of the students at Fountain Green Elementary School live in a residential neighborhood immediately adjacent to the school and in a network of streets with speed limits not exceeding 25 miles per hour, every student at this school is eligible for bus transportation.[15] The author has not yet received a reply to the question of who determines eligibility for bus transport to school.
In the process of researching pedestrian planning process in Harford County, MD, the author spoke with representatives from the Harford County Public Schools,[16] Harford County Board of Education,[17] Harford County Sheriff's Department,[18] and the Harford County Department of Public works.[19]

The School Board representative stated they do no pedestrian planning beyond the school site itself, and the jurisdiction the school is in, such as one of the three incorporated towns in Harford County or the County itself, is responsible for implementing pedestrian safety measures. Jurisdictional issues are further challenged because there are local, county, and state roads within the walking radius of many of Harford County's schools. Law enforcement agencies in each jurisdiction are heavily involved. The Harford County Sheriff's Department representative responsible for pedestrian safety programs stated they play little role, except to train and pay for crossing guards. The School Board pays for crossing guards for the first three years and the Sheriff's department pays for as long as they are needed beyond three years.[20]

The Department of Public Works performs traffic-related studies on streets determined by the School system and recommends safety measures, such as traffic calming or signage based on established warrants. The Department

[15] *E-mail message from Marcie Dawson on behalf of the Chief of Transportation, Harford County Public Schools, Feb 19,* 2004.
[16] *Don Morrison Director of Communications Harford County Public Schools, Feb* 12, 2004.
[17] *Kathy Sanner, Harford County Board of Education, March 3, 2004*
[18] *Sgt Van Seeters, Harford County Sheriffs Department, March* 3, 2004
[19] *Cheryl Banigan, Harford County Department of Public Works, March* 3, 2004.
[20] *Sgt Van Seeters, Harford County Sheriffs Department, March* 3, 2004

of Public Works implements and funds the improvements outside of the three incorporated towns, though there appeared to be some contention about who should actual pay for pedestrian oriented improvements. Despite numerous attempts, Harford County is yet to receive any funding under provisions of the Transportation Enhancements provision of TEA-21.[21]

The author had posed a number of questions about pedestrian planning to the Chief of Harford County's Transportation Department. Among the questions posed was what organizations are involved in pedestrian planning, who implements, and who funds proposed projects. Additionally, the author inquired about the number of students at each school and the number of which were eligible for bus transport. Only the questions about bus transport received a reply. No reply was provided to a subsequent question about who determines when students are eligible for bus transport.

SUMMARY AND CONCLUSION

Evidence from the health community is clear: Americans are in the midst of an obesity epidemic and the built environment bears some of the responsibility. A generation ago, more than half of American children walked to school, and now it's slightly more than 10%. Many parents aren't letting their children walk to school and part of the reason is the lack of pedestrian planning and implementation of safety provisions for pedestrians around schools.

Planning for pedestrian safety near schools in Harford County, Maryland, with the exception of Bel Air Elementary, is inadequate and inconsistent. There is an apparent lack of focus on pedestrian safety and planning in Harford County, particularly near schools. There appears to be no countywide standards for pedestrian planning and safety near schools. Even if Harford County had developed a comprehensive plan for pedestrian infrastructure improvements, funding would be limited to that available in local or county coffers. To date, Harford County has been unable to tap into Transportation Enhancement funds provided under TEA-21 legislation.

The successful implementation of safe routes to school programs in communities across the nation is evidence that positive change can happen. However, such change requires the positive energies and the cooperative efforts of the community residents along with a number of local, county, and state agencies. The literature clearly points out the benefits in terms exercise opportunities for school children, and for the rest of the population as well. Walking to school is not without its risk, but focusing the energies and expertise of qualified pedestrian and transportation professionals minimizes that risk.

The provisions of proposed transportation legislation now in Congress can be one means of funding the programs and infrastructure improvements for the benefit of pedestrians and bicyclists. Other communities will likely need to follow Marin County California's example in finding additional funding sources.

Representatives from planning, public works, health, law enforcement, and the school system, with the support and endorsement of elected leaders, are some of the key players in the effort that need to focus their efforts on the goal of improving pedestrian and bicycle conditions for the safety, and health of the children in their community. Without the combined and focused efforts of people dedicated to improving the pedestrian and bicycle safety conditions for children, parents will insist on driving their children to school, and schools in residential neighborhoods will insist its children ride a bus to school.

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