

The Built Environment: Is There a Connection Between Sprawl & Health?

The tale is in the taillights. Drive around almost any American city of size at almost any hour of any day and you'll see ahead of you an unending string of lights on the cars, SUVs and trucks heading to and from work, school and shopping malls. Stressful, no doubt, but in addition, a growing number of public health and urban planning experts are making a connection between suburban design and myriad other health hazards, from obesity and respiratory diseases like asthma to automobile-related pedestrian deaths.

A report issued in November by the National Center for Environmental Health at the Centers for Disease Control and Prevention (CDC) highlights the dangers. The lack of sidewalks and bike paths in many cities contributes to overweight and obesity and, in turn, to conditions like diabetes and heart disease, the authors of *Creating A Healthy Environment: The Impact of the Built Environment on Public Health* say, and the "bad air" generated by vehicle emissions "makes lung diseases, especially asthma, worse." Decisions about land use, they say, "are just as much public health decisions as are decisions about food preparations... We must be alert to the health benefits, including less stress, lower blood pressure and overall improved physical and mental health, that can result when people live and work in accessible, safe, well-designed, thoughtful structures and landscapes."

Noting that the research was financed by the Sprawl Watch Clearinghouse, a non-profit group dedicated to best land use prac-

tices, builders and developers blasted the report. The Southern California Building Industry Association, for example, labeled it "a ludicrous sham," suggesting that it has no scientific merit and that CDC should stick to its mission of "fighting physical diseases, not defending political ones."

But Chris Kochtitsky, the center's associate director for policy planning and a coauthor of the report, said that while there isn't yet enough evidence to draw hard conclusions, "there is evidence that our built environment affects our health." The report, he continued, "was not intended to attack any type of development but to provide information on how various urban design and land use decisions impact human health."

WHAT IS SPRAWL?

Once upon a time, neighborhoods were designed to allow an integrated mixture of work, education, entertainment and shopping that catered to pedestrians. Kids walked or rode their bikes to school—research comparing older to newer neighborhoods found that students are four times more likely to walk to schools that were constructed before 1983, for example—and adults tended to reserve the automobile for work and for errands outside of ambulatory range.

Then came "sprawl"—a relatively recent (post-World War II) phenomenon fostered by greater automobile ownership and government road-building subsidies and marked by a number of easily recognizable characteristics, most notably low-density development

with separate and distinct areas of education, work and commerce. Sprawl communities, which mushroomed beginning in the 1970s, often display "leapfrog" development and a lack of centralized planning and assume dependency on auto travel. The typical suburban home sits on a cul-de-sac that feeds into a high-volume road separating schools, homes and shopping malls by large distances. The one-car garage is a relic of the past.

Despite the long-held assumption that suburban living is healthier than urban, those who study the issue of community design tie sprawl to the nation's increasingly sedentary living habits. Today's neighborhoods, for example, often lack sidewalks or bike paths, making driving a necessity for even the shortest trips. Safety is also a concern. Many parents feel it's dangerous for their children to play outside or walk or bike unsupervised to the school, store or playground. The result: kids engage in less-active indoor pastimes, like watching TV or playing video games.

"The logic is that built and natural environments affect our health and behavior in a variety of ways," observed Rich Killingsworth, director of active living by design at the University of North Carolina School of Public Health. One simple solution, he suggested, "is providing choice. Everyone should have the choice to be physically active and there should be close-to-home opportunities, but the way we are using our land and designing our communities is not accommodating that choice."

HEALTH HAZARDS

In its November report, CDC spotlighted several major health hazards it said were connected to suburban design.

Obesity: Part of the impetus for studying the connection between health and the built environment grew out of the U.S. Surgeon General's landmark 1996 report on physical activity and obesity. The report, which synthesized data from thousands of studies, documents the tremendous toll that rising rates of overweight and obesity take on the public's health. The report attributed more than 200,000 deaths each year to sedentary lifestyles, and CDC pegs the direct and indirect annual cost of inactivity, obesity and its related illnesses (heart disease, diabetes, hypertension, osteoarthritis) at more than \$100 billion.

[Sprawl, p.6]

PUBLIC HEALTH NEWS

is produced by staff from the Environment, Energy and Transportation Programs and the Health Care and Prevention Projects Programs, located at the National Conference of State Legislatures headquarters in Denver.

For more information about the programs, visit: <http://www.ncsl.org> or call (303) 830-2200.

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This insert is supported in part by grants from the Centers for Disease Control and Prevention and the Health Resources and Services Administration, U.S. Department of Health and Human Services

By reducing opportunities to exercise safely, the CDC report suggested, sprawl is contributing to the obesity epidemic—six in ten adults are overweight and four in ten are obese, and childhood obesity has doubled, to nearly 25 percent, since the mid-70s. (See *SHN* #370, 4/22/02.) Americans consume at least as many calories as they did a decade ago, for example, yet over the past 20 years, the average adult took 42 percent fewer trips on foot, and the frequency with which kids walked or biked to school dropped 40 percent. As many as 70 percent of adults do not achieve the Surgeon General's recommendation for 30 minutes of moderate physical activity at least 5 days a week.

"Parking lots are built as close as possible to final destinations in order to increase convenience and safety for motorists," the report noted, and "the design of most new residential areas reflects the supposition that people will drive to most destinations." It may not seem that taking a few more trips on foot each day will have a meaningful impact on obesity, Killingsworth added, but such routine activities afford a great opportunity for daily exercise.

Respiratory Disease: Sprawl isn't just bad for physiques; the lungs suffer too. Longer commutes—CDC cited Sierra Club statistics suggesting that the average American driver spends 443 hours a year behind the wheel, or the equivalent of 11 work weeks—and more auto dependence result in "an increase in air pollution and in the incidence of respiratory disease." In fact, a broad body of research has demonstrated significant health effects from breathing polluted air, including decreased lung function, a greater incidence of asthma and increased mortality rates. (According to the Environmental Protection Agency, transportation-related air pollution causes 40,000 premature deaths a year in the U. S.) Particularly in warmer months, vehicle exhaust creates a sun-induced chemical reaction that generates ground-level ozone and smog, causing shortness of breath, coughing, wheezing, headaches and eye irritations.

Atlanta, **Georgia**, one of the fastest growing cities in the country and also one of the most notorious for urban sprawl, illustrates the problem. Huge increases in the number of vehicles on the road and the number of miles traveled have created very poor air quality, despite threats by the government to cut off federal highway funds for air quality violations unless the city takes steps to reduce health-threatening air pollution.

One dramatic example of the effects of air pollution on health occurred during the 1996 summer Olympics, when Atlanta restricted traffic in an effort to provide cleaner air for the athletes. According to a CDC analysis, smog levels fell 28 percent and emergency room visits for asthma attacks fell nearly 42 percent. Even so, the city reverted to its old habits once the games concluded.

Pedestrian Fatalities: In 1999 a Santa Rosa, California high school student was struck and killed by a car while walking home from school on a busy street with no sidewalks. As it turns out, the story isn't uncommon. According to the Surface Transportation Policy Project, walking is 36 times more dangerous per mile covered than driving. Consider this: Americans took about 1 out of 20 trips on foot, but 1 in 7 of all vehicle-related deaths are pedestrians. In a study comparing pedestrian fatalities in the U.S. and Europe, moreover, researchers found that the death rate per mile walked is 14 times higher in the U.S. than in Germany and the Netherlands.

The way in which many newer communities are designed, however, means the only way to visit a neighbor or get to the store on foot is to walk in the street. In sunbelt growth cities like Atlanta, Dallas and Miami, for example, pedestrian fatalities are far more common than in rustbelt cities like Milwaukee and Pittsburgh, which have a more walking-friendly infrastructure.

SEARCH FOR SOLUTIONS

While the health problems associated with growth seem to be intractable by-products of modern society, potential solutions are on the

table. In Santa Rosa, for instance, officials are taking steps to make sure the teen fatality tragedy isn't repeated, providing \$5 million to build new sidewalks and requiring schools to have safe, walkable routes.

Other steps suggested in the CDC report: setting and enforcing lower speed limits in urban areas (pedestrians hit by a car traveling 40 mph have a 15 percent chance of survival; at 20 mph, the odds leap to 95 percent) or using "traffic-calming" measures like speed bumps; using traffic signals to protect pedestrians in crosswalks; and providing over- or underpasses or tunnels for walkers and bikers to bypass particularly dangerous roads or intersections.

On a more global level, the agency outlined other ways for the public health sector to create healthier, more-livable communities, encouraging providers to join urban planners, architects, politicians and traffic engineers in the planning process and making developments more people-friendly by turning to mixed land use patterns that allow people to work, shop and recreate within walking distance of their homes.

Because they control much of the money for transportation and land use, states can also influence the process. "The perspective we have is to promote livable neighborhoods where people can walk or bike to the grocery store, to the library, to school," **Maine** Sen. Sharon Treat commented. "That's why we've worked on promoting downtown redevelopment and renovation [instead of] decentralized development."

One approach being tested, for example, is targeted school siting, a major community design component. Under a 2000 law, Maine school districts must work not only with the Department of Education but with state planners during the siting process and assess whether it is possible to locate schools near community centers or downtown areas. "We are trying to build in a preference for walkability," Treat said. ✦ **GA**

(To download a copy of the CDC report, go to <http://www.sprawlwatch.org>)

STATE HEALTH NOTES

FORUM FOR STATE HEALTH POLICY LEADERSHIP

Published biweekly (24 issues/yr.) by the FORUM FOR STATE HEALTH POLICY LEADERSHIP, an information and research center at the National Conference of State Legislatures in Washington, D.C.

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Howard Frumkin, M.D., chairman of the Environmental and Occupational Health Department at the Rollins School of Public Health at Emory University in Atlanta, has a special interest in the public health aspects of urban sprawl. In addition to his post at Emory, Frumkin, who has a doctorate in public health from Harvard University, sits on the board of the Environment Committee of Physicians for Social Responsibility and is directing a Centers for Disease Control and Prevention-funded project on “Communities of Excellence in Environmental Health.” In an interview, he discussed the health problems posed by sprawl.

Q: Why the sudden interest about possible connections between urban and suburban design and public health?

A: The real question is why it didn't happen sooner. For several decades, our country has grown in a pattern that includes heavy reliance on cars and on single uses of lands, and it's surprising that with such a thorough change in the form of the built environment, we haven't asked earlier what the health consequences of this are. The recent trigger may be recognition of [the twin epidemics] of obesity and diabetes.

Q: What do you see as the main health problems that might be connected with modern community design?

A: There is a whole set of health problems, and they are linked. Some relate to the way we use land, the fact that we build our buildings far apart from each other and segregate different uses. Some have to do with transportation, the fact that we drive everywhere. And some have to do with the social aspects of all of that, among them decreased physical activity, which results from replacing walking and bicycling with automobile travel. Air pollution in rapidly growing sun belt cities like Atlanta, Los Angeles and others has also become a major problem and a lot of that relates to motor vehicle traffic. Pedestrian fatalities [are an issue] because we are increasingly building roads that are pedestrian-hostile and automobile-friendly. Then there's the change in hydrology when we build, putting down lots of impermeable surface and removing tree cover, which has effects on both water quantity and water quality, which in turn can have health effects.

The mental health consequences of our transportation and land use decisions are also important. Road rage may be an indicator—the frustration and tension that go with long

HEALTH TALK

FRUMKIN: A DIALOGUE ON SPRAWL AND HEALTH

hours on the road. But of course, most people don't commit acts of road rage so that may be just the tip of the iceberg. There must be a larger reservoir of frustration and tension, and we don't know much about how that manifests itself. Then, there has been discussion about the connectedness among us, so-called social capital, trust and reciprocity. There's a case to be made for the idea that those things decline in sprawling neighborhoods. If it's true those things are good, that's another way in which land use and transportation decisions affect our health.

Q: What are the costs of the failure to plan without the pedestrian in mind?

A: Monetary costs? I can't [answer] that. Obesity is an example. Sprawl isn't the whole explanation for it. There are [diet] and activity issues, so you want to be cautious about assigning cost entirely to sprawl. There is a financial issue that's interesting, though. In Atlanta—and it is only one of many cities that demonstrates this pattern—land values are rising much more rapidly in town than in the suburbs, which suggests walkable neighborhoods are becoming more appealing to buyers. For decades, the main option for most American homebuyers, especially those worried about affordability, was a house in the suburbs. Now that older neighborhoods are being restored, there's huge interest in them, as demonstrated by the prices they command. So it may well be that we haven't had a good view of what Americans want because the options haven't been there.

Q: Some dispute the idea that sprawl affects public health, saying there's no scientific evidence to that effect and labeling the work of researchers like yourself 'junk science.' How do you respond?

A: There is science indicating a connection. Nobody can deny that if you move toward more automobile dependence, air pollution problems are aggravated. Nobody can deny that if you build pedestrian-hostile roads, there's a higher risk of pedestrian fatalities. On the other hand, there are many questions we need answers to. For example, what are the links between physical activity and the density and design of the built environment? If you build walkable neighbor-

hoods, will people walk more and lose weight and have less chance of getting diabetes?

At heart, all of us want the same thing: pleasant, livable, healthy, affordable, safe neighborhoods. The way to design those, especially at the beginning of a century in which the U.S. population is projected to double, is extremely important. I'm delighted we're opening a dialogue [between] the public health community and planners, homebuilders, developers and mortgage lenders so that we can figure out the best way to achieve widely shared social goals.

Q: What are examples of good design?

A: A lot of solutions go under the umbrella of smart growth, which involves both land use and transportation decisions. It also involves density—not *a la* New York City or Hong Kong but the scale of three- or four-story buildings or single-family houses balanced by preservation of green spaces, so that park land is available for everybody. It involves mixed land use so that residential, commercial, educational, recreational and retail facilities are close to each other, obviating the need to drive everywhere. And it involves transportation alternatives—not that we stop building roads but that we also construct sidewalks and bike paths, integrate different systems, so you can take your bike on a bus, take it off at the other end and continue biking.

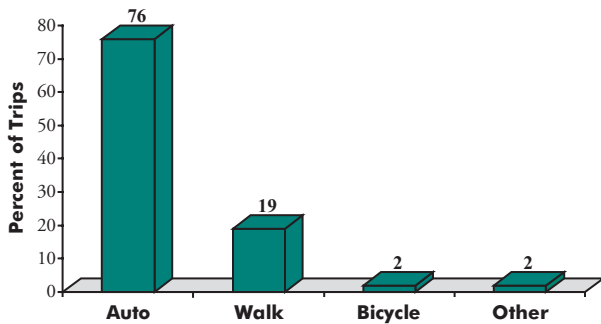
There's an agenda here that historical preservation people like, and it has to happen with community involvement to make it an open process. The bottom line is that smart growth may well be a public health intervention. If that's true, it's not new; it's simply rediscovering something that was standard wisdom a century ago when urban planners were very much public health people.

Q: What is the role for state legislators?

A: The challenge for us in public health is the same challenge that presents itself to state legislators, and that is cutting across disciplines. If you're on a public works committee and not a transportation committee, or if you're on a health committee and not a housing committee, work across the boundaries. Like every big institution, state legislatures have tended to build up silos, but people on health committees ought to understand that policy initiatives in transportation and land use are very much health initiatives. Also, put incentives in place. Much of this happens at the local level, and states can support creative, promising experiments at that level. ✦ GA

A Couch Potato Society?

Trips < 1 Mile by Mode of Transportation



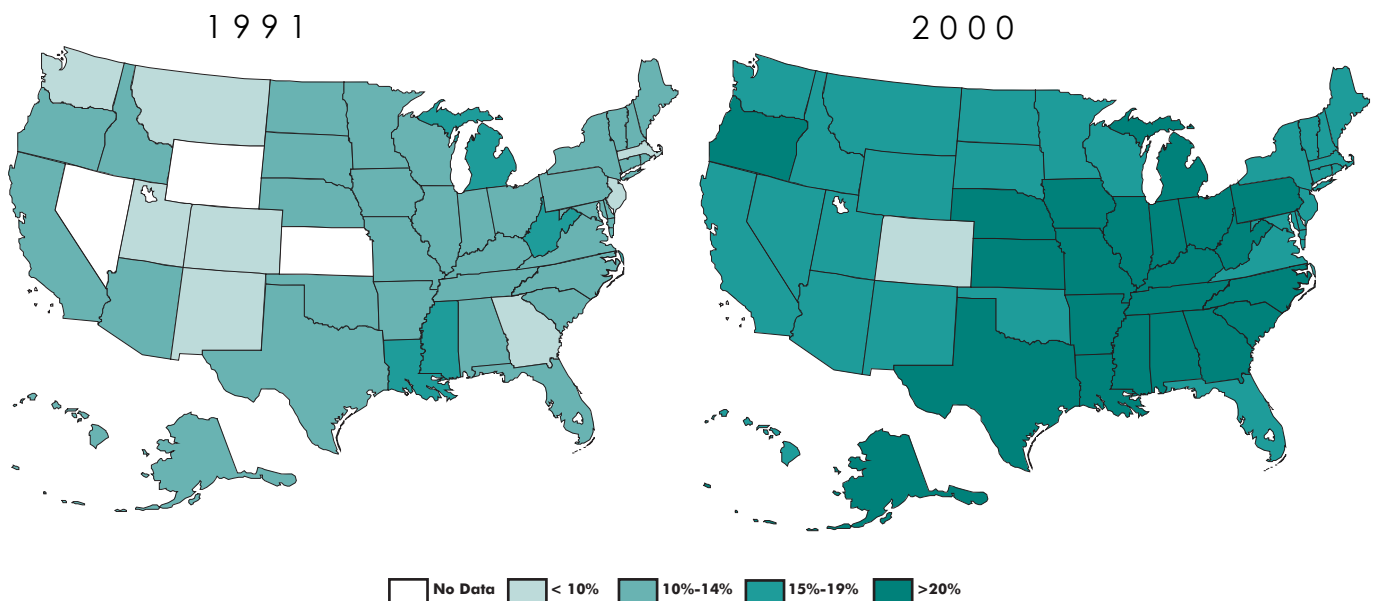
*Source: Nationwide Personal Transportation Survey, 1995.

Fast Facts

- * Since 1982, the U.S. population has increased 20%, but the time Americans spend in traffic has jumped an amazing 236%.
- * The average American driver spends 443 hours each year behind the wheel – the equivalent of 55 nine-hour days or 11 work weeks.
- * The number of trips the average American adult takes on foot each year dropped by 42 percent between 1975 and 1995.
- * Between 1986 and 1998, obesity among children has doubled. Fourteen million children—24 percent—between the ages of 2 and 17 are obese.
- * In 1997, smog pollution was responsible for more than 6 million asthma attacks, 159,000 visits to emergency rooms for the treatment of asthma attacks and 53,000 hospitalizations.

Obesity Trends Among U.S. Adults

(BMI > 30, or ~ 30 lbs overweight for 5'4" woman)



*Source: CDC, 2001.